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SYM1
PLAIN PACKAGING: EVIDENCE TO INFORM POLICY

Chair: David Hammond1
Presenters: Olivia M. Maynard2, Seema Mutti1, Crawford Moodie3, and James F. Thrasher4,5
Discussants: Melanie Wakefield6 and David Hammond1
1School of Public Health & Health Systems, University of Waterloo, Waterloo, Canada; 2School of Experimental Psychology, University of Bristol, UK; 3Centre for Tobacco Control Research, Institute for Social Marketing, University of Stirling, UK; 4Department of Health Promotion, Arnold School of Public Health, University of South Carolina, USA; 5Department of Tobacco Research, National Institute of Public Health, Mexico; 6Centre for Behavioural Research in Cancer, Cancer Council Victoria, Australia

Cigarette packaging represents an important form of promotion for tobacco companies. In December 2012, Australia will become the first jurisdiction in the world to implement “plain packaging.” The Australian regulations will prohibit colours, logos and other brand imagery from packs. Packs will display the brand name in a regulated font style and size, printed against a dark olive brown colour. The pack size and shape would also be standardized, as would the appearance and colour of cigarette sticks themselves. Health warnings and tax stamps would remain on packages as required by the government. The Australian regulations represent a novel measure for restricting tobacco industry marketing and will establish an international precedent in tobacco control policy. The current symposia will present data on the potential impact of plain packaging using a range of methodologies. First, Olivia Maynard will present data from an eye-tracking study that indicates that plain packaging may increase the salience of pictorial health warnings on packages. Second, Seema Mutti will report findings from an experimental study of branding and plain packaging among Mexican youth, as part of a larger international study being conducted in seven countries. Third, Crawford Moodie will present study findings from a novel methodology used to test the impact of packaging in “real world” settings among young women in Scotland. Finally, James F. Thrasher will provide some of the first evidence on the actual impact of plain packaging regulations in Australia using experimental data from Australia and Canada. Collectively, these studies will present evidence on the impact of package marketing and plain packaging policies using a diverse range of methodologies in very different cultural and tobacco control contexts. The evidence provides strong support for the plain packaging regulations in Australia and adds to the evidence base in other countries that are in the process of developing similar policies.

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SYM1A
VISUAL ATTENTION TO HEALTH WARNINGS ON PLAIN TOBACCO PACKAGING

Olivia M. Maynard, Ute Leonards, Nicole Roberts, and Marcus R. Munafò, School of Experimental Psychology, University of Bristol, UK

One of the ways in which plain packaging of cigarettes is expected to be an effective tobacco control measure is by making the health warnings more salient, therefore increasing visual attention to them. We present the findings from three studies designed to investigate the role of plain packaging in increasing attention to health warnings. In Study 1 (n=43), adult smokers and non-smokers viewed plain and branded packages of cigarettes while their eye movements were recorded. Results indicated that plain packaging increases visual attention to health warnings in adult non-smokers and weekly smokers, but not daily smokers. Study 2 (n=87), replicated Study 1 but in adolescents aged between 14 and 19. Results showed that plain packaging increased visual attention to health warnings among experimenters and weekly smokers. This was not observed among daily smokers, who looked equally at the health warnings and branding on both branded and plain packages or among never smokers, who looked at the health warnings more on both package types. Taken together, Studies 1 and 2 indicate that plain packaging might be effective in increasing attention to health warnings among non-established smokers, but not among regular daily smokers. Based on Studies 1 and 2, Study 3 (n=72) used fMRI and eye tracking to investigate the brain areas activated when participants viewed branded and plain packages of cigarettes, with a particular focus on areas in the brain areas linked to reward and threat processing.

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SYM1B
PERCEPTIONS OF BRANDED AND PLAIN CIGARETTE PACKAGING AMONG MEXICAN YOUTH

Seema Mutti1,2, David Hammond1, Jessica L. Reid1, Christine M. White2, and James F. Thrasher3,4, 1School of Public Health & Health Systems, University of Waterloo, Canada; 2Propel Centre for Population Health Impact, University of Waterloo, Canada; 3Department of Health Promotion, Arnold School of Public Health, University of South Carolina, USA; 4Department of Tobacco Research, National Institute of Public Health, Mexico

Background: Approximately 80% of the world’s smokers live in low-and middle-income countries such as Mexico. In light of bans on tobacco advertising and sponsorship in Mexico, the package has become even more important as a promotion vehicle. Plain packaging, which seeks to remove all brand imagery and standardize the shape and size of cigarette packs, represents a novel policy measure to reduce the promotional appeal of packaging among young people. The current study sought to examine the influence of branded and plain packaging on Mexican youth. Methods: An experimental study was conducted in Mexico City with smoking and non-smoking youth, 16 to 18 years of age (N=359). Respondents were randomly assigned to view cigarette packages in either a branded condition or a plain pack condition, in which all brand imagery and colours were removed from the branded pack, but the shape and size remained the same. Respondents viewed a series of 12 individual packs, one at a time, in random-order. Gender-specific packs were shown to males (n=174) and females (n=185). Respondents rated each pack on measures of brand appeal, taste, and harm to health, as well as positive smoker-image traits, such as ‘cool’, ‘popular’, and ‘stylish’. As a behavioural measure, respondents were offered one of four cigarette packs (either branded or plain, depending on their condition) and asked to select a pack to keep (no packs were actually given out). Findings: Branded packs were perceived to be more appealing (β=3.40, p<.001), contain better tasting cigarettes (β=3.53, p<.001), and be less harmful (β=0.12, p=.838) than plain packs. Branded packs were also associated with all seven positive smoker-image traits (β=2.10, p<.001). Packs with menthol flavour descriptors remained among the most appealing, even after removing all brand imagery, for both males and females. There was no difference in the proportion who accepted a pack when offered branded or plain packs (93.2% and 91.3%, p=.881). Conclusions: Plain packaging may reduce brand appeal among youth in Mexico. The findings are consistent with findings in high-income countries and support the implementation of plain packaging legislation.

National Institutes of Health (Grant #PO1 CA138-389-01: “Effectiveness of Tobacco Control Policies in High vs. Low Income Countries”). Additional support was provided by the National Institutes of Health (Grant #R01 CA167067) (Thrasher), the Propel Centre for Population Health Impact, a Canadian Institutes of Health Research New Investigator Award (Hammond), the CIHR Training Grant in Population Interventions for Chronic Disease Prevention (Mutti), and the Ontario Graduate Scholarship (Mutti).

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SYM1C  
YOUNG WOMEN SMOKERS’ EXPERIENCES OF USING PLAIN PACKS: A NATURALISTIC APPROACH

Crawford Moodie*, Susan Murray, and Anne Marie MacIntosh, Centre for Tobacco Control Research, Institute for Social Marketing, University of Stirling, UK

Aims: To explore young women’s experiences of using plain packs in real world settings. Methods: Naturalistic type research was employed, where participants from the six largest cities and towns in Scotland, used brown ‘plain’ cigarette packs for one week and their regular packs for one week. A total of 23 young women smokers aged 18-35 years participated in an interview to assess the impact of using plain packaging on pack perceptions, feelings about smoking, avoidant and smoking related behaviours. Results: In comparison to branded packaging, plain packaging was associated with more negative perceptions and feelings about the pack. Participants made comments about how they disliked the brown colour, which made them feel more embarrassed about the packs and about smoking in general. Engaging in avoidant behaviours, such as hiding the pack, was common when using the plain packs. Approximately a quarter of those interviewed reported smoking less and stubbing out cigarettes early when using the plain packs as the packs made the cigarettes feel less enjoyable, they decreased interest in smoking or because they highlighted the associated health risks. Conclusions: No research design can capture the true impact of plain packaging prior to its introduction but the findings from this study suggest that most young adult female smokers did not enjoy using plain packs, which reduced the appeal of packaging and of smoking and, in turn, resulted in greater engagement in avoidant behaviour and also reduce consumption.

Funding: Cancer Research UK.

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SYM1D  
EARLY EFFECTS OF THE AUSTRALIAN PLAIN PACKAGING POLICY ON ADULT SMOKERS

James F. Thrasher**,1,2, David Hammond*, Ron Borland¹, Hua Yong¹, and Richard O’Connor¹, Department of Health Promotion, Arnold School of Public Health, University of South Carolina, USA; ¹Department of Tobacco Research, National Institute of Public Health, Mexico; ²School of Public Health & Health Systems, University of Waterloo, Canada; ³Cancer Council Victoria, Australia; ²Roswell Park Cancer Institute, New York, USA

Background: On December 1, 2012, Australia will become the first country in the world to implement a plain cigarette packaging policy, and it will be accompanied by new pictorial health warning labels (HWLs) that cover 75% of the front and 90% of the back of cigarette packs. This policy is expected to reduce brand appeal and enhance the effects of HWLs. Canada recently introduced new pictorial HWLs that are comparable in size to the Australian HWLs (75% of front and back of the pack), making it a suitable comparison country for assessing the impact of the Australian policy. Objective: To determine effects of plain packaging on adult smokers’ perceptions of their brand and of HWLs on cigarette packs. Methods: A quasi-experimental study is being conducted with data from online consumer panels of adult smokers in Australia and Canada. Approximately 1000 participants in each country will complete the survey both before (September 2012) and after (January 2013) plain packaging policy implementation, with 50% follow-up of the samples and sample replenishment to maintain sample size at each wave. Survey domains include: perceptions of preferred brand relative to other brands (i.e., prestige, stylishness, satisfaction, pleasure, taste, harshness, harm); affective, cognitive and behavioral responses to HWLs (e.g., HWL salience; thoughts about risks and quitting due to HWLs; personal risk perceptions; quit-related expectancies; quit-related behaviors); and the social acceptability of smoking (e.g., cues from network members to quit; embarrassment about smoking in front of others). Generalized estimating equations will be used to determine changes in key study variables over time and to test interactions that allow assessment of different time-dependent changes across countries. Conclusions: The results from this study will provide an early assessment of the impact on adult smokers of the innovative and world-precedent setting Australian plain packaging policy. The results should help inform efforts to combat tobacco use in countries considering this policy and in the future evolution of the Framework Convention on Tobacco Control.

Funding: NIH/NCI (R01 CA167067 & P01 CA138389).

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SYM2  
MICE TO MEN: BASIC SCIENCE AND PRECLINICAL RESEARCH INFORMING DRUG DISCOVERY AND DEVELOPMENT THROUGH NOVEL MOLECULAR TARGETS

Chair: Joni L. Rutter, Ph.D.¹
Presenters: Marina R. Picciotto, Ph.D.;² Paul J. Kenny, Ph.D.;³ L. Elliot Hong, M.D.;³ and Ronald P. Hart, Ph.D.⁴
Discussant: Joni L. Rutter, Ph.D.¹
¹National Institute on Drug Abuse, NIH; ²Yale University; ³The Scripps Research Institute; ⁴University of Maryland School of Medicine; ⁵Rutgers University

Tobacco smoking is the primary avoidable cause of death in the US, yet tobacco dependence remains prevalent in ~20% of the population. Nicotine is a major component of tobacco smoke and exerts its actions on the nicotinic acetylcholine receptors. Alpha4beta2 subunits are the most prevalent in the brain, where a4b2nAChRs within the ventral tegmental area regulate the stimulatory effects of nicotine, and ultimately to their rewarding properties. In addition, the medial habenula and the interpeduncular nucleus pathway is emerging as a key circuit for regulating nicotine intake. Mouse models, imaging, induced pluripotent stem cells, and other approaches are providing us with a greater understanding of the genetic, molecular, and circuit-level mechanisms, culminating in a number of new avenues for understanding how to address the problem of nicotine dependence. This symposium is a follow-on to the symposium entitled “Bench to bedside: Translation of basic, pre-clinical and omics-based discovery to prevention and treatment of smoking and smoking related diseases,” which discussed how genome-wide association studies (GWAS) have identified and replicated an association of a common single nucleotide variant on chromosome 15q25 with nicotine dependence, as well as long term consequences of nicotine dependence, such as chronic obstructive pulmonary disease and certain types of lung cancer. This symposium will build upon the genetics findings to date by describing how those genetic changes cause functional consequences that lead to smoking behaviors and smoking related diseases. The speakers will present new technologies and approaches for studying the neurobiology and behaviors related to nicotine addiction.

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SYM2A  
ROLE OF NACHRs AND GENE VARIANTS IN MOLECULAR AND CIRCUIT-LEVEL MECHANISMS UNDERLYING NICOTINE’S EFFECTS

Marina R. Picciotto, Ph.D., Yale University

Tobacco smoking is still the primary avoidable cause of death in the developed world. Nicotine in tobacco is critical for ongoing smoking behavior and is the primary addictive component of tobacco smoke. Nicotine exerts its actions in the brain by binding to a family of nicotinic acetylcholine receptors (nAChrRs) composed of the alpha2-4 and beta2-4 subunits. These nAChRs can be both activated and desensitized by nicotine and are expressed in different subsets of neurons throughout the brain. The nAChRs expressed in the ventral tegmental area (VTA) are essential for the primary rewarding and reinforcing properties of nicotine, whereas nAChRs expressed in other pathways, such as the medial habenula (Mhb) to interpeduncular nucleus (IPN) pathway, can oppose the rewarding effects of nicotine and also appear to be involved in the aversive aspects of nicotine withdrawal. Both common and rare variants of genes encoding nAChR subunits have been identified in human subjects. One single nucleotide polymorphism (SNP) in the CHRNAS gene encoding the alpha5 nAChR subunit...
increases the risk of tobacco dependence by ~30% in individuals carrying a single copy of the variant, and more than doubles the risk in those carrying two risk alleles. In addition, rare SNPs have been identified in the beta4 subunit that appear to decrease the likelihood of smoking. Overall, the identification of these molecular and circuit-level mechanisms underlying the effects of nicotine provides new avenues for understanding how to promote smoking cessation.

This work was supported by R01DA14214.

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SYM2B

USING BEHAVIORAL GENETICS AND MOLECULAR APPROACHES TO UNDERSTAND NICOTINE REINFORCEMENT AND IDENTIFY NEW TARGETS FOR MEDICATIONS DEVELOPMENT

Paul J. Kenny, Ph.D., The Scripps Research Institute

Nicotine is considered the major component of tobacco smoke responsible for addiction. Nicotine exerts its actions in the brain through nicotinic acetylcholine receptors (nAChRs), with those containing the o4 and o2 subunits (denoted as o4β2* nAChRs) the most prevalent in the central nervous system. o4β2* nAChRs within the ventral terminal area (VTA) regulate the stimulatory effects of nicotine on mesocumbens dopamine transmission, which is considered a key action of nicotine central to its reinforcing properties. The habenula complex, comprised of media and lateral domains and densely expressing nicotinic acetylcholine receptors (nAChRs), is emerging as an important brain structure that regulates reward and motivation. Here, we will present evidence suggesting that nAChRs in the medial habenula (MHb), and its major site of projection, the interpeduncular nucleus (IPN), play a key role in regulating nicotine intake. Specifically, we will show that o5* and o3* nAChRs in the MHb-IPN system control nicotine intake by regulating the inhibitory effects of higher nicotine doses on brain reward systems (i.e., aversive properties of nicotine). We will also present new findings suggesting that the neuropeptide hypocretin (orexin), already known to regulate the reinforcing properties of all major drugs of abuse, controls nicotine intake by modulating the activation state of the lateral habenula (LHb) in response to nicotine intake. Specifically, we will show that activation of the LHb in response to nicotine decreases the amount of effort that rodents will expend in order to obtain the drug. Moreover, hypocretin transmission at hypocretin-1 receptors (Hrc1R), also known as orexin-1 receptors (OX1R), limits activation of the LHb in response to nicotine and thereby facilitates nicotine-seeking behaviors. Taken together, these findings represent important advances in our understanding of the mechanisms of nicotine reinforcement as they elucidate important new brain sites involved in regulating intake. Moreover, these findings identify new targets for medications development for tobacco dependence.

This work was supported by a grant from the National Institute on Drug Abuse; R01DA020866.

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SYM2C

IMAGING IN HUMANS WITH AND WITHOUT GENETIC VARIANTS ASSOCIATED WITH SMOKING

L. Elliot Hong, M.D., University of Maryland School of Medicine

Whole genome searches have identified smoking-related variants in the nicotinic acetylcholine receptor (nAChR) c5-c3-j4 gene cluster. A key functional nAChR alpha5 gene variant Asp398Asn is also associated with an anterior cingulate - ventral striatum / extended amygdala circuit (Hong et al., 2010). However, this single gene – single circuit model, although statistically significant, explained only a small portion of the variance of the smoking behavior and many heavy smokers do not share this genetic variant. We use nAChR alpha5 gene as the starting point to examine other genetic variants in the nAChR pathway. nAChR activation triggers downstream events in part through dopaminergic pathway and activating ion channels especially calcium channels. We identified additional genetic effects from dopaminergic and calcium channel gene variants that, together with the nAChR alpha5 gene variant, explain a significantly higher proportion of the overall smoking behavior. Using fMRI, we found that additional functional brain circuits associated with the dopaminergic and calcium channel gene variants appear to additively contribute to the functional circuits associated with nicotine addiction. Despite this effort, a substantial amount of the variance in smoking behavior remained unaccounted for by these genetic variants, especially in psychiatric patients who tend to have heavy smoking. Instead, we found that some of the genetically derived functional brain circuits are closely overlapped with those identified based on psychiatric illness phenotypes. In conclusion, we have identified in vivo circuit-based functional imaging bioassays linked to genetic variants in the nAChR – dopamine – calcium channel pathway. We also identified overlapping brain circuits that contribute to smoking in patients with mental illnesses that are not directly linked to these genes. We attempt to use these findings to construct a more comprehensive, brain circuitry based model to explain the key genetic and clinical variances associated with human nicotine addiction.

This work was supported by grants R01DA027680, R21DA033817 and R01MH085646.

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SYM2D

ANALYSIS OF HUMAN IPS CELLS CARRYING ADDICTION-ASSOCIATED GENE VARIANTS

Ronald P. Hart, Ph.D., Rutgers University

The pathogenesis of drugs associated with abuse behavior, including nicotine and opioids, remains elusive in humans because studies of the human brain are limited to functional brain imaging and post-mortem analysis. These types of analyses make it difficult or impossible to prove hypotheses directly since the system usually cannot be manipulated or sufficiently controlled. A large number of genetic variants have been identified to be risk factors for addictive behavior in human, however, relatively little is known about how these genetic variations impact the development of addictive behavior in humans. Recent advances in stem cell biology allow construction of induced pluripotent stem cells (iPSC) from adult cells derived from addicted individuals carrying identified genetic variants and provide possibilities for developing cell-based models of addiction. We prepared 16 iPSC lines from cryopreserved lymphocytes collected from subjects with known addiction behaviors and identified genetic variants. We chose to focus on two SNPs related to the CHRNA5 nicotinic receptor alpha5, one of which causes a change from aspartate to asparagine in amino acid 398 (D398N). A second SNP causes increased levels of CHRNA5 mRNA. A third group includes mutations in the OPRM1 gene, encoding the opioid receptor mu1 subunit, and a fourth group consisted of unaffected controls with none of the mutations listed. All iPSC have been extensively characterized to demonstrate pluripotency. Reprogramming was accomplished with Sendai viral vectors so that iPSC lines have no detectable viral genome after ~12 passages. These cells can produce neuronal cultures by culturing with growth factors or by direct induction with selected transcription factors. We will present evidence describing functional, cellular properties of neurons derived from these iPSC, including gene expression changes, calcium response, and electrophysiology, in response to ligand challenge. Our goal is to establish culture models of human neurons from addicted individuals in order to understand the mechanisms altered by risk variants.

This work was supported by NIH R21 DA032984-01 and U24 MH068457.

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FINDING AND INTERPRETING COCHRANE AND OTHER META-ANALYSES AND SYSTEMATIC REVIEWS

Chair: Robert West1
Presenters: Judith J. Prochaska2, Lindsay F. Stead2, and Jamie Hartmann-Boice2
Discussant: John Hughes3

1Health Behaviour Research Centre, University College London, UK; 2Cochrane Tobacco Addiction Group, University of Oxford, UK; 3 Departments of Psychiatry, Psychology and Family Practice, University of Vermont

Clinicians and scientists need to be aware of all the evidence informing a clinical problem or research project. Relying on the most recent, largest, or highest profile trial may give a misleading view of treatment effects. High quality meta-analyses benefit clinical practice and research, and finding and interpreting systematic reviews and meta-analyses is a necessary skill. This symposium will (1) educate tobacco scientists about using the resources in the Cochrane Library to evaluate the robustness of efficacy claims, (2) help tobacco scientists reach a conclusion when two seemingly well-done meta-analyses differ in their conclusions. The first presenter explains the rationale underlying the standard methods used by Cochrane Tobacco Addiction Group for meta-analyses of cessation interventions. It will cover the choices made about the inclusion criteria such as use of 6-month follow-ups, use of unpublished studies, use of relative risks rather than odds ratios, treatment of missing data, exploration of other sources of bias, and when not to conduct a meta-analysis at all. The second presenter will discuss what to look for when meta-analyses contradict each other; e.g., how missing data are handled and rigidity of inclusion criteria, and use of OR vs RR. The final presentation will focus on using the Cochrane Library to inform work on tobacco, explaining key features for researchers, clinicians and policy-makers. It will describe the updating process and how to identify key changes in already published reviews. It will describe the comprehensive databases of other meta-analyses, methodological articles, and economic databases hosted on the Library, and explain the best methods for navigating the Library and its content.

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CHOICES IN THE METHODOLOGY OF SYSTEMATIC REVIEWS: IMPLICATIONS FOR STUDY CONCLUSIONS

Lindsay F. Stead, Tobacco Addiction Group, Department of Primary Care Health Sciences, University of Oxford

The Cochrane Tobacco Addiction Group aims to address topics that are relevant to clinicians, synthesise high quality research using bias free methods, report important outcomes, and stay current. This presentation will explain the methodology for a typical systematic review of a cessation intervention, outlining the way in which decisions that are made around the following questions: How best can we group studies into useful reviews given the range of Populations, Interventions, Comparators and Outcomes covered in tobacco research? Which outcomes should we pool? Should we prefer sustained or non-sustained abstinence? Should unpublished studies be included? Should we require a minimum length of follow-up for study inclusion? Which outcomes should we pool? Should we prefer sustained or point prevalence cessation outcomes? What assumptions can be made about losses to follow-up? What are the arguments in favour of summarising study effects as risk ratios rather than odds ratios or risk differences? How important is biochemical validation of cessation, and does this depend on the type or setting of the intervention? When is it (in)appropriate to do meta-analysis? How do we deal with clinical or statistical heterogeneity? Can subgroups help to resolve problems with interpretation? Can sensitivity analyses confirm robustness of the results to different choices and assumptions? Finally, do all these choices affect the conclusions of the reviews, and can they explain the differences when Cochrane reviews have different conclusions to other reviews?

Funding: NHS National Institute for Health Research.

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RECONCILING DISCREPANT FINDINGS IN META-ANALYSES: CASE EXAMPLES WITH CRITICAL EXAMINATION

Judith J. Prochaska, Ph.D., M.P.H., Stanford Prevention Research Center, Department of Medicine, Stanford University

Systematic reviews and meta-analyses aim to summarize the state of science in a defined research arena and often are used to inform clinical practice guidelines and ultimately shape clinician behavior. As with all research, the value of a quantitative review depends on the methods of study selection, the analytic procedure, and the accuracy and clarity of reporting. The Cochrane Collaborative and PRISMA (Preferred Reporting Items of Systematic reviews and Meta-Analyses) checklist aim to standardize transparent and complete reporting of systematic reviews and meta-analyses. Yet, variability exists, and ultimately meta-analyses are directly influenced by decisions in the methods and procedures applied. This presentation will focus on methodologic and analytic considerations that contribute to discrepancies in meta-analyses including differences in inclusion and exclusion criteria; variability in study design; comparison to active versus inactive control groups; length of follow-up epoch; choice of summary statistic; selection of subgroup analyses, such as funding source and quality; and within study versus across study comparisons of treatment effects. Case examples will be presented from the tobacco control field with attendee involvement to identify key factors leading to differences in conclusions. Examined cases will include meta-analyses on the relationship between smoking and the development of Alzheimer’s disease (Almeida 2002 Addiction v. Csetal 2010 J Alzheimers Dis), the relative efficacy of single versus combination nicotine replacement therapies (Stead 2008 Cochrane v. Mills 2012 Ann of Med), varenicline and the risk of cardiovascular serious adverse events (Singh 2011 CMAJ v. Prochaska 2012 BMJ), and an update on tobacco cessation interventions in addiction treatment settings (Prochaska 2004 JCP). Attendees will gain an appreciation of key decision points in meta-analyses and the potential implications for study conclusions.

Funding provided by the California Tobacco Related Disease Research Program #21BT-0018.

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USING THE COCHRANE LIBRARY TO INFORM WORK ON TOBACCO: KEY FEATURES EXPLAINED

Jamie Hartmann-Boice, Cochrane Tobacco Addiction Group, University of Oxford

This presentation will explain key features of the Cochrane Database of Systematic Reviews including how to identify planned reviews, new reviews, updated reviews, and reviews with important changes. We will outline the scope of topics covered by tobacco addiction group reviews and demonstrate how to find those that cover interventions or populations of interest. We will describe future plans to identify research that will be relevant to reviews by coding trial registration details so that all reviews include a comprehensive list of ongoing studies that can be expected to contribute data. In addition to the Cochrane Database of Systematic Reviews, the Cochrane Library includes a range of other useful resources, and the second part of this session will focus on how researchers and policy makers can use these to aid their work. These include: The Cochrane Central Register of Controlled Trials, which acts as an index of published articles taken from bibliographic databases and other published and unpublished sources; the Database of Abstracts of Reviews of Effects, which contains abstracts of systematic reviews that have been quality-assessed; the Cochrane Methodology Register, a bibliography of publications that report on methods used in the conduct of controlled trials; the NHS Economic Evaluation Database, which systematically identifies and assesses economic evaluations from around the world; and the Health Technology Assessment Database, which brings together details of completed and ongoing health technology assessments.

Funding: NHS National Institute for Health Research.

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SYM4
ENGAGING AMERICAN INDIONS AND ALASKA NATIVES IN TOBACCO CONTROL RESEARCH

Chair: Jeffrey A. Henderson, M.D., M.P.H.*

Presenters: Jeffrey A. Henderson, M.D., M.P.H.*, Steven S. Fu, M.D., M.S.C.E.,
Caroline C. Renner, M.P.H., CTT5, and Stevens S. Smith, Ph.D.*

Discussant: Patricia Nez Henderson, M.D., M.P.H.*

1Black Hills Center for American Indian Health; 2Center for Chronic Disease and Outcomes Research, Minneapolis Veterans Affairs Medical Center; 3Alaska Native Tribal Health Consortium; 4University of Wisconsin, Center For Tobacco Research and Intervention

American Indians and Alaska Natives have some of the highest rates of commercial tobacco use in the country. Tobacco-related research can be especially challenging given the complexity of tobacco issues, such as the importance of keeping tobacco sacred in the Native community. Although there is a high prevalence of cigarette smoking, data reveal that many would like to quit. This symposium will highlight how to work within Native communities in culturally appropriate and respectful ways in order to further engage the members of this special population in tobacco-related research, including randomized controlled trials. The session will begin with the Chair providing an overview of tobacco control efforts in Native communities. Dr. Fu will present qualitative findings on American Indian’s opinions about innovative strategies for engaging smokers in evidence-based treatment and attitudes towards participating in cessation programs. Ms. Renner will share valuable experience working with the Alaska Native community in the Nicotine Exposure Metabolism Study, and highlight community engagement approaches that were used to conduct the research. Dr. Smith will share findings and experiences from clinical trial work with the Menominee Indian Tribe of Wisconsin. This research example will provide insight into the myriad challenges on working within an American Indian Tribe when doing clinical trial research. Finally, Dr. Nez Henderson will briefly summarize the three presentations and lead a discussion on the challenges and lessons learned in working within American Indian/Alaska Native populations on tobacco control research.

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SYM4A
THE LAY OF THE LAND IN TOBACCO CONTROL IN AMERICAN INDIAN AND ALASKA NATIVE POPULATIONS

Jeffrey A. Henderson, M.D., M.P.H.*, Black Hills Center for American Indian Health, Rapid City, SD

There are many unique differences between American Indian/Alaska Native populations and other racial/ethnic groups that bear importantly on tobacco control and related research efforts. The author will briefly discuss several of these differences and explain their consequences for tobacco control efforts.

No funding.

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SYM4B
DESIGNING AND EVALUATING CULTURALLY APPROPRIATE SMOKING CESSION INTERVENTIONS FOR AMERICAN INDIAN COMMUNITIES

Steven S. Fu, M.D., M.S.C.E.*,2, Kris Rhodes, M.P.H.,2,4 Christina Roberts, Ph.D.,1, Rachel Widome, Ph.D.,2,3, Jean L. Forster, PhD.,1 Anne M. Joseph, M.D., M.P.H.2, VHA HSR&D Center for Chronic Disease Outcomes Research, Department of Veterans Affairs Medical Center, Minneapolis, MN; University of Minnesota School of Public Health, Division of Epidemiology & Community Health, Minneapolis, MN; American Indian Cancer Foundation, Minneapolis, MN

There are few randomized controlled trials of culturally appropriate smoking cessation interventions to guide clinical practice for American Indian communities. We assessed American Indian’s opinions about innovative strategies for engaging smokers in evidence-based treatment and attitudes towards participating in tobacco treatment clinical trials. Methods: 6 focus groups were conducted separated by smoking status (current or former smoker), sex (male and female), and elder status (55 years and older or younger) in the meeting spaces of American Indian community organizations. This project was accomplished in partnership with the American Indian Community Tobacco Projects, an established community-academic research partnership based within the University of Minnesota. Results: Several key findings emerged. First, there was a strong preference for smoking cessation programs to be led by American Indian community members who are trained quit smoking experts. Second, participants expressed interest in connecting with other American Indian smokers interested in quitting and wanted programs to promote a healthy living lifestyle. Third, strategies to enhance engagement in evidence-based treatment endorsed by participants included provision of free pharmacotherapy, including NRT, nominal incentives (preferably gift cards to assist with daily living expenses), and culturally-specific program components such as identifiable American Indian images, education around traditional tobacco use, quit smoking messages that capitalize on the intrinsic value of family and extended family and the use of narratives or story telling in recruitment and program materials. Participants’ views towards clinical trial research will also be presented. Conclusions: Rigorously conducted randomized controlled trials of culturally appropriate smoking cessation interventions are sorely needed but will only be accomplished with the sincere commitment of funders, researchers, and communities in the recognition of the resources needed to establish collaborative relationships based on trust and credibility which are critical to successfully conduct research with American Indian communities.

The study was funded by the University of Minnesota Masonic Cancer Center VA Health Services Research and Development.

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SYM4C
COMMUNITY BASED PARTICIPATORY RESEARCH METHODS EMPLOYED AMONG ALASKA NATIVE RURAL COMMUNITIES TO STUDY EXPOSURE TO NICOTINE AND CARCINOGENS AND GENETIC VARIATION AMONG ALASKAN NATIVE CIGARETTE SMOKERS AND SMOKELESS TOBACCO USERS

Caroline C. Renner, M.P.H., CTT5, Alaska Native Medical Center, Cardiology Research and Program Development

Community Based Participatory Research (CBPR) is infrequently employed among Alaska Native communities. The prevalence of tobacco use among Alaska Native (AN) people is among the highest of any ethnic group in the United States. This study was a CBPR project initiated by regional Alaska Native health leaders and a multidisciplinary academic team of scientists to better understand factors that may be associated with the high rates of tobacco use and cancer. We will describe the methods and actions by which the research was planned, designed, approved, and conducted working with and among Alaska Native people and how the study aims, data collection tools and consents were jointly written to answer the questions of importance to both the AN and scientific communities. Further, we will outline how communication over the study timeline included working side by side with community members to enable the team to determine levels of carcinogens and nicotine in smokeless and smoked tobacco products, including a locally homemade product, iqmil, and biomarkers of exposure associated with use.
of these products for the first time. We will also describe how, at the request of the community, genetic profiles associated with nicotine and carcinogen metabolism among the AN population was undertaken, and how long term specimen storage activities are leading to the next steps for the team.

The study was co-funded by the National Institute of Drug Abuse and National Cancer Institute.

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SYM4D
CULTURALLY TAILORED SMOKE CESSATION FOR ADULT AMERICAN INDIAN SMOKERS: THE MENOMINEE SMOKE CESSATION CLINICAL TRIAL

Stevens S. Smith, Ph.D.1,*, Leah Arndt, Ph.D.2, Mark Caskey, B.S., R.N.3, J. Kevin Culhane, M.D.1, Jodi Fossum, M.A.1, Jerly Waukau, B.A.1, and Rick Strickland, M.A.1, 1Department of Medicine and Center for Tobacco Research and Intervention, University of Wisconsin School of Medicine and Public Health, Madison, WI; 2Department of Educational Psychology, University of Wisconsin-Milwaukee; 3Menominee Tribal Clinic, Menominee Indian Tribe of Wisconsin, Keshena, WI; 4UW Spirit of EAGLES, Carbone Cancer Center, University of Wisconsin School of Medicine and Public Health, Madison, WI.

Smoking prevalence rates are disproportionately high in many American Indian/ Alaska Native (AI/AN) communities. Effective smoke cessation interventions tailored for AI/AN smokers are needed to reduce the personal and community harms associated with commercial tobacco use. In 2005, the Menominee Indian Tribe of Wisconsin initiated a research partnership with the University of Wisconsin to improve smoking cessation treatment. The Menominee Smoke Cessation Clinical Trial (or START Project – “Stop Tobacco Abuse, Renew Tradition”) is a collaborative, community-engaged project that developed and tested a Culturally-Tailored Treatment (CTT) for AI/AN smokers in the Menominee Tribal community. The 3-year START project combined a qualitative randomized clinical trial with qualitative data collection at baseline and end of study (6 months). In this study, a total of 103 adult AI smokers at the Menominee Tribal Clinic were randomized to receive either CTT or Standard Treatment (ST). All participants received FDA-approved cessation medication (varenicline) and four counseling sessions. The primary quantitative study outcome was biochemically-confirmed, self-reported 7-day point-prevalence abstinence (PPA) at key study end-points including 3 and 6 months post-quit. The baseline qualitative interview focused on participants’ early experiences with commercial tobacco and how they became a regular smoker; their relationship with tobacco; how various areas of their life (mental, physical, spiritual, and emotional) have been affected by tobacco; and their knowledge of traditional tobacco. The 6-month interview included questions about participants’ experiences in making a quit attempt; how the quit attempt has affected their life and what it means to be able to quit smoking; any changes in their relationship with tobacco in the past six months (i.e., during study participation); and any other thoughts about commercial or traditional tobacco. The study was completed in November, 2011; key quantitative and qualitative outcomes will be presented along with discussion of the successful collaboration between the Menominee Tribe and the academic partners.

The START study was funded by the Wisconsin Partnership Program of the University of Wisconsin (UW) School of Medicine and Public Health with additional support from the “Spirit of Eagles Community Network Program” (U54 CA153605; PI, Dr. Kaur, Mayo College of Medicine), the UW Carbone Cancer Center, and the UW Center for Tobacco Research and Intervention.

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SYM5
DEVELOPMENTAL CHANGES IN ATTENTION AND AROUSAL AMONG TOBACCO EXPOSED CHILDREN

Chair: Rina D. Elden, Ph.D.*1
Presenters: Laura Stroud, Ph.D.1, Daniel Rodriguez, Ph.D.1, George Papandonatos, Ph.D.1, Amy Salisbury, Ph.D.1, Nicki Aabouchon-Endsley, Ph.D.1, Barry Lester, Ph.D.1, and Raymond Niaura, Ph.D.1, 1State University of New York at Buffalo; 2Brown University; 3American Legacy Foundation; 4Emory University School of Medicine; 5Emory University; 6University of Nebraska-Lincoln; 7Northwestern University; 8University of Oregon; 9Buffalo State College

Prenatal (PTE) and postnatal (PSTE) tobacco exposure is a significant public health issue that may have profound effects on development of arousal and attention systems in early childhood. Indeed, alterations in these systems may be one pathway to higher risk for conduct disorder and cigarette use among these children. However, little is known about how PTE and PSTE may influence these systems in early childhood, about developmental changes in these systems, or about mediators/moderators of these associations. This symposium will present results from four cutting edge prospective studies of cigarette exposure with papers spanning early childhood periods from neonates, infants, toddlers, to preschool age. Dr. Stroud will present on the association between PTE and trajectories of newborn attention over the first month of life. Results indicated lower attention among cigarette exposed neonates compared to controls, and significant dose response associations. Ms. Shisler will present data on the association between tobacco exposure and infant focused attention at 9 months of age. Both PTE and PSTE were significantly associated with lower focused attention in infancy. Birth head circumference and infant behavioral reactivity during a frustration task moderated these associations in different ways. Dr. Coles will present data on PTE and behavioral regulation among 24 month old toddlers. Tobacco exposed toddlers were reported by their mothers as exhibiting higher externalizing and total behavior problems. Results also indicated that the association between PTE and behavior problems varied as a function of child gender. Finally, Dr. Garza will present on the association between PTE and executive control among preschoolers. Tobacco exposed preschoolers exhibited deficits in set shifting for stimuli that engage basic cognitive skills but these differences were particularly marked for emotionally laden stimuli. Results suggest that processing of emotionally laden stimuli may interfere with basic cognitive abilities among these children. Dr. Schuetze will place these findings in a developmental context and discuss the clinical significance of these findings.

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SYM5A
MATERNAL SMOKE DURING PREGNANCY: EFFECTS ON TRAJECTORIES OF NEWBORN ATTENTION OVER THE FIRST MONTH OF LIFE

Laura Stroud, Ph.D.1,*, George Papandonatos, Ph.D.1, Daniel Rodriguez, Ph.D.1, Amy Salisbury, Ph.D.1, Nicki Aabouchon-Endsley, Ph.D.1, Barry Lester, Ph.D.1, and Raymond Niaura, Ph.D.1, 1State University; 2Brown University; 3American Legacy Foundation

Maternal smoking during pregnancy (MSDP) has been linked to attention deficits and ADHD in child and adolescent offspring. However, little is known regarding effects of MSDP on the emergence of attention deficits in the early neonatal period. Also lacking are studies using observational measures of infant attention and rigorous measures of MSDP. We conducted an intensive, prospective, longitudinal study of MSDP and trajectories of newborn attention over the first month of life. Participants were 97 mothers (51% smokers) from a diverse, low-income sample (Mage=25, SD=5; 43% Caucasian; 42% low income), and their infants (ages 0-32 days). MSDP was assessed prospectively by Timeline Followback and confirmed by maternal saliva cotinine. Neonatal attention was assessed with the NICU Network Neurobehavioral Scale (NNNS) administered at days 0, 1, 2, 3-4, 5, 10, and 30. Mean daily cigarettes and cotinine over pregnancy were utilized for dose response. Data were analyzed with latent growth
RESULTS reveal persistent effects of MSDP on neonatal orientation throughout infancy and childhood and interaction with familial contextual factors. Determining the developmental course of MSDP-induced attention deficits over infancy and childhood and interaction with familial contextual factors are needed to determine the developmental course of MSDP-induced attention deficits over infancy and childhood and interaction with familial contextual factors. Modeling (LGM) with MLR estimation fitted for repeated NNNS attention scores, accounting for individually varying observation times and controlling for maternal demographics and substance use. We found a significant influence of MSDP exposure on neonatal attention. Compared to unexposed infants, exposed infants had lower attention over the first month (beta= -7.9, z= -3.16, p<.002); however, groups did not differ on rates of change in attention over the first month. Significant dose response relations emerged for maternal daily smoking (beta= -.35, z= -3.15, p<.002) and maternal cotinine (beta= -.26, z= -2.26, p=.01) with neonatal attention. Results reveal persistent effects of MSDP on neonatal orientation throughout the first month, suggesting neurotoxic effects of MSDP rather than acute effects of nicotine or its withdrawal. Longer term prospective studies are needed to determine the developmental course of MSDP-induced attention deficits over infancy and childhood and interaction with familial contextual factors.

Funding: NIHNIDA Grant # R01 DA019558-05 and a FAMRI Clinical Innovator Award.

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SYM5C
EFFECTS OF PRENATAL TOBACCO EXPOSURE AND GENDER ON BEHAVIOR REGULATION AT 24 MONTHS
Claire D. Coles, Ph.D.*, Julie A. Kable, Ph.D., and Mary Ellen Lynch, Ph.D., Emory University

Prenatal tobacco exposure (PTE) is associated with arousal dysregulation and behavior problems, including ADHD, antisocial behavior and criminality. Whether these behaviors result solely from PTE or are influenced by environmental and family differences is not yet resolved making investigation of factors that potentiate or mitigate such effects important. In the current study, we examined the impact of different levels of PTE on behavior regulation of 203 24-month-olds controlling for parental SES, child’s age, gender, cognitive and language function. Mothers were recruited post partum and PTE measured through self-report and urine cotinine. To evaluate the impact of exposure on the development of behavior regulation, the Child Behavior Checklist was completed by the child’s caregiver at 2-year follow-up. MANCOVA was used with PTE level (3 Levels: None; <10 cigarettes/day; >10 cigarettes/day) and Gender (Male/Female) as Factors while controlling for SES, age, cognitive and language function. Most children were rated in the average range compared with same age peers but higher (more problematic) T-scores were noted related to tobacco exposure and gender. Significant main effects for Tobacco on Externalizing (F(2,195)=3.16, p<.05) and Total Behavior Problems (F(2,195)=3.19, p<.04) was found, with children with greater PTE having higher scores, and for Gender on Attention (F(1,195)= 3.74, p<.05) with boys having higher scores. However, the interaction of PTE and Gender was significant for Emotional Reactivity (F(2,195)=3.65, p<.03), Internalizing (F(2,195)=7.61, p<.001), Externalizing (F(2,195)=4.855, p<.009), and Total Problems (F(2,195)=8.04, p<.000). This interaction occurred because girls in the control group were reported to have significantly fewer behavior problems than boys but girls in the smoking groups showed equal or greater problem behaviors than boys. These results confirm that PTE affects behavioral regulation at 24 months. Effects cannot be attributed to SES or child characteristics like age or ability level. However, there appears to be an interaction with girls showing an increased level of behavior problems.

Funding: NIH/NICHD Grant # R01 HD041203-01A2.

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SYM5D
GETTING UNDERNEATH THE SURFACE: USING DEVELOPMENTALLY SENSITIVE EXECUTIVE CONTROL TASKS TO ELUCIDATE SUBSTRATES OF ATTENTION AND EMOTION IN PRESCHOOLERS PRENATALLY EXPOSED TO TOBACCO
John P. Garza, Ph.D.*, Caron Clark, Ph.D., Kimberly Andrews-Espy, Ph.D., and Lauren Wakschlag, Ph.D.*1, University of Nebraska-Lincoln; 2University of Oregon; 3Northwestern University

Prenatal tobacco exposure (PTE) has been linked to developmental psychopathology, particularly disruptive behavior and ADHD. However, the neuropsychological substrates of these pathways have not been established, particularly within the context of cognitive development. Here we report preliminary findings from a preschool follow-up of a prenatal cohort oversampled for PTE. We utilize novel tasks developed in our laboratory to tap into executive control (EC) and emotion processing in a developmentally sensitive manner. We chose these domains because of their salience to inhibition of impulsivity and modulation of emotion respectively. Shape School allows us to examine effects of tobacco exposure on attentional set-shifting and flexibility in general, while Emotional Stroop specifically examines these abilities in the context of emotional stimuli. Thus, we examined whether PTE was associated generally with problems in EC and whether attention was particularly disrupted in the context of emotion processing. PTE children made a significantly greater proportion of errors relative to NE children when set shifting in Shape School, but only when shifting from discriminating shapes to discriminating colors (p < .05). By contrast, PTE children made proportionally more errors in the Emotional Stroop task overall during shift blocks (p < .01), across both shift and non-shift trials. In shift trials, their proportion of errors when shifting to discriminating emotions were marginally significantly greater than NE children (p = .08), while there was no difference when when...
shifting to discriminating color. Thus, deficits in set shifting were found in PTE children for basic stimuli that engage basic cognitive/perceptual skills, in addition to emotionally laden stimuli in particular. However, the addition of the emotion discrimination task generated difficulties even when shifting was not required, suggesting that the maintenance of the emotion task interfered with general cognition. We consider the implications of increased emotional processing load negatively impacting general EC abilities, and consequently contributing to behavioral problems associated with PTE.

**Funding**: NIH R01 DA023953 and NIH R01 DA014661.

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**SYM6 POLICY NAVIGATION OF TOBACCO PRODUCT REGULATION: DOMESTIC AND INTERNATIONAL**

**Chair**: Jeffrey Drope1

**Presenters**: Jeffrey Drope1, Gregory N. Connolly2, Raphael Lencucha3, and Benn McGrady4

**Discussant**: Ryan Kennedy4

1American Cancer Society; 2Harvard University; 3University of Lethbridge; 4Georgetown University

In recent decades, product regulation has developed into a pillar of overall tobacco control strategy. While we have a wealth of knowledge about the scientific basis of many regulations, we do not yet have a sufficient understanding of the myriad policy challenges that governments face as they seek to implement new appropriate product regulations or improve existing ones. For example, the US - Clove Cigarette case in 2011-12 at the World Trade Organization demonstrated that there are difficulties (under WTO and other international law) associated with drawing regulatory distinctions between different products. The situation is becoming even more complex with the general uncertainty around new tobacco products, including for example, e-cigarettes. Moreover, the approach to understanding these complexities needs to involve researchers across multiple disciplines who must not only use evidence-based research in their own field to explain what is happening and how to move forward, but also be capable of working with others in related, relevant fields working on different aspects of the same challenges. With this requirement in mind, we approach product regulation from several major academic perspectives including legal, political economy and health promotion.

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**SYM6B IMPLICATIONS OF INTERNATIONAL LAW ON TOBACCO PRODUCT REGULATION**

Benn McGrady*, Georgetown University

This research will examine the implications of the law of the World Trade Organization for the regulation of tobacco and nicotine products. In US – Clove Cigarettes, a recent WTO dispute, the United States was found to have violated WTO law by prohibiting clove but not menthol cigarettes. The measure was considered to be discriminatory because it had an adverse effect on the competitive opportunities of imported as compared to domestic products and that effect did not stem solely from legitimate regulatory distinctions between the product categories. Drawing on case studies of tobacco product regulations in Brazil and Canada, the research will explain the implications of US – Clove Cigarettes for product regulation more generally. It will be argued that the lawfulness of regulations depends very much on the domestic circumstances of each WTO Member. This creates a minefield for tobacco product regulation because it makes it difficult for WTO Members to follow the regulatory lead of another Member and because WTO dispute settlement is not well adapted to fact-finding.

**Funding**: Johns Hopkins Bloomberg School of Public Health.

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**SYM6C EVIDENCE TO POLICY: KNOWLEDGE TRANSFER AND PRODUCT REGULATION**

Raphael Lencucha*, University of Lethbridge

Scholars in the health field continue to explore how scientific evidence moves from the academic context into the realm of policy-development and implementation. Tobacco control policy, including product regulation, is often celebrated as being bolstered by, if not based on scientific evidence. In fact, the Framework Convention on Tobacco Control is touted as being an “evidence-based” treaty. The rhetoric and reality of evidence-based tobacco control policy is particularly powerful when facing challenges of whether such regulation is necessary to protect the health of a population. This research will discuss findings from a study of tobacco product regulation in Brazil. The following questions will be addressed: (1) what type of evidence is used by different actors during the decision-making process (e.g., what type of evidence do civil society organizations use to influence decision-makers)? (2) how do these actors use evidence to facilitate or block decisions on tobacco regulation (i.e., what social and political channels do actors use)? and (3) how is this evidence framed in the broader political, economic and health context? Findings are derived from an analysis of official and unofficial documents and key informant interviews. Particular emphasis is placed on how evidence was used leading up to the enactment of Resolution RDC ANVISA No. 14 (March 15, 2012) which regulates the content of cigarettes and other tobacco products and previous regulation put in place to govern tobacco product packaging.

**Funding**: Johns Hopkins Bloomberg School of Public Health.

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SYM6D  
GLOBAL GOVERNANCE AND TOBACCO INDUSTRY CONSOLIDATION

Gregory N. Connolly, Harvard University

This presentation will review the structure and growth of the major four Transnational Tobacco companies and the upcoming entry of China Tobacco Monopoly to the group. Expansion has been primarily due to acquisitions of national companies over the past 15 years and in 2011 90% of the world’s cigarette market was controlled by 5 companies whose profits exceed that of the gross domestic income of the 40 poorest nations in the world. Once the national market is consolidated into the TTCS, the multinational promotes increased consumption through creation of sub brands of internationally recognized ones for target groups. Since 2000, cigarette consumption has fallen in high income nations by 15% and increased in low income nations by 18%. Overall global consumption has remained constant since passage of the FCTC. The investments of the multinationals are being vigorously protected from national efforts to curb tobacco use through FCTC policy adoption. The TTCS are using trade complaints to the World trade Organization and other trade bodies arguing certain health policies violate provisions of trade treaties. The lack of a coherent global governance structure or system involving agencies such as World Health Organization, World Trade Organization, International Monetary Fund and the World Bank has created a void between the competing forces of national sovereignty and globalization of the world’s tobacco market. Global governance of tobacco products is needed to assure global economic development and assure world health.

No funding.

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SYM7  
NOVEL APPROACHES TO NICOTINE DEPENDENCE RESEARCH: INTERVENTION FROM ANIMAL TO HUMAN

Chair: Cristiano Chiamulera
Presenters: Mohammed Shoaib, Angela S. Attwood, Cristiano Chiamulera, and Lee Hogarth
Discusant: Robert West

1Neuropsychopharmacology Lab, University of Verona; 2University of Newcastle upon Tyne; 3University of Bristol; 4University of New South Wales; 5Department of Epidemiology and Public Health, University College London, UK

Despite smokers often reporting a desire to quit smoking, few are able to achieve long-term abstinence. Many smoking cessation interventions target the early weeks post-quit, but many smokers relapse later, often in response to drug-related cues. Using Pavlovian conditioning principles, animal models of nicotine self-administration and relapse have been developed, which are now being translated into human research. Four presentations would discuss novel approaches to nicotine dependence research using both animal and human models of nicotine dependence and relapse. These would include recent developments in memory consolidation disruption of nicotine-related memories, including the post-retrieval extinction model. Data would also be presented on Pavlovian to instrumental transfer (PIT) in a rat model of instrumental responding for nicotine or non-drug rewards. As part of the design, the research findings also highlight the ability of non-drug alternatives such as sucrose pellets that can shift preference away from nicotine. Behavioural and pharmacological therapies for nicotine dependence exist, but their scope and efficacy are limited. Pharmacological potentiation of cue exposure techniques using cognitive-enhancing drugs will be reviewed. This work stems from animal research demonstrating greater extinction learning using these drugs, and suggests that they may be used as adjuncts to cue exposure therapy. The final presentation will delineate goal-directed, cue-elicited and habitual behaviours which, according to learning theory, summate to control behavior. The concurrent schedule findings illustrate the ability of non-drug alternatives to shift preference away from nicotine over time, a finding that is consistent with previous research. The devaluation procedure supports the role of value based decision making in drug addiction, consistent with current human research using concurrent choice procedure.

Research supported by Newcastle University.

SYM7A  
ASSOCIATIVE LEARNING AND CONCURRENT CHOICE PROCESSES: LOOKING BEYOND PRIMARY REINFORCING EFFECTS OF NICOTINE IN RODENTS

Mohammed Shoaib*, University of Newcastle upon Tyne

Nicotine-associated cues appear to play a key role in eliciting relapse in smokers over a prolonged period of abstinence. This presents a problem with the longevity of tobacco dependence treatment. The impact of nicotine-associated conditioned stimuli on nicotine-seeking behaviour was investigated in rats via the Pavlovian-to-instrumental transfer paradigm. Intravenous nicotine infusion (0.03mg/kg) and sucrose pellet (45mg) were paired with distinct cues. Rats were trained to perform instrumental responses on separate levers for each outcome. Then, responding on these two levers was assessed in the presence of each stimulus. When a single lever was available at test, the sucrose but not nicotine stimulus produced a general excitatory effect on both levers (general transfer). By contrast, when both levers were concurrently available at test, the sucrose but not the nicotine stimulus selectively enhanced responding for the sucrose over the nicotine lever (specific transfer). Subsequently, in the absence of cues, rats were retrained under a concurrent choice procedure in which both reinforcers were available. The majority of rats expressed an increased preference towards the sucrose lever (80%) on the first session which gradually increased further (90%). Devaluation tests in which nicotine or unlimited sucrose pellets were presented before the sessions reduced the appropriate preferences. In a group trained to self-administer nicotine, inclusion of a new lever that reinforced with sucrose pellets shifted preference away from nicotine. Results from the PIT study confirm a general transfer effect instead of a specific transfer, which suggests that offering a choice favours the retrieval of the identity of the instrumental outcomes guiding action selection. The concurrent schedule findings illustrate the ability of non-drug alternatives to shift preference away from nicotine over time, a finding that is consistent with previous research. The devaluation procedure supports the role of value based decision making in drug addiction, consistent with current human research using concurrent choice procedure.

SYM7B  
PHARMACOLOGICAL POTENTIATION OF EXTINCTION LEARNING USING NMDA AGONISTS: IMPLICATIONS FOR CUE EXPOSURE THERAPIES

Angela S. Attwood*, University of Bristol, UK

Stimuli that are repeatedly and contingently paired with drug administration can precipitate craving, drug seeking and relapse. Cue exposure therapy (CET) is considered a promising target for therapeutic intervention. CET is primarily based on the classical conditioning extinction paradigm in that drug users experience repeated non-reinforced exposure to drug-related stimuli that instills new learning that the drug-stimuli no longer reliably signal drug, and which in turn reduces subjective and physiological reactivity to them. However, the learned associations between drug and drug-related stimuli are robust and long-lasting, and therefore it is unsurprising that CET trials have often yielded inconsistent or weak results. The disappointing outcomes from CET trials are likely, at least in part, to be due to a failure to fully utilize our current theoretical understanding of conditioning principles. Conditioned extinction is an experimental model of clinical cue exposure therapies and is therefore an important research tool that can be used to develop these interventions. Preclinical animal studies demonstrate that extinction learning is enhanced by cognitive enhancing drugs that target the glutamatergic preclinical research. We would also discuss avenues for future research and perspectives for clinical intervention.
N-methyl-D-aspartate (NMDA) system, such as D-cycloserine. There is also evidence that these drugs may enhance the generalisability of extinction, an outcome that has significant clinical relevance. Recent findings from animal and human studies of pharmacological enhancements of extinction learning will be reviewed, and their relevance to clinical intervention discussed. There will be consideration of future directions for research and how the outcomes from human experimental research and clinic may be used to inform and develop preclinical animal models.

Funding: Pfizer Inc.

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SYM7C

TARGETING APPETITIVE RECONSOLIDATION MEMORY FOR THE PREVENTION OF RELAPSE

Cristiano Chiamulera*, University of Verona

Once retrieved, consolidated memories return to a vulnerable phase during which memories can be updated (memory reconsolidation) and can also be disrupted (reconsolidation disruption). In fact, during this phase, the so-called ‘reconsolidation window’, a cascade of molecular events are triggered in key brain areas such as amygdala, prefrontal cortex, hippocampus. The disruption of drug memories reconsolidation has been proposed as a novel target for preventing relapse in ex drug-addicts. Drug acting on receptors involved in drug memory reconsolidation showed promising effects. Moreover it has been shown that a cue-extinction session, applied after retrieval of fear-memories, prevented fear-memories reconsolidation both in rats and in humans. The difference from ‘traditional’ cue-extinction session is the time of extinction application that is within the ‘reconsolidation window’. Aim of our research is to investigate the nicotine-related memories reconsolidation and how it could be disrupted for the prevention of nicotine-seeking relapse. We used a paradigm of operant conditioning to nicotine-related behaviour, i.e., the model of nicotine self-administration in rats. The results showed that CS-extinction, applied 1, but not 6, hours after reactivation of Pavlovian nicotine memory, significantly reduced renewal of nicotine-seeking compared to no-CS-extinction condition. No effect of CS-extinction was observed in those subjects that did not receive nicotine CS reactivation. Moreover, the greater expression levels of zif268 in basolateral amygdala, a transcription factor known to be involved in the reconsolidation of appetitive memories, after nicotine CS reactivation compared to the no-reactivation condition, suggest that the effects of CS-extinction were taking place during the liable phase of memory reconsolidation. Therefore, these findings provide the evidence for the inhibition of nicotine Pavlovian memory reconsolidation by applying post-reactivation CS-extinction. Critical questions are how to translate this into therapeutic intervention, and if it is possible to ensure a long-lasting effect by associating drugs that disrupt reconsolidation. The study was funded by University of Verona.

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SYM7D

MOVING ASSOCIATIVE TARGETS FOR SMOKING PHARMACOTHERAPY

Lee Hogarth*, University of New South Wales

Learning theory has articulated a standard model of motivated behaviour which provides a basis for understanding pathological learning in addiction. The core position is that the propensity to engage in drug-seeking reflects the summation of three dissociable controllers. Goal-directed drug-seeking is determined by knowledge of the response–drug contingency and the expected value of the drug. Stimulus-elicited drug-seeking is determined by knowledge of the stimulus–drug contingency and the expected probability of the drug. Habitual drug-seeking is elicited automatically by drug stimuli which have formed a direct association with the drug-seeking response, without engaging knowledge of the consequences. The talk will outline human procedures translated from animal behavioural neuroscience which isolate the contribution of these three controllers to drug-seeking, specifically, their differential roles in vulnerability to dependence, pharmacotherapy and loss of intentional regulation of behaviour. Overall, the talk will argue that an abnormal balance between the three controllers is responsible for the pathological status of addictive behaviour relative to natural reward-seeking. Research support comes from MRC (G0701456) and ESRC (RES-000-22-4365) grants.

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SYM8

SMOKING CESSATION 2.0: HARNESING SOCIAL MEDIA TO HELP SMOKERS QUIT

Chair: Danielle E. Ramo, Ph.D.*1

Presenters: Danielle E. Ramo, Ph.D.*1, Howard Liu, B.A.1, Judith J. Prochaska, Ph.D., M.P.H.2,3, Connie Pechmann, Ph.D., M.B.A.1, Kevin Delucchi, Ph.D.1, Doug Calder, B.A.1, Sunny Panli, Ph.D., Cynthia Lakin, Ph.D.1, Amanda L. Graham, Ph.D.1, Sarah Cha, M.S.P.H.1, Ye Fang, M.S.1, Nathan K. Cobb, M.D.3, George D. Papandonatos, Ph.D.1, Raymond S. Niaura, Ph.D.1, and David B. Abrams, Ph.D.3

Discussant: Nathan Cobb, M.D.*1

1Department of Psychiatry, University of California, San Francisco; 2Stanford Prevention Research Center, Stanford University; 3Department of Medicine, University of California, San Francisco; 4University of California, Irvine, School of Business; 5Shanghai Jiao Tong University, Antai College of Economics and Management; 6University of California, Irvine, Department of Population Health and Disease Prevention; 7Schroeder Institute for Tobacco Research & Policy Studies, Legacy, Washington, DC; 8Department of Biostatistics, Brown University, Providence, RI

Reaching the US public health goals of cutting the smoking rate to no higher than 12% by 2050 will require novel approaches to create new interventions, enhance the effectiveness of existing treatments, and maximize the reach and utilization of both. Online social networks (e.g., Facebook, Twitter; known as “Web 2.0”) are overwhelmingly popular, with over 80% of American adolescents and 66% of American adults now using some form of social media or online social network. As of Fall 2012, an estimated 955 million people worldwide actively use Facebook, the largest of the online social networks, and 140 million use Twitter. Social media may present a novel and powerful approach to meeting public health goals with respect to smoking cessation. Yet, little is known about how to harness social media to engage smokers and/or to help them quit. This symposium will bring together findings from a mixed methods survey study and two treatment trials using social media for smoking cessation. The first study uses an online survey (quantitative) and 1:1 interviews over online chat (qualitative) to characterize young adults’ receptivity to using Facebook to quit smoking. Findings highlight that there is interest in using Facebook to change smoking behavior regardless of smoking severity, particularly among those ready to quit. The second study, in a 2x2 design, the separate and interactive effects of free NRT and a social media intervention to help smokers engage in an online smoking cessation website. Findings demonstrate that social media and free NRT can each help smokers engage in an online smoking cessation community. The third study piloted a Twitter-delivered group intervention for relapse prevention in smokers who were motivated to quit and demonstrated engagement and promising effects on 7-day point prevalence abstinence at 60-days follow-up. Taken together, these findings support the promise and initial efficacy of using social media to engage smokers in cessation treatment and to help them to quit. Discussion will highlight opportunities and challenges in using and evaluating social media as a tool for smoking cessation across populations.
SYM8A

YOUNG ADULTS’ RECEPTIVITY TO USING FACEBOOK TO QUIT SMOKING

Danielle E. Ramo, Ph.D.1, Howard Liu, B.A.2, and Judith J. Prochaska, Ph.D., M.P.H.3, 1Department of Psychiatry, University of California, San Francisco, CA; 2Stanford Prevention Research Center, Stanford University, Stanford CA

Introduction: Facebook (FB) may be a useful tool to engage young adults in smoking cessation. The receptivity to such intervention however, is largely unknown. This study used both qualitative and quantitative methods to examine: 1) Young adults’ reactions to using FB to quit smoking; and 2) How smoking behavior relates to social media use and intention to quit smoking using social media. Method: Participants age 18 to 25, who reported smoking at least one cigarette in the past 30 days were recruited on FB to complete an online survey about tobacco and social media use. Survey completers, stratified by stage of change, self-selected for a 1:1 online chat interview about their receptivity to using FB to quit smoking. Results: Qualitative interviews (N=30) showed that young adults were generally open to using FB to get information about smoking or to quit smoking. Pros included the social nature of FB (e.g., “camaraderie,” “encouragement,” “support from others”), and ease of access to support from cessation resources (e.g., “tips for quitting,” “reminders,” “facts about smoking”). Survey completers (N=570) averaged 10 cigarettes/day (SD=8) and 2.2 (SD=1.2) on the Heavy Smoking Index; 70% were daily smokers; and 42% planned to quit in the next 6 months. Most used the Internet several times a day (85%) and Facebook daily (87%). Few had used the Internet to aid a previous quit attempt (2%), and 31% expressed interest in using social media to quit. Smoking severity (past 30 day use, average cigarettes per day, dependence, years using, stage of change) was not associated with extent of Internet use, FB use, or using the Internet to aid a quit attempt (all p>.05). In a logistic regression model, correlates of change (self-selected for a 1:1 online chat interview about their receptivity to using FB to quit smoking) was previous use of the Internet to aid a quit attempt (OR=7.1, p=.007), and readiness to quit smoking in the next 30 days (OR=2.9, p=.001); smoking characteristics were not significant. Conclusions: There is interest in using FB to change smoking behavior regardless of smoking severity, particularly among those ready to quit. Motivational strategies are likely needed to engage those not ready to quit.

Funding: NIH: R01 DA030538.

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SYM8B

TWEETING TO STAY QUIT: ENCOURAGING FINDINGS FROM A TWITTER QUIT SMOKING SUPPORT GROUP

Judith J. Prochaska, Ph.D., M.P.H.1,2, Connie Pechmann, Ph.D., M.B.A.2, Kevin Delucchi, Ph.D.2, Doug Calder, B.A.3, Sunny Panli, Ph.D.4, and Cynthia Lakin, Ph.D.5, 1Departments of Psychiatry & Medicine, University of California, San Francisco, CA; 2Stanford Prevention Research Center, Stanford University, Stanford, CA; 3University of California, Irvine, School of Business, Irvine, CA; 4Shanghai Jiao Tong University, Antai College of Economics and Management, Shanghai, China; 5University of California, Irvine, Department of Population Health and Disease Prevention

Twitter, an online microblogging social networking service, with immense popularity (>500 million active users) and utility, has received little investigation as a platform for supporting health behavior change. This pilot study reports on the feasibility, acceptability, and initial efficacy of a 12-wk quit smoking support group conducted over Twitter. Recruited via Google Adwords, smokers motivated to quit were assigned to 20-member virtual quit-smoking groups and encouraged to tweet (140 character max messages) each other daily for 3 mo for relapse prevention support. All were instructed to set a quit date, referred to NCI’s smokefree.gov site for guidance on quitting, and mailed 2-mo of nicotine patches. Inclusion criteria were smoking 5+ cigarettes/day, English literacy, continental US resident, age 18-59, texting/twittering weekly, and smartphone ownership with unlimited texting. Two types of programmed messages were sent daily to encourage interaction over the 12-wk period: (1) a question tweeted to the group e.g., “Tell the group why you went to quit. Why now?” and (2) personalized feedback to individuals to thank tweeters for participating and encourage non-tweeters to do so, based on prior day tweets. The sample (N=40) had a mean age of 36 (SD=9), was 60% male, 95% Caucasian, 58% never married, and 43% college degree. Participants averaged 20 cigarettes/day (SD=9) and 18 years of smoking (SD=10). The group generated a median of 10 tweets/day with a high on day 2 (70 tweets) and low on day 78 (3 tweets); 8 participants did not tweet the group at all; among the 32 who did, participants sent a median of 51 tweets over the 12-wks. Self-reported 7-day point prevalence abstinence at 60-days follow-up (post-quit date) was 54% (33% counting those who were lost to follow-up as smokers). The group continued to tweet each other after the 12-wk commitment ended. September 2012 we started the randomized clinical trial. Lessons learned and future applications of Twitter for health behavior change interventions will be discussed.

Funding: #R34 DA030538.

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SYM8C

IMPROVING ADHERENCE TO WEB-BASED SMOKING CESSATION PROGRAMS: A RANDOMIZED TRIAL

Amanda L. Graham, Ph.D.1, Sarah Cha, M.S.P.H.1, Ye Fang, M.S.1, Nathan K. Cobb, M.D.2, George D. Papandonatos, Ph.D.2, Raymond S. Naura, Ph.D.1, and David B. Abrams, Ph.D.1, 1Schroeder Institute for Tobacco Research & Policy Studies, Legacy, Washington, DC; 2Department of Biostatistics, Brown University, Providence, RI

Introduction: Internet cessation programs hold great potential to reduce smoking prevalence but are hampered by poor adherence. Needed are intervention strategies to improve adherence to behavioral, pharmacologic, and social support components of Internet cessation treatment. This ongoing trial uses a 2x2 design to test the separate and interactive effects of two strategies to improve adherence: 1) free trial of nicotine replacement therapy (NRT), and 2) a social networking (SN) intervention to foster tie formation in an online community. Free NRT encourages uptake and may also increase use of behavioral and support tools. Social networks ties provide support, and may also encourage use of NRT and behavioral tools. Method: Adult smokers who register on the cessation website BecomeAnEX.org (EX) are recruited. Exclusion criteria are NRT contraindications. Following a baseline survey, participants are randomized to: EX, NRT, EX+NRT, EX×NRT, or EX×NRT+SN. Participants in NRT groups are sent 1 month of free NRT. Participants in SN groups receive proactive communications from designated EX community members. Follow-ups occur at 3 (recently underway) and 9 months. We report preliminary treatment effects on select utilization metrics gathered on all participants from 0-30 days via automated tracking. Results: 923 participants have been enrolled for at least 30 days. The sample is 70.8% female, mean age 39.4 years (SD 12.4), 88.0% White, 9.2% Black, 5.5% Hispanic, 53.4% married/partner. Average smoking rate is 16.4 cigarettes/day (SD 8.2), mean number of past year quit attempts is 2.9 (SD 8.8). Logistic regressions showed no significant interactions. There were significant main effects for SN on reading blogs (OR=1.72, 95% CI 1.08-2.73) and community use (OR=1.55, 95% CI 1.07-2.23), and a trend for return visits (OR=1.44, 95% CI 1.00-2.08). There were significant main effects for NRT on reading blogs (OR=1.71, 95% CI 1.08-2.71) and return visits (OR=1.48, 95% CI 1.02-2.13). Conclusions: A SN intervention and free NRT can increase Internet cessation program adherence. Analyses of treatment effects on a range of adherence metrics and smoking outcomes are forthcoming.

Funding: #R01 CA155489.

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SYM9 UNDERSTANDING HOW TOBACCO OUTLETS AND MARKETING AFFECT THOUGHTS AND BEHAVIORS IN REAL-TIME: A NEW GENERATION OF ECOLOGICAL MOMENTARY ASSESSMENT

Chair: Lorraine R. Reitzel, Ph.D.*
Presenters: Daniel Rodriguez, Ph.D.2, Steven C. Martino, Ph.D.3, Kellie L. Watkins, M.S.1, and Thomas R. Kirchner, Ph.D.4
Discussant: Saul Shiffman, Ph.D.*5

The University of Texas MD Anderson Cancer Center; 2The Miriam Hospital; 3RAND; 4Scheuerman Institute for Tobacco Research and Policy Studies; University of Pittsburgh

Tobacco companies largely rely on product availability and marketing at the point of sale (POS) for revenue, and ongoing legislation presents unprecedented opportunities to affect these practices. However, little is known about how exposure to tobacco retail outlets and associated marketing affects smoking outcomes, or the circumstances under which effects are strongest. Because people interact dynamically with their environments, assessment methodologies must also be dynamic to truly understand how tobacco retail outlets and POS marketing affect smoking-related thoughts and behaviors. This symposium explores how Ecological Momentary Assessment (EMA), the collection of data in real-time in real-world settings, can contribute to this understanding. First, Daniel Rodriguez presents a nationwide study demonstrating variability in the concentration of tobacco retail outlets based on area-level characteristics. Having set the stage for the potentially important environmental influence of POS marketing, the next three presenters examine its impact at the individual, momentary level. Steven Martino uses EMA to assess how real-time exposure to tobacco marketing and prosmoking media, largely at the POS, predicts acute changes in future smoking intentions among a young adult sample of ever and never smokers, and describes the role of social context. Next, Kellie Watkins integrates GPS assessments with EMA to examine how real-time exposure to tobacco retail outlets predicts smoking urges among quitting smokers, and the locations in which these relations emerge. Finally, Thomas Kirchner takes the integration of GPS and EMA further in his assessment of how real-time exposure to POS marketing predicts smoking lapses during a quit attempt, and the characteristics of tobacco outlets yielding the strongest effects. Saul Shiffman will serve as the discussant, and will expand upon the potential impact of a new generation of studies using EMA to better understand the dynamic interaction between real-time exposures to tobacco marketing and smoking outcomes, and how resulting information can be used to inform interventions and policies to reduce smoking rates.

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SYM9A THE INFLUENCE OF TOBACCO RETAIL OUTLETS ON REAL-TIME SMOKING URGES DURING A QUIT ATTEMPT

Kellie L. Watkins, M.S.1,2*, Seann D. Regan, M.A.1, Ngam Nguyen, M.S.1, Michael S. Businelle, Ph.D.1, Darla E. Kendzor, Ph.D.2,3, Adolfo G. Cuevas, Ph.D.1, Yumei Cao, M.S.1, Cho Lam, Ph.D.1, Insiya B. Poonawalla, M.S.1, Erica Cuate, M.P.H.2, Anshula Kesh, B.A.1, David Balis, M.D.1, and Lorraine R. Reitzel, Ph.D.1

The University of Texas MD Anderson Cancer Center; 2The University of Texas School of Public Health; 3The University of Texas Southwestern Simmons Cancer Center; 4The University of Texas Southwestern Medical Center and Parkland Health and Hospital System

The presence of tobacco retail outlets has been associated with smoking relapse during a quit attempt. This may be because tobacco outlets, and associated marketing, are cues that trigger the urge to smoke. This study uses ecological momentary assessment (EMA) data to analyze real-time associations between tobacco outlets and smoking urges among participants of low socioeconomic status undergoing a specific quit attempt. Participants (N=46, 43% male, 63% Black) were patients in the Parkland Health and Hospital System of Dallas, TX. EMA data were collected for 1 week following the quit day via smartphone, which recorded the strength of smoking urges up to 4 random times a day along with participant location data (latitude and longitude coordinates). EMA compliance was 80%. For each assessment, we calculated the proximity of the participant to the closest tobacco outlet, as well as the density of tobacco outlets within 1 mile around the participant’s location. Linear mixed model regressions were used to examine the effect of tobacco outlet proximity and density on smoking urges, and whether these relations differed based on how close the participant was to home (<1 mile vs. >1 mile). Analyses controlled for age, gender, race, partner status, education, treatment group, time, and daily smoking status. Main effects were not significant; however, the interaction terms were (ps=0.004, 0.017). Stratified analyses indicated that closer proximity to tobacco outlets was predictive of stronger urges to smoke within 1 mile of home (β=1.71, SE=0.58, p=0.005) but not >1 mile from home. Likewise, a greater density of tobacco outlets was associated with stronger smoking urges within 1 mile of home (β=0.05, SE=0.02, p=0.012) but not >1 mile from home. Results suggest that the presence of tobacco outlets may trigger urges to smoke among economically disadvantaged smokers trying to quit smoking. Because these relations were significant only within 1 mile of home, results suggest that neighborhood outlets are particularly salient cues for craving, perhaps due to increased participant familiarity with these locations or increased exposure to marketing there.

Steven C. Martino, Ph.D.*, Claude M. Setodji, Ph.D., Deborah M. Scharf, Ph.D., and William G. Shadel, Ph.D., RAND, Pittsburgh PA

The aims of our study were to gauge the utility of ecological momentary assessment (EMA) as a method for collecting detailed data on exposure to prosmoking media and to use this method to examine acute changes in youths’ smoking-related cognitions as a function of their exposure to prosmoking media. College students (N=134, ages 18-24 years) carried handheld data collection devices (smartphones) for 21 days to record information about each of their exposures to prosmoking media, including medium of exposure (e.g., point-of-sale [POS] advertising, smoking in movies or on TV) and the social context in which exposure occurred (e.g., whether alone or with friends). They also responded to investigator-programmed random prompts (3 per day) during the 21-day monitoring period (control prompts). After each exposure to prosmoking media and at each control prompt, students reported their intention to smoke in the future and smoking refusal self-efficacy. Compliance with the study protocol was high, with students responding to over 83% of random prompts. Across the 21 days of monitoring, students reported an average of 8.24 (SD=7.85) exposures to prosmoking media. Exposures occurred primarily in the afternoon (42%), on weekends (35%), and at POS (68%) or in movies/TV (20%). Future smoking intentions were stronger following exposure to prosmoking media than at control prompts, a pattern of response that was equally evident among never smokers (39% of the sample) and ever smokers (85% of whom were experimental smokers who had not smoked in the past month). Follow-up analyses revealed that the association between exposure and intentions was present only when exposure occurred in the context of friends. In addition, exposure to prosmoking media was negatively associated with smoking refusal self-efficacy, but only when participants were with friends at the time of exposure. These findings support the utility of EMA as a method for capturing detailed data on youth exposure to prosmoking media, demonstrate that exposure to prosmoking media is associated with acute changes...
in prosmoking cognitions, and suggest a new role for peers in mediating the impact of prosmoking messages.

This study was supported by grant # R21CA1237286 from the National Cancer Institute.

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SYM9C RETAIL TOBACCO EXPOSURE: USING GEOGRAPHIC ANALYSIS TO IDENTIFY AREAS WITH EXCESSIVELY HIGH RETAIL DENSITY

Daniel Rodriguez, Ph.D.*,†, Asha C. Pathik*,†, Emily S. Broder, M.D., M.P.H.*,†, Anna M. Adachi-Mejia, Ph.D.‡, and James D. Sargent, M.D.*,§ Centers for Behavioral and Preventive Medicine at The Miriam Hospital; *Psychiatry and Human Behavior, Brown University; †Cancer Control Research Program, Norris Cotton Cancer Center, Lebanon, NH; ‡Community and Family Medicine, The Geisel School of Medicine at Dartmouth; ‡Dartmouth Institute for Health Policy and Clinical Practice, The Geisel School of Medicine at Dartmouth; §Department of Pediatrics, The Geisel School of Medicine at Dartmouth; *Dartmouth Medical School

Objectives: There is great disparity in Tobacco outlet density (TOD), with density being highest in low income areas and areas with greater proportions of minority residents. This TOD disparity may have a drastic impact on health disparities, including cancer incidence. We sought to better understand the nature of this disparity by assessing how socio-demographic risk factors relate to TOD at the national level.

Methods: Using mixture regression analysis we aimed to determine the optimal number of latent disparity classes by modeling the effects of the proportions of Blacks, Hispanics, and families living in poverty on TOD, controlling for urban/rural status. Results: We identified six disparity classes, three urban and three rural. There was considerable heterogeneity in the relation to TOD for Hispanics in rural settings. For Blacks, there was no relation to TOD in an urban moderate disparity class, and among rural census tracts the relation was strongest in a moderate disparity class.

Conclusions: We demonstrated the potential power of classifying census tracts on heterogeneity of tobacco risk exposure. This approach provides a better understanding of the complexity of socioeconomic and demographic influences of tobacco retailing, and creates opportunities for policy makers to more efficiently target areas in greatest need of intervention.

The work was supported by the National Institutes of Health through a grant from the National Cancer Institute (CA077026).

SYM9D REAL-TIME GEO-SPATIAL EXPOSURE TO POINT-OF-SALE TOBACCO MARKETING PREDICTS DAILY SMOKING STATUS DURING SMOKING CESSION


The present work focuses on the cross-level nexus between variation in point-of-sale tobacco (POST) marketing at the community-level and variation in real-time POST exposure and smoking behavior at the individual-level, all of which interact dynamically over time. We examined behavioral outcomes during smoking cessation as a function of moment-to-moment exposure to POST marketing. Method: Real-time exposure to POST marketing was quantified via continuous mobile phone geo-location tracking. Individual mobility patterns from a cohort of DC resident tobacco users (N=476) were overlaid on an existing point-of-sale surveillance geodatabase (N=1,060 stores). Participants were smokers who recently sought cessation support from the DC Tobacco Quitline service.

Participants were offered the opportunity to be compensated and to learn more about their exposure to POST marketing by carrying a geo-tracking device over the first 4-weeks of their cessation attempt. Tracking data produced a mobility “signature,” physically linking each person to their surrounding point-of-sale marketing environment in real-time. Results: Participant mobility was tracked over a total of N=14,595 days. Eighty-seven percent (N=413) of participants recorded at least 1 lapse. One or more lapses were recorded on 24% (N=3,568) of days. All participants came into contact with POST, averaging 1 or 2 contacts per day (SD=3.4), on 52% (N=3,314) of all days. Lapses were significantly more likely on days with any POST contact (OR=1.17; 95% CI=1.16-1.18), and were increasingly likely as the number of daily POST contacts increased (OR=1.05; 95% CI=1.04-1.06). Contact with convenience stores predicted lapses more than other store-types (OR=1.08; 95% CI=1.07-1.09), as did stores with greater exterior and interior advertising intensity (ORs=1.08; 95% CI=1.07-1.06). Conclusions: These data shed light on the way mobility patterns drive a dynamic interaction between individuals and the built POST environment, and suggest that perceptions of the POST environment as relatively static fail to account for the mobility and preferences of individuals actively engaging with their surroundings over time.

This study was supported by a NIDA RC1 DA028710 and DC DoH Contract PO358719 to Thomas Kirchner.

SYM10 AN END GAME FOR TOBACCO?

Chair: Kenneth E. Warner, Ph.D.† Presenters: Kenneth E. Warner, Ph.D.‡, Ron Borland, Ph.D.¶, Neal L. Benowitz, M.D.¶, and Robert N. Proctor, Ph.D.¶ Discussant: Melanie Wakefield, Ph.D.¶*

†University of Michigan; ‡Cancer Council Victoria, Australia; ¶University of California, San Francisco; §Stanford University; ¶Cancer Council Victoria, Australia

From 2004 through 2009, adult cigarette smoking prevalence in the U.S. remained level at about 20%, dropping to 19.3% in 2010. A similar pattern of “stalled” prevalence is observed in many developed nations. The failure of conventional evidence-based interventions to have entirely “solved” the tobacco problem has led several visionaries to propose “end-game strategies,” novel— even radical—approaches to tobacco control that, their proponents believe, hold the potential of dealing smoking a knock-out punch. Each of these approaches requires the development of a scientific body of knowledge to inform policy makers about implications, positive and negative. Each confronts enormous political, legal, economic, social, and even ethical challenges that impede any effort to translate concept into policy. Nevertheless, the idea of going beyond the tried-and-true armamentarium of tobacco control policies has spawned an emerging debate on “the tobacco end game.” This symposium will inform the audience about the dimensions of this debate. Four papers will (1) explain the factors underlying the emergence of a “field” of end-game studies (Warner); (2) discuss regulatory frameworks that might facilitate adoption of an end-game policy (Borland); (3) describe the science— known, in progress, and needed — on one of the principal end-game proposals, reducing nicotine in cigarettes (“abolition”, as the speaker prefers to call it), as well as a smoke-free generation proposal to phase in prohibition (Proctor). A discussant (Wakefield) will offer perspective on the issues surrounding the end game debate.

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SYM10A
WHAT MOTIVATES PURSUIT OF A NOVEL TOBACCO END-GAME POLICY?
Kenneth E. Warner, Ph.D., University of Michigan

Proponents of tobacco end-game proposals share two beliefs: (1) that the status quo is unacceptable and (2) that reducing smoking substantially will require something “new” and “big.” This paper explains why these beliefs are supported by the evidence. Examination of data on recent years’ cigarette smoking prevalence in multiple countries demonstrates that declines in prevalence have slowed, even “stalling” in some countries, including the U.S. (In at least one low-prevalence country, Singapore, prevalence has been rising in recent years.) Further, dynamic simulation modeling of the demographics of smoking, undertaken by the author and colleague David Mendez, indicates that, absent dramatic changes in smoking initiation and cessation rates, U.S. adult smoking prevalence is unlikely to fall below 10% through the middle of the present century. This paper begins with a review of the prevalence data that motivate concern. The paper then describes the simulation modeling (which, using data through 1995, predicted 2005 U.S. smoking prevalence to the exact tenth of a percentage point and overestimated 2010 prevalence by only 0.6 percentage points) and examines its predicted paths for future prevalence, depending on assumptions about progress in reducing initiation and increasing cessation. The paper concludes with analysis of the limits of how much more progress can be achieved—and how rapidly—by relying solely on existing evidence-based tobacco control interventions.

Funded by a grant from the Robert Wood Johnson Foundation.

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SYM10B
REGULATORY OPTIONS FOR MOVING TO THE ELIMINATION OF SMOKING
Ron Borland, Ph.D., Cancer Council Victoria, Australia

This paper describes regulatory options and related frameworks to facilitate the elimination, as far as possible, of the harms associated with tobacco use. This challenge can usefully be considered as a two stage process: first, the effective elimination of smoking cigarettes and other high-harm forms of tobacco use, and second, tackling the residual problem associated with addictive use of low-harm nicotine products. Theory suggests that the first task will be easier if there are alternative nicotine delivery systems available to substitute for the high-harm forms. Current regulatory options being canvassed include: extension of age-related restrictions on purchase or selling; licencing schemes for smokers; reduction in outlets; shrinking the amount of products that can be sold; selective removal of high harm products from the market, and/or redistribution to greater relative access to low toxicant forms; and differential taxation with higher rates for high-harm products. The biggest challenges associated with achieving such goals are doing so while keeping any illicit market under control. Co-ordination of any or some of these possibilities requires a regulatory apparatus and some require complex regulatory mechanisms; ie, to approve novel low harm alternatives, and/or potential aids to help smokers transition to low-harm potential products (eg, denicinotized cigarettes), and to categorise high- from low-harm potential products. Depending on the rate at which the shift to low-harm potential products occurs, regulation will be easier to pursue if control of tobacco marketing is removed from interests motivated to slow or undermine the process. Further, depending on the consensus on the extent of the residual harm, it may also be desirable to constrain the low-harm market to not-for-profit marketing. Product regulation should be easier and more rapid if the marketers of products are not in intrinsically antagonistic relationships with regulators. This approach is contrasted with the main alternative of a regulatory apparatus like the US FDA which can work but involves the inevitable antagonistic relationships that are already becoming apparent.

No funding.

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SYM10C
REDUCING THE NICOTINE CONTENT TO MAKE CIGARETTES LESS ADDICTIVE
Neal L. Benowitz, M.D.**, and Jack E. Henningfield, Ph.D.††; †University of California, San Francisco; ‡Johns Hopkins University and Pinney Associates

Nicotine is highly addictive and is responsible for the maintenance of cigarette smoking. In 1994 Benowitz and Henningfield proposed the idea of federal regulation of cigarettes such that their nicotine content would be reduced over time, resulting in lower intake of nicotine and a lower level of nicotine dependence. When nicotine levels get very low, cigarettes would be much less addictive. As a result, fewer young people who experiment with cigarettes would become addicted adult smokers; and previously addicted smokers would find it easier to quit smoking when they choose to do so. The regulatory authority to promulgate such a public health strategy was provided by the Family Smoking Prevention and Tobacco Control Act which gives the Food and Drug Administration regulatory authority over tobacco products. Although it precludes “reducing nicotine to zero” it does not prohibit FDA from setting standards for cigarette nicotine content that would prevent cigarettes from being capable of causing addiction. We review the assumptions implicit in a nicotine reduction strategy, examine available data on the feasibility and safety of nicotine reduction, as well as new research designed to address data needs, and discuss the public education, surveillance and support services that would be needed for the implementation of such a policy.

Supported by U.S. Public Health Service grant # CA 78603 from the National Cancer Institute.

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SYM10D
THE CASE FOR ABOLITION
Robert N. Proctor, Ph.D., Stanford University

The cigarette is the deadliest artifact in the history of human civilization—and most of that death lies in the future. Richer countries of the globe, however, are making progress in reducing both smoking rates and overall consumption. Many different methods have been proposed to steepen the downward slope of tobacco consumption, including increased taxation, promotion of smoking cessation, and expansion of public smoke-free spaces indoors and outdoors. One option that deserves more attention is a comprehensive legal ban on the sale of cigarettes. There is historical precedent for such a ban in the U.S., since 15 states enacted such bans from 1890 to 1927. Such laws have never been declared unconstitutional; indeed in Austin vs. the State of Tennessee the right of states to bar the sale of tobacco was upheld by the U.S. Supreme Court. There are many different reasons to abolish the sale of cigarettes, including savings in the realm of health care costs, increased labor productivity, reduced human suffering, lowered harms and damages from fires, reduced consumption of scarce physical resources, a reduced global carbon footprint, and removal of a leading socioeconomic force responsible for global warming denial and environmental/ regulatory obstructionism. Barring the sale of cigarettes would also put a halt to one of the principal sources of corruption in modern science and society. The principal reason for abolishing cigarettes, however, is that smokers themselves don’t like the fact they smoke. Smoking is not a recreational drug, and abolishing cigarettes would therefore enlarge rather than restrict human freedoms. In addition to examining the arguments favoring abolition, this paper considers the merits of a proposal to “phase in” abolition by prohibiting sale to and possession of cigarettes by a given generation (say, born in 2000) as well as all subsequent birth cohorts.

No funding.

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SYM11
STRESS REACTIVITY AND NEGATIVE AFFECT AS MEDICATION TARGETS FOR SMOKING CESSION: A TRANSLATIONAL PERSPECTIVE

Chairs: Sherry A. McKee, Ph.D.1, and Stephen J. Heishman, Ph.D.2
Presenters: Abhiram Pushparaj, Ph.D.1, Adrie W. Bruijnzeel, Ph.D.4, Kenzie L. Preston, Ph.D.1, and Sherry A. McKee, Ph.D.1
Discussant: Caryn Lerman, Ph.D.5

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All currently FDA-approved smoking cessation medications target the nicotinic acetylcholine receptor system to some extent, and are primarily designed to attenuate nicotine-related reinforcement and withdrawal symptoms. However, the vast majority of smokers using nAChR agents fail to maintain long-term abstinence, underscoring the need to identify novel compounds. Factors that maintain smoking and precipitate relapse are varied and complex, and the underlying biology has yet to be fully elucidated. Stress and negative affect are recognized as primary mechanisms involved in the maintenance of, and relapse to smoking. Targeting stress-related relapse for medications development is a critical, yet relatively unexplored strategy. The aim of this translational symposium is to examine novel targets for smoking cessation designed to reduce stress-reactivity and negative affect. Dr. Forget will present preclinical data demonstrating that a noradrenergic alpha1 antagonist reduced stress reactivity, self-administration behavior, and reinstatement to nicotine or drug-associated cues. Additional studies examining mechanisms underlying these effects will be presented. Dr. Bruijnzeel will present preclinical work demonstrating that blockade of melanocortin 4 receptors (MC4) attenuated stress-induced reinstatement of nicotine-seeking behavior. In prior work, MC4 receptors attenuate depressive and anxiety-like behaviors in animal models. Clonidine is an alpha2 noradrenergic agent which has shown efficacy for smoking cessation. Dr. Preston will present a human laboratory study demonstrating that clonidine attenuated stress-induced craving in cocaine users. Dr. McKee will present a hybrid human laboratory and clinical outcome study demonstrating that guanfacine, an alpha2a noradrenergic agent, attenuated stress-induced smoking in the laboratory and improved clinical outcomes following a quit attempt. Finally, Dr. Lerman will discuss the therapeutic potential of these targets for treatment development.

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SYM11B
ROLE OF MELANOCORTIN 4 RECEPTORS IN NICOTINE WITHDRAWAL AND STRESS-INDUCED REINSTATEMENT OF NICOTINE-SEEKING BEHAVIOR IN RATS

Adrie W. Bruijnzeel*, Jon C. Alexander, Xiaoli Qi, Moe Igari, Yue Ji, Rayna M. Bauzo, and Hidetaka Yamada, University of Florida, Department of Psychiatry, Gainesville, FL

Tobacco addiction is characterized by withdrawal signs upon smoking cessation and relapse after periods of abstinence. Previous studies by our group indicated that corticotropin-releasing factor and norepinephrine play a critical role in the negative mood state associated with nicotine withdrawal and stress-induced relapse to smoking. Emerging evidence indicates that blockade of melanocortin 4 (MC4) receptors decreases depressive and anxiety-like behavior in rodents. The aims of the present studies were twofold: (1) investigate the effects of blockade of MC4 receptors on the negative mood state associated with nicotine withdrawal; and (2) Investigate the effects of blockade of MC4 receptors on stress-induced reinstatement of nicotine-seeking behavior. In the withdrawal experiments, nicotine dependence was induced in rats by minipumps that delivered 3.16 mg/kg of nicotine base per day. Nicotine withdrawal was precipitated with the nicotinic receptor antagonist mecamylamine and investigated with an intracranial self-stimulation (ICSS) procedure. Elevations in brain reward thresholds are indicative of a dysphoric state. For the reinstatement experiments, the rats were allowed to self-administer nicotine (0.03 mg/kg/infusion, base) for 16 days and then nicotine Seeking behavior was extinguished by substituting saline for nicotine. Nicotine seeking was reinstated by the administration of footshocks. In the nicotine withdrawal experiments, mecamylamine elevated the brain reward thresholds of the nicotine-treated rats. The intracerebroventricular (icv) administration of the MC4 receptor antagonists HS014 and HS024 did not affect the elevations in brain reward thresholds associated with nicotine withdrawal. In the reinstatement experiments, footshocks reinstated extinguished nicotine-seeking behavior. The icv administration of the MC4 receptor antagonists HS014 and HS024 attenuated stress-induced reinstatement of nicotine-seeking behavior. These findings indicate that blockade of MC4 receptors does not prevent the dysphoric state associated with nicotine withdrawal but prevents stress-induced reinstatement of nicotine-seeking behavior.

This work was supported by a NIDA grant (DA023575) to A. Bruijnzeel.

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SYM11C
ALPHA 2 ADRENERGIC AGONISTS FOR PREVENTION OF STRESS-INDUCED RELAPSE

Background: Reactivity to stressors and environmental cues, a putative cause of relapse in addiction, may be a useful target for relapse-prevention medication. In rodents, alpha-2 adrenergic agonists such as clonidine block stress-induced reinstatement of drug seeking, including nicotine. We have tested the effect of clonidine on stress-induced craving in human cocaine users in a laboratory study and are currently conducting a randomized, double-blind trial of clonidine for the prevention of relapse to cocaine use. Methods: In the laboratory study, healthy, non-treatment-seeking cocaine users (n = 59) were randomly assigned to three groups receiving clonidine 0, 0.1, or 0.2 mg orally under double-blind conditions. In a single test session, each participant received clonidine or placebo followed 3 days later by exposure to two pairs of standardized auditory-imagery scripts (neutral/stress and neutral/drug). Results: Subjective ratings of cocaine craving in response to stress scripts were significantly attenuated in both active clonidine (0.1 and 0.2 mg) groups, but only at the higher (0.2 mg) clonidine dose for drug-cue scripts. Other subjective measures of craving showed similar patterns of effects. Discussion: Clonidine was effective in reducing stress-induced (and, at a higher dose, cue-induced) craving in a pattern consistent with preclinical findings. These results converge with other evidence to suggest that alpha-2 adrenergic agonists may help prevent relapse in drug abusers experiencing stress or situations that remind them of drug use. We will discuss these results as they relate to the potential for the use of clonidine and other alpha-2 agonists in smoking cessation.

Supported by the Intramural Research Program of NIDA, NIH, DHH.

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SYM12
α4β2-NICOTINIC ACETYLCHOLINE RECEPTORS IN SCHIZOPHRENIA: IMPLICATIONS FOR COMORBID TOBACCO SMOKING AND THERAPEUTICS
Chair: Irina Esterlis, Ph.D., and Tony P. George, M.D., FRCPc
Presenters: Irina Esterlis, Ph.D.1, A. Eden Evins, M.D.2,3, Georg Winterer, M.D., Ph.D.2, and Victoria Wing, Ph.D.2
Discussant: Tony P. George, M.D., FRCPc
1Department of Psychiatry, Yale University; 2Department of Psychiatry, Centre for Addiction & Mental Health, University of Toronto; 3Massachusetts General Hospital/Harvard University; 4Charité – University Medicine Berlin

Tobacco smoking is 3-4 times more prevalent in individuals with schizophrenia vs. the general population, and is a leading preventable cause of morbidity and mortality through tobacco-related illnesses. However, smoking cessation rates are extremely low especially in psychiatric populations, which may be related to the pro-cognitive and mood-regulating effects of nicotine and tobacco. Nicotine is one of the addictive ingredients with known affective and cognitive benefits, and binds to the α4β2-nicotinic acetylcholine receptors (α4β2-nAChRs), which upregulate in response to chronic nicotine in healthy subjects. However, postmortem findings in schizophrenia suggest lack of upregulation in subcortical regions and other studies suggest α4β2-nAChR involvement in the psychiatric symptoms of schizophrenia. Nicotine’s actions in the brain are not fully understood and α4β2-nAChR role in schizophrenia is not well defined; however, it is established that smoking cessation impairs cognitive functioning and mood in psychiatric populations. In this symposium, we will examine α4β2-nAChRs in vivo in tobacco smokers with schizophrenia and show pro-cognitive benefits for pharmacotherapy of smoking addiction in schizophrenia. Dr. Esterlis will discuss an imaging study of α4β2-nAChRs in smokers and nonsmokers with schizophrenia, and show evidence of regional upregulation of α4β2-nAChRs, as well association with cognitive and behavioral outcomes. Dr. Winterer will discuss whether CHRNA4 exon 5 genotype affects nicotinic receptor sensitivity, clinical symptoms of schizophrenia, drug treatment-response, cognition and related brain function. Dr. Evins will discuss results from a recent clinical trial showing efficacy of varenicline, α4β2-nAChR partial agonist, vs. placebo in augmenting relapse-prevention outcomes as an adjunct to Cognitive Behavioral Therapy in smokers with schizophrenia. Dr. Wing will discuss cognitive deficits associated with smoking abstinence in schizophrenia, and the role of varenicline at reducing these deficits. Lastly, Dr. George will integrate the findings and lead a discussion on the neurobiological and therapeutic implications of the four presentations.

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SYM11D
GUANFACINE AS A POTENTIAL PHARMACOTHERAPY FOR STRESS-PRECIPTATED SMOKING RELAPSE
Sherry A. McKee, Ph.D.*, Rajita Sinha, Ph.D., Marc N. Potenza, M.D., Ph.D., Hedy Kober, Ph.D., Mehran Soffouglu, M.D., Amy F.T. Arnsten, Ph.D., Marina R. Picciotto, Ph.D., Andrea H. Weinberger, Ph.D., and Rebecca L. Ashare, Ph.D., Yale University School of Medicine, New Haven, CT

Stress drives smoking behavior, weakens self-control, and precipitates relapse in those trying to quit. However, there are no specific medications that improve stress-induced smoking relapse. Basic science evidence indicates that even mild uncontrollable stress weakens prefrontal cortical networks that mediate self-control through cAMP opening of potassium channels near prefrontal network synapses. In contrast, the α2A noradrenergic agonist, guanfacine, strengthens prefrontal network connectivity and cognitive function by inhibiting these cAMP actions. The primary aim of this double-blind placebo-controlled study was to examine whether guanfacine (0mg vs. 3mg/day) attenuated the effect of stress on precipitating smoking lapse behavior in the laboratory, and to determine whether guanfacine improved clinical outcomes during a brief treatment period. Following titration to steady state levels of guanfacine daily smokers completed two laboratory sessions where we modeled the effect of stress on smoking lapse behavior. Our lapse paradigm is focused on two primary aspects of early lapse behavior: (1) ability to resist the first cigarette; and (2) subsequent smoking. Following the laboratory sessions, participants completed a single fMRI session in which they performed the Stroop color-word interference task to assess attention and inhibitory control. Subjects set a quit day and then engaged in a brief 4-week treatment phase. Medication was continued during this period and basic behavioral support was provided on a weekly basis. Using a novel translational approach, we report for the first time that guanfacine significantly reduced smoking behavior and craving during the laboratory analog of stress-precipitated smoking, increased prefrontal activity associated with improved attention and self-control during a cognitive control task, and improved clinical outcomes during a brief treatment period. Our findings are consistent with preclinical results that guanfacine rescues stress-precipitated decrements in self-control, and support further development of guanfacine as a potential pharmacotherapy for stress-precipitated relapse in smoking cessation. Supported by NIH grants R01DA024857, R21DA017234, UL1DE019586, P60DA016389, P01DA024860, U1L RR024139 LR1A017539, K12DA000167, P20DA027844, 3P30CA16359, DA14241.

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SYM12A
B2-α-NACHR AVAILABILITY IN SCHIZOPHRENIA: EFFECTS OF SMOKING AND RELATIONSHIP TO SYMPTOMS
Irina Esterlis, Ph.D.1,2, Frederic Bois, Ph.D.1,2, Brian Pittman, M.S.1, Lara Shearer, B.A.1, Megan Krasicens, B.A.1, Marina R. Picciotto, Ph.D.1, Kelly R. Cosgrove, Ph.D.1,2, and D. Cyril D’Souza, M.D.1,2
1Yale University, School of Medicine, Department of Psychiatry; 2YACHS Department of Psychiatry

Nicotinic acetylcholine receptors (nAChRs) are critical for the addictive and cognitive effects of tobacco and upregulate in response to chronic nicotine exposure. Postmortem studies reveal lower β2-αnAChR numbers in the brains of subjects with schizophrenia vs. controls, and upregulation β2-αnAChRs in the cortex only. In this study, we measured β2-αnAChRs in vivo and related to clinical
SYM12B

CHRNA4 EXON 5 GENOTYPE AFFECTS NICOTINIC RECEPTOR SENSITIVITY AND IS ASSOCIATED WITH POSITIVE AND NEGATIVE SYMPTOMS AS WELL AS RAPID DRUG-TREATMENT RESPONSE IN SCHIZOPHRENIA

Georg Winterer, M.D., Ph.D.*, Charité – University Medicine Berlin, Germany

There is a longstanding interest in the relationship between epilepsy, schizophrenia and the nicotinic system. In familial autosomal dominant nocturnal frontal lobe epilepsy (ADNFLE), rare CHRNA4 exon 5 mutations lead to schizophrenia-like symptoms and cognitive deficits. The common exon 5 variant rs1044396 was recently associated (incl. own work) with nicotine dependence, selective attention and brain function. Here, we investigated whether CHRNA4 exon 5 genotype affects nicotinic receptor sensitivity, clinical symptoms of schizophrenia, drug treatment-response, cognition and related brain function. We conducted a voltage clamp study in a heterologous Xenopus oocyte model followed by clinical association studies: (1) Clinical study (PANS) in schizophrenia patients (N = 1,326 schizophrenia patients); (2) pharmacogenetic study (N= 212 schizophrenia patients incl. N = 70 first-episode patients); (3) population-based multicenter study (N = 1,794 healthy subjects). Main Outcome Measures: Xenopus model: Sensitivity changes in response to increasing doses of acetylcholine. Association studies: PANS incl. treatment-related changes, reaction time during a selective attention auditory oddball task and the related event-related potential N100 (functional neuroimaging). CHRNA4 exon 5 was genotyped and sequenced. Two exon 5 haplotypes (hap1 and hap2) including SNP rs1044396 led to opposite sensitivity changes of alpha4beta2 nicotinic receptor channels in response to increasing doses of acetylcholine. The common SNP rs1044396 (C-allele) is associated with a more favorable clinical outcome and treatment-response as well as superior reaction times with stronger cortical activation mostly in the prefrontal cortex associated with a more favorable clinical outcome and treatment-response as well as sensitivity changes of alpha4beta2 nicotinic receptor channels in response to nicotine and smoking cessation medication which has recently been shown to be effective for tobacco treatment in smokers with schizophrenia. However, varenicline’s mechanism of action in schizophrenia versus healthy control smokers has not been characterized. We therefore evaluated the effects of varenicline on tobacco reinforcement and features of the tobacco abstinence syndrome, including craving and cognitive dysfunction, in schizophrenia and control smokers. Methods: Over three separate test weeks, schizophrenia (n=12) and control (n=12) smokers were co-treated (using a counterbalanced sequence) with varenicline (0.5 and 1mg BID) during a 3-day laboratory paradigm incorporating assessments of craving, withdrawal and cognition (sensorimotor gating, attention, processing speed, visuospatial working memory (VSWM), verbal learning and memory and impulsivity) at baseline smoking, overnight abstinence and smoking reinstatement conditions. Results: Overnight abstinence from smoking increased craving in both control and schizophrenia smokers (p<0.05), whereas abstinence-induced deficits in smoking with schizophrenia (p=0.08), but attenuated abstinence-induced increases in craving only in control smokers (p<0.05). Conclusions: Our data suggest that varenicline may have specific neurocognitive actions in smokers with schizophrenia which target pathophysiological mechanisms related to nicotinic receptor dysfunction in this disorder. These findings have important implications.
for the development of nicotinic partial agonists as treatments for tobacco dependence and neurocognitive deficits in schizophrenia.

This work was funded in by an operating grant from the Ontario Mental Health Foundation, the Canada Foundation for Innovation (CFI-LOF #19229 and CFI/HRF # 19229 to TPG), and the University of Toronto Chair in Addiction Psychiatry to TPG. VCW and CEW were supported by Postdoctoral Research Fellowships from the Centre of Addiction and Mental Health. Varenicline was provided by Pfizer, Canada.

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SYM13
THE REGULATORY SCIENCE OF NICOTINE REDUCTION: NEW PERSPECTIVES, DATA, AND OPPORTUNITIES FOR ANIMAL RESEARCH

Chair: Eric C. Donny, Ph.D.
Presenters: Tracy G. Taylor, M.S., Mark G. LeSage, Ph.D., Laura O’Dell, Ph.D., and Darlene H. Brunzell, Ph.D.
Discussant: Jack E. Henningfield, Ph.D.*

The Family Smoking Prevention and Tobacco Control Act permits the regulation of nicotine in cigarettes. Reducing nicotine to reliably reduce consumption of, and dependence on, cigarettes could be a powerful approach to limit the abuse liability and consequent harm from cigarettes. Animal research can play an important role in developing the empirical basis of regulatory decisions, but this requires a new perspective. Speakers will present preclinical data addressing complex issues pertaining to nicotine reduction and discuss those results from a regulatory science perspective. Tracy Taylor will present data on the method of reduction (immediate versus gradual) and the impact of a history of high dose self-administration that begins to address whether nicotine naïve vs. nicotine exposed users might be affected differently by reduced nicotine. Dr. Mark LeSage will present findings from studies that examine predictors of individual differences in the magnitude of compensation, nicotine reinforcement thresholds, and elasticity of demand in rats self-administering progressively lower doses of nicotine. Predictors of interest include baseline behavioral measures (e.g. nicotine intake), nicotine metabolism, and sex. Dr. Laura O’Dell will present evidence demonstrating that there are fundamental differences related to age and sex in the degree to which the rewarding effects of nicotine and the negative effects of withdrawal contribute to tobacco abuse that could have implications for the effects of nicotine reduction strategies. Dr. Darlene Brunzell will focus on the diversity of nicotine receptor subtypes with differential sensitivity to nicotine and the role these receptors may play in the reinforcing effects of low doses of nicotine, particularly among individuals with psychiatric conditions or different motives for smoking. Finally, Dr. Jack Henningfield will discuss the importance of preclinical research in the regulatory science of nicotine reduction and provide insight into high priority areas of research that can be addressed within the context of animal models.

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SYM13B
INDIVIDUAL DIFFERENCES IN NICOTINE SELF-ADMINISTRATION IN RATS DURING PROGRESSIVE UNIT DOSE REDUCTION: IMPLICATIONS FOR NICOTINE REDUCTION TREATMENTS AND POLICY

Mark G. LeSage*, Paul R. Pentel, and Danielle Burroughs, University of Minnesota

The FDA is considering reducing the nicotine content in tobacco products as a policy to reduce the addictiveness of tobacco products. However, the feasibility and consequences of this approach have not been well studied. The threshold level of nicotine needed to maintain smoking in adults and the extent to which compensatory smoking would occur in response to a progressive reduction in nicotine content are largely unknown. Moreover, factors contributing to individual variability in nicotine reinforcement thresholds and compensation, which represent sources of variability in addiction and health risk across sub-populations, need to be elucidated. The present studies examined these issues in a rodent nicotine self-administration (NSA) model to characterize individual differences in nicotine reinforcement thresholds, degree of compensation, and elasticity of demand during progressive reduction of the unit nicotine dose. Experiment 1 examined whether these variables correlate with individual differences in baseline nicotine intake and nicotine pharmacokinetics. Experiment 2 examined sex differences in response to unit dose reduction. In both experiments, rats were trained to self-administer nicotine (0.06 mg/kg) during daily 23 hr sessions. Then, saline extinction and reacquisition of NSA was arranged, followed by weekly reductions in unit dose until extinction was achieved. In Experiment 1, baseline nicotine intake was a significant predictor of compensation. Male rats with low baseline intake exhibited greater compensation. Nicotine pharmacokinetics did not predict any NSA measure. In Experiment 2, females showed higher baseline intake and less compensation compared to males. Exponential demand-curve analysis provided a very precise (typical r2 > 0.9) measure of individual differences in overall sensitivity (i.e. elasticity of demand) to nicotine reduction (i.e. increases in the unit price (FR/unit dose) of nicotine). Together, these findings suggest that baseline nicotine intake and sex may be useful predictors of population response to nicotine reduction policies and that exponential demand analysis may provide a useful overall measure of this response.

Supported by NIDA grant R01-DA025444.

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SYM13A
EFFECTS OF RATE OF REDUCTION AND HISTORY OF HIGH DOSE SELF-ADMINISTRATION IN RATS SELF-ADMINISTERING LOW DOSE NICOTINE

Tracy G. Taylor*, Melissa E. Levin, Rachel Schassberger, Deanne M. Buffalari, Alan F. Sved, and Eric C. Donny, University of Pittsburgh

A policy regulating the content of nicotine in cigarettes to a level below the threshold for reinforcement has the potential to save lives by dramatically decreasing smoking rates in current U.S. smokers and preventing the emergence of chronic smoking in nonsmokers. However, little is known about the impact of behavioral and pharmacological history factors. In two studies, rats were given the opportunity to self-administer varying doses of nicotine along with a cocktail of other cigarette constituents. Non-nicotine constituents were included because experiments have shown they may contribute to dependence. Rats (N=52) that acquired self-administration at 60 mcg/kg were assigned to one of seven reduction groups: 60(no change), 30, 15, 7.5, 3.75, 1.875, or 0.0 (vehicle) mcg/ kg. Reduction to 3.75, 1.875, or 0.0(vehicle) mcg/kg resulted in significantly less administered infusions than the unchanged group, (p<0.05). To examine how the method of reduction (gradual vs. immediate) affects behavior at low doses, rats in the 30 mcg/kg group experienced progressive dose reductions (30, 15, 7.5, 3.75, 1.875 mcg/kg) resulting in infusion rates at each dose comparable to rats that experienced reduction immediately, p>0.05. Results indicate that the method of reduction did not shift the reinforcement threshold. Another critical issue is how nicotine reduction might affect smoking maintenance in current smokers differently than acquisition of smoking in nonsmokers. Rats given the opportunity to respond for low nicotine doses (N=42) did so at a higher rate after they self-administered a higher nicotine dose, p<0.01. Number of infusions earned was significantly higher in rats responding for the threshold dose (7.5 mcg/kg, p<0.01) and rats responding for vehicle only (p<0.05) after administrating 60 mcg/kg. These results indicate that nicotine standards based on studies of current smokers may also be highly effective in preventing chronic smoking in nonsmokers. Together, these studies indicate that animal self-administration can be a valuable tool for investigating historical factors that may affect behavior following nicotine reduction.

Study was supported by NIH grant DA031659.

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Much work has shown that tobacco abuse is mediated by experiencing the positive rewarding effects of nicotine and, ultimately, by avoiding the negative consequences of withdrawal. Our laboratory has shown fundamental sex and age differences in the degree to which these factors contribute to vulnerability in rodent models. Regarding age differences, this presentation will provide behavioral and neurochemical evidence that has led to our hypothesis that enhanced tobacco abuse during adolescence is driven by two factors: (1) the positive effects of nicotine during adolescence are greater than in adults and (2) the negative effects associated with nicotine and withdrawal are substantially lower than those experienced by adults. The overall result is that adolescents seek nicotine because the enhanced positive effects they experience are inadequately balanced against minimal negative effects. Regarding sex differences, enhanced tobacco abuse in females appears to be driven by both (1) enhanced positive effects of nicotine and (2) strong negative effects of stress produced by withdrawal as compared to males. The overall result is that females seek nicotine because of the strong positive effects of nicotine as well as avoiding strong stress responses that emerge during withdrawal from this drug. Taken together, our findings suggest that there are fundamental differences in the mechanisms that mediate tobacco abuse in various sub-populations. The unique aspect of our data is regulation of nicotine in cigarettes could have different effects on female versus male smokers from different age groups. These data will be discussed in the context of guiding future research on the regulation of tobacco products and the potential need to attend to sub-populations of smokers.

**SYM13C**

**PRECLINICAL EVIDENCE OF AGE AND SEX DIFFERENCES IN THE MECHANISMS THAT MEDIATE ENHANCED VULNERABILITY TO TOBACCO ABUSE: IMPLICATIONS FOR THE REGULATION OF NICOTINE IN CIGARETTES**

Laura O’Dell, University of Texas at El Paso

A diversity of nicotinic acetylcholine receptors (nAChRs) with different affinities for nicotine are expressed in brain. Activation of the high affinity beta2 subunit containing nAChRs (beta2*αnAChRs; *denotes assembly with other subunits) is necessary to support nicotine reinforcement and reward in rodents. Selective antagonism of a subgroup of these receptors enriched in mesolimbic dopamine areas, alpha6beta2*αnAChRs, significantly reduces intravenous nicotine self-administration in rats under progressive ratio schedules of reinforcement (PR). Our recent studies show a leftward shift in the dose response curve for nicotine conditioned place preference in mice with a mutation that renders their alpha6beta2*αnAChRs hypersensitive to nicotine-dependent activation (alpha6 L9'S). In contrast, selective antagonism of alpha7 nAChRs results in a significant increase in motivation to self-administer nicotine under PR. This may have implications for individuals with schizophrenia who have a 50% reduction in expression of their α7 nAChRs. Application of a selective agonist of alpha7 nAChRs significantly attenuated nicotine self-administration during PR, suggesting that alpha7 nAChRs work in opposition to beta2*αnAChRs to motivate nicotine use. Similar to anxiolytic drugs, we observe that low dose nicotine and administration of a selective beta2*αnAChR antagonist result in dose-dependent reversal of conditioned inhibition, a significant decrease in marble burying and increased open-arm activity in the elevated plus maze. These data suggest that low doses of nicotine may be sufficiently reinforcing for individuals who are motivated to smoke to relieve anxiety. These preclinical data suggest that smokers who have different incentives for smoking may respond differently to manipulation of nicotine concentrations in cigarettes.

Research was supported by NIH grants DA00702734, MH53631, GM48677 DA030396, DA11729, DA19735, DA023114 and DA031289.

**SYM14**

**TRANSLATIONAL APPROACHES TO REPURPOSING MEDICATIONS FOR NICOTINE DEPENDENCE TREATMENT: PROCOGNITIVE MEDICATIONS AS A MODEL**

Chair: Rebecca L. Ashare, Ph.D.1

Presenters: Heath D. Schmidt, Ph.D.2, Thomas J. Gould, Ph.D.2, Mehmet Sofuoglu, M.D., Ph.D.2, and Rebecca L. Ashare, Ph.D.2*

Discussant: Caryn Lerman, Ph.D.2

1University of Pennsylvania Perelman School of Medicine, Philadelphia, PA; 2Temple University; 3Yale University, School of Medicine and VA Connecticut Healthcare System

There is a critical need for novel smoking cessation treatments to help more smokers maintain abstinence. Repurposing medications that have been “de-risked” through phase I-II testing and target nicotine withdrawal symptoms provides a practical approach by reducing the time and cost burden of traditional drug development strategies. This process may be further expedited by integrating discoveries from preclinical, human laboratory, and clinical research paradigms. By evaluating whether a medication targets factors associated with relapse and providing convergent evidence across disciplines, translational research has the potential to efficiently identify more available treatments. This symposium provides a framework for examining novel treatments for nicotine dependence that target withdrawal-related cognitive deficits, using procoagulable medications, acetylcholinesterase inhibitors (ACHEIs), as a model. Dr. Schmidt will present new evidence from a series of studies demonstrating that the ACHEIs donepezil and galantamine attenuate nicotine self-administration and cue-induced nicotine reinstatement in rats. Dr. Gould will present evidence that galantamine reverses withdrawal-related deficits in contextual learning in mice. Dr. Sofuoglu will present evidence from a human laboratory study that galantamine attenuated craving for cigarettes and cognitive deficits in response inhibition. Dr. Ashare will present findings on the effects of donepezil and galantamine on cognition, smoking behavior, and short-term abstinence in humans. Together, these studies represent a multidisciplinary model for screening novel medications for nicotine dependence by identifying a “de-risked” medication that may attenuate nicotine seeking and ameliorate deficits associated with smoking relapse across species and paradigms. Dr. Lerman will comment on the clinical implications of translational approaches to medication development that have the potential to lead to the availability of treatment alternatives to help more smokers quit.

**SYM13D**

**ACTIVATION VERSUS INHIBITION OF HIGH AND LOW AFFINITY NICOTINIC RECEPTORS: IMPLICATIONS FOR DIVERSE SMOKING PHENOTYPES**

Darlene H. Brunzell, Ph.D.1, Shawn M. Anderson1, Karen Bosch1, Jennifer Lee, M.S.1, Patrick M. Beardsley, Ph.D.1, Henry A. Lester, Ph.D.2, Ryan M. Drenan, Ph.D.1, and Michael McIntosh, M.D., Ph.D.3, 1Virginia Commonwealth University; 2California Institute of Technology; 3Purdue University; *University of Utah

A diversity of nicotinic acetylcholine receptors (nAChRs) with different affinities for nicotine are expressed in brain. Activation of the high affinity beta2 subunit containing nAChRs (beta2*αnAChRs; *denotes assembly with other subunits) is necessary to support nicotine reinforcement and reward in rodents. Selective antagonism of a subgroup of these receptors enriched in mesolimbic dopamine areas, alpha6beta2*αnAChRs, significantly reduces intravenous nicotine self-administration in rats under progressive ratio schedules of reinforcement (PR). Our recent studies show a leftward shift in the dose response curve for nicotine conditioned place preference in mice with a mutation that renders their alpha6beta2*αnAChRs hypersensitive to nicotine-dependent activation (alpha6 L9'S). In contrast, selective antagonism of alpha7 nAChRs results in a significant increase in motivation to self-administer nicotine under PR. This may have implications for individuals with schizophrenia who have a 50% reduction in expression of their α7 nAChRs. Application of a selective agonist of alpha7 nAChRs significantly attenuated nicotine self-administration during PR, suggesting that alpha7 nAChRs work in opposition to beta2*αnAChRs to motivate nicotine use. Similar to anxiolytic drugs, we observe that low dose nicotine and administration of a selective beta2*αnAChR antagonist result in dose-dependent reversal of conditioned inhibition, a significant decrease in marble burying and increased open-arm activity in the elevated plus maze. These data suggest that low doses of nicotine may be sufficiently reinforcing for individuals who are motivated to smoke to relieve anxiety. These preclinical data suggest that smokers who have
nicotine-seeking behavior. Recent work from our laboratory indicates that acute administration of donepezil (0.3, 1.0 and 3.0 mg/kg, i.p.) or galantamine (0.1, 1.0, and 5.0 mg/kg, i.p.), 20 minutes prior to the start of an operant session, dose-dependently attenuated self-administration of nicotine when rats were maintained on a fixed-ratio 5 (FR5) schedule of reinforcement. Furthermore, chronic, daily administration of galantamine (5.0 mg/kg, i.p.) attenuated self-administration of nicotine when maintained on a FR5 schedule of reinforcement. Commonly reported adverse effects of galantamine and donepezil treatments in humans are nausea and vomiting. However, at doses required to attenuate nicotine self-administration in rodents, no effects of galantamine or donepezil on nausea/malaise as measured by pica (i.e. consumption of kaolin) were observed. Lever pressing for nicotine was extinguished by substituting saline for nicotine. Following extinction, the ability of donepezil (0.3, 1.0 and 3.0 mg/kg, i.p.) or galantamine (0.5, 1.0 and 5.0 mg/kg, i.p.) to block the reinstatement of drug seeking initiated by a priming injection of nicotine (0.2 mg/kg, s.c.) and non-contingent presentations of light/tone cues that were previously paired with nicotine self-administration was assessed. Donepezil and galantamine dose-dependently attenuated nicotine- and cue-induced reinstatement of drug seeking. Together, these findings suggest that acetylcholinesterase inhibitors, such as donepezil and galantamine, may serve as smoking cessation medications.

This work is support by K01 DA030445 to H.D.S., P50-CA-143187; Center for Interdisciplinary Research on Nicotine Addiction (CIRNA) pilot grant to (H.D.S.) and an Institutional Research Grant (IRG-78-602-31) from the American Cancer Society and the Abramson Cancer Center at University of Pennsylvania.

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SYM14B
THE CHOLINESTERASE INHIBITOR GALANTAMINE AMELIORATES WITHDRAWAL DEFICITS IN HIPPOCAMPUS-DEPENDENT LEARNING

Thomas J. Gould, Ph.D.*, and Derek S. Wilkinson, B.S., Department of Psychology, Temple University

Current smoking cessation aids are modestly effective at maintaining abstinence. While nicotine withdrawal is associated with a variety of symptoms, we have focused on cognitive deficits that emerge during withdrawal as these deficits are associated with relapse. Our work has examined the relationship between changes in nicotinic acetylcholinergic function and expression of cognitive withdrawal symptoms, and whether modulation of cholinergic signaling can ameliorate the cognitive withdrawal deficits. We examined if galantamine, an acetylcholinesterase inhibitor and allosteric modulator of nicotinic acetylcholine receptors, would alleviate cognitive withdrawal deficits in C57BL/6 mice. An initial acute dose-response experiment revealed that 0.5 and 1 mg/kg galantamine had no effect on learning. To determine if galantamine reverses nicotine withdrawal-related deficits in hippocampus-dependent learning, mice were implanted with osmotic mini-pumps that delivered chronic saline or 6.3 mg/kg nicotine for 12 days and then pumps were removed. Training and testing of contextual (hippocampus-dependent) and cued (hippocampus-independent) learning occurred 24 and 48 hours later, respectively. Nicotine withdrawal disrupted hippocampus-dependent learning, which was reversed with 1 but not 0.5 mg/kg galantamine; no withdrawal or drugs effects were seen for hippocampus-independent learning. Across all conditions in both studies 2 mg/kg galantamine lead to high levels of freezing behavior that were likely due to nonspecific effects. The ability of galantamine to reverse nicotine withdrawal-deficits in contextual learning is likely mediated through enhanced levels of acetylcholine via inhibition of acetylcholinesterase, alteration of hippocampal α4β2* nicotinic acetylcholine receptor function, or both. The results of the present study demonstrate that acetylcholinesterase inhibitors and/or drugs that act as allosteric modulators of nicotinic acetylcholine receptors might be targets for aiding in smoking cessation.

Funding: National Institute of Health Grant Support (DA024687, DA01749, CA143187).

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SYM14C
GALANTAMINE ATTENUATES SOME OF THE SUBJECTIVE EFFECTS OF INTRAVENOUS NICOTINE AND IMPROVES PERFORMANCE ON A NO-GO TASK IN ABSTINENT CIGARETTE SMOKERS

Mehmet Sofuoglu, M.D., Ph.D., Yale University, School of Medicine and VA Connecticut Healthcare System

Galantamine (GAL), a reversible and competitive inhibitor of acetylcholinesterase, is used clinically in the treatment of Alzheimer’s dementia. Some preclinical and clinical studies support the potential efficacy of cholinesterase inhibitors for smoking cessation, although their effects on the behavioral and physiological responses to nicotine have not been examined. The goal of this study was to characterize GAL’s actions on multiple outcomes including withdrawal severity and cognitive performance, as well as subjective and physiological responses to nicotine administered intravenously. A total of 12 smokers participated in a double-blind, placebo-controlled, crossover study. Smokers had two 4-day treatment periods, assigned in random sequence, to GAL (8 mg/day) or placebo treatment. On day 4 of each treatment phase, smokers had an experimental session in which they received an intravenous (IV) dose of saline or 1 mg/70 kg nicotine, one hour apart, in a random order. GAL attenuated the self-reported rating of “craving for cigarettes” and prevented decrements in performance in a Go/No-Go task. In response to IV nicotine, GAL treatment attenuated the self-report ratings of “like the drug effects,” “good drug effects,” “bad drug effects,” and “stimulated.” These findings support the potential utility of GAL as a treatment for smoking cessation.

This research was supported by the VA Mental Illness Research, Education and Clinical Center (MIRECC) and the NIH grant K02-DA-021304.

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SYM14D
EFFECTS OF TWO CHOLINESTERASE INHIBITORS ON COGNITION AND SHORT-TERM SMOKING ABSTINENCE

Rebecca L. Ashare, Ph.D.*, Rijiu Ray, Ph.D., Andrew A. Strasser, Ph.D., Steven Siegel, M.D., Ph.D., and Caryn Lerman, Ph.D., University of Pennsylvania School of Medicine, Philadelphia, PA

Despite the availability of pharmacotherapies for smoking cessation, most smokers relapse within the first few days of abstinence. Procedures for early medication screening, coupled with an emphasis on “reprogramming” of existing medications, provide a practical approach to identify novel treatments to help more smokers maintain abstinence. Withdrawal-related cognitive impairment, a common withdrawal symptom that is predictive of relapse, is a promising therapeutic target. Endogenous acetylcholine levels, which are modulated by acetylcholinesterase inhibitors (AChEIs), play an important role in smoking behavior and cognition. AChEIs are FDA-approved for treating the cognitive symptoms of Alzheimer’s disease and represent a potential therapeutic target. Recent work in our lab suggested that among 18 non-treatment seeking smokers, 4 weeks of treatment with the AChEI, donepezil was well-tolerated and modestly improved cognition. Donepezil improved accuracy during a working memory task and marginally improved discrimination during a sustained attention task. The donepezil group showed no changes in accuracy in either task. However, donepezil had no effect on smoking behavior. Because smokers in that study were not interested in quitting, we conducted a follow-up study with treatment-seeking smokers using the AChEI, galantamine. This study utilized a Phase II model of short-term quitting that has been shown to be clinically valid for early human screening of smoking cessation medications. Following 7 weeks of treatment with galantamine smokers underwent a ‘one-week practice quit attempt’ during which they were offered small monetary incentives for providing biochemically verified abstinence. The primary outcomes were the number of days abstinent during the 7-day quit attempt. Galantamine was well tolerated and among the 9 study completers, 22% were abstinent all 7 days during the quit week and 66% were abstinent between 4 and 6 days with mean CO levels of 5.4ppm. These studies suggest that AChEIs may have pro-cognitive

Funding: National Institute of Health Grant Support (DA024687, DA01749, CA143187).

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effects among healthy smokers while they continue to smoke as usual and show promise as potential therapeutics for smoking cessation.

This research was supported by grant #RG-78-002-30 from the American Cancer Society, grant #UL1RR024134 from the National Center for Research Resources, and by grant #P50 CA143187 from the National Cancer Institute.

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SYM15
ECOLOGICAL MOMENTARY ASSESSMENT OF SMOKING: CAPTURING MICROPREDICTS ACROSS THE TOBACCO USE LIFE CYCLE

Chair: Saul Shiffman, Ph.D.*1
Presenters: Saul Shiffman, Ph.D.*1, Robin J. Meremelstein, Ph.D.*1, and Thomas R. Kirchner, Ph.D.*1
Discussant: David B. Abrams, Ph.D.*1
1Schoeder Institute for Tobacco Research and Policy Studies, Legacy; 2University of Illinois at Chicago

Most analyses of smoking behavior focus on a macro-level—how many cigarettes population group smokes, or how dependent an individual is. Yet, tobacco use occurs on a more micro level, day-to-day and minute-to-minute—a teen decides to smoke a cigarette at a particular moment, and experiences a rewarding response...or doesn't. A young adult non-smoker experiences craving and smokes, even though she hasn't felt the need to smoke in several days. An adult smoker who is quitting is triggered to relapse by exposure to an environmental cue—perhaps a deliberately placed cue, such as tobacco promotion. Capturing such microprocesses is the forte of Ecological Momentary Assessment (EMA) methods that capture real-time data in real-world settings, usually using technology such as handheld computers or smart phones. This symposium presents data from the application of three different EMA designs to three different questions and populations. Robin Meremelstein presents data on the mood effects of smoking in young teens, and how they change over time as dependence develops. Saul Shiffman presents on the stimuli associated with craving and smoking in non-daily smokers, compared to daily smokers. Tom Kirchner presents on the how the built and manipulated environment—captured via built-in GPS recording and geocoding of tobacco sales outlets—affects relapse risk in smokers who are quitting. Together, the papers demonstrate the insights that can be derived from EMA data, and the challenges of collecting and analyzing such data. The presentations will be followed by a panel discussion / Q&A session discussing both theoretical and practical aspects of EMA, and by commentary and discussion by David Abrams, who discusses how such detailed micro-analyses can enhance our understanding not only of behavioral theory and treatment but also of populations and policy. Especially now that FDA has the mandate to regulate tobacco products, EMA has a role to assess subtle changes in patterns of tobacco use behavior in response to changing policies and products.

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SYM15A
SMOKING PROGRESSION FROM ADOLESCENCE INTO YOUNG ADULTHOOD: INSIGHTS FROM ECOLOGICAL MOMENTARY ASSESSMENTS

Robin J. Meremelstein, Ph.D.*1, and Donald Hedeker, Ph.D., University of Illinois at Chicago

Ecological Momentary Assessments (EMA) provide a unique opportunity to examine linkages between mood, nicotine dependence, contextual factors, and smoking patterns, particularly during the volatile developmental period of adolescence to young adulthood. This paper will present examples of how longitudinal EMA can help address questions about progression in a sample of adolescents (N=644) over a five year period. Participants were in 9th or 10th grade at baseline, and completed multiple 7-day EMA measurement waves between baseline and 24 months, and then at 5 years. Participants responded to random prompts and event-recorded smoking episodes. The present analyses were restricted to participants who provided at least two smoking episodes per wave over at least two EMA waves in order to examine specifically questions about changes in mood with smoking, changes in mood variability with smoking, and moderating effects of both smoking rate and nicotine dependence. We used a random intercept location scale model approach to examine the effects of smoking rate and nicotine dependence on initial mood changes (both positive and negative) with smoking, whether these mood changes diminished over time (as a potential indicator of tolerance), and whether either smoking rate or nicotine dependence (measured by NDSS) moderated both the mean change and the variability of the mood change. The model allowed us to disentangle the within-subject and between-subject effects. Adolescents showed notable and robust changes in mood initially. Between subjects, as smoking rate increased, we found a diminishing of the mood change. Importantly, within subjects and across waves, the effect of the mood change diminished as an individual's smoking increased, although the change in mood was still significant. In terms of variance or consistency of the mood change, with time and increasing rate, participants became more consistent in their mood responses to smoking. Although smoking rate moderated the effects of mood changes, we did not find significant moderating effect for the NDSS, suggesting that different dimensions of dependence emerge at different rates in smoking progression.

This work was supported by grant 5RO1DA20742 from the National Cancer Institute and was conducted at the University of Illinois at Chicago.

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SYM15B
AN ECOLOGICAL MOMENTARY ASSESSMENT STUDY OF SMOKING PATTERNS AND STIMULUS CONTROL IN NON-DAILY SMOKERS

Saul Shiffman, Ph.D.*1, Xiaoxue Li, B.S., Michael S. Dunbar, M.S., Sarah M. Scholl, M.P.H., and Hilary A. Tindle, M.D., M.P.H., University of Pittsburgh

Current models of smoking and dependence are based on the behavior of daily smokers, who smoke frequently, apparently to maintain levels of nicotine in the bloodstream. Yet, a growing proportion of adult smokers—25% in the US—are non-daily, or intermittent, smokers (ITS). We used Ecological Momentary Assessment (EMA) methods to study smoking patterns in a sample of 217 ITS (smoking 4-27 days/month), compared to daily smokers (DS, n=195, 5-30 cigarettes a day). For 3 weeks, subjects recorded each cigarette on an electronic diary, and situational and subjective variables were assessed in a random subset of smoking episodes (n = 21716); parallel assessments of non-smoking occasions were obtained by beeping subjects at random (n = 27012). ITS smoking occurred in the context of steep increases in craving, but their craving levels, even when smoking, were much lower than those among DS. Contrary to expectation, ITS were particularly likely to smoke in the morning, as well as at night. Compared to DS, ITS’ smoking was more strongly associated with being away from home, being in a bar, drinking alcohol, socializing, with friends and acquaintances, and when others were smoking. Mood had only modest effects in either group. The situations associated with increased probability of smoking were similar for ITS and DS, but the associations were consistently stronger for ITS. Consistent with this, an idiosyncratic analysis based on separate regressions for each subject demonstrated that ITS’ smoking was under very strong stimulus control, more so than DS’. For example, among ITS, social setting variables (who they were with, whether anyone was smoking) distinguished smoking and non-smoking situations with almost 85% certainty (based on ROC values from within-subject logistic regressions). Among ITS, we compared patterns of those who had previously smoked daily to those who had not. Differences in smoking patterns were modest, but previous DS demonstrated weaker stimulus control over smoking. Stimulus control may be an important influence in maintaining ITS smoking and making quitting difficult for ITS.

Funding for this research was provided by National Institute of Drug Abuse Grant 5R01DA20742.

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SYM15C
REAL-TIME MEASURES OF CRAVING AND EXPOSURE TO POINT-OF-SALE TOBACCO PREDICT OUTCOMES DURING SMOKING CESSATION

Thomas R. Kirchner, Ph.D.*, Jennifer Cantrell, Dr.Ph., M.P.A., Andrew Anesetti-Rothmer, M.P.H., Jennifer Pearson, Ph.D., Ollie Ganz, M.S.P.H., Jennifer Kreskaite, M.S.P.H., Donna Vallone, Ph.D., and David B. Abrams, Ph.D., Schroeder Institute for Tobacco Research and Policy Studies, Legacy

This work focuses on the cross-level nexus between variation in point-of-sale tobacco (POST) marketing at the community-level and variation in real-time POST exposure, motivational processes and smoking behavior at the individual-level, all of which interact dynamically over time. Ecological Momentary Assessment methods make it possible to collect and analyze this kind of real-world data. We examined outcomes during smoking cessation as a function of moment-to-moment exposure to POST marketing and craving to smoke. Real-time exposure to POST marketing was quantified via continuous mobile phone geo-location tracking. Individual mobility patterns from a cohort of DC resident tobacco users (N=476) were overlaid on an existing point-of-sale surveillance geodatabase (N=1,060 stores). Participants’ location was tracked continuously via mobile phone over the first 4 weeks of their cessation attempt. This mobility “signature” physically linked each person to their surrounding point-of-sale marketing environment in real-time. Participants recorded craving levels during random prompts and event-recorded smoking episodes. The final data set spans a total of N=14,959 days. Each participant recorded a lapse on an average of 7.7 days (SD=9.9, Md=n=40), with 87% (N=393) of participants lapsing for at least 1 day, and 74.6% (N=355) biochemically verified abstinent at 30-day follow-up. All participants came into contact with POST, averaging 2.7 contacts per day (SD=5.8), and 82.2 contacts over the first month (SD=172.3). Lapses were increasingly likely as the number of daily POST contacts increased (OR=1.05; 95% CI=1.04-1.06), POST contacts and craving levels interacted to affect cessation outcomes, such that the likelihood of both lapses and relapse at 1-month increased to the degree that POST contacts were positively associated with daily craving levels. These data shed light on the way mobility patterns drive a dynamic interaction between individuals and the built POST environment, and suggest that conceptions of the POST environment as relatively static fail to account for the mobility and preferences of individuals actively engaging with their surroundings over time.

This work was supported by grant RC1 DA028710 from the National Institute on Drug Abuse, as well as DC Department of Health Contract P0358719.

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SYM16A
TOBACCO CONTROL MASS MEDIA COMMUNICATION: WHAT HIGH-, MIDDLE-, AND LOW-INCOME COUNTRIES CAN LEARN FROM EACH OTHER

Sandra Mullin**, Nandita Murukutla, Ph.D.1, Tahir Turk, Ph.D.1, Tom Carroll, Ph.D.1, Stephen Hamilton2, Melanie Wakefield, Ph.D.7, and colleagues2, 8World Lung Foundation; ‘Anti-Cancer Council, Melbourne, Australia

Background: A significant challenge to the implementation of tobacco control mass media campaigns in LMICs has been the lack of evidence from LMICs on the kinds of messages that would be most effective in encouraging tobacco prevention and cessation, and whether the kinds of messages that are successful in HICs would be successful in LMICs. We examined the kind of messages that would be successfully transferable to LMICs. Research Approach and Method: Three message-testing projects were undertaken to identify the transferability of high-performing messages from HICs to LMIC contexts. The first compared the relative effectiveness of TV messages among smokers in 10 LMICs. The second examined the relative effectiveness of TV messages about the harms of SHS exposure among smokers and non-smokers in 3 LMICs. The third examined the effectiveness of anti-smoking and SHS exposure messages – prepared in TV and radio formats – in 3 African countries. We also identified effective messages addressing issues unique to certain LMICs, such as China (gift giving) and India (smokeless tobacco and bidis). Results: Across the disparate message-testing projects, a consistent theme has emerged: in all contexts and populations, advertisements that portray the health harms of tobacco graphically and in personally relevant ways were the most effective. High performing graphic advertisements from HICs consistently performed highly in LMICs, indicating the generalizability of these advertisements in LMICs. Testimonial ads – that is, ads featuring victims and their stories – from HICs performed more variably in LMICs, often influenced by the extent of how relatable the victim is to the local population. This was borne out in research in India where personal testimonials that featured local victims of typical demographic characteristics were found to be highly successful in eliciting the kinds of negative emotions necessary to effective tobacco control messages. Conclusions: Messages that are effective in HICs are also effective in LMICs, allowing for tremendous cost-savings in LMICs through the translation and adaptation of ads from HICs for local use. Personal testimonials from HICs do not generalize as easily to LMICs and cannot be as easily adapted, however locally produced personal testimonial style ads are highly effective, “Raw and real” journalistic style ads, developed of shoe-string budgets can be highly effective as long as the graphic portray of tobacco-related disease and the emotional backstory of the patients are clearly rendered.

Funding: The research for the 10-country study was funded by the Bloomberg Initiative to Reduce Tobacco Use funded by Bloomberg Philanthropies.

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SYM16B
SUCESS OF TOBACCO CONTROL IN TURKEY: ROLE OF GOVERNMENT APPROACH AND CIVIL SOCIETY SUPPORT

Nazmi Bilir, M.D.*, Hilal Ozcebe, M.D., Ph.D., Hacettepe University, Institute of Public Health

Background: The first tobacco control law in 1996 banned smoking in some indoor public places such as health and educational facilities, sports and cultural establishments, and public transport. The Law also banned all kinds of smoking prevalence by 30% in only five years. The fourth speaker (Lal) will argue that the supply side of tobacco products’ lifecycles needs to be addressed if tobacco taxes are to be effective, particularly in India. The final presentation will focus on lessons learned to date on doing tobacco control in China. Presentations will be limited in length to allow sufficient time for discussion with the audience.

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of advertisement and promotion of tobacco products. Following 12 years of implementation, this law was amended in 2008 covering all public places as smoke-free, including hospitality workplaces and taxis. Methods: When the draft tobacco control law was on the agenda of the Parliament in 1995, several civil society organizations joined efforts to form The National Coalition on Tobacco and Health. The National Coalition conducted a series of lobbying activities in favor of the law, visiting political party groups in the Parliament, the head of the Parliament and The President. Members of the Coalition participated in the Commissions in the Parliament, providing scientific evidence for smoke-free policies. Similar lobbying activities were conducted during the amendment of the Law in 2008. After the Law was enacted, the National Coalition organized a series of meetings with the representatives of the hospitality industry to explain the rationale and the importance of the smoke free legislation, as well as the benefits of implementation. Results: The first tobacco control law was enacted by a coalition government, and the second law by a single party government, nevertheless all political parties in the Parliament gave full support to both of the laws. In collaboration with civil society and the government, strong mass media campaigns were performed, particularly during the implementation of the law at hospitality workplaces. In addition, during the implementation of the amended Law, civil society conducted several surveys to demonstrate the public compliance, impact of the Law on indoor air quality and some health effects. These surveys found that indoor air quality was improved; symptoms of the workers at hospitality workplaces reduced and emergency admissions due to smoke-induced cardiac and respiratory health problems were reduced. Also, both the smoking and non-smoking customers were found to be pleased with the smoke-free indoor places. Conclusions: Following 12 years of implementation of smoke-free law since 1996, people and the establishments were quite well adopted to the comprehensive smoke-free implementation, with a high compliance. Political commitment and support of the government and good collaboration with civil society were the key elements of success.

**Funding:** The surveys were performed under the Project on “Expansion of SF Public Places and Workplaces in Turkey and Effective Enforcement”, funded by Bloomberg Philanthropies.°

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**SYM16C**

**DAILY SMOKING PREVALENCE IN UKRAINE DECREASED BY 30% IN FIVE YEARS**

Konstantin S. Krasovsky, Ph.D.*, and Tatiana I. Andreeva, M.D., Ph.D., Alcohol and Drug Information Center, Ukraine

Background: Daily smoking prevalence in Ukraine decreased from 37.2% in 2005 to 25.5% in 2010. It was a result of synergy of effective tobacco control policies: excise increases, extension of smoke free policies; tobacco advertising bans; health warnings and media campaigns. Ukraine follows best international practices, but the success was reached without governmental funding for tobacco control activities. Ukraine almost did not use those strategies, which require even small resources like quit-lines or paid media campaigns. Efforts to change legislation supported by media advocacy were crucial for the smoking prevalence decrease. Methods: Smoking prevalence trends by gender and SES were studied in the context of tobacco control policies implementation and situation in the country. Economic data on tobacco taxes, prices and revenues were analyzed. Cigarette smuggling (both into and out of the country) was also estimated. Results: Female smoking prevalence decreased faster than that for males. In 2008-2010 tobacco excise rates increased five-fold. Governmental revenues in 2007-2011 increased five-fold. The tobacco revenue increase was especially important as tobacco excise rates increased six-fold. Governmental revenues in 2007-2011 country. Economic data on tobacco taxes, prices and revenues were analyzed. Legislation supported by media advocacy were crucial for the smoking prevalence decreased. Also, both the smoking and non-smoking customers were found to be pleased with the smoke-free indoor places. Conclusions: Following 12 years of implementation of smoke-free law since 1996, people and the establishments were quite well adopted to the comprehensive smoke-free implementation, with a high compliance. Political commitment and support of the government and good collaboration with civil society were the key elements of success.

**Funding:** The surveys were performed under the Project on “Expansion of SF Public Places and Workplaces in Turkey and Effective Enforcement”, funded by Bloomberg Philanthropies.°

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**SYM16D**

**PERVERSE ECONOMICS OF TOBACCO TRADE IN INDIA**

Pranay Lal*, The Union South-East Asia Office, International Union Against Tuberculosis and Lung Disease

Tobacco and tobacco products are extremely affordable and widely accessible to all in India. As in much of South Asia, the entire lifecycle of tobacco products is subsidised – with low minimum wages for workers, heavy subsidies on input materials, and tax waivers for manufacturers. Such incentives keep production costs of tobacco products low, making them highly affordable to its users and profitable to its manufacturers. All of this is promoted by the Government with a stated intent of improving employment and livelihood opportunities in tribal and under-developed parts of India. However, its economic incentives are perverse as these policies permit tobacco manufacturers to extract a large and (currently) un-estimated price that violates human rights, keeps wages of workers, degrades the environment, and limits options for better livelihoods of vulnerable communities. These factors driving the lifecycle of tobacco and facilitating its production also limit the effectiveness of demand-side strategies to combat the prevalence of tobacco use. Increasing taxes, in particular, fails to induce any perceptible changes on retail prices of tobacco products. As input and manufacturing costs are kept artificially low, even significant tax increases do not translate into corresponding price increases and cuts to manufacturers’ profits are nil or negligible. At the same time, government are often reluctant to increase taxes drastically as it appears unethical to benefit from sin taxes. This presentation makes the argument that taxes will be effective only if several corrections are made across the supply side of the product lifecycle. It will analyse the political economy of the most popular forms of smoked (bidis) and chewed tobacco products (gutka and khaini), present evidence of policies that have been initiated, and identify potential methods of making demand-side strategies more effective.

**No funding.**

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**SYM17**

**INTERVENTIONS FOR HOSPITALIZED SMOKERS: TRANSLATING CLINICAL RESEARCH INTO HEALTH CARE PRACTICE AND POLICY IN THE U.S. AND U.K.**

Chair: Nancy Rigotti, M.D.*

Presenters: Sonia A. Duffy, Ph.D., R.N.*; Rachael Murray, Ph.D.2; Kimber Richter, Ph.D.3; and Nancy Rigotti, M.D.°

Discussant: Michael C. Fiore, M.D., M.B.A.°

1Harvard Medical School, Boston, MA; 2University of Michigan and Ann Arbor Veterans Administration Hospital, Ann Arbor, MI; 3University of Nottingham and UK Centre for Tobacco Control Studies, Nottingham, UK; 4University of Kansas, Kansas City, KS; 5University of Wisconsin, Madison, WI

Hospitalization offers smokers a unique opportunity to initiate cessation because hospital smoking bans require temporary tobacco abstinence by smokers which can jump start quitting. Illness, especially if smoking-related, provides a serious and salient motivational prompt to quit, and smokers are accessible for treatment. Evidence to support the efficacy of smoking cessation interventions initiated during a hospitalization and continued after discharge was summarized in a 2012 Cochrane systematic review. This review identified the need for effectiveness and implementation research as well as appropriate health policies to support the dissemination of this knowledge into practice. Hence, this symposium will highlight research and policy initiatives that address these challenges in the US
SYM17A SMOKING INTERVENTIONS FOR HOSPITALIZED SMOKERS: THE EVIDENCE BASE, RESEARCH NEEDS, AND A NEW TRIAL

Nancy Rigotti, M.D.* Tobacco Research and Treatment Center, Department of Medicine, Massachusetts General Hospital, Harvard Medical School

This presentation will summarize the results of a 2012 update of the Cochrane Collaboration systematic review of clinical trials testing the efficacy of smoking interventions for hospitalized smokers. The update, now including 50 trials, confirmed that intensive behavioral interventions that begin during a hospital stay and include at least 1 month of supportive contact after discharge promote smoking cessation among hospitalized smokers. Interventions are effective regardless of a smoker’s admitting diagnosis, though quit rates are higher in patients admitted for cardiovascular disease. A new finding is that adding nicotine replacement to counseling increases cessation rates over counseling alone. There was insufficient evidence about the benefit of adding varenicline or bupropion to counseling in the hospital setting. The next challenge is to determine how to translate these findings into routine clinical care and especially how to sustain support for cessation after discharge. This is especially challenging because health care systems often lack continuity of care from hospital to home. The review identified these research needs: (1) identify and demonstrate the effectiveness of models that can be adopted in routine clinical practice, (2) demonstrate the cost-effectiveness of intervention models, and (3) explore the impact of hospital based intervention on health and healthcare utilization outcomes. The presentation will end with a description of the Helping HAND 1 trial, which tested the effectiveness of a multi-component Extended Care intervention to sustain smoking cessation treatment after discharge. Extended Care provides free medication and automated telephone calls for 3 months after discharge. Results of study, a randomized controlled effectiveness trial of 397 smokers admitted to 1 hospital, will reported. In that trial, Extended Care increased quit rates at 1 and 3 months follow-up, compared to Standard Care. Six month follow-up data will be presented for the symposium.

Funded by grants from the National Heart Lung and Blood Institute (#RC1 HL99668 and #2K24 HL08880).

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SYM17B EFFECTIVENESS OF THE TOBACCO TACTICS PROGRAM IN THE DEPARTMENT OF VETERANS AFFAIRS

Sonia A. Duffy, Ph.D., R.N., FAAN,1,2,3,4 David L. Ronis, Ph.D.,1,5 Carrie A. Karvonen-Gutierrez, M.P.H.,5 Lee A. Ewing, M.P.H.,1 Gregory W. Dalack, M.D.,4 Patricia M. Smith, Ph.D.,1 Timothy P. Carmody, Ph.D.,1 Thomas Hicks, D.N.S., R.N., C.S.,6 Christopher Hermann, M.S.N., N.P.-C7, Pamela Reeves, M.D.,10 Petra Flanagan, Pharm.D.,1 and Richard White, M.S.N., R.N.1,1

The objective of this Veterans Affairs (VA) Service Directed Project was to determine the effectiveness of an inpatient, nurse-administered Tobacco Tactics program in three large Midwestern VA hospitals. This effectiveness trial was a pre- post- non-randomized comparison design in three large VA hospitals; Ann Arbor and Detroit were the intervention sites and Indianapolis was the control site (N=1,070). At the two intervention sites, research nurses taught the intervention to staff nurses using the Tobacco Tactics toolkit for providers. Staff nurses provided the intervention to inpatient smokers as standard of care using the Tobacco Tactics toolkit for patients. Smokers in both the intervention and control facilities were surveyed at baseline and 6 months after discharge about their smoking habits. The average age was 55.3 years, most were male (94%) and not married (76%). After adjustment for the propensity of actually receiving the intervention, which varied by age, comorbid diabetes, admission for heart disease, stroke, or psychiatric conditions, self-rated health and thinking that quitting smoking would be difficult, there was significant improvement in 6-month quit rates from the pre- to the post-intervention time periods in Ann Arbor (p=0.004) and Detroit (p<0.001) compared to the Indianapolis control site. The implementation of the Tobacco Tactics program has the potential to significantly decrease smoking and therefore potentially decrease smoking-related morbidity and mortality among smokers admitted to VA hospitals. This study was funded by the Department of Veterans Affairs (Service Directed Project 06-003).

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SYM17C SMOKING CESSATION PROVISION IN THE U.K. SECONDARY CARE SETTING

Rachael Murray, Ph.D.*, University of Nottingham and UK Centre for Tobacco Control Studies

Ascertaining smoking status in all hospitalised patients and providing cessation support for smokers willing to accept it has been recommended in UK clinical guidelines for over 15 years. However, implementation of this guidance in secondary care settings remains far from complete. Research has tended to focus on the content of interventions rather than on improving delivery mechanisms and reach of services, however more recent efforts have investigated ways in which the latter may be improved in the UK and a number of these will be discussed in this presentation. In 2009, the English Department of Health (DoH) developed guidance to support systemic and sustainable stop smoking interventions in secondary care, investigating delivery of advice to quit, use of nicotine replacement therapy and referral to local stop smoking services (SSS) on discharge. In 2011, the DoH also tested an electronic referral system incorporated within the main IT system of one large hospital to electronically refer patients to their local SSS after receiving very brief advice from healthcare professionals. A cluster randomised controlled trial conducted in one large UK teaching hospital in 2011 investigated the effect of systematic smoking cessation support delivered by specialist trained advisors at the bedside with community based follow up. Results from all of the above studies will be presented at the conference, including four week and six month quit rates where available. All of the above interventions show promise as an effective means of improving the delivery of smoking cessation support to hospitalised patients, a group of vital importance for decreasing the morbidity and
**SYM17D**

IMPLEMENTATION OF THE CONSORTIUM OF HOSPITALS ADVANCING RESEARCH ON TOBACCO (CHART)

Kimber P. Richter, Ph.D.1, Victor J. Stevens, Ph.D.2, William T. Riley, Ph.D.3, Catherine Stoney, Ph.D.4, Glen Morgan, Ph.D.5, Debra Grossman6, and the CHART Investigators, 1University of Kansas Medical Center; 2Kaiser Permanente Center for Health Research; 3National Cancer Institute; 4National Heart, Lung, and Blood Institute; 5National Institute on Drug Abuse

Now that the efficacy of initiating tobacco dependence treatment during hospitalization has been demonstrated, the challenge is to optimize the implementation and reach of treatment by identifying effective, cost-effective and sustainable intervention strategies. To this end, NHLBI, NCI and NIDA have jointly funded the Consortium of Hospitals Advancing Research on Tobacco (CHART), a network of 7 clinical trials that are each assessing the effectiveness and cost-effectiveness of smoking interventions begun during hospitalization. CHART projects use common measures to facilitate cross-site and subgroup analyses and assess clinical outcomes (hospital readmissions) as well as tobacco abstinence for 6 months after discharge. The CHART group expects to enroll approximately 10,000 hospitalized smokers admitted to a diverse group of nearly 20 private, public, academic, and community hospitals nationwide. All studies include in-hospital components and most focus on testing ways to sustain treatment after discharge. Interventions being tested include automated telephone calls using interactive voice recognition to assess smoking status and encourage renewed quit attempts post-discharge (OR, MA); tailored web- and e-message based intervention for post-discharge care (AL); alternative ways to refer hospitalized smokers to telephone quitlines for post-discharge follow-up (NY, KS, CA); facilitating use of smoking cessation pharmacotherapy after discharge (CA, MA) and a nurse-delivered intervention (MI). All sites are now recruiting. They use novel recruitment and retention strategies and have overcome numerous implementation barriers. The presentation will provide an overview of the 7 interventions being tested, report progress and explore barriers to research in this fast-paced setting. Overall, the combined data set from the 7 CHART studies will represent the largest and most diverse dataset of hospitalized smokers receiving smoking cessation assistance. The experience gained in conducting these studies will be invaluable in promoting the dissemination and implementation of the most effective smoking cessation interventions in hospitals.

*Funded by a grant from the National Heart, Lung, and Blood Institute (1U01HL105232).*

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**SYM18**

ENFORCED TOBACCO ABSTINENCE: A UNIQUE OPPORTUNITY FOR INTERVENTION

Chair: Karen Cropsey, Psy.D.1


Discussant: Jennifer G. Clarke, M.D., M.P.H.2

1Department of Psychiatry and Behavioral Neurobiology, University of Alabama, Birmingham; 2Departments of Medicine and Obstetrics/Gynecology, Alpert School of Medicine, Brown University, Providence, RI; 3Department of Family Medicine and Community Health University of Massachusetts Medical School, Worcester, MA; 4Department of Medicine, Stanford School of Medicine, Stanford, CA; 5Midwestern University College of Dental Medicine–Illinois

For nearly 30 years, complete tobacco bans have been imposed in correctional facilities, inpatient mental health and addiction facilities, and the military. Smokers experience these bans as enforced tobacco abstinence. As they have grown in scale, these bans have come to affect total populations of nearly four million people each year, a majority of whom are likely to be smokers. Upwards of two million American smokers annually, then, experience a period of time where they are not able to smoke. Despite this impact, there is a relative paucity of research and policy integration regarding these bans, perhaps because these settings are largely removed from academic connections. We offer this symposium as an introduction to long-term enforced tobacco abstinence and propose ways in which it can be further studied and integrated into overall smoking reduction policy.

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**SYM18A**

WISE: WORKING INSIDE FOR SMOKING ELIMINATION

Jennifer G. Clarke, M.D., M.P.H., Departments of Medicine and Obstetrics/Gynecology, Alpert School of Medicine, Brown University, Providence, RI

BACKGROUND: Tobacco use among prisoners is approximately three times that of the general population and minorities, poor, mentally ill and illicit substance using individuals are all overrepresented in correctional facilities. Since the announcement of the negative health consequences of secondhand smoke, correctional facilities are increasingly becoming tobacco free. The Rhode Island Department of Corrections (RI DOC) has been tobacco free since February 2003 with no tobacco products allowed anywhere on grounds by inmates or staff. However the majority of inmates return to smoking as soon as they are released back into the community. OBJECTIVE: To determine if a combination of Motivational Interviewing (MI) and Cognitive Behavioral Therapy (CBT) will increase tobacco quit rates after being released from a smoke free correctional facility. METHODS: Inmates were approached about the study eight weeks prior to their release date. Participation was limited to individuals who smoked more than ten cigarettes a day before incarceration and would be able to come to a follow-up visit three weeks after release. Participants were then randomized to either 6 weekly control videos or 6 sessions of MI and CBT. RESULTS: To date 136 participants have completed the study. Three week smoking abstinence rates among the intervention group were 23% (n=16) vs. 10% (n=7) in the control group. The Odds Ratio of quitting was 2.68 (95% CI 1.05-6.84) for the intervention group compared to the control group. Other results to follow. CONCLUSIONS: A combination of MI and CBT given to incarcerated individuals, who smoked before entering a smoke free prison, are more likely to remain smoke free upon release, compared to a control group. Smoking cessation interventions targeting this high risk and underserved population are instrumental to decrease health disparities and decrease tobacco related illnesses in vulnerable populations.

*Funding: 1R01DA024093-01A209 (PI Clarke) from National Institute on Drug Abuse.*

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SYM18B
AN INTRODUCTION TO LONG-TERM ENFORCED TOBACCO ABSTINENCE

Stephen A. Martin, M.D., Ed.M.*, Department of Family Medicine and Community Health, University of Massachusetts Medical School, Worcester, MA

With workplace and public building restrictions in the late 1970s, American smokers were compelled to abstain from smoking outside the home for a limited period of time. Extension of these restrictions to restaurants, public parks, and other settings led to complete, but relatively brief episodes of abstinence. Twenty-five years ago, however, restrictions were taken to their full potential—total outright bans that last for weeks to years. This approach has been gradually increasing in its prevalence and impact. The major entities developing and implementing these bans include correctional facilities, inpatient mental health and addiction facilities, and the military. While these three settings each have their own unique circumstances—ones to be discussed by our symposia panelists—they have common factors that are worthwhile to consider. First, individuals in these settings generally have a higher smoking prevalence than the general population. Second, smokers in each setting have to undergo some form of acculturation to enforced abstinence. Third, each setting develops environments that are largely without smoking-related cues. Fourth, research to date supports the overall sentiment from these paused smokers that “stopping is not quitting,” though current policies and lack of longitudinal treatment generally do not acknowledge this phenomenon. And fifth, smokers undergoing enforced bans generally want to stop their smoking and data suggest that relapse to smoking can lead to relapse to other substances. What interventions, then, are possible to support continued abstinence once a ban is lifted? This discussion will introduce the phenomenon of long-term enforced tobacco abstinence, describe the current state of practice, and propose promising areas for research and policy.

No funding.

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SYM18C
TOBACCO CULTURE AND CONTROL IN THE U.S. MILITARY

Larry Williams, D.D.S.*, Midwestern University College of Dental Medicine—Illinois

The enforced abstinence of tobacco in certain populations presents numerous opportunities and challenges. Various facilities, businesses, and schools can be highlighted as areas that have enforced the prohibition of tobacco use. Military recruit training facilities instituted this enforced abstinence in the 1980’s. The reasons for this abstinence included safety, time management, and health concerns. As with any military branch of service, recruits entering the military are predominantly risk takers. This risk-taking mentality includes the increased use of substances such as tobacco. When accurately measured, the Sailors entering the Navy may have combined smoked and smokeless tobacco use rates that approach 55%. Studies have shown that the impact of enforced abstinence can help a limited number of recruits stay tobacco free. But the stress of military training, boredom, socialization, and peer pressure lead to most tobacco users entering the Navy may have combined smoked and smokeless tobacco use rates that approach 55%. Studies have shown that the impact of enforced abstinence can help a limited number of recruits stay tobacco free. But the stress of military training, boredom, socialization, and peer pressure lead to most tobacco users entering the military facilities, and the military.

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SYM18D
RETURN TO SMOKING FOLLOWING INSTITUTIONALIZED CESSION IN INPATIENT PSYCHIATRY

Judith Prochaska, Ph.D., M.P.H.*, Norval Hickman, Ph.D.2, Kevin Delucchi, Ph.D.3, Stephen Hall, M.D.4, and Sharon M. Hall, Ph.D.5. 1Stanford University; 2California Tobacco-Related Disease Research Program; 3University of California, San Francisco

Recognizing the harms of tobacco exposure, psychiatric hospitals have adopted complete smoking bans though with rarely on-unit counseling or follow-up. In a 2-group RCT, we examined patient and treatment predictors of smoking following institutionalized cessation in inpatient psychiatry and over 12-months. We compared usual care (ban with on-unit NRT only) to usual care plus stage-tailored counseling initiated during hospitalization and continued with 10-wk NRT post-discharge. The sample (N=324) was 61% male, 58% Caucasian, with age M=40 (SD=13). Psychiatric diagnoses were 44% unipolar and 21% bipolar depression, 25% psychotic disorders, and 10% other; 67% had alcohol/ illicit drug problems. The sample averaged 19 (SD=12) cigarettes/day (CPD); 77% smoked within 30 min of waking (TTFC). Stage of change for quitting smoking was 36.7% precontemplation, 44.8% contemplation, and 18.5% preparation. Median length of hospitalization was 6 days (IQR: 4, 11). Most were involuntarily admitted (69%) as suicidal (88%), homicidal (2%), or gravely disabled (10%). On the SF12, mental health functioning was 2 SDs below norms (M=30, SD=14); physical functioning was at norms (M=48, SD=12). Smoking on the day of hospital discharge (61% of sample) was predicted by precontemplation stage of change (OR=3.3, 95% CI 1.6, 6.9; relative to preparation), involuntary hospitalization (OR=1.9, 95% CI 1.1, 3.2), and worse mental health functioning (OR=1.03, 95% CI 1.01, 1.05), and did not differ by treatment condition, length of stay, on-unit NRT use, demographics, diagnosis, substance use problems, physical functioning, or dependence measures (CPD, TTFC). In a non-linear mixed-effects model controlling for stage of change, admission status, and mental health functioning, tobacco abstinence over the 12-mo follow-up was independently predicted by not smoking on day of discharge (p=.002, OR=3.8) and the cessation intervention (p=.006, OR=3.1). Efforts to delay return to smoking following hospitalization may support long-term abstinence and ought to target smokers unmotivated to quit, hospitalized involuntarily, and those in worse mental health.

Funded by K23 DA018691, K05 DA016752, and P50 DA09253.

SYM19
IMPLICATIONS OF THE EVOLVING NICOTINE AND TOBACCO MARKETPLACE AND MORPHING TOBACCO INDUSTRY

Chair: Mitchell Zeller Program Chairs: Mitchell Zeller1, Dorothy K. Hatsukami2, and Martin J. Jarvis3
Discussant: Neal L. Benowitz4
1Pinney Associates; 2University of Minnesota; 3University College London; 4University of California, San Francisco

Over the past decade the marketplace for nicotine and tobacco products has evolved rapidly. At the same time there has been a morphing of the tobacco industry. Companies historically only in the business of selling cigarettes are now selling smokeless tobacco products, dissolvable tobacco products, and electronic cigarettes. They are even selling nicotine replacement therapy products regulated as drugs. The pace of these changes has accelerated at a time when there remains very little regulation of tobacco products. This symposium will explore the implications of these changes for policy, research, advocacy, and communications. The policy implications will focus on the opportunity and the need for a comprehensive nicotine regulatory policy in the United States now that the Food and Drug Administration has regulatory authority over both tobacco products and medicinal nicotine products. An overview presentation (Zeller) will describe in detail what the changes in the marketplace and tobacco industry have been. This will provide a framework for an exploration of the implications to be discussed. The second presentation (Hatsukami) will describe the existing science base on consumer use of these new products as well as their nicotine and toxicity profiles. Gaps in the evidence base and research priorities will be highlighted. The third presentation (Jarvis) will focus on the evolution in the
approach to nicotine policy in the United Kingdom that has culminated in major changes to how the U.K. medicines agency has expanded access to cessation aids to reduce the death and disease toll from tobacco use. The discussant (Benowitz) will share observations on the implications of these profound changes on the emerging thinking regarding so-called “end game” strategies, including the elimination of the use of combustible tobacco products over time. With only three main presentations and one discussant, ample time will be left for audience participation on a topic that poses more questions than answers for the future of research, policy, communications, and advocacy.

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SYM19A
EMERGING TOBACCO PRODUCTS: TOXICITY, APPEAL, AND USE
Dorothy K. Hatsukami, Ph.D., University of Minnesota

Little systematic research has been conducted on the toxicity of emerging products and how these products are being used. This presentation will cover three types of products: 1) snus; 2) dissolvable tobacco and 3) electronic cigarettes. Existing product constituent studies generally show lower tobacco specific nitrogen levels and other toxicants in these products compared to conventional tobacco products, which results or most likely results in lower toxicant exposure levels. However, levels of exposure tend to be higher than medicinal nicotine products, especially when examining the snus products. These emerging products vary in nicotine levels, although lower than observed in conventional products. Challenges associated with electronic cigarettes are the marked variability in nicotine levels due to the wide differences in dose in the product and how the product is used. Emerging products come in varying flavors, which can contribute to the appeal of the product, especially among young adults. Our studies show a strong preference for the mint-flavored snus and dissolvable products among smokers and survey studies show a notable number of users of e-cigarettes choosing the flavored variety. Several main principles and observations may provide insight into how products are used: (1) uptake of a product is dependent on the level of satisfaction derived from the product and based on individual preferences; (2) craving relief from oral tobacco products is dose-dependent, while e-cigarettes provide craving relief even at very low doses; (3) the ability to completely switch to a product is nicotine dose-dependent; (4) abuse liability and continued use of the product are determined by nicotine dose and rate of nicotine absorption; (5) a significant number of smokers engage in dual product use and this prevalence is likely to increase over time with the availability of these alternatives for smoking. The impact of dual use could potentially be negative but is unknown. More systematic and comprehensive studies need to be conducted for these products in all areas of tobacco product evaluation.

Funding: R01 CA135884, R01CA141531, and HHSN26120100438P.

SYM19B
DEVELOPMENTS IN TOBACCO CONTROL AND REGULATION POLICY: A UK PERSPECTIVE
Martin J. Jarvis, Department of Epidemiology & Public Health, University College London

The 1998 government white paper, Smoking Kills, marked the end of decades of official neglect of tobacco in the UK and initiated a continuing move towards comprehensive tobacco control policies, including for the first time reimbursement of pharmacological aids to cessation and the provision of NHS treatment services for dependent smokers. By 2011, against the background of the strong association of smoking with inequalities in health and recognition of that many smokers cannot or will not quit, the new tobacco control plan for England, Healthy Lives, Healthy People, explicitly expanded help for smokers to include harm reduction as an arm of policy, with a commitment to “encourage the manufacturers of safer sources of nicotine to develop new types of nicotine products that are more affordable and that have increased acceptability for use in the long term”. NICE is currently considering guidelines for the implementation of harm reduction approaches within NHS smoking services, and is due to report in early 2013. Decisions on whether to include electronic cigarettes within the MHRA’s regulatory framework are also pending. Important intermediate steps in the evolution of policy were the 2005 move by the MHRA to adopt a public health approach to regulating nicotine delivering products (and the change to viewing the effects of ongoing smoking as the appropriate comparator in considering new products), and the 2007 report by the Royal College of Physicians. Harm reduction in Nicotine Addiction: Helping people who can’t quit. A feature of the evolution of policy in the UK has been the close co-ordination and collaboration between government officials, the medicines regulator, the advocacy group ASH, and academic researchers, which has facilitated the opening of a space for innovative nicotine products with the potential to replace cigarettes.

SYM19C
OVERVIEW OF THE EVOLVING NICOTINE AND TOBACCO MARKETPLACE AND MORPHING TOBACCO INDUSTRY
Mitch Zeller, Pinney Associates, Bethesda, MD

A series of profound changes to the marketplace for nicotine and tobacco products has been taking place over the past decade. These changes have been accompanied by a morphing of the tobacco industry as many companies are now selling nicotine in multiple forms, both as tobacco and pharmaceutical products. This presentation will describe the evolution of the nicotine and tobacco marketplace to now include cigarettes, smokeless tobacco products, dissolvable tobacco products, electronic cigarettes, and nicotine replacement therapy products all being sold either by tobacco companies or their wholly-owned pharmaceutical subsidiaries. The marketplace for tobacco products in the United States is now under the regulatory control of the Food and Drug Administration. FDA has a historic opportunity to forge a comprehensive nicotine regulatory policy that cuts across the agency’s Tobacco and Drugs Centers. Experts agree that there is a distinct “continuum of risk” when it comes to products that deliver nicotine. FDA is uniquely poised to shift current tobacco users away from the deadliest form of nicotine delivery (conventional cigarettes) to the cleanest and safest (currently medicinal nicotine products). This presentation will highlight the impact of the evolving marketplace and morphing tobacco industry on FDA’s ability to design an agency-wide nicotine regulatory policy.

M. Zeller is employed by Pinney Associates, a health policy consulting firm. Pinney Associates provides consulting services to GlaxoSmithKline Consumer Healthcare on issues related to the treatment of tobacco dependence.

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SYM20
GLOBAL TOBACCO DEPENDENCE TREATMENT: A DISCUSSION ON SCIENCE-TO-PRACTICE
Moderator: Scott J. Leischow, Ph.D.
Panelists: Scott J. Leischow, Ph.D.; Tom Glynn, Ph.D.; Richard D. Hurt, M.D.; Lekan Ayo Yusuf, Ph.D.; Asaf Bilton, M.D.; John Pierce, Ph.D.; and David Levy, Ph.D.

*Mayo Clinic; 2American Cancer Society; 3University of Pretoria; 4Harvard University; 5University of California, San Diego; 6Georgetown University

Globally, about 1.6 billion people use tobacco in some form, with the majority, about 1.3 billion, smoking cigarettes. These numbers represent an enormous public health opportunity, as well as an enormous public health challenge, i.e. what is the appropriate and most effective role for public health to play in assisting these 650 million smokers who want to quit? This is a vitally important question because evidence-based treatment approaches exist that if implemented could effectively assist those addicted to tobacco, FCTC Article 14 requires Parties to the treaty to establish tobacco dependence treatment systems, and (3) other evidence-based
approaches identified by the FCTC have been a higher priority than tobacco
dependence treatment. Indeed, there has been a vigorous debate in the last few
years on whether formal tobacco treatment should be provided at all based on the
premise that, given limited resources, other tobacco control efforts will have a
greater public health impact and on the premise that real world tobacco treatment
is not very effective. Given the debate on the value of broad implementation of
formal tobacco treatment programs, this symposium will gather leading tobacco
dependence treatment scientists, clinicians and policy experts to discuss the
evidence on tobacco treatment as a global tobacco control strategy. Emphasis
will be placed on what role, if any, formal tobacco dependence treatment should
play in the mix of global opportunities to reduce tobacco use and tobacco-caused
morbidity and mortality. Using a format similar to the successful 2012 SRNT
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SYM21A
THE GENETIC INTERFACE OF NICOTINE ADDICTION AND ITS
CONSEQUENCES

Thorgeir E. Thorgeirsson, Ph.D.*, Decode Genetics, Reykjavik, Iceland

Genome-wide association (GWA) studies have identified association of a
common sequence variant on chromosome 15q25 with nicotine dependence
and smoking behavior. The same variant is associated with risk of several smoking-
related diseases, including lung cancer, peripheral arterial disease, and chronic
obstructive pulmonary disease and it has been implicated in addiction to other
substances as well. This locus has since these associations were identified been
extensively studied to characterize the effect of the key variant on numerous
phenotypes, and the underlying neurobiology has been examined in studies of
rodents and humans, paving the way for the translation of these findings to the
clinic. Recently, large meta-analysis efforts have identified additional variants
associating with smoking, some of which also exhibit clear associations with
consequences of smoking on health. All these findings are providing key insights
into the gene-environment interactions involved in addiction and leading to other
serious disease, and how such risk variants can be expected to impact diagnosis
treatment of addiction in the future.

Supported by NIDA grant R01-Da017932.

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SYM21B
NICOTINE DEPENDENCE AND SMOKING CESSATION—GENETIC INSIGHTS

Laura J. Bierut, M.D.*, Washington University in St. Louis

Nicotine dependence strongly predicts failed smoking cessation. The chromosome
15 region that includes the nicotinic receptor gene cluster CHRNA5-
CHRNA3-CHRN84 is strongly associated with heaviness of smoking and nicotine
dependence, and variants in this region are a risk factor for lung cancer and COPD.
However, previous research has not demonstrated increased risk in patients with
these genetic variants. This study aims to determine if these genetic variants
in the CHRNA5-CHRNA3-CHRN8 region that predict nicotine dependence also
predicted a 2 year delay in the age at smoking cessation. In the trial, high-risk
 genetic variants predicted an increased risk for relapse at end of treatment with
placebo. But with pharmacologic treatment, cessation rates were similar across
 all genetic categories. Persons with high-risk variants benefited much more from
cessation pharmacotherapy than did those without such variants. These findings
can be translated into a “Number Needed To Treat” (NNT), a measure used to
effectiveness of a health-care intervention. The NNT for pharmacologic
treatment is 7 across all individuals regardless of genetic status, supporting the
effectiveness of pharmacotherapy for smoking cessation. However, the NNT
varies widely depending on genetic makeup. The NNT is 4 for smokers with
the high-risk genetic group, 7 for smokers with the intermediate-risk group, and
>1000 for smokers with the low-risk group. An NNT of 4 shows that pharmacologic
treatment can be very effective in high risk individuals, an impressive finding when
compared to NNTs of many pharmacotherapies across other fields. A NNT > 1000
shows that some individuals receive virtually no benefit from pharmacotherapy.
The variation in NNT among smokers with different genetic risk profiles suggests
that personalized cessation intervention based upon genotype could meaningfully
increase the efficacy of smoking cessation treatment.

This work is supported by P01CA098392 and R01DA025888.

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SYM21C
GENETIC LINKS TO SMOKING AND LUNG CANCER

Christopher I. Amos, Ph.D.*, Geisel College of Medicine, Dartmouth College

Smoking is the strongest risk factor for lung cancer development. However,
population-based and family studies show effects from genetic factors that interact
with smoking to increase risk for some individuals. For a few individuals with
mutations in the p53 or retinoblastoma genes, targeted intervention to control
smoking has been effective. More commonly, several lower risk genetic factors
have been identified that contribute to lung cancer development. A region on
chromosome 15q25.1, containing the nicotinic acetylcholine receptor subunits
CHRNA3, CHRNA5, and CHRN84, are expressed at high levels in a few specific
regions of the brain and in nonneuronal tissues such as bronchiolipithelial cells.
The association of variants in these genes with both lung cancer risk and smoking
dependence treatment scientists, clinicians and policy experts to discuss the
evidence on tobacco treatment as a global tobacco control strategy. Emphasis
will be placed on what role, if any, formal tobacco dependence treatment should
play in the mix of global opportunities to reduce tobacco use and tobacco-caused
morbidity and mortality. Using a format similar to the successful 2012 SRNT
panel on the changing cigarette, these issues and others would be discussed in
a symposium through a Q&A format, with the moderator, Dr. Scott Leischow,
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their impact on smoking behavior or if there are independent effects directly on lung cancer risk. Recent studies that separate lung cancer cases according to histologic subtypes have shown that aside from the chromosome 15q25.1 region, effects from genes in other regions vary by histology. The second most prominent region includes two genes, hTERT and CLPM1L, which have generally stronger effects on adenocarcinomas and among never smokers. Animal modeling studies have shown that upregulation of the CLPM1L locus confers resistance to apoptosis and increases risk for lung cancer, focusing attention in part on this gene, while hTERT variants are also associated with many other cancers including lung cancer. Finally, studies of lung cancer cases with squamous carcinomas show effects from the HLA-A region on chromosome 6, CDKN2B region on chromosome 9, and RAD52 on chromosome 12. Surprisingly, analyses using the Cancer Genome Atlas have identified a strong concordance between changes occurring in the germline with those that occur in somatic tissues. These findings suggest that squamous carcinomas may have a simpler genetic and causal architecture in its etiology than previously assumed, raising the possibility that targeted prevention strategies beyond smoking cessation could be effective.

This work was supported by the following grants: U19CA148127, R01CA149442, CP001 RP100443, P20 Ca148110.

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SYM22A
STUDY DESIGN AND METHODOLOGY OF THE POPULATION ASSESSMENT OF TOBACCO AND HEALTH (PATH) STUDY

Andrew Hyland, Ph.D.*1, Nicolette Borek, Ph.D.*1, Kevin Conway, Ph.D.*2, Larry Corder, Ph.D.*1, Bridget K. Ambrose, Ph.D., M.P.H.*2, Nahla Hilmi, M.P.H.*2, Elizabeth Lambert, M.Sc.*1, Genevieve Vullo*2, Dana Van Bemmelen, Ph.D., M.P.H.*2, Jonathan Kwan, M.S.*2, Cathy Backinger, Ph.D.*2, Wilson Compton, M.D., M.P.E.*3, and the PATH Study Team, *Roswell Park Cancer Institute, Buffalo, NY; **FDA Center for Tobacco Products, Rockville, MD; *NIH National Institute of Drug Abuse, Bethesda, MD

The PATH Study is an annual longitudinal nationally representative cohort study of approximately 42,000 adults aged 18 years and older and 16,500 adolescents aged 12-17 years. Baseline data collection is scheduled to begin September 2013 and includes an annual in-home survey (translated into 5 languages) and biospecimen collection among adult participants. An area-probability sample of 150 Primary Sample Units (PSUs) will be used to ensure national coverage. Among other outcomes, the PATH Study will provide data on tobacco use initiation, dependence, cessation and relapse; identify trends in tobacco use patterns, including use of new products, dual use, poly use and switching of tobacco products; monitor changes in risk perceptions and other attitudes such as social acceptability and individual preferences for tobacco use; assess exposure to tobacco marketing; assess differences between and within critical subgroups including youth, young adults, racial/ethnic minority groups and users of new tobacco products; and collect biospecimens to analyze biomarkers of tobacco use and disease processes. The PATH Study will provide an evidence base for informing FDA's current and future regulatory actions in meeting its mandate under the Family Smoking Prevention and Tobacco Control Act.

Funding: FDA Center for Tobacco Products.

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SYM22B
FINDINGS FROM THE POPULATION ASSESSMENT OF TOBACCO AND HEALTH (PATH) STUDY FIELD TEST

Charles Carusi, Ph.D.*1, Kristie Taylor, Ph.D.*1, Scott Crosse, Ph.D.*1, Barbara O'Brien, M.P.H.*2, Andrea Piesse, Ph.D.*1, Roger Tourangeau, Ph.D.*1, Larry Corder, Ph.D.*1, Greta Tessman, M.A.*1, Jonathan Kwan, M.S.*2, Benjamin Blount, Ph.D.*2, and the PATH Study Team, *Westat, Inc., Rockville, MD; **FDA Center for Tobacco Products, Rockville, MD; *U.S. Centers for Disease Control and Prevention, Atlanta, GA

The PATH Study Field Test was a large-scale pilot test of the full set of protocols, procedures, and instruments developed for PATH. The Field Test took place November 2012–January 2013. This session will present selected findings related to the instruments, data collection protocols, biological specimen collection, and two-stage screening of every adult household member’s tobacco use status for sampling and questionnaire routing purposes. Findings will include quantitative and qualitative metrics of instrument performance, including both standard and new survey items, and will describe collection of product and brand information using pictures of tobacco products. Analyses will include selected data distributions, item non-response levels, and assessment of measures to classify tobacco use across twelve tobacco products for adults and youth. Data collection findings will cover operational aspects of the in-home survey procedures, such as operationalizing the address-based area probability sample, two-stage screening for adult tobacco use, management of multiple activities per respondent and multiple respondents per household, interviewing youths, and use of mixed modes: self-administered Audio Computer-Assisted Self-Interviews (ACASI), Computer-Assisted Personal Interviewing (CAPI), and paper questionnaires. Biological specimen collection issues will include respondent compliance rates for different specimens, and practicality and quality measures of collection and...
handling procedures from field to laboratory. The presentation will conclude with a summary of key lessons learned for the PATH baseline implementation.

**Funding:** U.S. Food and Drug Administration, Center for Tobacco Products.

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**SYM22C**

**FINDINGS FROM SELECTED FORMATIVE STUDIES OF THE POPULATION ASSESSMENT OF TOBACCO AND HEALTH (PATH) STUDY**

Cristine Delnevo, Ph.D., M.P.H.*,1 Karen Messer, Ph.D.*,1 Richard O’Connor, Ph.D.*,1 John Pierro, Ph.D.,1 Amanda Richardson, Ph.D., M.S.*,1 and the PATH Study Team, 1University of Medicine and Dentistry New Jersey, New Brunswick, NJ; 2University of California, San Diego, CA; 3Roswell Park Cancer Institute, Buffalo, NY; 4Legacy Foundation, Washington, DC

A series of secondary data analyses that will help inform aspects of the PATH study design and questionnaires are being implemented. In this session we will highlight findings from three of these studies. Study 1 will examine Nielsen scanner data from convenience stores in leading markets in the US to describe sales trends for non-cigarette tobacco products (cigars, smokeless tobacco, and smoking tobacco) as well as for flavored tobacco products annually since 2005. Study 2 will examine two data sets (one national and one California) with longitudinal follow-up over 6 years to identify how well curiosity about smoking among non-smoking adolescents is an independent risk factor for predicting smoking onset. Study 3 will utilize several data sources to examine patterns and reasons for use of new and emerging tobacco products. Data sources examined include the Legacy Longitudinal Smoker Cohort, the National Survey on Drug Use and Health, National Health Interview Survey, and the Tobacco Use Supplement to the Current Population Survey. Details on these studies’ findings will be reported in this symposium.

**Funding by FDA Center for Tobacco Products.**

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**SYM23**

**SMOKING AND PSYCHIATRIC COMORBIDITY: BEYOND THE SELF-MEDICATION HYPOTHESIS**

Chair: Jennifer W. Tidey, Ph.D.*,1

Presenters: Kirsten J. Langdon, B.S.2, Jennifer W. Tidey, Ph.D.*,1 Scott H. Kollins, Ph.D.3, and Adam M. Leventhal, Ph.D.4

Discussant: Kenneth A. Perkins, Ph.D.*,5

1Brown University, Providence, RI; 2University of Vermont, Burlington, VT; 3Duke University, Durham, NC; 4University of Southern California, Los Angeles, CA; 5University of Pittsburgh, Pittsburgh, PA

The most widely-held theory for the high rates of smoking among people with psychiatric illness is the self-medication hypothesis, which posits that people with psychiatric disorders smoke in order to alleviate aversive states associated with their illness. However, few studies have empirically examined this hypothesis, and even fewer have examined alternative hypotheses, such as the possibility that comorbid smokers may experience stronger positive reinforcing effects of nicotine or that they may smoke to enhance deficient positive affect. This symposium will take a closer look at the self-medication hypothesis and other mechanisms that may underlie the high rates of smoking among people with psychiatric illness. The studies presented have used laboratory or ecological momentary assessment (EMA) methods to systematically examine factors that contribute to smoking. Four different psychiatric populations or constructs are addressed: anxiety, anhedonia, ADHD and schizophrenia. Our first speaker (Langdon) will discuss results from an EMA study that examined whether anxiety sensitivity predicts the reward value of initiating and maintaining smoking, and affective mechanisms that mediate these associations. Finally, Dr. Perkins will provide a discussion of the overall symposium. Together, the talks will address mechanisms that have been empirically demonstrated to contribute to smoking among comorbid smokers, and implications for the treatment of tobacco dependence in these smokers.

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**SYM23A**

**ANXIETY SENSITIVITY IN RELATION TO POSITIVE AND NEGATIVE AFFECT DURING A SELF-GUIDED QUIT ATTEMPT: AN ANALYSIS FROM ECOLOGICAL MOMENTARY ASSESSMENT**

Kirsten J. Langdon,**1,2 Samantha G. Farris**1, Julianna Hogan**1, Kristin W. Grover**1, Catherine E. Peasley-Miklus**1, and Michael J. Zvolensky**1, University of Vermont, 1Alpert Medical School of Brown University, University of Houston

Background: Situations involving positive (PA) and/or negative affect (NA) are thought to play a role in substance use lapse (Marlatt & Gordon, 1980). Anxiety sensitivity (AS), defined as the fear of anxiety/internal sensations (Reiss & McNally, 1985), is one promising candidate for better understanding the nature of affective experiences during cessation. Here, smokers who tend to catastrophize bodily symptoms associated with smoking discontinuation may endorse greater NA while quitting. This study examined relations between AS and real time experiences of PA and NA during the course of a self-guided quit attempt. Consistent with past theory suggesting that AS is related to affective symptoms and disorders (e.g., depression; Cox et al., 1999), we hypothesized that AS would evidence significant relations with greater levels of NA only. Method: Participants included daily smokers (N=48; 65% Male; Mage = 34.78), who were interested in making a self-guided quit attempt. Prior to cessation, participants endorsed smoking an average of 15.04 cigarettes per day (SD=5.91). EMA was used to collect multiple daily ratings of PA and NA throughout the initial two weeks of cessation. Longitudinal multi-level modeling (MLM) was employed to analyze the present data. Compliance with the EMA protocol was assessed via mean percentage of random prompts (M=61.28%). Results: Results of the MLM analyses yielded a significant main effect for AS in relation to NA experienced on quit day, b = .29, t (56) = 5.73, p < .001. Participants who reported higher baseline levels of AS endorsed greater levels of NA on quit day. AS was not significantly related to PA on quit day. Next, we examined the trajectories of PA and NA over time. Change in affect over time was modeled as linear (days since quit day). Results from these growth curve models revealed that AS was not a significant predictor of the slopes of PA or NA over time. Conclusions: Findings suggest that AS may be important to understanding NA experiences during acute periods of smoking deprivation (e.g., quit day); yet, less relevant to understanding the course of NA over time. Treatment implications will be discussed.

This research was conducted at the University of Vermont and supported by a NIDA-funded National Research Service Award (F31 DA026634) awarded to K.J. Langdon.

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SYM23B
BEHAVIORAL AND SUBJECTIVE EFFECTS OF 72-H ABSTINENCE AND SMOKING REINSTATEMENT IN SMOKERS WITH SCHIZOPHRENIA AND CONTROLS
Jennifer W. Tidey, Ph.D.*, and Suzanne M. Colby, Ph.D., Center for Alcohol and Addiction Studies, Brown University, Providence, RI

Background: Schizophrenia is associated with an unusually high rate of cigarette smoking. Two potential contributing factors were examined in this study: (1) whether smokers with schizophrenia (SWS) experience stronger and more sustained cigarette craving and negative affect over a 72-hr continuous abstinence period than smokers without psychiatric illness (CS), and (2) whether SWS experience stronger reinforcing effects of nicotine than CS during smoking reinstatement. Methods: Before undergoing abstinence, SWS and CS sampled and then made a series of choices between nicotine and denicotinized cigarette puffs. Next, high-value monetary incentives were used to induce abstinence for 72 h, during which breath CO, smoking urges and withdrawal symptoms were measured twice daily. Following the abstinence period, participants repeated the puff sampling/choice procedure and rated subjective responses to puffs. Then, a small incentive was offered for participants to remain abstinent for the next 24 hrs and time to lapse was measured. Results: Participants (30 SWS, 30 CON) were 44.2 (Mean) years old, 42% female, 73% White and smoked 22.2 (Mean) cigarettes per day. 75% of each group maintained abstinence throughout the 72-hr period (NS). Significant main effects of Group and Time on MNWIS score (p < .01) indicated that nicotine withdrawal symptoms were higher among SWS and increased during abstinence in both groups. A significant main effect of Time (p < .001) and Group x Time interaction (p < .05) on urge levels indicated that within the first 24 h of abstinence, urge levels were higher among SWS than CS. A significant Group x Time interaction on nicotine puff choice (p < .05) indicated that SWS increased their nicotine puff choices pre- to post-abstinence whereas CS did not. Finally, the average duration between first and second smoking lapse was 4-times shorter in SWS than CS (p = .01). Discussion: SWS experience both higher urge levels during early abstinence and stronger reinforcing effects of nicotine during smoking reinstatement than CS. The clinical significance of these findings will be addressed.

Supported by R21DA026829 and U54DA031659.

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SYM23C
ALTERED SENSITIVITY TO REINFORCEMENT IN INDIVIDUALS WITH ADHD: IMPLICATIONS FOR SMOKING AND SMOKING CESSATION
Scott H. Kollins, Ph.D.*, Duke University Medical Center, Durham, NC

Background: Compared to their non-diagnosed peers, individuals with ADHD demonstrate differential sensitivity to reinforcing stimuli. A direct link between altered reinforcement processes and risk for cigarette smoking, however, has not been demonstrated. This talk will present data from several sources regarding the differential reinforcing effects of cigarette smoking in adults with and without ADHD. Methods: In 2 experiments, 66 adult smokers (32 with ADHD, 34 without) between 18-45 years were recruited. In Study 1, subjects completed 2 sessions: 1 following smoking as usual, and one following 24-hour abstinence. During each session, smoking reinforcement was assessed with a 90-min Progressive Ratio (PR) task. In Study 2, subjects completed 3 sessions in which they were administered 0, 10, and 40 mg methylphenidate under double-blind conditions and subsequently completed the PR task. In a separate analysis of 150 adult smokers with and without ADHD, subscales of the Wisconsin Inventory of Smoking Dependence Motives (WISDM) were compared between groups. Results: In Study 1, smokers worked more for cigarette puffs when abstinent, and smokers with ADHD worked more for puffs, regardless of condition. Smokers with ADHD worked relatively more for cigarette puffs during abstinence, as compared to non-ADHD smokers, suggesting that smoking reinforcement is greater during abstinence for this high-risk group of smokers. In the 2nd experimental study, there were no differences between ADHD and non-ADHD smokers with respect to smoking reinforcement. Moreover, there were no significant effects of methylphenidate on smoking reinforcement for either group. For the WISDM analyses, a number of significant group differences emerged and, after controlling for multiple comparisons, ADHD smokers reported elevated scores on the following subscales: Loss of Control, Cognitive Enhancement, and Cue Exposure. Conclusion: Collectively, these findings suggest important differences between smokers with and without ADHD with regard to the reinforcing effects of smoking and the motivations for smoking. The clinical relevance of these findings will be addressed.

Supported by K24DA023464 and R01DA025653.

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SYM23D
ANHEDONIA, POSITIVE AFFECT, AND MOTIVATION TO INITIATE AND MAINTAIN SMOKING ON A LAB-BASED SMOKING TASK
Adam M. Leventhal, Ph.D.*, Jennifer Tidey, Ph.D.*,2, Steve Sussman, Ph.D.*,1, and Christopher W. Kahler, Ph.D.*1

Anhedonia—a trait indicative of diminished interest, pleasure, and enjoyment in rewarding activities—is prominent in several psychiatric disorders and related to nicotine dependence. Yet, the mechanisms linking anhedonia and smoking are unclear. This study tested a positive reinforcement-based model of the affective mechanisms linking anhedonia and smoking motivation, which purports that high-anhedonia individuals smoke to counteract acute states of deficient positive affect. Adult smokers (n = 193, ≥ 10 cig/day) attended a baseline visit at which multiple facets of the anhedonia construct were assessed and combined into a composite index. Participants then attended two counterbalanced lab visits: (a) one after 16-hr smoking abstinence; and (b) one after ad lib smoking. At both lab visits, participants completed self-report measures of affect followed by a smoking delay task. During this task, participants were monetarily rewarded for each 5-min increment they chose to delay smoking over 50-min, with shorter delays reflecting greater motivation to initiate smoking. After the delay period, participants were able to purchase up to 8 individual cigarettes to smoke over a 60-min self-administration period. After controlling for covariates (i.e., gender, nicotine dependence, and baseline negative affect), higher baseline anhedonia predicted faster time to smoking on the delay task (beta = -.14, p = .02) and more cigarettes purchased during the self-administration period (beta = .14, p = .04). These relations were both mediated by lower acute positive affect experienced shortly prior to the delay task (betas > .06, ps < .02). Analyses of individual anhedonia measures revealed more robust effects for measures of pleasure and enjoyment than measures of interest and engagement. Deprivation did not moderate any effects. Smokers with diminished capacity to experience pleasure and enjoyment may be more likely to experience acute states of low positive affect, which may in turn increase motivation to initiate and maintain smoking. Positive reinforcement processes may be important mechanisms linking anhedonia-related psychopathology and nicotine dependence.

This research was supported by National Institute on Drug Abuse Grants R01-DA026831 and K08-DA025041.

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SYM24
YOUTH AND YOUNG ADULT USE AND RISK PERCEPTION OF TOBACCO PRODUCTS: RESEARCH TO INFORM FDA REGULATIONS
Chair: Benjamin J. Apelberg, Ph.D., M.H.S.1,2, Presenters: Bridget K. Ambrose, Ph.D., M.P.H.1,2, Greta K. Tessman, M.A.1,3, and Sarah E. Johnson, Ph.D.1
Discussant: Annette R. Kaufman, Ph.D., M.P.H.1,2
1Center for Tobacco Products, U.S. Food and Drug Administration, Rockville, MD; 2National Cancer Institute, National Institutes of Health, Bethesda, MD

When making regulatory decisions with respect to tobacco products, the Food and Drug Administration’s (FDA) actions must be “appropriate for the protection of public health”, taking into consideration the impact of those actions on users, as well as non-users, of tobacco products. A core priority of the FDA’s Center for Tobacco
SYM24A
YOUTH RISK PERCEPTIONS OF TRADITIONAL AND NON-TRADITIONAL TOBACCO PRODUCTS: FINDINGS FROM THE 2012 NATIONAL YOUTH TOBACCO SURVEY

Bridget K. Ambrose, Ph.D., M.P.H.*, Blair N. Coleman, M.P.H., and Benjamin J. Apelberg, Ph.D., M.H.S., Center for Tobacco Products, U.S. Food and Drug Administration

Although some progress has been made in reducing cigarette smoking prevalence among youth, young people in the United States remain highly susceptible to initiating tobacco use. Understanding youth perceptions of the health risks associated with tobacco product use will provide insight into potential determinants of initiation and continued use of traditional products as well as non-traditional products such as hookah, electronic cigarettes, and dissolvable tobacco products. We will examine data from the 2012 National Youth Tobacco Survey (NYTS), which for the first time, included questions pertaining to youth risk perceptions of a variety of tobacco products. NYTS is a nationally representative, school-based survey of approximately 20,000 middle and high school students. Survey items collected information on perceived risks of non-traditional tobacco products compared to cigarette smoking (“Do you believe that electronic cigarettes are less harmful, equally as harmful, or more harmful than regular cigarettes?”) and perceived harm from cigarettes and smokeless tobacco products, including dissolvables, based on frequency and amount of use. We will report the latest findings of multivariate analyses assessing the correlation between middle and high school students’ risk perceptions of tobacco products and demographic characteristics as well as reported experimentation, current and regular use of different types of tobacco products. These findings will help inform future research and regulatory policy development at the Food and Drug Administration (FDA) in order to prevent tobacco use among young people, one of the core priorities of FDA's Center for Tobacco Products.

Funding: Center for Tobacco Products, Food and Drug Administration.

SYM24B
RISK PERCEPTIONS OF DISSOLVABLE TOBACCO PRODUCTS AMONG YOUTH AND YOUNG ADULTS

Greta K. Tessman, M.A.*, Conrad J. Choiniere, Ph.D.†, Sarah E. Evans*, Julia Kish-Doto, Ph.D.‡, and Brian Southwell, Ph.D.‡, Center for Tobacco Products, U.S. Food and Drug Administration; †RTI International

Tobacco companies have begun developing and marketing a new form of smokeless tobacco—dissolvable tobacco products. These products represent a new and emerging form of tobacco, with shape, taste, packaging, marketing, and intended use differing distinctly from traditional smokeless tobacco and cigarettes. While much is known about risk perceptions of cigarettes and traditional forms of smokeless tobacco, little is known about how people perceive the risks associated with these products and how this may influence their use of these products. In March 2012, we conducted qualitative research to explore awareness, beliefs and perceptions of these products; completing twelve focus groups with young adults, 10 individual interviews with youth, and 11 interviews with young adults who were current or former users of dissolvable tobacco in three US test markets for these products: Portland, OR, Denver, CO, and Charlotte, NC. While these focus groups and interviews were designed to elicit discussions around a variety of topics, this presentation will focus on the discussions specific to risk perception. We found that the majority of participants—youth and young adults—reported beliefs that there were health risks associated with the use of dissolvables. Few participants thought the risks would be different from using existing tobacco products. Participants believed that while these products may not cause the respiratory problems associated with smoking, they would likely carry risks similar to smokeless tobacco. In some cases, participants thought of the health risks associated with smokeless tobacco as worse than cigarettes because of the perceived visible nature of oral disease. Participants speculated use of dissolvable tobacco would increase the risk of oral disease, tooth yellowing or decay, cancer, and gastrointestinal problems. This exploratory research could be furthered through additional qualitative research with other populations as well as quantitative population-level measures of risk perception.

Funding: Center for Tobacco Products, Food and Drug Administration.

SYM24C
HOW DO YOUNG ADULT CONSUMERS EVALUATE AND COMPARE THE HARMFULNESS OF CIGARETTES AND SMOKELESS TOBACCO? A FOCUS GROUP STUDY


According to the Family Smoking Prevention and Tobacco Control Act, consumer perceptions are among the factors that FDA must consider when evaluating the marketing of a tobacco product and its potential impact on public health. In order to effectively evaluate consumers’ perceptions of tobacco products, FDA must first understand how consumers form these perceptions: that is, how they form judgments about the risks and harms associated with tobacco products. To this end, FDA conducted a set of six focus groups of young adult (18-24 years old) tobacco users across 4 U.S. cities. Groups were segmented by gender and tobacco use (light and intermittent use vs. daily use). In an effort to elicit information about how users form judgments about harm, participants were asked to compare the harmfulness of: (1) different brands of cigarettes; (2) different brands of smokeless tobacco (ST); and (3) cigarettes and ST. In particular, the discussion was structured by a series of ranking exercises in which participants were asked to consider and rank the relative health risk associated with a variety of tobacco products. A group discussion of these rankings followed. Results suggested a variety of criteria were used—both within and across participants—in forming judgments of the harmfulness of products. When they had some familiarity with a product, participants were most apt to rely on firsthand experience, including memories of the physiological experience of the product, and information gained from friends or family. In the absence of firsthand experience or social information, participants relied on a variety of factors including extant knowledge about the brand. When judging less familiar brands or products, participants were more...
likely to use features of the packaging or label to evaluate the product and make inferences about its harmfulness. Implications of how this research and the results can be used to inform FDA's work will be discussed.

Funding: Center for Tobacco Products, Food and Drug Administration.

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BIOBEHAVIORAL MEASURES OF CRAVING AND DEPENDENCE

PA1-1
RELATIONSHIPS BETWEEN CRAVING AND SMOKING BEHAVIORS IN LABORATORY STUDIES: A SYSTEMATIC REVIEW OF THE LITERATURE

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Most smokers report that craving is strongly related to their smoking behavior, and several theories of addiction posit a strong prospec tive relationship between craving and use. Many laboratory studies of cigarette smoking that include a measure of smoking behavior also include a measure of craving; however, the relationship between craving and various smoking behaviors across studies has never been evaluated systematically. In the current study, published laboratory studies from the last 50 years that included measures of craving and smoking behavior were evaluated in order to assess the relationship between these two variables. Smoking behaviors included both measures of cigarette use and cigarette seeking. Studies that only included lapse or relapse in the context of a quit attempt as the outcome measure were not included in this review. Only studies that made an explicit statement about the relationship between either tonic or cue-elicited craving and smoking behavior were included. (Notably, more than 120 studies that included measures of craving and smoking behavior did not report on an association between the two.) Thirty-eight studies with 86 separate analyses were identified for inclusion. Using a p < .05 threshold, 59 significant associations between craving and smoking behavior were found (67% of studies). Ad-libitum smoking measures collected in the laboratory were significantly associated with craving in 13 of 22 (59%) analyses; the association between craving and natural environment ad-libitum smoking measures was significant in 8 of 9 (88%) analyses. The association between craving and various smoking topography measures was significant for 8 of 14 (57%) analyses. Cigarette seeking (including choosing cigarettes over money or other reinforcers as well as working/reaching for cigarettes) was significantly associated with craving in 29 of 41 (71%) of the analyses. This paper will include more extensive, formal meta-analyses of the effect sizes for the various associations reported in the literature. The implications of these findings and future directions of research on craving-smoking relationships will be discussed.

No funding.

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PA1-2
THE ACUTE EFFECTS OF SNUS ON ALCOHOL-RELATED CIGARETTE CRAVING AND SELF-ADMINISTRATION IN DEPENDENT AND NON-DAILY SMOKERS

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Background: Alcohol consumption has been linked to increased tobacco use and craving in both dependent and non-daily smokers, yet few treatments have been shown to be effective for reducing alcohol-related smoking. This study examined the acute effects of snus (4mg of nicotine) on alcohol related smoking related responses 17 dependent smokers and 17 non-daily smokers. Methods: During four randomized double-blinded sessions, participants assessed the effects of nicotine-containing or placebo snus following the administration of a moderately intoxicating dose of alcohol or a placebo beverage. After 30 minutes they could then self-administer additional puffs of their preferred brand of cigarette over a 60-minute period using a progressive ratio task. Results: Alcohol significantly increased tobacco craving, especially in non-daily smokers (p<0.001) but craving were not significantly impacted by snus in either type of smoker. In contrast, snus significantly decreased actual smoking behavior in dependent smokers in both beverage conditions (ps<0.05) but it did not alter smoking behavior in non-daily smokers. Conclusions: Findings suggest that snus may be effective in reducing alcohol related tobacco use in dependent smokers specifically and raise the possibility that different processes may mediate alcohol and cigarette co-use in different subgroups of smokers.

Funding: Alcoholic Beverage Medical Research Foundation and Natural Sciences and Engineering Research Council of Canada.

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PA1-3
SMOKING URGE AFTER ALCOHOL CONSUMPTION AMONG HEAVY DRINKER-SMOKER SUBGROUPS

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Co-use of alcohol and smoking decreases the likelihood of successful treatment for each substance, and increases risks for numerous health problems. While the prevalence of daily smoking has been on the decline, habitual nondaily smoking has increased, particularly in younger individuals. In the current study, we examined the effects of alcohol on smoking urges throughout the breath alcohol curve (BrAC) in heavy social drinkers who binge weekly (5+4+ drinkers per occasion for men and women, respectively) and who smoke but are not heavily tobacco dependent. Participants were 113 (54%) smokers from the larger group of the 208 heavy social drinkers enrolled in the first two waves of the Chicago Social Drinking Project. They were further subgrouped into light smokers (LS, 1-19 cigarettes/week; n=54), moderate smokers (MS, 20-49 cigarettes/week; n=38) and heavy smokers (HS, >50 cigarettes/week; n=21). FTND scores confirmed non tobacco dependence with average scores of .06±.3 SD, 1.0±1.2 and 2.7±1.6 for the groups, respectively. Participants abstained from smoking for 3 hours prior to and during each of the two 5-hour laboratory sessions. Compared with placebo, after consuming 0.8 g/kg alcohol (~4-5 drinks), smoking urges measured by B-QSU significantly increased in MS and LS but not in HS (group x dose x time, p<.02). HS exhibited the highest smoking urge at baseline and showed no sensitivity to alcohol increases in urge (p<.05). In MS and LS, alcohol increased smoking urges, and these elevations were sustained for hours and most pronounced during the rising vs. declining BrAC limb (p<.01). In terms of alcohol response, the groups did not differ on stimulation or sedation but did differ on alcohol liking and wanting with LS lower than MS and HS (ps<.05). In sum, alcohol’s effects on smoking urge and subjective reward vary among levels of co-users, with heavier smokers exhibiting high levels of smoking urge throughout the sessions but not specific to alcohol. However, they showed greater positive-like alcohol effects which may render them at risk to continue co-use or progress to dependence.

Funding: NIAAA: R01-AA013746.

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PA1-4
INCREASING SEVERITY OF PHYSICAL DEPENDENCE CORRESPONDS TO PROGRESSIVE CHANGES IN NEURAL STRUCTURE

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The brain condition that causes nicotine withdrawal is called physical dependence (PD). The most important symptom of PD is withdrawal-induced craving. Smokers describe 3 qualitatively distinct forms of withdrawal-induced craving that we have operationalized as ‘wanting,’ ‘craving,’ and ‘needing.’ On this basis we have developed a 3-item measure that classifies smokers according to their level of PD. We will present data that establish the concurrent validity of the Levels of PD measure against dozens of indicators of dependence and tobacco use. Proof that the Levels of PD correspond to physical changes in the brain would support the construct validity of this measure. Case histories indicate that wanting, craving and needing always develop in this sequence in all smokers. This implies that the neural changes that cause PD also develop in the same
sequence in all smokers, and therefore, that these might be identified as changes in brain structure that correlate with the Levels of PD. We conducted a study of 8 smokers and 10 nonsmokers using the MRT techniques of fractional anisotropy (FA), a measure of white matter structural organization, and diffusion tensor imaging probabilistic tractography. Advancing Levels of PD correlated strongly with decreased FA in the left caudal anterior cingulum white matter bundle (r = -0.85). ‘Structural connectivity’ between this structure and the superior frontal white matter was stronger in smokers, and the strength of this connection increased with increasing Levels of PD (p = 0.05). Both structures are strongly connected with drug craving. By demonstrating a strong correlation between the Levels of PD and physical changes in the brain, our data support the construct validity of the Levels of PD measure. The data also suggest that as PD advances FA in the dorsal anterior cingulate white matter bundle declines while structural connectivity between this structure and the frontal cortex increases. Together with our other results, these data suggest that smoking remodels the brain to support craving.

Internal funding from the University of Massachusetts Medical School.

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SMOKING CESSATION

PA2-1

GENERALITY OF PERCEIVED IMPORTANCE OF QUITTING SMOKING


Perceived importance of quitting smoking is a known correlate of cessation. However, there has been little research investigating the simultaneous effects of perceived importance and nicotine replacement therapy for cessation. A government-funded program in Ontario, Canada has made smoking cessation treatment (NRT and counseling) freely available to patients of family health teams (FHTs) since July 2011. We used self-report baseline, 3-month (3m), and 6-month (6m) follow-up data to estimate the relevance of importance of quitting smoking. Baseline data were obtained from 6,466 patients at 124 FHT sites. Measures of smoking status (not at all/occasional/daily), cigarettes smoked per day (CPD), and perceived importance of quitting (1=least importance, 10=most importance) were available. For CPD, higher quitting importance was significantly associated with future health concerns (p=0.001, p<0.001, respectively). Attempts to quit smoking were still abstinent, adjusting for key demographic and smoking characteristics. Respondents reported any triggers (>1 if necessary) that had prompted their most recent quit attempt. Reports of specific triggers are associated with future health concerns (p=0.001, p<0.001, respectively). Unplanned (versus planned) quit attempts were significantly associated with current health concerns (21%, cost (19%), family pressure (14%), current health concerns (12%) and someone else stopping (8%). Unplanned versus planned quit attempts were significantly associated with current health concerns as the trigger; whereas, unplanned quit attempts were associated with future health concerns (p<0.001, p<0.001, respectively). Attempts triggered by health professional advice were associated with cutting down, rather

PA2-2

IMPACT OF PROGRAM DESIGN FEATURES ON TREATMENT ENGAGEMENT: RESULTS FROM AN ONLINE INTERVENTION FOR SMOKERS

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Important questions exist about how to best design online smoking interventions to encourage program engagement and, ultimately, promote cessation. We conducted a Multiphase Optimization Strategy (MOST) screening experiment to evaluate the effect of different online intervention design strategies on engagement (visits to the website, pages viewed, time spent viewing content, and content areas viewed). Adult smokers (n = 1865; 63% female; mean FTND score = 4.2) were recruited, regardless of readiness to stop smoking (29% Preparation, 58% Contemplation, 13% Precontemplation) and randomized using a factorial design. Everyone had access to a personalized intervention, but were randomized to one of 2 contrasting levels of each experimental factor: navigation autonomy (content order dictated based on stage of change vs. not), message tone (motivational vs. prescriptive), and proactive outreach (email reminders vs. not). Program engagement was monitored for 2 months post-enrollment.

Adjusting for baseline stage of change, persons who received content written in a prescriptive message tone made the same number of visits as persons receiving content in a motivational tone, but viewed 15% more pages (95% CI: 4-48%; p<0.001) and 17% more content areas (8-28%; p<0.001) despite spending 14% less time online (3-23%; p<0.05). Persons receiving proactive email reminders had 20% more visits (9-33%; p<0.001), viewed 58% more pages (48-68%; p<0.001), spent 59% more time online (39-78%; p<0.001), but visited a similar number of content areas as persons receiving no reminders. Persons required to view content in a dictated order made the same number of visits and spent the same amount of time online as people able to freely navigate the site, but viewed 17% more pages (6-31%; p<0.01) and 20% fewer content areas (13-26%; p<0.001).

The results indicate using a prescriptive message tone, sending reminder emails, and dictating content viewing order may each increase page views, but there may be trade-offs in the effects on number of visits, time spent viewing content, or the number of content areas viewed. Implications for the design of future population-based online cessation programs will be discussed.

This research is funded by the National Cancer Institute (R01 CA138598, J. McClure, PI).

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PA2-3

ARE SPECIFIC TRIGGERS FOR QUIT ATTEMPTS ASSOCIATED WITH METHOD OF QUITTING AND QUIT SUCCESS?

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BACKGROUND: Little is known about the triggers for quitting smoking. We conducted the first study to assess whether reports of specific triggers are associated with the method of quitting and quit success. METHODS: A national household survey recruited 6,126 smokers and ex-smokers who reported making at least one serious quit attempt in the last 12 months. Respondents reported any triggers (>1 if necessary) that had prompted their most recent quit attempt. Reports of specific triggers were regressed onto method of quitting and whether they were still abstinent, adjusting for key demographic and smoking characteristics. RESULTS: 53% of the sample were women and the mean (SD) age was 40.1 (16.0) years. 89% (n=5466) identified a trigger prompting their most recent quit attempt. The most frequently cited trigger was advice from a health professional (25%), followed by concern about future health problems (21%), cost (19%), family pressure (14%), current health concerns (12%) and someone else stopping (8%). Unplanned versus planned quit attempts were significantly associated with current health concerns as the trigger; whereas, unplanned quit attempts were associated with future health concerns (p<0.001, p<0.001, respectively). Attempts triggered by health professional advice were associated with cutting down, rather
than quitting abruptly, and with being assisted by medication or specialist support (both p<0.001). Assisted quit attempts were also associated with concern about the cost of cigarettes and someone else quitting (both p<0.001). Concern about current health and cost, as triggers, were associated with an increased likelihood of remaining abstinent (p<0.001, p=0.002, respectively). CONCLUSIONS: What triggers a quit attempt may influence the method used in that attempt and the likelihood of success; most notably concern about current health and cost may be influential in quit success.

The study was funded by a programme grant from Cancer Research UK.

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PA2-4
PROMOTING SMOKING cessation AFTER A HOSPITAL STAY: THE HELPING HAND RANDOMIZED CONTROLLED COMPARATIVE EFFECTIVENESS TRIAL

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BACKGROUND: Hospitalization provides an opportunity for smokers to quit. Hospital-initiated tobacco treatment is effective only if it continues >1 month post-discharge. However, sustaining treatment from hospital to home is difficult for health care systems to accomplish. We tested a model that aimed to facilitate the post-discharge delivery of evidence-based smoking cessation counseling and medication (med). METHODS: A randomized controlled trial at 1 hospital compared 2 post-discharge treatments, Extended Care (EC) vs. Standard Care (SC), for smokers who were counseled in hospital and wanted to quit smoking. EC provided 3 mo of free med at discharge (NRT, bupropion, or varenicline) and 5 automated interactive voice response (IVR) phone calls at 2, 14, 30, 60, and 90 d. IVR calls encouraged cessation and med adherence and offered med refills and a return call from a live counselor. SC patients were given quitline and med recommendations only. Outcomes (use of treatment, smoking status) were assessed 1, 3, and 6 mo post-discharge. RESULTS: 397 smokers admitted from 7/2010 – 4/2012 were randomly assigned to EC (n=198) or SC (n=199). Groups were comparable at baseline (49% male, 85% white, mean age = 52 y; mean cig/day=17). Follow-up rates were 91% (1 mo), 85% (3 mo), and 84% (ongoing at 6 mo). EC, compared to SC, increased smokers’ post-discharge use of pharmacotherapy (87% vs 66%, p<0.001, at 1 mo; 91% vs. 73%, p<0.001, at 3 mo), and counseling (41% vs 26%, p=0.002 at 1 mo; 52% vs. 40%, p=0.021 at 3 mo). EC, compared to SC, increased self-reported continuous abstinence at 1 mo (46% vs 34%, p=0.010) and 3 mo (34% vs 24%, p=0.024) post-discharge and 7-day tobacco abstinence at 1 mo (53% vs 40%, p=0.011) and 3 mo (46% vs 37%, p=0.092). 6-mo cotinine-verified quit rates will be available by December 2012. CONCLUSION: A multi-component post-discharge telephone-based intervention designed to facilitate smokers’ access to tobacco treatment enhanced counseling and pharmacotherapy use and increased smoking cessation rates for 3 mos. This promising model could be adopted by hospitals to provide post-discharge treatment and help meet tobacco quality of care standards.

Funded by NIH/NHLBI grant #5RC1HL99668. Dr. Japuntich is now affiliated with the Boston Veteran’s Administration Medical Center.

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GENETIC BIOMARKERS OF EXPOSURE AND RISK

PA3-1
GENOME-WIDE association STUDY OF nicotine DEPENDENCE IN COPDGene

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Cigarette smoking, which is strongly influenced by nicotine dependence (ND), is a primary environmental risk factor for the development of chronic obstructive pulmonary disease (COPD). A large fraction of ND is attributable to genetic factors with heritability estimates between 50-75%. ND is a complex phenotype that is often measured using the Fagerstrom Test for Nicotine Dependence (FTND). Chromosome 15 has been repeatedly associated with ND and smoking quantity specifically within a cluster of three nicotinic acetylcholine receptor genes (CHRNA5/CHRNB3/CHRNB4). We performed a genome-wide association study (GWAS) of three phenotypes of ND using the COPDGene Study. A population of 9978 Non-Hispanic white (NHW) (n=6678) and African American (AA), (n=3300) current and former smokers (age 44.7-81.1) with ≤ 10 pack-years of smoking from the COPDGene Study were analyzed to identify ND loci. Several traits associated with ND were considered including: smoking initiation age, average cigarettes smoked per day, and FTND score. FTND score was available only in current smokers (52.6%). Analyses were adjusted for age, gender, COPD Global Initiative for Obstructive Lung Disease (GOLD) stage as an indicator variable), and ancestral informative marker principal component adjustments (PCAs) in NHW and AA separately. No SNPs reached genome-wide significance (GWS) for association with FTND score of smoking initiation age in NHW or AA. However, 8 SNPs on chromosome 15 reached GWS for association with average cigarettes smoked per day in NHW [rs12914385 (6.9 x 10-9), rs80341911 (1.3 x 10-8), rs931794 (1.8 x 10-8), rs2036527 (2.1 x 10-8), rs16969968 (4.0 x 10-8), rs1051730 (4.9 x 10-8), rs8040898 (5.6 x 10-8), and rs951286 (6.6 x 10-8). These SNPs are represented by 3 LD blocks: CHRNA3 8kb, CHRNA3 20kb and CHRNA3 1kb. Of interest in this study is this region of chromosome 15 is not associated with ND in AA. These data implicate chromosome 15 with nicotine-related behaviors in a large population of long-term smokers with nicotine-related behaviors possibly mediating the association between chromosome 15 and smoking-attributable diseases.

Funding: NIH/NHLBI HL089897 and HL089856.

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PA3-2

FTO (FAT MASS AND OBESITY GENE) PREDICTS POST-SMOKING CESSION WEIGHT GAIN

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Weight gain following smoking cessation is an important public health problem, and genomewide association studies (GWAS) of addiction and obesity have become more common. However, we are unaware of reports that have specifically focused on the phenotype of post-cessation weight gain (PCWG). This Australian GWAS examined PCWG, defined in lifetime smokers as self-reported weight gain of 6 or more pounds within 12 months of quitting or cutting down on cigarettes use for at least 2 weeks (affected: N=1875; unaffected: N=1922 who reported not gaining 6 or more pounds). These smokers were recruited from families associated with the Australian Twin Registry.

Participants were selected from three studies: 1) the Nicotine Addiction Genetics (NAG) study ascertained families through index-cases with a lifetime history of heavy cigarette smoking and two interrelated Interactive Research Program Grant (IRPG) alcohol studies 2) the Big-Sibships Study had families with 5 or more offspring sharing both biological parents and was unselected in regard to phenotype; and 3) the Extreme Discordant and Concordant Study focused on sibships extremely discordant or concordant for heavy drinking and alcohol dependence risk. The analyses tested for genetic association for candidate genes (POMC, FTO, GPHL, NPY, CHRNA5/CHRNA3/CHRNAB4) using 66 SNPs and for GWA using ~280,000 autosomal SNPs, which set our candidate gene significance level at p=8x10-4 and genomewide significance level at p=2x10-7. We found a significant association between FTO and PCWG (rs2869550, p=5.2x10-4); 7 additional SNPs in FTO were also nominally associated with PCWG, with p-values ranging from .04 to 1x10-3. GWA tests were significant for 2 nongenic SNPs on chromosome 4 (rs9211495 and rs7683303, p-values: 1.1x10-7 and 1.4x10-7). While these findings will require future replication (e.g., in our Finnish smoking sample), they suggest that FTO, a gene widely reported to be associated with obesity (although different SNPs), is also associated with self-reports of excess weight gain following smoking cessation.

Funding: NIH Grants: DA12854 (PAFM); AA13320, AA13321 (ACH); DA019951 (MLP); Juho Vainio Foundation (TK).

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PA3-3

CHRNA5-AS3-B4 GENE VARIANTS INTERACT WITH TOBACCO USE TO INFLUENCE BODY WEIGHT IN ALASKA NATIVE TOBACCO USERS

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Smoking and obesity are the greatest preventable causes of premature death. Although smoking and obesity appear to be distinct epidemics with different etiologies, smoking and body weight are intertwined in many ways. Nicotine activates c384 nicotinic receptors (encoded by CHRNA5-AS3-B4) located on POMC neurons in the arcuate nucleus of the hypothalamus, which leads to the activation of the melanocortin 4 receptor by POMC, ultimately suppressing appetite. Gene variants in CHRNA5-AS3-B4 have also been associated with altered tobacco consumption. Thus, genetic variation in CHRNA5-AS3-B4 may contribute to inter-individual differences in smoking and body weight. Methods: Alaska Native individuals (n=400) were recruited in local villages near Bristol Bay, Alaska; 290 were current tobacco users and 110 of them were non-smokers. Thirteen SNPs in the CHRNA5-AS3-B4 gene cluster were genotyped. Results: The tobacco users had significantly lower body mass index (BMI) compared to the non-smokers (28.9 vs. 31.0 respectively, P<0.001). Among the tobacco users, there was a significant inverse correlation between plasma cotinine level and BMI, suggesting that nicotine dose-dependently reduces body weight (Rho=-0.128, P=0.04). Rs578776, which alters nicotine intake in this population, was not significantly associated with BMI. Rs2869550, a prevalent (35%) SNP located 3’ to the CHRNAB4 gene, was not associated with altered nicotine intake, but was significantly associated with BMI in the tobacco users (P=0.006), even after adjusting for plasma cotinine levels (P=0.0035). Rs2869550 was not significantly associated with BMI in the non-smokers. Conclusions: The negative dose response relationship between nicotine intake and BMI is consistent with the known effects of nicotine to increase metabolic rate and suppress appetite. This study suggests that genetic variation in CHRNA5-AS3-B4 cluster can alter nicotine’s ability to reduce body weight, possibly via the β4 nicotinic receptors located on POMC neurons, even after controlling for differences in nicotine intake.

Funding by NIDA and NCI (NARCH III U26IHS300012, HHSN261200700462P, CA114609, DA012353, DA020830 and DA012353) CHRR (MOP86471).

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PA3-4

VARIABILITY IN NICOTINE METABOLISM ALTERS SMOKING: IDENTIFICATION AND CHARACTERIZATION OF NOVEL CYP2A6 VARIANTS

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Nicotine, the main addictive ingredient in tobacco, is metabolically inactivated to cotinine primarily by CYP2A6. Interindividual and interethnic variation in the CYP2A6 gene, and resulting enzyme, contributes to wide variation in the rates of nicotine metabolism which in turn is associated with variation in smoking behaviours (i.e., amount smoked, risk for dependence and smoking cessation). While many different alleles of the CYP2A6 gene have been identified, many individuals without these known variants have low rates of nicotine metabolism. Our goals were to identify new variants in CYP2A6 and characterize their functional impact. Approximately 500 African American clinical trial participants provided a baseline blood sample. Using LCMS, we determined the 3-hydroxyxycotinine/cotinine, or nicotine metabtole ratio (NMR), which is highly correlated with nicotine clearance and used as a phenotypic marker for CYP2A6 activity. Individuals with low rates of nicotine metabolism were selected. DNA samples were extracted from blood and the CYP2A6 gene region was amplified using PCR. The PCR product was sub-cloned and sequenced. Seven new variants were identified that predict the following amino acid changes: I149M, R265Q, E390K, I268T, T303I, V68M, and L462P. Genotyping assays were developed to measure variant allele frequencies. For example, variant R265Q was identified in six individuals, all within the lowest NMR tertile. The functional impact of these variants was also assessed in vitro. Variant CYP2A6 enzymes were expressed in E. coli and quantified via western blotting. Five variants displayed a lower than wildtype expression pattern, two of which exhibited no expression. In addition, the variants were characterized using an in vitro nicotine metabolism assay and some were found to have substantially reduced velocity, consistent with their lower in vivo activity. This study indicates the utility of sequencing slow metabolizers in order to identify and characterize additional sources of variability in CYP2A6 and nicotine metabolism.

The authors would like to acknowledge the support provided by NIH grant CA019172, CHRR grant MOP86471, NIH grant DA020830, CAMH and the CAMH foundation, the Canada Foundation for Innovation (#20289 and #16014) and the Ontario Ministry of Research and Innovation.

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SOCIOECONOMICALLY DISADVANTAGED SMOKERS

PA4-1
HOW DO THEY AFFORD IT? MAINTENANCE OF SMOKING DESPITE CIGARETTE PRICE RISES AMONGST HIGHLY SOCIOECONOMICALLY DISADVANTAGED SMOKERS

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Background: Modelling studies show that taxation policies and increasing cigarette pricing have the potential to reduce smoking prevalence rates across social groups. However, there is evidence that socially disadvantaged smokers experience higher levels of financial stress, and financial stress leads to a reduction in the likelihood of making quit attempts. Smokers from socially disadvantaged backgrounds spend a greater proportion of their income on tobacco than most other smokers. It is unclear what behaviors are modified in order to accommodate smoking maintenance despite rising tobacco prices amongst smokers experiencing financial hardship. Methods: Clients seeking welfare assistance from a Social and Community Service Organisation in NSW, Australia were invited to complete a touchscreen computer survey. Questions covered smoking history, personal budgeting, financial stress and cigarette price-minimising behavior. Highest price to encourage quitting was assessed. Results: Survey response rate was 76%. N=400 smokers completed the survey (59% female; mean age 38 years). The smoking prevalence rate in this sample was 65% (daily and occasional). Most smokers had an income of less than AUD$400/week, had not completed high school, and spent an average of AUD$56 on tobacco each month. All smokers had experienced financial stress; half had experienced smoking-related debt. Smokers estimated that they spent at least 20% of their income on personal luxuries such as tobacco and alcohol, and when faced with 10% or 20% price increases selected the following as the most popular response strategies: (i) try to quit, (ii) no change, (iii) buy lower priced brands, (iv) smoke fewer sticks, (v) use loose tobacco. Smokers nominated $25 as the average price a 25-pack of cigarettes would need to get to before they would quit. In depth interviews with a random sample of survey participants are being conducted to help explain individual budgeting and price-minimisation strategies. Conclusions: Severeley disadvantaged smokers make use of numerous price-minimizing strategies in order to sustain current smoking behaviors in spite of increases in taxation and product prices.

This study was conducted while the first author was at the University of Newcastle, supported by an Australian Postgraduate Award. This research was conducted with infrastructure support and project grant funding from the Hunter Medical Research Institute. B. Bonevski is supported by a Cancer Institute NSW Career Development Fellowship.

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PA4-2
IS DISPARITY IN SMOKING CESSION RATE BETWEEN EDUCATIONAL LEVELS INCREASING?

Yue-Lin Zhuang, Ph.D.*, and Shu-Hong Zhu, Ph.D.

A recent study has shown that there is no consistent trend of increase in the cessation rate at the population level over the last two decades (1991-2010) despite the substantial development of cessation interventions during this period. Moreover, it appears that there is a slight trend of decrease in cessation rate among those with lower social economic status. The present study employed education as the proxy for social-economic status and examined the cessation rate in the last twenty years using NHIS data 1991-2010. Smokers were divided into two education groups: low (up to high school education) and high (at least some college) groups. To avoid potential confounding due to the changing ethnic composition in the US over the last twenty years, the comparison was performed for non-Hispanic white only. The results show that the difference in annual cessation rate between the high and low education groups is smallest in 1992 (1.1%), and is at its biggest in 2010 (4.4%). The linear trend for the difference in cessation over this period is significant (r= 0.53, p <0.05), indicating an increasing disparity. These results suggest that the less educated group might have benefited less from the development of cessation interventions. More in depth analyses are needed to further clarify this increasing difference in cessation rate.

Supported by a grant from National Cancer Institute U01 CA154280.

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PA4-3
“SMOKING IS A PART OF MY LIFE NOW”: A SYSTEMATIC REVIEW OF THE SELF-REPORTED BARRIERS TO SMOKING CESSATION WITHIN SELECTED SOCIOECONOMICALLY DISADVANTAGED GROUPS

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Background: The prevalence of smoking is disproportionately higher in socially disadvantaged populations. Effective interventions to reduce smoking within these groups require an understanding of the factors that prevent disadvantaged groups from stopping smoking. This study aims to identify and synthesise the literature describing the barriers to smoking cessation within selected disadvantaged groups and classify these barriers within the Social Determinants of Health framework (SDHF). This framework recognises that health behaviours are influenced by multiple factors including an individual, their community networks, living conditions and wider socio-cultural contexts. Method: Medline, Embase, CINAHL and PsycINFO were searched for publications prior to March 31 2011. Inclusion criteria were: qualitative or quantitative descriptions of the self-reported barriers to smoking cessation within six socially disadvantaged groups: Indigenous populations, people with a mental illness, people of low socioeconomic status (SES), the homeless, prisoners and at risk youth. Identified barriers were categorised using the SDHF. Methodological quality was assessed using existing adapted tools. Results: 34 papers were included in this systematic review (13 Indigenous, 7 mental illness, 11 low SES, 3 homeless, 2 prisoners) no papers were found that described barriers for youth at risk. The results of this review indicated that barriers to smoking cessation occurred at all levels identified within the SDHF and include: addiction to nicotine, lack of social support, high acceptability of tobacco use amongst community, stressful life situations, limited resources to quit, cultural norms and socioeconomic factors. Most barriers were common across all groups, but differed in the way in which they manifested in each disadvantaged group. Implications: The barriers identified by this review suggest multiple factors have compounding effects on the ability of individuals in disadvantaged groups to stop smoking. Encouragingly, many of the barriers identified are modifiable, and can be addressed by both social and health intervention programs and policies.

This research has been funded by a grant from the National Health and Medical Research Council of Australia. Scholarship funding is provided to LT from the University of Newcastle and Cancer Institute NSW.

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PA4-4
HOMELESSNESS, CIGARETTE SMOKING, AND DESIRE TO QUIT: A NATIONAL STUDY

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BACKGROUND: Cigarette smoking is common among homeless individuals, but whether the association between homelessness and smoking is independent of mental illness, substance abuse, and poverty is unknown. Homeless smokers are often assumed to be uninterested in quitting, although clinical experience and small studies suggest otherwise. We used data from a national survey to
determine if homelessness is independently associated with current smoking or desire to quit. METHODS: We analyzed data from the 2009 Health Resources and Services Administration Patient Survey (participation rate 72%), a nationally representative survey of individuals, using adjusted data funded through Section 330 of the Public Health Service Act. These health centers target medically underserved populations, providing a sampling frame that includes both homeless and housed low-income individuals. We used multivariable logistic regression to examine the association between homelessness and (1) current cigarette smoking among all adults, and (2) past-year desire to quit among current smokers. RESULTS: Of 2,678 adult respondents, 4% were currently homeless and 11% were formerly homeless. In unadjusted analyses, adults with any history of homelessness were more likely than never homeless respondents to be current smokers (57% vs 27%, p<0.001). In multivariable models, a history of homelessness was independently associated with current smoking (AOR 1.96; 95% CI 1.32-2.91), even after adjusting for age, sex, race, veteran status, education, employment, income, mental illness, and alcohol and drug abuse. Housing status was not significantly associated with desire to stop smoking in unadjusted (p=0.26) or adjusted (p=0.69) analyses; 84% of currently homeless, 89% of formerly homeless, and 82% of never homeless smokers reported wanting to quit in the past year. CONCLUSIONS: Homelessness is associated with 2-fold higher odds of smoking even after robust adjustment for confounders. Despite this, homeless smokers do not differ from non-homeless smokers in their desire to quit. Our findings emphasize the need for creative efforts to reduce tobacco use disparities in this vulnerable population.

Funding by National Institute on Drug Abuse, National Institutes of Health (Award Number K23DA040008), and Massachusetts General Hospital, and 3. Boston Health Care for the Homeless Program.

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HOOKAH

PA5-1
THE WATERPIPE CAFE: HAZARDOUS TO YOUR HEALTH

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Introduction: The use of a waterpipe to smoke tobacco is emerging as a popular trend in the United States and waterpipe smoking establishments have had an increasing presence, even in locations with smoke-free air legislation. Dangers of waterpipe smoking have been documented in the literature, but less data has been gathered about the waterpipe cafe itself. This project sought to conduct surveillance on the existing waterpipe cafes of western and central New York State (n=7). Methods: In March, April, and September 2012, indoor air quality was assessed in 7 waterpipe cafes in three counties of central and western New York. The seven venues represented the totality of hookah establishments that allow indoor smoking in the 3 major cities sampled. Real-time measurements of particulate matter (PM2.5) and carbon monoxide (CO) were obtained, while observations were recorded on the behaviors of waterpipe users. Results: The mean PM2.5 concentration was 515 micrograms per cubic meter (SD=338) while the mean ambient CO was 20.5 parts per million (SD=18.3). The highest mean PM2.5 concentration in a venue was 1137 although the highest mean concentration of carbon monoxide was found at a different venue (52ppm). On average there were 5.6 waterpipes and 1.1 cigarettes being smoked at any given time with 3.2 people per waterpipe. This translates into a mean active smoking density of 2.41 per 100 cubic meters of air. The PM2.5 levels increased with increasing active smoking density (rho=0.68, p<0.09). Conclusions: The concentrations of both particulate matter and carbon monoxide were above established air quality standards and therefore increase the health risks of both patrons and workers of these establishments. Mean PM2.5 levels were 30 times higher than the Environmental Protection Agency “Good” air quality standard, and it is about two times higher than what is typically seen in bars with only cigarette smoke. Carbon monoxide health standards range from 9-50ppm as permissible exposures; mean CO levels in waterpipe cafes often exceed these limits. The waterpipe cafe is shown to be hazardous and warrants further surveillance and regulatory scrutiny.

This work was partially funded by a grant from the Flight Attendant Medical Research Institute and was part of an integrative research project for the Masters in Public Health at the University at Buffalo School of Public Health and Health Professions.

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PA5-2
INTRA-SUBJECT VARIABILITY IN SMOKING TOPOGRAPHY IN A SAMPLE OF WATER PIPE SMOKERS, USING STANDARDIZED EQUIPMENT AND METHODS

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Background: Water pipes (WP), also popularly known as hookah, vary in many of their components and operating conditions, which may contribute to variation in smoking behavior and exposure to smoke toxins. Although WP puff topography has been reported in the literature, intra-subject variation in puff parameters has not been explored. Using a research-grade WP equipped to record puff flow rate, standardizing the smoking experience, and using a repeated measures design, we evaluated intra-subject variability in WP smoking topography. Methods: Hookah smoking topography, exhaled CO boost and peak were obtained for ten participants, all established WP smokers, which was defined as having smoked WP for at least a year and at least 3 times in the previous six months. Each participant smoked the standard WP, with 20 g of “double apple” shisha tobacco and a single quick light charcoal in three laboratory sessions spaced at least one week apart, and at approximately the same time of day (±1 hour). Each participant was 12-hours abstinent from all tobacco/nicotine products prior to each visit and smoked ad lib to satiation. Results: The sample was male, primarily Asian (80%), with a mean age of 21.4 years. To examine the intra-subject variability, we estimated the intra-class correlation coefficient (p) for three topography measures. The p was estimated for each topography measure by fitting a mixed model with a random intercept for individuals. Puff volume was more variable with a value of 54.6%, whereas puff duration and puff interval were more stable, with ρ values (~100) of 69.8% and 79.6%, respectively. Conclusion: There is a growing literature on WP smoking topography and measures of exposure. Variability of the WP construction and operating conditions pose a problem to standardizing research methods. This was the first study to measure intra-subject variability among WP smokers using standardized methods and equipment. Future studies should consider intra-individual variability while testing WP smoking topography.

Funding: NIH, NCI.

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PA5-3
EFFECT OF BEHAVIOURAL SUPPORT WITH AND WITHOUT BUPROPION ON SIX-MONTH SMOKING ABSTINENCE AMONG HOOKAH SMOKERS: A SUB-GROUP ANALYSIS OF THE ASSIST PAKISTAN TRIAL

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Hookah (waterpipe) smoking, a traditional form of tobacco use in Middle East and South Asia, is associated with health risks similar to cigarette smoking. It is also the most popular and socially acceptable form of tobacco smoking among women. To our knowledge, randomized controlled trials (RCT) of smoking cessation interventions have not been conducted in hookah smokers. We report on a post-hoc analysis of a cluster RCT that examined the effect of behavioural support intervention (with and without bupropion) on six-month smoking

40 2013 Paper Sessions
CIGARETTE PACKS

PA6-1
RECEPTIVITY TO GRAPHIC WARNING LABELS IN U.S. YOUNG ADULTS
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Recent industry-led litigation has deemed that there is insufficient evidence for the FDA’s new graphic warning labels to be placed on cigarette packaging. The current study uses data from the second wave of the Legacy Young Adult Cohort study to examine past reactions to cigarette health warning labels (HWLs), awareness of new graphic HWLs, and anticipated response to new graphic HWLs among young adults aged 18-34 who provided information on past and current tobacco use. Data were collected in January 2012 and weighted to provide nationally-representative estimates. Of 4,196 young adults, including both tobacco users and non-users, 54% reported awareness of new graphic HWLs, 21% reported that current HWLs had led them not to have a cigarette (past behavior) and more than twice that number (53%) endorsed that graphic HWLs would lead them to think about not having a cigarette (future response). Multivariable analysis identified respondents of Black race and lower education as 35% less likely to report awareness, controlling for demographic variables and combustible use; smokers had a 27% increased odds of awareness of new graphic HWLs. Predictors of future response to graphic HWLs in a multivariable model included younger age (18-24: OR = 1.34), female gender (OR = 1.35) and awareness of new graphic HWLs (OR = 1.86). The greatest predictor of future response was past behavior as a result of HWLs (OR = 13.08) and smokers were 38% less likely (OR = 0.62) to report future response to graphic HWLs. These data suggest that young adult non-smokers may be more receptive to graphic HWLs than smokers and that young adults aged 18-24 and young women may be particularly receptive to new graphic HWLs. In the young adult population, graphic HWLs are likely to have a greater impact than current HWLs on deterring smoking experimentation and initiation, in addition to motivating cessation. Educational efforts to raise awareness of graphic HWLs in Black and less educated young adults will be needed to increase the impact of these labels on smoking behavior at the population level.

This study was supported by Legacy.

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PA6-2
A SEM MODEL OF THE RELATIONSHIP BETWEEN ‘SMOKING SENSORY EXPERIENCE’ AND SMOKERS’ PERCEIVED IMPORTANCE OF CIGARETTE PACKAGES
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BACKGROUND: The tobacco industry studies on complete smoking event identified smokers’ subjective assessment of their smoking experience in relation to three levels of sensation namely, mouth level (taste), during inhalation (nose flavour, throat impact) and whole body response (satisfaction). However, only limited data is available at a population-level demonstrating the relationship between cigarette dependence and smokers’ perceived importance of various sensory attributes when making brand choices. AIM: This study sought to determine the reliability of a measure of ‘smoking sensory experience’ and to explore the relationship between cigarette dependence, smoking sensory experience and importance of cigarette packaging. METHODS: This involved a nationally representative sample of smokers (n=633) who participated in the 2010 South African Social Attitude Survey (N=3112) and responded to questions related to rating on a scale of 1-5, the importance of the following attributes in making cigarette brand choices - health concern, cost, packaging, taste, satisfaction, flavour and strength. Using structural equation modelling (SEM), a priori model was
specified based on the hypothesis that taste, satisfaction, flavour and strength are measures of a construct of ‘smoking sensory experience’ and that smoking sensory experience would be positively related to cigarette dependence i.e. cigarettes smoked per day (CPD). Further that, cigarette packaging would be positively related to smoking experience. RESULTS: The SEM model demonstrated that the model specified fitted the data well as demonstrated by all model fit statistics \(X^2 (df 10)=16.1; p=0.10; \text{GFI} = 0.993; \text{CFI} = 0.99; \text{NFI} = 0.978; \text{REMSA} = 0.031\). The construct - Smoking sensory experience' was considered reliable (\(α=0.75\)). Smoking sensory experience was directly associated with increasing CPD (\(β=0.12\)). Higher rating of cigarette package in brand choice covaried with smoking sensory experience (\(β=0.29\)) and higher rating of health considerations (\(β=0.42\)). CONCLUSIONS: The study findings support the regulation of cigarette packaging as part of efforts to reduce product attractiveness and abuse liability.

Supported by an American Cancer Society Grant #AU106.

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PA6-3

PERCEPTIONS OF NOVEL HEALTH WARNING LABELS FOR SMOKELESS TOBACCO PACKAGES IN INDIA AND BANGLADESH

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Background: Increasingly, the global burden of tobacco use is borne by low-and-middle-income countries (LMICs), such as India and Bangladesh. India and Bangladesh have more smokeless tobacco users than the rest of the world combined. Health warnings on product packaging are among the most cost-effective policy interventions; however, there is little research to guide regulators in LMICs on selecting content. The current study was among the first to examine perceived effectiveness of health warnings for smokeless tobacco in India and Bangladesh. Methods: An experimental study was conducted in India (n=1002) and Bangladesh (n=1081), with adult smokeless tobacco users, and youth users and non-users. Respondents were randomly assigned to view smokeless tobacco health warnings according to one of four experimental conditions: (1) text-only, (2) pictorial warning with symbolic imagery, (3) pictorial warning with a graphic health effect, or (4) pictorial warning with a personal testimonial. Each respondent viewed five warnings within that condition for the following health effects: (1) oral cancer, (2) mouth disease, (3) heart disease, (4) addiction, and (5) death, and rated each warning on a scale of 1 to 10 for perceived effectiveness. Results: In a linear regression model, text-only warnings were rated as less effective than all of the pictorial styles: symbolic imagery, graphic health effects, and personal testimonials (\(β=0.36, p<0.001, β=2.39, p<0.001, β=1.88, p<0.001\)). Graphic health effects and personal testimonials were given higher ratings compared to warnings with symbolic imagery (\(β=2.03, p<0.001, β=1.52, p<0.001\)). Graphic health effects were given higher ratings than personal testimonials, (\(β=50, p<0.001\)). Adults gave higher ratings than youth (\(β=0.32, p<0.002\)), and females gave higher ratings than males (\(β=0.16, p<0.02\)). No significant differences were observed between countries or between smokeless tobacco users and non-users (among youth). Conclusions: Pictorial smokeless tobacco warnings are more effective than text-only, and graphic health effects may have the greatest impact overall, consistent with research from high-income countries on cigarette warnings.

International Development Research Center (Grant # 105136-008: “The Impact of Health Warning Labels for Smokeless Tobacco Packages in India and Bangladesh”), the National Institute of Health (Grant #: P01 CA138-389-01: “Effectiveness of Tobacco Control Policies in High vs. Low Income Countries”). Additional support was provided by the Propel Centre for Population Health Impact, a Canadian Institutes of Health Research New Investigator Award (Hammond), the CIHR Training Grant in Population Interventions for Chronic Disease Prevention (Muti), the Ontario Graduate Scholarship (Muti), and the Canadian Institutes of Health Research Doctoral Award (Muti).

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PA6-4

THE IMPACT OF PACK SHAPE, SIZE, AND OPENING: EVIDENCE FROM TOBACCO COMPANY DOCUMENTS

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Background: Packaging is an increasingly important form of promotion for tobacco products. In recent years, a number of new package innovations in shape and opening method have been introduced to the market. Australia is the first country to standardize the shape and size of packaging as part of "plain packaging" regulations implemented in December 2012. Currently, there is limited "independent" evidence on the impact of pack shape and openings on consumer perceptions and behavior. This study reviewed tobacco industry documents on pack shape, size, and openings, as well as implications for brand imagery, product attributes, and cigarette sales among consumers. Methods: Internal tobacco industry documents contained in the Legacy Tobacco Documents Library were searched using key word searches referring to different pack shapes, sizes and opening methods. Results: The search identified 67 relevant documents related to consumer research and company marketing plans on pack shape, size and openings. Cigarette packs that deviated from the traditional flip-top box were effective at projecting impressions of "modern," "elegant," and "unique" brand imagery. Pack shape and openings were a means to communicate product attributes, and innovations often conveyed impressions of premium quality and smooth taste. Pack shape, size and opening style influenced perceptions of reduced product harm, and were often used to communicate a 'lighter' product. Tobacco companies used pack shape and openings as a means to increase brand appeal: slim, rounded, and booklet packs were particularly appealing among young adults. Among consumers, purchase interest increased for tobacco products presented in novel packaging shape or opening. Evidence from consumer tracking reports and company presentations show that pack innovations in shape or opening method increased market share on some brands. Conclusions: The findings from this review demonstrate how the tobacco industry uses variations in packaging shape, size and opening method to influence brand appeal, product perceptions, and increase cigarette sales. The findings support the regulation of pack shape and size implemented in Australia.

This research was supported by a CIHR Training Grant in Population Intervention for Chronic Disease Prevention: A Pan-Canadian Program (Grant #: 53993) (Kotnowski), the Propel Centre for Population Health Impact, a Canadian Institutes for Health Research New Investigator Award (Hammond), and a Canadian Cancer Society Research Institute Junior Investigator Research Award (Hammond).

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PA7-1

NICOTINE AND HIGHER FUNCTIONS

WHICH NICOTINIC RECEPTOR SUBTYPES ARE TARGETS FOR IMPROVING ATTENTION AND WORKING MEMORY DEFICITS IN NEUROPSYCHIATRIC DISORDERS?

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Cognitive dysfunction is a common feature in various psychiatric disorders such as schizophrenia, bipolar disorders and old-age dementia. In many of these conditions, nicotinic acetylcholine receptors (nAChRs) have been shown to be altered and thus nicotine and its related agonists have been proposed as potential targets for treatment of underlying cognitive deficits. The present studies highlight the beneficial effects of nicotinic agonists selective for the α4β2 or α7 nicotinic receptor subtypes in two rodent models: the attentional set-shifting (AS-S) paradigm and odour-span task (OST), compared across control subjects and cognitively impaired rats having been treated with a sub-chronic regimen of ketamine (daily injections of 10mg/kg for 5 days). The set-shifting task involves rats discriminating between compound stimuli differing along two perceptual dimensions (digging medium or colour) to obtain a food reward. In the OST, rats were trained in a non-matching to sample rule and then the full OST, which
involved identifying a novel odour from an increasing number of odours. Acutely administered nicotine significantly reduced the number of trials to criterion in the extradimensional shift phase of the AS-S task, as did the α7 selective nicotinic agonist compound A. In contrast, β2* selective agonists produced mixed results; metanicotine and epibatidine were without effect while 5-I-AG5380 significantly improved EDS performance. In the OST, acutely administered nicotine significantly increased mean span length. Similarly, β2* selective agonists, metanicotine and 5-I-AG5380 improved performance in controls and ketamine-treated, while the α7 compounds, compound A, PHA453613, choline and the positive allosteric modulator PNU 120596 only restored performance in ketamine-treated subjects. These data suggest that ketamine exposure may be useful in examining novel treatments to restore cognitive impairments associated with neuropsychiatric disorders such as schizophrenia. The improvements observed with nicotinic agonists on attentional flexibility and memory capacity in rats suggest both α7 and α4β2 receptor subtypes should be targeted for therapeutic intervention.

Research supported by BBSRC (UK) project grant and research funds from Johnson & Johnson Pharmaceuticals.

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PA7-2
ENHANCEMENT OF COGNITION BY TOBACCO OR NICOTINE

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Tobacco smoking or nicotine administration can influence cognition, but in different ways depending on whether a smoker is tobacco deprived or nondeprived or whether the research participant is a nonsmoker. One of the most reliable symptoms of nicotine withdrawal that follows at least 4-6 h of tobacco abstinence is difficulty concentrating. Withdrawal-induced performance impairment has been demonstrated across a number of cognitive and attentional domains. Subsequent smoking or nicotine administration can reverse these temporary deficits. As a result, impaired concentration is an important relapse factor in individuals trying to quit smoking. A number of early studies purported to demonstrate true enhancement of cognition, but instead only documented reversal of withdrawal-induced impairment. However, studies over the past decade have avoided the confound of withdrawal relief by testing the effects of tobacco or nicotine in nondeprived smokers or nonsmokers. We recently conducted a meta-analysis of studies conducted with nonsmokers and smokers who were either not tobacco deprived or minimally deprived. Enhancement was reliably demonstrated in the domains of fine motor skills, alerting and orienting attention, short-term episodic memory, and working memory. Effect sizes were in the small to moderate range. As an example, we have conducted a series of studies in which we examined the effect of nicotine nasal spray on performance of a Continuous Performance Test (CPT). We found that nicotine reversed impairments in tobacco-deprived smokers and enhanced CPT accuracy and response time in nondeprived smokers and nonsmokers. These data suggest that attentional and cognitive deficits observed during tobacco abstinence represent potential targets for medications that could result in more effective smoking cessation rates.

This research was supported by the Intramural Research Program of the NIH, National Institute on Drug Abuse.

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PA7-3
COGNITIVE CONTROL TRAIT MODERATION OF NICOTINE INDUCED CORTICAL ACTIVATION AMONG NONSMOKERS

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Introduction: Numerous studies have shown that nicotine can enhance cognitive control processes (e.g., attention and working memory). It has also been suggested that nicotine enhances cognitive control to a greater extent among individuals who are lower in cognitive control (Evans & Drobes, 2009). However, evidence for this view among normal populations is lacking. Previous work among smokers has shown that nicotine enhances alpha suppression, a measure of cortical activation which in turn is associated with cognitive control. In the present study, the moderating effect of trait cognitive control on nicotine-induced alpha suppression was tested. We expected that individuals lower in trait cognitive control would show greater cortical activation (i.e., alpha suppression) when nicotine was administered. A nonsmoker sample was recruited to examine absolute facilitation of cognition via nicotine independent of withdrawal effects. Methods: 85 non-smokers attended two double-blind counterbalanced experimental sessions that included three minutes of resting-state electroencephalogram (EEG) data collection. Four to five hours prior to each recording, participants received a placebo or 7 mg nicotine patch. Self-reported cognitive control was measured by the Cognitive Failures Questionnaire (Broadent et. al., 1982). Results: Alpha power decreased significantly in the nicotine condition (p = .026), most prominently in the lower range of this bandwidth (i.e., alpha1) (p = .001). Self-reported cognitive control moderated nicotine-induced alpha suppression (p = .018) in the expected direction, with lower levels of cognitive control predicting greater alpha suppression. This effect was also driven by alpha1 (p = .001). Discussion: These findings indicate that nicotine-induced changes in cortical activation are greater among individuals lower in cognitive control. Changes in these indices related to cognitive control suggest that early dependence may develop more rapidly and/or become stronger among individuals who exhibit generally lower levels of cognitive control.

Funding: Florida Department of Health Grant #09KN-02.

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PA7-4
TESTING INCENTIVE SENSITIZATION: COMPARING EX AND CURRENT SMOKERS IMPLICIT AND EXPPLICIT COGNITIVE PROCESSING

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The incentive-sensitisation model (ISM) of addiction states that repeated drug use causes sensitization to regions that mediate incentive-motivational functions. This leads to excessive attribution of salience to drug representations, which causes a type of pathological ‘wanting’. Furthermore, sensitisation is considered a permanent neuro-adaptation that persists even after drug use has ceased. The current research sought to establish support for the permanence hypothesis proposed by ISM through comparing smokers and ex-smokers performance on several implicit and explicit cognitive tasks. Five separate experiments with 5 experimental groups were included. An Implicit Association Task (IAT), 2 Stimulus Response Compatibility Tasks (SRC), a modified-Stroop task and explicit valence ratings of smoking concepts was completed by smokers (total n = 115) & ex-smokers (total n = 100). Ex and current smoker demonstrated similar negative associations with smoking on the IAT (p > .05). Both groups demonstrated larger RT for smoking pictures (M = 865.13; 805.10 respectively) compared to neutral pictures (M = 829.11; 750.01) on the modified Stroop task (p < .05). The direct version of the SRC task revealed that ex and current smokers were both faster to make approach smoking reactions (M = 788.45; 850.39 respectively), compared to avoid smoking reactions (M = 885.85; 925.02 respectively) (p< .05). No differences were seen on the indirect SRC task. Differences emerged on the explicit rating of smoking concepts; ex-smokers were more negative about smoking pictures than current smokers (p < .05). Results support the ‘permanence’ hypothesis proposed by IST. Both groups demonstrate similar attentional and approach biases for smoking stimuli suggesting that attribution of incentive salience is a long-lasting adaptation, which persists into abstinence. Interestingly, ex-smokers were explicitly more negative about smoking concepts, suggesting that explicit associative processes may be implicated in successful abstinence.

This research was funded by a post graduate scholarship from Trinity College Dublin.

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GENES AND PHENOTYPES

PA8-1
MICROARRAY ANALYSIS OF HEPATIC GENE EXPRESSION IN NICOTINE-EXPOSED ZEBRA FINCHES REVEALS A LINK BETWEEN ALPHA-7 AND ALPHA-9 NICOTINIC ACETYLCOLINE RECEPTOR EXPRESSION AND GENES INVOLVED IN PANCREATIC AND BREAST CANCER PATHOGENESIS

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Preclinical and clinical studies have shown an association between smoking and the development of pancreatic as well as breast cancers. Two subtypes of nicotinic acetylcholinergic receptors (nAChRs) play a major role in the proliferation of these types of cancer. Overexpression of alpha-9 nAChRs, accompanied with long-term nicotine treatment, induces normal breast epithelial cell transformation, while alpha-9 nAChRs expression knockdown inhibits breast cancer cell growth. Via alpha-7 nAChRs mediated signal transduction pathways, nicotine induces a dose-dependent increase in the proliferation of breast and pancreatic cancer cells. The goal of this study was to identify candidate genes associated with processes of nicotine exposure in zebra finch liver. 20 adult male finches were at random divided as follows: saline (n=6), single (n=7) and repetitive (n=7, 2x/day for 7 days) nicotine treatment (0.16 mg/kg, s.c.). Four hours after the last drug exposure finches were sacrificed and liver tissue was flash frozen and stored at -20°C until analysis. Total RNA samples were isolated with TRIzol reagent. RNA samples were subjected to total cDNA synthesis by using a High Capacity cDNA reverse transcription kit followed by Qiagen PCR purification. Changes in gene expression levels were evaluated using our custom-designed NimbleGen zebrafish liver array. Nicotine treatment contributed to differential expression of 25 genes; 8 and 3 genes were up- and down-regulated after a single or repetitive nicotine exposure; a treatment-dependent effect was observed for 7 genes (up-regulation – single, down-regulation – repetitive), 1 gene showed an opposite treatment-dependent effect; 3 genes were affected by a single nicotine administration, while 3 other genes were affected by repetitive treatment. Unexpectedly, we found that all 25 genes are involved in transcriptional repressor activity, signal transduction, GABA synthesis, cell adhesion, survival and motility, which are activities important in breast and pancreatic cancer pathogenesis. This work will contribute to a further understanding of nicotine-mediated mechanism of breast and pancreatic cancer pathogenesis.

This work was funded by Departmental Start-up funding (SLTC) and the Addiction Research Institute (ARI, Inc., Bear, DE) travel grant (WMP).

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PA8-2
GENETIC VARIATION UPSTREAM OF CHRNA3 INFLUENCES GENE EXPRESSION

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SNPs in the putative promoter region of CHRNA3 have emerged from meta-analyses as top hits associated with number of cigarettes smoked per day. Additionally, this region has been associated with nicotine dependence, subjective response to nicotine, and quit attempts. Prior results have shown that the 3kb region upstream of CHRNA3 influences the expression of a reporter gene whereby the haplotype containing the major alleles led to increased expression of a reporter gene compared to the minor haplotype. We expanded on these initial findings by examining three SNPs in this region: rs13277254, rs6474413, and rs4950. Constructs were created that had the major or minor haplotype with the alleles flipped (e.g. minor allele on major haplotype background) at the three SNPs located directly upstream of the luciferase reporter gene. Constructs were tested in two human neuroblastoma cell lines, BE(2)-C and SH-SY5Y, and HEK 293T human embryonic kidney cell lines. In all cell types the major haplotype led to greater luciferase gene expression than the minor haplotype. When the allele at rs6474413 was reversed, this difference was attenuated. In HEK 293T cells, rs13277254 also appeared to modulate this response. Preliminary data from electrophoretic mobility shift assays suggest that the major allele at rs6474413 binds more strongly to proteins found in nuclear extracts derived from BE(2)-C cells compared to the minor allele. Four transcription factors are predicted to bind differentially depending on the nucleotide present at rs6474413 and these will be examined. These data provide evidence that specific SNPs upstream of CHRNA3 may be involved in regulating gene expression, thereby providing insight into a possible underlying biological mechanism for the observed association with tobacco behaviors.

Funding: R01 AA017889 and K01 AA019447.

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PA8-3
THE ALLElic EFFECTS OF SNP RS1948, ASSOCIATED WITH EARLY NICOTINE AND ALCOHOL USE, ARE 3'-UTR-DEPENDENT

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Regulation and coordination of nicotinic acetylcholine receptor subunit (Chrm) genes have been shown to be important in nicotine and alcohol-related phenotypes. Our lab has shown an association between SNP rs1948, located in the 3'-UTR region of CHRN4, and early age of initiation for both tobacco and alcohol use in human genetic studies. Emerging evidence reveals that miRNAs, factors that act directly on the 3'-UTR of targeted mRNAs, have an important role on the regulation and coordination of gene expression. The present study examines whether the risk variant of rs1948 is associated with differences in gene expression and whether these differences are due to selected microRNAs. To address this aim, two constructs of different 3'-UTR lengths (0.8kb, 1.7kb) containing the rs1948 were generated and then cloned in a pGL3-Promoter vector downstream of the luciferase reporter gene. Three different mammalian cell lines (B35, N2A, and SH-SY5Y) were co-transfected with each construct and selected miRNAs. Luciferase assays were performed to assess gene expression at 48-h and 96-h (undifferentiated and differentiated cells) post-transfection time points. Results revealed different allelic and miRNA effects on luciferase expression due to the length of the construct. Overall, the results demonstrate that the risk allele of rs1948 could play a role in the age of initiation for tobacco and alcohol use by modifying the expression of CHRN4 gene.

Funding: NIH grants R21 DA015353 (MAE, JAS), R01 AA017889 (MAE).

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PA8-4
NON-CODING VARIATION IN CYP2B6 IS ASSOCIATED WITH ALLElic EXPRESSION, NICOTINE METABOLISM, AND SMOKING CESsATION INDEPENDENT OF COMMON AMINO-ACID CHANGES, AND BUPROPION TREATMENT

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In a recent candidate gene study, variants in the Cytochrome P450 2B6 (CYP2B6) gene show the strongest association with smoking cessation. The CYP2B6 enzyme makes a relatively small contribution to hepatic nicotine metabolism relative to CYP2A6, encoded by an adjacent gene, but CYP2B6 is primarily responsible for metabolism of the cessation drug bupropion. Therefore it has been assumed that CYP2B6’s association with cessation is due to altered metabolism of bupropion, or perhaps coincidental linkage with CYP2A6. However, using CYP2B6 genotype as a covariate, we find that the non-coding CYP2B6 polymorphism previously associated with smoking cessation is significantly associated with nicotine metabolism independent of CYP2A6. The association is also independent of well-studied closely-linked amino-acid changes in the CYP2B6
PA9-1 ASSESSMENT OF ELECTRONIC CIGARETTES AS A SOURCE OF EXPOSURE TO ACROLEIN

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Significance: Acrolein (also known as propylene aldehyde or 2-propenal) is a highly reactive chemical that causes irritation to the nasal cavity, damage to the lining of the lungs, and is thought to contribute to cardiovascular disease in cigarette smokers. Electronic cigarettes (e-cigarettes) are battery-powered devices that deliver vaporized nicotine, usually in propylene glycol or glycerin. Since acrolein may be formed as a result of heating glycerin, we examined the hypothesis that inhalation of e-cigarette vapor leads to exposure to acrolein. Aim of the study: The aim of this study was to assess exposure to acrolein from e-cigarette smoking. Materials and methods: Vapors were generated from 12 brands of e-cigarettes in controlled laboratory conditions using modified smoking machine. Acrolein was extracted from aerosol to solid phase with 2,4-dinitrophenylhydrazine (DNPH) and analyzed with high-performance liquid chromatography with spectrophotometric DAD detector. To compare levels of acrolein in e-cigarette aerosol and mainstream smoke of conventional cigarette we assumed that 15 puffs from an e-cigarette (typical use pattern) would correspond to smoking one conventional cigarette. S-(3-hydroxypropyl)meterminic acid (3-HMPA), a metabolite of acrolein, was measured in urine of 20 e-cigarette users and 20 tobacco cigarette smokers with liquid chromatography/tandem mass spectrometry method. Results: The levels of acrolein in e-cigarette vapor ranged from 0.07 to 4.19 µg per 15 puffs, which about 4 times lower than levels in cigarette smoke. The average urine 3-HMPA concentration in e-cigarette users was 308 ng/mg creatinine and was significantly lower than in tobacco cigarette smokers (822 ng/mg creatinine; p<0.05). Conclusions: Our findings suggest that e-cigarette vapor is a source of acrolein, however the level of exposure is less than than that from a conventional cigarette. Substituting tobacco cigarettes with electronic cigarettes may substantially reduce exposure to acrolein. Further research is needed to evaluate long term effects of inhalation exposure to acrolein from e-cigarettes.

This study was conducted while the first author was at Medical University of Silesia, Poland and was supported by the Ministry of Science and Higher Education of Poland under grant number N 404 025638. Analytical Chemistry at the University of California, San Francisco was supported by grants P30 DA012393 and S10 RR028437 from the National Institutes of Health, and from the National Institute of Mental Health, Sosnowiec, Poland; and was supported by the Ministry of Science and Higher Education of Poland and was supported by the National Cancer Institute (P01 CA-089392 to LJB, and P50 CA-84724 and K05 CA-139871 to TBB); and the National Institute on Drug Abuse (P50 DA-19706 to TBB, R01 DA-026911 to NJS, and K02 DA-021237 to LJB); and the National Human Genome Research Institute (U01 HG-004422 to LJB).

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PA9-2 ASSESSMENT OF PASSIVE EXPOSURE TO AEROSOL FROM ELECTRONIC CIGARETTES

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Background: Electronic cigarettes (e-cigarettes) are battery-powered devices that deliver vaporized nicotine, usually in propylene glycol or glycerin. When a user inhales through the device, air flow is detected by a sensor, which activates a heating element that vaporizes a nicotine solution contained in a cartridge. Although no vapor is generated during puff breaks, some vapor is exhaled by e-cigarette user. It is unknown whether e-cigarettes release potential toxic compounds into the indoor environment. Aim: The aim of this study was to evaluate the passive exposure to aerosol from e-cigarettes. Materials and methods: We compared passive exposure produced from 'vaping' e-cigarette, smoking conventional cigarettes, and no-smoking. Five dual-product users were recruited for the study and asked to use both electronic and tobacco cigarettes subsequently in a ventilated experimental room. After baseline measurements were taken, each of the subjects was asked to use e-cigarette twice during the one-hour period following smoking of two conventional cigarettes for the next hour. Concentrations of air constituents including respirable aerosol (PM2.5), carbon monoxide (CO), nicotine, and volatile organic compounds (VOCs) were measured. Results: Passive exposure to nicotine from electronic cigarettes was about 10-times lower than from tobacco cigarettes (3.3±2.5 vs 31.6±6.9 microgram/cu m., p=0.0081). Concentrations of PM2.5, CO and VOCs were substantially reduced when volunteers were using e-cigarettes as compared to smoking conventional cigarettes (p<0.05). Second-hand exposure to CO and VOCs from e-cigarette was in the same range as nonsmoking. Conclusions: E-cigarettes are a secondhand source of exposure to nicotine, but to much lower extend than tobacco cigarettes. Further research is needed to evaluate long term effects of passive exposure to vapor from e-cigarette, including using the products to reduce harmful tobacco smoke exposure to others and to get around smoke-free policies.

This study was conducted while the presenting author was at the Medical University of Silesia, Poland and was supported by the Ministry of Science and Higher Education of Poland under grant number N N404 016939.

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PA9-3 MOUTH LEVEL INTAKE OF BENZO[a]PYRENE FROM REDUCED NICOTINE CIGARETTES

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Background: Benzo[a]pyrene is one of the most potent carcinogens generated in cigarette smoke. Previously, we developed a new method to estimate mouth-level BaP intake using filter analysis. Based on the amount of BaP retained in cigarette butts and the amount on pads, we can relate them using a linear relation regression model. Using this model and subsequently analyzing cigarette filters collected from smokers, we are able to estimate their mouth-level intake, which smokers received when they consumed cigarettes. Methods: We applied this method to estimate mouth-level BaP intake by analysis of cigarette filter butts collected from smokers participating in a clinical study to investigate the behavior of smoking using reduced nicotine cigarettes (Quest cigarettes). Results: Linear
relations of BaP were observed between mainstream smoke yield (trapped by Cambridge filter pad) and filter tip from three Quest cigarettes and all the smokers' own cigarettes. More than 55% of butts from smokers' own brands exhibited intensive smoking behavior greater than the Canadian intense smoking regime; however, less than 20% of Quest 3 butts exhibited such behavior. Conclusions: Box plot analysis indicates the median BaP intake decreases as the subjects are given the Quest cigarettes. Similar trend was observed when urinary cotinine levels were subjected to the same analysis. However, the median 1-HOP shows no significant change as the subjects are given the Quest cigarettes. Impact: This technique provides a non-invasive and accurate means to estimate intake of BaP on a per cigarette basis.

FDA/CDC interagency agreement Original study was funded by the Health Canada Tobacco Control Program.

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PA9-4
SMOKING AND SLEEP DISTURBANCES PREDICT HIGHER INTERLEUKIN-6 LEVELS AMONG PATIENTS NEWLY DIAGNOSED WITH HEAD AND NECK SQUAMOUS CELL CARCINOMA

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Our prior work has shown that elevated Interleukin-6 levels are associated with recurrence and survival among head and neck cancer patients. Health behaviors (smoking, problem drinking, nutrition, exercise, and sleep) have been shown to be associated with recurrence risk and survival among cancer patients and are also associated with Interleukin-6 levels, but few epidemiologic studies have investigated the relationship of health behaviors and Interleukin-6 among cancer populations. Patients (N=409) were recruited in otolaryngology clinic waiting rooms and invited to complete written surveys. A medical record audit was also conducted. Descriptive, bivariate, and multivariate analyses were conducted to determine which health behaviors were associated with higher Interleukin-6 levels controlling for demographic and clinical variables among newly diagnosed head and neck cancer patients. While smoking, alcohol problems, body mass index, physical activity, and sleep were associated with Interleukin-6 levels in bivariate analysis, only smoking (current and former) and decreased sleep were independent predictors of higher Interleukin-6 levels in multivariate analysis. Covariates associated with higher Interleukin-6 levels were age and higher tumor stage, while comorbidities were marginally significant. Treating health behaviors problems, especially smoking and sleep disturbances, may be beneficial to decreasing Interleukin-6 levels and improving cancer treatment outcomes.

This work was supported by the U. S. National Institutes of Health through the University of Michigan’s Head and Neck SPORE (Grant #P30 CA97248).

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CIGARS, SNUS, AND E-CIGARETTES

PA10-1
PRIMARY AND DUAL- USERS OF LITTLE CIGARS/CIGARILLOS AND LARGE CIGARS: DIFFERENTIAL DEMOGRAPHIC AND TOBACCO USE PROFILES

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BACKGROUND: Cigar sales have dramatically risen in the U.S. over the past two decades. Little cigars and cigarsillos (LCCs) represent the bulk of this rise, and given restrictions placed on cigarettes as part of the Family Smoking Prevention and Tobacco Control Act, further increases are expected. Despite this, little is known about the prevalence and differential demographic profile and tobacco use patterns of LCC versus large cigar users. METHODS: This study uses data from Legacy’s Young Adult Cohort, a nationally representative study of 4,215 young adults, ages 18-34. Cigar use was divided into three groups: LCCs only, LCs only, and dual-users of both. Logistic and multinomial regression was used to determine the differential demographic characteristics and tobacco use behaviors associated with LCC, LC and dual-use. RESULTS: Cigar use was endorsed by 37.9% (n=1,596) of the young adult cohort. Of the cigar smokers, 21.5% (n=344) had used only LCCs, 32.3% (n=515) had used only LCs and 46.2% (n=737) were dual-users of both. In comparison to LC-only users, LCC-only users were more like to be younger (RRR=0.40, p<0.001 for 25-34 years vs. 18-24 years), female (RRR=4.92, p<0.001), non-Hispanic black (RRR=2.91, p<0.001) and daily cigarette smokers. Dual-users were more likely than LC-only users to be female (RRR=1.61, p=0.03), non-Hispanic black (RRR=2.06 , p=0.04), and poly-tobacco users(RRR=4.44, p<0.001). DISCUSSION: Cigar use is prevalent among young adults with the highest proportion dual-users of both LCCs and LCs. Interventions to curb use should consider the differential demographic and tobacco use patterns of user subtypes.

No funding.

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PA10-2
WILL THE AVAILABILITY TO SNUS RESULT IN DUAL USE THAT MIGHT JEOPARDIZE THE POTENTIAL ROLE OF SNUS IN TOBACCO HARM REDUCTION? THE NORWEGIAN EXPERIENCE

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There is medical consensus that a total substitution of cigarettes with low-nitrosamine Swedish snus will be beneficial to public health, but a question frequently being asked is whether the availability to snus might result in dual use of snus and cigarettes that might jeopardize the potential role of snus in tobacco harm reduction? The answer depends upon quite a number of factors – of which several still not have been addressed empirically. The long history of snus use makes Norway a case for observational studies on patterns of dual use. We have used data from the time series of national representative cross sectional surveys, conducted each year by the Norwegian health authorities since 1985 (annual sample=2000). Our results demonstrate that the magnitude of dual use has been relatively small and relatively stable since 1985 (between 4.7-7% of the male population aged 16-74 years), while the overall snus use increased from 7% to 20% and the prevalence of regular smokers halved from 50% to 25%. The use of snus among women has a shorter history, but the same tendency is evident. The most typical pattern of dual use was a combination of daily use of one product associated with occasional use of the other. Dual users of snus and cigarettes report approximately 40% lower cigarette consumption than do exclusive smokers. Frequent motives for additional snus use were smoking reduction (held by 55%) and smoking cessation (held by 43%). Additional snus use was not associated with any delay in smoking cessation (intentions to quit within 6 months), and positively correlated with expectancies of being smoke-free 5 years into the future. Among respondents with a history of dual use, only 24% had started with snus before
cigarettes. However, the concern is that this fraction increased to 40% in the youngest age group.

**Fundied by the Norwegian Institute for Alcohol and Drug Research.**

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**PA10-3**

THE USE AND PERCEPTION OF ELECTRONIC CIGARETTES AND SNUS AMONG THE U.S. POPULATION

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E-cigarettes have generated controversy in the tobacco control field similar to that of Swedish snus, which came to the U.S. market six years earlier. Some argue that e-cigarettes have great potential to help smokers quit regular cigarettes while others contend they should be banned for lack of safety and efficacy data. We conducted a population survey in the U.S. with a national probability sample (N=10,041) from February 24 to March 8, 2012, and compared the use of e-cigarettes with that of snus. Survey respondents were asked if they had heard about e-cigarettes, where they had heard about them, whether they had used e-cigarettes or snus, how often they used them, and why they used them. Responses were weighted to represent the entire U.S. population, and data were compared with another population survey conducted in 2010. The main findings are: A high proportion, 75.4%, reported having heard about e-cigarettes. Television ranked as the number one source of information, followed by “heard in person” and “Internet.” About 8.1% had tried e-cigarettes, and 1.4% were current users. These rates were twice those of snus (4.3% and 0.8%, respectively). Among current smokers, 32.2% had tried e-cigarettes, and 6.3% were current users. Compared to the survey data in 2010, the proportion of smokers who have experimented with e-cigarettes has increased by 182%, and the current use of e-cigarettes by 54%. Women were significantly more likely to have tried e-cigarettes than men, even though they were less likely to have heard about them. Those who had tried e-cigarettes were more likely than those who tried snus to report their products being safer than regular cigarettes (49.9% vs. 10.8%). Almost half (49.9%) of current smokers were susceptible to using e-cigarettes in the future. Conclusions: That e-cigarettes have surpassed snus in adoption rate, despite there being no promotion of e-cigarettes before this national survey by major tobacco companies, suggests that the former have tapped into smokers’ intuitive preference for potentially harm-reducing products, probably due to the product design. E-cigarette use is likely to increase in the next few years.

Supported by a grant from National Cancer Institute U01 CA154280.

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**PA10-4**

USE OF ELECTRONIC NICOTINE DELIVERY SYSTEMS BY TEENAGERS IN A LONGITUDINAL STUDY

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Electronic Nicotine Delivery Systems (ENDS) have been gaining in popularity recently. Prevalence studies in adults have found that most ENDs users are current or former smokers. The objectives of this study were to estimate the prevalence of ENDS usage in adolescents over time, and examine the correlates of use. Surveys assessing tobacco use were conducted multiple times in two suburban Western New York high schools between 2010 and 2011. In School A, grades 9-12 were surveyed three times: February 2010, October 2010, and June 2011. In School B, students were surveyed in October 2010 and June 2011. The survey included questions on ever use of ENDS and past 30 day use. Correlates examined included grade, gender, race, survey year, cigarette use in the 30 days prior to the survey, and susceptibility to smoking. Descriptive statistics on prevalence of ever and past 30-day use and logistic regression to assess correlates of past 30-day use were conducted. Three findings are observed from the results: (1) the prevalence of ENDS use increased in each school over time [Ever use was 2.9% in Spring 2010, 4.2% in Fall of 2010, and 5.7% in Spring 2011; Past 30 day use was 1.1% in Spring 2010, 1.0% in Fall of 2010, and 2.0% in Spring 2011]; (2) ENDS use is mostly concentrated in current smokers or those susceptible to smoking; and (3) no demographic differences in ENDS use were observed. These data indicate that in this sample, the use of ENDS more than doubled over 14 months, and there were no demographic differences in use. ENDS use is almost exclusively concentrated in current smokers and non-smoking youth who are more susceptible to become cigarette smokers in the future. Youth not otherwise susceptible to smoking appear to have little interest in ENDS. Important unanswered questions are whether dual use of ENDS with cigarettes increases or diminishes future likelihood of smoking cessation, and whether use of ENDS in those susceptible to smoking increases or decreases future likelihood of becoming smokers among adolescents. Prospective data are needed to understand these critical potential consequences of youth ENDS use when trying to estimate the net population health impact of ENDS.

Supported by R01DA026450.

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NEW FRONTIERS IN SMOKE POLICY

**PA11-1**

PUTTING THIRDHAND SMOKE ON THE POLICY AND RESEARCH AGENDA: KNOWLEDGE GAINS AND EXPERT PANEL RECOMMENDATIONS

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Thirdhand smoke (THS) refers to residual tobacco smoke pollutants that remain on surfaces and in dust after tobacco has been smoked, are reemitted into the surrounding air or react with oxidants and other compounds to yield secondary pollutants. In response to growing concerns about THS, a multi-disciplinary Expert Panel of leading scientists and tobacco control policy specialists was convened in spring 2012 to disseminate existing and emerging evidence on THS, and identify knowledge gaps and opportunities for research and policy. Expert Panel members presented the current state of knowledge about THS to an audience of 129 (36 on site; 93 webcast) knowledge users in science, medicine, public health and policy. An online survey sent to knowledge users before and after the workshop provided information on perspectives and information needs. The Expert Panel met over two days to discuss and develop recommendations for research and policy. All respondents who completed the pre-workshop survey (n=104) indicated they were knowledgeable about secondhand smoke (SHS), whereas only 70% indicated they were knowledgeable about THS. THS knowledge levels increased to 91% post-workshop, among the 75 participants who responded. Strong agreement that THS is a health problem increased from 54% to 81% following the workshop. The Expert Panel identified the need for additional research to confirm the health risks from cumulative exposure to novel persistent toxic agents that are derived from tobacco use. Opportunities for addressing THS exposure through existing tobacco control policies, such as no-smoking legislation, were also identified. Challenges persist for reducing exposure among vulnerable populations in locations where tobacco use is currently unregulated (e.g., homes), and in vehicles where children are exposed to THS despite regulations that restrict smoking in their presence. Survey results and Expert Panel deliberations demonstrate the growing need for evidence-based resources on THS, including contamination and clean-up, for tobacco control and public health communities. Future efforts include the development and dissemination of such resources.

**Funding:** Ontario Tobacco Research Unit and the Canadian Institutes of Health Research.

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PA11-2
BIOMARKERS OF SECONDHAND SMOKE EXPOSURE IN MOTOR VEHICLES
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The objectives of this study were: (1) to characterize the exposure of nonsmokers exposed to secondhand smoke (SHS) in a vehicle using biomarkers, (2) to describe the time-course of the biomarkers over 24 h, and (3) to examine the relationship between tobacco biomarkers and environmental markers of SHS. Eight nonsmokers were individually exposed to SHS from a smoker who smoked 3 cigarettes at 20 min intervals over an hour in cars with fully open front windows and closed back windows. The nonsmokers sat in the backseat, passenger side, while the smoker sat in the driver’s seat. Plasma cotinine and urine cotinine, 3-hydroxytocotinine (3HC), and 4-(methylcitroso)-3-pyridyl)-1-butanol (NNAL) were measured in samples taken at baseline and several time-points after exposure. Nicotine, particulate matter (PM2.5), and carbon monoxide (CO) were measured in air inside and outside the vehicle and ventilation rates in the cars measured. Average plasma cotinine and the molar sum of urine cotinine and 3HC (COT+3HC) increased 4-fold, urine cotinine increased 6-fold, and urine NNAL increased ~27 times compared to baseline biomarker levels. Plasma cotinine, urine COT+3HC and NNAL peaked at 4–8 hours post-exposure while urine cotinine peaked within 4 hours. Plasma cotinine was significantly correlated to air PM2.5 (Spearman correlation (rs) = 0.94) and CO (rs = 0.76) but not to nicotine. The correlations between urine biomarkers, cotinine, COT+3HC, and NNAL and nicotine, PM2.5, and CO were moderate but non-significant (rs range, 0.31 – 0.60). Brief SHS exposure in cars resulted in substantial increases in tobacco biomarkers in nonsmokers. For optimal characterization of SHS exposure, tobacco biomarkers should be measured 4–8 h post-exposure. Additional studies are needed to better describe the relationship between tobacco biomarkers and environmental markers of SHS.

Supported by the Flight Attendants Medical Research Institute and US Public Health Service grant DA12393 from the National Institute on Drug Abuse and grant R25 CA 113710 from the National Cancer Institute, National Institutes of Health. Carried out in part at the General Clinical Research Center at San Francisco General Hospital Medical Center (NIH/NCRR UCSF-CTSI UL1 RR024131).

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PA11-3
MEASURING SECONDHAND SMOKE EXPOSURE IN OUTDOOR AREAS OF DOWNTOWN BUFFALO
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An increase in indoor smoking restrictions has lead to a relocation of smokers to the entranceways of buildings and other outdoor public areas. Active smoking in these public outdoor areas may expose non-smokers to harmful levels of second hand smoke (SHS). This study assessed exposure to outdoor secondhand tobacco smoke at 13 different locations in downtown Buffalo including 3 transportation stops, 5 office building entranceways, and 5 cafes with outdoor patio seating. Each location was visited for 30-60 minutes during a period of significant activity. Exposure to SHS (or SHS-PM2.5) was determined by measuring the levels of respirable particulate matter (PM) with a diameter of 2.5 micrometers (μm) or less and subtracting background particle levels. PM2.5 levels were recorded at one second intervals using a TSI SidePak AM510 Personal Aerosol Monitor and then converted to 4 second averages to mimic human respiratory rate. Results: During monitoring the relative humidity averaged 58% (range 53-62), temperature averaged 76°F (range 72-80) and ground-level wind speeds averaged 3.6ms-1 (range 1.8-5.4). Smoking was observed at 11 locations, 8 of which had no-smoking signs. The average background level was 7 micrograms per cubic meter (range 2-9) and the average SHS-PM2.5 measurement across all locations was 7 (range 1-9). Maximum PM2.5 levels reached 124 for transportation stops, 1542 for office building entrances and 1255 for cafes. On average the peak exposure in places with smoking was 367. Distance from cigarettes or proximity effect had a profound impact on exposure with PM2.5 levels declining rapidly after about 2 meters (y=10.6+13.9x-1+8.1x-2, Rsqr=0.76). Despite the presence of non-smoking signs, active smokers were present and no enforcement was noted throughout all testing periods. Outdoor smoking causes high short-term particle exposures for those in close proximity and doubled average particle exposure. The results of this study demonstrate that more data are needed to expand the evidence base on SHS exposure in outdoor public areas to inform policy and enforcement bodies aimed at protecting the public from outdoor SHS.

This study was supported by a grant from the Flight Attendant Medical Research Institute.

PA11-4
AN EVALUATION OF ALTERNATIVE SMOKEFREE MESSAGE THEMES
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Achieving New Zealand’s vision of a smokefree society by 2025 requires dramatic increases in quit attempts, improved quit success rates, and reduced lapsing. Although smokefree communications stimulate quit attempts and support quitters in remaining smokefree, smokers differ in their behaviour and life phase; consequently, messages need to reach and motivate diverse groups. To estimate the effect of different message themes, we undertook a three phase study comprising two qualitative studies followed by a quantitative study involving a best-worst experiment. Based on the qualitative findings, we developed twenty print advertisements, representing several themes, including health, child protection, cessation, and industry denormalisation. Current daily and non-daily smokers (N=546) evaluated ten pairs of randomly presented advertisements and identified the one in each pair they thought most likely to lead them to think about quitting. Data were analysed using multi-nomial logit regression. Respondents then viewed two randomly selected advertisements and used an 11-point probability scale to estimate the likelihood each ad would prompt them to think about quitting; these data were analysed using independent sample t-tests. Advertisements focussing on the loss others, especially children, experience when smokers die were chosen as more likely to prompt thoughts of quitting than ads that focussed on cessation (Hazard Ratios 5.85 and 3.61, cf. HR 1.18 and 1.11, p<0.001). Advertisements promoting financial benefits of quitting, child harm, and industry denormalisation were also seen as likely to prompt thoughts of quitting (HR 2.72; 2.47; 2.20, p<0.001). The probability estimates followed a similar pattern; nearly two thirds of the sample indicated the loss-framed messages would stimulate them to think about quitting. This work was funded by the New Zealand Ministry of Health.
PA12-1
BUYING CIGARETTES FROM INDIAN RESERVATIONS: MAGNITUDE OF THE DISCOUNT
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The Constitution and the federal government recognize Native American tribes have limited local sovereignty over their members and territory, as “domestic dependent nations.” Consequently, tribal members are not subject to state cigarette excise taxes. But in practice, on many reservations, the taxes are not applied to sales to non-tribal members who buy cigarettes on the reservation thereby reducing the public health benefits of cigarette price increases. Although previous research describes behaviors and characteristics of smokers associated with tax-free sales on reservations and related policy issues, few have evaluated price reduction related to sales on reservations. The limited evidence is usually based on experience of a single state and thus cannot be generalized to the US population.

We conducted a nationwide study to examine potential discounts using data from the 2009-2010 National Adult Tobacco Survey that collected information on cigarette purchases on Indian reservations, the prices paid, and the use of other price minimization behaviors. In the analysis, we use the instrumental variables technique (IV) to calibrate our estimates from the impacts of reverse causality and confounding factors that may be correlated with both cigarette retail prices and purchases on Indian reservations. The IV approach has been widely used in economic studies and recently adopted by public health and health service research. In our model, we use the distance between the mean population center of a respondent’s county of residence and the closest reservation as an instrument for the probability of cigarette purchases on reservations. Our estimates suggest that a little more than 10% of U.S. current smokers have purchased cigarettes from reservations in the last 12 months and on average, purchases on reservation were that a little more than 10% of U.S. current smokers have purchased cigarettes from reservations in the last 12 months and on average, purchases on reservation were associated with a price reduction of $0.67 per pack (12.7%). We also found some evidence of geographic variations in these estimates. It suggests that expanding state-level negotiations with Native American tribes to collect taxes from non-tribal member purchases can increase the public health impact from raising cigarette prices.

No funding.

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PA12-2
TOBACCO INDUSTRY PRICING STRATEGY AND THE SUSTAINABILITY OF EXCISE REVENUE UNDER DIFFERENT TAX STRUCTURE
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Given the global evidence of inelastic demand and low excise tax share in the retail price of tobacco products, it is expected that excise revenue will be higher with increase in tobacco tax in the short -to mid-term. Most studies are done by assuming that the industry will not increase its own price as the tax increases and yield overestimates for the expected excise revenue. Using data on the cigarette tax and market structure of Kenya, we examine the extent of the impact of industry’s price schema on excise tax revenue for cigarettes as tax increases under different excise systems. We use the tax simulation model developed by the Tobacco Control Economics unit of the Tobacco Free Initiative, World Health Organization. In a baseline scenario of 2011 with the same level of consumption and excise and industry revenue, we introduce tax increase under three different tax regimes of ad valorem, specific and mixed system and estimate the new levels of consumption and excise and industry revenue. The first set of simulation is done under the usual assumption that the industry does not change producer price after the tax increase. In the second set of simulation, we allow the industry to raise producer price. We find that when tax is increased, excise revenue goes up and industry revenue falls provided that the industry does not raise producer price in all three tax structures. If, however, the industry decides to raise producer price, both the government and the industry may benefit from higher excise revenue and higher profit under ad valorem tax. This is not necessarily the case under specific tax because the tax revenue does not get any share from the higher price level under this tax structure. Consequently, the tax share in price falls and the government runs into the risk of losing revenue in the long run as consumption decreases further from the price increase over and above the tax increase. Thus, in countries employing specific tax on tobacco products, excise revenue may suffer from loss of sustainability in the face of industry pricing strategies in response to tax increases.

No funding.

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PA12-3
IMPACT OF ILLICIT TRADE ON TOBACCO CONSUMPTION, LOST REVENUES, AND PRODUCT HARM: THE HUNGARIAN EVIDENCE
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Background: An estimated 8% of the total tobacco consumed in Hungary reaches consumers through illicit trade. Neighboring countries (e.g., Serbia and Ukraine) have lower prices of tobacco—thus, Hungary serves as both a destination for illicit tobacco as well as a gateway to Western Europe. There are several key stakeholders in smuggled tobacco, including: the Hungarian Tax and Customs Administration (TCA), the tobacco industry, the Finance Ministry (due to lost tax revenues), and the Health Ministry (due to lost tax revenues), and the Health Ministry (due to the unknown content of smuggled tobacco and potential health risks associated with its use). Methods: We conducted analysis of TCA data on the amount of recovered contraband tobacco over the last decade and the economic loss to the Hungarian state budget. We also obtained product samples collected by the TCA from three major smuggling routes (via China, Ukraine, Serbia). Laboratory analyses of burnt and solvent tobacco are being conducted according to international standards to measure levels of nicotine, tar, metals, and volatile organic compounds, and the in vitro toxicity and mutagenicity of multiple compounds. Results: In 2000, 1.68B smuggled tobacco pieces were recovered by the TCA. Smuggling reached an all-time high of 3.6B pieces in 2005, estimated at 23% of total tobacco consumed. In 2010, estimated smuggled tobacco declined to its lowest level in the past decade: 1.27B pieces (8% of total consumption). Most recent data suggest a tax loss of ~10M Euro/year to the country’s budget. Chemical analyses will be completed by end of 2012 and results will be presented at SRNT. Conclusion: Smuggled tobacco comprises a significant amount of total tobacco consumed in Hungary and causes huge losses in the country and in the EU, more generally. The chemical content of the smuggled tobacco in Hungary has not been measured since the fall of Communism, when tobacco manufacturing and sales were privatized. Contraband products from other regions have shown an increase in cancer-causing and banned agents. Chemical analyses of smuggled products may offer some explanation as to why Hungary has the highest lung cancer prevalence among the OECD countries.

Funding: This publication was made possible by Grant Number 1 R01 TW007927-01 from the Fogarty International Center, the National Cancer Institute, and the National Institutes on Drug Abuse, within the National Institutes of Health.

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PA12-4
PROBING THE SMOKING-SUICIDE ASSOCIATION: EFFECTS OF CIGARETTE TAX INCREASES ON SUICIDE RISK
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BACKGROUND: There is strong and consistent association between smoking and suicide, but the etiology remains unclear. Smoking may contribute directly to suicide risk by causing or exacerbating mental or physical health problems.

No funding.

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Funding: This publication was made possible by Grant Number 1 R01 TW007927-01 from the Fogarty International Center, the National Cancer Institute, and the National Institutes on Drug Abuse, within the National Institutes of Health.

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On the other hand, it has been suggested that smoking cessation can precipitate depressive episodes, thereby increasing suicide risk. Finally, the association may be completely attributable to confounding factors. These hypotheses can be evaluated by examining the influence of tobacco-control policy on suicide rates. OBJECTIVE: Using U.S. epidemiological data, to examine the associations between (1) changes in state-level smoking prevalence and subsequent change in suicide risk, and (2) changes in state cigarette excise taxes, the primary policy instrument for tobacco control, and subsequent change in suicide risk. METHODS: Aggregate smoking prevalence by state and year for the 18 to 65 year-old population were estimated from the 1990 to 1999 Behavioral Risk Factor Surveillance System (N=66,283 to 148,007 per year). Population suicide data was obtained from the Multiple Causes of Death database maintained by the National Center for Health Statistics, 1990 through 2000, with reference population data from standard sources. RESULTS: Decreases in state-level smoking prevalence were associated with decreased suicide risk: A 10% decrease in the state-level point-prevalence of smoking corresponded to a 9.0% decrease in relative risk for suicide (95% CI: 2.6, 15.8, p=0.005). Each $1 increase in state-tax corresponded to a reduction in relative risk for smoking of 20.4% (95% CI: 9.3, 32.5, p=0.0002). Tax increases were likewise associated with reduction in suicide risk: Each $1 tax increase corresponded to a subsequent 23.9% reduction in relative suicide risk for (95% CI: 9.7%, 39.9%). These results support the hypothesis that smoking contributes to suicide risk, and are inconsistent with the hypothesis that smoking cessation increases suicide risk. If nicotine mediates such effects—epidemiological data support the plausibility of such a mechanism—these phenomena warrant intense investigation as emerging tobacco products grow in popularity.

**PA13-2**

**EFFECT OF INHIBITING BRAIN CYP2B-MEDIATED NICOTINE METABOLISM ON ACQUISITION AND REINSTATEMENT OF NICOTINE SELF-ADMINISTRATION IN RATS**

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Nicotine is metabolized by CYP2A6 and CYP2B6; both enzymes are highly polymorphic in humans. Genetically slow CYP2B6 increased acquisition of smoking in adolescents and craving and relapse during cessation, with no impact on levels of smoking. CYP2B6 variation does not affect hepatic nicotine metabolism, mediated primarily by CYP2A6, but may alter nicotine metabolism within the brain. A mechanism-based (suicide) inhibitor selective for CYP2B, C8-xanthate (C8X), was used to investigate the role of brain CYP2B-mediated nicotine metabolism in the acquisition of nicotine self-administration (NSA). C8X, via intracerebroventricular injections (ICV), increased the percentage of rats that acquired NSA at a dose of 7.5 microg/kg compared to vehicle and increased breakpoints under a progressive ratio schedule at 7.5, 15, and 30 microg/kg doses. To investigate whether C8X treatment also influences relapse we examined its effect after extinction and reinstatement. Rats were trained with 7.5 microg/kg and underwent extinction with no cues. There was no difference between C8X and vehicle ICV treatment during extinction. Nicotine-induced reinstatement was tested at 0, 15, 30, 60, and 150 microg/kg through intravenous (i.v.) and subcutaneous (s.c.) routes. For i.v. nicotine there was no reinstatement after vehicle ICV; responding was not different at all nicotine doses compared to saline. Reinstatement after C8X ICV treatment trended towards significance (p = 0.07) at 60 microg/kg i.v. nicotine compared to saline, where rats responded higher after nicotine pre-treatment. Responding at this nicotine dose was significantly different (p < 0.05) for ICV C8X compared to ICV vehicle. For s.c. nicotine reinstatement was established at 60 and 150 microg/kg nicotine for both ICV C8X and ICV vehicle treated rats. Responding was significantly higher for nicotine compared to saline (p > 0.05); however there was no difference between ICV groups. These results, in addition to the previous findings, suggest that reducing brain CYP2B activity can influence nicotine’s reinforcing effects and may play a role in increased acquisition and reduced cessation in slow CYP2B6 metabolizers.

**PA13-3**

**ACTIVATION OF ALPHA6BETA2 NICOTINIC ACETYLCHOLINE RECEPTORS IS SUFFICIENT FOR NICOTINE REWARD-LIKE BEHAVIOR IN MICE**

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An accumulation of evidence suggests that high affinity α6β2 subunit containing nicotinic acetylcholine receptors (α6β2 *nACHRs; *denotes other subunits
may be present) on ventral terminal area (VTA) dopamine (DA) neurons are crucial for nicotine-stimulated dopamine release and for nicotine reinforcement and reward. Nicotine can activate or desensitize (inactive) αβ2* nAChRs. To determine whether αβ2* nAChR activation or desensitization is required for nicotine reward, we studied transgenic mice expressing αβ2* subunits that are "hypersensitive" to nicotine (αβ L9'S). Using patch clamp electrophysiology, we demonstrate that αβ2* nAChRs in VTA of αβ L9'S mice are 100-fold more sensitive to puff-applied agonist. We find that administration of low doses (0.01 mg/kg and 0.03 mg/kg i.p.) of nicotine that are subthreshold for nicotine place conditioning in non-transgenic mice are sufficient to condition a place preference in αβ L9'S mice. In patch clamp experiments, bath application of a subthreshold concentration of nicotine (100 nM) is sufficient to depolarize αβ L9'S VTA neurons, but not neurons from non-transgenic mice. Using fast scan cyclic voltammetry, we demonstrate that burst-evoked DA release in NAc shell is greater in αβ L9'S mice, supporting the hypothesis that these effects were due to activation of αβ2* nAChRs. Lastly, mice that received NAc shell-infusion of the αβ2* nAChR antagonist did not show elevated nicotine place conditioning, but rather showed a decrease in nicotine place preference; i.e. αβ2* nAChR antagonist blocked nicotine effects in this task. Together, these results suggest that activation rather than desensitization of αβ2* nAChRs supports nicotine reward.

This work was supported in part by NIH grants MH53631 and GM48677 to JMM, DA 17279 and DA19735 to HAL, DA030396 to RMD, and DA031289 to DHB.

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PA13-4
NIC7-001, A NOVEL ANTI-NICOTINE VACCINE, SHOWS SIGNIFICANTLY SUPERIOR FUNCTION IN NON-HUMAN PRIMATES (NHP) COMPARED TO A CYT002-NICQB MIMETIC

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Background: Anti-nicotine vaccines induce antibodies (Ab) that reduce nicotine to brain. Ph2 testing of CYT002-NicQb (NicQb, Cytos) showed the top 1/3 of Ab responders had better 1yr quit rates than placebo. Ab function depends on both quantity (titer) and quality (avidity) and poor overall efficacy of NicQb, despite induction of high Ab titers, may be due to low avidity Ab. NIC7-001, which was developed using functional readouts, was compared to a NicQB mimetic in NHP. Methods: NIC7-001 is comprised of a nicotine-like hapten conjugated to CRM197 (~15 hapten/CRM) as antigen (NIC7), and aluminum hydroxide and CpG as adjuvants. Prior results showed both antigen and CpG contributed to Ab titer and avidity. Cynomolgus monkeys were immunized 4 to 6 times with NIC7 (30, 100, 300 or 500 µg), aluminum hydroxide (125, 250 or 500 µg Al3+) and CpG (0, 250, 500 or 1000 µg) on different schedules. One group received a mimetic of NicQb (100 µg conjugate (~600 nicotine-like hapten per E. coli Qβ phage virus-like particle) with 500 µg Al3+). Plasma was tested for Ab titre (ELISA), avidity (IC50 by competitive ELISA) and function (nicotine-binding capacity by equilibrium dialysis assay and LC/MS/MS). After the last dose, animals received 3H-nicotine (IV) and nicotine concentrations in brain and plasma were determined. Results: For NIC7-001, Ab titers were highest with the greatest antigen dose but avidity and function were best with the lowest dose, whereas highest CpG dose gave best titer, avidity and function. Boosts enhanced titer, avidity and function. In contrast, the NicQb mimetic induced Ab of very high titer but relatively low avidity and function; NicQb booster doses did not enhance these further. Reduction of nicotine to the brain compared to non-immunized controls was significantly greater with NIC7-001 (81%) than the NicQb mimetic (7%; P<0.0001). Even the NIC7 vaccine without CpG had better function (33% reduction of nicotine to brain) despite having about 10-fold less Ab than the NicQb mimetic (P<0.01). Conclusions: The functional Ab response in NHP with NIC7-001 was significantly superior to that observed with a NicQb mimetic, largely due to higher Ab avidity.

Funded by Pfizer.

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GREAT EXPECTATIONS: EXPECTANCY AND SMOKING OUTCOMES

PA14-1
EXPLORING RISK PERCEPTIONS FOLLOWING LUNG SCREENING: A QUALITATIVE STUDY AMONG ACRN NATIONAL LUNG SCREENING TRIAL (NLST) PARTICIPANTS

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Background: The NLST reported a 20% reduction in lung cancer mortality among older current and former smokers, with a minimum history of 30 pack-years, screened with low-dose CT compared with chest x-ray. Previous work indicates that postscreening smoking behaviors and risk perceptions are relatively unchanged. We conducted a qualitative subsity to elucidate risk perceptions for lung cancer and smoking related diseases (SRD) and explore whether lung screening is a cue to behavior change. Methods: In-depth interviews were conducted using a semi-structured interview guide based on Health Belief Model and Self-Regulation Model constructs. A random sample of 35 (50% current smokers) participants from 4 study sites were interviewed following the one-year follow-up screen. Content analyses were conducted using NVivo 9.0. Results: Most participants endorsed high risk perceptions for lung cancer and SRDs but denied concern about risk as a motivator for seeking screening. Risk perceptions were mostly attributed to their heavy smoking history yet former smokers expressed a relatively optimistic bias of reduced risk. Lung cancer and SRDs were perceived as very serious, yet there was a disconnect in that participants endorsed low worry about these diseases. Current smokers had low confidence in their ability to quit and none reported quitting. However, many enacted other health behavior changes (e.g., improved physical activity) which were explained as compensatory behaviors. Conclusions: Following lung screening, high risk perceptions did not translate into current smokers quitting; former smokers' optimistic inclinations could make them vulnerable to relapse. Cognitive and emotional disconnects may deter engagement in smoking behavior change. Lung screening cessation and prevention interventions should explore emotional responses, risk beliefs, and quitting confidence.

This project was funded by the ACS (MRSG-005-05-CPPB), ACRIN/NLST Trial U01 CA079778 & U01 CA080098.

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PA14-2
SMOKING RISK PERCEPTIONS IN IRISH ADOLESCENTS WITH VARIED SMOKING EXPERIENCE

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Background: Health behaviour models suggest that perceived vulnerability to harm and the balance of perceived risks and benefits guide smoking decisions. Although there is substantial support for this model among adults, results in terms of how adolescents understand smoking risk are inconsistent. This study aimed to develop an understanding of how adolescent daily, weekly, experimental, ex-, and never-smokers perceive smoking risk. Method: 602 adolescents (145 daily, 35 weekly, 35 ex, 130 experimental, 257 never smokers) completed a smoking perceptions survey which included questions related to the perception of health and addiction risk, and the perceived general and immediate harm from smoking, avoidance of health-related thoughts, and 3 subscales from a domain specific measure of risk (DOSPERR) relating to social, recreational, and health and safety risk. Results: Daily smokers differed significantly to all other groups on general risk measures (p<.001 for each). They perceived higher levels of relative risk and were less optimistic about the risks, but they were significantly less likely to...
perceive general or immediate harm from smoking. They were less likely to avoid health risks than never (p<.001), experimental (p<.001), and ex-smokers (p<.05), whereas weekly smokers only differed significantly from never-smokers (p<.05). Weekly smokers also perceived less general harm from smoking than never (p<.001) and experimental (p<.01) smokers. No smoking status differences were seen in overall levels of domain specific risk-taking (DOSPERT) but significant differences are found for social risk between never and daily smokers (p<.05) and for health and safety risks between never- and ex- (p<.05), weekly (p<.05), and daily (p<.001) smokers. Discussion: These findings suggest that risk is an important factor in adolescent smoking decisions. They challenge the contention that adolescent smokers are not aware of the risks involved with smoking but despite this awareness, regular smokers seem more inclined to take health-related risks and are less concerned about immediate harm from smoking. Further examination of DOSPERT risk assessment in adolescents is recommended.

No funding.

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PA14-3
USE OF COUNSELING INCENTIVE FOR MEDICAID SMOKERS


Economic incentives have been shown to be effective in getting people to engage in preventive health behaviors, at least in the short term and with behaviors that are well defined. Smoking is still the behavior that has the greatest impact on morbidity and mortality in the U.S. Smoking rates are especially high among low income populations, which contributes to health disparities. California was funded by the Centers for Medicare and Medicaid through its Medicaid Incentives for the Prevention of Chronic Diseases initiative to examine the use of incentives among Medi-Cal (California’s Medicaid program) members who smoke. As part of a randomized trial testing different policies regarding the distribution of quitting aids and financial incentives, callers to the California Smokers’ Helpline who met eligibility criteria were randomly assigned to receive incentives for participating in telephone counseling or not. Incentives included a choice of gift cards to one of four retail stores. Subjects in the incentive condition received $20 for a first counseling session and $10 for each follow up session up to four. Preliminary results (N=691) indicate that the incentives were effective in increasing the rates of counseling (92% and 87% for the incentive and non-incentive conditions, respectively, p<.001). The implications and limitations of incentivizing participation in counseling by providing small financial incentives will be discussed. This study is supported by Centers for Medicare and Medicaid Services (CMS) grant #1B1CMS330882.

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PA14-4
DOES INCREASING ACCEPTANCE OF URGES BOOST QUIT RATES OF WEB-DELIVERED cessation INTERVENTIONS? RESULTS FROM A RANDOMIZED CONTROLLED TRIAL

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Background: Web-delivered cessation interventions, which annually reach over 4 million US smokers, have low quit rates (10%; Civljak et al., 2010). To boost their quit rates, interventions targeting specific theory-based processes hold great promise. Accordingly, we tested Acceptance and Commitment Therapy (ACT) in a randomized trial. The intervention targeted the core ACT process of “acceptance”—i.e., noticing and not acting on smoking cues (e.g., urges). The current study examines the extent to which this acceptance process mediates the influence of the ACT intervention on smoking cessation. Design: In a double-blind randomized controlled trial, 222 nationally-recruited participants were randomized to either ACT (n =111) or the NCI’s Smokefree.gov standard of care intervention (n =111). At baseline and three months post randomization, participants completed ACT theory-based mediator measures of acceptance of physical urges, emotions, and cognitions that cue smoking (all alphas >.90). The primary outcome was 30-day point prevalence quit rate at three months post randomization. We used the Sobel test for the mediation analysis (MacKinnon, 2008). The model is expressed as three regression equations that relate the main independent variable X (ACT intervention), the mediator M (change from baseline to three months post randomization), and the binary endpoint Y (30-day abstinence). Results: Over double the fraction of participants in the ACT arm quit smoking as compared to the control arm (23% vs. 10%; OR = 3.05; 95% CI = 1.01 to 9.32; p = .050). At the 3-month follow-up, ACT participants reported higher acceptance of physical urges (p = .001), emotions (p = .022), and cognitions (p = .083) that cue smoking. The mediation model showed that all three acceptance processes explained a very large amount of the effect of the ACT intervention on smoking cessation: 76.0% (acceptance of physical urges), 73.0% (acceptance of emotions), and 68.7% (acceptance of cognitions; all three p-values < .001). Conclusion: Increasing one’s willingness to notice and not act on smoking cues holds great promise in boosting the quit rates of web-delivered smoking cessation interventions.

Funding: Fred Hutchinson Cancer Research Center CCGS Grant Program (P30CA015704).

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TOBACCO MARKETING TO YOUTH

PA15-1
ENHANCING NATIONAL ESTIMATES OF YOUTH CIGAR USE: ADDING BRAND NAMES TO THE 2012 NATIONAL YOUTH TOBACCO SURVEY

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Among middle and high school students cigars are the most commonly used tobacco product after cigarettes. More than one in ten high school students report smoking a cigar in the past 30 days. Cigar smoking causes certain cancers and heart disease. Compared with cigarettes, cigar tobacco can have higher concentrations of nicotine and tobacco-specific nitrosamines. Cigars may be attractive to youth because, unlike cigarettes, they can be sold singly or in small packs and can contain characterizing flavors like cherry or chocolate. Further, federal tobacco excise taxes are now higher on manufactured cigarettes relative to certain cigar products that are similar in size and shape. Accurate monitoring of youth cigar use is imperative. Yet assessing cigar use is challenging given cigars comprise many lengths, widths and other characteristics. Youth may recognize the cigar brands they smoke, but be unaware the product is a cigar per se. Previous analysis of state- and county-level surveys estimated that the prevalence of cigar use as much as doubled once specific brand names were included. To better capture national youth cigar use the 2012 National Youth Tobacco Survey (NYTS) was modified to incorporate five popular cigar brand names (“Have you ever tried smoking a cigar, cigarillo, or little cigar, such as Black and Mids, Swisher Sweets, Dutch Masters, White Owl, or Phillies Blunts?”). We will present the first nationally representative estimates of lifetime and current cigar use among middle and high school students that includes specific cigar brand names. We will report on statistical analyses conducted to examine changes in cigar use between 2011 (no brand names) and 2012 stratified by age, sex, race/ethnicity and other tobacco use. Cigars are not yet regulated under the Family Smoking Prevention and Tobacco Control Act, although the Food and Drug Administration intends to
assert jurisdiction on these and other tobacco products. Monitoring youth cigar use will be enhanced by the brand name cigar questions introduced on NYTS 2012. Fundxing: Center for Tobacco Products, U.S. Food and Drug Administration.

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PA15-2 MONITORING THE BUZZ: USE OF SOCIAL MEDIA MONITORING TO CAPTURE LITTLE CIGAR/CIGARILLO-RELATED CONVERSATIONS

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BACKGROUND: Use of little cigars and cigarillos (LCCs) is becoming increasingly prevalent in the population, and given restrictions placed on cigarettes as part of the Family Smoking Prevention and Tobacco Control Act, further increases are expected. Despite this, little is known about how consumers perceive and talk about these products, particularly in the online environment where mistruths may be propagated and those at-risk inadvertently subjected to positive claims of the product. METHODS: Social media monitoring of LCC-related conversations occurring from August 1, 2011 through July 31, 2012 was conducted using Harris Research Lifestreaming®, a panel of approximately 50,000 who give Harris access to their Facebook and/or Twitter accounts. Text analysis was then conducted using Clarabridge to categorize the topics discussed, which was then linked to demographic and tobacco use patterns of Research Lifestreaming panelists. RESULTS: In one year, there were 327 Facebook posts, 62,244 comments, and 84 tweets about LCCs by 356 panelists, most of which were positive. Over half (60%) of those conversations were related to ‘blunts’, or a cigar filled with marijuana. Respondents engaging in blunt conversations were more likely to be Hispanic, non-Hispanic black and have a high school education or less. Respondents engaging in non-blunt LCC conversations were more likely to be younger, female and single. Topics discussed within the ‘blunt’ and non-blunt category also differed by demographics, geographic location and the tobacco use patterns of panelists. DISCUSSION: Conversations taking place about LCCs were overwhelmingly positive and many centered around their use for ‘blunts’. Public health messages should consider the high use of these products for purposes of smoking marijuana and work to counter this positive flow of information arising out of online conversations through targeted messaging. No funding.

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PA15-3 POSTED CIGARETTE PRICES IN RETAIL OUTLETS AND PROXIMITY OF HIGH SCHOOLS AND NEIGHBORHOODS WITH YOUTH

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Background: Cigarette price discounts that lower prices consumers pay is the largest category of tobacco industry promotional spending. Younger people are a highly price-sensitive population. It is currently unknown whether advertised cigarette prices are lower near high schools or in areas with more adolescents. High school students are more capable of purchasing tobacco products compared to younger students and may experiment with smoking if given access to affordable cigarettes. Objective: To examine whether displayed cigarette prices were lower in retail outlets with more high schools and a higher proportion of adolescents. Methods: A multimodal, real time surveillance system was used to survey the lowest advertised price of cigarettes in 750 licensed tobacco retail outlets in Washington D.C., and joined with data at the block group level using ArcGIS. Outcome variables included lowest displayed exterior price, lowest displayed price inside the store, and the posted price of a cigarette brand popular among youth (Newport). Independent variables included number of high schools within a radius of 0.5 miles, store type, population density and proportion of adolescents in the outlet block group.

Results: Advertised cigarettes prices on store exteriors were significantly lower in outlets with a greater number of high schools within a 0.5 mile radius (p<0.01), controlling for neighborhood demographics and store type. For adjusted interior prices, the number of nearby high schools was not a significant predictor of posted price, but neighborhoods with a greater proportion of adolescents had significantly lower posted prices (p<0.001). For Newport menthol cigarettes, posted prices were significantly lower in neighborhoods with a greater proportion of adolescents (p<0.001). Conclusions: Lower cigarette prices have been associated with higher smoking prevalence and frequency in youth. Given that adolescence is a prime time for experimentation and initiation, prominently displayed advertisements for low-priced cigarettes near schools and in areas with large adolescent populations may increase smoking uptake among a price-sensitive population.

This project was supported by a contract with the District of Columbia Department of Health and Legacy Foundation.

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PA15-4 EXPLORING THE ASSOCIATIONS BETWEEN ATTITUDES TOWARDS PLAIN PACKAGING AND SMOKING SUSCEPTIBILITY AMONG YOUTH

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Background: It has been suggested that the introduction of tobacco pack plain packaging is an effective approach to restrict marketing of tobacco products and will reduce appeal of these products to young people thus reducing smoking prevalence. This study explores predictors of attitudes towards plain packs by investigating associations between attitudes towards packaging and susceptibility to smoking. Methods: Data on smoking susceptibility, smoking status and attitudes towards cigarette packs were obtained from a cross-sectional study carried out in eight schools in England including 4300 students. Students were categorized as ever smokers, susceptible and non-susceptible never smokers, and differences in attitudes towards packaging between these groups were investigated using Chi-square tests. Results: Over 75% of respondents thought that branded packs were most appealing; however a larger proportion of non-susceptible never smokers compared to ever smokers reported no difference in the appeal of packs. A significantly larger proportion of smokers and susceptible never smokers viewed branded packs as less harmful compared to non-susceptible never-smokers, although the majority of all students reported no difference. Half of ever smokers, and more than a third of susceptible non-smokers preferred to be seen with branded packs; however, this was true for only 14% of non-susceptible never-smokers. Half of ever smokers preferred to use branded packs to try smoking, while only 17% of non-susceptible never smokers would choose branded packs and most commonly reported that they would not use any of the packs. About 20% of students agreed that the introduction of plain packs (either green or white) would reduce smoking prevalence. Conclusions: The results suggest that, compared to non-susceptible never smokers, ever smokers and susceptible never smokers are more likely to view branded packs as more appealing, less harmful and would prefer to be seen with branded packs and try out smoking using these packs. As plain packaging is viewed as significantly less attractive it is likely that introduction of plain packs would help to prevent the uptake of smoking.

This study was originally supported by Cancer Research UK, Nottingham City PCT and the UK Centre for Tobacco Control Studies, with core funding from the British Heart Foundation, Cancer Research UK, Economic and Social Research Council, Medical Research Council, and the Department of Health under the auspices of the UK Clinical Research Collaboration.

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TOBACCO PRODUCTS

PA16-1 REDUCED NICOTINE CONTENT CIGARETTES: SMOKING BEHAVIOUR, BIOMARKERS OF EXPOSURE, AND PRODUCT PERCEPTIONS

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At present, all conventional cigarette brands contain ample levels of nicotine to promote and sustain addiction. Previous research demonstrates that smokers increase the intensity of their smoking behaviour to compensate for modest differences in the level of nicotine present in cigarette smoke. However, it remains unclear whether smokers will engage in similar “compensatory” behaviour in response to substantial reductions in nicotine content that go beyond the negligible differences present among conventional cigarette brands. In the current study, 72 adult smokers (18-65 years old, min 5 cigarettes per day, no intention to quit, no NRT or other tobacco product use) completed an open-label trial of reduced nicotine content cigarettes. Participants completed a 7-day baseline period during which they smoke their usual cigarette brand. Participants then smoked Quest cigarette brands with 3 levels of reduced nicotine content: 6mg, 3mg, and 0.05mg of nicotine. Each of the brands was smoked for a 7-day period, for a total of 3 consecutive weeks. Validated measures of nicotine dependence and withdrawal, patterns of smoking behaviour, and biomarkers of exposure were collected during each 7-day period. Biomarkers included urinary levels of cotinine (the main metabolite of nicotine), 1-hydroxypyrene, and exhaled-breath levels of carbon monoxide. The findings indicate no significant difference in urinary cotinine levels between usual brand smoking (~12mg of nicotine per cigarette) and use of Quest 1 cigarettes (8.8mg of nicotine per cigarette). Significant reductions in cotinine were observed with Quest 2 (8.4mg) and Quest 3 (6.0mg), compared to usual brand smoking. The findings provide little evidence of compensatory smoking, with no increases in exhaled-breath carbon monoxide levels or levels of 1-hydroxypyrene associated with reduced nicotine content cigarettes. Participants provided generally lower subjective ratings of the Quest cigarettes compared to their usual brand. No significant changes were observed for smoking urges or measures of nicotine dependence.

This study was funded by Health Canada Tobacco Control Program. Additional support was provided by a Canadian Institutes of Health Research New Investigator Award (Hammond), and a Canadian Cancer Society Research Institute Junior Investigator Award (Hammond).

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PA16-2 NEW AND EMERGING TOBACCO PRODUCTS: GAINING INSIGHTS FROM NIELSEN STORE SCANNER DATA

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Tobacco control environment has changed rapidly in the past few years. The federal taxes on tobacco products were increased in 2009. The Family Smoking Prevention and Tobacco Control Act of 2009 gave FDA authority to regulate tobacco product production, distribution and marketing. In addition, many state and local governments have adopted or strengthened smoking free policies and other tobacco control policies. Tobacco industry has responded by focusing on, among other things, product design and development. This study examines the sales trend of new and emerging tobacco products using the quarterly market level Nielsen store scanner data between 2010 and 2011. The Nielsen store scanner data contain detailed information on retail prices, sales, and price-related promotions for all tobacco products. Data were directly gathered from participating retailers’ tapes in 52 U.S. markets defined by Nielsen. The markets consist of groups of counties centered on a major city (similar to metropolitan statistical areas). Participating retailers include mass stores, drug stores, grocery stores, and convenience stores. Our analyses show a dramatic increase in electronic cigarettes sales between 2010 and 2011. Sales volume of e-cig kit increased 9 times from about half a million pieces in 2010 to more than 4.5 million pieces in 2011. E-cig refill cartridge increased more than 14 times during the same time period (from about half a million pieces to more than 7 million pieces). Sales volume of dissolvable lozenges/tablets has increased 20% from less than 50 million pieces to more than 60 million pieces. The sales volume of dissolvable strips and sticks were lower compared to that of lozenges/tablets, less than half a million pieces annually and their sales volume has been declining since the first quarter of 2010. Dissolvable orbs sales have also declined between 2010 and 2011, from approximately 13,000 ounces to less than 4,000 ounces. Snus sales have declined steadily since early 2010. Our results revealed a rapidly changing landscape of new and emerging tobacco products and have important implications on government regulations targeting these products.

Support for this project was provided by a National Cancer Institute-funded grant (Grant #1U01CA154249), titled “Monitoring and Assessing the Impact of Tax and Price Policies on U.S. Tobacco Use.” The opinions expressed here are those of the authors, and do not necessarily reflect those of the sponsors. None of the funding agencies played any role in study design, in the collection, analysis and interpretation of data, in the writing of the report; and in the decision to submit the paper for the conference.

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PA16-3 IMPACT OF REDUCED IGNITION PROPENSITY CIGARETTE REGULATION ON CONSUMER ACCEPTABILITY AND SMOKING CESSATION: EVIDENCE FROM 6 WAVES (2004-11) OF THE ITC FOUR COUNTRY SURVEY

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Introduction: Although on the decline, smoking-related fires remain a leading cause of fire death worldwide. Since 2004, lawmakers in a number of jurisdictions have enacted legislation requiring manufacturers to comply with reduced ignition propensity (RIP) standards for cigarettes. The tobacco industry historically opposed such legislation, arguing that RIP cigarettes would increase toxicity and reduced consumer appeal that would result in changes in smoking behaviors, including quitting. Methods: Participants for this research include 12,426 current and former smokers from waves 3 through 8 of the International Tobacco Control (ITC) Four Country Survey conducted longitudinally from 2004 through 2011 in the United States, United Kingdom, Australia, and Canada. We employed generalized estimating equations to assess how implementation of RIP safety regulations influenced smokers’ perceptions of cigarette self-extinguishment and the impact on consumer smoking behavior including number of cigarettes smoked per day, intention to quit smoking, and making a quit attempt over 6 waves of data. Results: Results show that respondents in places where RIP safety standards are in place had greater odds of noticing cigarette self-extinguishment, and of having an intention to quit smoking; however, they did not have increased odds of attempting to quit smoking. Conclusions: These longitudinal analyses provide no support for the contention that RIP standards reduce consumer acceptability. Implementation of RIP standards in all jurisdictions may substantially reduce the number of cigarette-related fire deaths and damage.

The ITC Four Country Project was supported by the U.S. National Cancer Institute (RO1 CA100362 and P01 CA138389), Canadian Institutes of Health Research (79551 and 115016), National Health and Medical Research Council of Australia (450110, APP100592), Cancer Research UK (C312/311943), Ontario Institute for Cancer Research (Senior Investigator Award to GTF), and Canadian Cancer Society Research Institute (Prevention Scientist Award to GTF).

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PA16-4
EFFECTIVENESS OF THE MASSACHUSETTS FIRE SAFE CIGARETTE LEGISLATION IN REDUCING RESIDENTIAL FIRE INCIDENCE

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Background: Since June 2004, all 50 U.S. states, Canada, Australia, Finland, and the European Union implemented reduced ignition propensity (RIP) cigarette requirements based on the standard developed by the U.S. National Institute of Standards and Technology. Massachusetts (MA) implemented Fire Safe Cigarette Legislation (FSCL) in January, 2008. Technical, economic, and commercial feasibility of the standard has been demonstrated. No overall change in toxicology, consumer response, smoking, smoking topography, or fire-risk behaviors have been observed in prior research. Effects on fire incidence, morbidity, and mortality reduction have yet to be evaluated. Methods: Fire surveillance data for years 2004-2010 were analyzed from MA Fire Incidence Reporting System data, restricting to unintentional residential fires. Pre-post FSCL change in the proportion of cigarette-caused fires was analyzed, excluding potential confounding by factors influencing general fire incidence trend. Covariates were time, month, weekday/weekend, hour (day/night), property use, area of fire origin, first item ignited, and human factors. Random effects of county and county-level smoking prevalence from MA Behavioral Risk Factor Surveillance System were included in mixed effects multivariable logistic regression analyses. An interrupted time series model was used to assess whether or not FSCL implementation resulted in a change in outcome upon implementation or over time. Results: The proportion of unintentional residential fires caused by cigarette as the heat source decreased by 31% (OR 0.69, 95% CI 0.56, 0.85) following FSCL implementation. This change did not occur gradually, but soon upon implementation, as indicated by the non-significant FSCL-time interaction term (p=0.430). County as a random effect was statistically significant, variance 0.045, SE 0.024; while county smoking prevalence was not (likelihood ratio test, p = 0.619). Conclusions: The FSCL has substantially reduced the likelihood of cigarette-caused residential fires, but they remain an important problem. Further research will examine effectiveness of the standard on reducing fire-related morbidity and mortality.

Funding: Scholarship, Harvard School of Public Health.

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PA17-1
THE CATEGORIZATION OF CHANGES TO CRYSTALLIZED SONG INDUCED BY NICOTINE

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The zebra finch (Taeniopygia guttata) as an animal model has long been utilized to study cognitive processes using the natural occurring song pattern as a parameter for synaptic plasticity. The song pattern of the male zebra finch crystallizes 90-120 days after hatching, and remains constant for the entirety of the animal’s life. The presence of nicotinic acetylcholine receptors was recently demonstrated in two song nuclei that are involved in learning and memory of vocalizations and thus implies a role for these receptors in the vocalization process. Our laboratory has shown that a 7-day treatment (2x/day) of nicotine has a qualitative effect on the crystallized song of adult male zebra finches. This effect was mainly on intersyllable duration or ISD (the spaces occurring during vocalizations and thus implies a role for these receptors in the vocalization process. The goal of this study was two-fold: to define the initiation period of the observed temporal change and to investigate the amount of time necessary to regain the original quality of the song. Sixteen mature (>120 days old) male birds were selected at random, and housed individually in recording cages to monitor song production. After baseline recording (7 days) and saline injections (0.03 ml/10 g BW, 7 days, 2x/day) were given, nicotine (n=8, 0.18 mg/kg, s.c.) or saline (n=8) was administered for 7 days, 2x/day. After the cessation of the treatment, the animals were allowed to remain in the recording cages for a two month period to observe their behavior. Songs were recorded in real time, before being analyzed using Song Analysis Pro. Our results show that the observed changes in ISD appear the day after nicotine administration was discontinued, and did not return to baseline during the entirety of our recording period (two months). Age matching controls did not show this effect. These results indicate that the long term changes in temporal features can possibly be attributed to a change in synaptic plasticity. We hypothesize this change is due to the presence of alpha-7 nicotinic acetylcholine receptors, which are found in the song nucleus known as the HVC (proper name).

This work was funded by the James and Esther King Biomedical Research 06-NIR02 (SLTC) and the Addiction Research Institute (ARI, Inc., Bear, DE) travel grant (WMP)

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PA17-2
NICOTINE PATCH FOR SMOKING CESSION AMONG PREGNANT SMOKERS: A RANDOMIZED, PLACEBO CONTROLLED, MULTICENTER STUDY (STUDY OF NICOTINE PATCH IN PREGNANCY: SNIPP)

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Background: Smoking during pregnancy is one of the main causes of low birth weight and disorders during pregnancy involving the mother, the fetus/newborn or both. Nicotine replacement therapies (NRT) can be prescribed to pregnant smokers for smoking cessation in France. Previous studies did not demonstrate evident efficacy of NRT, in particular nicotine patch (NP) in this population. Aims: To assess the efficacy of NP in pregnant smokers. Design: Randomized, double blind, placebo controlled trial. Placebo or active NP was administered from the beginning of the 2nd trimester up to delivery and at the discretion of the mother up to 2 months post-delivery. The NP dose was adapted according to before quit date saliva cotinine targeting a 100% substitution. NP daily doses could vary between 10 and 30 mg/16h. Women attended 7 visits from randomization to delivery. Main outcome measures: 1. birth weight; 2. continuous, complete smoking abstinence (expired air CO ≤8 ppm) from the first patch administration until delivery. Secondary outcome measures: serious adverse events, adverse effects, point prevalence abstinence, birth characteristics, craving for smoking, ultrasound results, treatment compliance. Results: At each study year, the independent Drug Safety Monitoring Board approved the continuation of the study. 480 pregnant smokers were screened, 477 included, 203 were randomized to receive treatment A and 200 to receive treatment B. The mean age at randomization was 29.3 (SD=5.9) and 29.3 (SD=5.8) years; the gestational age at randomization was 17.4 (3.6) and 17.2 (3.6) weeks; the mean number of cigarettes/day at randomization was 12.4 (6.3) and 12.2 (5.8) and the expired air CO 11.6 (6.5) and 11.8 (6.8) ppm, respectively. There was no difference in previous number of pregnancies, previous fetal hypotrophy or maternal disorders during the current pregnancy before randomization. At the time of the abstract submission not all participants gave birth, the last delivery is scheduled for November 2012. The double blinded data analysis is ongoing and will be terminated by the end of February 2013, thus, available for presentation in March 2013.

Funding: Ministry of Health, France, ClinicalTrials.gov Identifier: NCT00507975.

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PA17-3
IT IS BETTER TO BE A FAT EX-SMOKER THAN A THIN SMOKER: FINDINGS FROM THE 1997-2004 NATIONAL HEALTH INTERVIEW SURVEY–NATIONAL DEATH INDEX LINKAGE STUDY

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Context: Smokers generally weigh less than non-smokers and smoking cessation is associated with considerable weight gain. There are no studies that examine mortality differentials between normal-weight smokers and overweight/obese ex-smokers. Aim: To compare the risk of all-cause mortality and mortality from all cancers combined, lung cancer, respiratory diseases, cardiovascular diseases, and diabetes mellitus between normal-weight smokers and overweight/obese ex-smokers. Design and setting: We used data from 1997-2004 National Health Interview Survey (with response rates ranging from 70% to 80%) which were linked to records in the National Death Index. Mortality follow-up was through Dec 31, 2006. We limited the sample to normal-weight smokers and overweight ex-smokers 25 years of age and older (n = 54,139). Main outcome measures: The outcomes were all-cause mortality, and mortality from all cancers combined, lung cancer, respiratory diseases/COPD, and diabetes. Hazard ratios (HR) from Cox regression were computed to represent mortality effect. Results: In both women and men, normal-weight smokers, relative to overweight/obese ex-smokers, had a higher risk of all-cause mortality (in women, HR: 1.60, 95% CI: 1.44-1.78, and in men HR: 2.13, 95% CI: 1.93-2.36), all cancers combined, lung cancer, and respiratory diseases. There was no difference in mortality risk from diabetes mellitus between normal-weight smokers and overweight/obese ex-smokers. Conclusion: Overall, mortality risk is smaller in overweight/obese ex-smokers than normal-weight smokers. Smoking cessation interventions can tailor messages that highlight the greater reduction in mortality associated with quitting, compared to potential weight gain.

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PA17-4
ELECTRONIC CIGARETTE MARKETING: A GLOBAL TOBACCO CONTROL CHALLENGE

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Background: Electronic cigarettes (e-cigarettes) are battery-powered nicotine delivery products advertised widely on the internet, and increasingly, in retail stores. The products are not evaluated by any regulatory authority before going to market and their availability and promotional marketing are currently unregulated in the U.S., though other countries have partially or completely restricted their sale and use (e.g., Brazil). Methods: This presentation will include examples of marketing from several countries, information about the regulatory status of e-cigarettes and selected results from a content analysis of the marketing on 55 e-cigarette retail websites. Results: The results of our content analysis indicated that most prevalent advertising appeals focused on health benefits, cessation-related benefits, use of the product to circumvent smoke-free policies and reduction of secondhand smoke exposure. Sites contained imagery of doctors and celebrities that imply endorsement of the product and videos or sponsorships that overtly promote the product, as well as testimonials, branded social networking sites, and programs recruiting consumers to become sellers of the products. Products came in various nicotine strengths that differed widely in corresponding nicotine content (e.g., products marked “high” corresponded with a range of nicotine content from 6-24mg). Products were offered in various flavors; most commonly tobacco, mint, candy, fruit and coffee flavors. In many countries, advertising techniques also include television and radio commercials, newspaper advertisement, point-of-sale displays and direct email marketing. Conclusions: E-cigarette marketing with unsubstantiated health, cessation and secondhand smoke exposure claims could result in negative population health effects if they deter or undermine cessation or encourage uptake by youth. Product content, labeling and safety should be evaluated and assured by a government regulatory authority. Consumer perceptions of e-cigarette marketing should be a required component of regulation development in order to determine potential public health impact of the products. Supported by NIH grant R25T: CA 113710.

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PA18-1
CIGARETTE PRICE BREAKPOINT: THE PRICE AT WHICH SMOKERS SAY THEY WOULD QUIT

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BACKGROUND In 2011-12, 17% of New Zealand adults age 15 and over smoked daily. Government bans tobacco promotions and indoor smoking in workplaces and hospitality venues, supports a &ldquo;smokefree nation&rdquo; goal by 2025, and is increasing tobacco excise 10% annually to 2016 when 20 factory-made (FM) cigarettes will likely cost $&gt;$20. METHODS In 2012, 343 smokers age 18 and over who purchased their own cigarettes were recruited on worksites and by newspaper publicity, interviewed face to face in four cities and rewarded with a voucher for $15 ($NZ3, 1 NZ$= 0.85 USD) and a chance to win an electronic tablet. Smokers supplied demographics, addiction scores and estimated future smoking consumption against 64 prices from zero to $5 per cigarette, ie $100/ pack of 20 FM, all in 2012$. RESULTS Cigarette purchase task (CPT) method (MacKillop 2012) generated demand curves that were not significantly different for FM and roll-your-own (RYO) smokers, (FM median breakpoint $24; RYO $26; all, $25) allowing pooled analysis. Mean values: 67% smoked FM, paying $0.72; 33% smoked RYO, at $0.38, each containing 0.4g tobacco. Cigarettes per day (cpd) overall were 14.9, cost $0.58. At $14 for 20, 2% of current smokers would quit; at $19, 16%; at $20, 25%; at $25, 50% would quit (the breakpoint); at $28, 60%; at $30, 65%; at $35, 72%; at $40, 75%; at $50, 80%. Breakpoint price intention was unrelated to age, gender, ethnicity, income, education, or addiction scores. FM smokers estimated they would reduce cpd most between $19 and $20 per packet, by 1.7 cpd. CONCLUSIONS Greatly increased quit attempts are expected as price increases from $19 to $25 a packet. Planned excise increases if continued past 2016 would by 2018 lift price to the $25 breakpoint, at which price &lt;10% of adults intend to smoke; and by 2021 would lift price to $35, at which price &lt;5% of adults intend to smoke. Further surveys are planned to track intentions against future changes made. Given widespread intention to quit if price increases, a range of policies and products is needed to assist smokers to make their intentions come true.

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PA18-2

CHRNAS RS2036527 ASSOCIATION WITH SMOKING QUANTITY IN FIRST GENOME-WIDE META-ANALYSES OF SMOKING BEHAVIORS IN AFRICAN AMERICANS

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The identification and exploration of genetic loci that influence smoking behaviors have been conducted primarily in populations of European ancestry. Here we report results of the first genome-wide association study meta-analysis of smoking behavior in African Americans in the Study of Tobacco in Minority Populations (STOMP) Genetics Consortium (n = 32 389). We identified one non-coding SNP (rs2036527[A]) on chromosome 15q25.1 associated with smoking quantity (cigarettes per day) that exceeded genome-wide significance (β = 0.040, standard error (s.e.) = 0.007, P = 1.84 x 10^-8). This variant is present in the 5’prime; distal enhancer region of the CHRNAS gene and defines the primary index signal reported in studies of European ancestry. No other SNP reached genome-wide significance for smoking initiation (ever vs. never smoking), age of smoking initiation, or smoking cessation (former smokers). Three other SNPs in the current smoking exposure and informative associations that approached genome-wide significance included three modestly correlated variants, at 15q25.1 within PSM4A, CHRNAS and CHRNA3 for smoking quantity, which are associated with a second signal previously reported in studies in European ancestry populations, and a signal represented by three SNPs in the 3’end region as an important susceptibility locus for smoking quantity in men and women of African ancestry.

The WH program is funded by the National Heart, Lung, and Blood Institute, National Institutes of Health, U.S. Department of Health and Human Services through contracts N01WH22110, 24152, 32100-2, 32105-6, 32108-9, 32111-13, 32115, 32118-32119, 32122, 42107-26, 42129-32, and 44221. Personal funding is supported to S.P. David from National Institute on Drug Abuse grants DA-06731 and DA-017441 and National Institute of General Medical Sciences grant GM-061374.

A.W. Bergen is supported by DA-020830. Note: 46 other institutions received additional funding for the work contributing to STOMP are too numerous to report here but are available at: http://www.nature.com/jt/pjournal/v2/n5/full/tp201214a.html.

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PA18-3

COMPLEMENTING CURRENT NHS STOP SMOKING SERVICE TREATMENT FOR SMOKE WITH BEHAVIOURAL REPLACEMENT: THE ROLE OF DE-NICOTINISED CIGARETTES

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Background: Standard smoking cessation treatments typically combine pharmacotherapy and behavioural support (BS). These treatments normally do not address the sensory and behavioural aspects of smoking. Taste, smell, and handling of cigarettes may play a role in the maintenance of smoking behaviour and replacing such sensations temporarily after people stop smoking their normal cigarettes may have a potential to enhance treatment efficacy. De-nicotinised cigarettes (DNCs) have a very low content of nicotine, which have negligible or no central effect, but provide sensory and behavioural stimuli very similar to conventional cigarettes. There are some data to show that DNCs can reduce tobacco withdrawal symptoms (TWS) and increase cessation rates. We hypothesised that DNCs could complement standard treatment (ST) provided by the NHS Stop Smoking Services by lowering urges to smoke in the first week of abstinence and increasing short-term quit rates. Methods: 200 smokers aged 18 or over, received 9 weekly BS sessions and pharmacotherapy (100 used varenicline and 100 used NRT). They were randomised on the TQD to receive 280 DNCs to use ad lib over 2 weeks, or to ST alone. Participants rated their urges to smoke and TWS on the Mood & Physical Symptoms Scale, reported smoking status and provided a CO reading at baseline and weekly for 6 weeks post TQD and then again at 12 weeks. We compared urges to smoke in the first week of abstinence and cessation rates at 4 and 12 weeks post-TQD. Results: Smokers were, on average, 46 years of age, and smoked 19 cigarettes per day. 56% were men. Time spent with urges to smoke (2.61 vs. 2.96, p=0.03), but not strength of urges (2.85 vs. 3.10, p=0.20) in the first week of abstinence were significantly lower in DNC users versus ST alone. There were no significant differences in composite withdrawal scores between groups (change from baseline 0.26 vs. 0.25, p=0.93). Abstinence data will also be reported. Conclusions: Adding BR to smoking cessation treatments has potential to assist smokers early in their quit attempt. DNCs provide one option for BR; the electronic cigarette is another that shows promise.

This study was funded by a grant from the Global Research Awards for Nicotine Dependence (GRAND). GRAND is a program of research grants funded by Pfizer to support clinical research into the treatment of tobacco and nicotine dependence.

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PA18-4

STOP-SMOKING MEDICATION USE IN CANADA AND THE IMPACT OF A PROVINCIAL SUBSIDIZATION POLICY

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BACKGROUND: Approximately half of smokers attempt to quit each year, but fewer than 10% succeed. Evidence suggests stop-smoking medications (SSMs) can increase quit success. In 2000, Quebec became the first province in Canada to offer reimbursement for SSMs under their provincial drug insurance plan. The objective of this study was to examine potential differences in rates of SSM use, quit success, and reasons cited for not using SSMs, comparing Quebec to other provinces where SSMs were not subsidized. METHODS: Outcomes (SSM use, quit success, reasons cited for SSM non-use) were examined using self-reported data from the 2004 to 2010 waves of the nationally representative Canadian Tobacco Use Monitoring Survey (n=144,496). Regression modelling tested differences between Quebec and other provinces, and over time. RESULTS: In 2010, 47% of current smokers and recent quitters who tried to quit or quit smoking in the past two years in Quebec used some form of SSM (nicotine gum/patch, Zyban/Wellbutrin/Champix), compared to 49% in other provinces. While use varied by year, the proportion of smokers using a SSM remained relatively stable between 2004 and 2010 in Quebec and other provinces. In 2010, of those who tried to quit in the last 12 months, 11% in Quebec were abstinent for at least one month at the time of the survey, compared to 9% in other provinces. This represents a decrease over time in Quebec (from 15% in 2004) and slight increase in other provinces (from 8% in 2004). In 2010, among current smokers and recent quitters who tried to quit or quit in the past two years, 10.4% of those in Quebec cited cost as a reason for not using SSMs to help quit, compared to 23.8% in other provinces. While there was some variability by year, the proportion of smokers and recent quitters citing cost as a reason for SSM non-use remained relatively stable over time in Quebec and other provinces. CONCLUSIONS: While subsidization of SSMs in Quebec appears to have reduced the cost barrier to use, fewer Quebec smokers used SSMs to assist quitting. The higher rate of quit success observed in Quebec may be related to subsidization but is not fully explained by increased access/use.

Financial support for this project was provided by the National Institutes of Health (grant number 1 P01 CA138-389-01), a Canadian Institutes of Health Research New Investigator Award (Hammond), the Canadian Cancer Society Research Institute Junior Investigator Award (Hammond), and the Propel Centre for Population Health Impact.

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**NEW INVESTIGATORS**

**NIPA-1**

TOBACCO DIRECT MAIL MARKETING AND SMOKING BEHAVIORS IN A CORHOT OF ADOLESCENTS AND YOUNG ADULTS: A PROSPECTIVE ANALYSIS

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Objective: Tobacco direct mail marketing is a known tobacco marketing strategy. While tobacco companies dramatically increased their spending on direct mail marketing after the Master Settlement Agreement of 1998, little is known about the characteristics of those who are the target of this strategy, or the influence of this strategy on smoking behaviors. Our analysis attempts to fill this knowledge gap. Methods: Adolescents and young adults (ages 17-22) from the U.S. upper Midwest region were surveyed between October 2006 and March 2007, and again between April and September 2007 (n=3546). At baseline, participants were asked if they had received direct mail materials from tobacco companies in the past six months. Smoking behaviors were assessed at baseline and follow-up. We assessed baseline characteristics associated with receiving tobacco direct mail materials at follow-up, and the associations between receipt of these materials at baseline and smoking behaviors at follow-up, adjusting for socio-demographics and baseline smoking behavior. Analyses were stratified by whether participants smoked in the past 30 days at baseline. Results: About 6% of non-smoking and 27% of current-smoking participants in our regional sample had received tobacco direct mail materials in the past six months (3% and 11% among <18 year-old non-smokers and current smokers, respectively). Older, less educated participants, and those who had received tobacco direct mail materials at baseline were more likely to have received these materials at follow-up (p<0.05). Receipt of these materials at baseline was associated with smoking >15 days (adjusted odds ratio=2.00, 95% confidence interval [CI]=1.26, 3.19) and smoking more packs of cigarettes in the past 30 days (adjust regression coefficient=1.69, 95% CI=0.04, 3.34) at follow-up among baseline current smokers. Conclusions: This analysis demonstrates prospective effect of tobacco direct mail marketing on escalating smoking in late adolescents and young adult smokers. It also shows that those <18 years old (particularly smokers) were exposed to tobacco direct mail marketing despite the regulations and industry claims.

This research was funded by the National Cancer Institute (R01 CA86191; Jean Forster, Principal Investigator).

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**NIPA-2**

THE IMPACT OF RECENT QUITTING HISTORY ON FUTURE CESSATION OUTCOMES: DATA FROM THE INTERNATIONAL TOBACCO CONTROL 4-COUNTRY COHORT STUDY

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Most smokers have a history of numerous unsuccessful quit attempts. It is therefore important to understand how this quitting history may impact future cessation outcomes. The present study used data from seven waves (2002 ÷ 2009) of the International Tobacco Control 4-country cohort study to prospectively examine the role of the recency, length and number of smokers past quit attempts at the baseline wave on their likelihood of making a quit attempt and achieving at least 6 months of sustained abstinence (SA6M) by the next wave, around 1 year later. Data was analysed using generalized estimating equations, which allowed for the combination of data from multiple wave pairs while controlling for correlations arising from multiple responses. This resulted in 30719 observations from 13817 individuals. The likelihood of a quit attempt at the outcome wave increased significantly and independently with the recency (especially within the last year) and number of past failed quit attempts at baseline. In contrast, among those participants who made quit attempts from baseline to follow-up, the likelihood of achieving SA6M was significantly reduced if they had made a failed quit attempt within the last year (e.g. OR: 0.55, 95% CI: 0.36 ÷ 0.85, for those with a failed quit attempt in the past month versus over a year ago). Having two or more failed attempts in the last year versus only one further reduced the likelihood of achieving SA6M (OR: 0.55, 95% CI: 0.37 ÷ 0.83 for those with 2 or more attempts whose last attempt was not their longest). These results persisted when controlling for levels of addiction, self-efficacy to quit, and use of stop smoking medications. These findings are interpreted from the perspective of a cessation fatigue model, where failed quit attempts within the past year, especially 2 or more, may deplete smokers’ capacity to remain abstinent unless given time for recovery. The ITC Four-Country Survey is supported by multiple grants including R01 CA 100362 and P50 CA111236 (Roswell Park Transdisciplinary Tobacco Use Research Center) and also in part from grant P01 CA138389 (Roswell Park Cancer Institute, Buffalo, New York), all funded by the National Cancer Institute of the United States, Robert Wood Johnson Foundation (045734), Canadian Institutes of Health Research (57897, 79551), National Health and Medical Research Council of Australia (265903, 450110, APP1005922), Cancer Research UK (C312/A3726), Canadian Tobacco Control Research Initiative (014578); Centre for Behavioural Research and Program Evaluation, National Cancer Institute of Canada/Canadian Cancer Society.

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**NIPA-3**

MEDICATION EXPECTANCIES PREDICT SMOKE CESSATION SUCCESS

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Smokers treatment expectancies may influence their choice of a particular medication as well as their direct medication experience. We examined smokers' treatment expectancies and attempting to maintain or improve their medication expectancies. Assessing smokers' positive baseline nicotine patch expectancies predicted longer latency to first cigarette among all participants but higher counseling expectancies were not associated with smoking cessation outcomes. For other expectancies, higher positive baseline naltrexone expectancies were more likely to perceive that they had received naltrexone (vs. placebo) at study completion than those with lower naltrexone expectancies. For other expectancies, higher positive baseline nicotine patch expectancies predicted longer latency to first cigarette among all participants while higher counseling expectancies were not associated with smoking cessation outcomes. The results suggest that smokers' positive expectancies for smoking medications, including the experimental treatment naltrexone and the nicotine patch, may contribute to better treatment response. Assessing smokers' expectancies and attempting to maintain or improve their medication expectancies may be an important component in the delivery, evaluation, and targeting of smoking cessation treatments.

Funding: This research was supported in part by National Institutes of Health grants R01-DA016834, K23-AA020000, ULI-RR024999, P30-CA145999.

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POS1-1
THE NUCLEUS TRACTUS SOLITARIUS AND NICOTINE REINFORCEMENT
Luis Tuesta and Paul J. Kenny*, The Scripps Research Institute

Nicotine, the major addictive component of tobacco smoke, exerts its actions in the brain through nicotinic acetylcholine receptors (nAChRs). The nAChRs in the ventral tegmental area (VTA) regulate the stimulatory effects of nicotine on mesocumbens dopamine transmission, and are hypothesized to play a key role in the reinforcing properties of nicotine. nAChRs are very densely expressed in the medial habenular (MHb) and interpeduncular nucleus (IPN). Recently, the MHb-IPN pathway was shown to play a key role in regulating nicotine intake in rats and mice. Another brain site that densely expresses nAChRs, but whose role in nicotine reinforcement is unknown, is the nucleus tractus solitarius (NTS). The NTS is enriched in catecholaminergic neurons that project to midbrain and limbic systems involved in drug reinforcement. We found that nicotine activates NTS neurons, as measured by increases in cFos immunoreactivity. Interestingly, nicotine preferentially activated the small population of NTS neurons that produce the neuromediated glucagon-like peptide-1 (GLP-1) rather than the more abundant catecholaminergic neurons. We found that null deletion of GLP-1 receptor agonist fibers in the IPN, a brain site known to densely express GLP-1 receptors. Infusion of the GLP-1 receptor agonist exendin-4 (EX-4) into the IPN profoundly decreased nicotine intake in rats. Conversely, intra-IPN infusion of the GLP-1 receptor agonist exendin-3 (EX-3) resulted in greater nicotine intake in rats. These findings identify a new brain circuit – IPN-projecting GLP-1 neurons – that regulate nicotine intake, and suggest that modulation of GLP1-receptor transmission may be a novel target for medications development for smoking cessation.

This work was supported by a grant from the National Institute on Drug Abuse (NIDA; DA020686).

CORRESPONDING AUTHOR: Noboru Hiroi, Ph.D., Professor, Albert Einstein (NIDA); DA020686. for medications development for smoking cessation.

POS1-2
PROTEIN KINASE C EPSILON FACILITATES RECOVERY FROM SAZETIDINE-A-INDUCED HYPOTHERMIA AND ALPHA4BETA2 NICOTINIC RECEPTOR DESSENSITIZATION
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The desensitization of nicotinic acetylcholine receptors (nAChRs) appears to be regulated by receptor phosphorylation, but the kinases that regulate desensitization are not known. Desensitization is implicated as the molecular mechanism mediating hypothermia observed with administration of sazetidine-A, a compound that primarily desensitizes α4β2 nAChRs without activating them. nAChR desensitization is also implicated in nicotine addiction. Thus, identifying factors that regulate nAChR desensitization may reveal important novel drug targets for the treatment of addiction. Here, we found that injection of 2.0 mg/kg of sazetidine-A or 2.0 mg/kg nicotine resulted in hypothermia that was much more severe and prolonged in knockout mice that lack PKCc than in wild-type littermates. To investigate whether this difference in recovery was related to an effect of PKCc on receptor desensitization, we examined recovery from receptor desensitization in HEK293 cells stably expressing human α4β2 nAChRs. As there are no drugs that can specifically inhibit PKCc, we have developed an ATP analog-specific mutant of PKCc (as-PKCc) that is specifically inhibited by 1-naphthyl-PP1 (1Na-PP1), and stably transfected this mutant into HEK293 cells.

The rate of recovery from acetylcholine-induced desensitization was significantly delayed when PKCc activity was inhibited (Control tau=6.53 min vs. 1Na-PP1 tau=14.66 min, P<0.0001). Our results indicate that PKCc-mediated phosphorylation facilitates recovery from hypothermia and recovery of α4β2 nAChRs from desensitization. Ongoing studies are identifying the PKCc substrates that mediate these effects.

This work was supported by grant AA017072 from NIAAA to ROM, a CIHR post-doctoral fellowship to AML, and by funds provided by the State of California for medical research on alcohol and substance abuse through UCSF to ROM.

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POS1-3
NICOTINIC ACETYLCHOLINE RECEPTORS CONTAINING THE ALPHA4 SUBUNIT MODULATE ALCOHOL REWARD
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Nicotine and alcohol are the two most co-abused drugs suggesting a common mechanism of action may underlie their rewarding properties. While nicotine increases dopaminergic (DAergic) neuron activity in the ventral tegmental area (VTA) by activating high affinity neuronal nicotinic acetylcholine receptors (nAChRs), the mechanism by which alcohol activates these neurons is unclear. To investigate this phenomenon, we measured the effects of alcohol on midbrain slice DAergic neurons in the presence of nAChR antagonists. Ethanol significantly increased the firing rate of VTA DAergic neurons. Pre-application of the non-specific nAChR antagonist, mecamylamine, blocked alcohol-activated induction of VTA DAergic neurons; whereas, the alpha7 nAChR antagonist, methyllycaconitine, had no effect indicating a role for high, but not low, affinity nAChRs in alcohol reward. Because the majority of high affinity nAChRs expressed in VTA DAergic neurons contain the alpha4 nAChR subunit, we measured alcohol-activated activation of DAergic neurons in two mouse models, an alpha4 KO mouse line and a knock-in line expressing a single point mutation (Leu9'Ala) in the alpha4 subunit rendering nAChRs containing this subunit more sensitive to agonist compared to wild-type (WT). At intoxicating concentrations, ethanol activation of DAergic neurons was significantly reduced in alpha4 KO mice compared to WT. In Leu9'Ala mice, DAergic neurons were activated by low ethanol concentrations that did not increase activity of WT neurons. Consistent with these results, rewarding doses of alcohol failed to condition a place preference in alpha4 KO mice, while a sub-rewarding alcohol dose was sufficient to condition a place preference in Leu9'Ala mice.

This study was supported by National Institute on Alcohol Abuse and Alcoholism award number R01AA017656 (ART) and F31AA019815 (LMH). The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institute on Alcohol Abuse and Alcoholism or the National Institutes of Health.

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POS1-4
CHRONIC NICOTINE INCREASES RESPONDING FOR ALCOHOL AND ALCOHOL-ASSOCIATED CONDITIONED REINFORCERS
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Nicotine increases the value of certain environmental stimuli; however, it is not known if nicotine increases the value of stimuli predictive of alcohol availability. The current study investigated whether nicotine would increase responding for alcohol itself and responding for visual stimuli paired with the availability of alcohol. Five Long-Evans rats were exposed to an acquisition condition in which a single lever press resulted in a 3s duration, 0.1 ml dipper presentation of a 20% (v/v) ethanol solution (prepared in water with 95% ethyl alcohol). Sessions lasted 14h (overnight) and occurred intermittently; following evidence that ethanol was maintaining responding the sessions were shortened to one hour. Subjects were then exposed to discrimination training; periods in which presses on one lever resulted in ethanol according to a VI 15s schedule alternated with periods of extinction, and different visual stimuli were correlated with each period (either...
a blinking or solid houselight). Upon evidence of successful discrimination, presses to a previously inactive, second lever produced the schedule-correlated stimuli. Presses that resulted in schedule-correlated stimuli were considered to be maintained by alcohol-associated conditioned reinforcement. Nicotine was then administered via subcutaneous injection acutely (vehicle, 0.03, 0.1, 0.3, and 0.56 mg/kg) and chronically at a dose of 0.3 mg/kg. Results indicated that chronic, but not acute, nicotine administration significantly increased responding both for alcohol and for alcohol-associated visual stimuli. In particular, chronic nicotine nearly doubled the total number of responses made to obtain alcohol-associated conditioned reinforcers. Nicotine may effect this increase either through an increase in the value of the stimuli themselves; or through an increase in the value of the alcohol reinforcer, which in turn increases the value of alcohol-predictive stimuli. A better understanding of how nicotine and alcohol interact behaviorally is crucial to combating the complex cycle of abuse and relapse. This work was supported by an internal grant from the University of Florida Department of Psychology.

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POS1-5

ACTIVATION OF THE CRF-CRF1 SYSTEM IN THE CENTRAL NUCLEUS OF THE AMYGDALA MEDIATES THE NEGATIVE AFFECT OF ABSTINENCE THAT PREDICTS EXCESSIVE NICOTINE INTAKE

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Tobacco dependence is associated with the emergence of negative emotional states, characterized by withdrawal signs, anxiety, and hyperalgesia. However, current animal models of nicotine dependence have failed to demonstrate the mechanisms mediating the role of abstinence-induced increases in anxiety and hyperalgesia in promoting excessive nicotine intake. Rats self-administered nicotine for either 21-23 h/day (i.e., long access; LgA) or 1 h/day (i.e., short access; SaA). Each 4 days of nicotine self-administration were followed by 72 h of abstinence. Following abstinence, rats were tested for anxiety-like behavior, nociceptive threshold to mechanical stimuli, somatic signs of precipitated withdrawal, and motivation for nicotine on a progressive ratio schedule. Involvement of the corticotropin-releasing factor 1 (CRF1) receptors in these measures was examined via delivery of the antagonist MPZP either subcutaneously or to the central nucleus of the amygdala (CeA). Following abstinence, LgA rats, but not SaA rats, showed excessive nicotine intake that was correlated with increased anxiety-like behavior, and nociceptive hypersensitivity, and these behaviors were prevented when MPZP was administrated subcutaneously. Intra-CeA MPZP infusion blocked the post-abstinence increases in nicotine intake and nociceptive hypersensitivity. The emergence of a negative emotional state during abstinence predicts future excessive nicotine intake in rats given extended access to nicotine, providing an explanation for the lack of relationship observed in previous studies with limited access, and demonstrating the translational relevance of the extended access model. Moreover, CRF1 receptors activation, particularly in the CeA, represents a key mechanism for the emotional and motivational effects of nicotine abstinence.

This work was supported by the Tobacco-Related Disease Research Program (TRDRP) from the State of California (grant 17RT-0095), Pearson Center for Alcoholism and Addiction Research, and National Institute on Drug Abuse grant DA023597.

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POS1-6

THE INTERPEDUNCULAR NUCLEUS IS A COMPONENT OF THE CORTICOTROPIN-RELEASING FACTOR STRESS NETWORK THAT MEDIATES ANXIETY DURING NICOTINE WITHDRAWAL

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Anxiety is a prominent affective withdrawal symptom driving abstinent smokers to relapse, yet the neuroanatomical and molecular bases underlying the anxiogenic effects of nicotine withdrawal are unclear. Using a multidisciplinary approach, we have identified the interpeduncular nucleus (IPN) as a neuroanatomical substrate of nicotine withdrawal-induced anxiety. The anxiogenic effects of nicotine withdrawal could be precipitated by infusion of a nicotinic acetylcholine receptor antagonist into the IPN of nicotine-dependent, but not nicotine-naïve mice. Conversely, nicotine infusion into the IPN during spontaneous nicotine withdrawal reduced anxiety. As the stress neuropeptide corticotropic releasing factor (CRF) has been implicated in anxiety, we assayed expression of CRF receptor 1 and 2 in the IPN. CRF1 receptors and to a lesser extent, CRF2 receptors, were highly expressed in the IPN. Infusion of CRF into the IPN was anxiogenic and this effect was more robust in nicotine-dependent animals. In addition, CRF1 receptors were upregulated after chronic nicotine exposure. During nicotine withdrawal, neurons within the intermediate sub-nucleus of the IPN were activated. IPN infusion of a CRF-1 but not a CRF2 receptor antagonist, blocked activation and alleviated withdrawal-induced anxiety. Resting-state functional connectivity analysis revealed that the IPN is part of a network functionally connected to brain regions of both the HPA and extra-hypothalamic stress axis. These data indicate that the IPN is a component of the CRF stress network that mediates anxiety during nicotine withdrawal.

This study was supported by National Institute on Alcohol Abuse and Alcoholism award number R01AA017656 and by National Institute on Drug Abuse award number R21DA025853 (ART). The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institute on Alcohol Abuse and Alcoholism, the National Institute on Drug Abuse, or the National Institutes of Health.

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POS1-7

INVESTIGATION OF NICOTINE-INDUCED WITHDRAWAL IN RATS USING RESTING-STATE FUNCTIONAL CONNECTIVITY

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Resting-state functional connectivity (RSFC) measured by functional magnetic resonance imaging (rsfMRI) can non-invasively measure dynamic changes of neural circuitry connectivity and thus provides an ideal tool to study nicotine-related neuroplasticity. However, this technique has rarely been used in animal models. This is largely attributed to confounding effects of anesthetic agents used in most animal studies. To avoid these confounding effects of anesthesia and establish RSFC studies in animal models, it is vital to investigate RSFC in awake animals. In addition, acquiring RSFC in awake animals is of particular interest because it will provide invaluable information regarding intrinsic connectional architecture of the animal brain and its reconfiguration in response to stimuli. Furthermore, it may provide a unique window to explore comparative functional anatomy between species. We have recently developed a non-invasive rsfMRI approach that allows RSFC to be measured in awake animals. In this imaging paradigm, animal motion and stress during MRI scanning are substantially minimized by using an entirely noninvasive restraining system and a routine acclimation procedure. By utilizing
this awake animal imaging approach, we have found that the neural circuitry of the interpeduncular nucleus is associated with nicotine-induced withdrawal. This abstract was made possible by institutional funds from the University of Massachusetts Medical School and NIH Grant Number 5R01DA021848-02 from the National Institutes of Health.

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POS1-8
ABT-089 AMELIORATES NICOTINE WITHDRAWAL-RELATED COGNITIVE DEFICITS IN C57BL/6J MICE
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Nicotine withdrawal symptoms include a set of cognitive deficits that are shown to predict relapse. Amelioration of these cognitive deficits emerges as a major aim in current smoking cessation therapies. In animal models, withdrawal from chronic nicotine disrupts contextual fear conditioning, a paradigm that approximates important aspects of declarative memory in humans, while acute nicotine enhances this hippocampus-specific learning and memory paradigm. These cognitive modifications are shown to be mediated by β2 subunit containing nAChRs in the hippocampus. ABT-089 (2-methyl-3-(2(S)-pyrrolidinylmethoxy)-pyridine, dihydrochloride salt) is a novel β2 subunit containing nAChR ligand that has partial agonist activity at α4β2* and α6β2* receptors with cognition-enhancing properties. The current study was designed to test ABT-089 for amelioration of cognitive deficits induced by withdrawal from chronic nicotine in mice. In the first set of experiments, male C57BL/6J mice received intraperitoneal injections of ABT-089 or saline before training and testing in contextual fear conditioning. Acute administration of ABT-089 in a range of doses (0.6, 1.2, 6, 12 mg/kg) enhanced contextual fear conditioning, while a 0.3 mg/kg dose did not have any effect on freezing to context. Cued conditioning was not affected by any of the doses tested. In the next set of experiments, mice were implanted with osmotic minipumps that delivered 12.6 mg/kg/day nicotine or saline for 12 days followed by a 24-hour withdrawal. At the end of the withdrawal period, mice were injected with 0.6 mg/kg ABT-089 or saline and were trained and tested in contextual fear conditioning. Withdrawal from chronic nicotine precipitated cognitive deficits in contextual fear conditioning which are rescued by acute administration of ABT-089. Cued conditioning was not affected in any of the groups. Taken together, our results suggest that modulation of hippocampal learning and memory by ABT-089 may be an effective therapeutic strategy for nicotine addiction.

This study was funded by NIH (CA143187).

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POS1-9
ACUTE NICOTINE PRETREATMENT ENHANCES THE ABILITY OF MECAMYLAMINE TO ELICIT WITHDRAWAL-LIKE SIGNS IN ADULT BUT NOT ADOLESCENT RATS
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The mechanisms underlying the pronounced vulnerability of adolescents to nicotine addiction have not been well established. Severity of withdrawal following long-term (chronic) nicotine exposure is reduced in adolescent compared to adult rats. We have found that acute nicotine pretreatment enhances the ability of the nicotinic acetylcholine receptor antagonist mecamylamine to elicit withdrawal-like signs in adult rats, a phenomenon that may reflect the early development of the nicotine abstinence syndrome. The current study examined sensitivity of adolescent rats in this model. Single or repeated injections of mecamylamine (1.5 or 3.0 mg/kg, s.c.) elicited withdrawal-like somatic signs (e.g., abdominal constrictions, facial fasciculations) in adolescent rats, but this effect was not influenced by 2 hr pretreatment with acute nicotine (0.5 mg/kg, s.c.). In a subsequent experiment, the ability of mecamylamine (2.25 mg/kg, s.c.) to elicit withdrawal-like somatic signs in adult rats was enhanced following the second of two daily acute nicotine injections (0.5 mg/kg, s.c.). This phenomenon was not observed in adolescent rats, even when a 1.0 mg/kg nicotine dose was used to account for between-age differences in nicotine pharmacokinetics. Acute nicotine pretreatment enhanced the ability of mecamylamine to elicit withdrawal-like somatic signs in adult but not adolescent rats. These findings parallel previously reported age differences in withdrawal severity following long-term (chronic) nicotine exposure, thereby supporting the relevance of the current acute exposure models to the nicotine abstinence syndrome. Together, these data suggest that adolescents may be relatively insensitive to nicotine withdrawal during both initial and prolonged tobacco use.

Supported by the Minneapolis Medical Research Foundation Translational Addiction Research Program (ACH) and the University of Minnesota Undergraduate Research Opportunities Program (CEM, KEM).

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POS1-10
NICOTINE-INDUCED AMOTIVATION: A RODENT MODEL OF TOBACCO WITHDRAWAL
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Clinical investigations have noted that amotivation is a symptom of nicotine withdrawal and is predictive of tobacco-use relapse. A rodent model of nicotine-induced amotivation was developed, and amotivation was assessed using the PR and DRL schedules. Rodents were reinforced with sucrose solution, and nicotine (0.05-0.3 mg/kg) was administered subQ once daily for 10 consecutive days. Rat performance on the schedules was evaluated hours post-nicotine dosing. Amotivation was dose dependent and emerged progressively over the course of 10 days of dosing, and this occurred in the absence of the development of somatic symptoms of withdrawal. Mecamylamine attenuated the effects of nicotine, and this demonstrates that amotivation is related systematically to nicotinic-acetylcholine activation.

Support made possible by the Vermont Genetics Network through Grant Number BP20GM103449 from the INBRE Program of the National Institute of General Medical Sciences (NIGMS) and the National Center for Research Resources (NCRR), components of the National Institutes of Health (NIH). Its contents are solely the responsibility of the authors and do not necessarily represent the official views of NIGMS or NIH.

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POS1-11
MOLECULAR ATTRIBUTES OF CONJUGATE ANTIGEN IN NIC7 ANTI-NICOTINE VACCINE INFLUENCE AVIidity AND FUNCTION OF ANTIBODIES INDUCED IN MICE AND NON-HUMAN PRIMATES
Michael J. McCluskie*,1 Dana M. Evans1, Heather L. Davies1, Jennifer Thorn2, Paul R. Mehelei1, Parag Kolhe2, Keshab Bhattacharya2, Jari I. Finneman2, Michele Bailey Piatche2, and James R. Merson3, 1Minnesota Department of Neuroscience; 2University of Minnesota Department of Medicine

Background: Anti-nicotine antibodies (Ab) reduce nicotine entering the brain which is expected to reduce the sense of reward associated with smoking tobacco. Ab function depends on both quantity (titer) and quality (avidity) of the Ab. Anti-nicotine vaccines tested previously in humans had disappointing efficacy (continuous abstinence rate at 1yr) despite high Ab titer, perhaps due to induction of primarily low avidity Ab. We had previously determined that the function of Ab induced in mice by nicotine conjugate vaccines is influenced by
the carrier, hapten and linker. Herein, we explored the effect of additional antigen characteristics on Ab responses induced by NIC7 (nicotine-like hapten conjugated to CRM197). Methods: 24 different lots of NIC7 conjugate were generated under different reaction conditions, resulting in variations in hapten load (~5-10 haptens/CRM), and molecular size (monomer ~50 – 100%; high or low molecular mass species [HMMS/LMMS] 0 ~ ~50%). Mice were immunized at 0 & 3 wks with a NIC7 conjugate (10 μg) adjuvanted with aluminium hydroxide (40 μg Al3+) and CpG (10 μg) or a mimetic of NicQb (10 μg antigen (~600 nicotine molecules conjugated to each E. coli Qβ phage virus-like particle) with 40 μg Al3+). Plasma was tested for Ab titer (ELISA) and avidity (IC50 by competitive ELISA ) at 4 wks, mice received 3H-nicotine (IV) and concentration of nicotine in the brain was determined. Selected conjugates were similarly tested in NHPs. Results: All lots of NIC7 conjugate resulted in equivalently high titers of anti-nicotine Ab, but varied greatly for avidity and function. The best functional responses were induced with conjugates having low HMMS content and epitope densities of 10-18. Of note, the functional responses with all lots of NIC7 were better than those induced by the NicQb mimetic. Conclusions: Immune responses induced by nicotine-conjugate antigens are influenced not only by carrier, hapten and linker but also by molecular characteristics such as hapten density and molecular size. While these antigen attributes did not impact Ab levels, they had a profound effect on Ab avidity and thus the nicotine-binding capacity and in vivo function.

All studies were funded by Pfizer Inc.

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**POS1-12** IMMUNOGENICITY OF INDIVIDUAL COMPONENTS IN A BIVALENT NICOTINE VACCINE UNDER DIFFERING VACCINE FORMULATIONS AND IMMUNOGEN DOSES

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Structurally distinct nicotine immunogens can elicit independent antibody responses when administered concurrently. Combining different nicotine immunogens and co-administering them as a multivalent vaccine could be a useful way to generate higher antibody levels than with monovalent vaccines alone. The immunogenicity of this approach was studied across a range of immunogen doses, adjuvants, and routes to assess its generality. Rats were vaccinated with total immunogen doses of 12.5 - 100 μg of 3′-aminomethyl nicotine conjugated to recombinant Pseudomonas exoprotein A (3′-AmNic-EP), 6-carboxymethylureido nicotine conjugated to keyhole limpet hemocyanin (6-CMUNic-KLH), or both. Vaccines were administered s.c. in alum, since alum is one of the few adjuvants acceptable for clinical use, or i.p. in Freund’s adjuvant, which is commonly used in animals. The main finding was that the contributions of the individual immunogens to total serum nicotine-specific antibody (NicAb) titers and concentrations were preserved when the bivalent vaccine was administered s.c. in alum across a range of doses. When the bivalent vaccine was administered i.p. in Freund’s adjuvant, the contributions of the individual immunogens to NicAb titers and concentrations were lower than expected at most doses. In addition, the relationship between dose and antibody response differed between vaccines administered s.c. in alum or i.p. in Freund’s adjuvant. Serum NicAb titers and concentrations increased with dose when vaccines were administered s.c. in alum. When administered i.p. in Freund’s adjuvant, titers decreased with dose and concentrations showed no clear trend. These results support the potential strategy of combining nicotine vaccines to enhance overall vaccine immunogenicity, and highlight the importance of formulation in ensuring component additivity in a multivalent approach.

Funding: NIDA DA10714 NIDA T32007097.

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**POS1-13** THE EFFECTS OF INTRAVENOUS NICOTINE ON MEAL PATTERNS AND BODY WEIGHT IN RATS

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Rationale: Increased appetite and weight gain after cessation is a deterrent for quitting smoking. Attempts to understand the mechanism for these effects using animals have been hampered by the difficulty or inconsistency of modeling the effects seen in humans. Objective: To examine the effects of extended daily access to intravenous nicotine, via self-administration or programmed infusions, on body weight and patterns of food intake in rats. Methods: A first experiment determined temporal relationships between spontaneous meals and nicotine self-administration in 23 h/day access. In the second experiment, nicotine infusions were programmed to emulate the patterns of self-administration. The effect of these infusions on food intake, meal patterns, and weight change were examined relative to a vehicle-infused group during treatment and in a post-nicotine phase. Results: In the first experiment, hourly intakes of nicotine and food were positively correlated, with the highest levels early in the night and lowest levels during the first part of the light period. Most intervals during which nicotine was self-administered also contained eating. In the second experiment, nicotine-treated rats ate less than those that received vehicle primarily by taking smaller meals, and they gained less weight. In a post-nicotine phase, the nicotine group maintained a lower weekly weight for one week and then gained weight back to control levels by eating more. Conclusion: The finding that self-administration of nicotine and food coincide suggests that both appetitive behaviors are linked. When nicotine was infused in a similar pattern, principal changes were in satiation via reduced meal size. Post-nicotine weight gain may not occur immediately after nicotine is withdrawn.

This study was conducted while the first author was at the University of Florida. Supported by NIH/NIDA grant: 1R21 DA091288.

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**POS1-14** ALTERED NICOTINE PHARMACOKINETICS IN ADOLESCENT VS. ADULT RATS IMPACTS THE INTERPRETATION OF ANIMAL MODEL DATA

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Human adolescent nicotine dependence is often modeled in rodents. Several nicotine self-administration studies report that adolescent rats display enhanced responding for nicotine compared to adults. This study aims to investigate acute intravenous (IV) nicotine pharmacokinetics (PK) through development. An acute IV dose of 0.2 mg/kg of nicotine was administered via the tail vein to 24 male Wistar rats of three ages: early adolescents (EA) (PND25; n=8), mid adolescents (MA) (PND36; n=8) and adults (AD) (PND71; n=8). Blood sampling was done at time points of 10 and 30 minutes, 1, 2, 3 and 4 hours post-injection. Nicotine and cotinine levels were analyzed in the plasma and brain (at 4 hours) by LCMS. The EA group had lower levels of plasma nicotine levels compared to other groups; they had lower mean maximal nicotine concentrations (Cmax) and area under the plasma concentration-time curve (AUC) compared to adults (138 ng/ml vs. 186 ng/ml, p<0.001; 186 vs. 304 ng.ml/hr, p<0.001). The EA group also modestly lower brain nicotine levels (approximately 70% of adult levels) but equivalent brain/ plasma levels, suggesting that the lower brain levels were consistent with lower plasma levels in EA. The EA group had lower levels of plasma cotinine compared to other groups and modestly lower brain cotinine (80% of adult levels), but similar brain/plasma levels. In vitro metabolism indicates slower metabolism of nicotine to cotinine in the EA group. The lower plasma cotinine levels in vivo and slower cotinine formation in vitro in the EA group argues against an increase in metabolism of nicotine to cotinine as being responsible for the lower plasma nicotine levels. To investigate this further, a urinary nicotine metabolite pharmacokinetic study will be performed. This study illustrates key differences observed in terms of pharmacokinetics of nicotine in vivo and in vitro, as a function of rat age. When comparing behavioural responses, and/or biomarkers of nicotine exposure...
among rats of different ages, care should be given to account for differences in pharmacokinetics.

**Funding:** CIHR MOP97751 and MOP86471, CAMH and The CAMH Foundation, The Canadian Foundation for Innovation (#16014) and the Ontario Ministry of Research and Innovation.

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**POS1-15**

**INVESTIGATION OF COMBINATION TREATMENTS IN THE ANIMAL PRECLINICAL MODEL OF INTEROCEPTIVE CONDITIONING WITH NICOTINE**

Sergios Chamtitkov*, Kayla Fink, Scott T. Schepers, Chelsea E. Durham, Steven Pittenger, Linda P. Dwosink, and Rick A. Bevins

Typically, individuals attempting to quit smoking first receive a mono-therapy like nicotine replacement therapy (NRT). If they begin having difficulty maintaining abstinence, then one increasingly popular approach is to combine the first drug with some other smoking cessation drug (Zyban [bupropion] or Chantix [varenicline]). Given the increased use of combinational pharmacotherapies for nicotine dependence, along with the sparse preclinical literature on drug combination, we investigated the impact of drug combination on interoceptive conditioning with the nicotine stimulus. To this end, a variety of notable pharmacotherapeutic agents (e.g., sazetidine-A, PNU 120596, PHA-543613, nornicotine, cytisine, bupropion) were tested for their ability to substitute for the nicotine stimulus either alone or in combination with another ligand. Further, this research used male and female rats to explore potential sex-dependent effects with these ligands or their combination. Sazetidine-A, but not PNU 120596 or PHA-543613, partially substituted for the 0.4 mg base/kg nicotine stimulus. The most notable findings were as follows: Sazetidine-A increased conditioned responding to the lower doses of nicotine with females being more sensitive to this combination. Sazetidine-A also increased responding to the lower doses of bupropion, with higher doses suppressing responding. Females appeared to be more sensitive to this response disruption effect. For nornicotine alone, substitution for the nicotine stimulus occurred at a lower dose for females. The increased sensitivity was also seen with the combination of sazetidine-A and nornicotine. Given the different pharmacological profile of the ligands under investigation (partial agonist vs. agonist vs. allosteric modulator vs. α7 versus α4β2, etc.), these results hint to possible therapeutic targets for nicotine dependence and potential sex differences in effectiveness.

**Funding:** DA034398, DA018114.

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**POS1-16**

**NEURAL CORRELATES OF NICOTINE WITHDRAWAL-INDUCED DECREMENTS IN SUSTAINED ATTENTION**

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Cognitive impairment is a common symptom of nicotine withdrawal and predicts relapse. Sustained attention, or vigilance, may represent a core process of cognitive control underlying nicotine dependence and smoking relapse. The goal of this blood oxygen level dependent (BOLD) fMRI study was to examine the neural correlates of abstinence-induced decrements in performance on a sustained attention task. Seventy three treatment-seeking smokers (31 female; mean cigarettes per day=16.2; mean age=42.2 years) performed a Continuous Performance Test, Identical Pairs version (CPT) while undergoing fMRI on two separate occasions in counterbalanced order; following 24-hours of smoking abstinence and while smoking as usual. Prior to scanning, participants completed measures of craving and withdrawal. Abstinence significantly impaired behavioral measures of accuracy (i.e., responses to true positives; p=1.5x10-6) and the ability to discriminate between targets and distractors (p=3.x10-5). There was a significant session (smoking vs. abstinence) x accuracy (correct vs. incorrect) interaction on mean percent BOLD signal change in the thalamus. During the abstinent session, relative to the smoking cessation, there was a marked increase in thalamic activation during correct responding compared to incorrect responding. Exploratory regression models suggested that increased craving (abstinent vs. smoking) was significantly related to increased activation in the thalamus (abstinent vs. smoking). These data indicate that the ability to sustain attention during abstinence may require greater neural activation in thalamus, perhaps due to inefficient neural processing or distractions due to craving. These findings suggest novel mechanisms by which withdrawal-related cognitive deficits promote relapse.

This research was supported by NIH grants P50 CA143187 and R01 DA026849 to C.L.

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**POS1-18**

**DECISIONS ABOUT COVARIATE SPECIFICATION IN TIME-VARYING EFFECTS MODELS: DOES IT MATTER?**

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The relative roles of smoking quantity and nicotine dependence (ND) in the development of regular smoking are difficult to disentangle, as effects of these measures on smoking regularity vary across time. Recent methodological advances in time-varying effect models (TVEMs) allowing effects of predictors on outcomes to vary over time permit a more direct examination of how smoking quantity and ND influence smoking regularity. In addition to typical longitudinal mixed model considerations, however, TVEMs require researchers to make decisions about using covariates with fixed values or time-varying values to estimate effects that are averaged over time or vary over time. Different specifications of covariates and their effects may produce different results. The current research examines how different specifications affect results of TVEMs investigating the association between smoking quantity and smoking regularity (# days smoked) controlling for time-varying ND effects. Four TVEMs were tested using data on 535 adolescent experimenters (<100 cigarettes/life at baseline) at baseline, 6, 15, 24 and 48 months. Models estimated (1) an average effect of baseline smoking quantity; (2) a time-varying effect of baseline smoking quantity; (3) an average effect of time-varying smoking quantity; and (4) a time-varying effect of time-varying smoking quantity. Although significant in Models 1 & 3, the average effect of quantity on smoking regularity was weaker when the time-varying quantity was used compared to when baseline quantity was used. In Model 2 with time-varying effects of baseline quantity, there was a significant decrease in the effect of quantity from baseline to 6 months, but no significant change in this effect after 6 months. In Model 4 with time-varying effects of time-varying smoking quantity, there was a significant change in the effect of quantity from baseline to 15 months, no significant change in the effect between 15-24 months, and a significant decrease in the effect from 24-48 months. Overall, TVEM covariate specification is an important consideration as conclusions about associations between quantity and smoking regularity differ depending on specification.

This research was supported by Project Grant P01CA098262 (Merkelstein) from the National Cancer Institute, R01 DA022313 A2, R01 DA022313 S1 (Dierker), and R21 DA029834-01 (Rose) from the National Institute on Drug Abuse, and Center Grant Project P50 DA010075 awarded to Penn State University.

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POS1-19
GENDER DIFFERENCES IN NEGATIVE AFFECT AND SMOKING LAPSE BEHAVIOR DURING ACUTE TOBACCO WITHDRAWAL: A LABORATORY ANALOGUE STUDY

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Given prior work illustrating female smokers experience greater increases in negative affect during acute abstinence, gender differences in smoking relapse risk could relate to gender differences in motivation to resume smoking to offset withdrawal effects. However, little controlled experimental work addresses this hypothesis. The current study investigated gender differences in: (a) withdrawal-related negative affect, (b) motivation to resume smoking on a lab analogue measure of smoking lapse, and (c) the interaction between gender, withdrawal-related negative affect and smoking lapse behavior. Following a baseline session, current smokers (> 10 cig/day; women: n = 68; men: n = 131) attended two counterbalanced lab sessions, one following 6 hours of smoking abstinence (deprived session) and one following ad libitum smoking (non-deprived session). At both lab sessions participants completed self-report measures of mood and withdrawal symptoms followed by a smoking lapse analogue task during which they were monetarily rewarded for each 5-minute increment they chose to delay smoking. Performance on this task serves as an analogue model of smoking lapse behavior by measuring smoker’s capability to resist temptation to smoke under conditions where abstinence is advantageous. After controlling for demographics and nicotine dependence severity, females showed greater abstinence-induced increases in several forms of negative affect (i.e. depression, anger, anxiety, confusion, Betas > 0.14, ps < 0.04) but no differences in abstinence-induced changes in other forms of affect or craving. Females also exhibited marginally greater abstinence-induced decreases in their willingness to delay smoking for money (reflecting increased lapse-type behavior; Beta = 0.12, p = 0.07), which was significantly mediated by abstinence-induced increases in anger. These results suggest that acute tobacco withdrawal symptoms, particularly anger, could underlie gender specific smoking patterns. A better understanding of mediating factors of gender on time to smoke could provide important information for designing gender-tailored treatments that address these issues in females.

This research was supported by National Institute on Drug Abuse Grants R01-DA026831 and K08-DA025041.

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POS1-20
A META-ANALYTIC INVESTIGATION OF RESPONSE INHIBITION IN CIGARETTE SMOKERS

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An extensive empirical literature suggests a role of various facets of impulsivity in smoking, yet few quantitative reviews have been conducted in this domain. Response inhibition is one such facet of impulsivity and is generally conceptualized as the ability to suppress thoughts or actions that are erroneous, dangerous, or no longer appropriate in a given context. The aim of the current meta-analysis was to quantitatively summarize differences in response inhibition as measured by the Go/No-go Task, Stop-Signal Task, and Continuous Performance Test in current smokers (> 10 cig/day; women: n = 68; men: n = 131) attending two counterbalanced lab sessions, one following 6 hours of smoking abstinence (deprived session) and one following ad libitum smoking (non-deprived session). At both lab sessions participants completed self-report measures of mood and withdrawal symptoms followed by a smoking lapse analogue task during which they were monetarily rewarded for each 5-minute increment they chose to delay smoking. Performance on this task serves as an analogue model of smoking lapse behavior by measuring smoker’s capability to resist temptation to smoke under conditions where abstinence is advantageous. After controlling for demographics and nicotine dependence severity, females showed greater abstinence-induced increases in several forms of negative affect (i.e. depression, anger, anxiety, confusion, Betas > 0.14, ps < 0.04) but no differences in abstinence-induced changes in other forms of affect or craving. Females also exhibited marginally greater abstinence-induced decreases in their willingness to delay smoking for money (reflecting increased lapse-type behavior; Beta = 0.12, p = 0.07), which was significantly mediated by abstinence-induced increases in anger. These results suggest that acute tobacco withdrawal symptoms, particularly anger, could underlie gender specific smoking patterns. A better understanding of mediating factors of gender on time to smoke could provide important information for designing gender-tailored treatments that address these issues in females.

This research was supported by National Institute on Drug Abuse Grants R01-DA026831 and K08-DA025041.

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POS1-21
REINFORCEMENT ENHANCING EFFECTS OF NICOTINE VIA CIGARETTE SMOKING

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Animal research suggests that, aside from its primary and secondary (e.g., “cues”) reinforcing effects, nicotine may enhance the reinforcing effects of other reinforcers in the environment that are unrelated to nicotine, especially sensory rewards. Dependent (n=25) and non-dependent (n=27) smokers engaged in 4 sessions, 3 after overnight smoking abstinence (>12 hrs; CO<10 ppm) and varying in 3 smoking conditions: no smoking, 0.05 mg (denic), or 0.6 mg nicotine cigarettes (under blind conditions). The 4th session, for comparison, involved ad lib smoking of own brand (i.e. unblinded) after no abstinence. Reinforced responding was assessed via progressive ratio (PR30%) for the following rewards (one per 15-min trial): 30 sec of preferred music (sensory reward), money ($5.10), avoidance of white noise for 30 sec (i.e. negative reinforcement), or no reward (control). Analyses of the 3 abstinence conditions showed an overall smoking x reward interaction, F(6,300)=2.13, p=.05. Follow-up ANOVAs showed main effects of smoking condition for the music reward, F(2,102)=10.49, p<.001, but not for the other available rewards (n.s.). Reinforced responding for music was increased by nicotine vs denic cigarette (p<.001) and by nicotine vs no smoking (p<.001), but nicotine did not increase responding for money or avoidance of aversive noise. Responding in the comparison ad lib smoking condition (no abstinence) was very similar to that for the acute nicotine/cigarette condition after abstinence. Although withdrawal was greater in dependent than nondependent smokers, as expected, reinforced responding did not differ due to dependence, indicating greater reinforced responding was not a symptom of withdrawal relief. These results suggest that nicotine via acute smoking increases reinforced responding for a sensory reward that is unrelated to smoking per se, but perhaps not responding for other reward types. Findings could increase understanding of why cigarette smoking is so persistent.

Supported by NIH Grant DA031218.

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POS1-22
TRANSCRANIAL DIRECT CURRENT STIMULATION (TDCS) AS AN ADD-ON TO STANDARDISED BEHAVIOURAL THERAPY FOR TOBACCO DEPENDENCE—A PLACEBO-CONTROLLED, DOUBLE-BLIND STUDY

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Background: The changes in attention and cognitive performance that result from direct current stimulation of different brain regions have been known since the 1960s and investigated in many studies since then. Our group was able to show improved performance in an n-back procedure (memory test to assess working memory) after TDCS. (Keesser et al; 2010) Proof of this effect in healthy controls leads to the assumption that TDCS increases activity in neuronal networks in tobacco-dependent patients and thus increases attention and concentration abilities, which will in turn increase the probability that smoking cessation during behavioural therapy will be successful within a predetermined period (1, 3, 6 and 12 months). Methods: Stimulation is performed with a DC stimulator MC. The location of stimulation is anode over the left dorsolateral cortex (DLPFC), corresponding with F3 (in 10-20 EEG system); cathode over the right temporal cortex with an intensity of 2 mA. The total duration is a constant stimulation for 20 minutes. The stimulation time schedule for each participant is a total of 7 times over 6 weeks. The stimulation is followed by a 90-minute session of the
POS1-23
SMOKING URGES AND BEHAVIOR AMONG RESTRAINED EATERS IN THE LABORATORY

Michelle A. Kovacs, B.A.*, John B. Correa, B.S., and Thomas H. Brandon, Ph.D., University of South Florida

Rates of smoking are elevated among women with restrained eating (i.e., those who ignore satiation and hunger cues, often resulting in disinhibited eating when a salient emotional or environmental cue disrupts their cognitive control). This study is an experimental test of mechanisms that may underlie the relationship between restrained eating and smoking. Aims were: a) To test whether a food prime used in studies of dietary restraint would increase craving to smoke and smoking behavior; and b) to test whether group differences would be moderated by restrained eating. Female young adults (N = 100) completed the Restraint Scale (RS) and were randomized to either receive a food prime (vanilla milkshake) or read magazines. Both groups then received access to ad-lib cigarettes and food during a "taste test." Hypotheses were tested using 2 (prime vs no prime) X 2 (high vs low dietary restraint) ANOVAs. As hypothesized, smokers who received the food prime reported greater cravings to smoke (p = .07), but there was no effect of restraint. Moreover, as predicted, there was a significant interaction, such that the greatest cravings were found in the prime condition among smokers high in restraint (p = .004). No main effects or interactions were found on the smoking variables (e.g., latency, # of puffs). However, there was a trend for smokers high in dietary restraint to show shorter latency to smoke (p = .07). Finally, in contrast to previous research on restrained eating without the option to smoke, participants who received the food prime ate significantly less food in grams (p = .001) and calories (p <.001) than control participants. These preliminary results provide initial evidence of the interaction between mechanisms involved with restrained eating and smoking behavior among young adult women. That is, the availability of cigarettes may deflect the disinhibition to eat found among restrained eaters, such as after a food prime. The discussion will address implications and limitations of the current study, and future directions for research and application. The final sample size for this ongoing study will be 128.

This study was funded by Moffitt Cancer Center, Tampa, FL.

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POS1-24
ACUTE NICOTINE EFFECTS ON ERROR MONITORING IN WOMEN

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Nicotine has been shown to modulate many cognitive and behavioral domains in a rate-dependent manner, including response inhibition and risk-taking. Improvements in cognition and behavioral control may help to explain the strong association between cigarette smoking and psychiatric illnesses including ADHD and schizophrenia. Performance monitoring is a component of behavioral control that has been linked to affect regulation in mental illness and relies on attentional orienting and signal detection, two cognitive processes that are modulated by the nicotinic cholinergic system. We have previously shown that a nicotinic agonist improves performance monitoring through post-error slowing (error monitoring), during the Stop Signal Task (SST) in adults with ADHD. We sought to determine if acute nicotine would produce similar effects on error monitoring in females. This was a secondary analysis of a study to examine the effects of acute nicotine on brain activity during the SST. 23 (18-25 years) females, screened to be high or low impulsive on the SST (HI or LO), participated in an acute, within-subjects, randomized, double blind study with placebo (PLC) and 7 mg transdermal nicotine (NIC). Performance monitoring during the SST was measured by changes in reaction time after stop versus go trials. Mixed model ANOVAs were used to examine differences in slowing after successful vs failed stop trials across both group and drug. There was a main effect of group on behavior following successful stop trials such that HI subjects slowed more than LO subjects. There was no main effect of nicotine, and no drug by group interaction. To examine rate-dependent effects, groups were re-assigned based on baseline error monitoring (GOOD or POOR). Analysis revealed a significant drug by group interaction on post-error trials with NIC decreasing slowing in the GOOD group and increasing slowing in the POOR group. This study found rate dependent effects of acute nicotine on error monitoring. The bidirectional nature of the effects, which were dependent on baseline performance, may represent a "corrective" effect of nicotine on performance adjustments after errors.

Funding: R03DA023460, K23MH079216, US DOE SC0001753, GCRC M01-00109.

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POS1-25
FMRI OF REWARD AND LOSS PROCESSING IN TREATMENT-SEEKING ADOLESCENT SMOKERS: RELATIONSHIPS WITH IMPULSIVITY, RISK-TAKING, AND TREATMENT OUTCOME

Suchitra Krishnan-Sarin*, Iris Balodis, Hedy Kober, Patrick Worhunsky, Thomas Liss, Michael Stevens, Godfrey Pearlson, and Marc Potenza, Yale University School of Medicine

Adolescence represents a critical phase in the development of neural circuitry underlying reward and motivation. Developing an understanding of the role of this circuitry in adolescent-specific high risk behaviors, could aid in the development of optimal interventions. To date, few neuroimaging studies have examined reward processing during this developmental stage, and even fewer have examined nicotine-dependent adolescents. Twenty-one, 14-18 year old, daily adolescent smokers, who expressed interest in a high-school based smoking cessation research study underwent functional magnetic resonance imaging (fMRI) while performing a version of the Monetary Incentive Delay Task (MIDT) that parses prospect, anticipation and outcome phases of reward/loss processing. Relative to neutral trials, participants demonstrated relatively increased frontostriatal activations during reward/loss prospect and diminished activity in the ventromedial prefrontal cortex (vmPFC) and the left inferior frontal gyrus (IFG) during reward/loss anticipation. During winning outcome relative to neutral phases, participants demonstrated increased activity in the anterior cingulate and diminished activity in the fronto-polar and left IFG areas. In the losing outcome relative to neutral phases, participants showed increased anterior cingulate activity and also bilateral IFG activation extending to the insula. Ventral striatal activity during anticipatory phases of the MIDT correlated with out-of-scanner measures of impulsivity and risk-taking. In a subgroup of adolescents (n=11) who participated in the smoking cessation program, percent decrease in cotinine levels was positively correlated with posterior cingulate activity during reward anticipation and increased bilateral ventral striatal activity during losing outcomes. All findings were significant at p<0.05, family-wise error corrected. The findings suggest that in adolescent smokers specific regional brain activations underlie different aspects of reward and loss processing, and that individual variations in the neural correlates of reward/loss processing relate importantly to impulsivity, risk-taking and treatment outcome.

Funding: P50DA009241.

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POS1-26
REDUCTION IN BRAIN NICOTINIC ACETYLCHOLINE RECEPTOR DENSITY WITH TREATMENT FOR TOBACCO DEPENDENCE

Arthur L. Brody, M.D.*, Alexey G. Mukhin, M.D., Ph.D., Stephanie Shulenberger, M.S., Michael S. Mamoun, M.D., Maggie Kozman, B.S., Jonathan Phuong, B.S., Meaghan Neary, B.S., Tirth Lui, M.S., and Mark A. Mandelkern, M.D., Ph.D.

Background: Cigarette smoking leads to up-regulation of nicotinic acetylcholine receptors (nAChRs) in the human brain, including the alpha4beta2* nAChR, which is a common receptor subtype. Current first-line treatments for smoking include cognitive-behavioral therapy (CBT) and bupropion HCl. We sought to determine the effects of these first-line treatments and smoking reduction/cessation on alpha4beta2* nAChR up-regulation in cigarette smokers. Method: Forty-eight otherwise healthy adult smokers underwent positron emission tomography scanning with the radiotracer 2-FA (a ligand for the alpha4beta2* nAChR) before and after 11 weeks of treatment with either group CBT, bupropion HCl, or matching pill placebo (random assignment). For the central study analysis, an overall two-way repeated-measures two-way analysis of covariance (ANCOVA) was performed using specific binding volume of distribution (VS/fP) for the prefrontal cortex, brainstem, and cerebellum (a measure of alpha4beta2* nAChR density) as the repeated measure, treatment type and quit status as between-subject factors, and age as a covariate. Results: An overall pre- to post-treatment effect was found (F = 5.6, P = 0.02), along with an effect of quit status (F = 5.8, P = .02), but not treatment type (F = 1.2, n.s.). Undergoing treatment was associated with changes in VS/fP in the prefrontal cortex, brainstem, and cerebellum of -20, -25, and -25%, respectively. Participants who quit smoking had greater reductions in VS/fP values across regions than non-quitters (for prefrontal cortex, brainstem, and cerebellum: -25, -38, and -42% for quitters and -19, -21, -20% for non-quitters). Furthermore, correlations between reductions in cigarettes per day and decreases in VS/fP for two of the three regions were significant (r = .33, P = 0.02 for brainstem and r = .37, P = 0.01 for cerebellum). Conclusion: Smoking reduction and cessation with commonly-used treatments are accompanied by decreases in alpha4beta2* nAChR densities across brain regions. These findings indicate that specific receptor abnormalities caused by cigarette smoking improve as smoking is reduced and resolve with successful cessation.

This study was supported by the Tobacco-Related Disease Research Program (ALB [19KT-0135]), the National Institute on Drug Abuse (ALB [R01 DA20872]), and a Veterans Affairs Type I Merit Review Award (ALB).

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POS1-28
THE EFFECT OF EXPOSURE TO CIGARETTE SMOKE ON FUNCTIONAL ACTIVITY IN CURRENT SMOKERS, FORMER SMokers, AND NEVER SMokers

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The occurrence of an addiction to smoking is largely due to neuroadaptations caused by repeated exposure to nicotine, the psychoactive ingredient of tobacco. As people quit smoking, nicotine exposure suddenly ceases. As a function of abstinence, new neuroadaptations may thus occur or established nicotine-induced neuroadaptations may reverse. The present study examines the effects of exposure to cigarette smoke on brain activity using functional magnetic resonance imaging (fMRI) in current smokers, former smokers, and never-smokers. We specifically focused on the striatum as this brain region is involved in reward and motivation, but it is also the brain area that is activated when exposed to aversive, novel, and intense stimuli. We hypothesize that brain activity resulting from exposure to nicotine changes as a function of the duration of abstinence. Specifically, we expect that activation in the striatum will be different in individuals who quit recently compared to those who quit a longer time ago. To test this we designed a device that enables the exposure of cigarette smoke to subjects without having them to actively smoke a cigarette. One aversive and one pleasant odor will be included as reference stimuli. Activation in the striatum was strongest in never smokers. The lowest activation levels were found in smokers. With respect to former smokers, activation in the striatum was stronger in those who quit for a longer time as compared to those who had quit more recent. Results indicate that response to cigarette smoke in former smokers may change over time: activation levels of the striatum return to levels of activation comparable to never smokers. Demonstration that nicotine-induced functional alterations in neural structures are reversible upon abstinence may enhance our current understanding of recovery from nicotine addiction. Insight into the time in which these changes take place may be of value in preventing relapse to smoking.

No funding.

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POS1-27
EFFECTS OF ACUTE NICOTINE ADMINISTRATION ON EMOTIONAL IMPULSIVITY

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Background: Attention Deficit/Hyperactivity Disorder (ADHD) is associated with cigarette smoking including earlier initiation, greater daily use, and increased likelihood of relapse compared to community controls. Human and animal models have linked impulsivity, a hallmark ADHD symptom, to the initiation and maintenance of nicotine self-administration. Several studies have demonstrated that acute nicotine reduces impulsivity in subjects with ADHD. Emotional state, especially negative affect, is related to impulsive behavior and craving for nicotine. However, how nicotine, impulsivity and emotion interact to produce behavioral disturbances is unknown. This study examined the effects of acute nicotine administration on emotional impulsivity, described as the inability to regulate behavior to emotional stimulation, in non-smoking subjects with and without ADHD. We hypothesized that ADHD subjects would show greater sensitivity to emotional stimuli and reduced activation of inhibitory circuitry, which would be reversed during nicotine exposure. Methods: Twelve (6 ADHD, 6 CONTROL) young adults (age 18–25) completed two study days including fMRI scanning while completing the Faces Stop Signal Task, a test of emotional impulsivity. Before scanning, Transdermal Nicotine (7mg for 45 minutes) or Placebo was administered in a double blind design. Results: Results indicated a difference in the processing of inhibitory and emotional stimuli dependent on ADHD profile. Specifically, ADHD subjects compared to CONTROL had reduced activity in the frontal cortex during inhibition in the PLC condition, not seen in the NIC condition. The effect of emotion was seen in all subjects as increased parietal activation during inhibition of negative compared to positive stimuli, but was maximal in ADHD subjects during the PLC condition. Conclusion: This demonstrates that nicotine can regulate activity in neural circuitry related to the integration of emotional information during response inhibition. This implicates emotional impulsivity as a possible factor for nicotine use in ADHD subjects, but future research is needed to elaborate the relationship between nicotine, emotion and impulsivity.

Funding: K23 MH079216.

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POS1-29
DIFFERENCES IN CRAVING OVER TIME AMONG ADULT SMOKERS WHO LAPSE VERSUS THOSE WHO DO NOT

Ellen B. Beckjord, Ph.D., M.P.H.*, and Saul Shiffman, Ph.D., University of Pittsburgh

Background: Lapses after a period of abstinence are exceedingly common among smokers trying to quit. The progression from lapse to relapse may be mediated by craving: lapses may trigger or perpetuate increased craving. Treatment with nicotine patch slows progression to relapse, perhaps by blunting this hypothesized increase in craving. The aim of this analysis was to examine changes in craving over time in the context of 1) lapse status and 2) treatment status (nicotine patch or placebo). Methods: Data are from 305 individuals who

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POS1-30
SENSITIVITY AND SPECIFICITY OF A PROCEDURE FOR EARLY HUMAN SCREENING OF NOVEL SMOKING CESSATION MEDICATIONS

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We have developed an inexpensive and efficient procedure to evaluate medication efficacy for smoking cessation by optimally combining the practicability of lab studies (e.g., cross-over design) with the validity of clinical trials (e.g., abstinence as the dependent measure). Prior studies showed the sensitivity of this approach for identifying efficacy in two drugs known to be effective for increasing tobacco abstinence, nicotine patch and varenicline. The present study determined whether the sensitivity of this procedure generalizes to a third FDA-approved cessation medication, bupropion (Zyban). It also validated the specificity of our procedure for detecting lack of efficacy in a medication known to be ineffective for cessation, modafinil (Provigil). Subjects were 45 healthy adult smokers who smoked at least 10 cigs/day, had screening CO>10 ppm, and intended to quit permanently within the next 3 months (i.e., high in quit interest). All participated in three consecutive 3-week periods, varying only in the medication condition, which was presented double-blind. In each period, all smoked ad lib during week 1 (baseline or washout), began medication run-up during week 2 while smoking (bupropion 150 mg b.i.d., modafinil 100 mg b.i.d., or placebo), and were instructed to try and quit during week 3 while continuing medication. The order of medication conditions was counter-balanced between subjects. Abstinence was verified daily (Mon-Fri) during week 3 by CO<5 ppm and no cigarettes in the prior 24 hr. Results showed differences in days quit across the 3 medications, F(2,88)=4.35, p<.02. Consistent with our prior studies, bupropion resulted in 50% greater quit days vs. placebo (p=.005), verifying the sensitivity of our procedure. Specificity was evidenced by no difference (<10%) in quit days for modafinil vs. placebo (p>.80), as hypothesized. These data confirm that a small sample of smokers high in current quit interest can provide a sensitive and specific test of the clinical efficacy of cessation medications in a brief simulated quit trial, suggesting that this procedure is useful for testing the efficacy of novel compounds for cessation.

Supported by NIH Grant P50 CA143187.

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POS1-31
SCIENTIFIC AND ECONOMIC BENEFITS OF SEQUENTIAL PARALLEL COMPARATIVE DESIGN (SPCD), A COST EFFICIENT APPROACH TO THE PROBLEM OF PLACEBO RESPONSE

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Introduction: Placebo response has become an increasingly significant challenge in clinical trials, one which, at best, forces the use of a larger n, increasing cost and duration of trials, and, at worst, leads to type two error and failure to detect efficacy of an intervention. The Sequential Parallel Comparative Design (SPCD) is a cost efficient clinical trial methodology, developed in 2003 at Massachusetts General Hospital (MGH), that may be able to reduce placebo response rates and the expense of clinical trials related to a wide range of indications including addiction. Methods: An SPCD trial involves two phases (i.e., stages) of treatment and typically two randomizations of subjects. Phase 1 is aimed at: (a) comparing drug and placebo, and (b) generating a cohort of placebo non-responders. Phase 2 is aimed at comparing drug and placebo, as in a conventionally designed trial, but including only participants who were placebo non-responders in Phase 1. Sample sizes and power for standard design and for SPCD trials were computed using a score test and various assumptions regarding differences between drug and placebo response rates. To date, 14 SPCD treatment trials are completed, ongoing or planned. Results: When estimating sample size at assumed levels of statistical power, the SPCD method typically allowed for a 20-50% reduction of sample size. Likewise, when estimating statistical power with given sample sizes, the SPCD method allowed for a 10-25% increase in statistical power. In the 3 SPCD trials with reported results, placebo response in the second stage was below 10%. SPCD trials to date have included an active comparator, adjunctive treatment, multiple doses, and both binary and continuous outcomes. Conclusions: It is estimated that the SPCD design would reduce the placebo response rate in clinical trials, resulting in significant savings in direct clinical trial costs, decreased time-to-clinic for effective new treatments, and reduced costs associated with “failed” trials.

RCT Logic, LLC provided funding for analysis of sample size and power.

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POS1-32
FEASIBILITY AND COMPLIANCE RELATED TO EXTENDED EVALUATION OF NOVEL TOBACCO PRODUCTS: A PILOT STUDY USING CARLTON CIGARETTES

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Background: Compliance with product use and validity of self-report present major methodological challenges in studies evaluating tobacco products. This is particularly difficult when behavior is assessed over an extended period of time and biochemical verification is difficult. Methods: In the present study, daily smokers were recruited to determine the feasibility of study procedures and product compliance prior to a randomized clinical trial investigating study cigarettes with a range of nicotine content. Subjects (n=17) smoked their usual brand cigarettes during a two-week baseline period, and then were asked to smoke Carlton cigarettes (1 mg tar, 0.1 mg nicotine) for six weeks. Subjects were provided with free study cigarettes but were not incentivized for smoking Cartons because real-time biochemical verification of compliance with the study cigarettes during the clinical trial is not feasible. Instead, subjects were told there was no penalty for non-compliance, encouraged to be compliant during weekly review sessions, and asked to provide accurate self-report. Incentives were used to reinforce completion of daily Interactive Voice Response (IVR) phone calls and laboratory visits. A timeline follow back (TLFB) Questionnaire was given during each visit to measure study and non-study cigarette use as well as other tobacco use. Results: Four subjects withdrew; however, only 2 of 15 subjects withdrew after switching to Cartlons. IVR and TLFB data were highly concordant; 70% of subjects reported smoking only Cartlons regardless of the measure. The remaining

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subjects reported minimal use of non-study cigarettes and other tobacco products. Importantly, non-compliance occurred primarily during the first two weeks. By the third week smoking Cartons, 92% of subjects reported full compliance despite finding them less satisfying than usual brand. These findings suggest a combined method of daily and weekly recall without penalty for non-compliance may foster honest self-reporting. Although not biochemically verified in this study, good compliance with novel tobacco products may be possible even without incentives within the context of an intensive clinical trial.

National Institutes of Health: DA031659 (Donny).

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POS1-33
REPRODUCIBILITY OF NICOTINE METABOLITE RATIO AMONG DIFFERENT METHODS
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The Nicotine Metabolite Ratio (NMR) is the ratio of 3-hydroxycocaine (3-HC) to cotinine (COT). NMR serves as an indicator of CYP2A6 enzymatic activity and is highly correlated with the rate of nicotine clearance. In clinical studies, NMR can be used to assess the impact of heritable individual differences in nicotine metabolism on smoking behaviors and cessation. Sources of variation between studies may arise from differing analytical methods for quantifying COT and 3-HC, or differences in the same technique performed at different locations. Our objective was to compare NMR using three analytical methods and identify potential disparities. The correlations of log-normalized NMR, COT and 3-HC to values derived from our LC-MS/MS method were compared using linear regression. The level of agreement between the measurements was assessed by Bland-Altman analysis and the results are given as a ratio (mean difference between the two measures). The results for 15 plasma samples that were analyzed previously using the same LC-MS/MS method, at different locations (St Helen et al, 2012), were: R² = 0.93, 0.97 and 0.96, ratio = 0.94, 1.12 and 1.05 for NMR, COT and 3-HC, respectively. The results for 35 saliva samples that were analyzed using two different LC-MS/MS methods, at different locations, were: R² = 1.00, 0.99 and 1.00, ratio = 2.05, 1.01 and 2.06 for NMR, COT and 3-HC, respectively. The results for 26 plasma samples analyzed by LC-MS/MS and HPLC at the same location were: R² = 0.84, 0.90, and 0.92, ratio = 1.34, 0.90 and 1.20 for NMR, COT and 3-HC, respectively. All correlations were significant (p < 0.0001). These findings indicate that when using the same method, a different location has little effect on the measurements. By contrast, while NMR is highly correlated across different analytical methods, the absolute levels differ substantially due primarily to the >2 fold difference in 3-HC quantification. Further investigation of the source(s) of this variation, and assessment of additional methods, is on-going. Thus although highly correlated, when comparing absolute values for NMR, or 3HC, the specific method used should be considered.

We acknowledge the support of a CIHR MOP86471 and TMH-109787, NIH DA 020832 = CAMH, the CAMH foundation, the Canada Foundation for Innovation (#20289 and #16014) and the Ontario Ministry of Research and Innovation.

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POS1-34
THE RELATIONSHIP BETWEEN SMOKING AND C-REACTIVE PROTEIN (CRP) IN PARTICIPANTS ATTENDING RESIDENTIAL ALCOHOL AND OTHER SUBSTANCE ABUSE TREATMENT
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Introduction: Cardiovascular disease (CVD) is the leading cause of mortality for people with a history of substance abuse. In part, this is a result of the extremely high rates of smoking. C-reactive Protein (CRP) is a marker of inflammation that is increasingly being recognized as an independent predictor of CVD in population based studies. When compared to non-smokers, smokers have been shown to have elevated CRP levels. However, the relationship between CRP and rates of smoking has been inconclusive. The aim of the current study was to examine the relationship between smoking and CRP in a substance abuse population.

Methods: Participants were attending residential rehabilitation services provided by the Australian Salvation Army (N = 111). All participants were current smokers and had been diagnosed with a substance use disorder. Participants completed a structured interview that examined smoking, diet, alcohol & drug use, and physical activity. Biomedical measures included expired carbon monoxide, blood pressure, height and weight. Fasting blood samples were provided to collect high sensitivity CRP. Using established guidelines, participants with CRP scores (>10mg/L) were removed from the analysis, as this is likely to indicate an acute infection (n = 7).

Results: Participants demonstrated elevated levels of inflammation, as measured by CRP. Using the guidelines established by the American Heart Association, 37% of the sample was at high risk of developing cardiovascular disease (>3mg/L). CRP was not significantly related to average number of cigarettes smoked daily. However, it was significantly correlated with nicotine dependence as measured by the Fagerstrom Nicotine Dependence Scale (Spearman’s r = .30, p = .04). Nicotine dependence accounted for a small (5%), but statistically significant amount of the variance in CRP scores. Conclusion: Participants demonstrated multiple risk factors for CVD, including elevated CRP levels. Results underscore the importance of addressing these multiple risk factors as part of more comprehensive treatment for people with substance abuse disorders.

The Cancer Council, NSW and The Salvation Army.

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POS1-36
ISTOPSMOKE: RESULTS FROM A PILOT STUDY OF AN INTERACTIVE MOBILE HEALTH SMOKING CESSATION PROGRAM IN ISRAEL
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Automated, text messaging programs on mobile phones have shown some promise in helping people quit smoking. To promote the dissemination of such programs, the US DHHS has made available the message library for Smokefree.gov. This study describes a pilot test of iStopSmoke, an adapted version of SmokefreeTXT, in Israel, where cell phone penetration is amongst the highest in the world. Study participants were recruited using a listserv at Hebrew University/Hadasah Medical Center for students and employees of the University and hospital. Participants (n=40) were enrolled in iStopSmoke and interviewed at baseline and at 2 and 4 weeks after enrollment. Results indicate that the program is feasible in Israel, and support was found for the text messaging program. Preliminary results (N=27) indicate that 81.4% (n=22) of participants would totally recommend or recommend the program to a friend, and 70% (n=19) of participants rated the program as somewhat helpful, helpful or highly helpful. The majority (89%) (n=24) of participants reported reading most or all of the text messages. Eighteen percent of participants unsubscribed from messages within the first two weeks of the program (n=5). A handful of technical problems were encountered including problems for participants in sending or receiving specific keywords. Suggestion for further adaptation for the Israeli smoker include translation into Hebrew, broadening interactive features, increasing the personalization of messages, and giving the user more control in the program timing and intensity. This pilot test provides some support and insights for the further development of the iStopSmoke program. Automated text messaging programs on mobile phones may represent a promising strategy for the dissemination of evidence-based smoking cessation programs in different cultural settings.

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POS1-37
A RANDOMIZED TRIAL OF AN INTERACTIVE MOBILE TEXT-MESSAGING PROGRAM TO PROMOTE SMOKING CESSATION IN U.S. ADULT SMOKERS


Text messaging programs on mobile phones have shown some promise in helping people quit smoking. Text2Quit is an automated, personalized and interactive mobile text-messaging program that sends text messages and emails timed around a participant’s quit date. The Be Free Study aimed to evaluate Text2Quit in the context of a randomized trial. Adult smokers were recruited on the Internet and enrolled in the Be Free Study. Participants (n=502) were randomized to receive Text2Quit or the control condition (Smokefree.gov/Clearing the Air). Participants were surveyed at baseline and at 1, 3, and 6 months post-enrollment. Self-reported quitters were asked to provide a saliva sample to verify smoking cessation status through salivary cotinine. Results from the 1 month follow-up indicate improved quitting outcomes in the Text2Quit condition compared with the control condition. Using an Intent-to-Treat (ITT) analysis, 30.7% of the intervention group and 14.5% of the control group reported not smoking in the past 7 days (p<0.05). More participants in the intervention group also reported quitting for more than 7 consecutive days (38.3% vs. 21.2%; p<0.05). For the intervention group participants, 87.2% reported reading > 75% of the texts. On average, users made 15.0 responses to the texts over a 4-week period, although responses declined after the 2-month mark. The interactive feature for tracking cigarettes was the most used interactive feature, followed by the craving trivia game. The majority of participants in the intervention group (78.0%) reported liking the program. Reasons given for liking the program in order of prevalence included that it was a constant reminder of their efforts to quit smoking (26.0%), that it provided on-demand tools and information, and it was convenient. More participants in the intervention group who had at least one response over the 3 and 6 month periods also reported liking the program (69.7% vs. 57.8% at 3 months and 57.7% vs. 47.5% at 6 months, p<0.05). Future studies are recommended that identify the value of the interactive and personalized features that characterize this program.

This research was supported by 5K07 CA124579-02 and AARA supplement to Dr. Abroms, from National Cancer Institute of the National Institutes of Health. Support also came from the Department of Prevention & Community Health at the George Washington University School of Public Health and Health Services to Dr. Abroms.

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POS1-38
AN EXPLORATORY TRIAL TO EVALUATE THE EFFECTS OF A PHYSICAL ACTIVITY INTERVENTION AS A SMOKING CESSATION INDUCTION AND CESSATION AID AMONG THE ‘HARD TO REACH’: EXERCISE ASSISTED REDUCTION THEN STOP (EARS)

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BACKGROUND: The aims were to develop an accessible physical activity counselling intervention for disadvantaged smokers wishing to reduce but not quit (in the next month), and conduct a pilot RCT to inform the design of a larger trial. METHODS: 98 smokers were randomised to receive up to 12 weekly client-centred motivational sessions (informed by theory and developmental work) delivered by a health trainer, or brief advice on smoking cessation. The intervention aimed to support reduction using behavioral strategies (without NRT) with a focus on physical activity (to manage smoking), and refer quitters to local cessation support services. Recruitment to the RCT was by invitation letter from a primary care physician or stop smoking service, or via various community engagements. The primary outcome was 4 week post quit CO (<10ppm) confirmed abstinence but an aim was to determine the feasibility of capturing the most rigorous flexible smoking cessation outcome. Follow-up assessments took place at 8 & 16 weeks, to capture a variety of other outcomes. RESULTS: The sample had 74% unemployed or low skilled manual workers and 41% with mental health problems. Participants had a mean age of 47.3(SD 11.3) yrs, a median (IQR) BMI of 27.3(22.5-32.4), left school at 16.0 (15.0-16.0) yrs, started smoking at 14.0 (13.0-16.0) yrs, smoked the equivalent of 19.0(14.4-24.4) cigarettes per day, and had a FTND score of 5.5(SD 2.1). Intervention participants attended on average 4.2(2.7) support sessions (56% face to face, 44% by phone). 23% (n=11) of intervention vs 6% (n=3) of control participants made a quit attempt, of whom 7 and 2, respectively, had CO confirmed point prevalence abstinence and self-reported continuous abstinence between 4-8 weeks post quit. Two intervention quitters used local stop smoking service support. The 11 intervention participants who made a quit attempt did so 7.6 (SD 3.1)(range 1.7-12) weeks post randomisation. Qualitative data revealed the challenges of working with disadvantaged smokers and individual variation in the extent of engagement with the intervention. INTERPRETATION: There appears to be support to conduct a larger trial, building on the present findings.

The study received full UK NHS ethical approval (LREC no: 10/H0106/59), is registered as a clinical trial (ISRCTN no: 13837944) and was funded by a grant from the national Institute of Health Research (Health Technology Assessment) (HTA no: 07/78/02).

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POS1-39
DIFFERENCES IN SMOKING AND CESSATION CHARACTERISTICS AMONG NON-DAILY NAMIDAY SMOKERS: FINDINGS FROM THE 2009-2010 NATIONAL ADULT TOBACCO SURVEY

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The prevalence of nondaily smoking in the U.S. has increased over the past decade. While a growing body of research reflects the differences between daily and nondaily smokers, differences among nondaily smokers are poorly understood. This study provides updated national data on smoking and cessation characteristics among nondaily versus daily smokers, and assesses within-group differences among former-daily nondaily smokers, based on the length of time since daily smoking. Data were obtained from the 2009-2010 National Adult Tobacco Survey, a stratified, national, dual-frame (landline and cell) telephone survey of adults. Participants were categorized into daily smokers, former-daily nondaily smokers (NDNS), and established-converted (i.e., daily smokers within the past year) nondaily smokers (RCNS), and established-converted (i.e., former smokers over one year ago) nondaily smokers (ECNS). Chi-square tests were used to assess differences across groups, and a multivariable logistic regression was used to identify factors associated with past year quit attempts. Among nondaily smokers (17.8% of the total sample of smokers), 27.12% were NDNS, 37.44% were RCNS, and 35.44% were ECNS. RCNS were the most likely to report ever having tried to quit (p<.0001), having tried to quit in the past year (p<.0001), having used cessation treatment during their last quit attempt (p<.05), and wanting to quit smoking for good (p<.001). Compared to NDNS, RCNS had more than two times the odds of having made a quit attempt in the past year, even after controlling for differences in demographic and smoking characteristics (AOR=2.05, 95% CI: 1.34, 3.14). However, no significant differences existed between NDNS and ECNS. These findings suggest that significant heterogeneity exists among “converted” or former-daily nondaily smokers based on how long ago they previously smoked daily. Smoking characteristics of RCNS seem to fall between characteristics exhibited by daily smokers those exhibited by other nondaily smokers (NDNS and ECNS), suggesting that RCNS are in transition either to quitting or to more long-term nondaily smoking. Different interventions for RCNS versus ECNS may be warranted.

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**POS1-40**

**HOW DOES SOCIOECONOMIC STATUS INFLUENCE THE UTILIZATION OF CESSION TREATMENT AMONG TAIWANESE ADULT SMOKERS?**

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Aim: To examine the association between socioeconomic status (SES) of smokers and their use of cessation treatment service in Taiwan. Methods: A cohort of 3,633 adult smokers was drawn from Year 2005 National Health Interview Survey (NHIS) in Taiwan. Use of cessation treatment was defined based on the claim data of National Health Insurance. Survival analysis was conducted to explore whether the SES of smokers influenced their use of cessation treatment. Results: Only 187 subjects (5.15%) received cessation during the 2-year follow-up period. The socioeconomic factors with positive impact for smokers to get professional treatment included: college or above education, marriage and lower income. The corresponding HRs to look for treatment for subjects with monthly family income >=70000, 50000-70000 and 30000-50000 vs. <30000 Taiwan dollars were 0.60, 0.56 and 0.62. Single or widowed smokers were also less likely, HR=0.57, to take treatment. Only smokers with college or above education favored professional therapy, with a HR of 1.95 as compared with elementary school or below subjects. Factors such as age, sex, duration of smoking, employment and occupation type were not statistically significant. Comorbidity with diabetes or coronary heart disease could motivate smokers to quit smoking with treatment. Conclusions: Smokers of higher education level were more likely to use cessation service. Use of cessation service was not deterred by the economic reason. This research was funded by Bureau of Health Promotion, Department of Health, Taiwan, R.O.C.

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**POS1-42**

**FACTORS INFLUENCING SEVERITY OF NICOTINE DEPENDENCE AMONG THE BIDI SMOKERS IN INDIA**

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Bidi is the predominant smoking tobacco product in India with 73.3 million users. Average number of bidi sticks smoked per day by the daily bidi users in India is 11.6. Exploring the determinants of high nicotine dependence among bidi users would help us in designing the most appropriate smoking cessation program for the majority of smokers in India. Present study assessed the factors influencing high nicotine dependence among bidi users in India. Methods: A cross-sectional study was conducted at primary care health facilities in two Indian states, Gujarat and Andhra Pradesh. The severity of nicotine dependence among the bidi smokers was assessed using Fagerstrom Test for Nicotine Dependence (FTND). The determinants of high nicotine dependence (FTND score > 5) among bidi users were identified by logistic regression model. Mean FTND score among the daily bidi smokers was 4.9. The regression model indicates that male bidi smoker has higher odds of becoming high nicotine dependence (OR-13.27, 95% CI: 1.73-101.65) and tobacco user with higher social capital has lower chance of being high nicotine dependent (OR-0.56; 95% CI: 0.36-0.89). This study identified male gender and low social capitals as the major determinant of high nicotine dependence among the bidi users in India. These groups need to be given due importance while designing the smoking cessation programs in India. The study is being funded by Bill and Melinda Gates Foundation.

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**POS1-43**

**DISCORDANCE IN THE ASSESSMENT OF NICOTINE DEPENDENCE AMONG ADULT CIGARETTE SMOKERS IN INDIA A COMPARISON OF DSM-IV AND FTND**

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Several measures are in use to assess nicotine dependence ranging from specialized academic clinical criteria to screening tools. However the most appropriate measure to use is often unclear. This study assessed level of concordance between two widely used measures of nicotine dependence among cigarette smokers in two Indian states. Cross-sectional survey of clients of public health facilities using a pretted semi structured interview schedule was conducted during January to March 2012, in 12 districts of Andhara Pradesh and Gujarat. During this survey addiction to nicotine was assessed with the Diagnostic and Statistical Manual of Mental Disorders Fourth Edition (DSM-IV) criteria and the Fagerström Test for Nicotine Dependence (FTND) in 187 current cigarette smokers. To test the concordance between two measures, we ran a generalized regression analysis using logistic regression with the DSM-IV as the dependent/outcome variable and FTND score as the independent variable. The diagnosis of nicotine dependence by DSM-IV criteria was 52% while mean FTND score was 4.25 with range 0 to 9. Nearly 1/4th scored less than 3 and 1/3rd scored 6 or more in FTND assessment. The logistic regression coefficient was br=0.15683 (p-value =0.000397) indicating significant discordance between the FTND and DSM measures i.e. if FTND values increase the chances/probability of dependence as diagnosed by DSM-IV criteria decrease. There is a significant discordance observed in assessing nicotine dependence using FTND and DSM-IV criteria. This may be due to different dimensions of criteria (both questions and scales) used to measure the dependence. Additionally, further studies involving larger sample size is required to confirm these findings. The study is funded through a tobacco research grant funded by Bill and Melinda Gates Foundation.

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**POS1-41**

**TOBACCO QUITLINE IN BRAZIL, AN ADDITIONAL INFORMATION SOURCE TO THE POPULATION**

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The Tobacco Quitline is an important service of telephone counseling for population-based smoking cessation, as well as a population-based source of elucidation about tobacco use. The purpose of this study is to carry out a descriptive analysis of the Tobacco Quitline and to discuss the growing number of calls, relating them to some political measures. Data collected from both “Ouvidor SUS” and “Web Report” systems were analyzed. These analyses enabled us to depict a profile of the people who looked for the service as to the number of calls and distribution according to social and demographic characteristics, such as gender, marital status, education, age and reason for calling. Questions regarding their smoking status are asked, for instance, if they are smokers at present, ex-smokers or have never used tobacco before, and also if it is their first time calling the service.

No funding.

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POS1-44
A META-ANALYSIS OF CHANGES IN PSYCHOLOGICAL WELL-BEING AFTER SMOKING CESSATION

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One of the most common reasons given for smoking is stress relief. If smoking relieves stress, psychological well-being may deteriorate after cessation. An alternative explanation of this perception is that smoking induces nicotine withdrawal, marked by psychological symptoms (e.g., low mood, anxiety). Understanding whether smoking cessation improves or worsens psychological well-being could be important in framing public health messages. We conducted a systematic review and meta-analysis to examine the association between cessation and change in psychological well-being compared to continuing smokers. METHOD: We followed MOOSE reporting standards. We searched 5 databases for longitudinal studies, in any language, published between inception to April 2012. Inclusion criteria: studies reporting baseline and follow-up mood scores in smokers who quit and continue smoking. There were no exclusion criteria. We approached authors of records with insufficient data. Included studies were quality assessed. Studies were combined using inverse variance meta-analysis to assess the difference in change in mood between baseline and follow-up in smokers who stopped and smokers who continued smoking. RESULTS: We included 21 studies. Follow-up ranged from 4 months to 9 years. Quitters and continuing smokers’ depression scores improved from baseline to follow-up; but the improvement was significantly greater in quitters (standardized mean difference (SMD) -0.18; 95% CI -0.28 to -0.07, P=0.001). Quitters displayed a decrease in anxiety from baseline to follow-up and continuing smokers displayed an increase in anxiety; the difference between the groups was significant (SMD -0.28; 95% CI -0.43 to -0.13, P<0.0002). CONCLUSION: Successful quitters display a decrease in anxiety and depression after a sustained period of cessation compared to continuing smokers.

The University of Birmingham Research Support Facility studentship.

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POS1-45
ASSESSING THE POTENTIAL OF A NOVEL NICOTINE INHALER DEVICE: A SIMULATED TEST MARKET STUDY


Aim: To assess the market share potential and consumer intention to buy a novel nicotine inhaler device using a simulated test market research study.

BACKGROUND: More appealing medicinal grade nicotine products may help reduce the prevalence of smoking as many users of tobacco products are unable or unwilling to quit. A new device designed to mimic many of the aspects of a cigarette (physiological, psychological, behavioural and sensorial) could offer an alternative to smoking but without the associated serious health risk.

DESIGN: This multicentre, randomised, open-label study assessed the acceptability of a novel device. Current smokers (at least 5 cigarettes/day) aged 18 yrs or more were enrolled (N=602). Participants were issued a supply of test product (novel device with nicotine dose 0.22 mg [low] or 0.45 mg [medium]) or Nicorette Inhalator (15 mg nicotine). Subjects completed a product market research questionnaire at baseline, and after 3 and 6 days of use (n=574). Data fed into a market research model developed by MASMI enabled modelling of expected market performance of the product and validation against a database of historically tested tobacco products.

RESULTS: The new product could result in a 1.8% share of the UK tobacco market after 24 mths. The Nicorette Inhalator achieved 0.045% using the same methodology, inferring 40 times greater in-market potential for the novel device. Purchase intent (define/probable) after 6 days was 51.7, 42.4 and 33.2% for the low- and medium-dose novel or Nicorette devices, respectively. Based on use of this early prototype device, rejecter rate was low; the proportion of participants who reported they would definitely not buy the brand was 14.0 and 23.4% compared with 34.7% for the Nicorette Inhalator.

CONCLUSIONS: This novel nicotine inhaler device was well received by participants in the study with around half reporting they would ‘definitely’ or ‘probably’ buy the product in the future, resulting in a significant projected share of the tobacco market. By offering smokers a viable and safer alternative to cigarettes, this new product has the potential to make a significant positive impact on public health.

Funding: Nicoventures Ltd.

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POS1-46
PATIENTS PERSPECTIVE OF TOBACCO COUNSELING PRACTICES BY HEALTH CARE PROVIDERS: FINDINGS FROM A CROSS SECTIONAL STUDY IN INDIA


Offering help to quit tobacco use is one of the six evidence-based tobacco-control strategies included in the World Health Organization’s MPOWER package.

Counselling by health care providers is recognised as one of the best practices in tobacco control. The study presents patients perspectives regarding counselling practices of health care workers providing in primary health care facilities. The study is a cross-sectional study conducted in the forms of exit interviews using semi structured questionnaire among 1151 tobacco users visiting primary health care facilities in the states of Gujarat and Andhra Pradesh in India.

Data captured information given during counselling, duration of session, intention to quit and reduce tobacco use after getting counselled. Chi-square test was employed to test the association between different variables. More than half of the respondents (57%) reported that they have been asked about tobacco use during their visit to a health facility. Information on interest to quit, willingness to quit, and information pertaining to ways to quitting was given only to half of the patients. Information sharing on medications for quitting and follow-up activities was undertaken merely by 12% and 10% of primary care providers respectively. Almost all (90%) respondents reported that they are planning to reduce and quit tobacco use if they would get counselled by the primary care providers. One-third (30%) of patients also opined that that they would decide on a quit date after getting counselled.

Tobacco use history is captured by primary care providers but information given is limited only to harmful health effects of tobacco and benefits of quitting. Assessing tobacco dependence and assisting and arranging for proper referrals for quitting tobacco activities were undertaken only by a few primary care providers. There is a need to complement the existing efforts to ensure that patients who want to quit tobacco use are able to do so.

The study forms a part of a tobacco control project funded by Bill and Melinda Gates Foundation.

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POS1-47
FACTORS THAT INFLUENCE DECISIONS TO ADOPT AND IMPLEMENT SMOKING CESSATION PRACTICES WITHIN THE NORTH AMERICAN QUITLINE CONSORTIUM

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Decision makers within quitlines decide which cessation practices to adopt and to implement. Although information from within and outside the network of North American quitlines has some bearing on adoption decisions, other factors impose constraints on what quitlines can and cannot offer clients. We argue that decisions to adopt and implement smoking cessation routines and protocols by members of the North American Quitline (NAQCC) Consortium are constrained by factors internal and external to each member’s organization. Such constraints include but are not limited to, budgets, expertise to implement, organizational mission, and the extent to which the organization is a leader or follower in terms of adopting and implementing smoking cessation practices. Moreover, the type of...
decision-making process used (e.g., consensus, one person decides) is related to the types of constraints perceived by organizational members. One-hundred-seventy-one NAQC members responded to an online survey regarding decision-making practices related to the adoption and implementation of smoking cessation protocols. Factor analysis identified two dimensions of constraints, one related to issues internal to quitlines, the other external issues. In addition, respondents indicated the extent to which decisions within quitlines were made by consensus or unilaterally. Results indicate that consensus is the preferred decision-making process when both types of constraints are high. Furthermore, participants reported that organizations were more likely to adopt cessation practices in general when consensus decision-making processes were used. The data also indicate that other processes are at play when quitline organizations decide to adopt smoking cessation practices. We discuss the implications for our findings for both theoretical issues as well as practical problems associated with decision-making in the North American quitline community.

This research was funded by the National Institutes of Health National Cancer Institute grant R01CA128638.

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POS1-48
USE OF AN ONLINE TOBACCO CESSATION EDUCATION PROGRAM FOR POST-DOCTORAL DENTAL STUDENTS AND DENTAL RESIDENTS
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Introduction: To address barriers associated with implementing tobacco cessation education into the postdoctoral curriculum, a web-based, self-paced, interactive module on tobacco cessation was developed and evaluated for effectiveness. The course consists of 3 sections: Pre-exam, Post-exam, and Helping Your Patient Quit. These are designed to align with typical dental practice and help post-doctoral students and dental residents assimilate tobacco cessation counseling into their clinical experience. The educational content is presented as text and video, brief interactive knowledge, skills assessments, and final virtual patient exercise. A course guide and pharmacotherapy guide accompany the program. Methods: Prior to viewing or taking the tobacco course, participants were administered a survey to assess pre-program tobacco-related knowledge, attitudes, and behaviors. A follow-up survey is administered after completion of the course. Results: Results from the pre-survey are presented for 61 post-doctoral dental students and dental residents in prosthodontics, oral surgery, oral pathology, endodontics, periodontics, and orthodontics. 79% thought it should be the responsibility of the hygienist and 3% thought it should be the dental assistant's job. At baseline, 37% of respondents reported that their knowledge about tobacco cessation counseling was poor or fair, compared to 61% who reported good or very good knowledge, with only 2% reporting excellent knowledge. 12% of students reported current smoking behavior. At baseline, 26% of respondents were not at all confident in their ability to prescribe nicotine gum and 41% were not at all confident in their ability to prescribe varenicline. The course increased respondent knowledge on the goal of nicotine replacement therapy (p=.001). Conclusions: The course is designed to provide knowledge and skills on how to incorporate tobacco cessation into clinical practice, and to encourage dentist participation in tobacco cessation counseling. No funding.

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POS1-51
PROVISION OF SMOKING CESSATION SERVICES BY DENTAL HEALTH PROFESSIONALS

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Background: Between 65% to 70% of smokers in Ontario, Canada, visit dental office at least once in a given year. Studies indicate that brief cessation intervention (using 5As protocol) by dentists and dental hygienists can increase cessation rates. Little is known about Ontario dental health professionals’ practice of the brief cessation intervention, especially after the enhancement of training opportunities and cessation resources for health professionals following the introduction of the Smoke-Free Ontario Strategy in 2006. This study explored the experiences of dentists, dental hygienists and dental assistants in providing brief cessation services in routine daily practice. Methods: A total of 1,966 dentists, dental hygienists, and dental assistants completed an online survey in late 2011. Follow-up phone interviews were conducted with a convenience sample of dental health professionals who completed the online survey (n=23) to validate the survey findings. Results: The proportion of dentists, dental hygienists and dental assistants providing brief cessation services to all or most patients was as follows: asking patients about their smoking status - 52.1%, 55.6%, and 33.3%; advising to stop smoking - 47.7%, 49.7%, and 25.8%; assessing readiness to quit - 29.7%, 49.5% and 17.4%; assisting to quit smoking by offering self-help materials - 9.0%, 17.9% and 10.2%, recommending nicotine replacement therapy - 7.1%, 16.0% and 8.8%, referring to external resources - 12.6%, 18.1% and 8.1%; and arranging follow-up visits - 2.3%, 9.2% and 4.7%. Dental hygienists were more likely to report providing brief cessation services than dentists and dental assistants. Lack of patients’ interest in discussing smoking, time constraints, fear of alienating patients and lack of training were the most commonly perceived barriers identified through the survey and interviews. Conclusion: Dental health professionals in Ontario do not routinely provide brief smoking cessation services. Many of them do not go beyond the first steps (asking and advising) to assess patients’ readiness to quit and assist them in quitting. These results are consistent with those from other studies.

Funding from the Ontario Ministry of Health and Long-Term Care.

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POS1-52
A PROACTIVE FAMILY SMOKING CESSATION INTERVENTION FOR FATHERS OF CHILDREN 0-18 MONTHS: A RANDOMIZED CONTROLLED TRIAL (RCT)

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Background: Second-hand smoking is a serious health hazard to infants and the major source of SHS is from their parents. However, few healthcare professionals would advise parents of infants stop smoking. This RCT aimed to evaluate the effectiveness of a proactive multi-step theory-based family smoking cessation intervention to non-smoking mothers and smoking fathers, in order to help fathers change their smoking behaviours. Methods: A total of 24,315 families were screened at 22 Maternal Child Health Centres in Hong Kong during 2008-2010. 1,158 consented families with smoking father, non-smoking mother and an infant under 18 months were randomized into intervention (n = 598) and control group (n = 560). The intervention group received face-to-face and telephone counselling (for mothers) on implementing a complete household no-smoking policy and supporting their husbands to quit smoking in 3 telephone smoking cessation counselling sessions (for fathers); an additional face-to-face family intervention session (for couples); and a smoke-free kit with health education materials. The control group received a pamphlet about smoke-free home (mothers) and a self-help smoking cessation pamphlet (fathers). All families were followed up for 12 months to assess the fathers' smoking status. Results: The mean age of the participating fathers was 35.6 years (SD=7.7); most were daily smokers (98%) and around one-third had moderate to high nicotine dependency. On average, fathers in the intervention group had higher daily cigarette consumption at baseline (mean= 14.1 vs. 13.0, P<0.03). At 12-month follow-up, fathers in the intervention group had a higher quit rate (13.7% vs. 6%, P<0.01). Also, more fathers in the intervention group had made a quit attempt (30.6% vs. 24.1%, P<0.01). Conclusions: This is one of the largest RCT to study a family intervention approach to help fathers of the 0-18 month infants quit smoking. The multi-step theory-based family intervention was effective in helping the fathers quit smoking. It should be adopted as standard practice to engage new parents with smoking fathers to quit smoking so as to protect the babies from exposure to SHS at home.

This project was funded by Health and Health Services Research Fund, Food and Health Bureau, Hong Kong SAR Government (HHSRF #05060751) and Flight Attendant Medical Research Institute, USA (FAMRI reference no.: 062496).

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POS1-53
IGNITE INNOVATION: IMPROVING HEALTH FOR PREGNANT WOMEN WHO SMOKE

Nadia Minian*1, Shelley Clevery2, and Pat Campbell3, 1Centre for Addiction and Mental Health; 2Echo: Improving Women's Health in Ontario; 3Ontario Hospital Training and Consultation Center (PTCC) came together to strategically advance the creation of a smoking cessation system for Ontario pregnant women. This presentation will showcase Echo’s partners and funded programs to help Ontario pregnant women quit smoking. Two partners, Peterborough PHU, and NBIFC are hosts to newly designed programs which were designed by supporting community women to tailor best practice guidelines in order to reflect local needs. CAMH is...
reviving PREGNETS, an online provincial resource that helps pregnant women quit smoking and provides up to date information to health care providers. OTRU is offering a participatory and realistic evaluation. ECHO, CCBR and PTCC are working together with the demonstration sites in order to spread the innovation of these three sites across the province.

Funding by Ontario's Ministry of Health and Long Term Care.

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POS1-54 FACTORS INFLUENCING THE EFFECTIVENESS OF UK STOP SMOKING SERVICES FOR PREGNANT WOMEN

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Twenty-six percent of UK women smoke at some point during pregnancy and twelve percent do so continuously. Smoking cessation support is provided through free at the point of use Stop Smoking Services for Pregnant women (SSSP). We aimed to assess relationships between SSSP effectiveness and key variables hypothesised to influence this. Data relating to SSSP delivery were collected via an online survey sent to each service. Effectiveness, measured using routine data, was the proportion of women who tried quitting with SSSP support remaining abstinent at 4 weeks. Multiple linear regression models assessed the relationship between the following factors and effectiveness: index of multiple deprivation (IMD), having a specialist smoking cessation in pregnancy advisor, smoking in pregnancy (in mandatory midwifery training), identifying pregnant smokers through exhaled CO and referring via an ‘opt-out’ pathway, self-referral being amongst the most frequent referral methods, using specialist advisors to contact referrals, nicotine replacement therapy combinations, using CO monitoring routinely during treatment, one-to-one support in smokers’ homes, couple/family support and financial incentives. Eighty-six percent (121/141) of SSSP completed surveys. Responding services were larger than non-responding services but did not differ in terms of effectiveness or IMD. There was considerable variation in service provision; for example, where used, support provided in patient’s homes took significantly longer to deliver than that provided in clinics (p<0.005). The only factor significantly associated with effectiveness was the location of one-to-one support (p=0.011); where provided in a clinic, rather than a home setting, was associated with a 5.6% increase in effectiveness. There was marginal evidence of association between effectiveness and increasing PCY-level IMD (p=0.08). This is the first study to quantitatively assess service delivery factors associated with a 5.6% increase in effectiveness. There was marginal evidence of association between effectiveness and increasing PCY-level IMD (p=0.08). This is the first study to quantify the relationship between the following factors and effectiveness: index of multiple deprivation (IMD), having a specialist smoking cessation in pregnancy advisor.

This is the first study to quantitatively assess service delivery factors associated with a 5.6% increase in effectiveness. There was marginal evidence of association between effectiveness and increasing PCY-level IMD (p=0.08). This is the first study to quantify the relationship between the following factors and effectiveness: index of multiple deprivation (IMD), having a specialist smoking cessation in pregnancy advisor. Smoking cessation services for pregnant women in England. Interventions delivered in clinics were associated with greater effectiveness and these were reported to be less resource intensive.

POS1-55 SMOKING CESSATION AMONG PREGNANT HUNGARIAN WOMEN LIVING IN UNDERDEVELOPED REGIONS

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Background: Tobacco use is high among Hungarian women living in the underdeveloped northeastern region of the country. In our sample of mothers with live births in 2009, 42% were smokers and more than 6 out of ten continued smoking during the pregnancy. Methods: We conducted a retrospective cohort study of pregnant women and their smoking habits among women living in an underdeveloped region of northeastern Hungary. We sought to obtain a census of the population. 71% of the target population was interviewed (9,040 of 12,778).

Logistic regression was used to assess factors associated with continuing versus quitting tobacco use (significance level, p ≤0.01). Results: There were 3,505 smokers in the cohort; 63.8% continued smoking and 36.2 quit smoking at the time of pregnancy. Women who continued to smoke were more likely to live in housing that lacked of partial and full housing amenities (OR 1.64, 95%CI 1.18-2.26 and OR 2.89, 95%CI 2.11-3.94, respectively), were living with regularly smoking partner (OR 1.70 95% CI 1.36-2.14), were exposed to secondhand smoke daily (OR 3.39, 95%CI 2.63-4.36) and consumed coffee daily (OR 1.75, 95%CI 1.42-2.16). Factors promoting cessation were younger age (518 years) (OR 0.45, 95% CI 0.29-0.71), under and normal BMI versus obesity (OR 0.52 95%CI 0.36-0.75 and OR 0.50, 95%CI 0.37-0.69), marriage versus contractual cohabitation (OR 0.54, 95% CI 0.44-0.67), being employed versus unemployed (OR 0.43, 95%CI 0.33-0.58), consuming fruits, vegetables, and dairy products daily (OR 0.68, 95%CI 0.52-0.85; OR 0.73, 95%CI 0.68-0.91; OR 0.72, 95%CI 0.57-0.91), and being the woman’s first pregnancy (OR 0.71, 95%CI 0.56-0.90). Conclusions: Tailoring cessation programs for pregnant women is a high priority to reduce tobacco-related morbidity and mortality. Particular attention should be given to other family members’ smoking and other health behaviors (e.g., nutrition). Complex socioeconomic and public health programs are needed for ameliorating the high smoking rates in this underdeveloped part of Hungary.

This research project was supported by the Fogarty International Center, the National Cancer Institute, and the National Institute of Drug Abuse (1 R01 TW007927-01, PI: Dr. Foley; Co-PI Dr. Balazs).

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POS1-56 NICOTINE ADDICTION AND OBSTETRICAL OUTCOMES AMONG TOBACCO SMOKING PREGNANT WOMEN

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Background: Pregnancy is an optimal motivator for tobacco cessation, but breaking the habit depends on the level of nicotine addiction. Methods: We conducted the Fagerström Nicotine Dependency Test in a retrospective cohort of women (2009-2011) with live-born babies (N=9,810) in three counties of Northern Hungary. Data were analyzed by the SPSS (v. 20.0). Results are reported in odds ratios and 95% confidence intervals (p<0.001). Results: 76.7 % (n=75,272) either decided for cessation in the first trimester or never smoked. 23.3% (n=2,293) were daily smokers throughout their pregnancy. Among the smokers, 25.6 % were moderately or less dependent while 74.4% were extremely strongly or strongly dependent. Prevalence of preterm births increased as levels of addiction increased (6.4% for non-smokers or quitters; 11% for less//moderately addicted and 13.3% for strongly addicted). Women who were strongly addicted were significantly more likely than those moderately (OR=1.44, 95%CI: 1.11-1.81) or less/not addicted (OR 2.02, 95%CI: 1.70-2.41) to have a PTB baby. In the same order, the low birth weight frequency was 5.6 – 13.1 – 17.8%, that of the stillbirth 1.3 – 2.1 – 3.2 %. Body weight values in average were 2912 g. 3010 g. and 3032 g. Women who were strongly addicted were significantly more likely than those moderately (OR=1.44, 95%CI: 1.11-1.87) or less/not addicted (OR=2.02, 95%CI: 1.70-2.41) to have a LBW baby. Odds ratios were significantly different too in maternal health status and other neonatal biometrics. Conclusions: There appears to be a dose-response relationship between level of nicotine addiction, pre-term birth and birth weight of babies. A more comprehensive evaluation of the risk of nicotine dependency among pregnant smokers and obstetrical outcomes is needed.

This research project was supported by the Fogarty International Center, the National Cancer Institute, and the National Institute of Drug Abuse (1 R01 TW007927-01, PI: Dr. Foley; Co-PI Dr. Balazs).

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POS1-57  KNOWLEDGE, ATTITUDES, AND HEALTH BEHAVIOURS ASSOCIATED WITH WOMEN SMOKING IN HONG KONG: A CROSS SECTIONAL STUDY

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Background: Despite the existence of gender-specific associations on smoking, assessments of women’s knowledge, attitudes and behaviours associated with ever-smoking are rare in the context of Chinese culture. Aims: This study examined the knowledge, attitudes and health behaviours of adult female in Hong Kong and their associations with ever-smoking. Methods: A cross-sectional population-based telephone survey was conducted from July 2011 to February 2012 to recruit 3044 females aged 15-64 years, including 2032 non-smokers, 509 ex-smokers, and 503 current smokers. Results: The mean age of participants was 43.1 years (±14.3). The majority of participants attained secondary education (56.0%), were married (65.0%) and unemployed (55.3%), and had children (54.2%). Ever-smokers were less likely to report belief that third hand smoking is harmful to health (OR=0.77; 95% CI: 0.60, 0.97) and traditional women do not smoke (OR=0.74; 95% CI: 0.59, 0.93), and supportive attitude on avoiding second hand smoking, including ‘I avoid second hand smoking’ (OR=0.32; 95% CI: 0.21, 0.48), ‘I ask people not to smoke around me’ (OR=0.48; 95% CI: 0.37, 0.62), ‘I do not allow people including my family members to smoke at home’ (OR=0.62; 95% CI: 0.49, 0.80). In contrast, ever-smokers were more likely to report belief that ‘smoking can reduce stress and control emotion’ (OR=3.09; 95% CI: 2.48, 3.84), ‘female smoking is acceptable’ (OR=3.27; 95% CI: 2.60, 4.11), ‘passive smoking causes osteoporosis’ (OR=1.25; 95% CI: 1.00, 1.56), supportive attitude that ‘the person-in-charge of the venue is subjected to penalty if he/she allows smokers to smoke in an area where smoking is forbidden’ (OR=1.41; 95% CI: 1.05, 1.90), having smoking family members (OR=1.59; 95% CI: 1.27, 2.00), having physical activity (OR=1.64; 95% CI: 1.32, 2.03), alcohol drinking (OR=1.95; 95% CI: 1.57, 2.41), and use of contraceptive (OR=2.14; 95% CI: 1.26, 3.64). Conclusions: Interventions which clarify some smoking myths, promote knowledge of third hand smoking and supportive attitudes on avoiding second hand smoking, and reduce some risk behaviours, may prevent smoking.

Funding by: The Hong Kong Council on Smoking and Health.

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POS1-58  WOMEN’S LONGITUDINAL SMOKING PATTERNS IN THE PERINATAL AND EARLY PARENTING PERIOD: PROFILES OF BIOLOGICAL MOTHERS OF A 2001 U.S. BIRTH COHORT

Elizabeth A. Mumford, Ph.D.*, Elizabeth C. Hair, Ph.D., Tzy-Chyl Yu, Ph.D., and Weiwei Lu, Ph.D., NORC at the University of Chicago

The aims of this study are to identify longitudinal patterns of women’s smoking during the peri-conception, perinatal, and early parenting period and to describe risk factors distinguishing the different longitudinal profiles. The study sample consists of 8,650 biological mothers of the Early Childhood Longitudinal Study – Birth Cohort (ECLS-B), nationally representative of U.S. births in 2001. Longitudinal latent class analysis (LLCA) was applied to estimate profiles of biological mothers by their self-reported smoking status, measured as a binary characteristic at three months preconception, the third trimester, and at the child’s approximate age of 9 months, 2 years, 4 years, and 5 or 6 years (samples allowing for staggered entry into kindergarten). Five latent classes were identified: Pregnancy-Induced Quitters (4.3%), Delayed Committed Smokers (5.1%), Early Committed Smokers (8.5%), Post-Partum Relapers (10.4%), and Nonsmokers (71.7%). These classes were distinguished by age, race/ethnicity, education, poverty status, marital status, parity, drinking behavior, and depression. For example, when compared to those with college degrees, those with less than high school degree are more than 20 times (Odds Ratio=21.26; 95% Confidence Interval, 5.15, 87.71) as likely to be in the “delayed committed smokers” class (versus the non-smoker class). In sum, longitudinal patterns of smoking relapse and potential uptake post-delivery of a child indicate the need for improved screening to better target prevention and cessation interventions during this period. This research is supported by a grant from NIDA (1 R01 DA030496-01A1).

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POS1-59  BIOMARKER EVIDENCE OF TOBACCO SMOKE EXPOSURE IN CHILDREN PARTICIPATING IN LEAD SCREENING

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Objective: Lead screening programs provide an opportunity to concurrently detect tobacco smoke exposure (TSE) at well-child visits. Our study objective was to describe TSE, defined by detection of cotinine, in dried blood spots (DBS) collected for lead screening in very young children. Methods: We analyzed DBS from a national sample of Black and White children, <48 months old, whose blood was analyzed for lead at a commercial laboratory (lead levels <9 μg/dL; Ni<1541). These punches were extracted and then analyzed for cotinine by solid phase extraction, followed by liquid chromatography tandem mass spectrometry (LC/MS/MS). An anonymous administrative data set including age, race, sex, month of DBS collection, zip code, Medicaid status, and lead level was used in univariate and multivariate analyses of factors that predicted cotinine and lead levels. Results: Cotinine was detected in 61% of DBS: 17% of samples had cotinine levels >3 ng/g (~2 ng/ml plasma). Median cotinine levels were higher in Blacks than in Whites (0.66 ng/g vs. 0.30 ng/g, p<0.001) and in Medicaid recipients (0.94 ng/g vs. ~0.3 ng/g, p<0.001). In multivariate analyses, a significant increase in cotinine was associated with Black race (reg coeff 1.27, p=0.049), older age (reg coeff for 6 month intervals 1.10, p=0.001), Medicaid recipient (reg coeff 1.80, p<0.001), and state smoking rate (cotinine ratio for 1% increase 1.12, p<0.001). The following factors predicted lead levels in the sample: age (reg coeff for 6 month intervals 1.07, 95% CI 1.05-1.09, p<0.001), female sex (reg coeff 0.92, p=0.013), collection month in the summer (reg coeff 1.20, p<0.001), and cotinine >0.3 ng/g (reg coeff 1.21, p<0.001). Conclusions: TSE is highly prevalent among children who undergo lead screening. Exposure is higher among Blacks and children on Medicaid. TSE may contribute to lead exposure up to 9 μg/dL. Concurrent lead and biological screening for TSE at well-child visits is be a feasible approach to increasing childhood TSE detection. This work was supported by NHLBI 1RC2HL10140.

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POS1-60  AN UPDATE ON THE TRENDS IN THE EXPOSURE OF U.S. NONSMOKERS TO SECONDHAND SMOKE: 1999-2010

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The objective of this study was to update the trends in the exposure of nonsmokers in the US population to secondhand smoke (SHS). This study builds on a previous report and presents an additional 8 years of data. We analyzed serum cotinine and interview data collected from the biannual National Health and Nutrition Examination Survey (NHANES) for the years 1999-2010. Study participants were representative of the U.S. civilian, non-institutionalized population, greater than or equal to 3 years of age. We examined the geometric mean of serum cotinine concentrations in nonsmokers in each survey for all participants and by participant age, sex and race/ethnicity. We measured serum cotinine using a highly sensitive liquid chromatography tandem mass spectrometric method that has been maintained continuously in the same laboratory. Stability and precision of the method has been monitored by annually re-assaying aliquots of the original quality control pools that were used in the first NHANES survey.
to measure serum cotinine. Despite the ongoing improvements in methodology and instrumentation that have been incorporated into the assay, no systematic drift in serum cotinine measurements has been detected. We found a significant decrease in mean serum cotinine concentrations in the population overall and for all demographic groups based on age, sex and race/ethnicity. For all nonsmokers the mean serum cotinine concentration decreased 33.7% from 1999 to 2010. Teenagers had the largest decrease of all age groups (65.7%), followed by children (63.7%), then adults (29.2%). Males showed a larger decrease (62.9%) than females (29.6%). Non-Hispanic blacks had a larger decrease (46.0%) than either Mexican Americans (37.2%) or non-Hispanic whites (28.5%). Data from these analyses show a substantial decline in exposure of US nonsmokers to SHS over the past 12 years. Much of the decline is probably due to intensive public health efforts aimed at reducing SHS exposure. However certain demographic groups, namely non-Hispanic blacks and children, continue to have higher serum cotinine levels than the overall population, indicating higher risk of adverse health effects.

No funding.

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POS1-61
HEALTH INEQUALITY IN CHILDREN'S EXPOSURE TO THE SECONDHAND SMOKE AT HOME IN TAIWAN
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Objective: To examine the children’s risk of secondhand smoke at home with respect to the family socioeconomic characteristics. Method: This study used the 2001 National Health Interview Survey (NHIS) to identify 3,302 children who aged less or equal than 12 years (1,701 boys and 1,601 girls). Logistic regressions were used to examine the association between the risk of SHS exposure at home and their family socio-economic status and smoking behavior. Result: In Taiwan, 64.84% of children were exposed to SHS at home. Children’s risk of being exposed to SHS smoke at home was negatively associated with the educational level of the best-educated family member (OR=0.22, 95%CI: 0.10 - 0.46). Children were less likely to be exposed to SHS at home if born in the family of higher income level (OR=0.57, 95%CI: 0.39 - 0.83). The number of male and female family members who smoked strongly increased the children’s risk of SHS exposure smokers (male: OR=14.8, 95%CI: 12.22 - 17.92; female: OR=4.38, 95%CI: 2.72 - 7.05). Conclusion: Children in the family with lower socio-economic level bear higher risk of being exposed to SHS at home. Male smokers play the most important role in the high risk of SHS at home. Future tobacco control policy should put efforts on reducing the SHS at home by provoking smoke-free home. Family members who had high education level and household income level tended to reduce the risk of exposure in second-hand smoking among children. However, children lived with smokers would increase the risk of exposure in second-hand smoking.

This research was funded by Bureau of Health Promotion, Department of Health, Taiwan, ROC.

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POS1-62
EFFECT OF SECONDHAND SMOKE ON HEALTHCARE UTILIZATION AMONG CHILDREN WITH AND WITHOUT ASTHMA
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Background: Childhood secondhand smoke exposure has been linked to healthcare utilization and asthma. However, research examining the association between childhood smoke exposure and healthcare utilization among asthmatic children is limited. Given the increasing trend of childhood asthma prevalence, understanding the association between secondhand smoke exposure and asthma-related healthcare utilization is necessary. Methods: A total of 7482 children aged 0-11 years were included in the study. Healthcare utilization, asthma diagnosis and demographic information came from the 2001 and 2006 Medical Expenditure Panel Surveys (MEPS). Secondhand smoke exposure was determined by in-person interviews in the 2000 and 2005 National Health Interview Surveys (NHIS). Multivariable regression models were used for analysis. Asthma diagnosis and healthcare utilization were outcomes and secondhand smoke exposure was the primary predictor. All the analyses were weighted and adjusted for child characteristics, family characteristics and survey year. Results: Secondhand smoke exposure was associated with an 18% increased odds of asthma (95% CI=0.97-1.43). The prevalence estimates of childhood asthma were 10.8% and 9.5% among children with and without secondhand smoke exposure, respectively. Secondhand smoke exposure was associated with a 37% increased odds of having emergency department visits (95% CI=1.24-1.51). Among asthmatic children, secondhand smoke exposure doubled the odds of hospitalization (OR=2.18, 95% CI=1.29-3.67). Among non-asthmatic children, the effect of secondhand smoke exposure was not significant (OR=1.10, 95% CI=0.84-1.49). Childhood asthma was related to a higher odds of using healthcare services, including emergency department visits (OR=1.66, 95% CI=1.43-1.63), ambulatory visits (OR=1.69, 95% CI=1.25-2.22) and prescription medication use (OR=4.36, 95% CI=3.72-5.77). Conclusion: Secondhand smoke exposure was associated with greater healthcare utilization, and exposure exacerbated use of inpatient services among asthmatic children. Reducing secondhand smoke inside the home would help to reduce utilization among children, especially asthmatic children.

No funding.

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POS1-63
PROTECTING DISADVANTAGED CHILDREN FROM SECONDHAND SMOKE AT HOME: A PILOT FEASIBILITY STUDY
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Background: In the UK over half of children who live with smokers are regularly exposed to secondhand smoke (SHS) at home. If parents cannot stop smoking the next best way to reduce children’s exposure is to promote smokefree homes. There is limited evidence of the effectiveness of interventions to reduce children’s SHS exposure in the home and therefore the aim of this study was to evaluate the feasibility and acceptability of a novel intervention package to help parents to reduce home smoking. Methods: The trial had two waves; experience gained in the initial wave was used to revise trial procedures for the second. 14 families who smoked in the home were recruited from Children’s Centres in Nottingham and were seen in their own home during a 12 week intervention (wave 1 at baseline, weeks 4, 8, 12; wave 2 at baseline, weeks 1, 4, 7, 12). The intervention consisted of three key components: (1) behavioural support, (2) prescription of nicotine replacement therapy (NRT) for temporary abstinence and (3) feedback on levels of smoke exposure in the family of children’s salivary cotinine or PM2.5 air quality. Change in levels of smoke exposure between baseline and week 12 were assessed and qualitative interviews were conducted with parents at the end of the intervention. Results: Of the 14 participants recruited, 12 mothers completed the study (six in each wave). All mothers received feedback on home smoke exposure and behavioural support and the majority at least tried NRT. Mother’s reported feedback was the most important component of the intervention, followed by behavioural support and then provision of NRT. Saliva cotinine results were highly variable in wave 1 therefore measures of air quality (PM2.5) were used for feedback and evaluation in wave 2. Average 24 hour PM2.5 levels reduced by 49% (range -85% to +9%) between baseline and week 12. Conclusions: The intervention is both acceptable and feasible. Saliva cotinine was highly variable possibly reflecting children’s exposure outside the home. Using PM2.5 in wave 2, we found initial evidence that this novel intervention may be effective in helping parents to make changes to their home smoking behaviours.

This study presents independent research commissioned by the National Institute for Health Research (NIHR) under its Programme Grants for Applied Research funding scheme (RP-PG-0608-10201). The views expressed in this
abstract are those of the authors and not necessarily those of the NHS, the NIHR, or the Department of Health.

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POS1-64
TOBACCO SMOKING AND SECONDHAND SMOKE EXPOSITION OF PREGNANT WOMEN IN HUNGARY

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Background: Smoking and exposure to secondhand tobacco smoke has a significant impact on the health of neonates and overall health of expectant mothers. Smoking and SHS exposure is worse in the least developed northeastern counties of Hungary with a considerable ethnic Roma population. This study aimed to compare tobacco use and SHS exposure among Roma and non-Roma women living in northeastern Hungary. Methods: Data were collected among all mothers with live births living in these counties who consented to participate in the study (n= 9,040, 71% response rate). The in-person interview questionnaires contained biometric data of neonates and demographic, socioeconomic and sociocultural data of their mothers. Chi square tests were used to compare exposure to smoking and SHS among Roma and non-Roma pregnant women (p<0.001). Results: Prior to pregnancy, 39.8 % of women were smoking. 49.2% Roma women and 29.7% non-Roma. When smokers learned they were pregnant only 12.9 % of Roma decided to quit versus 53.2 % of non-Roma women. During pregnancy 69.7% of all expectant mothers were “ever” exposed to secondhand smoke and 47% were routinely exposed in confined spaces. Work place exposure occurred among 17.5% of the women. The average birth weight of neonates of smoking women was lower by 214 gram (p<0.001). Conclusions: Active smoking and exposure to secondhand smoke during the pregnancy has a significant impact on the weight of newborn babies. Ethnicity must be considered in targeted programs to improve maternal and child health outcomes. Prevalence of workplace SHS exposure should now decrease with new national clean indoor air laws that went into effect in January 2012.

This research project was supported by the Fogarty International Center, the National Cancer Institute, and the National Institute of Drug Abuse (1 R01 TW007927-01, PI: Dr. Foley; Co-PI Dr. Balázs).

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POS1-65
HOUSEHOLD SECONDHAND SMOKE POLICIES AND ENT SYMPTOMS IN CHILDREN

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Introduction: Exposure of children to secondhand smoke is known to be associated with ear, nose and throat (ENT) symptoms; however, the household non-smoking policies may mitigate these conditions. Methods: A convenience sample of children attending an outpatient ENT clinic at the national children’s hospital (Heim Pal) in Budapest, Hungary was drawn for the study, yielding a participation rate of 97 %. Parents/caregivers of participating children completed a survey that collected information on ENT symptoms, living situation (e.g., mutli-unit housing), home/car smoking policies, and difficulty asking people not to smoke in the home, among other measures. Linear and logistic regression analyses were conducted to assess the relationship among study variables. Results: The average age of the sample children was approximately 72 months: 54% were male, and 39% lived in a household with at least one smoker. Smoking was not allowed in the home at any time for 85% of children, not allowed in the car for 91% of children, and more than 83% of children had no smoke exposure at home. Parents/caregivers of children with pneumonia found it less difficult to ask visitors in the home not to smoke (OR=0.23, 95% CI=0.06-0.98). Conversely, parents/caregivers of children who had adenoidectomy found it over three times more difficult to ask strangers not to smoke near the child compared to those of children without adenoidectomy. Child symptoms of rhinitis and sinusitis correlated with younger age; male sex (for rhinorrhea and daytime cough); and parent/caregiver difficulty asking others not to smoke. Conclusions: Our data show that nearly half of the smoking families still do not perceive harm to the child from household smoke. In general, the children of parents who found it easier to ask others not to smoke in the house or near the child had fewer ENT conditions. So, supporting smokers to quit smoking is a public health priority.

Supported by Fogarty Found.

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POS1-66
FACEBOOK POSTS DECLARING REASONS FOR QUITTING OR REDUCING TOBACCO USE: WHAT ARE YOUNG ADULTS SAYING?

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PURPOSE: The study examined how young adult smokers expressed their reasons for quitting or reducing their tobacco use on Facebook. METHODS: As part of a smoking cessation contest hosted at 42 post-secondary institutions in Ontario (Canada), in 2012, contestants were invited to post their top reason for quitting or reducing their tobacco use on a dedicated Facebook page. Two raters categorized each post into these broad categories: cost; health; appearance; family; other. Other salient features of the posts were also noted. RESULTS: During a 2-week period, 145 smokers posted to Facebook. The most common reasons for quitting or reducing tobacco use were health (47%), family (29%) and other (15%). It was noted that, beyond these traditional categories, posts frequently expressed compelling reasons of personal growth, redefinition of self, accountability, social responsibility and the pursuit of dreams/better futures. Many individuals spontaneously offered multiple reasons for quitting and supported their reasons with complex rationales, personal anecdotes, or even lengthy stories. A strong passion for change was evident in the posts. Posts reflected well-developed, often profound, reasons for quitting. SIGNIFICANCE: Despite the often-personal nature of their comments, smokers appeared comfortable with the public, casual nature of posting on Facebook, allowing for a unique glimpse into the ‘real world’ reasons young adults quit. It is believed that comfort with the interface may have allowed young adult smokers to express themselves in ways traditional surveys may not capture. A strong passion for quitting was evident in the posts and it was apparent that though the contest may have acted as a motivator, smokers often had previously constructed, widely variant reasons for quitting. Use of information posted on social media sites may provide pertinent, personal data from this age group granting insight that could be used to further enrich programs and policies aimed at reducing young adults’ smoking prevalence. Funding: Ministry of Health Promotion and Sport (Ontario).

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POS1-67
YOUNG ADULT SMOKERS’ USE OF NICOTINE REPLACEMENT THERAPY: IS COST THE ONLY BARRIER?

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Purpose: Young adult students who smoke may not use nicotine replacement therapy (NRT) because the cost is prohibitive. To eliminate this barrier, college health clinics were fully supplied with multiple strengths of patch and gum to distribute free-of-charge. This study explored whether non-cost barriers restricted young adult smokers’ use of NRT. Methods: In Fall 2011, with extensive messaging
about its availability, free NRT was supplied to 44 post-secondary health clinics in Ontario, Canada. In Spring 2012, all medical professionals in these clinics were asked to complete an anonymous survey about their use of the free NRT with patients who smoke. Surveys were returned by 56% of doctors and 77% of nurses (N = 254). Results: On average, health professionals asked 44% of their patients about smoking and discussed smoking with 61% of those identified as smokers. Among smokers with whom smoking was discussed, professionals identified 60% as ‘good candidates for NRT,’ but gave free NRT to just 34%. Responding on 5-point scales, medical professionals who had (vs. had not) given out free NRT were more likely to view NRT as helpful (4.6 vs. 3.7). They also felt more effective at instructing smokers about correct use of NRT (3.9 vs. 2.7), supporting smokers to make a quit attempt (3.1 vs. 2.4), and helping smokers overcome relapse (3.3 vs. 2.7). They felt more confident in their ability to provide brief (3.9 vs. 3.1) and intensive (3.5 vs. 2.6) interventions. Significance: Medical professionals gave free NRT to only a fraction of young adult smokers they considered good candidates. Given that age of cessation strongly impacts reversibility of smoking-related health risks, young adults should be offered evidence-based interventions sooner rather than later. Multiple failed attempts, older age, and stronger addiction cannot be seen as necessary indications for pharmacological treatment. Medical professionals who have less favourable perceptions of NRT’s effectiveness and their own abilities to support patients’ smoking cessation may benefit from continuing education about NRT’s effectiveness and tailored strategies for assisting young adults to quit. The MISSYA project was funded by Health Canada, with support from the Ministry of Health Promotion and Sport (Ontario).

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**POS1-68**

**CYP2A6 ALTERS NICOTINE DEPENDENCE RISK AND PROGRESSION IN ADOLESCENCE: A REPLICATION ANALYSIS**

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**OBJECTIVE:** Seemingly opposite observations for CYP2A6 in nicotine dependence (ND) in adolescence were described by longitudinal studies of white youths. O’Loughlin et al (2004; NDIT, N=228) reported that slow nicotine metabolizers, conferred by CYP2A6 reduced activity variants, had an increased risk of developing ND, while Audrain-McGovern et al (2007; GATOR, N=222) reported that nicotine dependence emerged at a faster rate among normal than slow/intermediate metabolizers. In a reanalysis of the two data sets (Koudsi et al., 2010), the distinction between onset of dependence and progression in symptoms became crucial. Slow metabolism increased the risk of becoming dependent (ICD-10, mFTQ), while normal metabolism increased progression in level of dependence (mFTQ). We attempted to replicate these analyses in a third longitudinal sample.

**METHODS:** The data are from a subsample of 183 non-Hispanic white smokers aged 12-16, who were not dependent at baseline, from a cohort drawn from the Chicago Public Schools and followed for 2 years. Participants were classified as normal, intermediate or slow nicotine metabolizers based on CYP2A6 genotype.

Nicotine dependence phenotypes included (1) dichotomous measures based on the DSM-IV and three cut-off points on the mFTQ, and (2) a continuous measure of mFTQ scores. Hazard models were implemented for onset and latent growth models for symptom progression. RESULTS: Small sample sizes affected the significance of results. As in NDIT, onset of dependence was higher among slow than normal metabolizers. As in GATOR, progression in nicotine dependence was faster (higher linear trends) among normal than slow/intermediate metabolizers, although the results did not reach statistical significance. Unexpectedly, intermediates had the lowest ND rates of any group. CONCLUSION: We have replicated that in adolescence, early in the process of smoking, CYP2A6 variants that reduce nicotine metabolism appear to increase the risk of ND onset but decrease the rate of escalation of ND symptoms. Underlying mechanisms accounting for these differing impacts between onset and progression remain to be elucidated.

We acknowledge the support of grants DA12697 from NIDA/NCI, DA026305 and K05-DA0881 from NIDA, and ALF-CUS1672301A1 from the American Legacy Foundation (Dr. Kandel); CAMH, the CAMH Foundation, the Canada Foundation for Innovation (W20289 and #16014), CIHR MOP86471 and TMH 109787 (Dr. Tyndale).

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**POS1-69**

**TIME TO FIRST CIGARETTE PREDICTS NNAL IN DAILY AND NON-DAILY ADOLESCENT SMOKERS**

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**The time to the first cigarette of the day (TTFC) is an indicator of several dimensions of nicotine dependence including ability to quit smoking. Smokers who consume their first cigarette immediately after waking have higher blood cotinine levels than smokers who refrain from smoking a half hour or more after waking. An early TTFC is also associated with an increased risk of lung and other tobacco-related cancers. We hypothesized that TTFC is an indicator of exposure to tobacco smoke carcinogens as well as nicotine. This is supported by data that shows a correlation between urinary cotinine and the tobacco-specific carcinogen 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol (NNAL) in active smokers.**

**Due to several factors including social restrictions and access to cigarettes, adolescents have different smoking behaviors than adults. For example, adolescents smoke fewer overall cigarettes, have smaller overall puff volume, and may not smoke on a daily basis. As such, it may be more difficult to determine the relation between cigarettes per day (CPD) and key biomarkers of nicotine exposure and cancer risk in adolescent populations. The present study sought to determine the relation between TTFC and serum NNAL levels among both daily and non-daily adolescent smokers.**

The study utilized 2007-2008 and 2009-2010 National Health and Nutrition and Examination Survey (NHANES) data from 220 adolescent smokers who had smoked on at least one day in the past five days. Participants were divided into groups of daily (reported smoking on five of the last five days) and non-daily smokers (reported smoking on four or fewer days in the last five days). Weighted multiple linear regression analyses predicting log-transformed NNAL levels included 6 covariates: (1) age, (2) age first started smoking, (3) gender, (4) creatinine, (5) average CPD, and (6) TTFC. Separate analyses were conducted for daily and non-daily smokers. In both daily and non-daily smokers, TTFC emerged as a significant predictor of NNAL levels, p < .01. This suggests that TTFC is an important behavioral indicator of nicotine exposure and risk, even in those adolescents who do not smoke on a daily basis.

**No funding.**

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**POS1-70**

**LET'S TALK: THE IMPACT OF ANTI-SMOKING PARENTING PRACTICES AMONG FOREIGN- AND U.S.-BORN MOTHERS ON THEIR PREADOLESCENTS’ SUSCEPTIBILITY TO SMOKE CIGARETTES**

Krista Beth Highland, Ph.D.*,†, Kenneth Tercyak, Ph.D.,‡, Cassandra A. Stanton, Ph.D.,§, and Ray Niaura, Ph.D.,‖

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**Anti-smoking parenting practices have been shown to protect children against smoking uptake and progression, even after controlling for their parents’ smoking status. Parenting style may further impact the anti-smoking strategies used, as children of authoritative parents report receiving more anti-smoking parenting. Findings such as these have commonly been established in White Midwestern samples.** Far less is known about these associations among multi-ethnic urban members and whether associations vary between foreign- and US-born mothers and other parent-child factors. School-based self-report surveys were collected to examine these associations among eighth graders (N=458; modal age 14 years;
POS1-71
MATERIAL AND LIFESTYLE PROBLEMS AMONG DAILY SMOKERS IN NORWAY 1999-2011

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Background: Findings from international studies suggest growing concentration of smoking among marginalized groups, which also suggest that the accumulation of problems among daily smokers may grow over time. This study examines how material problems and poor health-behaviours among daily smokers have changed over time.

Methods: Data from repeated cross-sectional surveys conducted every two years from 1999 to 2011 by Synovate Norway were used. The sample was representative of Norwegian adults 16 years and older. The sample size varies between 3429 and 3999 subjects (50.3 to 51.0 % women) in the time period, and number of daily smokers varies between 1115 in 1999 (31.9 %) and 567 in 2011 (14.2 %). The changes over time in low occupational status, renting the home, not owning a car, meeting friends seldom, poor health behaviours (diet, physical activity, alcohol use), self-rated poor health and a fatalistic attitude and the sum of these problems among daily smokers (DS) and non-daily (NDS) and non-smokers (NS) combined were assessed using chi square and logistic regression analyses.

Results: The proportion of women among DS increased from 50 % in 1999 to 55 % in 2011. Number who rented their home, with poor health behaviours and a fatalistic attitude decreased over time for both DS and NDS/NS; in 1999 17 % of DS had at least four problems (P<0.001). These results suggest a protective effect, particularly among foreign-born mothers, of authoritative and anti-smoking parenting that may, in turn, reduce children’s susceptibility to smoke. Anti-smoking prevention programs should assess for the presence of effective parenting practices within the target community and assist parents to develop culturally-acceptable strategies that optimally deter smoking among their children.

Supported by National Cancer Institute Award K07CA95623.

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POS1-72
CHARACTERIZING TRAJECTORIES OF MATERNAL SMOKING DURING PREGNANCY

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Maternal smoking during pregnancy (MSDP) is a major public health issue. Rates in the United States range from 9-30%. MSDP is associated with low birthweight and sudden infant death syndrome, and long-term adverse neurobehavioral outcomes. Prior studies showed that individual factors such as maternal age, income, education, and mental and physical health, along with context factors such as neighborhood socioeconomic status distinguish smokers and quitters during pregnancy. Little research though characterized MSDP trajectories over pregnancy in relation to psychosocial and medical predictors despite implications for intervention and prevention efforts for mothers and exposed offspring. Utilizing a diverse, low income sample of pregnant smokers, quitters, and non-smokers, we characterized trajectories of smoking in relation to medical and psychosocial correlates. Participants were 124 mothers (ages 18-40, M=24.62, SD=4.88; 43% Caucasian). We used timeline followback to estimate average cigarettes smoked/day across pregnancy (gestational ages 36-42 weeks, M=38.54 SD=11.29). We modeled 11 repeated measures of cigarettes smoked (every fourth week) to reduce the parameter/participant ratio. A mixture of empirical (BIC & BLRT) and substantive criteria were used to identify MSDP trajectories, which were then characterized on 13 known biopsychosocial correlates using multinomial logistic regression. We found four trajectories; Non-smokers (NS; n=57), persistent high smokers (PH; n=42), quitting (QN; n=18), and slow reducers (SR; n=7). Mothers with pregnancy related stress had more than seven times higher odds (Odds Ratio=7.58, 95% Confidence Interval= 1.41, 40.67) of being in the QN than NS trajectory. First trimester alcohol use was higher and education lower in all three smoking trajectories versus NS. QN participants had significantly higher birthweight versus PS (Mean difference=22.74, p<0.02). To our knowledge, the present study is the first to model MSDP trajectories in relation to a comprehensive set of biopsychosocial measures of MSDP risk factors. Teaching pregnant smokers to manage stress may help them quit, particularly when facing high environmental stressors.

Funding: NIH/NIDAGrant R01 DA019558-05 and a FAMRI Clinical Innovator Award.

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POS1-73
CHARACTERISTICS AND RISK FACTORS OF POLYTABacco USING YOUTH IN MARYLAND

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Polytobacco users may be at increased risk for negative health consequences, greater nicotine dependence, and use of other substances (alcohol, marijuana, cocaine). Understanding the characteristics and attitudes of polyyobacco users is important for prevention. This study examined patterns of single and polyyobacco use using data derived from the 2010 Maryland Youth Tobacco Survey (MYTS), a classroom-based survey of 86,098 public middle (MS) and high (HS) school students. A subsample of underage (<18) youth who reported current (past month) tobacco use (N=16,928) were classified into one of four groups: (1) cigarettes only (16.0%), (2) single use of a non-cigarette product (e.g., cigarettes, smokeless, bidis, kreteks, etc.) (30.0%), (3) polyyobacco use including cigarettes (41.4%), and (4) polyyobacco use excluding cigarettes (12.6%). We explored group differences on demographic characteristics, attitudes, and use of other substances. Youth who reported using cigarettes only were more likely to be White, female, and in HS. Youth who reported single use of a non-cigarette product were more likely to be in MS and African American. Youth who reported polyyobacco use including cigarettes were more likely to be in HS, male and Hispanic while polyyobacco users excluding cigarettes were more likely to be male and African American or from an ‘other’ racial group. There were significant single vs. polyyobacco use differences on smoking related attitudes (e.g., tobacco is harmful, addictive, etc.) with single product users endorsing more negative attitudes regarding smoking.
relative to polytobacco users ($p < .001$). Similarly, polytobacco users reported higher rates of past month alcohol use, binge drinking and marijuana use relative to single tobacco users ($p < .001$). Prevention and intervention efforts targeting youth tobacco users should address unique characteristics, needs, and risks of polytobacco users.

No funding.

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POSTER SESSION 1 • Thursday, March 14, 2013 • 11:30 a.m.–1:00 p.m.

POS1-74 TOBACCO USE AND PSYCHOTIC EXPERIENCES IN UK TEENAGERS - A LONGITUDINAL STUDY

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A consistent association between cannabis use and psychotic experiences (PES) has been described, but confounding by tobacco is hard to rule out. We attempt to assess the independent effect of tobacco on PES, as there are more tobacco users who don’t use cannabis than there are cannabis users who don’t use tobacco. This means that while collinearity is a problem when assessing cannabis’ independent association with PES, this is not the case for tobacco. We used data from the Avon Longitudinal Study of Parents and Children (ALSPAC) birth cohort (N=2050). Tobacco use at age 16 was assessed via self-report questionnaire. PES at age 18 were assessed via semi-structured interview. Confounders were: pre-birth: family history, maternal education; childhood: childhood depression, borderline personality traits, conduct disorder; and teenage: alcohol (AUDIT), cannabis use and other illicit drug use. Ordered logistic regression analyses were conducted between frequency of tobacco use at age 16 (never/experimenter/weekly/daily) and severity of PES at age 18 (none/suspected/definite/definite plus problems). Anyone who self-reported PES at age 16 was excluded. There was a strong association between frequency of tobacco use at 16 and severity of PES at 18 (Odds Ratio (OR) 1.70,95% CI:1.41,2.04). Adjustment for pre-birth confounders did not alter the relationship. Further adjustment for childhood confounders attenuated the relationship slightly, although a strong association remained (OR 1.60,95% CI:1.32,1.94). Additional adjustment for teenage confounders further attenuated the relationship, but a strong association still remained (OR 1.48,95% CI:1.31,1.95). The association between tobacco and PES was robust to confounding by measured variables. This was contrary to findings in the same sample investigating cannabis use, where adjustment for illicit drug or tobacco use greatly attenuated the previously similar relationship. There is little evidence as yet for a psychogenic effect of tobacco, so our findings may be due to confounding. If so, there are implications for interpreting cannabis and psychosis associations, as not all studies adjust for tobacco, and those that do use crude measures.

PhD is funded by Medical Research Council.

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POS1-75 GENDER DIFFERENCES IN THE RELATIONSHIP BETWEEN ADOLESCENT CONDUCT PROBLEMS, EXPOSURE TO TOBACCO ADVERTISING, AND SMOKING INITIATION

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Background: Adolescent conduct problems are associated with an increased risk for smoking, with gender possibly moderating this relationship. Exposure to tobacco advertising also increases adolescents’ smoking risk, but it remains unclear how gender, conduct problems, and advertising exposure may jointly influence smoking initiation over time. Methods: Data were from adolescent participants of a multigenerational study of biospsychosocial risk factors for smoking. Adolescents completed a baseline interview with a parent and a follow-up themselves 5 years later. Baseline measures included lifetime conduct problems (16 items, KR-20 = .77) and tobacco advertising exposure (3 items, α = .76). Smoking initiation was assessed at both time points. Analyses examined gender differences in the relationship between conduct problems, advertising exposure, and smoking initiation, accounting for the presence of siblings in the study. Results: At baseline (n = 542, 53% female, 85% white, M age 14.0, 27% lifetime smokers), 36% of males and 24% of females reported conduct problems (p = .002). Moderate levels of tobacco ad exposure were evident at baseline (M 3.4, SD 1.2, range 1-5), with greater exposure among those with conduct problems (p = .008). For males (n = 255), conduct problems were marginally associated with greater baseline ad exposure independent of demographics and smoking status (B = .32, p = .06). For females (n=287), non-smokers who reported conduct problems had significantly greater ad exposure at baseline (B = .48, p=.07). By the 5 year follow-up (n =323, M age 19.6), 62% had initiated smoking. After adjusting for demographics, baseline conduct problems (B =1.03, p < .001) and ad exposure (B = .29, p = .04) predicted smoking initiation at 5 years. A significant interaction revealed that baseline ad exposure predicted smoking initiation at 5 years for females (B = .29, p = .04) but not males (B = .25, p = .13). Conclusions: Preventive interventions targeting youths with conduct problems should consider gender differences. For adolescent females, risk of smoking initiation may be greater among those with conduct problems and those who are exposed to tobacco advertising. This research was supported by NIH Transdisciplinary Tobacco Research Center Award CA084719.

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POS1-76 LAY THEORIES OF SMOKING AND YOUNG ADULT NON-SMOKERS’ AND SMOKERS’ SMOKING EXPECTATIONS

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The 2012 Surgeon General’s Report, “Preventing Tobacco Use among Youth and Young Adults,” reports that 1 in 3 people under the age of 26 smoke cigarettes and 2,500 occasional smokers under 26 become regular smokers each day in the U.S. The present study introduces and examines a theoretical construct, lay theories of smoking (LTS), as a correlate of smoking expectations among young adults. LTS lie on a continuum with incremental beliefs—the notion that smoking is dynamic and changeable—on one end and entity beliefs—the perception that smoking is static and fixed—on the other. A related but distinct construct, perceived behavioral control (PBC), refers to the extent to which people believe performance of a given behavior is within their own, personal control. The present study investigated the relationship between young adults’ LTS and expectations to smoke in the future. Undergraduate nonsmokers and smokers (N = 338) completed an online survey that assessed LTS and smoking expectations. PBC was controlled for in all analyses to understand how LTS differentially influenced smoking expectations. Hierarchical multiple regression was conducted to test if LTS explained smoking expectations independent of PBC. Among nonsmokers, stronger incremental beliefs were associated with greater expectations of trying smoking (B=-.41, p<.01). Among smokers, stronger incremental beliefs were associated with lower expectations of becoming a regular smoker (B=.36, p<.05). LTS explained expectations to smoke in the future differentially for young nonsmokers and smokers. For nonsmokers, stronger incremental beliefs were associated with greater expectations to try smoking. Believing smoking can be changed may lead nonsmokers to the (mis)perception that this behavior is less risky. Among current smokers, stronger incremental beliefs were associated with lower expectations of becoming a regular smoker. Confidence in the malleability of smoking behavior may be empowering, and as such health promoting for smokers. Thus, incremental beliefs may be detrimental for nonsmokers yet salutary for...
Young adults who have never smoked may be vulnerable to smoking initiation and adults first use cigarettes while enrolled in college. Estimates of the number of adult smokers varies dramatically across occupational groups and educational and sociodemographic backgrounds. Smoking usually takes place. Young adults have the highest smoking rate of any age group in the United States. Few studies, however, have examined the burden of smoking in relation to occupation among young workers. Methods: We used data from a representative sample of young workers aged 18-24 years from the National Health Interview Survey (NHIS), 2004-2010, to determine the prevalence of cigarette smoking by occupational group, as well as by gender, race, ethnicity, health insurance, and education. Workers were grouped into nine occupational categories based on the US Census Occupational codes (officials and managers, professionals, technicians, sales workers, administrative support workers, craft workers, operatives, laborers and helpers, service workers). All analyses were performed with adjustment for sample weights and design effects using SUDAAN and SAS statistical packages. Results: The sample consisted of 11,216 young workers (49.01% males). The overall prevalence of current cigarette smoking was 24.08% (27.89% in males; 20.03% in females). Among the occupational subgroups, craft workers had the highest prevalence of current smoking (36.4%); [95% Confidence Interval 32.2-40.7], while professionals had the lowest (12.3%; [10.29-14.54]). In addition, those with less than a high school education had the highest overall smoking prevalence (34.8%; [31.4-38.4]), while Hispanics had the lowest (16.0%; [14.2-18.0]). Conclusions: Smoking prevalence among US young workers varies dramatically across occupational groups and educational level. Occupation may play a role in encouraging smoking behavior and should be considered when prioritizing groups that need to be targeted with smoking prevention and cessation programs.

This study is funded in part through the National Institute for Occupational Safety and Health (NIOSH) Grant number R01 (MH03915). Funding is also provided to the European Centre for Environment and Human Health of the University of Exeter Medical School by the European Union Convergence Programme (European Regional Development Fund and European Social Fund).

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Poster Session 1 • Thursday, March 14, 2013 • 11:30 a.m.–1:00 p.m.

Given the increased prevalence of alternative tobacco product use among young adults and increased marketing of these products, we examined smoking status, other substance use, sociodemographic, and psychosocial characteristics in relation to alternative tobacco product use. In 2010, students at 6 colleges in the Southeast were recruited to complete an online survey assessing tobacco product use (i.e., cigarettes, cigars, little cigars, cigarillos, hookah, chew, and snus), along with alcohol and marijuana use, and other psychosocial variables. Of students who invited to participate, 20.1% (N=4,849/24,055) returned a completed survey. We created a variable for any alternative tobacco product use in the past 30 days. Bivariate analyses indicated differences in alternative tobacco product use among nonsmokers, nondaily smokers, and daily smokers, as well as in relation to gender, number of friends that smoke, living with a smoker, depressive symptoms, attitudes toward smoking, sensation seeking, and alcohol and marijuana use. Multivariate analyses indicated that daily and nondaily smokers were more likely than nonsmokers to use alternative tobacco products in comparison to nonsmokers (p<0.01), controlling for sociodemographic and psychosocial factors. Among current (past 30 day) smokers, never daily nondaily smokers were three times as likely as former daily nondaily smokers and daily smokers to have used alternative tobacco products (p<0.001). Never daily nondaily smokers represent the group at highest risk for using these products. This is notable given that patterns of use of these tobacco products may mirror how cigarettes are consumed among the nondaily smoking population. Intervention strategies might be applicable to polytobacco users who demonstrate this overall pattern of occasional tobacco consumption.

This research was supported by the National Cancer Institute (1K07CA139114-01A1, PI: Berg) and the Georgia Cancer Coalition (PI: Berg).

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POS1-80
PREVALENCE OF SMOKING AND ITS RELATED BEHAVIORS AND BELIEFS AMONG SECONDARY SCHOOL STUDENTS IN RIYADH, SAUDI ARABIA

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Objective: To estimate the prevalence of smoking among secondary school students in National Guard area of Riyadh, and explore the reasons for the smoking and the attitude of non-smoker toward smoking habit. Design: A cross-sectional study was conducted in June 2009. By random sampling technique 255 students were enrolled from secondary school of National Guard area, Riyadh, Saudi Arabia. A self-administered questionnaire was used for data collection. Results: Current smokers represented 28.6% of the students. The most common reasons for smoking were: having free time (81.6%), for the relief of stress (63.2%) and seeing some of their teachers smoking (61.8%). Most of the smokers started the habit before the age of 15 years old (89%). 84% of non-smokers suggested to ban smoking in public places. 42.2% of students were planning to start smoking in future. Religion was the most important reason for not smoking among non-smokers. Conclusion: The prevalence of smoking is big enough a problem to be considered and to warn for an impending epidemic Health education provision should have a greater role in schools Governmental commitment and social support are vital if health education and awareness and especially quit smoking programs are to be implemented and sustained.

No funding.

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POS1-81
TOBACCO SMOKING AND THE BELIEF THAT SMOKING CONTROLS BODY WEIGHT AMONG ADOLESCENTS: A THREE-YEAR PROSPECTIVE STUDY

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Background: The belief that smoking is an effective weight control strategy is widespread among adults but weight control beliefs are inconsistent among adolescents. This study aimed to assess changes in weight control beliefs of tobacco smoking and to explore predictors of this belief during a three-year period of adolescence. Methods: Baseline and two follow-up self-administered surveys were collected yearly (2010-2012) among students in six Hungarian metropolitan cities. At baseline, randomly selected 6th and 9th graders completed the survey (n=1,096, 54.1% girls). Covariates include the Appetite-Weight Control Scale, body mass index (BMI) calculated by subjective anthropometric data, smoking status, parental and friend’s smoking. Results: The prevalence of smoking increased continuously during the three surveys (Wave 1: 16%, Wave 2: 22%, Wave 3: 36%; Chi2-square(1)=90.16, p<.001). Stronger beliefs about the weight control effects of smoking was associated with greater odds of smoking, controlling for gender and age, at all three waves (OR1: 1.52, p<.002; OR2: 1.34, p<.007; OR3: 1.73, p<.001). The belief that smoking promotes weight control increased significantly from baseline to follow-up 1 using two-way mixed ANOVA (F(1)=24.16, p<.001), but this finding was not sustained between follow-ups 1 and 2. Of the potential explanatory variables of smoking’s weight control belief (gender, age, subjective BMI, perceived body shape, peer and parental smoking) the presence of smoking peers was significantly and positively related to the perceived weight control effect of tobacco smoking at all three waves (β1=0.11, p<.007; β2=0.19, p<.001; β3=0.16, p<.001). Conclusions: The belief that smoking controls weight is an important risk factor for smoking among adolescents. Tobacco prevention programs that focus on peer effects should also dispel the myth of tobacco’s weight control effects while emphasizing healthy methods of weight management.

This study was supported by Grant Number 1 R01 TW07927-01 from the Fogarty International Center, the National Cancer Institute, and the National Institutes on Drug Abuse, within the National Institutes of Health (NIH).

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POS1-82
SMOKING PATTERNS AMONG ADOLESCENT “REGULAR” VERSUS “LIGHT” CIGARETTES USERS

Melissa Mercincavage, M.S.*, and Steven A. Branstetter, Ph.D., The Pennsylvania State University

Given the range of negative outcomes associated with smoking and the fact that most smokers begin smoking when they are adolescents, there remains a great need to understand the smoking behaviors of adolescents. Research has shown that adolescent smokers believe cigarettes previously labeled as “light” and “ultra-light” pose significantly less risk of disease and illness than regular brands. Although these brands are currently marketed under different labeling (e.g., “light” now “Blue” or “Gold”, “ultra-light” now “Silver”), a comprehensive understanding of brand-specific youth smoking patterns may lead to improved prevention and intervention strategies, and can help identify those at greatest risk for a range of negative tobacco-related outcomes. The present study looked at how a range of smoking-related characteristics differed between smokers of regular and light brands of cigarettes. The study utilized 2007-2008 and 2009-2010 National Health and Nutrition and Examination Survey (NHANES) data from 175 adolescent smokers who had smoked on at least one day in the past 30 and who reported their preferred brand of cigarette, coded as “regular,” “light,” or “ultra-light.” Due to the small number of ultra-light smokers (n=8), light and ultra-light smokers were combined. Independent samples t-tests demonstrated that compared to regular cigarette smokers (n=120), smokers of light cigarettes (n=55) had smoked on fewer days in the last 30 (p<.01), smoked fewer cigarettes/day (p<.01), had lower serum cotinine levels (p<.01), had lower carcinogen exposure (NNAL; p<.05), had started smoking at an older age (p<.01), and were less likely to smoke soon after waking in the morning, (p<.05). Overall results suggest that adolescent smokers who choose light or ultra-light cigarettes may be exposed to less overall risk (e.g., lower carcinogen levels) and may be less dependent on nicotine (e.g., lower cotinine levels) perhaps due to consuming fewer cigarettes per day. Adolescent smokers who select light or ultra-light cigarettes seem to be newer smokers who may be looking for less “addictive” or harsh brands.

No funding.

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POS1-83
INITIAL INSIGHT INTO WHY PHYSICAL ACTIVITY MAY HELP PREVENT ADOLESCENT SMOKING UPTAKE

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Whereas research supports the importance of maintaining regular physical activity to decrease the likelihood of smoking uptake, the mechanisms by which physical activity protects adolescents from smoking are poorly understood. The present study sought to determine whether the enjoyment or reward derived from physical activity is one mechanism underlying the relationship between smoking and physical activity. The sample was composed of 1,374 adolescents participating in a prospective longitudinal survey study of adolescent health behaviors. Smoking, physical activity and physical activity reward were measured via self-report every six months for eight waves of data spanning four years. An associative processes latent growth curve model revealed a significant and negative indirect effect of baseline physical activity on baseline smoking through baseline physical activity reward (beta indirect = -.18, z = -.31, p = .002; 95% CI = -.29, -.07). Similarly, there was a significant and negative indirect effect of physical activity trend on smoking trend through physical activity reward trend (beta indirect = -.16, z = -2.09, p = .04; 95% CI = -.30, -.01). The effect of physical activity on smoking at baseline and across time was completely mediated by physical activity reward. Thus, greater physical activity was associated with higher levels of physical activity reward, which in turn, was associated with reduced odds of smoking progression. There was less support for the idea that smoking progression was associated with less physical activity reward and subsequent declines in physical activity. This study provides the first evidence implicating physical activity reward as one mechanism by which physical activity could reduce the likelihood of adolescent smoking uptake. Smoking prevention interventions...
that promote physical activity and target physical activity enjoyment may have an important impact on adolescent smoking initiation and progression. This study was supported by National Cancer Institute R01 CA126958.

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POS1-84
PRESENCE OF DEPRESSIVE SYMPTOMS DELAYS QUIT ATTEMPTS AND SHORTENS SUSTAINED ABSTINENCE AMONG YOUTH SMOKERS: A COHORT STUDY

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Background: The presence of depressive symptoms hinders adult smokers from quitting smoking, but the effect is not known on youth smokers. This study aims to examine the time patterns of the quitting process among youth smokers with different levels of depressive symptoms after calling a Quitline. Methods: Youth smokers aged 12–25 (n = 578) acknowledged any depressive symptoms when they called the Quitline from March 2006 to May 2011. They received immediate telephone counseling by peer counselors, and were followed-up at 6 months to report the duration of quit attempt initiation (from the first call to the Quitline to initiation of a quit attempt) and the duration of smoking abstinence (from the initiation of a quit attempt to sustain quitting, i.e., before smoking relapse). Non-parametric Kaplan-Meier methods with log-rank tests were applied to compare the time patterns between groups. Results: One-third of youth smokers who rarely had depressive symptoms initiated a quit attempt within 7 days after receiving the baseline telephone intervention, compared to 14 days among smokers who sometimes had depressive symptoms, and 22 days among smokers who often had depressive symptoms. Of the youth smokers who often had depressive symptoms who initiated a quit attempt, around 25% remained abstinent ≥ seven days, compared to 20 days and 19 days for others who sometimes or rarely had depressive symptoms, respectively. Conclusions: Depressive symptoms delay youth smokers in initiating quit attempts and reduce the period of sustained abstinence. A baseline screening of depressive symptoms could identify youth smokers who need special care to relieve their daily stress when they call a Quitline service.

This project was funded by The Department of Health, Hong Kong; Health Care and Promotion Fund of the Food and Health Bureau, Hong Kong SAR Government (HCFP #18040084); and Hong Kong Council on Smoking and Health.

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POS1-85
SYMPTOMS OF NICOTINE DEPENDENCE AND TOBACCO WITHDRAWAL IN MIDDLE AND HIGH SCHOOL TOBACCO USERS: RESULTS FROM THE 2012 NATIONAL YOUTH TOBACCO SURVEY

Benjamin J. Apelberg, Ph.D., M.H.S.*, Allison Hoffman, Ph.D., Nicolette Borek, Ph.D., Cathy Backinger, Ph.D., M.P.H., Catherine Corey, M.S.P.H., and Corinne Huster, M.D., M.P.H., Center for Tobacco Products, U.S. Food and Drug Administration

Nicotine dependence is the primary determinant of maintenance of tobacco use. Limited data exist on nicotine dependence and tobacco withdrawal among nationally representative samples of youth tobacco users. Existing studies primarily focused on cigarette smokers with limited data on use of other tobacco products. Yet, non-cigarette tobacco products appeal to youth and their use among this population is rising. The updated 2012 National Youth Tobacco Survey (NYTS) asks dependence and withdrawal questions and extends tobacco use to include any tobacco product, such as cigars, smokeless tobacco and waterpipes. We will present analyses from the 2012 NYTS, a nationally representative, U.S. school-based survey of about 20,000 middle and high school students. For the first time in 2012 the survey included four questions to assess potential indicators of nicotine dependence and tobacco withdrawal among youth using tobacco products, such as cigarettes, cigars, smokeless tobacco and waterpipes. The questions focus on cravings (“During the past 30 days, have you had a strong craving or felt like you really needed to use a tobacco product of any kind?”), strong desire to use (“During the past 30 days, was there a time when you wanted to use a tobacco product so much that you found it difficult to think of anything else?”), “How soon after you wake up do you want to use a tobacco product?”) and withdrawal symptoms (“How true is this statement for you? I feel restless and irritable when I don’t use tobacco for a while.”). We will report on the prevalence and determinants of nicotine dependence and tobacco withdrawal among middle and high school tobacco users, stratified by demographic characteristics, type and frequency of tobacco product use. We will also examine relationships between symptoms of dependence and withdrawal and tobacco use, quitting intentions and quitting behavior. Under the Family Smoking Prevention and Tobacco Control Act, the Food and Drug Administration (FDA) has the authority to regulate the manufacture, distribution and marketing of tobacco products to protect public health. These and other data from the NYTS will help inform FDA’s regulatory actions.

Funding: Center for Tobacco Products, U.S. Food and Drug Administration.

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POS1-86
DOES YOUTH TOBACCO USE CLUSTER? INVESTIGATION OF SPATIAL CLUSTERING IN YOUTH TOBACCO USE

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Background: Current national research indicates that approximately one-fourth of youth currently use tobacco (including cigarettes). While understanding geographic variation in youth tobacco use is important for prevention interventions and can also elucidate potential etiologic factors, we are not aware of any research that has examined spatial clustering of tobacco use. The objective of the present study is to examine spatial clustering of youth tobacco use. Methods: Participants came from the 2008 Boston Youth Survey Geospatial Dataset, a racially/ethnically diverse representative sample of 9-12th grade public school students in Boston, Massachusetts who provided their complete residential address (n=1,292), 1,212 (93.81%) of the youth answered the past-month tobacco use item. Response options included “none”, “1-2”, “3-9”, and “10 or more.” Spatial clustering in youth tobacco use was calculated via the Global Moran’s I and Local Moran’s I statistic. The pseudo p value for the Moran’s I was calculated via a Monte Carlo simulation consisting of 999 random replications. Results: In our sample, approximately 13% of youth reported any past-month tobacco use. We found significant overall spatial clustering of youth tobacco use (Global Moran’s I = 0.1046, p = 0.023). We also found significant localized spatial clustering in youth tobacco use as assessed via the Local Moran’s I (p<0.05), highlighting locations of high-high, low-high and high-low clusters of youth tobacco use. Conclusion: Significant spatial clustering in youth tobacco use was found, and this research can be used for local targeting of tobacco control prevention interventions. Future research should evaluate the reasons for youth tobacco use spatial clustering, e.g., whether spatial clusters of youth tobacco use are caused by neighborhood peer-effects and/or neighborhood environmental factors.

D.T. Duncan was supported by the Alonzo Smythe yerby Postdoctoral Fellowship at Harvard School of Public Health. D.R. Williams was supported in part by a grant from the National Institutes of Health (Grant # 1PS0CA148596) to the Lung Cancer Disparities Center at Harvard School of Public Health. The 2008 Boston Youth Survey (BYS) was funded by a grant from the Centers for Disease Control and Prevention (Grant # U48/CC007040) to the Harvard Youth Violence Prevention Center at Harvard School of Public Health (D. Hemenway - PI). A grant to D. Duncan from Robert Wood Johnson Foundation’s Active Living Research Program (Grant # 67129) supported the development of the BYS geospatial dataset. This study was supported by the Robert Wood Johnson Foundation Health and Society Scholars Seed Grant Program, Harvard Center for Population and Development Studies, Harvard School of Public Health (D. Duncan - PI).

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POS1-87
A PROFILE OF WEEKDAY AND WEEKEND SMOKING PATTERNS AMONG ADOLESCENT HEAVY SMOKERS

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The number of cigarettes smoked per day (CPD) is an important indicator of nicotine exposure, ability to quit and exposure to lung cancer and diseases. Social constraints typically lead to teens smoking fewer CPD than adults. Data from the 2007-2010 NAHNES survey suggest teens smoked half as many CPD (M=7.5) as adults (M=14.2). Additionally, youth smokers tend to vary their smoking patterns from weekdays, when social constraints are higher (e.g., school), to weekends such that adolescents smoke 50% more cigarettes on weekends than on weekdays. However, adolescents seeking to quit smoking represent a population of highly involved tobacco users who smoke nearly as many CPD as adults (M=14.5). Within this heavy smoking population is a sub-set of heavy smokers who use more than 90% of all youth smokers looking to quit (MCPD=25). These smokers tend to be consistently heavy weekday and weekend smokers, and are consequently likely at the highest risk of continued smoking disease risk. The present study sought to examine the characteristics of this heavy smoking sub-population in an effort to increase the understanding of these smokers which may help in early identification and modified intervention strategies. The sample for the present study was 8,855 adolescents (4,970 female) who participated in either the Not On Tobacco (NOT) program or a Brief Intervention program between 1998 and 2008. On average, the sample smoked 11.8CPD on weekdays and 17.6 CPD on weekends. Participants whose CPD total was in the 90th percentile were coded as “heavy smokers.” On average the heavy smokers used 20 CPD on weekdays and 30 CPD on weekends. Overall, males were more likely to be heavy smokers on both weekdays and weekends, while females were more likely to be classified as heavy smokers on weekends only. Analyses suggest that both weekend and weekday heavy smokers were more likely to be older, to have started smoking younger and have been smoking for longer, to be less confident in their ability to quit and less motivated to quit. Results suggest that these heavy smokers are the “worst of the worst” in terms of potential for dependence, cessation failure and disease.

No funding.

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POS1-88
BUILDING CAPACITY ON YOUTH TOBACCO USE PREVENTION IN INDIA

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Background: Tobacco control (TC) is a secondary priority in developing countries because of (1) scant resources due to competing public health challenges, and (2) lack of capacity for implementing tobacco control programs and policies. Therefore, sustainable, non-resource intensive and inclusive capacity building is vital to give legs to enforcement. This paper describes the capacity building initiatives to administer a proven school based youth tobacco prevention curriculum under Project STEPS (Strengthening of Tobacco control Efforts in India through Innovative Partnerships and Strategies) in two Indian states of Gujarat and Andhra Pradesh (AP). Methods: A Training of Trainers approach was adopted. To effectively engage all stakeholders, sustained advocacy with Government Education and Health departments at state and district level was undertaken. Two models, one with involvement of the teacher training government organization (Gujarat Council for Education Research and Training, GCERT), and second without (AP), were tested. Trainings cascade were organized with national, state, district (only Gujarat) and school sessions. All trainings were hands on, skill based, and underwent a post evaluation. Results: At national level, 25 State level government officials from Education and Health departments in from AP and Gujarat were oriented to TC. At the state level training, 36 GCERT staff and 30 project staff participated. The GCERT in turn trained 600 teachers ten district level sessions. About 650 teachers will be trained in joint sessions with the student peer leaders (PLs) in AP. Overall, about 6250 PLs will be trained in 960 school based sessions. Discussion: Capacity development of grassroots and government stakeholders is crucial in TC in developing countries. Project STEPS demonstrated that capitalizing on existing systemic capacities is absolute key to ensure sustainability and possibly impact long term outcomes. At the system level, all stakeholders - most importantly the Education department – were oriented in TC. At the community level, teachers and youth peer leaders were empowered to promote TC in their communities.

Funding: Bill and Melinda Gates Foundation.

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POS1-89
DEVELOPING EVIDENCE-BASED INITIATIVES FOR PARENTS TO REDUCE SMOKING UPTAKE AMONG INDIGENOUS YOUTH: FROM THEORY TO PRACTICE

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BACKGROUND: Smoking rates among Māori (the indigenous peoples of New Zealand) are double those of non-Māori. Reducing smoking uptake among Māori youth is a key means of addressing smoking disparities. The WAKA project was undertaken to better understand parent-related determinants of smoking uptake among Māori children and how they can be addressed. METHOD: The project began in 2007 and has evolved over four phases. Phases 1 and 2 sought to develop evidence based explanatory and change models for smoking uptake. Phases 3 and 4 involved piloting, evaluating and applying key findings within tobacco control initiatives. Information sources for the first two phases included literature reviews, qualitative studies, analysis of survey data and stakeholder meetings. The draft change model was critiqued through stakeholder interviews and focus groups with parents. FINDINGS: Parental attitudes and behaviours were found to have an ongoing influence on smoking susceptibility throughout childhood regardless of parental smoking status. Ethnicity was not associated with smoking uptake. However, greater exposure to common risk factors may be a reason why Māori children are more likely to take up smoking. A key finding of the project was the importance of addressing smoking specific parenting behaviours (e.g., parental smoking) in the context of more general parenting behaviours (e.g., communication) in order to create family environments that are protective from smoking. Phase 3 pilot evaluation findings indicated the change model had potential to reduce smoking uptake, however careful attention needed to be paid to fidelity of implementation. Learnings from this project have been used to develop resources to support parents to reduce smoking uptake among their children, including use of social media for parents to share parenting tips.

CONCLUSION: There is very little evidence on the causes of smoking disparities between indigenous and non-indigenous peoples. This project made an important contribution to this evidence by identifying potential parent related causes for smoking uptake and how they can be addressed.

Funding: Health Research Council of New Zealand, New Zealand Ministry of Health, Whanganui District Health Board.

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POS1-91
REASONS FOR NONDAILY SMOKING IN YOUNG ADULTS: SCALE DEVELOPMENT AND VALIDATION

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Among US smokers, up to 33% smoke nondaily or smoke between 1 and 29 days out of every 30, with young adults being particularly affected by this pattern of smoking. Developing a validated measure to assess reasons for smoking among nondaily smokers in the young adult population is critical in the process of intervention development and testing. However, traditional models of addiction...
and assessments of smoking motives were developed based on the daily or more regular smoking pattern. Thus, the current study aimed to develop a scale assessing reasons or triggers for nondaily smoking, and examine its reliability, factor structure, and concurrent validity. We administered an online survey to 2,000 students at six Southeast colleges; 718 (35.9%) completed the survey. Analyses focused on the 105 nondaily smokers. In addition to items created for scale development, measures included sociodemographics, other measures of motivation and confidence/self-efficacy, past smoking/quitting history, readiness to quit, and other smoking-related factors. The 19-item Reasons for Nondaily Smoking Scale (RNS) demonstrated an average score of 45.36 (SD=15.55) and internal consistency (Cronbach’s alpha=0.79). Factor analysis extracted four factors, accounting for 57.4% of score variance: Social influences; Enhancing buzzes and positive affect; Negative affect regulation; and Lack of concern of addiction. The resulting subscales and items were in line with themes identified in our formative research. The RNS is also appropriately framed within the Theory of Planned Behavior, such that attitudes toward smoking and the utility of smoking (e.g., to regulate affect or enhance physiological experiences), consideration of the social norms related to smoking, and perceived behavioral control (e.g., volition, concern of addiction) were important and distinct factors associated with nondaily smoking behavior. Given this emerging public health problem and the lack of validated measures designed to assess factors associated with nondaily smoking, this assessment may be critical in informing our intervention strategies and potentially for predicting cessation among young adult nondaily smokers.

This work was supported by the National Cancer Institute (1K07CA139114-01A1; PI: Berg) and the Georgia Cancer Coalition (PI: Berg).

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POS1-92
WHO IS STARTING SMOKING? AN INVESTIGATION OF UPTAKE AMONG ALL AGES USING PROSPECTIVELY COLLECTED DATA

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Introduction: The industry argues that smoking is an informed choice by adults. Investigations of smoking initiation often focus on the experience of children and youth, and demonstrate that this is where most initiation of smoking occurs. However, prevalence data suggests substantial uptake of smoking also occurs between 15-19 and 20-24 years. Identifying initiation rates is difficult using cross-sectional prevalence data, particularly among older age groups which are subject to cohort effects and where quitting and premature mortality reduce prevalence. We are not aware of data which explores initiation by age prospectively. Methods: The SoFIE-health longitudinal survey is a population based study from New Zealand which included 15,095 subjects aged ± 15 years who responded in the three years including the health module, 2004/5, 2006/7 and 2008/9. We calculated the proportion of never smokers who became regular smokers (initiation), and the proportion of current smokers who subsequently became ex-smokers (quitting) by age at baseline. Results: Initiation between 2004/5 and 2008/9 was 14.2% for 15-17 year olds, 7.0% for 18-19 years, 3.1% for 20-24 years, with low rates of 0.5-1.4% for older age groups. Quitting rates over the same time period were 20.6-30.6% with no clear trend with age. Conclusions: Substantial initiation occurs among young adults, but is rare after age 24. The rarity of smoking initiation among mature adults provides further evidence that industry arguments that smoking is an ‘informed choice’ are false.

Funding: Health Research Council of New Zealand.

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POS1-93
SMOKING BEHAVIORS AMONG COLLEGE-AGE STUDENTS IN RABAT, MOROCCO

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Tobacco use is one of the most preventable causes of premature death. With increasingly effective anti-tobacco programs in the Western world, rates of cigarette use have declined. In the developing world, however, tobacco use remains highly prevalent, with rates as high as 60% among males in certain countries. The focus of this study is to identify the familial, social, knowledge and cultural factors involved in tobacco consumption in Morocco, as a means of exploring the rise in smoking prevalence in the developing world. This study was conducted on the campus of Mohammed V University in Rabat, Morocco, where attending students were surveyed on tobacco use and particular behaviors surrounding tobacco use. The dependent variable in the study is the use of tobacco in the form of cigarettes. Various independent variables were assessed to look for possible links that may have an effect on tobacco use, including: smoking experience, peer relationships, knowledge of health effects and cultural orientation. Interviews were first performed with key informants, including tobacco shop owners and other non-student-olds who understand the smoking culture. 115 males were surveyed, with a mean age of 23 ± 0.28 (mean ± S.E.), ranging from 17-33. Sixty-three percent of subjects had at least one puff of a cigarette during the course of their life, and 45% of subjects are ‘current smokers’—having smoked a cigarette in the past 30 days, and therefore 55% were current non-smokers. We identified differences in smokers and non-smokers with regards to smoking experience, peer relationships, and cultural orientation. Stronger indicators of smoking, such as cultural preferences (music preference [p<0.001], religious activity [p<0.001], language preference [p=0.042]) and the influence of family (p<0.001) can impact whether a student will decide to smoke, while knowledge of health effects seemed to have minimal impact on the choice to smoke (p=0.05). As the anti-tobacco idea continues to grow in Morocco, a few of these factors may be used for intervention campaign to help reduce smoking prevalence in the developing world.

This study was conducted while the first author was at Université Mohammed V, Rabat, Morocco. Supported by University of Connecticut Summer Research Fund.

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POS1-94
OVERESTIMATION OF THE SMOKING STATUS OF THEIR PEERS BY COLLEGE AND HIGH SCHOOL SMOKERS

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The majority of teenagers want to meet the social norm of their peers, but their statuses in return influence their perception of this standard. Method: 2011 and 2012 PST surveys that measure annually by self-administered questionnaire smoking status of teenagers of 2% of classes in Paris included a question about the estimated number of smokers in the class. This rate was compared with the actual rates of smoker (daily + occasional in this group. Results: Overall, there are 28.0% of smokers in the population, whereas students consider it to 35.1%. Non-smoking boys give almost exact estimate (28.4%), non-smoking girls a slight overestimation (30.6%). Smokers give a strongest overestimation: 53.2% believe their peers smoke. Over the years, the difference continued: Occasional smokers and ex-smokers give an overestimate half of smokers. In the 12-15 years old schoolchildren, whereas smoking is 17.8% real, the estimates are lower in non-smokers (16.8%) and overestimated more than 3 times daily smokers (49.4%). In 16-19 years we observe a smaller overall overestimation (estimated 51.4% among non-smokers and 59.4% of smokers for actual consumption of 41.0%). Conclusion: if the non-smoking teens have a satisfactory estimate of the smoking status of their peers, and overestimate the smoking rate. The overestimation is higher among girls than among boys and among college age groups.
students than among older students. It is important to establish the truth on the social norm, in fact over 80% of these students are not daily smokers.

PST receive support of CPAM Paris and Rectoral Académie de Paris.

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POS1-95 DIFFERENCES IN EXPOSURE TO SECOND-HAND SMOKE AMONG UNIVERSITY STUDENTS IN JORDAN

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Background and Methods: As the rate of tobacco consumption in Jordan increases, Jordanian policy makers are urged to enforce their policies on second-hand smoke (SHS) exposure. A survey was conducted among university students at three public Jordanian universities. A total of 800 non-smoker students between the age of 18 and 22 were included in the analysis. Two questionnaires regarding SHS exposure were used to measure knowledge, attitudes, and avoidance practices. Results: Students were highly exposed to SHS through their daily life despite the overall high knowledge and positively correlated attitudes. For example non-cumulative actual daily exposure was as follows: 80%; college: 60%; restaurants and cafés; 73.3%). Further, the students in the study stratified by their household smoking policy to three groups: Group 1 (Household with NON-smokers), Group 2 (household with smokers smoking inside) and group 3 (Household with smokers smoking not permitted to smoke inside). Using one-way ANOVA, avoidance behaviours were significantly different across the three groups, F (2, 797) = 7.96; p = .0004. Tukey post-hoc comparisons of the three groups indicated that Group 1 had highly significant higher avoidance behaviour than Group 3 p = .0002. Comparisons between Group 2 and the other two groups were statistically significant at p < .05. However, when stratified by gender, only girls had a significant finding in relation to their avoidance behaviour as the behaviour difference between those in group 1 and group 3. Conclusion: Our result suggests that there is a large discrepancy between SHS exposure and knowledge, attitudes and avoidance behaviours among university students. This discrepancy is likely influenced by different cultural factors. Concerning household indoor smoking policy influence, it seems to have affected the overall SHS avoidance behaviour. However, only girls’ avoidance behaviour appears to be influenced by having smoking permitted in their homes which could be due to the gender inequality that potentially restricts girls’ freedom at this age beyond family supervision.

Funding: Dean Award of Jordan University of Science and Technology.

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POS1-96 FACTORS ASSOCIATED WITH BEING PERMISSIVE OF SECOND-HAND SMOKE EXPOSURE AMONG SOUTH AFRICAN NON-SMOKING ADOLESCENTS

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Introduction: Protecting the population from second-hand smoke exposure (SHS) is a key tobacco control policy recommendation within the WHO FCTC, yet little is known of factors associated with adolescent’s level of tolerance for exposure to SHS. Objective: The objective of this study was to determine the factors associated with being permissive of SHS exposure among South African non-smoking adolescents. Methods: This cross-sectional study was a secondary data analysis of three nationally representative samples of school-going adolescents who participated in the 1999, 2002 and 2008 Global Youth Tobacco Surveys. Data was collected through self-administered questionnaires and included participants’ demographic characteristics, tobacco use behaviour and exposure to second-hand smoke. Main outcome measure: Permissive attitude to second-hand smoke exposure,’ defined as allowing others to smoke in their presence. The three data sets were merged, and analysis was restricted to non-smokers (n=14,690) and included Chi-square statistics and multi-variable adjusted logistic regression. Results: There was a significant increasing trend in adolescents being permissive of SHS over time (p=0.019). Those permissive of second-hand exposure (SHSe) were more likely to report exposure to SHS at home than in other places. A greater proportion of never-experimenters as compared to ever-experimenters of smoking were not permissive of someone smoking around them (48.6% vs 26.9%, p<0.001). Those with a more negative attitude to smoking were less likely to be permissive of exposure to SHS (OR=0.88; 95%CI=0.84-0.92). Those who reported that either parents smoke or that only mother smoke were more permissive to SHSe than those who reported none of the parents or only father smokers. Those owning an item with a cigarette brand logo were more permissive of exposure to SHS (OR=1.45; 1.16-1.82). Conclusions: This study’s findings highlight the need to protect younger non-smokers from exposure to parental smoke by reducing adolescents’ positive attitudes towards smoking, including preventing the promotion of tobacco products through distribution of objects with cigarette brand logos.

This study was supported by the American Cancer Society (Grant A0U146).

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POS1-97 PREVALENCE AND PATTERNS OF TOBACCO PRODUCT PROMOTIONS VIA SOCIAL NETWORKING SITES AND TEXT MESSAGES AMONG YOUTH

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Given recent stricter tobacco advertising regulations, different media may increasingly play a role in marketing of tobacco products to youth. We aimed to describe the prevalence and patterns of tobacco product ad exposure via social networking sites and text messaging. We used the 2011 National Youth Tobacco Survey, a nationally representative sample of U.S. youth in grades 6-12. The analysis was restricted to youth < 18 years old. The analysis was also restricted to non-users of tobacco products. Promotion was defined as any contact with tobacco brands via social networking sites and text messaging. We used the 2011 National Youth Tobacco Survey, a nationally representative sample of U.S. youth in grades 6-12. The analysis was restricted to youth < 18 years old (unweighted N=17,240). Youth were asked whether they received promotions (ads/coupons) from tobacco companies via social networking sites (Facebook and MySpace) or text message in the last 30 days. Logistic regression models were used to assess whether exposure to tobacco ads/coupons via these venues differed by sex, age, race, and current cigarette or smokeless tobacco use, and whether exposure to the promotions among non-users was associated with tobacco use beliefs. Overall, 11.2% of youth reported recently receiving promotions from tobacco companies via social networking sites, and 4.3% via text message. In multivariable models, younger age (≤11 years old OR 1.9, 95% CI 1.5-2.5, 12-13 years old 1.9, 1.6-2.3, 14-15 years old 1.6, 1.4-2.0, versus 16-17 year olds), African American (1.9, 1.5-2.2) and Hispanic (1.5, 1.3-1.8) race, and current use of cigarettes (1.7, 1.4-2.2) or smokeless tobacco (2.0, 1.5-2.7) were associated with receiving promotions via social networking sites. Similar patterns were seen for receiving promotions via text message. Among never-tobacco users, promotion exposure via social networking sites was associated with decreased belief that all tobacco products are dangerous (social network 0.8, 0.7–0.9), increased belief that smoking makes people look cool (social network 1.5, 1.1-2.1), and increased belief that they will try a cigarette soon (2.2, 1.4–3.3). Tobacco companies are using social networking and text messaging to target youth, and exposure is greater among minorities and those who are younger. While promotions were more likely to be received by current tobacco users, they also impacted social norms among non-users. Tobacco advertising via these media outlets should be more closely monitored and regulated.

This study was conducted while the first author was at the Washington University School of Medicine. Supported by NIH K01 DA025733 (PCR), NIH R01 DA032843 (PCR), and NIH R01 DA031288 (RAG).

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POS1-99
VISUAL ATTENTION TO HEALTH WARNINGS ON PLAIN TOBACCO PACKAGING IN ADOLESCENT SMOKERS AND NON-SMOKERS

Olivia M. Maynard*, Ute Leonards, and Marcus R. Munafò

Previous research in adults indicates that plain packaging increases visual attention to health warnings in adult non-smokers and weekly smokers, but not daily smokers. The present research extends this study to adolescents aged 14-19 years. A mixed-model experimental design was used, with smoking status as a between subjects factor and package type (branded or plain package) and eye gaze location (health warning or branding information) as within subjects factors. Participants were recruited from three schools in Bristol, UK and comprised never smokers (n = 26), experimenters (n = 34), weekly smokers (n = 13) and daily smokers (n = 14). The number of eye movements to health warnings and branding on plain and branded packs was measured. Analysis of variance revealed more eye movements to health warnings than branding information on plain packages, but an equal number of eye movements to both regions on branded packages [P = 0.002]. This was observed among experimenters [P < 0.001] and weekly smokers [P = 0.047] but not among never smokers or daily smokers. These results partially replicate the findings in adults, indicating that among light and non-established adolescent smokers, plain packaging increases visual attention to health warnings and away from branding. Perhaps indicative of their decision not to smoke, adolescent never smokers attend the health warnings preferentially on both types of packs. By contrast, daily smokers, even relatively early in their smoking careers, seem to be resistant to the health warnings on the plain packages.

No funding.

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POS1-100
AN EXAMINATION OF POLY-TOBACCO USE BY SEXUAL AND GENDER MINORITIES (SGM)

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Introduction: A recent proliferation of new tobacco products raises concerns that individuals are consuming more than one form of tobacco product on a regular basis. Poly-tobacco users have higher risk for health problems (e.g., myocardial infarction, problem drinking, obesity), a potential for higher nicotine dependence and greater difficulty quitting, and increase likelihood of relapse after a quit attempt. The SGM community is an underserved group with high smoking rates and can be considered a population at risk for increased use of other tobacco products. Purpose: To examine poly-tobacco use in a large sample of predominantly SGM individuals. Methods: Volunteer participants attending Pride Festivals in Missouri during the summer of 2012 completed a survey of tobacco use (inclusive of cigarettes, smokeless tobacco, and other smoked tobacco products), other health behaviors, and basic demographic information. Cigarette smoking was classified as some days and daily smoking (very light, light, moderate, and heavy). The analyses plan included calculation of simple statistics and a regression model predicting poly-tobacco use. Results: The sample (N = 4636) consisted of 73% SGM and 27% heterosexual individuals. Rates of tobacco use (smoking or smokeless) were 46.8% for SGM and 38.5% for heterosexuals and poly-tobacco use of 13.1% and 11.3% respectively. Current cigarette smoking was 41.0% and 31.5%; current smokeless tobacco use 3.3% and 2.7%; and other smoking products 18.6% and 17.8% respectively for SGM and heterosexuals. Of those smoking cigarettes: 37% of non-daily smokers and very light daily smokers (<5 cigarettes per day) use other forms of tobacco compared to 30% of heavy smokers (>1 pack per day). Predictors of poly-tobacco use are: younger age, less than a college degree, rating health as fair or poor, alcohol use, and higher stress ratings. Conclusions: Smoking and poly-tobacco use rates of this sample are twice the national average. About 1/3 of smokers are using other forms of tobacco, increasing health risks. An awareness of poly-tobacco use can improve effectiveness of interventions to reduce tobacco use in the SGM community.

A grant from the Missouri Foundation for Health (11-0439-TRD-11).

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POS1-101
COLLEGE “DUAL SMOKERS” (HOOKAH+CIGARETTES) VS. CIGARETTE SMOKERS ONLY: COMPARISON OF 30-DAY CONTINUOUS ABSTINENCE RATES

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Introduction: College represents a critical transition period for the use of tobacco. Cigarette smoking prevalence among young adults in America is 34.2%. "Dual" smoking (i.e., smoking both hookah and cigarettes during the same 30-day period) is on the rise yet little is known about these high risk smokers. We examined baseline characteristics and self-reported 30-day continuous abstinence rates among dual smokers vs. cigarette-only smokers enrolled in a 30-day, college-based, quit and win contest. Methods: Two and four-year college students (N = 658) enrolled in
POSI-103
RISKY COMBINATIONS: THE PREVALENCE AND PREDICTORS OF TOBACCO AND ALCOHOL USE WITHIN A HIGHLY SOCIOECONOMICALLY DISADVANTAGED SAMPLE

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Background: Tobacco use and excessive alcohol consumption are both major modifiable risk factors for morbidity and mortality. High levels of tobacco and alcohol use have been identified within disadvantaged populations, however little is known about the prevalence of co-occurring tobacco and alcohol use in disadvantaged groups. Given the associations between alcohol use, smoking maintenance and relapse, an examination of the prevalence of these two risk behaviours has important implications for the content of smoking cessation programs targeted at disadvantaged groups. This study aimed to assess the prevalence and predictors of concurrent tobacco smoking and risky alcohol use within a disadvantaged sample. Possible predictors included sociodemographic factors (e.g., income, housing, education) and psychological factors (depression, anxiety, resilience). Method: A cross sectional survey using a touch screen computer of adult clients attending a non-government social and community service organisation assessed smoking status, alcohol use, sociodemographic and psychosocial variables. Univariate and multivariate analyses were carried out in the form of logistic regressions. Results: In total, 200 participants completed the survey (88% response rate). The mean age of participants was 40 years (SD = 11), 55% were female and 13% were Indigenous Australian. Participants experienced significant disadvantage, with 78% earning AUD$400 or less per week and 68% having left school before the age of 16. 66% of respondents reported to be daily smokers and 60% reported to drink at nationally defined ‘risky’ levels. The prevalence of concurrent tobacco smoking and risky alcohol use was high at 68%. Predictors of concurrent alcohol and tobacco use will be discussed. Implications: High levels of concurrent tobacco and risky alcohol use within this sample indicate that interventions that address alcohol use may improve tobacco cessation amongst socioeconomically disadvantaged groups. The impact of specific predictors of concurrent alcohol and tobacco use will be discussed within the context of improving cessation programs within these groups. This research has been funded by a grant from the National Health and Medical Research Council (NHMRC) of Australia. Scholarship funding is provided to LT from the University of Newcastle and the Cancer Institute NSW. Dr. Bonevski is supported by a Cancer Institute NSW Career Development Fellowship.

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POSI-104
EXAMINING THE CHEMICAL CONSTITUENTS OF SECONDHAND VAPOR

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Many municipalities, workplaces, and airlines are banning the use of e-cigarettes (ECs) due to fear that the secondhand vapor (SHV) emitted from the user may have dangerous chemical constituents that could negatively affect non-users. Little is known about the chemical constituents of SHV as they are just now being explored. With this in mind, we sought to examine the presence and the amount of nicotine, diethylene glycol, ethylene glycol and propylene glycol (PG) in SHV and secondhand smoke (SHS). 20 smokers, naïve to ECs, were recruited as part of a clinical laboratory trial; 18 completed four sampling sessions, each separated by 1-hr, following a 12-hr abstinence from smoking. 3 popular brands of ECs (bluCig, ProSmoke, SmokeTip) and participants’ own brand of cigarette (DBE) were sampled in a counterbalanced fashion. After completing paper-and-pencil measures and spirometry, participants vaped/smoked for 5 minutes. After 2 minutes of vaping/smoking, participants would inhale and then exhale the vapor/smoke into a modified 1 L glass Erlenmeyer flask. After methanol extraction, the liquid was analyzed by gas chromatography mass-spectrometry. Reported values are the averages of 18 participants and are based on integrated spectral areas, concentrations which correspond to those generated by standard curves produced from commercial standards of each compound. SHV from SmokeTip contained

a “quit and win” tobacco cessation research study, completed questionnaires and provided urine samples at both enrollment and at the completion of a 30-day contest. Logistic regression (LR) analyses examined predictors of 30-day abstinence between “dual” vs. cigarette only smokers after adjusting for significant baseline covariates. Results: All participants smoked cigarettes on at least >10 occasions in the prior month and 36.4% used hookah in that same time period (i.e., “dual” smokers). Dual users (n=139) vs. cigarettes only smokers (n=519) were significantly more likely to be male, younger, and report more binge drinking and overall impulsivity. Dual smokers were more likely to smoke in response to smoking-related cues and endorse more cigarette smoking quit attempts, but report less loss of control over smoking or nicotine dependence. After controlling for covariates, LR analyses identified a trend in abstinence outcome rates in that dual smokers were 23% less likely to report 30-day abstinence than cigarette only smokers (OR= .77, 95% CI= .51-1.16). Conclusion: Results suggest that college students who smoke both hookah and cigarettes display multiple smoking-related risk factors including binge drinking, impulsivity and cue-responsive smoking. Overall trend indicates that dual smokers may be less likely to achieve tobacco abstinence following a 30-day tobacco cessation program. Novel tobacco cessation methods may be needed to successfully help dual smokers to obtain tobacco abstinence.

POSI-102
SEX DIFFERENCES IN PSYCHOSOCIAL CORRELATES OF POLYSUBSTANCE USE AMONG HETEROSEXUAL, HOMOSEXUAL, AND BISEXUAL COLLEGE STUDENTS

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College students identifying as Lesbian, Gay, or Bisexual (LGB) are at increased risk for smoking and other substance use. While research has explored the use of individual substances (e.g., tobacco, alcohol, illicit drugs) among LBG college students, few studies have assessed correlates of concurrent or polysubstance use, which increases the risk for substance use disorders. The current study aimed to examine differences in substance use among male and female sexual minorities and identify psychosocial factors related to concurrent substance use. We administered a web-based survey assessing a variety of health behaviors, psychosocial characteristics, attitudes, and demographics to students from six colleges in the southeastern U.S. Of the 4,840 respondents, 2.9% reported a homosexual identity (n=111), and 3.5% reported a bisexual identity (n=135). Multivariable modeling was used to assess the relationship between sexual identity and number of substances used, adjusting for demographic and psychosocial factors. Bivariate results indicated that bisexual females were significantly more likely than their homosexual or heterosexual counterparts to report tobacco use (p<.001), binge drinking (p<.05), and marijuana use (p<.001) in the past 30 days. No differences in substances used existed among males. After adjusting for age and ethnicity, homosexually- and bisexually-identified females were more likely to have increased polysubstance use than those who identified as heterosexual females (p<.001 and p<.001, respectively). Adding psychosocial factors to the model slightly decreased the magnitude and significance of the association (p<.01 and p<.01, respectively), suggesting that a number of psychosocial factors mediate the relationship between sexual identity and substance use. Specifically, depressive symptoms, sensation seeking, and satisfaction with life were some significant factors related to polysubstance use. In conclusion, female sexual minorities are at high risk for substance use. Moreover, targeting specific psychosocial factors might be helpful in our intervention efforts to address use of tobacco, alcohol, and marijuana among this group.

This research was supported by the National Cancer Institute (1K07CA139114-01A1; PI: Berg) and the Georgia Cancer Coalition (PI: Berg).

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Poster Session 1 • Thursday, March 14, 2013 • 11:30 a.m.–1:00 p.m.
the highest level of PG, 17.03 micro-M. Despite advertisements that bluCig and ProSmoke do not contain PG, SHV bluCig and ProSmoke contained 0.17 micro-M and 6.61 micro-M, respectively. In OBC the PG levels were 1.40 micro-M. Nicotine levels were highest in SHS (1.11 micro-M), while nicotine levels in SHV varied based on EC product and strength. Of the ECs, nicotine was lowest in bluCig Light SHV (0.10 micro-M) and highest in SmokeTip Full Flavor SHV (0.45 micro-M). bluCig had the highest level of glycine, 382.45 micro-M, with OBC the lowest at 43.73 micro-M. Glycerin levels in ProSmoke and SmokeTip were 179.31 and 237.86 micro-M, respectively. No ethylene glycol or diethylene glycol was detected in any of the SHV samples.

Funding: Oklahoma Tobacco Research Center Seed Grant.

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POS1-105
MORE THAN JUST AVERAGE: A SYSTEMATIC REVIEW OF DATA REDUCTION TECHNIQUES FOR THE CRESS SMOKING TOPOGRAPHY DEVICE
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Characterizing smoking behaviour in an objective and ecologically valid manner is integral to understanding the relationship between how tobacco products are consumed and the associated health complications. Smoking topography provides a representation of the physical attributes of this behaviour including puff volume, velocity, and duration. A range of portable, computerized devices, such as the CReSS Pocket (Borgwalt, KC, Inc., Virginia), have been developed to quantify smoking topography. However, there is no clear guidance on smoking topography data exclusion and reduction techniques. The objective of this study was to first, systematically review the literature to identify reported data reduction techniques, and second, apply common techniques to topography data collected using the CReSS Pocket to explore the impact of different techniques on outcome measures.

A review was conducted using MEDLINE, PubMed, and Scopus. The search was limited to studies published between 2001 and 2012, and keywords included smoking topography, puffing topography, and CReSS. The search identified 23 studies using the CReSS device. Eleven and six of the 23 studies provided specific data reduction and exclusion criteria, respectively. Four common data reduction techniques emerged and were applied to the dataset (n = 193, Mage = 38.98, FTDN = 5.19, mean 17.23 cigarettes per day). Using repeated measures analysis of variance, there were statistically significant differences amongst all techniques for puff volume (F [1.5, 289.1] = 4.4, p < 0.05), peak flow (F [1.5, 290.3] = 5.7, p < 0.05), puff duration (F [1.5, 285.8] = 4.1, p < 0.05), and interpuff interval (F [2.0, 381.8] = 26.7, p < 0.05). The results of this review highlight inconsistency in the literature regarding the disclosure of smoking topography data exclusion and reduction techniques. The results of this review highlight inconsistency in the literature regarding the disclosure of smoking topography data exclusion and reduction techniques. The objective of this study was to first, systematically review the literature to identify reported data reduction techniques, and second, apply common techniques to topography data collected using the CReSS Pocket to explore the impact of different techniques on outcome measures.

Funding: Canadian Cancer Society, Ontario Tobacco Research Unit.

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POS1-106
THE ASSOCIATION OF CAMPUS DEMOGRAPHICS WITH TOBACCO PRODUCT CHOICE AND PERCEIVED HARM AMONG COLLEGE STUDENTS

Background: College students use tobacco at rates similar to the general adult population, while their intensity and patterns of use differ. Less attention has been given to product choice and whether campus demographics are correlated with perceived harm of different tobacco products. Methods: A self-administered survey of college students at 7 N.C. campus health clinics was conducted as part of a content validity study, clinic-based trial to improve clinical use of the US PHS guidelines (n=559, 69% response rate). There were 2 public traditionally black institutions (TBIs), 2 large, non-TBI public universities, and 3 medium-sized private colleges. Results: 23% of students reported any tobacco use in the past 30 days. Students from TBIs were 1.14 times more likely to report tobacco use (32%) compared to non-TBI public (20%) and private schools (20%) (p<.02). However, TBI students never tried and consistently reported more accurate perceptions of harm associated with different products. TBI students were more likely to use cigarettes (25%) compared to non-TBI public (5%) or private schools (8.3%) (p<.001), yet these products were perceived to be less harmful than cigarettes by public versus public non-TBI and TBI students (20.1% private, 13.5% public non-TBI, 8.3% TBI) (p<.001). Prevalence of hookah (6.3%-7.0%) and cigarette (9.2%-11.9%) use was similar across campuses (p=n.s.). Hookah was perceived as less harmful than cigarettes by 36% of respondents overall, with more accurate perceptions among TBI students (42% private, 40% public non-TBI, and 20% TBI, p<.001). Bidi and kretek were rarely used, but occurred almost exclusively at one private university (p<.001). Knowledge of harm associated with use of these products was poor with ~50% of students indicating “don’t know.” Conclusions: Campus demographics are related to students’ perceived harm of tobacco products and product choice. However, perceived harm does not appear to be associated with product choice. Comprehensive tobacco control programs that extend beyond perceived harm should be tailored to the individual university’s environment and product-specific use.

Research reported in this abstract was supported by the National Cancer Institute of the National Institutes of Health under Award Number R21CA161164. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

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POS1-107
HOOKAH USE BETWEEN CIGARETTE AND NON-CIGARETTE SMOKING COLLEGE STUDENTS
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Hookah (water-pipe) smoking is increasingly prevalent among the college population and closely follows cigarette use ranging from 15 to 40% lifetime use. Smoking hookah presents a substantial public health problem in that a single smoking session is equivalent to smoking almost three packs of cigarettes. Paradoxically, college students do not perceive this form of tobacco as safe and less addictive. Poly tobacco use may commonly occur in the form of dual cigarette and hookah smoking. However, research is limited in understanding patterns of concurrent cigarette and hookah smoking, especially by sex and race. This study aimed to identify the relationship between hookah and cigarette smoking among college students and identify patterns of concurrent tobacco use by sex and race. College students (n=490) aged 18-25 were recruited from a large Southern California university. Cigarette smoking behavior, hookah smoking, social and addictive attitudes toward smoking and demographics were measured in a cross-sectional survey. Among the whole sample, 16% reported current cigarette smoking and 21% reported hookah use. Of the hookah users, 23% were current smokers, 20% were never smokers, and 57% were nonsmokers who had tried cigarettes (tried nonsmokers). Tried nonsmokers were more likely to smoke hookah than the other groups (γc = 37.00, N = 490, p = .00). Hookah smoking prevalence was highest in Whites (39%), followed by Asians (24%) and Latinos (22%), although no significant differences were found between groups. A majority of hookah smokers were female (62%). Current smokers had significantly more favorable social attitudes toward smoking (F (2, 69) = 43.08, p<.001) but were less likely to recognize addictive aspects of smoking (F (2, 69) = 35.59, p<.001), than both never tried and tried nonsmokers. Hookah smoking prevalence exceeds cigarette smoking prevalence in a college population and a substantial number of non-cigarette smokers are engaging in hookah smoking. These findings highlight
the need to address hookah smoking among non-cigarette smoking college students across multiple racial groups, with particular attention to females.

No funding.

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POS1-108 PHARMACOTHERAPY EFFECTS ON SMOKING CESSATION VARY WITH GENETIC RISK (CYP2A6)

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Objective: There is evidence that genetic variants in the nicotinic receptor genes on chromosome 15 (CHRNA5-CHRNA3-CHRNB4) and the Cytochrome P450 2A6 (CYP2A6) gene can influence smoking behaviors and cessation success. This study examines the influence of these genetic variant settings on smoking cessation success and response to cessation pharmacotherapy. Method: Survival analyses were used to model the relationship between smoking cessation (relapse likelihood over 90 days) and nicotine metabolism in subjects from a randomized smoking cessation trial (N=1,073, European ancestry). We examined haplotypes in CHRNA5, and derived metabolism estimates using haplotypes in CYP2A6. Slower metabolism is defined as the lowest quartile of metabolic function. Results: Individuals with faster CYP2A6 nicotine metabolic activity are more likely to relapse than are individuals with slower metabolism when both are given placebo (Wald=6.11, df=1, p=0.013). Further, pharmacotherapy condition (active vs. placebo) interacts with CYP2A6 estimated nicotine metabolic function (Wald=7.15, df=1, p=0.007). The number needed to treat (NNT) varies by genotype (3 for smokers with faster metabolism vs. >1000 for smokers with slower metabolism). This pharmacogenetic interaction is concentrated among those receiving nicotine replacement therapy (NRT). The effect of NRT differs significantly with CYP2A6 metabolism status (Wald=4.84, df=1, p=0.028), while the effect of bupropion does not (Wald=0.73, df=1, p=0.395). The genetic risks of CYP2A6 and the previously reported genetic marker (CHRNA5-CHRNA3-CHRNB4) on smoking cessation are independent and additive. Conclusions: Individuals with faster nicotine metabolism have an increased risk of cessation failure, and NRT is effective in faster, not slower, metabolizers. The effect of bupropion is un-affected by CYP2A6, and can benefit individuals with slower metabolism. The wide variation in NNT between smokers with different genetic backgrounds may guide the development of a personalized smoking cessation intervention based upon genotype.

This research was supported by NIH grants P01 CA093932 (LJB), P50 CA18724 (TB), and K05CA139671 (TB) from the National Cancer Institute, P50 DA19706 (TBB), RO1 DA029994 (LJB), and KO8 DA030938 (LSC) from the National Institute on Drug Abuse, and U01 HG004422 (LJB) from the National Human Genome Research Institute, sub-award KL2 R2024994 (LSC) from the National Center for Research Resources, and ST32MH014677-33 from the National Institute of Mental Health (AJB). Genotyping services for the UK-TTURC sample were provided by the Center for Inherited Disease Research (CIDR). Funding support for CIDR was provided by NIH grant U01HG004438 and NIH contract HHSN268200728096C to The Johns Hopkins University. Assistance with genotype cleaning was provided by the Gene Environment Association Studies (GENEVA) Coordinating Center (U01 HG004446).

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POS1-109 WATERPIPE TOBACCO SMOKING AMONG UNIVERSITY STUDENTS IN JORDAN

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The purpose of this study was to investigate the prevalence and characteristics of water pipe tobacco smoking among university students in Jordan. A questionnaire was administered randomly to undergraduate students at four universities in Jordan. The questionnaire assessed sociodemographic data and personal history of waterpipe use. Of the 5941 participants, 56.6% were female. More than half (55.8%) had ever smoked tobacco from a waterpipe, and use at least monthly was reported by 37.4%. Past 30 days use is significantly associated with gender (59% in males versus 16.8% in females, P < 0.01) and income (P < 0.05). In conclusion, waterpipe tobacco smoking is highly prevalent among university students in Jordan. Thus, educational interventions emphasizing the harm and addictiveness of waterpipe tobacco smoking may be valuable in Jordan.

Funding: NIH.

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POS1-110 UNDERSTANDING THE BEHAVIORS AND ATTITUDES ASSOCIATED WITH HOOKAH USE IN A COLLEGE POPULATION

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Introduction: Emerging tobacco products pose a threat to public health gains in reducing tobacco use. Hookah smoking is one product that is showing gains in popularity in the United States. Method: A survey study of a university campus was conducted. Participants (N=1203) completed a computer-aided survey assessing use of multiple tobacco products. Associated behaviors were measured for those reporting hookah use. Additionally, attitudes of harm and addictiveness were assessed for the entire sample, including non-tobacco users. Results: For those that reported current hookah use, many (28.3%) owned their own hookah pipe and 74% reported purchasing it from a tobacco shop. Over three fourths (76.1%) reported smoking in hookah bars/cafes or restaurants; and nearly as many (72%) also reported smoking in their friends’ homes. While current hookah users (44.0%) reported hookah was less harmful than cigarettes, nearly one-fourth (23.7%) of never tobacco users reported hookah as less addictive than cigarettes. Of the overall sample, 20.5% reported that cigarette smoking is somewhat or very acceptable among their friends, while more than double (46.6%) reported that hookah smoking is somewhat or very acceptable among their friends. Conclusion: While the research continues to estimate the growing popularity of hookah among adolescents and young adults, further research to understand the associated behaviors regarding this tobacco use are warranted. Similarly, attitudes toward hookah by users and non-users are pertinent in prevention and cessation efforts. More than one-fifth of tobacco-naïve participants reported less harm and addictiveness in hookah, leaving them vulnerable to situations where hookah is both accepted and available.

Funding by University of Florida Research Opportunity Fund.

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POSI-111
POPULARITY OF HOOKAH LOUNGE AMONG COLLEGE STUDENTS, SAN DIEGO, CALIFORNIA: A WEB-BASED SURVEY

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Introduction: Hookah lounges are venues that offer customers the opportunity to smoke tobacco using hookahs (waterpipe). Hookah lounges are opening near colleges in increasing numbers. A hookah smoker inhales charcoal-heated tobacco smoke that passes through a partially-filled water container. The purpose of this study was to investigate patterns of hookah lounge attendance among undergraduate college students. Methods: A random sample of 10,000 undergraduate college students at a public university in San Diego, California, were selected to receive an email invitation to participate in a web-based survey on hookah use. A total of 1,367 consented to participate. Results: The mean age was 22.3 years (SD=3.94). The majority were females (66.4%), White (45%) followed by Hispanics (22.5%); and were aware of hookah (95%). More than one-half (69%) were first aware of hookah lounges by friends and 14% by passing near one. Of those who had ever tried hookah (71.8%), a total of 53.3% reported current occasional hookah use. Of those who had ever visited a hookah lounge (65.1%), a total of 45.4% visited a hookah lounge near college; 37.6% reported usual time spent at a hookah lounge to be 91-120 minutes. Males were more likely to have ever tried hookah (76%) than females (69.5%). Logistic regression analysis showed that ever cigarette smokers and ever hookah smokers predicted ever hookah lounge attendance among undergraduate college students. Gender, ethnicity and age were not significant predictors. Conclusions: Policy makers and health professionals need to address the proliferation of hookah lounges and the spread of hookah use among college students.

This research was supported by funds provided to Dr. Kassem (PI) by the Flight Attendant Medical Research Institute (FAMRI) Award # 052364.

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POSI-112
WHAT ARE YOUNG ADULTS SMOKING IN THEIR HOOKAHS?

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Background: Hookah smoking continues to be a popular form of tobacco use, especially among college students. Although hookahs are commonly used to smoke tobacco, other substances, including herbal shisha, marijuana and hashish may also be used. To date, no studies have investigated the variety of substances college students smoke using a hookah. Methods: In fall 2010, 3,447 students (62% female, 83% White) from 8 colleges in N.C. completed an online survey (34% response rate) as part of a randomized community trial to reduce high-risk drinking. Results: 44% (N=1,509) of students reported ever smoking tobacco from a hookah. Of those ever users, 90% reported smoking flavored tobacco in a hookah, 45% marijuana, 37% herbal (non-tobacco) shisha, and 18% hashish. Latent class analysis revealed two distinct classes. The most prevalent class (77%) primarily smoked flavored tobacco, with minimal use of herbal shisha and marijuana and virtually no use of hashish. The second class (23%) primarily smoked marijuana, hashish and flavored tobacco with moderate use of herbal shisha. Logistic regression analysis adjusting for clustering within-schools revealed that males (AOR=1.59, p<.01), illicit drug users (AOR=3.41, p<.001), daily cigarette smokers compared to never smokers (AOR=2.01, p<.05) and those whose mothers had higher levels of education (AOR=1.64, p<.05) were significantly more likely to be in the second class compared to the first. Conclusions: Rates of lifetime use of hookah were high in our sample of college students. While the majority of hookah users smoke tobacco in hookahs, they also smoke other substances, notably marijuana and herbal shisha. Prevention efforts need to recognize that students are using hookahs to smoke a variety of substances. Additionally, campus policies should consider banning the use of hookahs on campus properties, regardless of what substances are smoked in them.

Research for this abstract was supported by National Institutes of Health under Award Number R01AA14007. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

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POSI-113
WHAT ARE THE DETERMINANTS OF THE ALARMING PREVALENCE OF WATERPIPE SMOKING AMONG 6TH AND 7TH GRADERS IN LEBANON?

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Prevalence of waterpipe tobacco smoking is increasing worldwide. This rise poses a serious health threat given the emerging evidence of toxicant content and health effects of waterpipe tobacco smoking. Current waterpipe tobacco smoking has been documented among university and high school students globally, and among middle school students in the Eastern Mediterranean region. The objective of this research is to expose the alarming prevalence of waterpipe use rates among 6th and 7th graders, and begin to analyze possible determinants. Methods: A self-reported survey was administered in 2011-2012 to a sample of 1616 students in 6th and 7th grade (mean age=12.3 years, SD=1.2) in randomly selected schools representing all the Lebanese governates. Results: Findings revealed that 40.4% of students surveyed had ever tried the waterpipe, and 37.9% were current smokers. Half of the students initiated waterpipe smoking at age ten years or before (47.2%). Almost a third (29.3%) of those who smoked the waterpipe were also cigarette smokers. Although males were more likely than females to have ever smoked waterpipe, males and females were equally likely to be current smokers. Ever and current waterpipe smoking in this young age group was more likely if the parents as well as all/most of their friends smoked cigarettes or waterpipe. Students were asked to respond to a variety of knowledge and attitudes items. When combined into a scale, the knowledge items were not predictive of current waterpipe smoking but the attitude items were associated with current use. The more positive the attitude towards waterpipe smoking (such as ‘If I smoke waterpipe I would: relax, have more friends, be more attractive’), the more likely a young person was to be a current smoker. Conclusion: The prevalence rate of current waterpipe tobacco smoking among this very young age group is alarming, and extends the evidence of the rising epidemic globally. Immediate intervention is needed to curb and control use of the waterpipe and a focus on changing attitudes is critical. In addition, research and practice to apply FCTC policies to alternate tobacco types should be greatly augmented.

This research was supported by a grant from the Qatar National Research Foundation.

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POSI-114
PERCEPTIONS OF SMOKERS ABOUT LOCATION-SPECIFIC COMMUNITY NORMS REGARDING SMOKING

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Objective: This study examined change in the perceptions of the social unacceptability of smoking in seven locations in a representative cohort of Minnesota smokers between 2008 and 2010. Method: The sample comprised 544 participants of the Minnesota Adult Tobacco Survey Cohort Study who reported smoking at least one cigarette in the past 30 days on the 2008 interview and who completed yearly follow-up interviews in 2009 and 2010. On each occasion, participants were asked whether people in their community thought that it was acceptable to smoke in each of seven locations that varied from private to public. Demographic information and smoking status were also assessed. Latent growth analysis was used to examine changes in location-specific norms over time. Results: Most participants indicated that smoking was socially acceptable...
in two private places, homes and cars, and two public places, outside bars and restaurants and in the street. There was less agreement about smoking in three public areas: in parks, near building entrances, and in bars and restaurants. Perceived acceptability changed significantly over time for only one location (slope=-0.06, p<.01): whereas 40% of subjects thought that smoking was acceptable in bars and restaurants in 2008, only 25% did so in 2010. Conclusions: Smokers’ perceptions of the social acceptability of smoking differed greatly by location. Consistent with findings of previous studies that bans are associated with perceived unacceptability of smoking, smokers were more likely to believe that smoking was unacceptable in locations that had been subject to considerable recent action in Minnesota to restrict smoking: in bars and restaurants, in public parks, and near building entrances. Researchers have noted a probable reciprocal relationship between bans and community norms: bans increase the perceived unacceptability of smoking, but some level of an anti-smoking norm might be necessary before legislation can be enacted. Examination of location-specific norms could provide guidance concerning where efforts to ban smoking might be the most successful.

This study was funded by ClearWay Minnesota.

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POS1-115 KNOWLEDGE AND ATTITUDES ABOUT A FORTHCOMING SMOKING BAN AMONG SMOKERS IN PUBLIC HOUSING


In September 2012, the Boston Housing Authority (BHA) implemented a policy that bans smoking in BHA owned properties, including residents’ apartments. Boston is the largest city in the country with such a ban. Prior to implementation, we examined knowledge and attitudes toward the smoke-free policy. Seventy-three current smokers who were planning to quit smoking within 30 days, or were thinking about quitting within 6 months, completed a survey on the policy immediately following completion of a separate baseline questionnaire. The first 36 surveys were administered anonymously and could not be linked to other data. Responses of the remaining 37 respondents were further analyzed using data from baseline questionnaires. Surveys were completed 2 to 10 months prior to implementation of the policy. 97% of respondents were aware of the policy, and 90% expected it to be implemented at their development. 64% of early (n=36) and 90% of late (n=37) respondents correctly agreed that the policy prohibited smoking in either apartments or common indoor areas, while 49% and 73%, understood that smoking was also prohibited outside building entrances. Certain elements of the policy were widely misunderstood. 43% of early and 54% of late respondents mistakenly stated that no smoking was allowed anywhere on the grounds, and 37% and 24%, respectively, incorrectly believed that the policy required all smokers to quit. 58% of respondents said that quitting smoking had been very much or somewhat influenced by the impending policy, and a similar percentage (63%) thought the policy was a good idea, with little change across time in either measure. However, 25% of those interviewed believed the ban violated their rights. Support was highest among Hispanics (82%) and lowest among Black (33%) respondents and was also higher among smokers with children in their household. Resident understanding of the policy appeared to improve closer to implementation, although important areas of misunderstanding remained. As many municipalities across the country move towards considering similar smoke-free policies, lessons learned in Boston provide an important framework for future public health efforts.

Funded by NIH grants #R01CA141587 and #R01CA141157.

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POS1-116 UNDERSTANDING SECONDHAND SMOKE LAWS IN HIGH-PREVALENCE LMICS: EARLY FINDINGS FROM INDONESIA

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Laws to reduce exposure to secondhand smoke are now being attempted in low- and middle-income countries (LMICs), such as Indonesia, where 67% of men and 3% of women age over 15 smoke. In Indonesia, awareness about the harms of second-hand smoke is low, and there is some suspicion that smoke-free laws are not addictive or that certain cigarettes may be beneficial to health. In 2010, the city of Bogor implemented the first comprehensive smoke-free law in the country. Two years later, inspections show that compliance is high in venues such as hospitals (96%) and child-care places (93%), but remains low in restaurants (56%). In mid-2012, we investigated the reasons for low compliance by conducting 11 focus groups (segregated by age (18-25, or 26+), gender, and smoking status) with a total of 89 Bogor city residents. We used photo elicitation techniques to learn their perspectives about where the law applies. Additionally, we conducted 42 individual interviews with 38 public leaders (including city and national government, NGOs, professional organizations, religious organizations, and media) and 17 restaurant and shopping area managers. We also photographed venues and collected samples of communication materials. The first review of the findings reveals the following core challenges, which may be applicable to other LMICs: (1) The vast majority of restaurants are outdoors or open-air, creating confusion about where the smoke-free law applies; (2) There is some suspicion that smoke-free laws may be efforts by high-income countries to impinge on local culture; (3) Common sightings of city officials ignoring the law in their own offices causes residents to doubt the seriousness of the law; (4) Enforcement is sporadic and sparse and is complicated by a legal system that makes it difficult to give fines for violations of local regulations; (5) The public education and communication effort has been insufficiently broad because of limited funding; and (6) Cultural gender roles and norms of politeness limit social enforcement of the law. We will discuss recommendations to address these challenges, and implications for future secondhand smoke policies in LMICs.

Funded by the Bloomberg Initiative to Reduce Tobacco Use through the Institute for Global Tobacco Control, Johns Hopkins Bloomberg School of Public Health.

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POS1-117 CAN SMOKE-FREE LEGISLATION BE AN OPPORTUNITY TO REDUCE SECOND-HAND SMOKE EXPOSURE AND INCREASE PRACTICE OF SMOKE HYGIENE AT HOME? THE CASE IN HONG KONG

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Background: Smoke-free legislation is effective in reducing second-hand smoke (SHS) exposure among non-smokers, but there are no consistent findings on whether such legislation resulted in an increase in the SHS exposure of children with smoking parent(s) at home. The effect on spousal action to sustain smoking hygiene has not been studied. Method: Cross-sectional surveys were conducted before (2005-2006) and after (2007) the implementation of new legislation in Hong Kong. 323 and 742 families in pre- and post-legislation respectively with a smoking father were recruited from Maternal and Child Health Centres and Student Health Service Centres. The outcome measures included fathers’ smoking habit, SHS exposure among children at home, hair cotinine level of children, mothers’ action to protect children from SHS, and their support to fathers to quit. Logistic regression and multiple linear regression models were used to assess the effect of legislation on the changes of the outcome measures. Wilcoxon signed rank test was used to test the change in nicotine level in hair. Results: Proportion of fathers smoking near children reduced from 83% to 14.6% after legislation (p<0.01). The children’s exposure to SHS at home reported by mothers significantly reduced from 87.2% to 29.3% (p<0.01). The hair nicotine level of children was significantly lower after legislation. Proportion of mothers who took their children away from smoke increased from 6.3% to 92.2% (p<0.01). Among those mothers who advised fathers to quit (65% of all mothers), the proportion of advise over 3 times in the past month increased from 8.3% to 33.8% (p<0.01). No significant change
after legislation was found in the content of smoking cessation advice, and in the proportion of mothers who took specific action (23.1% vs 26.7%) and gave support (28.2% vs 31.9%) to fathers to quit. Conclusion: Our finding supported that SHS exposure at home among children reduced after the legislation. Legislation did not lead to increase in mother’s tangible support to fathers to quit. Adequate support to cessation services and specific intervention for families with smokers should be expanded with smoke-free legislation.

The funding source for this study is the Food and Health Bureau, Hong Kong SAR government (Ref: SHS-T02).

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POS1-118
ON THE BORDER: ECONOMIC EFFECTS OF A STATEWIDE CLEAN INDOOR AIR POLICY ON RESTAURANTS AND BARS IN BORDER AND NON-BORDER COUNTIES

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Introduction: Numerous studies have confirmed clean indoor air (CIA) policies do not have negative economic impacts on the hospitality sector. However, fewer studies have examined sub-state regions, such as border areas near jurisdictions without CIA policies. Ohio implemented a statewide CIA policy in May 2007 and was surrounded by states without such policies until mid-2010. The current study evaluated the impact of Ohio’s policy on taxable restaurant and bar sales for border and non-border counties. Methods: An interrupted time series analysis was used, which also accounted for seasonality, unemployment rates, and general trends in the hospitality sector. The primary outcome was the ratio of monthly taxable sales in full-service restaurants and bars (evaluated separately) to total hospitality sales. Data were available from four years prior to policy implementation to three years post-policy. Counties that bordered non-Ohio counties with 100% countywide smoke-free policies (n=5) were considered to be non-border counties. Border (n=21) and non-border (n=67) counties were evaluated separately. Results: There were non-significant increases in outcome ratios for restaurants (p=0.51) and bars (p=0.71) in the state. Similarly, there were non-significant increases for restaurants in border (p=0.99) and non-border (p=0.74) counties. There were non-significant decreases for bars in both border (p=0.09) and non-border (p=0.73) counties. Conclusions: This study found that a statewide CIA policy in Ohio did not have significant effects on sales in restaurants or bars along the state border areas. Results are also likely to be important for other states considering establishing new policies or enhancing or defending existing ones, especially since CIA policies provide protection from exposure to secondhand smoke for workers and the general public.

Funding for this project was provided by the Ohio Department of Health.

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POS1-120
ATTITUDES TOWARD TOBACCO-FREE CAMPUS POLICIES IN A U.S./MÉXICO BORDER UNIVERSITY

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Tobacco-free campus policies have recently increased in the U.S.; studies have indicated their impact in promoting tobacco use reduction. This study assessed potential predictors of attitudes and beliefs toward tobacco-free campus policies at a U.S./México border university. Students, faculty, and staff (N=3002; Mage=30.4, SD=12.86; 60% female; 63.1% Hispanic) completed an online consent form and a survey that assessed tobacco use history/predicted health risks, attitudes toward tobacco-free campus policies (TFC), and problematic campus tobacco use. Linear regressions assessed predictors of perceived tobacco use health risks (M=1.66, SD=0.61) (model 1), attitudes toward TFC (M=1.77, SD=0.79) (model 2), and problematic campus tobacco use (M=2.52, SD=9.2) (model 3). Overall, participants reported positive attitudes toward TFC. Significant predictors for model 1 F(13, 481)=4.01 p < .001 (“There is no safe level of exposure to secondhand smoke”; higher numbers indicate less perceived risk) were gender B=-.18, ethnicity (whites B=+.19, Asian Americans B=-.56), daily smoking for 6 months B=.22, and the ability to identify current policy B=.21 (all p’s < .05). Significant model 2 predictors F(13, 456)=6.5 p < .001 (“Colleges should regulate tobacco use on campus”; higher numbers indicate less agreement) were gender B=-.24, ethnicity (whites B=+.25, Asian Americans B=-.63), current smoking B=.39, daily smoking for 6 months B=.25, and the ability to identify current policy B=.21 (all p’s < .05). White ethnicity B=.30, and current smoking B=.22 (all p’s < .05) were significant model 3 predictors F(13, 447)=3.41 p < .001 (“assess the extent of smoking at the following locations: dormitories”; higher numbers indicate more problems). Results indicated that females, white individuals, current tobacco users, and past daily smokers had more positive attitudes toward smoking, less positive attitudes toward TFC, and perceived less problematic campus tobacco

POS1-119
REDUCTIONS IN PRE-PREGNANCY SMOKING AMONG LOW-INCOME MOTHERS FOLLOWING OHIO’S COMPREHENSIVE CLEAN INDOOR AIR POLICY

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Objectives: Lower income women are at higher risk for prenatal smoking, are less likely to spontaneously quit smoking during pregnancy, and have higher prenatal relapse rates than women in higher income groups. Policies prohibiting tobacco smoking in public places are intended to reduce exposure to secondhand smoke; additionally, these policies may promote a smoke-free norm and there have been associations between smoke-free policies and reduced smoking prevalence. Given the public health burden of smoking, and specific concerns for women who may become pregnant and for their offspring, our objective was to assess the impact of smoke-free policies on smoking cessation among low-income women prior to pregnancy. Methods: We estimated the odds of pre-pregnancy smoking among low-income women in Ohio between 2002 and 2009 using data from annual repeated cross-sectional samples of 485,913 women participating in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). A logistic spline regression was applied fitting a knot at the point of enforcement of the Ohio Smoke-free Workplace Act (May 2007) to evaluate whether implementation of this policy was associated with changes in the odds of smoking. Results: After adjusting for individual- and environmental-level factors, implementation of the Ohio Smoke-free Workplace Act was associated with a small, but statistically significant reduction in the odds of pre-pregnancy smoking in WIC participants (OR=0.98, 95% CI: 0.98-0.99). For every 6 months after policy enforcement, the odds of pre-pregnancy smoking among a sample of low-income women decreases by 11% after accounting for ethnicity, socioeconomic factors, age, parity, region of the state, and cigarette taxes. Conclusions: Comprehensive smoke-free policies prohibiting smoking in public places and workplaces may be associated with modest reductions in odds of smoking among low-income women. This type of policy or environmental change strategy may promote a tobacco-free norm among an important population at risk for smoking.

This study was supported in part by the Health Resources and Services Administration, Maternal and Child Health Bureau’s Graduate Student Internship Program.

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use. Thus, it is important to address misconceptions about the dangers of secondhand smoke and disseminate the benefits of tobacco-free campus policies. This project was funded by a Smoke Free Paso del Norte Grant No. 26-8113-63.

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POS1-121 HAZARDOUS AIR QUALITY LEVELS FOUND INSIDE AND OUTSIDE TORONTO WATERPIPE CAFES
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Flavoured herbal and tobacco waterpipe smoking has increased exponentially in recent decades, particularly among youth and young adults. Although tobacco smoking is banned in most indoor public places, waterpipe smoking has been exempt in jurisdictions where only tobacco smoke is specified. We present findings from the first study to use multiple methods and markers to assess both waterpipe exposure and environmental and patron characteristics. This presentation focuses on air quality data collected from five waterpipe cafes (three with patios) in Toronto, Canada. August-September 2012. Real-time measurements of fine particulate matter (PM2.5) using TSI AM510 SidePak and carbon monoxide (CO) using TSI Q-Track (model 7575), were collected in 2-hour sessions. Exposure to second-hand smoke and disseminate the benefits of tobacco-free campus policies. Thus, it is important to address misconceptions about the dangers of secondhand smoke and disseminate the benefits of tobacco-free campus policies.

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POS1-122 DO ATTITUDES AND RESPONSES TO SMOKEFREE LEGISLATION VARY ACCORDING TO MENTAL HEALTH STATUS?
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Background: Tobacco control policies introduced over the last decade have generally not been targeted specifically at population subgroups in whom smoking prevalence remains stubbornly high, such as those with mental ill health. This study investigated attitudes towards national comprehensive smokefree legislation in England (introduced on 1st July 2007) and reported impacts on smoking behaviour in this group. Methods: Data from the 2007 Health Survey for England were used to identify respondents self-reporting a longstanding mental illness or currently taking psychoactive medication. Smokers were asked a number of questions to quantify their attitudes to the smoking ban, and chi squared tests used to compare responses in those surveyed before and after legislation enactment. Results: In all respondents there was a significant increase in reported support for the legislation post-ban compared to pre-implementation, with support increasing more amongst those reporting mental ill health or medication use (e.g., from 66% to 84% in those taking medications, and from 71% to 77% in those not). Similarly, in all groups of respondents interviewed post-ban reported wanting to quit because of the legislation than those expressing a desire to do so pre-implementation, e.g., 26% of medication users interviewed pre-ban reported wanting to quit because of the ban, compared to just 5% post-ban (p<0.010). Approximately 50% of respondents without an indicator of mental ill health reported pre-ban that the legislation would make them reduce their daily cigarette consumption, decreasing significantly to 40% of those interviewed post-ban (p<0.001). Reductions of a similar magnitude were observed in those reporting mental ill health and medication use. Conclusions: There is some evidence of a disparity in translating good intentions pre-legislation about quitting or reducing consumption into behavioural change post-legislation, despite high levels of agreement with the ban. These patterns are similar regardless of mental health status, suggesting no differential impact of smokefree legislation and no subsequent widening or narrowing of smoking-related health inequalities.

Funding: Both authors are members of The UK Centre for Tobacco Control Studies, a UKCRC Public Health Research Centre of Excellence. Funding from British Heart Foundation, Cancer Research UK, Economic and Social Research Council, Medical Research Council, and the National Institute for Health Research, under the auspices of the UK Clinical Research Collaboration, is gratefully acknowledged.

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POS1-123 100% SMOKE-FREE LAW: THE BRAZILIAN EVOLUTION
Felipe Lacerda Mendes*, Cristina de Abreu Perez, and Tânia Maria Cavalcante, National Committee for FCTC Implementation

According the World Health Organization the second-hand tobacco smoke kills 600,000 people every year and there is no safe level of exposure to second-hand tobacco smoke. The purpose of this paper is to describe the smoke-free law implementation in Brazil. Since 1996, there is a federal law that prohibits smoking in public places. However, this law is outdated under the Framework Convention on Tobacco Control (FCTC), as it allows smoking in "isolated and ventilated areas" in public places. Progress is being made since that in specifics municipalities, but we have found many barriers in a range of areas to implement a comprehensive law attending the FCTC guideline. Studies have shown that there is strong compliance with the smoke-free law, anyway until these days we face difficulties to regulate the last Federal Law prohibiting smoking in enclosed places nationwide, ending with all designated smoking rooms in public places. This description will enable us to present the challenges faced in our country, which will possibly be faced by other countries that intend to implement similar legislation considering that the tobacco industry strategies are the same to for delaying or blocking the tobacco control in all countries.

No funding.

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POS1-124 MAKING EVIDENCE COUNTRY SPECIFIC: LESSONS FROM NATIONAL TOBACCO CONTROL PROGRAM (NTCP) TOBACCO DEPENDENCE TREATMENT GUIDELINES IN INDIA
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Introduction: Tobacco cessation with nicotine replacement therapy (NRT) is a new approach in India. As an over the counter product it has implication for access to tobacco cessation service. However its prescription requires customization. NRT use has been advocated under National Tobacco Control Program (NTCP) and a
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with validation of adapted scientific information from the appropriate professional aspect of NRT is also not covered in the guideline. Conclusion: There are issues smokeless tobacco products which is more prevalent in India. Pharmacovigilance the NRT prescription has concentrated more on cigarette or bidi but not on nicotine dependence without any validation in India are cause of concern. Further, the NRT prescription has concentrated more on cigarette or bidi but not on smokeless tobacco products which is more prevalent in India. Pharmacovigilance aspect of NRT is also not covered in the guideline. Conclusion: There are issues in adapting international standards and making it country specific. The authors of training materials for new public health program like NTPC need to examine the other international standards before adapting. Standardizing national guidelines with validation of adapted scientific information from the appropriate professional bodies in the country and pilot testing the guideline with the involvement of key stakeholders are need of the time.

No funding.

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POS1-125
WEB ASSISTED TOBACCO INTERVENTION WITH COMMUNITY COLLEGES: PHASE I QUALITATIVE RESEARCH FINDINGS

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A trial of Web Assisted Tobacco Intervention (WATI) with Community Colleges is being conducted in 3 phases: qualitative research, randomized trial, and dissemination. This presentation on Phase 1 findings includes a qualitative baseline assessment of Community College policies and efforts towards smoking prevention and cessation. Findings provide context of this unique setting in preparation for recruitment and launch of the Phase 2 trial (2 treatment conditions, 16 matched campuses) which will test various combinations of WATI components. Through 32 Key Informant Interviews, 4 Focus Groups, document reviews and direct observation on 4 Community College campuses, we examined the role of the Community College in smoking policy and health promotion. Following transcription of interviews and focus groups, we engaged in open and then axial coding of transcript data to describe the policy and programmatic approaches related to smoking prevention and cessation at 4 Western New York Community Colleges. Findings indicate: 1) a consistent pattern of policies prohibiting indoor smoking with designated outdoor smoking areas; 2) adherence to indoor restrictions, but non-compliance with designated outdoor areas; and 3) clear signage communicating policies. Enforcement of compliance varied, with some campuses reporting strong intervention efforts, while others were permissive. Evidence-based programs were limited and inconsistent. Students were uniformly unaware of programs, but they could identify relevant brochures and/or staff for treatment referral. Campuses had small health offices focusing on relatively few health-related topics, often determined by the interests and knowledge of campus staff. Findings support the unique role of Community Colleges in health promotion compared to traditional 4-year campuses. These campuses have identifiable policies, but limited enforcement and undeveloped prevention or cessation programs. This limited infrastructure to deliver and enforce traditional programmatic efforts supports the need for less expensive, wide-reaching and evidence-based approaches such as WATI.

Funded by NIH National Cancer Institute grant # R01CA152093 (McIntosh, PI).

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POS1-126
ENHANCING TOBACCO QUITLINE EFFECTIVENESS: IDENTIFYING A SUPERIOR PHARMACOTHERAPY ADJUVANT

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Telephone tobacco quitlines are effective and widely used, with more than 500,000 U.S. callers in 2010. This study investigated the clinical- and cost-effectiveness of three different quitline enhancements: combination nicotine replacement therapy (NRT), longer duration of NRT, and counseling to increase NRT adherence. A total of 987 quitline callers were randomized to a combination of quitline treatments in a 2X2X2 factorial design: NRT duration (2 vs. 6 weeks), NRT type (nicotine patch only vs. patch plus nicotine gum), and standard 4-call counseling (SC) vs. SC plus medication adherence counseling (MAC). The primary outcome was 7-day point-prevalence abstinence (PPA) at 6 months post-quit in intention-to-treat (ITT) analyses. Combination NRT for 6 weeks yielded the highest 6-month PPA rate (51.6%) compared to 2 weeks of nicotine patch (38.4%), odds ratios [OR] = 1.71 (95% confidence interval [CI]:1.20-2.45). A similar result was found for 2 weeks of combination NRT (48.2%), OR=1.49(95%CI:1.04-2.14), but not for 6 weeks of nicotine patch alone (46.2%), OR=1.38 (95%CI:0.96-1.97). The MAC intervention effect was non-significant. Cost analyses showed that the 2-week combination NRT group had the lowest cost-per-quit ($442 vs. $484 for 2-week patch only, $505 for 6-week patch only, and $675 for 6-week combination NRT). The effects of gender, race, and smoking heaviness were examined in secondary analyses. For gender and race, there were no significant moderator-by-treatment interactions. For smoking heaviness, there was a significant moderator-by-treatment interaction such that lighter smokers in the group receiving 2 weeks of combination NRT had a higher 7-day PPA rate at 6 months (57.4% vs. 34.9% for 2 weeks of patch only) than heavier smokers (42.4% vs. 40.3% for 2 weeks of patch only), interaction p=0.03. In summary, combination NRT for 2 or 6 weeks increased 6-month abstinence rates by 10% and 13%, respectively, over rates produced by 2-weeks of nicotine patch when offered with quitline counseling. A 10% improvement would potentially yield an additional 50,000 quitters annually, assuming 500,000 callers to U.S. quitlines per year.

National Cancer Institute (NIH) grant K05CA139871.

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POS1-127
IMPLEMENTATION OF THE CLINICAL EFFORT AGAINST SECONDHAND SMOKE EXPOSURE (CEASE) IN PEDIATRIC OUTPATIENT PRACTICE: A RANDOMIZED CONTROLLED TRIAL TO DELIVER ASSISTANCE TO PARENTS WHO SMOKE

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OBJECTIVE: To evaluate a program that enables pediatric outpatient practices to deliver tobacco control assistance (TCA) to parents in the context of their child’s visit. METHODS: In collaboration with the American Academy of Pediatrics...
POSTER SESSION 1 • Thursday, March 14, 2013 • 11:30 a.m.–1:00 p.m.

POS1-128

PHYSIOLOGIC AND BIOCHEMICAL CHANGES AFTER LABORATORY SMOKING OF MAKE YOUR OWN (MYO) AND FACTORY MANUFACTURED (FM) CIGARETTES


Smoking cigarettes made or produced by oneself is becoming increasingly popular in the United States. This is consistent with other countries where intense tobacco regulation and higher prices are associated with a notable increase in the prevalence of smokers making their own cigarettes. Make your own (MYO) cigarettes are made either by rolling shredded tobacco in paper (Roll Your Own [RYO] cigarettes) or using a machine to inject tobacco into a preformed cigarette paper tube (Personal Machine Made [PMM] cigarettes). As part of a larger study, toxicant exposure as a result of RYO and PMM smoking was compared to exposure seen among smokers of factory manufactured (FM) cigarettes. Participants (N = 76) were exclusive RYO smokers (n = 32), exclusive PMM smokers (n = 24) or exclusive FM smokers (n = 20) who reported to the laboratory where they smoked their usual cigarette ad lib. Physiologic effects were similar across cigarettes, including average boosts in heart rate (RYO = 5 bpm; PMM = 3 bpm; FM = 1 bpm) and systolic blood pressure (RYO = 2 mmHg; PMM = 2 mmHg; FM = 5 mmHg); however, the average increase in diastolic blood pressure was significantly lower in PMM than RYO and FM smoking (RYO = 4 mmHg; PMM = 1 mmHg; FM = 4 mmHg). Like FM smokers, MYO smokers were exposed to increased amounts of carbon monoxide with RYO, PMM, and FM boosts of 4 ppm, 5 ppm, and 9 ppm, respectively. Based on a reduced sample of MYO smokers (n = 34), no differences in blood plasma nicotine were seen as a function of the type of MYO smoked (RYO = 14.1 ng/ml; PMM = 18.3 ng/ml). Examination of preliminary data suggests similarities in physiologic and biochemical changes after MYO and FM smoking. Comparisons across the groups suggest that MYO cigarette smokers are exposed to significant toxicants comparable to those seen after FM smoking.

Therefore, the regulation of self-produced cigarettes and the tobacco available for cigarette production is an important public health challenge. This research was supported by a grant from the National Cancer Institute to the National Institutes of Health (R01CA138973-01). CORRESPONDING AUTHOR: Jennifer Potts, Battelle Memorial Institute, Center for Analytics and Public Health, 6115 Falls Road, Baltimore, MD 21209, United States, Phone: 410-372-2724; Email: potts@battelle.org

POS1-129

CHRNAS-A3-B4 GENETIC VARIANTS ALTER TOBACCO CONSUMPTION IN ALASKA NATIVE TOBACCO USERS

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Alaska Native people (ANP) have the highest prevalence of smoking, at 43.3%, among all racial groups in the United States. We investigated whether genetic variation in CHRNAS-A3-B4 (nicotinic receptor genes), alone and in combination with CYP2A6 (a nicotine metabolizing enzyme), modulates tobacco consumption in ANP. Methods: Tobacco users (n=290) were recruited in local villages near Bristol Bay, Alaska. Seventeen SNPs in CHRNAS-A3-B4 were genotyped. In vivo CYP2A6 activity was measured by the plasma ratio of 3-hydroxyxycotine to cotinine. Biomarkers of tobacco and tobacco-derived carcinogens, including plasma cotinine (COT), urinary total nicotine equivalents (TNE), urinary NNAL, and urinary 1-hydroxyxfluorene, were measured. Results: The 'G' allele of rs587776, which uniquely tagged a 30kb haplotype between CHRNAS and CHRNA3 in ANP, was prevalent (16%) and associated with 20% higher COT and 16% higher TNE (P<.001 and P=0.076, respectively). CYP2A6 had a larger impact on tobacco exposure than rs587776, for example, those with faster CYP2A6 activity had 36% higher TNE. CYP2A6 and rs587776 also acted in combination to alter tobacco consumption. For example, TNE was the highest in those with faster CYP2A6 activity and the 'G' allele of rs587776 (84 nmol vs. the 47 nmol observed in those with slower CYP2A6 activity and no 'G' allele, P=0.0003). The prevalence of the 'A' allele of rs16969968 was low (3%), but it had a sizeable albeit non-significant impact on tobacco consumption. The 'GA' genotype, compared to the 'GG' genotype, was associated with 46% higher COT and 38% higher TNE. Conclusion: While gene variants in CHRNAS-A3-B4 occurred at substantially different frequencies in ANP compared to Caucasians, they altered tobacco consumption in a similar way. Due to the high allele frequency in ANP, rs587776 may play a more important role in governing tobacco consumption than rs16969968. The prevalence of the protective CHRNAS-A3-B4 and CYP2A6 alleles was higher in ANP than in Caucasians, suggesting that these genetic variants may contribute substantially to the differences in risk for tobacco related illnesses within ANP. 

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NIH and NC1I (NARCH III U26HS300012, HHSN261200700462P, CA114609, DA012453, DA020830 and DA012453) CIHR (MOP86471).

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POS1-130
SMOKING CESSATION REFERRALS BY OPTOMETRISTS: A NATIONAL STUDY ASSESSING PRACTICES AND OPPORTUNITIES
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PURPOSE: Smoking is causally associated with certain prevalent visually impairing eye diseases, including age-related macular degeneration and macular degeneration. Studies have found that people are afraid of “going blind” and may be motivated to quit smoking if they know that vision loss is associated with smoking behavior. Little is understood about the level of optometrists’ involvement in tobacco use prevention and cessation, or how optometrists perceive this type of intervention within their scope of practice. METHODS: An online bilingual (English/French) survey was developed and sent to all 4,528 optometrists registered in Canada. Optometrists were asked about their knowledge of the causal links to tobacco with ocular disease and their tobacco history and education practices. RESULTS: There were 850 respondents (19%); 77% English-surveyed, 60% women, 80% Canadian-educated, 90% non-smokers, 16 years (mean) practicing. Knowledge about tobacco’s links to eye disease ranged from 98% age-related macular degeneration (AMD) to 15% thyroid-associated ophthalmopathy (TAO). Tobacco histories involved new patients (55%), patients under 19-years-old (7%), and teens in the presence of parents (15%). Questions addressed daily consumption (53%) and smokeless tobacco (5%). Updating tobacco histories was motivated by observable tobacco stains or odor (73%), known smoking-related eye disease (56%) or systemic disease (27%). Patient education and management involved: regularly or always explaining smoking links to eye disease (71%) and cardiovascular disease (21%), advising quitting (58%), assessing quitting interest (33%) and providing prevention information (29%). Only 22% were aware of cessation services, accounting for limited provision of nicotine replacement advice (15%), educational materials (14%), and Smoker’s Helpline information (7%). Training in tobacco cessation and prevention was rare (4%) but interest in provision of cessation services, accounting for limited provision of nicotine replacement advice (15%), educational materials (14%), and Smoker’s Helpline information (7%). Training in tobacco cessation and prevention was rare (4%) but interest in obtaining education was frequent in smoking eye health links (80%) and cessation strategies (79%). CONCLUSIONS: Canadian optometrists would benefit from further education regarding tobacco-related disease, history, prevention and cessation.

Funding for this study was provided by Health Canada Through the Federal Tobacco Control Strategy.

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POS1-131
MONETARY CM PAYMENTS FOR TOBACCO ABSTINENCE DO NOT INCREASE RISK OF RELAPSE TO SUBSTANCE USE IN ALCOHOL-DEPENDENT PARTICIPANTS RECEIVING SMOKING CESSATION TREATMENT
Christoffer Grant*, Sharon Cooper, Suchitra Krishnan-Sarin, Ned Cooney, and Judith Cooney

Use of monetary contingency management for confirmed tobacco abstinence has been shown to be an effective tobacco treatment for treatment refractive smokers, including alcohol-dependent smokers (e.g., Cooney et al., 2010). However, assuming financial CM payments to be risky for substance use relapse, many investigators and clinicians have preferred to use vouchers redeemable for goods and services as CM payments. To date there have been no examinations of the allocation of CM payment expenditures to examine this risk. Use of CM payments were assessed as part of a trial of 80 alcohol-dependent participants enrolled in a smoking cessation trial. Forty-two participants were randomized to a three-session Cognitive Behavioral Treatment (CBT) for smoking cessation and 41 were randomized to a 12-session brief-behavioral intervention that included CM-payments (FBB-CM) for smoking abstinence. Participants in both groups received $40 in research payments to complete questionnaires, while only participants in the CM group received up to an additional $140 for carbon monoxide confirmed smoking abstinence. Immediately prior to the end of their treatment participants were asked to itemize allocation of research and CM payments. There did not appear to be any differences between conditions on purchases that had been made with their research payments. A single person in the CBT group endorsed using research payments to purchase cocaine. In regards to the CM payments, sixty-four responses were divided into 8 general categories. No participants reported spending CM payments on drugs, alcohol, or cigarettes and only one participant reported spending money on lottery tickets. Participants were biochemically assessed for drug and alcohol use at each follow-up research sessions (end of treatment, 1-month, 6-months). Chi-square analyses were conducted and revealed that there were no differences between conditions on drug and/or alcohol use (all p’s > .05). This suggests that in this particular population, the use of monetary CM-payments in tobacco treatment is not associated with increased risk for drug and/or alcohol use, and should be considered in future CM tobacco treatments.

No funding.

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POS1-132
UNDERSTANDING INTERNALIZED STIGMA AND MOTIVATION TO QUIT IN SMOKERS WITH SERIOUS MENTAL ILLNESS
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Context: Tobacco use is a hidden epidemic among persons with serious mental illness (SMI), a group dying 25 years prematurely with major causes being chronic, tobacco-related diseases. Internalized stigma, which is associated with negative health outcomes and high-risk behavior, has not been studied in relation to tobacco use. Purpose: The current study of smokers with SMI examined thoughts about quitting and internalized stigma in three domains: mental illness, ethnicity, identity as a smoker. Sample: Current smokers (N=701) were recruited from psychiatry inpatient units in the San Francisco area; recruitment rate=76%. The sample was 50% male with age M(SD)=39 years (13); 45% were non-Hispanic White, 25% African American, and 30% other ethnicity; years smoked averaged 19 (SD=14); 52% met criteria for PTSD, 31% for bipolar depression, 39% for unipolar depression, and 27% for psychotic disorders. Results: Internalized stigma scores averaged 2.4 (SD=0.7) for mental illness, 2.2 (SD=0.6) for smoking, and 1.9 (SD=0.6) for ethnicity, indicating mild to moderate internalized stigma. Ethnicity-based stigma was highest among African-Americans M(SD)=2.2 (0.6) and lowest among Caucasians 1.8 (0.5), relative to other ethnic groups 2.0 (0.6), F(2,678)=35.6, p<0.001. Desire to quit smoking was greater for those with greater smoking-related stigma (stdBeta=0.33, p<0.001) and lower for those with more ethnicity-based stigma (stdBeta=0.10, p=0.027). Participants who endorsed complete abstinence had higher internalized stigma scores for mental illness with M(SD)=2.6 (0.7), F(2,678)=5.4, p<0.005, smoking with 2.4 (0.6), F(2,678)=2.4, p=0.001, and ethnicity with 2.0 (0.6), F(2,672)=3.1, p<0.05, compared to participants with either an intermediate or no goal. Discussion: The association between stigma and desire to quit smoking was domain specific: higher for smoking-based and lower for ethnicity-based stigma. Greater stigma in all domains was associated with a goal of complete abstinence. Tobacco treatment interventions ought to consider the discrimination experiences of diverse smokers with co-occurring disorders and the relationship to motivation to quit.

Funding: R01 MH083684 R25MD006832.

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STRESS-INDUCED CIGARETTE CRAVINGS
REWARD DEPENDENCE PREDICTS HEIGHTENED LEVELS OF CUE- AND STRESS-INDUCED CIGARETTE CRAVINGS

Michael E. Saladin1,2, Kevin M. Gray3,4, Matthew J. Carpenter2,4, Nathaniel L. Baker,4 Steven D. LaRowe4, Karen J. Hartwell4, Erin A. McClure3, and Himanshu P. Upadhyaya2, Department of Health Sciences and Research, Medical University of South Carolina; 2Clinical Neuroscience Division, Department of Psychiatry and Behavioral Sciences, Medical University of South Carolina; 3Youth Division, Department of Psychiatry and Behavioral Sciences, Medical University of South Carolina; 4Substance Abuse Treatment Center Mental Health Service, Ralph H. Johnson VA Medical Center; *EIL Lilly and Company, Indianapolis, IN

Over the past 10 years, our research group has been studying the role of gender in smoking behavior in an effort to identify vulnerabilities that may make smoking cessation especially difficult for women. In one of our previous studies, we found that women and men respond similarly to smoking cues but that women were more craving and stress responsive to personalized, imagery-based, stress cues than men (Saladin et al., 2012). The present study expands on those findings by assessing whether the menstrual cycle phase of the women in that study significantly contributed to the observed gender differences in stress cue reactivity. We used two objective criteria, onset of menses and luteinizing hormone surge (determined via home testing kits), to determine whether women smokers were in either the follicular (n=22) or the luteal (n=15) phase of their menstrual cycle, respectively. The women and a sample of men smokers (n=53) were then administered WTC responders (n=4 Caucasian males) who were regular smokers (M=25 cigarettes/day) with significant PTSD symptoms. At baseline, participants all met criteria for PTSD based on clinical interview and self-report [PTSD checklist (PCL); M = 62]. Three participants completed treatment, 1 quit smoking, 2 reduced the number of cigarettes/day, and the 3 completers experienced a reduction in PTSD symptoms (10point reduction on PCL). Treatment challenges and future research steps will be discussed. This study is supported by National Institute for Occupational Safety and Health #200-2011-42057.

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POS1-134
REWARD DEPENDENCE PREDICTS HEIGHTENED LEVELS OF CUE- AND STRESS-INDUCED CIGARETTE CRAVINGS

Alexandra Michalowski, B.A.*, and Joel Erblich, Ph.D., M.P.H., Department of Psychology, Hunter College, CUNY; Department of Oncological Sciences, Mount Sinai School of Medicine

Cigarette cravings following exposure to smoking cues in a smoker’s environment are thought to play an important role in cessation failure. Although these cue-induced cravings have been modeled reliably under laboratory conditions, there is substantial variability in the magnitude of such reactions. The possibility that dispositional factors may impact cue-induced cravings, though intriguing, has received little attention. According to Cloninger’s tridimensional personality theory, factors such as reward dependence (RD), harm avoidance (HA), and novelty seeking (NS) may figure prominently in risk for addiction, as well as relapse, in substance users attempting to abstain. Particularly intriguing in this regard is the possibility that smokers with higher levels of RD, who are especially sensitive to reward signals, will have heightened craving reactions to smoking cues. To that end, non-treatment-seeking nicotine dependent smokers (n=96, Mean age=40.8, 42.4% African American, 16.2% Caucasian, 21.2% Hispanic, 19.3 cig/day, FTND=5.5) underwent a classic experimental cue-induction, during which they were exposed to: (1) smoking, (2) neutral, and (3) stress cues, and reported their cigarette cravings (0-100) before and after each exposure. In addition, participants completed the Tridimensional Personality Questionnaire. Not surprisingly, smoking and stress cues (but not neutral cues) elicited significant elevations in craving (p< 0.0001). Consistent with study hypothesis, smokers who scored higher on RD had stronger craving reactions to smoking cues (p<0.02). Interestingly, the same pattern of results emerged for smokers’ craving reactions to the stress cues (p<0.01). Findings raise the intriguing possibility that dispositional characteristics, in particular, reward dependence, influence smoking by potentiating reactions to environmental smoking cues. Furthermore, the similar effects of RD on stress-induced craving suggest that both cue-and stress-induced cravings may be influenced by a common underlying disposition. Clinical implications may include increased attention to managing environmentally-triggered cravings among smokers with high levels of RD.

This research was supported by NIH grants R03DA031327, R21CA118703 and #K22CA124800 (Erblich - PI).

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POS1-135
MENSTRUAL CYCLE AND GENDER DIFFERENCES IN CRAVING AND STRESS REACTIVITY TO STRESS CUES

Michael E. Saladin1,2, Kevin M. Gray3, Matthew J. Carpenter4, Nathaniel L. Baker4, Steven D. LaRowe4, Karen J. Hartwell4, Erin A. McClure4, and Himanshu P. Upadhyaya2, Department of Health Sciences and Research, Medical University of South Carolina; 2Clinical Neuroscience Division, Department of Psychiatry and Behavioral Sciences, Medical University of South Carolina; 3Youth Division, Department of Psychiatry and Behavioral Sciences, Medical University of South Carolina; 4Substance Abuse Treatment Center Mental Health Service, Ralph H. Johnson VA Medical Center; *EIL Lilly and Company, Indianapolis, IN

Over the past 10 years, our research group has been studying the role of gender in smoking behavior in an effort to identify vulnerabilities that may make smoking cessation especially difficult for women. In one of our previous studies, we found that women and men respond similarly to smoking cues but that women were more craving and stress responsive to personalized, imagery-based, stress cues than men (Saladin et al., 2012). The present study expands on those findings by assessing whether the menstrual cycle phase of the women in that study significantly contributed to the observed gender differences in stress cue reactivity. We used two objective criteria, onset of menses and luteinizing hormone surge (determined via home testing kits), to determine whether women smokers were in either the follicular (n=22) or the luteal (n=15) phase of their menstrual cycle, respectively. The women and a sample of men smokers (n=53) were then administered a laboratory-based cue reactivity assessment that involved exposure to four cue types: (1) in vivo smoking cues, (2) in vivo neutral control cues, (3) imagery-based stressful cues, and (4) relaxing imagery control cues. Both before and after each cue exposure, participants provided subjective reports of smoking-related craving, stress and affective reactions. ANCOVA served as the primary data analytic approach, with order of stimulus presentation, level of nicotine dependence (FTND score) and post-control cue reactivity serving as covariates. Findings raise the intriguing possibility that dispositional characteristics, in particular, reward dependence, influence reactions to the stress cues (p<0.01). Findings raise the intriguing possibility that dispositional characteristics, in particular, reward dependence, influence smoking by potentiating reactions to environmental smoking cues. Furthermore, the similar effects of RD on stress-induced craving suggest that both cue-and stress-induced cravings may be influenced by a common underlying disposition. Clinical implications may include increased attention to managing environmentally-triggered cravings among smokers with high levels of RD.

This research was supported by NIH grants R03DA031327, R21CA118703 and #K22CA124800 (Erblich - PI).

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**POS1-136**  
**GENETIC VARIABILITY OF SMOKING PERSISTENCE IN AFRICAN AMERICANS**


To date, most genetic association analyses of smoking behaviors have been conducted in populations of European ancestry and many of these studies focused on the phenotype that measures smoking quantity, that is, cigarettes per day. Additional association studies in diverse populations with many different linkage disequilibrium patterns and an alternate phenotype, such as total tobacco exposure which accounts for intermittent periods of smoking cessation within a larger smoking period as measured in large cardiovascular risk studies, can aid the search for variants relevant to smoking behavior. For these reasons, we undertook an association analysis by using a genotyping array that includes 2,100 genes to analyze smoking persistence in unrelated African American participants from the Atherosclerosis Risk in Communities study. A locus located approximately 4 kb downstream from the 3′-UTR of the brain-derived neurotrophic factor (BDNF) significantly influenced smoking persistence. In addition, independent variants rs12915366 and rs12914385 in the cluster of genes encoding nicotinic acetylcholine receptor subunits (CHRNA5–CHRNA3–CHRNB4) on 15q25.1 were also associated with the phenotype in this sample of African American subjects. To our knowledge, this is the first study to more extensively evaluate the genome in the African American population, as a limited number of previous studies of smoking behavior in this population included evaluations of only single genomic regions.

MO Scientist Fellowship in Genetic Medicine, National Research Service Award F32DA024920 (NIH/NIDA), Dr. Spring’s Professional Account at Northwestern Feinberg School of Medicine, KL2 RR024130-02. CARe wishes to acknowledge the support of the National Heart, Lung and Blood Institute and the contributions of the research institutions, study investigators, field staff, and study participants in creating this resource for biomedical research (NHLBI contract number HHSN268200900600C). ARIC is carried out as a collaborative study supported by National Heart, Lung, and Blood Institute contracts N01-HC-55015, N01-HC-55016, N01-HC.

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**POS1-137**  
**UNDERSTANDING THE GENETIC LINKS TO KEY TOBACCO DEPENDENCE AND WITHDRAWAL PHENOTYPES**

Megan E. Piper*, Jessica W. Cook¹, Timothy B. Baker⁴, Laura Biernat⁴, Robert Weise¹, and Dale Cannon², University of Wisconsin; ²Washington University; ³University of Virginia

Preclinical rodent studies suggest nicotine effects are mediated by different brain regions, each associated with dense expression of different nAChR subunits. Alpha5 receptors in the Nucleus Accumbens are associated with nicotine appetitive reinforcement, alpha5 receptors in the Medial Habenula and Interpeduncular Nucleus are associated with aversive effects of nicotine, and studies with alpha5 and alpha2 knockout mice suggest that these nAChRs subunits in these regions are associated with withdrawal. In adult smokers we tested the hypotheses that CHRNA3β6 single nucleotide polymorphisms (SNPs) are associated with measures of nicotine’s appetitive effects, CHRNA5A3B4 SNPs are associated with smoking heaviness reflecting sensitivity to nicotine’s aversive effects, and both CHRNA5A3B4 and CHRNA2 are associated with withdrawal. We examined genetic variants in these genes in white, non-Hispanic participants from three clinical trials (N=1653). Subjects provided baseline data on cigs/day, CO and tobacco dependence and real-time data on withdrawal (craving, negative affect and loss of pleasure). Logistic regression, using phenotype median splits as the dependent variables, controlling for gender, revealed the strongest associations (p<.05) were: CHRNA5A3B4 SNPs with smoking heaviness (cigs/day, CO), CHRNA5A3B4 SNPs with post-quit loss of pleasure, and CHRNA2 SNPs with withdrawal and smoking heaviness. SNPs from these genes were also differentially associated with dimensions of tobacco dependence. Our findings support the hypothesis that CHRNA5A3B4 SNPs were related to smoking heaviness. CHRNA2 SNPs were related to withdrawal as hypothesized, and were also related to smoking heaviness. CHRNA3β6 SNPs were related to loss of pleasure from daily activities, which may be related to appetitive effects of nicotine, partially supporting our hypothesis. These findings extend the preclinical literature into human smokers, suggesting the distinct role that various nAChR receptors play in developing and maintaining smoking behavior.

This research was supported by the following grants: P50 DA019706 from NIDA, M10 RR031166 from the General Clinical Research Centers Program of the National Center for Research Resources NIH, P01 CA089392, U01 HG004422, K08DA021311 (Cook), 2K05CA139871 (Baker), K02DA021237 (Biernat) and by the Wisconsin Partnership Program. Genotyping services were provided by the Center for Inherited Disease Research (CIDR). Funding support for CIDR was provided by NIH grant U01HG004438 and NIH contract HHSN26820072029C to The Johns Hopkins University. Assistance with genotype cleaning was provided by the Gene Environment Association Studies (GENEVA) Coordinating Center (U01 HG004446). Medication was provided to patients at no cost under a research agreement with GlaxoSmithKline (GSK). GSK had no further role in study design; in the collection, analysis and interpretation of data; in the writing of the report; or in the decision to submit the paper for publication.

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**POS1-138**  
**DETERMINATION OF A RARE VARIANT AND COMMON VARIANTS IN COMT FOR THEIR INVOLVEMENT IN THE ETIOLOGY OF SMOKING DEPENDENCE USING MID-SOUTH TOBACCO CASE-CONTROL STUDY SAMPLES**

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Catechol-O-methyltransferase (COMT) is responsible for degrading catecholamines, including the neurotransmitters dopamine, epinephrine, and norepinephrine. Given the role of the dopamine reward pathway in nicotine dependence (ND), in a previous study, we showed that several common variants and haplotypes within the COMT gene are significantly associated with smoking quantity, the Heaviness of Smoking Index, and the Fagerström Test for ND score (FTND) in both European Americans (EA) and African Americans (AA) of the Mid-South Tobacco Family (MSTF) sample. To confirm the involvement of COMT in ND, we performed a case-control-based association analysis in an independent sample, called the Mid-South Tobacco Case-Control study, which consists of 1387 EA subjects and 3161 AA subjects recruited primarily from the state of Mississippi since 2005. The SNPs selected were rs6269, rs4633, rs5031015, rs4818, rs4680, and rs174699, where rs4680 represents a Val/Met missense polymorphism and rs503105 is a rare variant located in exon 4 of the membrane-bound COMT transcript or exon 2 of the soluble COMT transcript that leads a non-synonymous change of G to A (Ala/Thr). Our analysis revealed a significant association of rs4680 (Val/Met) with FTND in the EA (P = 0.00057) and pooled (P = 0.00223) samples and of rs503105 (Ala/Thr) with FTND in all samples (P = 0.00072 for the AA, P = 0.00365 for the EA, and P = 5.2E-08 for the pooled samples). We further found that the A allele of rare variant rs5031015 represents a significant risk effect in the AA (frequency 0.19%, beta = -1.583), EA (frequency 0.4%, beta = -1.945), and pooled (frequency 0.25%, beta = -1.835) samples. In addition, we identified a haplotype, A-T-G-A-C-T, formed by SNPs rs6269, rs4633, rs5031015, rs4818, rs4680, and rs174699, with a significant protective effect against ND in the EA sample (frequency 49.1%, P = 0.00037). In sum, our results not only provide evidence for a significant association of COMT variants with ND in an independent sample but also demonstrate that the rare variant rs5031015 likely plays a significant role in susceptibility to ND.

Supported by NIH grant DA-012844.

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POS1-139
GENETIC VULNERABILITY FOR MAXIMUM CIGARETTES SMOKED PER DAY: INVOLVEMENT OF COPY NUMBER VARIATION ON CHROMOSOME 22Q11-Q12

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Previously we conducted a genome-wide linkage screen of a lifetime measure of heavy smoking, maximum number of cigarettes smoked in a 24-hour period (MaxCigs24), using data from two independent samples: 289 Australian and 155 Finnish nuclear families, all of European ancestry. A combined sample analysis detected a linkage region for MaxCigs24 that peaked on chromosome 22q12 at 25.46 cM (LOD: 5.21). Recently we analyzed copy number variation with high-density SNP data and identified a single, large (> 500 kb), common (~5%) copy number variant (CNV) under this peak (22q11-12). The copy number of this CNV, including deletions and duplications were validated with qPCR (98% concordance rate) in the Australian linkage families. Controlling for data source, generation, sex and parent x sex, a significant association (p=0.01) was observed between this CNV and the variant MaxCigs24; the same phenotype association was noted with our original linkage peak on Chr 22. Further analyses were conducted in Australian families that do not carry this CNV (260 families), and a substantially lower score was observed (from LOD=3.04 to 1.99). Simulations, dropping equal numbers of random families 1000 times, produced a distribution of LOD scores that suggest this CNV accounts, in part, for the linkage signal observed on Chr 22 (empirical p=0.10), in the Australian families. A dose relationship was observed with MaxCigs24; a single copy deletion was associated with the average self-report maximum of 28 cigarettes on heaviest smoking occasion; the norm variant, an average maximum of 39; and single copy duplication, an average lifetime maximum of smoking 45 cigarettes in 24 hours. However, analysis of Australian (N =4,000) and Finnish (N=1,800) genome-wide association data did not find an association between this CNV and MaxCigs24, suggesting the importance of rare variants. Further study of this CNV in the original Finnish linkage families, using qPCR; and of mutations occurring in this CNV, as transmitted in NAG linkage families, is warranted.

Study was supported by NIH grants DA12854 to PAFM, AA07580 and AA13321 to ACH, AA13320 to the late Richard Todd, and DA019950 to MLP, and DA024722 and American Cancer Society grant IRG-58-010-50 to SFS; grants from the Australian National Health and Medical Research Council, by Academy of Finland grants to JK, the Academy of Finland Center of Excellence to Complex Disease Genetics to JK, and by Doctoral Programs of Public Health to UB.

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POS1-140
CYP2A6 GENOTYPE AND RESPONSE TO TRANSDERMAL NICOTINE IN ASIAN-AMERICAN, BLACK, AND CAUCASIAN NEVER-SMOKERS

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The aim of the study was to examine genetic factors that influence sensitivity to nicotine in never smokers. Sixty never-smokers, balanced for gender and race (Asian, Black, and Caucasian), wore 7 mg nicotine skin patches for 8 hours. Serial blood nicotine concentrations and subjective and cardiovascular effects were measured, and genetic variation in the CYP2A6 gene, the primary enzyme responsible for nicotine metabolism, was assessed. Removal of the patch due to nicotine-induced sickness was the main outcome of interest. Nicotine was measured in plasma by GC. Forty participants had a *1/*1 (normal) CYP2A6 genotype, while 19 had one or more reduced/loss of function variant alleles (genotype was not obtained for 1 participant). The proportion with a variant vs. *1/*1 genotype was significantly different by race (p = 0.040); 55% of Asians had at least one variant allele compared to 21% of blacks and 20% of Caucasians. Overall 4 each among Asians and Caucasians removed their patch due to sickness compared to 1 Black. The rate of nicotine metabolism estimated by 3-hydroxycotinine/cotinine, the nicotine metabolic ratio, was slower in individuals with variant alleles (p = 0.003). Plasma nicotine area under the concentration-time curve (AUC 0-6hr) and maximum concentration (Cmax) were not significantly different by genotype but were higher in participants who removed their patches (p < 0.025). Using time to event analysis, where the event was patch removal, and adjusting for the effects of BMI, sex, and race, the hazard ratio (HR) of nicotine-induced toxicity in those with variants compared to *1/*1 individuals was 4.70 (1.09-20.3). Subjective perceptions of lightheadedness and nausea at 1.5 hours and dose perception at 6 hours were significantly higher in individuals in the variant genotype group compared to those *1/*1 (all p<0.05). Cardiovascular parameters, diastolic blood pressure, systolic blood pressure, and heart rate were not different between *1/*1 and variant groups. In conclusion, genetic variation in CYP2A6 leads to altered sensitivity to nicotine, which might play a role in individual differences in susceptibility to tobacco addiction.

National Institutes of Health grant DA02277, DA02830, DA12393 and R25 CA 113710 and Canadian Institute for Health Research grants MOP86471 and TMH100987.

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POS1-141
DIFFERENTIAL EFFECTS OF VARENICLINE AND NICOTINE REPLACEMENT THERAPY ON CUE-INDUCED CRavings IN RECENTLY ABSTINENT SMOKERS

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Rationale: Separate studies of cue-induced cravings in smokers receiving either nicotine replacement therapy (NRT) or varenicline have shown different effects. Cue-induced cravings appear to be retained with NRT but not with varenicline treatment. Objective: We aimed to further investigate these differences in cue-reactivity in the same cohort of participants. Methods: We investigated cue-reactivity in a sample of 37 recently abstinent smokers who were taking open-label pharmacotherapy while undergoing cue exposure as part of a larger study utilizing behavioral treatment for relapse prevention. Results: We found that cue reactivity in response to visual, in vivo, or emotional cue exposure was significantly more common in participants who were engaged in NRT vs. those who were taking varenicline. Conclusions: These findings have important implications for cue-exposure treatments and the role of maintained cue-reactivity (cravings) in relapse prevention treatments.

Funding: DAM R21 DA030808.

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POS1-142
VARENICLINE VERSUS NICOTINE PATCH FOR SMOKING CESSATION IN WOMEN: EFFICACY FINDINGS FROM A FOUR-WEEK DOUBLE-BLIND TRIAL

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Objective: Women may have more difficulty quitting smoking than men, and comparative evaluation of cessation pharmacotherapies in women may be
Feasibly determine body composition and metabolic changes during smoking quit activity should be addressed as part of smoking cessation. The BOD POD (n= 39) gained 0.55 kg fat mass and 0.46 kg fat free mass, while TNP (n= 33) had an average of 0.78 kg fat mass and 0.54 kg fat free mass, compared to -0.05 kg fat mass and -0.04 kg fat free mass on placebo.

Results: Participants reduced smoking from an average of 14.9 to 1.4 cigarettes/day. Metabolic rate before and after a one-month double-blind randomized course of nicotine patch, varenicline, and matched placebo were supplied by Pfizer, Inc. A 12-week double-blind trial directly comparing the efficacy of varenicline versus nicotine patch. Background: The majority of methadone maintenance patients smoke, but the efficacy and safety of varenicline in this group is unknown. Varenicline reduces tobacco use and may promote cessation without adverse psychiatric effects.

Supported by NCCRR UL1 RR025750, NIDA K23 DA025736, and NIDA R25 DA023021.

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Significant. A 95% confidence interval for the baseline–3m reduction was 8.9–10.3 (P<0.001), 7.3–9.4 for baseline–6m (P<0.001), and 0.1–2.4 for 3m–6m (P=0.03). The intraclass correlation coefficient (ICC) is essential to the design of cluster randomized and longitudinal health service studies. Based on empty multilevel models, two ICCs for baseline and longitudinal CPD (1 and 3 measurements, respectively) were both 0.02, i.e., moderate. Cost-free cessation treatment at FHTs was associated with rapid abstinence and reduction that stabilized by 6m. Baseline smoking behaviour varied significantly between FHTs. Contextual factors of FHTs may influence smoking reduction apart from NRT and individual differences.

Support for this research was provided by the Ontario Ministry of Health and Long-Term Care.

POS1-146
LONG-TERM NRT USE AND CESSATION OUTCOMES IN PRIMARY CARE SETTINGS
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Since July 2011, a government-funded program in Ontario, Canada has made smoking cessation treatment (free nicotine replacement therapy (NRT) plus counseling) available to patients enrolled in multidisciplinary primary care settings called Family Health Teams (FHTs). Patients can receive up to 26 weeks of NRT through the program; follow-ups are completed 3- and 6-months after enrollment. This analysis tested the hypothesis that long-term NRT use would be associated with improved abstinence rates at 3m and 6m. Data from 3,911 patients in 95 FHTs (121 unique sites) were analyzed (44% male; mean age: 50 years). 2,189 and 780 patients have completed 3m and 6m follow-ups, respectively. 49% of patients reported current NRT use at 3m, as did 27% at 6m. The 7-day point prevalence of smoking (TPP) rate between NRT users and non-users was not significantly different at 3m or 6m (3m: 39% vs 40%; 6m: 37% vs 40%). NRT users reported less daily smoking (3m: 32% vs 47%, p<0.01; 6m: 27% vs 45%, p<0.01) and more occasional (non-daily) smoking than non-users (3m: 22% vs 11%, p<0.01; 6m: 31% vs 15%, p<0.01). Of the 584 patients who completed both 3m and 6m follow-ups, 7-day PPA increased 2% for patients who used NRT at both 3m and 6m (n=130; 36% vs 38%); decreased 5% for patients who used NRT at 3m but not 6m (n=187; 42% vs 37%); and remained stable for patients who did not use NRT at 3m or 6m (n=159; 42% vs 42%). Daily smoking by 3m–6m decreased 4% for 3m and 6m NRT users, increased 16% for 3m but not 6m NRT users, and increased 1% for 3m and 6m non-users. Long-term smoking between 3m–6m increased 7% for 3m and 6m NRT users, decreased 4% for 3m but not 6m NRT users, and increased 2% for 3m and 6m non-users. Providing long-term free NRT was not associated with statistically significant increases in 3- or 6-month abstinence rates, but may help some daily smokers become occasional smokers at 3m and 6m. Long-term NRT use may also help 3m abstainers to remain quit at 6m. More occasional smokers who stop using NRT between 3m and 6m go back to daily smoking instead of quitting. Further analysis is needed to evaluate the program approach to maximize outcomes for long-term NRT users.

Support for this research provided by the Ontario Ministry of Health and Long Term Care.

POS1-147
WHAT HAPPENS AFTER FORCED ABSTINENCE FROM SMOKING IN PRISON
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Cigarette smoking among prisoners is three times that of the general population. Many prisons and jails are tobacco-free; but 97% of inmates return to smoking after they are released back into the community. Little is known about the unique and specific needs of incarcerated adults who have been tobacco free for months to years, who have completed the physical withdrawal from nicotine and who are returning to environments where tobacco is available. Project WISE (Working Inside for Smoking Elimination) is a randomized trial of a smoking intervention developed to target the needs of inmates in a smoke-free prison about to be released to the community. Incarcerated adults (N=247) in Project WISE smoked prior to incarceration and were scheduled for release within 8 weeks. Participants were contacted at 24 hours and 7 days after release to assess smoking status. Participants who had smoked were asked for details of the circumstances surrounding the first cigarette. At time of release the median time since last cigarette was 1.5 years. Of the 194 participants assessed, over half (N=129) reported smoking since release. 70% smoked within 24 hours and the average time to first cigarette was 17 hours 8 minutes. Half of participants smoked the first cigarette while waiting for a ride or on the way home from prison. The majority of participants (70%) were given the first cigarette. Half reported the situation as reunifying with family, friends, or children, 42% being with other smokers and 25% were celebrating. Only 23% were alone. Before smoking the first cigarette, participants reported feeling happy (58%), nervous/excited (66%), sad/angry/upset (12%) and worried (15%). When asked what might have helped prevent the first smoke, participants reported: not being around other smokers (27%), avoiding stress (16%), not drinking/glassing drugs (12%), not having access to cigarettes (11%) and 22% reported there was nothing that could have helped. This study examined cognitive, affective and other factors that influence smoking after release from prison and may therefore increase our ability to understand and help this population affected by forced tobacco abstinence.

This research was supported by grant 1R01DA024093-01A209 from NIDA.

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POS1-148
ASSOCIATION BETWEEN TOBACCO USE AND OTHER PSYCHOAUTO SUBSTANCES USE DISORDERS AMONG INTRA-CITY COMMERCIAL DRIVERS IN NIGERIA
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Aims: The aim of the study was to determine 12 month prevalence of tobacco use (TU) and dependence (TD), and the association between TU and any other psychoactive substance use disorder under influence of tobacco psychoactive substances (DUIP) among intra-city commercial drivers in Ibadan, Nigeria. Design: This was a multistage descriptive study. Setting: The study involved drivers consecutively selected from a motor park randomly selected from each local government out of the 11 local governments in Ibadan city between January and July 2009. Participants: Eight hundred and fifty one consenting intra-city commercial drivers were interviewed. Measures: Assessment was carried out using socio-demographic questionnaire, opinion survey and the alcohol and drug sections of the Composite International Diagnostic Interview (CIDI). Findings: Prevalence of TU was 41.6%, commonest combination with tobacco was with alcohol 60.1%. TU was a risk factors for any psychoactive use disorder (PSUD) OR= 3.9 95% CI (2.4 – 4.8). Conclusion: TU was highly prevalent among commercial drivers and was a risk factor for any PSUD. There is a need for...
comprehensive tobacco use prevention program, in order to prevent use and abuse of other psychoactive substances.

**Funding:** New World Psychiatric Hospital, Ibadan, Nigeria.

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**POS1-149**

**BMI AND CIGARETTE USE AS PREDICTORS OF SEXUAL BEHAVIOR**

Krista Lange, B.S.*, Sneh Thamothonar, M.S., Michale Sferra, B.A., Ashley Herrick, B.S., and Sherezde Fields, Ph.D., Texas A&M University

It is estimated that 8,300 adolescents and young adults have had HIV infection in 2009 and nearly 9.5 million STD cases reported in 2000 were individuals aged 15-24 (CDC,2009; Weinstock, Berman, Cates, 2000). Due to the detrimental health effects resulting from sexual behavior it is important to determine individual characteristics that predict engagement in risky sexual behaviors. Few studies have focused on the role of body mass index (BMI) or smoking in the engagement of sexual behaviors. However it has been shown that females with a BMI >25 are more likely to report having had intercourse (Kanehiro et al., 2008), and that smoking and sexual behaviors covary (Duncan, Strycker, & Duncan, 1999). Previous findings have revealed that an additive effect of obesity and smoking behavior is observed in measures of impulsivity such that obese smokers perform more impulsively on behavioral tasks (Fields et al., 2010). Therefore it was hypothesized that smokers with a greater BMI would also report greater sexual impulsivity. Participants were 20 young adult males from East Central Texas. 10 males were smokers and 10 non-smokers served as gender and ethnicity matched controls. An ANOVA was completed to examine group differences on impulsivity and revealed that smokers were more impulsive than non-smokers (F(1,17) = 9.045, p = .008). Regression analyses revealed that sexual impulsivity cannot be predicted being an overweight non-smoker (β= -0.350, p = .309); however overweight smokers were shown to be less sexually impulsive (β=0.526, p<.009). The current findings were contrary to our hypothesis, and instead suggest that overweight smokers are less likely to engage in risky sexual behaviors. Though in contradiction with impulsivity research, these results may be explained by past findings which indicate overweight individuals have fewer opportunities to engage in sexual activity and thus may result in lower sexual impulsivity (Bess, 1997). Future research should work to further understand factors which may affect engagement in risky sexual activity as well as understanding impulsive behaviors to which overweight smokers may be more susceptible.

No funding.

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**POS1-150**

**DOES PAIN TRIGGER CHANGES IN CRAVING AND AFFECT AMONG NON-HEAVY SMokers? an EXPLORATORY ANALYSIS**

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It is known that pain can trigger negative emotions and craving among heavy tobacco users, but the link has not been investigated among the growing population of non-heavy smokers. In this exploratory study, 42 non-heavy smokers (≥15 cigarettes per day) participated in a cold pressor task with a pre-and post-experimental administration of the Tobacco Craving Questionnaire-Short Form (TCQ-SF) and the Positive Affect Negative Affect Schedule (PANAS). Paired samples t-tests were used to compare pre-and post-test scores for craving, positive affect, and negative affect. There was a non-statistically significant increase in general craving from the pre (M = 39.31, SD = 14.94) to post-test (M = 42.39, SD = 18.47), t(40)= -1.67, p = .102, and a significant increase from the pre (M = 7.57, SD = 4.83) to post-test (M = 9.00, SD = 5.35) emotionally craving subscale, t(41) = -2.13, p < .05. There was also a non-significant decrease in PA from pre-test (M = 31.47, SD = 8.97) to post-test (M = 29.24, SD = 9.54), t(38)= 1.08, p = .29, and a significant decrease in NA from pre-test (M = 14.17, SD = 5.54) to post-test (M = 13.02, SD = 5.18), t(39) = 2.79, p < .05. This study provided preliminary evidence that pain triggers increases in craving among non-heavy smokers. In contrast to previous research with heavy smokers, negative affect decreased following pain. It is possible that non-pain related factors, such as relief about reaching the end of the study, contributed to a significant reduction in negative affect. Additional research to better understand the link between pain and negative affect among non-heavy smokers is recommended. Similarly, it would be valuable to replicate the study with greater power to determine if the trend toward decreased positive affect following pain is a stable finding. Although exploratory, results indicated that pain among non-heavy smokers should not be over-looked as a trigger for craving and changes in affect. Future research should determine whether pain-evoked craving and affect changes are linked to smoking behaviors among non-heavy smokers and address these issues in cessation treatment.

Internal grants from California State University San Marcos awarded to K. Pulvers.

**POS1-151**

**MOMENTARY PREDICTORS OF ABSTINENCE AMONG SOCIOECONOMICALLY DISADVANTAGED SMOKERS PARTICIPATING IN CESSATION TREATMENT**

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Smoking prevalence and relapse following smoking cessation treatment is considerably higher in socioeconomically disadvantaged smokers as compared to the general U.S. population (31.1% vs. 20.6%) (Bush, 2012). To understand the reasons for these differences, we investigated momentary measures of craving (SCQ) and negative affect (PANAS) as predictors of smoking urge, depressed mood, and the ability to engage in protective behaviors (MBP) among socioeconomically disadvantaged smokers. Participants were recruited into a smoking cessation treatment at 2 clinics in Dallas, Texas. Inclusion criteria for the current analyses included 30 minutes of random ecological momentary assessment (EMA) among 112 socioeconomically disadvantaged smokers (31.0% female, mean age=44.2±11.8 years). After baseline, smokers were enrolled into a 7-day smoking cessation treatment and randomized to standard treatment (n=54) or a treatment including momentary assessment feedback (n=58). Smoking urge, negative affect, and stress predicted biologically confirmed 7-day point prevalence abstinence at 4 weeks post-quit. Results indicated that neither quit date urges nor the trajectory of smoking urges across the first week post-quit predicted 4 week abstinence (all ps > .34). However, analyses indicated that lower negative affect on the quit date (controlling for baseline negative affect; OR = 1.23, p = .039) and decreasing negative affect (i.e., linear slope) over the first week post-quit (OR = 2.94, p = .045) both significantly predicted greater likelihood of abstinence at 4 weeks post-quit. In addition, quit date stress level (controlling for baseline stress) was negatively related to 4 week abstinence (OR = 2.16, p = .029). Declining stress (i.e., linear slope) across the first week post-quit was marginally associated with abstinence at 4 weeks post-quit (OR = 3.48, p = .068). Findings highlight the relations of momentary measures of negative affect and stress with smoking abstinence in socioeconomically disadvantaged smokers.

**Funding for this research was provided by the University of Texas School of Public Health, Data analysis and presentation preparation were additionally supported through American Cancer Society grants MRSSTG-12-114-01-CPPB (to MSB) and MRSSTG-10-104-01-CPPHS (to DEK).**

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Early-escalating smoking trajectory whereas sensation seeking alone increased the probability of belonging to the late-escalating group, relative to non-smokers. Conversely, behavioral impulsivity measures did not influence the probability of smoking group membership, and behavioral impulsivity did not increase in groups demonstrating an escalation of smoking. SUMMARY: Preliminary results suggest that young adult college students display heterogeneous patterns of tobacco use that are influenced by multiple dimensions of trait impulsivity. These dimensions may be useful prevention strategies targeting individuals at risk of escalation of smoking.

Funding: DA-05312.

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POS1-154

INDIVIDUAL DIFFERENCES IN EFFECTS OF EXERCISE ON SMOKING IN THE HUMAN LABORATORY

A.N. Kurt* and J. Dallery

A single bout of exercise can decrease cigarette cravings and withdrawal, and increase the delay to ad libitum smoking. The present study used a laboratory analogue of smoking and a within-subjects design to assess individual differences in the relation between exercise and smoking. Participants (N = 17) experienced 20-min of exercise and 20-min of leisure activities across four sessions in an ABAB design. Results indicated that the delay to ad lib smoking was significantly longer after exercise sessions (M = 19.7) than control sessions (M = 3.7), although the magnitude of this effect appeared to differ between individuals. To assess individual differences in effects of exercise on smoking, a median split distinguished participants as responders (exercise increased delay > 1 min relative to control sessions) or non-responders (exercise increased delay < 1 min relative to control sessions). Responders waited 30.2 min longer to smoke after exercise relative to control sessions, and smoked 2.4 cigarettes per session. Non-responders waited 0.4 min longer to smoke after control relative to exercise sessions, and smoked 3.8 cigarettes per session. Responders also displayed lower resting heart rates, initiated smoking at a later age, and tended to smoke fewer cigarettes per day than non-responders. These results suggest that exercise increases the delay to ad libitum smoking in the human laboratory, although there are substantial individual differences in the magnitude of this effect. Future research should identify characteristics that might predict, or conditions that might enhance, the efficacy of exercise to reduce smoking.

Internal funding, overhead account in the dept of psychology (Dallery).

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POS1-155

SMOKING STATUS AS A MODERATOR OF THE ACUTE EFFECTS OF AEROBIC EXERCISE AMONG SMOKERS IN CESSATION TREATMENT

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AIM: Previous studies have documented the acute effect of exercise on mood, affect, smoking withdrawal and craving among smokers in experimental settings as well as those undergoing cessation treatment. However, the extent to which smoking status (i.e., abstinence vs smoking on the day of acute exercise) moderates the acute benefits of exercise on mood and craving among smokers has yet to be carefully examined. Method: The acute effects of mood, anxiety, and smoking urges were examined among 81 smokers (66% female, mean age = 47.9 years; mean of 19.7 cigarettes/day) randomized to either a 12-week aerobic exercise intervention (AE) or health education (HE) for smoking treatment. Both conditions received an 8-week telephone-delivered, smoking cessation treatment (with the nicotine patch) and quit date set for week 5. At each of the 12 weeks of either intervention, participants were asked to rate mood, anxiety, and urges to smoke before and after each AE and HE session. Results: Hierarchical linear modeling analyses were conducted to examine treatment condition, smoking

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Funded by the Ontario Ministry of Health and Long Term Care.

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POS1-152

DEFINING ‘HARDCORE’ SMOKERS IN A POPULATION SAMPLE OF NO-COST NRT USERS: CHARACTERISTICS AND 6-MONTH CESSION OUTCOMES

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Following several years of decline, smoking prevalence rates in North America have plateaued in recent years. One explanation for this phenomenon is the hardening hypothesis which postulates that tobacco control efforts have been effective for those who were able to easily quit and the remaining smokers are more resistant to quitting. While the literature cites several common characteristics of the hardcore smoker, there is no universal definition and little conclusive evidence in support of the hardening hypothesis. Studies comparing cessation rates between hardcore and regular smokers are lacking. The purpose of this study was to compare cessation outcomes among a large group of smokers (n=13,158) based on whether or not they met currently accepted ‘hardcore smoker’ criteria. All smokers in this sample had called a toll-free number to receive 5-weeks of no-cost nicotine replacement therapy (NRT) by mail. We hypothesized that hardcore smokers (HCS) would have lower quit rates at 6-months compared to regular smokers. Of the 6,261 participants who completed a 6-month follow-up, 1,125 (18%) were characterized as HCS (at baseline, >15 cigarettes per day, Heavyness of Smoking Index score >4, smoked > 5 years, no past year quit attempt). Baseline characteristics that significantly predicted HCS status using binary logistic regression included male gender (OR=1.2; 95% CI 1.0-1.4), no post-secondary education (OR=1.5; 95% CI 1.3-1.8), household annual income < $40k (OR=1.2; 95% CI 1.1-1.4), and age started smoking daily < 14 (OR=1.3; 95% CI 1.0-1.5). The intent-to-treat (ITT) rate at 6-months was 9.2% for regular smokers and 6.7% for HCS (p>0.05). In summary, HCS are able to achieve long-term abstinence with 5-weeks of mailed NRT treatment and no ongoing counseling. Abstinence at 6-months was only slightly lower in HSC compared to regular smokers, suggesting that HCS status has only a small moderating effect on treatment success and may not be a valid phenotype. Increasing accessibility to no-cost, low-intensity smoking cessation interventions may serve to increase quit rates among all smokers and therefore further decrease smoking prevalence at the population level.

Funded by the Ontario Ministry of Health and Long Term Care.

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POS1-153

ANALYSIS OF THE RELATIONSHIP BETWEEN IMPULSIVITY AND DEVELOPMENTAL TRAJECTORIES OF CIGARETTE SMOKING IN A LONGITUDINAL STUDY OF YOUNG ADULTS

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BACKGROUND: Previous research has identified impulsivity as a risk factor for tobacco use initiation as well as the development of tobacco dependence. However, impulsivity is a multi-dimensional construct, and further research is needed to determine how individual differences in dimensions of impulsivity contribute to developmental trajectories of tobacco use. This study will determine (1) which dimensions of impulsivity are most closely associated with escalating tobacco use, and (2) if behavioral impulsivity changes as a consequence of escalating tobacco use. METHOD: Young adults (N=428) were repeatedly assessed in three waves across their first three years of college. Measures included self-reported (UPPS-P) and performance-based (cued go/no-go, BART, MCQ) indices of impulsivity, and self-reported (Life History Calendar) tobacco use. Group-based trajectory modeling (SAS proc tia) examined whether dimensions of impulsivity influenced trajectories of smoking behavior, and linear mixed models determined whether behavioral impulsivity changed as a function of tobacco use. RESULTS: Group-based trajectory modeling indicated that young adults demonstrated heterogeneous patterns of tobacco use, with four distinct smoking trajectories emerging (non-smokers, early-escalators, late-escalators, and decreasing smokers). Higher scores on UPPS-P negative urgency, (lack of) premeditation, and sensation seeking significantly increased the probability of being in the...
status at each week, pre-quit vs post-quit time period, condition by time, and condition by smoking status interactions as predictors of acute changes in mood, anxiety, and urges. Participants in the AE condition showed significant acute improvements in mood and reductions in urges in smokers. There was also a main effect of time where acute decreases in urges were more evident during the post-quit weeks across both conditions. Lastly, a significant condition by smoking status interaction was found such that abstinence on the day of either AE or HE session was associated with greater acute improvements in mood for AE and lower mood improvement in HE, while no differences in acute mood changes were observed between conditions if participants smoked on that session day. Conclusion: Consistent with previous work, smokers engaged in cessation treated experienced the acute benefits of exercise on mood and smoking urges. In addition, current study’s findings contribute to previous work by pointing toward the potential blunting effect of cigarette smoking on these acute benefits of exercise. This research was supported by NIDA grant K23 DA019950 awarded to Dr. Abrantes.

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POS1-156
PATIENT-LEVEL VARIABLES MODERATE SMOKING CESSATION TREATMENT OUTCOMES IN DIFFERENT PRIMARY HEALTH CARE SETTINGS


A smoking cessation intervention program funded by the provincial government in Ontario, Canada facilitated the provision of no-cost smoking cessation treatment (Nicotine Replacement Therapy [NRT]) plus counseling as per evidence-based guideline recommendations, to patients of participating primary care organizations (either a Community Health Centre [CHC] or Family Health Team [FHT]). The CHC model of care offers healthcare to underserved or at-risk populations. Therefore, it may be expected that CHC patients would exhibit more challenges related to psychosocial factors that would negatively impact cessation outcomes. To test this hypothesis, self-report baseline data was compared between CHC (N= 641) and FHT (N = 625) patients and were related to 3 month quit rates. Our analysis revealed no difference in the average age when patients started smoking (15.76 years vs. 15.62 years) for CHCs and FHTs, respectively. However, CHC patients smoked significantly more cigarettes per day than FHT patients (22.2 vs. 20.5, p<.05). Additionally, a Chi-Squared revealed significantly (all p values <.05) more psychosocial triggers identified by CHC patients compared to FHT patients including: financial stress (89.2% vs. 77%), unemployment stress (72.2% vs. 49.3%), psychiatric illness (69.2% vs. 48.7%) and medical illness (84.5% vs. 71.1%). Past substance use was also significantly higher for CHC patients for the following substances: cocaine (20.4% vs. 13.1%), sedatives (12.9% vs. 9.7%), opiates (13.4% vs. 8.8%) and stimulants (7.6% vs. 4.2%). Finally, CHC patients self-reported significantly higher rates of mental health diagnoses including: depression (46.2% vs. 36.4%), anxiety (39.1% vs. 30.9%), schizophrenia (3.3% vs. 2%) and bipolar disorder (7.7% vs. 4%). Furthermore, intent-to-treat quit rate was significantly lower in CHC patients (6%) than in FHT patients (13%) indicating that CHC patients are a more cessation treatment resistant population, requiring unique cessation treatment approaches. Logistical modeling will be presented to compare outcome predictors of cessation between these two distinct populations. Funded by the Ontario Ministry of Health and Long Term Care.

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POS1-157
ATTENTIONAL RETRAINING ADMINISTERED IN THE FIELD ON A MOBILE DEVICE REDUCES SMOKERS’ ATTENTIONAL BIAS AND CRAVING

William Kerst, M.Sc., and Andrew J. Waters, Ph.D.*, Uniformed Services University of the Health Sciences

Attentional retraining (AR) is a potential new treatment for addiction. AR trains addicts to attend away from drug-related cues. Therefore AR may reduce exposure to drug cues and reduce craving. In previous studies of AR in tobacco addiction, AR has been administered in a single laboratory session. We examined the utility of administering multiple sessions of AR over a 1-week period in a naturalistic setting. Smokers (N=60) not seeking to quit were randomly assigned to an AR group or control (no training) group. They carried a personal digital assistant (PDA) with them for one week. They were prompted to complete 4 assessments daily, including 3 attentional retrainings (AR group) or 3 control trainings (control group). AR was implemented using a modified visual probe task. Attentional bias was assessed using a standard visual probe task on the PDA. Overall, participants responded to 80.1% of the auditory prompts. The AR group completed 434 attentional retrainings (mean = 15.0) and 146 assessments on the PDA, and the control group completed 448 Control trainings (mean = 14.9) and 145 assessments on the PDA. At baseline, participants exhibited significant attentional bias to smoking cues. As hypothesized, attentional bias at assessments (n=291 assessments) significantly declined over the week in the AR group, but there was no decline in the control group. After day 5, the AR group exhibited significantly lower attentional bias than the control group. AR also reduced craving ratings following briefly-presented pictures containing both smoking and non-smoking features presented on the PDA. AR may train smokers to attend to the non-features of the picture and therefore reduce exposure to the smoking features and reduce craving. AR did not significantly influence self-reported smoking behavior or biochemical measures of smoke intake. This study provides proof of concept that a cognitive retraining intervention can be administered on a mobile device in the natural environment and that AR can reduce attentional bias and craving in response to a cue.

Funded by Intramural Grant of the Uniformed Services University of the Health Sciences (C012J).

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POS1-158
EFFECTS OF SWITCHING TO VERY LOW NICOTINE CIGARETTES ON SMOKING BEHAVIOR

Michael R. Moynihan, Ph.D.*, and Joseph Pandolfini, 22nd Century Group, Inc.

It is generally accepted that while cigarette smoke contains a very large number of constituents, nicotine plays a major role in sustaining smoking behavior. Several studies have shown reductions in smoking and increases in quitting after switching to cigarettes with a very low nicotine content. In a recent study of VLN cigarettes as an aid to smoking cessation, smoking was monitored over a six week ad lib smoking period in 234 smokers randomized to VLN or cigarettes with conventional nicotine content. Although the median number of cigarettes smoked was reduced to 11% of baseline during the 4-week abstinence period, there was no statistical difference in continuous abstinence between the VLN cigarette and the control. Cigarette consumption and exhaled CO declined significantly in the VLN cigarette group prior to the target quit date. However, use of non-study cigarettes appears to have been higher than in prior independent studies of VLN cigarettes. The cigarettes used in this study had a lower nicotine content of approximately 0.5 mg/g, compared to 1 to 1.5 mg/g nicotine in prior studies. This difference may contribute to difference in the effect of VLN cigarettes on smoking behavior. Changes in the smoking behavior over time of subgroups of smokers using VLN cigarettes will also be presented.

This project was supported in part by a grant from the Qualifying Therapeutic Discovery Project of the U.S. Internal Revenue Service.

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POS1-159
MENTHOL TOBACCO USE IN PSYCHIATRIC SAMPLES: A COMPARISON FROM THREE CLINICAL TRIALS TO NATIONAL ESTIMATES IN THE GENERAL POPULATION

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Context: Epidemiological evidence suggests elevated prevalence of menthol cigarette use among smokers with psychological distress. Purpose: The current study examined the presence of menthol use among smokers with psychiatric disorders participating in three clinical trials relative to nationwide epidemiological data. Method: This cross-sectional study analyzed baseline data from 2 adult inpatient tobacco treatment trials in public (N=100, 44% Caucasian) and private (N=724, 45% Caucasian) psychiatric hospitals and one adolescent/young adult study in community mental health clinics (N=60, 42% Caucasian) conducted in the San Francisco area from 2008 to 2011.  Comparisons were made to 2004 data from the National Survey on Drug Use and Health (NSDUH). Results: Menthol rates were elevated among adult psychiatric samples relative to national data within all ethnicities except for African Americans where menthol rates approximated 80% for all three groups

POS1-160
THE EFFECT OF MENTHOL ON CIGARETTE SMOKING BEHAVIORS, BIOMARKERS, AND SUBJECTIVE RESPONSES

Andrew A. Strasser, Ph.D.,D, Rebecca L. Ashare, Ph.D., Madison Kaufman, B.S., Kathy Z. Tang, M.S., A. Clementina Mesaros, Ph.D., and Ian A. Blair, Ph.D., Perelman School of Medicine, University of Pennsylvania
As part of the Family Smoking Prevention Control Act, the United States Congress requested formal studies to investigate the effect of menthol on cigarette smoking and cigarette smokers. Menthol cigarettes comprise approximately 25% of all cigarettes sold in the United States and therefore regulating menthol would potentially affect a significant number of smokers. The purpose of the current study was to examine smoking behaviors, biomarker exposure and subjective responses when switching from a novel menthol cigarette to a non-menthol cigarette to isolate the effect of menthol and to approximate the effect a menthol brand might have on smokers. Sixty current smokers were recruited to this 35-day randomized, open-label, laboratory study. After a 5-day baseline period, participants were randomized in a 3:1 ratio to the experimental group where they would smoke menthol Camel Crush for 15 days followed by 15 days of non-menthol Camel Crush, or the control group where they smoked their own brand cigarette across all periods. Participants attended study visits every 5 days and completed measures of smoking rate, smoking topography, biomarkers of exposure, and subjective responses. There were significant condition x period interactions for total puff volume (p=0.028) and puff duration (p=0.024). The experimental group exhibited a marginal increase in total puff volume from baseline to crush (p=0.06) and from crush to no crush (p=0.06) and a significant increase between baseline and no crush (p=0.02). The control group showed no significant changes in total puff volume (p>0.4). There was no significant change in daily cigarette consumption in the experimental condition (p=0.89). Carbon monoxide, nicotine, cotinine and 8-oxo-Gua, a biomarker of oxidative stress and cancer risk, did not significantly differ in the experimental condition. Subjective ratings related
to taste and smell decreased during the non-menthol period (p<0.01) compared to the menthol. Results suggest menthol has minimal impact on smoking behaviors, exposures and subjective ratings.

This work was supported by the National Institutes of Health R01-120594, R01-120594-S1, R01-130961, P30-ES003508 and P50-CA143187.

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POS1-161
NICOTINE BIOMARKERS AND SMOKING RATE IN DAILY AND NON-DAILY SMOKERS

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Background: Non-daily or intermittent smokers (ITS) are becoming more common, but is not known how much nicotine ITS ingest, or what role nicotine plays in ITS smoking patterns. We examined differences between ITS and daily smokers (DS) in nicotine intake and metabolism. Methods: 497 smokers (229 DS; 268 ITS) contributed data on smoking patterns, including cigarettes per day (CPD), and biochemical indices of nicotine exposure, including: urinary cotinine, and nicotine metabolite ratio (NMR; 3-OH-cotinine/cotinine), the latter a biomarker of the rate of nicotine metabolism. Potential moderating effects of ethnicity (African American (AA) vs. White (WH)) and gender were examined. Results: DS had higher cotinine concentrations than ITS (1394 vs 494 ng/ml; SEs 62.1, 61.5), but differences were accounted for by rate of cigarette consumption (CPD). Cotinine increased linearly with increasing CPD (β=55.21, SE=7.59, p < 0.0001), but leveled off at higher levels (β=3.07, SE=0.66, p < 0.0001) in both groups. There were no differences in NMR (5.69, 5.96; se 0.29, 0.30). There were no gender effects or gender by group interactions. However, there were marked ethnic differences in cotinine and CPD, and ethnicity x smoker group interactions. Cotinine levels were similar for AA DS and WH DS, but AA ITS cotinine was over twice that of WH ITS. CPD also varied by race and group, such that AA DS smoked significantly fewer cigarettes than WH DS (14.5 vs 17.5, SE 0.62, 0.49), whereas AA ITS smoking significantly more than WHs (4.81, 3.32, SE 0.63, 0.43). ITS AA had 66% higher cotinine:CPD ratio than WH (p<0.001). There were no ethnicity or ethnicity x group effects on NMR. Conclusion: DS and ITS consume the same amount of nicotine per cigarette and have similar rates of nicotine metabolism. As such, differences in nicotine intake and metabolism cannot account for observed differences in DS and ITS smoking patterns. However, within ITS, AA appear to take in more nicotine per cigarette than WH, consistent with the view of ITS as a heterogeneous group of smokers. Ethnic differences in ITS may shed light on broader ethnic variation in smoking patterns and motivations.

This work was supported by grant R01-DA020742 (Shiffman) from the National Institutes of Health, National Institute on Drug Abuse. Additional support for authors was provided by National Science Foundation Graduate Research Fellowship (Dunbar), grant R01-DA02277 (Benowitz) and grant R01-DA12393 (Benowitz).

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POS1-162
LIGHT AND INTERMITTENT SMOKING CESSION, MOTIVATION CHANGE, AND REDUCTION IN A PREDOMINANTLY HISPANIC SAMPLE

Few smoking cessation studies for light (≤10 cigarettes per day) and intermittent (non-daily smoking) smokers have been conducted. This study assessed the efficacy of a brief smoking intervention and its impact on abstinence, motivation change, and reduction. Community and student participants (N = 249, Mage=34.5, SD = 13.81, 85.3% Hispanic) at baseline completed measures assessing demographics and tobacco use and history. Participants were randomized to receive either an immediate (II) or delayed (DI) brief smoking cessation intervention. The II consisted
POS1-164
AN EXAMINATION OF ADOLESCENT AND EMERGING ADULT NON-SMOKERS, TRIERS AND SMOKERS AND SUBSEQUENT HIV RISK BEHAVIOR
Sneha Thamotharan, M.A.*, Krista Lange, B.S., Ashley Herrick, B.A., Michelle Sferra, B.A., and Shereccie Fields, Ph.D., Texas A&M University, Department of Psychology, Health Behavior Research Group

The combined use of substances and risky sexual behavior increases the likelihood of contracting an STI, such as HIV, and impregnation (Thamotharan et. al, unpublished). Two prominent behaviors that have been linked to one another include cigarette smoking and sexual intercourse. However, little research has examined the differences in smoking status and proclivity for HIV risk. For the current study, we examined patterns of HIV risk in three different smoking status groups (Non-smokers, Triers, and Smokers). The study utilized a sample of adolescents and emerging adults (N=87, Smokers = 25, Triers = 18, and Non-Smokers = 44). Analysis of Variance (MANOVA) revealed significant differences (p < 0.05) between smoking status groups and HIV risk behaviors, specifically sexual impulsivity (F(2) = 6.880), age of onset for Kissing (F(2) = 3.538), French Kissing (F(2) = 4.961), Touch Penis (F(2) = 4.328), Touch Vagina (F(2) = 3.459), Oral Sex (F(2) = 5.772), Vaginal Sex (F(2) = 8.167), vaginal sex condom use frequency (F(2) = 3.545 as well as ever having unprotected oral (F(2) = 4.946) and vaginal (F(2) = 5.162) sex. To test the simple effect of smoking status by HIV risk, a Tukey HSD post-hoc analysis (p < 0.05) was conducted. Smokers were significantly different from Non-Smokers in age of onset for Kissing (M = 12 vs.15 years), French Kissing (M = 13 vs. 16 years), Touch Penis (M = 16 vs. 18 years), Vaginal Sex (M = 16 vs. 19 years), Oral Sex (M = 17 vs. 19 years), and Vaginal Sex (M = 19 vs. 22 years) respectively. Triers were significantly different from Non-Smokers in sexual impulsivity (M = 4.608 vs. 8.292 years, with lower values indicating greater impulsivity), condom use frequency during vaginal sex (sometimes vs. always) and ever having unprotected vaginal sex (yes vs. no), but both Smokers and Triers were significantly different from Non-Smokers in reporting having unprotected oral sex. These findings indicate that smoking status may relay differences in HIV risk. Future research efforts should examine not only smokers but triers, an understudied group that is vulnerable for HIV risk.

No funding.

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POS1-163
SMOKING CESSATION IN AFRICAN AMERICAN AND WHITE SMOKERS: PSYCHOLOGICAL MECHANISMS
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Some evidence suggests that African Americans (AAs) experience greater difficulty quitting tobacco than Whites, but the mechanisms underlying racial differences in smoking cessation are unclear. We examined a number of candidate variables that may potentially mediate an association between race and short-term smoking cessation outcomes. Smokers (146 Whites, 100 AAs) recruited from two study sites enrolled in a smoking cessation study were followed from two weeks pre-quit through 4 weeks post-quit. Two-hundred participants (110 Whites, 74 AAs) attended a quit-day session and attempted to quit. Participants did not receive pharmacotherapy but did receive brief individualized counseling. At each study visit participants completed a battery of subjective and cognitive assessments. Although AAs initially reported higher motivation to quit (p < .05) and greater confidence in quitting (p < .05), AAs were more likely to relapse during the first week (Biochemically-verified point prevalence (PPI) Abstinence, OR = 5.90, p < .001) and at Week 4 (OR = 3.76, p < .01). For Week 1, the association persisted when controlling for study site, income, and years of education (p < .05). Counterintuitively, but consistent with some previous data, AAs reported lower craving ratings on the Questionnaire for Smoking Urges on quit-day, relative to their craving ratings at a pre-quit non-abstinent session (p < .01). In contrast, AAs reported higher ratings of attentional bias to cigarette cues before quit-day (p < .01). AAs exhibited comparable levels of attentional bias on a modified Stroop task, but they exhibited worse performance on the Rapid Visual Information Processing (RVP) task (p < .05). Overall, AA had worse cessation outcomes despite reporting greater motivation and confidence in quitting, and despite reporting relatively lower levels of craving on quit-day. In contrast, AAs reported greater attentional bias to smoking cues and exhibited worse performance on a task assessing sustained attention which may have hindered smoking cessation. Future research will further identify the pathways that link race and smoking cessation outcomes.

Study funded by NIDA DA020436 (Waters).

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cigarette use and co-use as outcome variables due to the predicted relationship that a part-time job is problematic primarily for sensation seekers. There were no significant interactions involving impulsivity. In summary, impulsivity and sensation seeking related to individual use of alcohol and cigarettes, as well as co-use. Parental permissiveness and part-time job status moderated relationships between sensation seeking and substance use.

Support provided by K01 AA 019694, K05 AA014715, RL1 AA017539, VA VISN 1 MIRECC, Connecticut Department of Mental Health and Addiction Services and the Connecticut Mental Health Center.

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POS1-166
R U A SMKN M0??: ASPECTS OF A TEXT MESSAGING SMOKING CESSATION/REDUCTION INTERVENTION FOR YOUNGER MOTHERS

Sophie Soklaridis, Ph.D., Jenna Robinson, M.A., Nadia Minian, Ph.D.*, Rosa Dragonetti, M.Sc., and Peter Selby, M.B.B.S.

Background: Women who are younger in age are more likely to smoke during pregnancy and tend to have less success with quitting smoking. There is an unmet need for cessation interventions targeted to pregnant young women that engage them and provide them with support and assistance to quit long term in the postpartum period and beyond. One intervention is text messaging (TM), which provides an anonymous, low-cost means for delivering messages to women that avoids some of the barriers of face-to-face support. Objective: Our study aimed to gain an in-depth understanding of pregnant and postpartum women's experiences of mobile communication, in general, and TM, in particular, as a potential conduit for smoking cessation/reduction. Methods: Six focus groups and six telephone interviews were convened across Ontario with 36 women who were either thinking about getting pregnant, pregnant, or up to one year postpartum. Participants were 16 years or older, smoked daily and spoke English. Results: Three main themes with various subthemes were identified. First, the respondents identified topic areas that they would be interested in hearing more about in the form of a text message including financial costs of smoking, tips on cessation and reduction and dispelling misconceptions. Second, these topical areas needed to be tailored to their quit/reduction process (thinking of quitting, reduction, quit, maintenance, relapse etc.) and address specific concerns related to pregnancy and postpartum. Lastly, to be well-received, the tone of the text messages needed to indicate an understanding of the diversity and complexity of women's lives by being judgment-free, positive and sensitive. Conclusion: Respondents of this study supported the idea of a cessation intervention that utilized a TM component and they had clear themes with various subthemes were identified. First, the respondents identified topic areas that they would be interested in hearing more about in the form of a text message including financial costs of smoking, tips on cessation and reduction and dispelling misconceptions. Second, these topical areas needed to be tailored to their quit/reduction process (thinking of quitting, reduction, quit, maintenance, relapse etc.) and address specific concerns related to pregnancy and postpartum. Lastly, to be well-received, the tone of the text messages needed to indicate an understanding of the diversity and complexity of women's lives by being judgment-free, positive and sensitive. Conclusion: Respondents of this study supported the idea of a cessation intervention that utilized a TM component and they had clear

Funded by Echo: Improving Women's Health in Ontario, an agency of the Ministry of Health and Long-Term Care.

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POS1-167
EFFECTIVENESS OF PROACTIVE TELEPHONE COUNSELING ON SMOKING CESSATION IN SMOKING PARENTS RECRUITED THROUGH PRIMARY SCHOOLS: RESULTS OF A RANDOMIZED CONTROLLED TRIAL

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BACKGROUND: Cessation support is still underutilized in North-America and Europe. In the Netherlands, less than 1% of smokers contact the national quitline. This study examined whether low-intensity outreach to smoking parents (i.e., one-time mailings distributed through primary schools) improved smoking cessation rates and quit attempts and reduced cigarette consumption. METHODS: We conducted a randomized controlled trial to evaluate the effectiveness of quitline support (i.e., proactive telephone counseling) and self-help-materials to increase smoking cessation rates among smoking parents. A total of 512 smoking parents were proactively recruited through their children's primary schools and randomly assigned to either quitline support or self-help materials (control condition). Proactive telephone counseling was delivered by trained counselors of the Dutch national quitline (STI/VRÖ). Telephone counseling consisted of up to seven counselor-initiated calls based on cognitive-behavioral skill building and motivational interviewing. In the control condition, parents received a standard brochure to aid smoking cessation. Assessments took place at baseline, three months after start of the intervention (post-measurement), and twelve months after start of the intervention (follow-up measurement). RESULTS: At 3-months post-measurement, parents receiving quitline support were significantly more likely than controls to report 7-day point prevalence abstinence (50% vs. 13%, p<0.05). Primary outcome measures including sustained abstinence, 7-day point prevalence abstinence, quit attempts, and reduction in cigarette consumption will be reported for the 3-months and 12-months post-intervention assessment. CONCLUSIONS: Quitline support is highly effective in increasing short-term smoking cessation rates among smoking parents who were proactively recruited into cessation support through primary schools in the Netherlands. Long-term outcomes will be examined. Preliminary evidence indicates that public schools may constitute an additional venue (next to clinical settings) for reaching the population of smoking parents.

This study is funded by ZonMw, Netherlands organization for health care research and development (grant # 50-50110-96-639).

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POS1-168
PROACTIVE TELEPHONE SMOKING CESSATION TREATMENT IN A VA MENTAL HEALTH POPULATION

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Background: It is unclear whether telephone-based treatment is acceptable and effective for smokers with a mental health diagnosis. We evaluated the feasibility, acceptability and clinical outcomes of a proactive telephone care program for VA smokers with mental illness and compared counseling delivered by VA staff to that delivered by the smokers' state Quitlines. Methods: We conducted a six-site VA trial implementing a telephone care coordination program for smokers with mental illness. Mental health providers referred smokers to the program via electronic consult. Patients were contacted by phone to offer enrollment. Patients who enrolled were offered mailed self-help materials, smoking cessation medications, and proactive, multi-call telephone counseling. Participants were randomized to receive counseling either from a VA counselor who had received specialized training on smokers with mental illness or from their state Quitline. Participants completed a telephone survey assessing 30-day point prevalence abstinence at 2 months (response rate 74%) and 6 months (response rate 67%). Results: We received 1206 referrals to the program, and we reached 919 (76%) patients by phone to offer enrollment. Of those, 66% enrolled in treatment, 9% enrolled in the follow-up surveys only, 9% were ineligible and 15% declined participation. 100% of participants in both treatment arms were enrolled in an appointment to begin counseling, and nearly all were interested in using smoking cessation medications. Approximately 70% of participants in each arm completed at least one counseling session. At 6-month follow-up, the abstinence rate was 22% among respondents (15% if we treated all non-respondents as smokers. Among all people who enrolled in treatment, the 6-month abstinence rate was higher in the VA counseling arm than in the Quitline arm (18% vs 12%, p=0.048). Conclusion: The telephone program engaged a significant number of smokers with a mental health diagnosis into smoking cessation treatment and produced long-term abstinence rates
comparable to those seen in non-mental health populations. VA counseling appeared more effective than counseling from the state Quitline. This study was supported by a grant from the VA Health Services Research & Development Service RSDP-07-034.

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POS1-169
SMOKING CESSATION OUTCOMES AMONG LGBT AND HETEROSEXUAL SMOKERS IN EXTENDED SMOKING TREATMENTS
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Lesbian, gay, bisexual, and transgender (LGBT) smokers have higher smoking rates than the general population. Questions remain regarding whether smoking treatments should be tailored to LGBT smokers, who are at higher risk for factors associated with smoking and smoking treatment failure. The present study is a secondary data analysis comparing the efficacy of extended pharmacological and behavioral treatments with LGBT and heterosexual smokers. Data from two clinical trials were combined to increase statistical power and generalizability of the findings. Both trials began with 12 weeks of combined counseling and pharmacological treatment. Study 1 (N = 403) compared extended counseling, extended NRT, and extended combined counseling +NRT in smokers age 50 years and older. Study 2 (N = 407) then compared extended active vs placebo bupropion SR alone, or combined with extended counseling for 40 weeks. Follow-up assessments were conducted at Weeks 12, 24, 52, 64, and 104. Abstinence was defined as biochemically verified self-report of no smoking within the past 7 days. Of the 810 smokers who participated, 17% identified as LGBT and 83% as heterosexual. The combined sample was predominantly non-Hispanic Caucasian (75%), with 86% completing at least some college, 68% reported being employed, and 59% reported earning at least $50,000 per year. Mean daily cigarettes was 19.8. Mean FTND score = 4.8. Overall, abstinence rates did not differ significantly between LGBT and heterosexual smokers. Rates for LGBT were 55% at Week 12, 50% at Week 24, 37% at Week 52, 34% at Week 64, and 38% at week 104. Rates for heterosexual smokers were 62% at Week 12, 50% at Week 24, 40% at Week 52, 40% at Week 64, and 40% at week 104. Conclusions: LGBT smokers appear to achieve similar abstinence rates as heterosexual smokers in extended, non-tailored interventions. However, these findings may not generalize to other areas where access to treatment is limited or a higher stigma of sexual orientation exists.

This work was supported by the NIDA grants P50 DA09293, R01 DA 015732, R01 DA 002538, K05 DA016752, and T32 DA007250.

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POS1-170
PROJECT AURORA: A CULTURALLY TAILORED INTERVENTION FOR CIGARETTE SMOKING CESSION AMONG LATINOS LIVING WITH HIV/AIDS
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Latinos account for 20% of all USA AIDS cases, a rate 3.1 times higher than that of non-Hispanic Whites. Cigarette smoking is highly prevalent among people living with HIV and poses unique health risks including rising lung cancer rates. Higher smoking rates, especially among Latinos of Puerto Rican origin, are associated with high cancer rates. Research is limited in the area of HIV among Latinos, with even less known regarding smoking. We sought to address these disparities by developing a brief clinic-based culturally tailored smoking cessation treatment that included 8 weeks of NRT (patch), tailored materials for Latinos with an emphasis on issues related to HIV, and a strong social support component. An RCT was conducted comparing the Culturally-Tailored Intervention (CTI) to a Standard Care Intervention (SCI) condition among 302 participants recruited from 9 Northeastern immunology clinics (mean age = 45, SD=8 years; 64% male; 51% not born in USA; 56% Puerto Rican). Logistic regressions and bivariate analysis tests were used to assess associations between treatment conditions, patient characteristics, and biochemically verified 7-day and 24-hour point-prevalence abstinence (PPA) rates. Intent-to-treat (ITT) 24-hour PPA rates at 3-month, 6-month and 12-month follow-ups were 13%, 11% and 7%, respectively, in CTI, and 16%, 13% and 7%, respectively, in SCI, indicating no statistically significant between-group differences. Similar rates with no differences between groups were found for ITT 7-day PPA. The majority (71%) of participants received the patch, however non-compliant use was common (12% never wore it, 14% wore it inconsistently). Participants who were not born in the US were more likely to use the patch (p=0.037) and to be 7-day PPA at 6-months (p=0.014). Those who had tried the patch prior to the study were less likely to be 7-day point-prevalence abstinent compared to those who received the patch for the first time with the support of the intervention (p=0.027). Intervention approaches that include medication adherence strategies and other NRT alternatives for coping with withdrawal may be critical to delivering more effective interventions.

Supported by NIDA R01 DA018079-D.

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POS1-171
PARENTAL PROTECTION OF YOUNG CHILDREN FROM TOBACCO SMOKE EXPOSURE: A SYSTEMATIC REVIEW AND META-ANALYSIS
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Background: Tobacco smoke exposure (TSE) harms and kills adults and children. Young children are especially vulnerable to TSE due to their small size, developmental stage, and metabolism. Yet nearly half of children worldwide are regularly exposed to tobacco smoke. Interventions aimed at voluntary reduction of child TSE are important, but trials have shown mixed results regarding effectiveness. Methods: We performed a systematic review and meta-analysis to quantify the effects of interventions aimed at helping parents prevent or reduce child exposure to tobacco smoke. We searched Pubmed, the Cochrane library, Web of Science, and Psychinfo. Key outcome variables were parental report of parental protection from TSE (“protection”), and biochemical markers of child exposure (“exposure”). Risk ratios and risk differences were calculated using the DerSimonian and Laird random-effects model. Subgroup analyses were performed. Results: The interventions included self-help materials, face-to-face counseling, telephone counseling, cessation medications, and biochemical feedback. Eleven studies (N=4657), were included in the Protection analysis. The risk ratio was 1.71 (CI:[1.21,2.40], p=.002). The relative difference (RD) of 0.11 (CI:[.03,.18], p=.007) showed that an additional 11% of the intervention parents took steps to protect their child from smoke compared to control parents (Weighted Mean, Intervention: 28.9%, Control:15.1%). Ten studies (N = 1895), were included in the analysis of exposure. The intervention was found to be beneficial in 8 (80%) of the studies, with 5 (50%) showing a statistically significant advantage to the intervention group. The relative difference was -0.85 [confidence interval (CI) [-1.72,0.01]], p=.05. Conclusions: Interventions to reduce exposure in children to tobacco smoke are modestly successful. Further research is warranted to improve the effectiveness of interventions, and to understand how best to disseminate interventions to exposed populations.

This research was funded by the Flight Attendant Medical Research Institute (FAMRI) Award 072066_YCSA.

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**POS1-172**

DEVELOPING NEW ANALYTICAL TECHNIQUES FOR THE DETERMINATION OF TOXIC COMPOUNDS IN HOOKAH SMOKE

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A rapidly spreading smoking habit known as hookah is acquiring vast popularity mainly among younger generations all around the world. About 17% of high school seniors and 22% to 40% of university students in the United States had used hookahs in 2010. There are growing evidences that hookah smoke contains many of the same harmful components found in cigarette smoke. In this paper, several sampling and analysis methods for hookah smoke were applied. Tenax and carbon chemical sampling traps were used. Thermal gravimetric analysis (TGA) and thermal desorption–gas chromatography–mass spectrometry (TD–GC/MS) analysis techniques were used. In addition, solvent extraction of the sampling traps followed by gas chromatography – mass spectrometry (GC/MS) and Liquid chromatography–mass spectrometry (LC–MS) analyses were also applied. Solvents of different polarity were used to extract and separate the chemical components in the smoke based on chemical polarity. The number of smoke puffs collected on the traps was varied in order to evaluate the saturation capacity of the traps. The smoke was sampled using a test bench that simulates a human smoking process. This bench is based on generating pulsing sinusoidal pneumatic flow via a robot machine developed by "IREADYCo LLC", a Minnesota based company. The results showed that the capacity of the traps, mainly Tenax, is consumed after very few puffs due to the large amount of glycerin. Since some of the harmful compounds are usually diffused into the smoke stream by glycerin, a method was developed to separate glycerin from the smoke stream prior to the chemical traps. Separation of glycerin resulted in a clearer GC/MS analysis from desorption of traps. The composition of the separated glycerin was also analyzed. A wide range of chemical groups were identified in the hookah smoke, ranging from polycyclic aromatic hydrocarbons (PAHs), nitrosamines, aromatic amines, aldehydes, fatty acids, esters, ketones, and alcohols. As of means of comparing hookah smoke to cigarettes, results showed that cigarettes smoke are richer in the amount of large molecular weight compounds per volume of tobacco.

Faculty research grant-FRGII (2011-2013), American University of Sharjah, UAE.

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**POS1-173**

DO HEALTH POLICY ADVISORS KNOW WHAT THE PUBLIC WANTS?
AN EMPIRICAL COMPARISON OF PUBLIC PREFERENCES REGARDING SMOKE-FREE AIR WITH HEALTH POLICY ADVISOR ASSESSMENTS OF SAME

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Background: Health policy-making, a complex, multi-factorial process, requires balancing conflicting values. A salient issue is public support for policies; however, one reason for limited impact of public opinion may be misperceptions of policy makers regarding public opinion. In the health-related area of smoke-free public spaces, research on perceptions of policy makers regarding public opinion is scarce. Methods: Public desire for smoke-free air was compared with health policy advisor (HPA) perception of same. Two representative studies were conducted, with the public (N=505), and health policy advisors (N=34), in December 2010. “Mirror-image” questions regarding desire for smoke free areas were asked. Possible smoke-free areas included: Common areas of multi-dweller apartment buildings, cars with children, railway platforms, entrances to health facilities, 100% smoke-free bars and pubs, college campuses, and outdoor areas (eg, pools and beaches). A 1-7 Likert scale was used for each measure, and responses were combined into a single primary outcome, DESIRE. Results: Public desire for smoke-free areas and HPA assessment of this desire differed significantly for DESIRE (Public: Mean: 5.08, [4.94, 5.17]; HPA: Mean: 4.06 [3.61, 4.52]; p<0.0001). Policy makers underestimated public desire for smoke-free areas on every measure. Using a Bonferroni correction, the following areas reached statistical significance: common areas of multi-dweller apartment buildings, 100% smoke-free bars and pubs, cars carrying children, and entrances to healthcare facilities. Conclusions: Health policy advisors underestimate public desire for smoke-free air. Accurate understanding of public opinion by policy makers may lead to stronger legislation. Monitoring policy-maker assessment of public opinion, and adopting it as a mediating variable on policy, may shed light on incongruities between policy making and public opinion. Further, the publication of policy-maker misperceptions may encourage policy-makers to demand more accurate information before making policy.

This research was supported by the Israel National Institute for Health Policy Research.

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POS2-1
COMMON AND UNIQUE PARENTING PREDICTORS OF ADOLESCENT TOBACCO AND ALCOHOL USE
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Tobacco and alcohol use initiation during adolescence tends to be positively associated, though this does not imply they are necessarily predicted by the same antecedents. A variety of parenting characteristics have been linked with both behaviors. This study seeks to illustrate common and unique parental predictors of early adolescent tobacco and alcohol use. The sample consisted of 796 adolescents (6th-8th grade) at baseline, with 681 followed-up on one year later. At time 2, 7% of adolescents have smoked a full cigarette and 8% have had a full alcoholic drink. Two hierarchical logistic regressions were run predicting lifetime (a) smoking of a full cigarette and (b) drinking of a full drink of alcohol at time 2. Grade in school, sex, race (White/non-White), parent education, and number of adults and children in the household were included in Step 1. Parental monitoring, child disclosure, parental control, parental solicitation, parent social support, parent-child negative interactions, and after-school days of parental supervision were included in Step 2. Variables in Step 1 provided better prediction of alcohol use (Pseudo R2=.13) than tobacco use (Pseudo R2=.09). There was a stronger effect of grade in school on alcohol use (Odds Ratio=3.23, p < .001) than tobacco use (OR=1.88, p < .01), though parent education was only predictive of tobacco use (OR=.64, p < .05). There was relatively equivalent prediction of tobacco and alcohol use in Step 2 (Delta Pseudo R2=.15, .17 respectively). Negative interactions between parents and children were predictive of both tobacco and alcohol use (OR=1.73, 1.97 respectively, p < .05). The only other significant predictor of tobacco use was child disclosure to parents (OR=.46, p < .01), whereas parental monitoring (OR=.50, p < .05) and parental solicitation (OR=1.90, p < .01) were predictive of alcohol use. In general, results reveal a pattern of differential prediction of lifetime tobacco and alcohol use during early adolescence. Findings imply that tobacco prevention programs might seek to foster greater child disclosure, whereas multi substance interventions may benefit from targeting several common parenting predictors.

This research was supported by grants from NIAAA to K. Jackson (R01 AA016838) and P. Monti (T32 007459).

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POS2-2
TOWARD A COMPLETE GENETIC MODEL OF VARIATION IN NICOTINE METABOLISM: IN VIVO EXPERIMENTS REVEAL NOVEL FUNCTIONAL POLYMORPHISM IN CYP2A6, UGTB10, AND FMO3
A. Joseph Bloom, Ph.D.*,1, Manibel Martinez*,1 Laura J. Bierut, M.D.*,1 Alison Goate, D.Phil.,1 Sharon E. Murphy, Ph.D.,1 and Linda B. von Weymarn, Ph.D.2, Brown University, Center for Alcohol and Addiction Studies

Nicotine is metabolized via three pathways: (1) C-oxidation by the cytochrome P450s (CYP), (2) glucuronidation by the UDP-Glucuronosyltransferases (UGT), and (3) N-oxidation by flavin-containing monoxygenases (FMO). Genetic variants in CYP2A6, the enzyme primarily responsible for nicotine C-oxidation to cotinine, are associated with cigarette consumption and smoking cessation. CYP2A6 is highly polymorphic, including multiple common null alleles, and we find in an in vivo experiment that common variants in the gene can account for ~70% of the variance in nicotine metabolism in European Americans. These data also demonstrate the relative activities of common CYP2A6 haplotypes, including more subtle differences: for example, a synonymous variant is associated with reduced activity and lower mRNA splicing efficiency, while a second adjacent variant compensates for the first variant’s effect on splicing and restores full activity. Along with CYP2A6, variants in UGT2B10 and another associated gene account for ~50% of the variation in in vivo nicotine glucoronidation. This includes common amino acid changes in UGT2B10 associated with both reduced and increased activity. Finally, FMO3 haplotypes indirectly affect the ratio of nicotine converted to cotinine, revealing common functional variation in the gene. Despite its metabolic role in hepatic nicotine metabolism, these FMO3 haplotype classes also significantly predict cigarette consumption, interacting with CYP2A6 genotype. FMO activity has been demonstrated in the brain, and these results indicate a larger role for FMO3 in determining smoking behavior than previously believed. Integrated together, functional variation in these genes, demonstrated by in vivo experiments, will form the foundation of a complete predictive genetic model of variation in nicotine metabolism.

Funding: National Institute of Mental Health (5T32MH014677-33 to AJB) and the National Cancer Institute (P01 CA-089392 to LJ B); and the National Institute on Drug Abuse (K02 DA-021237 to LJ B, CA77598 to SEM).

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POS2-3
CHRNAS AND CYP2A6 INFLUENCE DIFFERENT ASPECTS OF SMOKING BEHAVIOR: CONTRASTING THE GENETIC CORRELATES OF CARBON MONOXIDE, CIGARETTES PER DAY, AND FTND
A. Joseph Bloom, Ph.D.*,1 Sarah M. Hartz, M.D., Ph.D.*,1 Dorothy K. Hatsuikami, Ph.D.1, Louis Fox, Ph.D.1, Eric Johnson, Ph.D.1, Nancy L. Saccone, Ph.D.1, Manibel Martinez1, Timothy B. Baker, Ph.D.1, Alison Goate, D.Phil.1, and Laura J. Bierut, M.D.1, 1Washington University; 2University of Minnesota; 3RTI; 4University of Wisconsin

Variation in the nicotinic receptor subunit genes CHRNAS-CHRNAS-CHRNB4 and in the nicotine metabolism gene, CYP2A6, are associated with both smoking behavior and lung cancer risk. We have compared breath carbon monoxide (CO), a biomarker of cigarette consumption, to cigarettes-per-day (CPD), and dependence (defined by the Fagerström Test of Nicotine Dependence: FTND) regardless of associations with these genetic loci, in conjunction with the first genome-wide association study (GWAS) using CO, conducted in ~1,500 European American smokers. A key non-synonymous SNP in CHRNAS, rs16969968, was GWAS-significantly associated with CO but nominally associated with CPD. A genome-wide-based estimate of CYP2A6 activity is associated with both CPD and CO. CO/CPD, a ratio that measures smoking efficiency, is significantly associated with CHRNAS but not with CYP2A6. We conclude that different genetic loci influence distinct aspects of smoking behavior differentially captured by CO versus CPD, with CYP2A6 influencing smoking frequency (CPD), and CHRNAS primarily influencing smoking efficiency, which is captured by CO and CO/CPD rather than by CPD. These results demonstrate how the association between CHRNAS and lung cancer can be mediated by smoke exposure despite that the association is partially independent of CPD.

Funding: NIH grants CA069392, CA77598, DA021237, 5T32MH014677-33, AA015572, P50 CA47424 (TBB), and K05CA139871 (TBB) from NCI and P50DA19706 from NIDA.

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POS2-4
IMPACT OF CIGARETTE SMOKE EXPOSURE ON THE EXPRESSION OF CARDIAC HYPERTRPHIC GENES, CYTOCHROME P450 ENZYMES, AND OXIDATIVE STRESS MARKERS IN RATS
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Various experimental and clinical studies strongly support a cigarette smoke-heart disease association and suggest possible mechanisms, unfortunately, the involvement of genetic modulations remain unexplored. Thus, the main aim of the current study was to evaluate the effects of sub-chronic cigarette smoke exposure on the mRNA expression of cardiac hypertrophy genes, cytochrome P450 (CYP) enzymes, and the oxidative stress markers in heart rats. For this purpose, Wistar albino rats were exposed to increasing doses of passive cigarette smoke 2, 4, 8, and 24 cigarettes per day for 7 consecutive days. The mRNA expression of seventeen cardiac genes was determined using real-time polymerase chain reaction. Our results showed that the levels of hypertrophic genes; atrial natriuretic peptide, brain natriuretic peptide, and β-myosin heavy
chain were significantly induced, whereas the anti-hypertrophic gene α-myosin heavy chain was dramatically inhibited, in heart tissues of passive-smoke-exposed groups compared with normal-control groups. This was accompanied with a significant induction of CYP enzymes; CYP1A1, CYP2C11, CYP2E1, and CYP3A2, and the expression of oxidative stress genes, heme oxygenase 1, catalase, cyclooxygenase, and glutathione S-Transferase. The ability of cigarette smoke to induce cardiac hypertrophic genes, CYPs enzymes, and oxidative stress, collectively explore the molecular mechanism of cigarette smoke-induced cardiac diseases and brings further investigative attention to the public health issue of the injurious effects of chronic passive smoke exposure. In conclusion, sub-chronic environmental tobacco smoke exposure increases the incidence of cardiovascular diseases through modulation of cardiac genes.

No funding.

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POS2-5
CHARACTERISATION AND APPLICATION OF AN IN VITRO MODEL OF CIGARETTE SMOKE INDUCED LUNG INJURY

INTRODUCTION: A series of research questions set out by the US Food and Drug Administration (FDA) includes comparing the toxicology associated with different tobacco products. We are developing in vitro models of disease to assist the evaluation of toxicant reducing technologies and products. Here we describe the characterisation of an in vitro model to assess the cytotoxic and inflammatory response of lung cells following exposure to smoke from Kentucky 3R4F reference tobacco, a commercial cigarette control. This model may therefore be useful, as part of a battery of tests, for comparative toxicological evaluation of novel tobacco products.

RESULTS: In-house characterisation studies demonstrate that whilst there was a significant (p<0.001) effect of passage number on cytotoxicity, and -8) measured in the culture medium as markers of the inflammatory response. Cells were then exposed to toxic and subtoxic doses (0.0 – 150µg/cm2) of WS for 30 minutes. Following a 24hr recovery period the cell viability data was used to plot dose-response curves and the concentration of secreted cytokines (interleukin-6 and -8) measured in the culture medium as markers of the inflammatory response. Dose-response curves and the concentration of secreted cytokines (interleukin-6 and -8) were measured in the culture medium as markers of the inflammatory response. Dose-response curves and the concentration of secreted cytokines (interleukin-6 and -8) measured in the culture medium as markers of the inflammatory response.

CONCLUSIONS: In-house characterisation studies demonstrate that whilst certain experimental parameters need to be controlled (i.e., cell passage and cell seed density), the model is robust and able to discriminate between an RTP and a commercial cigarette control. This model may therefore be useful, as part of a battery of tests, for comparative toxicological evaluation of novel tobacco products.

This work was funded by British American Tobacco.

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POS2-6
CUMULATIVE ASSESSMENT OF THREE ALDEHYDES PRESENT IN TOBACCO SMOKE: APPLICATION OF MARGIN OF EXPOSURE (MOE) AND MODE OF ACTION (MOA) EVALUATIONS

In January 2012, the US Food and Drug Administration (FDA) outlined seven research priority areas relating to tobacco products. Research area three focused on “reducing toxicity and carcinogenicity of tobacco products and smoke.” This has been coupled with an increased interest in characterising individual tobacco smoke toxicants from the perspective of regulatory frameworks and tobacco product development focused on selective toxicant reduction. We previously described using the Margin of Exposure (MOE) model as part of a quantitative risk assessment paradigm for individual tobacco smoke toxicants. To generate a combined MOE assessment two assumptions are made: (1) the compounds are structurally similar; (2) they share similar toxicological properties. In this example, three saturated aldehydes (acetaldehyde, formaldehyde and propionaldehyde) present in tobacco smoke have had MOE and mode of action (MOA) assessments completed. The cumulative MOEs generated were: Genotoxicity – 0.09 Cytotoxicity – 80.55 HyperMetaplasia – 7.42 Tumours – 74.15 For each of the postulated MOA key events, the lowest generated MOEs have been combined. In all instances, the MOEs are lower than 100 suggesting that these aldehydes are of high priority for risk reduction research.

This work was funded by British American Tobacco.

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POS2-7
THE RADIOACTIVITY OF CONTEMPORARY SMOKELESS TOBACCO PRODUCTS
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Over the last 50 years a considerable body of research has examined radionuclides in cigarette tobacco and smoke, leading to concerns over the potential carcinogenicity of the alpha emitter polonium-210, due to its intense radioactivity and ability to transfer to smoke. In contrast, there have been very few studies examining the radioactive content of smokeless tobacco products (STPs). As summarised in IARC Monographs 89 and 100E attention has focused on uranium in Indian STPs, and polonium-210 in US STPs, leading to the inclusion of the alpha-emitters uranium-235, -238 and polonium-210 on the FDA's list of Harmful and Potentially Harmful Constituents (HPHC). However, historic studies on general tobacco point to the possible presence of a much wider range of radionuclides in contemporary STPs. This study investigated the radionuclide content of 70 major STPs on sale in the US and Sweden in 2008-2010. 27 radionuclides were examined, covering those reported historically in general tobacco sources and also several species examined for the first time. 12 alpha-emitting and 15 beta-emitting nuclides comprising primordial isotopes, their major progeny, man-made sources and cosmic ray generated nuclides were examined. The study demonstrated a distinctly different picture to that summarised in IARC M89 and M100E. A plurality of radionuclides were found in contemporary STPs. Some isotopes such as carbon-14, radium-226, polonium-210 and potassium-40 were found in almost all STPs; lead-210 and thorium-228 were found in almost half, and seven other isotopes found in a handful of STPs. Potassium-40 accounted for the greatest activity, and the activity of alpha emitters such as polonium-210 was found to be a very small percentage of the overall radioactivity of contemporary STPs. The relevance of the penetrating power of alpha and beta radioactivity from emissions within the tobacco matrix, and isotope solubility, to the exposure of STP users to radioactivity from STPs is also discussed. In conclusion, the radioactive character of STPs is more complex than previously considered, with a number of alpha- and beta-emitting nuclides identified.

The study was funded by British American Tobacco.

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POS2-8
ALTERED BLOOD VESSEL WALL THICKNESS IN ADULT MALE ZEBRA FINCH HEART INDUCED BY IN VIVO NICOTINE EXPOSURE

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Exposure to risk factors, such as cigarette smoking, hypertension, excessive alcohol consumption and diabetes increase an individual's risk of myocardial infarction and stroke. Experimental links between smoking and ischemic stroke are attributed to structural arterial wall damage. The goal of this study was to investigate if in vivo nicotine exposure affects the blood vessel wall thickness in adult male zebra finch heart. Adult male heart tissue was excised and embedded in paraffin, cut on a microtome (5 micron thick sections) and stained with Masson's Trichrome Stain. Three blind observers measured wall thickness and the ratios of the outer and inner diameter of each blood vessel. Longitudinal sections or wavy vessels showing multiple sections within a region were excluded from the analysis. The number of vessels examined is listed following each testing condition. We used five different testing conditions divided as follows: (1) saline (n=156), (2) single nicotine exposure (0.18 mg/kg, s.c., n=197), and three repetitive nicotine (0.18 mg/kg, s.c. 7 days twice/day conditions), (3) nicotine on-board (n=197), (4) six hours (n=101) and (5) three months (n=324) after the last nicotine administration. Our results show that a single nicotine treatment did not affect the wall thickness compared to the control treatment. However, a 7-day nicotine treatment decreased wall thickness significantly compared to the single nicotine and the control treatments. An increase in wall thickness occurred after the 6 hour withdrawal period and this increasing trend continued with a return to normal wall thickness 3 months after the cessation of nicotine. In conclusion, this data indicates that repetitive exposure to nicotine significantly affects the wall thickness, which could be indicative of wall damage. This effect appears to be reversible; however, the underlying mechanism of this change is unknown at this moment.

This work was funded by the James and Esther King Biomedical Research 06-NIR02 (SLTC) and the Addiction Research Institute (ARI, Inc., Bear, DE) travel grant (WMP, JLA).

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POS2-9
INVESTIGATION OF THE TOXICITY OF CIGARETTE SMOKE CONDENSATES IN THE ZEBRAFISH

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The smoking of tobacco continues to be the leading cause of preventable death worldwide and is linked to the development of a number of serious illnesses including heart disease, respiratory diseases, stroke and cancer. In Canada, the tobacco industry is required under the Tobacco Reporting Regulations (TRR) to submit to the Minister of Health information on the toxicity of cigarettes that are manufactured or imported for sale in the Canadian market. Currently, 3 in vitro toxicity test methods are specified in the TRR - the Bacterial Reverse Mutation Assay, the Neutral Red Uptake Assay and the in vitro Micronucleus Assay. The zebrafish model is emerging as an invaluable tool in toxicology and 5 Canadian cigarette brands, including 2 brands with novel design features, were evaluated for acute, developmental, cardiac and behavioural toxicity (neurotoxicity) using zebrafish larvae. By making use of this multifaceted approach to evaluate the toxicity of cigarette smoke condensates on zebrafish larvae, we show that concentration dependant differences between extracts are measureable and can be used to compare and rank individual extracts. When comparing the condensates produced under the International Organisation for Standardisation (ISO) or the Health Canada Intense (HCl) smoking conditions for the 5 different cigarette brands, we show that across all of the measures of toxicity used in our zebrafish assays, the ISO extracts are consistently more toxic than the HCl extracts. This is consistent with previously reported findings from cell line data that have been used to evaluate mutagenicity and toxicity and supports our observations of generally higher concentrations of cigarette smoke condensate components in the ISO extracts detected by liquid chromatography-high resolution mass spectrometry. This work was funded by Health Canada.

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POS2-10
LEVELS OF TRACE AND TOXIC METALS IN BRANDS USED BY US SMOKERS IN 2009

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Metals in tobacco, particularly known toxic elements such as Pb, Cd, Cr, and As, may contribute to tobacco-related diseases. Prior research has shown differences in tobacco metal content by world region and by genuine vs. counterfeit status. The current study explored whether different brands, manufacturers, and price points (premium versus discount/ generic) differed in concentration of metals in the tobacco rod. Participants from the 2009 International Tobacco Control United States survey sent in an unopened pack of their usual brand of cigarettes to examine brand characteristics such as tobacco weight, pressure drop, and filter ventilation (N=323). Unburned tobacco from these cigarettes was analyzed for trace and toxic metal elements using polarized X-ray fluorescence spectrometry. MANOVA was used to examine metal (Ba, Sr, Ni, Cr, Cd, As, µg/cig) differences among brands, between major vs. minor manufacturers, as well as between premium vs. other brands. Correlations examined relationships between metals and cigarette design features. Overall multivariate effects were seen by brand (p<.001), manufacturer (p<.001), and price point (p<.001). Mean Ni values were 0.342 µg/cig for Premium cigarettes vs. 0.308 µg/cig for other cigarettes (p<.001). Mean Cr values were 0.378 µg/cig for Premium cigarettes vs. 0.326 µg/cig for other brand cigarettes (p<.003), while As values were 0.022 µg/cig vs. 0.026 µg/cig (p<.001). We observed no differences in Pb or Cd concentration by price point. There were no significant correlations found between filter ventilation levels of cigarettes and trace metals in the tobacco rod. Smokers with lower income (p=0.012) were more likely to smoke discounted brands, which tended to be higher in metal content. It may be advisable to begin implementing continuous monitoring of metal levels in tobacco and cigarettes in order to reduce exposure of these metals via tobacco use.

This work was supported by a grant from the National Cancer Institute (P01CA133839).

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POS2-11
THE ANALYSIS OF MINOR TOBACCO ALKALOIDS IN CIGARETTE FILLER AND VARIOUS TOBACCO TYPES USING GC/MS/MS

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Minor tobacco alkaloids have been shown contribute as precursors to the formation of harmful tobacco specific nitrosamines (TSNAs); some of which are IARC Group 1 carcinogens. Therefore, the accurate quantitation of minor alkaloids in tobacco products is important from a public health standpoint. This presentation will report the first use of GC/MS/MS with Multiple Reaction Monitoring for the quantitation of the five minor tobacco alkaloids (nornicotine, myosmine, anabasine, anatabine and isonicotine) in 50 commercial brands, research cigarettes (1RF, 2RF, 3RF, 3RFM, and CM), various tobacco types commonly used in American blended cigarettes (Burley, Flue Cured, Oriental, Reconstituted), and other tobacco species (Nicotiana rustica and Nicotiana glauca). The levels of anatabine and nornicotine were higher in Burley and Flue Cured commercial cigarette tobacco filler than in N. rustica; whereas, anabasine in N. glauca is more than 15 times higher than in a typical cigarette. The GC/MS/MS method developed for this study provided a very sensitive and reliable means of measuring minor alkaloids in various tobacco types.
POS2-12
HETEROCYCLIC AMINES HEMOGLOBIN BIOMARKERS: IN VITRO STUDIES OF AAC

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2-Amino-9H pyrido[2,3-b] indole (AαC) is a heterocyclic amines (HCAs) formed during the combustion of tobacco or during high temperature cooking of meats. In mainstream tobacco smoke its level is up to 258 ng/cig. AαC has been shown to be carcinogenic in animal studies and it is considered as a potential human carcinogen. However, representative data on human exposure to AαC and its correlation to AαC carcinogenicity do not exist due to the lack of methods to monitor human exposure to AαC. Towards the goals of developing methods for efficient identification, and quantification of hemoglobin biomarkers for future human molecular epidemiological and exposure studies for AαC, we have investigated the in-vitro metabolism of AαC with different hepatic enzymes. We demonstrate here that AαC is oxidized in presence of P450 1A2 or myeloperoxidase to produce reactive metabolites such as NO-AαC or N-OH AαC and form adducts with Cys 93 of human hemoglobin beta chain. Structures of 3 major peptide adducts are proposed on the basis of accurate mass of the parent ions and fragment ions from tandem MS spectra. The major adducts were produced through bond formation between the sulfhydryl group of Cys and the N2/C2 of AαC. These AαC adducts have been identified for the first time. They provide information about bioactivation of AαC and may serve as biomarkers for future human exposure studies for AαC.

Federally funded.

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POS2-14
PREDICTORS OF ATTRITION FROM A BEHAVIORAL INTERVENTION FOR SMOKERS WITH DEPRESSIVE SYMPTOMS

Aaron C. Lim, Nalia Harrell, Soraida Castillo, Lindsay Keyte, C.W. Lejuez, and Laura MacPherson

Despite the demonstrated effectiveness of smoking cessation programs, a considerable number of participants do not complete even one session of treatment. These attrited groups are often difficult to follow-up with and study extensively. But an examination of their distinct characteristics can elucidate risk factors for attrition and help construct comprehensive pre-assessment profiles. Given the documented barriers to cessation and lower cessation rates among low-income, minority groups, studies working with community samples may particularly benefit from this information in their efforts to retain participants. This study explored attrition risk factors within a sample of 76 adults (38.2% female, 80.3% African-American; median income = $20,000-29,000) with elevated depressive symptoms (baseline BD-I score greater than or equal to 10) enrolled in a Stage II randomized controlled trial of a behavioral smoking cessation program. Behavioral activation treatment for smoking (BATS) paired with standard smoking cessation strategies including nicotine replacement therapy (n=45) was compared to a control condition of standard smoking cessation strategies (ST) alone including nicotine replacement therapy (n=21).17 participants (22.4%) never completed one session of treatment. Evidence suggests that after controlling for daily smoking, that expectancies for negative reinforcement from smoking and higher levels of anhedonia are related to treatment attrition.

Funding: R01 DA018730 (LM).

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POS2-15
VARENICLINE IS WELL TOLERATED BY METHAMPHETAMINE-DEPENDENT CIGARETTE SMOKERS

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High rates of smoking (87-92%) have been observed among methamphetamine-dependent individuals compared to the general population. Compared to just smokers, smokers with co-morbid substance use disorders are at greater risk of suffering from smoking-related death and negative health issues. However, few studies have examined smoking cessation treatments for those with stimulant dependence. In the current study, we investigated the early effects of varenicline (0, 0.5, and 1 mg, BID) using a within-subject, randomized controlled trial design on cigarette smoking in non-treatment seeking, methamphetamine-dependent individuals (N=14). The dose of varenicline was titrated and the target dose was achieved by study Day 5, and the full protocol was complete by Day 8. Participants were mostly male (71%), 34.9(±8.9) years old, and completed 12.4(±.9) years of school. In regard to methamphetamine use, participants reported using 15.3(±7.2) days in the last 30, and used for 15.3(±7.2) years. With regard to cigarette smoking, participants smoked 17.4(±8.3) cigs/day, had FTND scores of 3.6(±2.7), and baseline breath CO was 11.3(±7.0) ppm. ANOVA revealed no differences in breath CO on study Days 5 (F2,39=1.3, p=.29) nor 8 (F2,39=1.1, p=.36). However, note that this was a non-treatment seeking population for nicotine dependence and normal patterns of smoking behavior were constrained due to the inpatient setting. Of importance, no serious adverse events were noted in any treatment group, the most commonly reported adverse event was headaches, and no neuropsychiatric adverse events were detected. At a minimum, our results show that varenicline can be safely administered to methamphetamine-dependent smokers, and future changes were seen in HT-29 cells. cPLA2 particularly IVA isoform seems to have important role in colon cancer progression.

No funding.

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investigations should be conducted using a standard 12-week outpatient clinical trial design to evaluate efficacy in this population.

Funding provided by the National Institute of Health grant DA027134.

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POS2-16 TRAINING QUITLINE COACHES TO FIDELITY FOR SMOKING CESSATION CLINICAL AND ALCOHOL COUNSELING

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Quitlines are effective for smoking cessation. Recent evidence shows that there is a high prevalence of hazardous drinking among quitline callers. We conducted a clinical trial testing the impact of a brief alcohol intervention added to a standard smoking cessation regimen for smokers who were also hazardous drinkers. Coaches were trained in a series of half-day training seminars by an expert in motivational interviewing and cognitive behavioral treatment. We randomized smokers (N=1,948) to either an Alcohol Intervention group or a Practical Counseling smoking cessation group, both in addition to standard quitline treatment (smoking cessation coaching and nicotine patches). All counseling sessions were recorded, and approximately 20% of the audio recordings (n=400) were evaluated by 7 independent tape raters trained to reliably rate intervention integrity (ICCs range=.81-.99) using items from the Yale Adherence and Competence Scale (YACS) that captured adherence to the different approaches. Discrimination between the groups was demonstrated. When conducting the Alcohol Intervention, coaches were more likely to "link alcohol and smoking" [Alcohol Intervention M=4.1, SD=1.7, Practical Counseling M=1.9, SD=0.8, t=16.2 (398), p<.01] and "elicit a change goal for drinking" [Alcohol Intervention M=3.1 (SD=1.5), Practical Counseling M=1.1 (SD=0.4), t=16.7 (398), p<.01], whereas when conducting Practical Counseling, they were more likely to use specific smoking cessation strategies such as "cope with negative moods and stress" [Alcohol Intervention M=1.3 (SD=0.7), Practical Counseling M=3.0 (SD=1.1), t=19.1 (398), p<.01]. As expected, there was no difference between groups on the use of standard care smoking techniques, such as "assess smoking" [Alcohol Intervention M=4.6 (SD=1.6), Practical Counseling M=4.5 (SD=1.6), t=0.3 (396), p=.75]. This is the second study to show that short, quitline coaches can be trained to use novel counseling paradigms with integrity. Importantly, this shows the feasibility of conducting clinical trials of behavioral treatments in the context of a quitline, which is a health service that is now a core component of tobacco control.

This research was supported in part by NIH Grants R01-CA140256 and R25DA02051, and by the NYS Department of Health.

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POS2-17 THE PAIN AND SMOKING INVENTORY: DEVELOPMENT AND INITIAL VALIDATION

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Research in the broad domain of pain and smoking has increased dramatically over the past several years (Ditre et al., 2011), indicating that interactions between acute/recurrent pain and tobacco smoking are likely critical components to the treatment of smoking cessation. While cohabitation of pain and cigarettes has been explicitly considered in smoking cessation models, there is no validated measure of pain and tobacco smoking. Such a measure is critical for identifying the extent of clinical overlap between smokers and chronic pain patients, as well as for assessing the effectiveness of smoking cessation interventions in this population. Despite this, there is currently no measure available to assess these perceptions, and potential associations between smokers' pain-tobacco perceptions and smoking behavior remain unknown.

This project was supported by Grant No. R21DA034285 awarded to J.W. Ditre by the National Institute on Drug Abuse.

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POS2-18 SMOKERS WITH CHRONIC PAIN ANTICIPATE GREATER DIFFICULTY QUITTING

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Complex interrelations between pain and tobacco smoking have been of increasing interest to researchers and clinicians from across the medical and behavioral sciences. There is also mounting evidence that recurring pain may serve as a barrier to smoking cessation. The main goal of the current study was to compare smokers with and without chronic pain on self-report measures of motivation to quit smoking, and expectancies for smoking abstinence. Survey respondents (N=91) smoked an average of 16.5 cigarettes per day, and had a mean FTND score of 4.0. Given that female smokers were overrepresented in the chronic pain group (n=25), and underrepresented in the no chronic pain group (n=11), all analyses controlled for the influence of gender. Although ANCOVA revealed no association between chronic pain status and motivation to quit smoking (p=.80), smokers with chronic pain did endorse expectations for greater difficulty quitting and remaining smoke free (p=.05). These findings suggest that smokers who live with chronic pain are just as motivated to quit as their no-pain counterparts, despite holding expectations that quitting will be more difficult. Discussion will address clinical implications and directions for future research.

This project was supported by Grant No. R21DA034285 awarded to J.W. Ditre by the National Institute on Drug Abuse.

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POS2-19 THE INFLUENCE OF BINGE DRINKING STATUS ON CHANGES IN APPETITIVE, AFFECTIVE, AND REINFORCEMENT EXPECTANCIES AMONG A NICOTINE DEPENDENT COLLEGE-AGED SAMPLE

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BACKGROUND: As more seasoned cigarette smokers, smoking behaviors and levels of cigarette consumption among young adults increase with the inclusion of alcohol. Previous findings have demonstrated that any amount of smoking among young adults is associated with greater alcohol consumption, and when compared with non-daily or intermittent smokers, daily smoking is associated with the highest frequency of drinking and binge drinking. Yet, despite of this association and the strong contextual motivators (i.e., socialization, activities, settings) often influencing this population, much remains unknown about whether binge drinking serves as a risk factor for smoking relapse. As a
result, the goal of the current study was to examine the function of binge drinking status on differences and changes in appetitive, affective, and smoking-related reinforcement constructs. METHODS: Participants (N = 40) were college-aged nicotine dependent cigarette smokers who reported either regular engagement in binge drinking (n = 20) or no binge drinking during the past year (n = 20). All participants completed self-report assessments prior to (baseline) and following a 24-hour period of smoking abstinence. RESULTS: Compared to their non-binge drinking peers, binge-drinking smokers reported significantly higher scores on the PANAS-N (p < .05) following 24-hours of smoking abstinence. Furthermore, during the baseline assessment, binge-drinking smokers endorsed significantly greater beliefs in the positive reinforcement values of a cigarette as measured by the SCQ (p < .05). However, no significant differences on measures of cigarette craving or withdrawal were observed between the groups prior to or following the abstinence period (all ps > .05). CONCLUSIONS: Findings suggest that the co-occurrence of smoking and binge drinking behaviors among a college-aged population may influence smoking relapse potential through increases in negative affect and differences in beliefs regarding the reinforcement properties of a cigarette. Further understanding of these differences may aid in the development of smoking cessation strategies targeted at this high-risk group.

No funding.

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POS2-20
PTSD SYMPTOMS, UNDERLYING AFFECTIVE VULNERABILITIES, AND SMOKING FOR AFFECT REGULATION

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Post-Traumatic Stress Disorder (PTSD) is overrepresented among cigarette smokers and has been linked to elevated nicotine dependence. One hypothesis to explain PTSD-smoking comorbidity is that individuals with PTSD symptomatology smoke in order to regulate high negative affect and low positive affect commonly associated with PTSD symptoms. However, limited research has examined associations between PTSD symptomatology and motives for smoking. Furthermore, it is unclear whether underlying affective vulnerability factors for PTSD are mechanisms linking PTSD symptoms and smoking motives. Here, we sought to examine: (1) if PTSD symptoms are associated with smoking for positive reinforcement/pleasure enhancement and negative reinforcement/distress reduction; and (2) whether two affectively vulnerability factors implicated in PTSD—anxiety sensitivity (i.e., fear that anxiety-related sensations have harmful consequences) and anhedonia (i.e., diminished capacity to experience pleasure)—account for the relation between PTSD symptoms and affect-based smoking motives. Data were drawn from a community sample of 228 non-treatment-seeking smokers (10+ cig/day) participating in a lab study of acute tobacco deprivation. Questionnaire measures of PTSD symptoms, smoking motives, anhedonia, and anxiety sensitivity were administered at study intake. PTSD symptom level was significantly associated with negative reinforcement smoking motives (β = .31, p < .001), but no positive reinforcement smoking motives (β = .09, p = .16). Variation in anxiety sensitivity significantly mediated the relation between PTSD symptom level and negative reinforcement smoking motives (μ = .11; 95% CI .05-.17), whereas anhedonia did not (μ = .004; 95% CI -.01-.024). Though limited by a cross-sectional design, these findings suggest that anxiety sensitivity may be an important feature of PTSD that enhances motivation to smoke for negative reinforcement purposes. Smoking cessation interventions that alleviate anxiety sensitivity and enhance coping with negative affect may be useful for smokers with elevated PTSD symptoms.

This research was supported by National Institute on Drug Abuse Grants R01-DA026833 and K08-DA025041.

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POS2-21
A COMPARISON OF DEMOGRAPHIC AND CLINICAL FEATURES IN VETERANS WITH PATHOLOGICAL GAMBLING: SMOKERS VS. NON-SMOKERS

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Pathological gambling is associated with high rates of smoking. Previous research indicates that pathological gamblers who smoke have more severe gambling symptoms and psychiatric problems. However, little research has investigated associations between pathological gambling and smoking in a sample of Veterans. Demographic characteristics, clinical features, and comorbidity were assessed and compared between Veterans with pathological gambling who smoke (n=95) and do not smoke (n=25). Participants were administered reliable and valid measures of nicotine dependence (Fagerström Test for Nicotine Dependence; FTND) and gambling severity (South Oaks Gambling Screen (SOGS), Pathological Gambling Yale-Brown Obsessive Compulsive Scale (PG-YBOCS), alcohol severity (Alcohol Use Disorders Identification Test; AUDIT), other psychiatric symptoms (Hamilton Depression Rating Scale (HAM-D), Hamilton Anxiety Rating Scale (HAM-A)), and psychiatric disorders (SCID). Participants who did not want to quit and did not smoke for negative reinforcement purposes. Smoking cessation interventions that alleviate anxiety sensitivity and enhance coping with negative affect may be useful for smokers with elevated PTSD symptoms.

While information on barriers to smoking cessation is available for smokers in general, such information is needed for substance dependent patients in treatment so as to adequately address the concerns of these patients. A previous instrument, Barriers to Quitting Smoking in Substance Abuse Treatment, was developed to assess barriers among alcohol dependent adults. The purpose of the present study was to modify the Barriers to Quitting Smoking in Substance Abuse Treatment in order to assess barriers among substance dependent adults. The items reflect reasons some smokers do not want to quit and include affective and physical effects of withdrawal, losing benefits of smoking, effects of smoking cessation on sobriety and on urges to drink or use drugs, and self-efficacy about quitting. Participants were asked to rate "how much each reason mattered to you" on a likert-type scale (1=hardly matters at all to 5=matters a lot). The development and psychometric properties of this instrument were examined with two samples of adult smokers with drug abuse or dependence in residential substance abuse treatment as part of two larger studies designed to motivate smoking cessation.
Factor structure and validity were examined in Study 1 (N=184). Confirmation of the factor structure and predictive validity (smoking at 1 and 3 months follow-up) were assessed in Study 2 (N=239). Results demonstrated construct, discriminant and predictive validity and reliability of the Barriers to Quitting Smoking in Substance Abuse Treatment. Providing corrective feedback about these barriers may be helpful when addressing smoking with substance dependent patients. This research was supported by a by a grants from NIDA (R01 DA13616 and R01DA023995) and by a Senior Research Career Scientist Award from the Department of Veterans Affairs.

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**POS2-23**

**SMOKING STATUS IS ASSOCIATED WITH COMORBID PSYCHOPATHOLOGY AMONG PERSONS WITH CHRONIC PAIN**

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Numerous studies have documented a greater prevalence of psychiatric disorders among both smokers and persons with chronic pain, and there is reason to believe that tobacco smoking may confer additional risk for psychopathology within a chronic pain population. Smokers (vs. non-smokers) with chronic pain are more likely to endorse substance misuse, have been shown to report greater levels of pain-related anxiety, and be more likely to endorse suicidal ideation. Given that comorbid psychopathology has been associated with adverse pain-related outcomes, it is important to identify factors that may contribute to the prevalence of psychiatric disorders among persons in pain. The main goal of the current study was to test associations between tobacco smoking and psychopathology among persons with comorbid pain disorders. Data were derived from a nationally representative survey of adults in the United States (NCS-R), and respondents who endorsed past-year chronic pain (n = 2518) were included in the current analyses. Past-year mood, anxiety, and substance use disorders were assessed using Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) criteria. All analyses controlled for sociodemographic factors (e.g., age, gender) that have previously been associated with both pain and smoking. The percentage of current smokers with chronic pain who met criteria for at least one mood disorder (20%) was nearly twice that observed among never smokers with chronic pain (11%). Substance use disorders and anxiety disorders were also more prevalent among current smokers with chronic pain when compared to never smokers with chronic pain. Results of multiple logistic regression analyses indicated that smokers in pain (vs. never smokers in pain) were more likely to meet criteria for most psychiatric disorders, including depression (AOR = 1.72, p < .01), generalized anxiety disorder (AOR = 1.82, p < .01), and alcohol abuse/dependence (AOR = 7.81, p < .001). Clinical implications and directions for future research are discussed.

This project was supported by Grant No. R21DA034285 awarded to J.W. Ditre by the National Institute on Drug Abuse.

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**POS2-24**

**THE BIOLOGIC AND CLINICAL EFFECTS OF TOBACCO ON CANCER TREATMENT**


Tobacco use is an established risk factor for the development of several cancers, but less is known regarding the effects of tobacco on cancer treatment. Prospective structured tobacco assessment in 5185 cancer patients demonstrate that smoking at diagnosis significantly increases overall and disease specific mortality. Importantly, smoking increases mortality in tobacco related (head/neck, lung) as well as non-tobacco related (prostate, breast) disease sites. Moreover, patients who quit smoking within the past 12 months have improved survival as compared with current smokers suggesting that smoking cessation improves outcomes in cancer patients. Further extensive review of the literature confirms the potentially reversible adverse effect of tobacco use on toxicity, treatment response, and survival in virtually all cancer disease sites. Biochemical evaluation demonstrates that 29.4% of smoking head/neck cancer patients and 35.4% of smoking lung/prostate cancer patients may misrepresent true tobacco use with structured self-reported assessments. However, repeated assessments increase accurate identification of dynamic tobacco use. Data suggest that 85% of self-reported inaccuracy can be corrected with parallel consideration of disease site, employment, and pack year history. Further preclinical examination demonstrates that exposure to tobacco products specifically during cancer treatment is a critical determinant of therapeutic response to chemotherapy and/or radiotherapy. Activation of nicotinic acetylcholine receptors (nAChR) and downstream activation of the Ras-Raf-MAPK-ERK as well as PI3K-Akt oncopgenic pathways may be common mechanisms of decreased therapeutic response, proliferation, angiogenesis, migration, and invasion in vitro and/or in vivo. Biologic studies further suggest that non-nAChR based cessation strategies may have an important role for cessation support in cancer patients due to a neutral or sensitizing cancer therapy response profile associated with non-nAChR cessation agents. Collectively, data confirm the adverse effects of tobacco on cancer treatment and support mandatory cessation strategies to increase cancer treatment efficacy.

Supported in part by the American Cancer Society Grant MRSG-11-031-01-CCE and the Roswell Alliance Foundation.

CORRESPONDING AUTHOR: Ellen Gritz, PhD, Professor, UT MD Anderson Cancer Center, Behavioral Science, 1155 Pressler Street, Houston, TX 77030, United States, Phone: 713-745-3187, Fax: 713-794-4730, Email: egritz@m synchronized system. This is particularly critical when persistent use of tobacco hinders outcomes, such as with a cancer diagnosis. Many oncologists have believed that tobacco cessation interventions are most appropriately left to primary care physicians, and that it is not their responsibility. As more data accrue about the impact of persistent tobacco use, independent of causation, oncologists must learn how to assist their patients who still use, to stop. Lung cancer is the archetypical cancer caused by smoking. The International Association for the Study of Lung Cancer has completed a survey of their members to assess the knowledge, beliefs, attitudes and behaviors concerning tobacco use interventions within their practices. 1,854 members responded to the survey—a 40% response rate. 86% were physicians: 33.4% medical oncologists and 24% surgical oncologists: 50% were from the USA or Europe. The majority were in a university/academic setting and had been in practice >10 years. 5.3% of respondents reported current tobacco use and 70.2% reported ‘never’ tobacco use. The majority (90.2%) stated that they always or most of the time ‘ask’ if the patient uses tobacco: 86% always or most of the time provide advice to quit. However, only 40.2% always or most of the time discuss medications, with a similar percent (38.8) who ‘actively treat or refer’ patients for cessation interventions. When addressing tobacco use interactions with current cancer treatment during follow-up clinic visits, only 62-73.5% address persistent/relapse tobacco use. Per this survey, the majority (91.7%) agree or strongly agree that persistent tobacco use impacts treatment outcomes with a similar percent (90.2) who agree that cessation should be part of cancer treatment. Despite this belief, only 32.7% believe that they have had adequate training to effectively intervene and 82.3% believe that they need more training. This survey provides an excellent baseline to develop tobacco cessation intervention training for oncologists with the evidence that such training is much needed and desired.

Supported in part by the American Cancer Society Grant MRSG-11-031-01-CCE and the International Association for the Study of Lung Cancer (IASLC).

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POS2-26
TRAINING IN TOBACCO DEPENDENCE TREATMENT IN MEDICAL SCHOOL: PERSPECTIVES FROM MEDICAL STUDENTS IN THE MSQUIT TRIAL

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Medical school is an optimal time for comprehensive training in tobacco dependence counseling. Students with more exposure to tobacco counseling education are more likely to counsel smoking patients as practicing physicians. Despite efforts to increase tobacco treatment training during medical school, there is still limited instruction. Further, best methods for learning this skill and core tobacco teaching principles for training students are less well understood. Using a mixed-methods approach we explored medical students’ learning experiences and self-reported efficacy in tobacco dependence counseling. We also explored their perceptions of the barriers to learning this skill while in medical school, skills they believe they needed, and their thoughts on how to implement a tobacco treatment-specific curriculum. We conducted 10 focus groups of 1st through 4th year medical students (n=35) from 10 U.S. medical schools. We also administered surveys to 3rd year medical students across these medical schools (n=1213). Qualitative themes suggest that didactic tobacco education varies year-to-year within any medical school and across medical schools. Clerkship experience in tobacco counseling is limited and also varies by preceptor interest and skill. Students believed didactic knowledge acquisition (e.g., veterans), and real patient tobacco counseling practice. Perceived barriers to learning and providing tobacco counseling included limited time and focus in the school curriculum, negative attitudes about patients (e.g., ‘they won’t quit!’), and poor student self-efficacy. Students believed a tobacco curriculum should be mandatory, implemented over the 4 years, and focused on practice. Survey data corresponded to these results. Student self-efficacy for tobacco counseling was highest for asking about smoking, but lowest for assisting and arranging follow-up. A majority of students had worked with <3 patients in areas of Assist (63%) and Arrange (79%). Overall, medical students report limited tobacco counseling education and practice. Many are in favor of additional training opportunities while in school.

Funded by the National Cancer Institute Grant R01 CA136888 to J. Ockene and CA136888S1 to R. Hayes.

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POS2-27
NICOTINE LOZENGES TO PROMOTE BRIEF PREOPERATIVE ABSTINENCE: A PILOT STUDY

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Cigarette smoking is a risk factor for several perioperative complications, and abstinence from smoking can reduce risk for some of these complications. The duration of abstinence needed for benefit is not known, but there are plausible physiological reasons to believe that for some complications, even brief preoperative abstinence may be beneficial. Current recommendations are that smokers maintain at least 12 hours of abstinence from smoking before admission to the surgical facility, but prior studies show that many patients continue to smoke until immediately before surgery. This study evaluated the feasibility of using nicotine replacement therapy in the form of nicotine lozenges to help patients maintain brief preoperative abstinence before elective surgery. After IRB approval, 46 cigarette smokers evaluated in a preoperative clinic received a brief practice-based intervention encouraging preoperative abstinence for at least 12 hours before admission to the surgical facility. They were then randomized to receive either active or placebo lozenges (2 or 4 mg, depending on daily cigarette consumption) in a double-blinded fashion, to be used starting the day before surgery as desired to control cigarette cravings. The primary outcome measures were exhaled carbon monoxide (CO) level measured in the preoperative holding area and self-reported abstinence on the day of surgery. Demographics and smoking history of the two groups (n=22 in active and n=24 in placebo groups) were similar. Of the 46 subjects, 10 (46%) in the active group and 15 (63%) in the active group used at least one lozenge (p=0.15). CO levels tended to be less in the active group (7.8 ± 5 and 13.0 ± 10 ppm in active and placebo groups, respectively, p=0.11). CO values were consistent self-reported abstinence (73% and 54% in active and placebo groups, respectively, p=0.19). This study shows that use of nicotine lozenges to aid preoperative abstinence is feasible, although strategies to increase utilization of lozenges would be useful, and that there is preliminary evidence of efficacy. These results provide information to support the conduct of larger efficacy trial.

Funding: Dr. Warner’s Research Funds.

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POS2-28
AN OPEN TRIAL OF RELAPSE PREVENTION THERAPY FOR SMOKERS WITH SCHIZOPHRENIA

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Objective: Following successful smoking cessation, smokers with schizophrenia are vulnerable to relapse shortly after treatment discontinuation. Our objective was to assess the feasibility and effectiveness of a 12-month relapse prevention intervention in recently abstinent smokers with schizophrenia. Method: Adult outpatient smokers with schizophrenia received weekly cognitive behavioral therapy groups, bupropion SR, transdermal nicotine patch, and nicotine gum or lozenge for 3 months. Subjects with 7-day point prevalence abstinence at month 3 received an additional 12 months (months 4-15) of therapy with bupropion, transdermal nicotine patch, and nicotine gum/lozenge in conjunction with relapse prevention based cognitive behavioral therapy groups that were held weekly in month 4, biweekly in months 5-6, and monthly in months 7-15. Results: Seventeen of 41 participants (41.5%) attained biochemically verified self-report of 7-day point prevalence abstinence at the end of 3-month treatment and entered relapse prevention treatment. There was an 81% attendance rate at relapse prevention groups. At the end of the 12-month relapse prevention phase (month 15 overall), 11 of 17 (64.7%) demonstrated biochemically verified 7-day point prevalence abstinence, and 10 of 17 (58.8%) reported 4-week continuous abstinence. Almost one quarter of the sample (23.5%) demonstrated long term prolonged abstinence through the end of the trial. There were no clinically detected cases of psychiatric symptom exacerbation. One participant, who was managed as an outpatient, self-reported psychiatric symptom exacerbation in the interim period between study visits. Conclusions: Extended duration smoking cessation treatment is well-tolerated and may improve smoking outcomes for recently abstinent smokers with schizophrenia. Controlled trials are warranted.

This work was supported by a grant from the Sidney R. Baer Foundation (Drs. Cather, Evins, and Goff), NIMH 5K24MH002025-10 (Dr. Goff) and the National Institutes of Drug Abuse 1K23DA00510 Nicotine and smoking cessation in schizophrenia (Dr. Evins).

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There is a high incidence of tobacco use among patients diagnosed with cancer. Many of these smokers continue to smoke before cancer surgery, which increases risk and often leads to complications. Indeed, quitting smoking is known to improve surgical outcomes (e.g., better wound healing). Contingency management, a behavioral intervention in which abstinence is directly reinforced (typically with monetary rewards), has shown promise as an intervention for promotion of abstinence from smoking. In Phase I of this project, we developed a contingency management protocol for pre-operative cancer patients. Specifically, we conducted 10 individual semi-structured interviews with patients who had engaged in our clinical smoking cessation program to obtain feedback and opinions on a proposed protocol. Patients were unanimous in indicating that cancer patients would be interested in participating in the proposed program, and the majority of participants rated monetary rewards as providing the highest degree of motivation to quit smoking. In Phase II of the project, we conducted a pre-operative smoking cessation pilot study in which patients were randomized to receive either: a) standard care (SC; 3-6 counseling sessions and nicotine replacement therapy [NRT]), or b) standard care + contingency management (CM; 3-6 counseling sessions and NRT + weekly meetings with positive reinforcers). We conducted this study with patients with thoracic, breast, and gynecologic cancers. Results for the participants accrued to date have been promising. Six participants have completed treatment (2 CM, 4 SC), with a total projected sample of 8. Of the participants who have completed treatment, both in the CM group demonstrated biochemically confirmed abstinence from smoking prior to surgery, and none of the participants in the SC group were biochemically confirmed abstinent before surgery. These preliminary data suggest that a contingency management intervention, added to standard care, may be a promising method for inducing pre-surgical abstinence in cancer patients who smoke.

This research was supported in part by NIH grant P50-DA009241 and Smilow Cancer Hospital at Yale-New Haven.

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POS2-30

PROVIDER-BASED BARRIERS TO THE INTEGRATION OF SMOKING CESSATION INTERVENTIONS IN CANCER CARE SETTINGS: AN ATTRIBUTIONAL PERSPECTIVE

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Despite evidence documenting the effects of tobacco in promoting tumor growth and contributing to treatment resistance in cancer populations (Jin et al, 2004), cessation support is rarely offered by providers or incorporated in clinical care. A study of 160 head/neck and lung cancer patients for example, reported that only 27.2% of smokers were offered cessation interventions (Cooley et al., 2011). Given this, it is critical to identify factors that contribute to the resistance of care providers to offer this important treatment component. Examining the provider-patient interaction, we maintain that caring for cancer patients is, at its most basic, a helping intervention. As such, beliefs of the provider and recipient can influence the treatment interaction. One critical set of beliefs empirically shown to influence helping behaviors are perceptions or attributions about responsibility for the patients’ illness related problems; namely who is responsible for the cause of the problems, and who is responsible for the solution to the problems. When crossed, four helping orientations are defined: the Moral Model (high responsibility for cause and solution), the Compensatory Model (low responsibility for cause, high responsibility for solution), the Enlightenment Model (high responsibility for cause, low for solution), and the Medical Model (low responsibility for cause and solution). Each model has associated beliefs that influence the interaction and determine the behavior of the provider and patient. Applying these models to smoking cessation services for cancer populations, we argue that smoking by cancer patients is often approached from a Moral Model perspective by providers, a model empirically associated with a view that individuals create their own problems through their stubbornness, laziness, or lack of will. These negative provider beliefs can, in turn, influence the willingness of the provider to engage in cessation interventions in the context of what is often an already time pressured interaction. Applications of alternative models will be discussed, as well as interventions capitalizing on the more positive aspects of the attributional models.

No funding.

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POS2-31

THE INFLUENCE OF ANXIETY ON SMOKING IN WOMEN UNDER COMMUNITY CORRECTIONS SUPERVISION

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Smoking rates for women in the criminal justice system have been found to be remarkably high with prevalence rates ranging as high as 71%-80%. Risk and protective factors for women have been shown to be different in the criminal justice system in comparison to men. The number of women in the criminal justice system is growing and understanding the characteristics and unique need to this population is paramount to creating and tailoring more effective treatments. The study compared male to female smokers using data extracted from an ongoing randomized clinical trial (5R01CA141663-02) examining the effectiveness of Bupropion and counseling within a community corrections population. Participants were asked at baseline (N=601) a number of questions about their demographics, mental and physical health, drug use, and smoking characteristics. Univariate comparisons were used to examine differences between male and female smokers. There were no differences between men and women on many measures of smoking behavior including number of cigarettes smoked, age of first cigarette, and number of quit attempts. The major difference between the genders involved the role that anxiety played in smoking. Female smokers reported higher rates of trauma, stress, panic disorder, and PTSD. There were no differences for the mood disorders or in substance use, with the exception of higher alcohol use in men. Furthermore, female smokers also reported that stress related antecedents to smoking were more salient compared to the men. For example, the women rated stress, anger, and frustration each as more powerful antecedents compared to the men. The most notable difference between the genders was the role anxiety played in its relationship with smoking. Women reported higher rates of anxiety and it demonstrated a stronger relationship with their urges to smoke. These results suggest that smoking cessation programs for women in the criminal justice system should include a stress management or anxiety reduction component.

Supported the National Institute of Health: 5R01CA141663-02.

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POS2-32

AFFECTIVE PREDICTORS OF CESSATION FAILURE WITHIN 24 HOURS OF QUIT ATTEMPT IN SMOKERS WITH ELEVATED DEPRESSED SYMPTOMS

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Introduction: While the important role of affect in the process of smoking cessation has been well established, little is known about the relations between pre-quit affective trajectories and cessation failure within 24 hours of a quit attempt. Understanding the risk factors that influence cessation outcome on quit day may help improve treatments to promote initial cessation. Methods: This study examined whether changes in positive affect, negative affect, and depressive symptoms in the 8 weeks preceding a cessation attempt were related to failure to quit on quit day in a sample of 206 smokers with elevated depressed symptoms randomized to sequential (8 weeks prior to cessation) fluoxetine treatment versus placebo. Results: A total of 83 smokers (40%) failed to stay quit for the first 24
hours of a quit attempt. Rates of failure to quit for 24 hours were not significantly different across treatment conditions. Latent growth model analyses revealed that pre-quit changes, but not baseline (i.e., 8 weeks prior to quitting) levels, in depressive symptoms and negative affect differentiated those who failed to quit on quit day and successful abstainers, adjusted for baseline covariates (i.e., gender, nicotine dependence, treatment condition). Smokers with increases in negative affect and depressive symptoms in the 8 weeks preceding a quit attempt were more likely to smoke on target quit day. In fact, quit day abstinence rates were lower and increased in negative affect in the weeks prior to quitting, as well as higher baseline levels of positive affect. Alleviating aversive mood states prior to a cessation attempt may help smokers with elevated depressed symptoms achieve the first important smoking cessation milestone.

Supported in part by grant 1R01 DA023190 from the National Institute on Drug Abuse to Dr. Brown.

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**POS2-33**  
POST-OPERATIVE SMOKING STATUS IN CANCER PATIENTS: ASSOCIATION WITH MOOD, PAIN, FATIGUE, AND CANCER-RELATED COGNITIONS

Jason A. Oliver, M.A.*, Erika L. Bloom, Ph.D., Riddhi Patel, B.A., Angelina C. Fink, M.P.H., Steven K. Sutton, Ph.D., Paul B. Jacobsen, Ph.D., Judith McCaffrey, M.D., Thomas H. Brandon, Ph.D., and Vani N. Simmons, Ph.D., University of South Florida and Moffitt Cancer Center

Receiving a cancer diagnosis can serve as a catalyst to motivate a quit attempt in ongoing smokers. Unfortunately, despite the substantial risks posed by relapse, a significant proportion of cancer patients return to smoking following surgical treatment. At present, little is known about the impact of smoking status on psychosocial and quality of life outcomes in cancer patient populations. Identification of variables associated with smoking status post-surgery may inform the development of tailored interventions for this population. In the current study, we sought to extend our previous report on prospective prediction of smoking relapse by examining the association between post-surgical smoking status and emotional, physical, and cognitive variables. Along with smoking status, emotion (depression, fears about cancer), cognition (perceptions of smoking risk) and physical (pain, fatigue) measures were administered at 2, 4, 6, and 12 months after surgery. Participants were 154 patients with lung or head and neck cancer who had quit smoking shortly prior to surgery or intended to quit for at least 24 hours following surgery. Results revealed that across all follow-ups, patients who resumed smoking had significantly greater depression (ps < .01) and perceived fewer risks associated with resuming smoking (ps < .05). Fears about cancer were significantly higher in smokers at 2 months (p < .001), however these effects faded over time. Physical variables were less consistent. Smokers exhibited greater fatigue at 2 and 12-months (p < .05), but not the interceding time points. Consistent with prior research, current smokers reported greater pain interference observed at 2, 4 and 12 months (p < .05), with a trend at 6 months (p < .10). These results suggest that patients who relapse to smoking may be at significantly higher risk for reduced quality of life following cancer treatment. Alternatively, reduced quality of life may increase the likelihood of smoking relapse. Although future research is needed to address causality, these findings have important implications for both the content and timing of targeted relapse prevention programs for cancer patients.

This research was funded by NCI grant R03 CA120799.

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**POS2-34**  
QUALITY OF LIFE AFTER QUITTING SMOKING AND INCREASING AEROBIC EXERCISE

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Introduction: Recent research has shown that quitting smoking conveys benefits with respect to quality of life in multiple domains one and three years later (Piper et al., 2012). We examined the effects of smoking cessation and beginning aerobic exercise on quality of life within one year, hypothesizing that abstinence and exercise would have independent, additive effects. Methods: Participants were 61 sedentary smokers (66% female, mean age = 47.9 years; smoked a mean of 19.7 cigarettes/day) who were randomized to either a 12-week exercise intervention OR a 12-week health education contact control. All participants also received 8 weeks of telephone-delivered smoking cessation counseling and transdermal nicotine patch. Multilevel models were used to examine the time-varying effects of smoking status (abstinent vs. smoking), 7-day point prevalence and exercise status (low active vs. high active; less than or greater than 150 minutes of exercise during the previous week) at 3- (end of treatment), 6-, and 12-month follow-ups on quality of life (QOL) measured with the 16-item Quality of Life Enjoyment and Satisfaction Questionnaire – Short Form (Q-LES-Q-SF) (Endicott et al., 1993). All models controlled for time, gender, age, treatment condition, and baseline Q-LES-Q-SF scores. Results: Across time, abstainers reported greater Q-LES-Q-SF total and physical health scores than smokers. There was no effect of exercise on total or physical health score. With respect to overall sense of well-being, there was a significant interaction between smoking and exercise status such that across time low active smokers reported poorer well-being compared to high active smokers, low active abstainers, and high active abstainers. Conclusion: Relative to smoking, abstinence was associated with greater total and physical health-related QOL within one year. Exercise had no effect on total or physical health QOL but buffered the negative effect of continued smoking on sense of well-being. Findings suggest that the benefits of smoking cessation on quality of life occur within one year, extending previous research demonstrating effects after one year.

Funding: NIH grant K23DA019950.

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**POS2-35**  
ASSOCIATIONS BETWEEN CHRONIC PAIN STATUS AND NICOTINE WITHDRAWAL SEVERITY

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A growing body of evidence suggests that chronic pain may serve as a significant barrier to smoking cessation, and there is reason to believe that persons with chronic pain may experience more severe nicotine withdrawal when attempting to quit. Withdrawal severity has been shown to increase following experimental pain induction, and there is evidence that pain reactivity may predict early relapse to smoking. However, we are not aware of any studies that examined differences in withdrawal severity as a function of chronic pain status. The main goal of the current study was to test whether smokers with chronic pain (vs. no pain) reported greater nicotine withdrawal during their most recent quit attempt. We also tested associations between pain intensity, pain-related disability, and withdrawal severity. Participants were 70 current smokers (M cpd = 15.87) who completed a comprehensive survey on pain and smoking, and endorsed at least one previous attempt to quit smoking. The FTND was used to assess nicotine dependence (M = 3.92), and participants were asked to rate the severity of eight nicotine withdrawal symptoms during their most recent quit attempt. After adjusting for FTND, results indicated that smokers with chronic pain (n =30) reported greater withdrawal severity during their most recent quit attempt (M = 32.69, SE = 1.80), relative to their pain-free counterparts (M = 27.63, SE = 4.63), p < .05. Chronic pain intensity and pain-related disability were also positively associated with greater levels of nicotine withdrawal severity (ps < .05). The current findings suggest that smokers in pain may experience greater nicotine withdrawal when attempting to...
POS2-36
PERCEIVED STRESS SCALE IN A SMOKING CESSATION TRIAL WITH REDUCED NICOTINE CONTENT CIGARETTES

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Introduction: Previously, we found that smokers who switched to very low nicotine content (VLNC) cigarettes or a nicotine lozenge experienced significantly lower withdrawal symptoms and higher rates of abstinence than smokers who switched to low nicotine content cigarettes. The aim of this study is to investigate how subjects’ perceived stress varied during cessation from usual brand cigarettes and study product. Methods: A total of 165 smokers were randomized in a partial double-blind parallel arm design where they completed six weeks of either: VLNC cigarettes (0.05 mg nicotine yield; n=53); low nicotine cigarettes (0.3 mg nicotine yield; n=52); or 4 mg nicotine lozenge (n=60). Smokers were screened to have: smoked 10-40 cigarettes per day for the past year; be in good health, and be between the ages 18-70. Subjects were seen for visits each week during treatment where subjective stress was assessed with the Perceived Stress Scale (PSS), a 14 item, five point scale, measuring the individual’s perceived stress and ability to cope. After the sixth treatment week, subjects discontinued product use and attended follow up visits where PSS was assessed. Results: No significant difference of PSS within product groups was observed after smokers switched from usual brand to the assigned product. A significant increase in PSS (p=0.0044) was observed as participants ceased product usage in the low nicotine (0.3 mg) cigarette group, but no significant increase in PSS was observed upon cessation of either nicotine lozenge or the VLNC cigarettes. Increase in PSS upon cessation of the low nicotine cigarette was significantly related to continuous abstinence after controlling for study product (p=0.0010). As the PSS total score increased one unit upon cessation of product, the odds of having continuous abstinence from any tobacco product decreased 17% (OR=0.83, 95% CI: 0.75 – 0.93). Conclusion: Higher perceived stress experienced after product cessation could be a contributing factor to the higher relapse in the low nicotine content cigarette group. Nicotine lozenge and VLNC cigarettes are not associated with increased stress after cessation.

This study was funded by P50 DA013333 and US4 DA031659.

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POS2-37
WHAT IS THE RELATIONSHIP BETWEEN EUDEMONIA AND SMOKING AMONG OLDER ADULTS?

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INTRODUCTION: Although a large body of evidence has demonstrated the link between pathology or distress (e.g., negative affect, mental illness, difficult life circumstances) and smoking, little research has evaluated the association between eudemonia or “human flourishing” (e.g., life satisfaction, optimism, well-being) and cigarette use. Evaluating the relationships between eudemonia and smoking would advance theories of addiction, and suggest possible targets for tobacco dependence interventions. METHODS: Smokers (n = 43) and nonsmokers (n = 43) from the 2006 Health and Retirement Study, a survey study of Americans 50 years of age and older, were compared on four measures of flourishing: the Satisfaction with Life Scale; the Life Orientation Test (a measure of optimism); a composite of the Ryff Measures of Psychological Well-Being; and the Midlife Development Inventory Affect Scales. RESULTS: Compared to nonsmokers, smokers were much less likely to report satisfaction with their lives (d = -.61, p = .007). Furthermore, smokers reported less optimism (d = -.39, p = .07) and self-acceptance (d = -.29, p = .18) than nonsmokers, though these differences fell short of statistical significance. All other findings, though nonsignificant, were indicative of lower levels of eudemonia among smokers. DISCUSSION: Smokers may flourish less than nonsmokers. Although it is consistent with theory that deficits in eudemonia drive cigarette use, whether these differences reflect causes or outcomes of smoking is unclear and warrants further investigation. Tobacco interventions may benefit from components designed to boost life satisfaction, optimism, self-acceptance, and other eudemonic constructs.

No funding.

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POS2-38
HOSTILITY, DEPRESSION, AND CIGARETTE USE: A COMPARISON BETWEEN SMOKERS AND NON-SMOKERS IN A MATCHED SAMPLE OF ADOLESCENTS

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A wealth of adult research shows that smoking is positively associated with hostility and depression. Although less frequently investigated, adolescent research mostly mirrors these findings. Specifically, cross-sectional studies show that young smokers are more hostile and depressed than non-smokers. Longitudinal investigations have found that elevated hostility and depression early in life tend to predict smoking later on. The current study is an examination of these associations but departs from most previous research in two ways. First, in addition to a standard self-report survey, a recently developed measure of hostility is included. This task asks participants to recognize one of four possible emotions in a series of pictures that start with a neutral face and end with an intensely angry, happy, sad, or fearful face. Second, for smoker-non smoker comparisons, participants were matched on several demographic characteristics. Matched participants (N=190) were 51% female, 85% white and had an average age of 16.3. Results confirmed prior self-report studies by showing that smokers were more depressed and slightly more hostile than non-smokers using questionnaires. Among smokers only, hostility, but not depression, was related to the age of: a) first puff (r=.26), b) first whole cigarette (r=-.19), and c) daily smoking onset (r=-.22). The hostility-smoking link with the novel measure, however, yielded mixed results. While smokers made fewer errors in judging an angry face compared to non-smokers, t(185)=2.0, p<.05, smokers were not quicker to recognize angry faces, as hypothesized. As a whole, these results largely confirm past research while adding in a novel measure of hostility. Further investigation is needed to examine the links between hostility and smoking.

This study was funded by P50 DA013333 and U54 DA031659.

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POS2-39
INVESTIGATING CORRELATES RELATED TO THE USE OF “LEGAL HIGHS” AND RELATED EMERGING SUBSTANCES

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“Legal highs” (i.e., marijuana alternatives, emerging drugs) are increasingly being recognized as a serious public health concern. However, few studies have examined potential correlates related to the use of these substances. This study investigated whether demographic, substance use history, and related variables were related to having ever used Spice (e.g., Spice Gold, K2), Salvia, and “bath...
salt” (e.g., "Ivy Wave"). Five hundred and eighty-two Hispanic participants (63.9% female; mean age = 20.73, standard deviation = 8.85) were recruited from a University on the U.S. / Mexico border for an online study. Participants completed measures assessing demographics, substance use history, and smoking status. Gender, smoking status, and past 30-day marijuana and alcohol use were entered into three separate logistic regression analyses, with lifetime use of Spice, Salvia, and “bath salts” as the dependent variables. Nine percent, 5%, and 2% of the sample indicated ever use of Spice, Salvia, and “bath salts,” respectively. Past 30-day marijuana use (OR 1.10, p < .001) was significantly associated with ever use of Spice and related products. Similarly, past 30-day marijuana use was significantly related to ever use of Salvia (OR 1.12, p < .001) and ever use of “bath salts” (OR 1.11, p = .018). These findings suggest that the assessment of “legal highs” and related emerging substances is warranted in studies of other addictive behaviors. Specifically, intervention and prevention efforts aimed at emerging drugs should target current marijuana users as this group may be at an increased risk for use of emerging substances, specifically focusing on concomitant use of licit and illicit drugs.

This study was funded in part by A Smoke Free Paso del Norte Grant No. 26-8113-63.

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POS2-40
ANXIETY SENSITIVITY PREDICTS MOTIVATION TO QUIT SMOKING AMONG WOMEN BUT NOT IN MEN IN RESIDENTIAL SUBSTANCE USE TREATMENT
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Background: Among individuals in residential substance use treatment, daily cigarette use is estimated to be 70-90%. Because smoking abstinence contributes to drug abstinence, it is important to identify targets for improving smoking cessation outcomes among this population. Motivation to quit (MTQ) smoking is one factor implicated in cessation attempts. In community smokers, higher levels of anxiety sensitivity (AS), the sensitivity to anxiety-related aversive internal states, is predictive of higher MTQ. The purpose of the present study was to examine the relationship between AS and MTQ among adults enrolled in inpatient substance use treatment. We conducted analyses separately by gender as smoking and cessation behaviors may be motivated by different factors, such as AS, for men and for women. Methods: To examine the relationship between AS and MTQ, data was used from an intake interview at an inpatient substance use treatment center in Washington, DC. Participants included 464 individuals (31.7% female, 86.6% African-American, mean age=42.9 + 21.2) who reported smoking at least one cigarette per day (CPD) before treatment entry (mean CPD=11.6 + 9.1). AS was assessed using the Anxiety Sensitivity Inventory (ASI) and MTQ was assessed by asking participants to rate their MTQ on a scale from 1-10 (mean MTQ=6.5 + 3.5). Results: Men and women did not differ significantly on age, MTQ, ASI total, or CPD. We used a series of linear regressions to examine the relationship between AS and MTQ, controlling for CPD, separately in men and in women. Results indicated that higher AS significantly predicted stronger motivation to quit among women (R2=.05, F (2, 129)=3.60, p=.03), but not among men (R2=.001, F (2, 280)=1.70, p=.19). Conclusion: Different processes may contribute to smoking cessation among men and women and AS appears to be related to MTQ among women enrolled in inpatient substance use treatment. Because individual high in AS tend to have less success in the initial stages of smoking cessation, AS is an important factor to consider when creating targeted interventions for high risk populations such as women enrolled in inpatient substance use treatment.

Funding: R01 DA19405.

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POS2-41
PERCEIVED STRESS AND DEPRESSIVE SYMPTOMS AMONG TREATMENT-SEEKING HISPANIC SMOKERS
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Hispanics are the largest ethnic minority group in the U.S., with a 12.5% smoking prevalence. Evidence suggests that smoking rates in this population vary by nationality and may increase in the future. Research in the general population has demonstrated robust associations between perceived stress and depressive symptoms as they relate to smoking maintenance. No previous studies among Hispanic smokers have examined independent relationships between key psychosocial factors (maladaptive coping and perceived social support) and these variables. The aims of the present study were to examine correlates of (1) perceived stress and (2) depressive symptoms among Hispanic smokers. Hispanic smokers in South Florida (N=123), enrolled in an RCT, completed demographic and smoking history, maladaptive coping, perceived social support, perceived stress, and depressive symptom measures. Participants were mostly young (M=35.36 years), female (55.5%), single (58.5%), and moderate to low-income (58.2% household under $30K/year). Participants smoked for 16.58 cigarettes/day for 17.39 years. Levels of perceived stress and depressive symptoms were moderate. Bivariate associations indicated that perceived stress was positively correlated with depressive symptoms and maladaptive coping, and inversely related to perceived social support. These relationships were maintained in multiple regression analyses. Depressive symptoms were positively correlated with nicotine dependence, perceived stress, and maladaptive coping, and inversely related to education and perceived social support. Hierarchical regression analyses demonstrated independent associations between depressive symptoms and maladaptive coping, perceived stress, and education, but not perceived social support or nicotine dependence. These findings suggest that stress and depression among Hispanics are related to factors known to impact cessation. Recommendations for targeted interventions will be discussed.

Funding: American Cancer Society 115787-MRSG-08-142-01-PCCP.

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POS2-42
LONGITUDINAL FOLLOW-UP OF SMOKING AND DRINKING BEHAVIORS IN HEAVY AND LIGHT SOCIAL DRIN KINGS
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Smoking and heavy alcohol drinking are highly correlated, yet additional work is needed to further examine the progression of this co-use over time. Participants were heavy [HD: 10+ drinks/week with weekly binges (5+ drinks/occasion for men, 4+ for women)] and light [LD: <6 drinks/week with no/rare binges] social drinkers enrolled in an alcohol challenge study (Chicago Social Drinking Project) without regard to smoking levels as long as smoking abstinence during sessions did not result in significant nicotine withdrawal. Participants completed a Timeline Follow Back Interview for past month cigarette and alcohol consumption both during baseline and as part of a 5-year follow-up. Of the 190 participants, 98% completed the 5-year follow-up and were included in this analysis. At baseline, compared with LD (n=65, 52% male), the HD (n=101, 72% male) reported greater number of drinking days per month (14.3 vs 6.4 p<.001) and binge drinking occasions (8.0 vs 0.1 p<.001), and also had a higher prevalence of smoking (64% vs 12% p<.001). Comparisons of these smokers in HD (n=65) and LD (n=101) revealed that HDs smoked on average 3 times more cigarettes per month (128.5 vs 45.2, p<.008), and engaged in more than twice as many co-use days (11.2 vs 4.0, p<.001). At 5-year follow-up, approximately two-thirds were still smoking (62% HD, 70% LD). Among these continued smokers, in HD, 32.5% increased the amount they smoked, 65% decreased, and 2.5% remained stable, with similar rates among LD (29% increased, 71% decreased). Finally, among HD smokers, those in the highest quartile of continued and exacerbated binge drinking showed the highest prevalence of continued comorbid smoking (62%) whereas those who were no longer weekly binging had the lowest rate (22%). In sum, smoking and drinking co-use remains strongly related to drinking patterns proximally and over time. As only one-third of social drinkers were able to stop smoking 5 years after initial assessment, and smoking rates were highest among the heaviest binge drinkers,
early education and targeted intervention strategies may improve motivation and behavior change to avoid habitual and progressive co-use. Funding by: NIAAA: R01-AA013746.
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POS2-43
TIME-VARYING PREDICTORS OF SMOKING AFTER QUIT ATTEMPT: APPLICATION OF A NEW APPROACH TO EMA DATA
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Researchers have increasingly begun to gather ecological momentary assessment (EMA) data on smoking, but new statistical methods are necessary to fully unlock information from this data. In this paper we use a new technique, the logistic time-varying effect model (logistic TVEM; Yang, Tan, Li & Wagner, 2012) to examine the odds of smoking in the two weeks after a quit attempt. Data are from a subsample of participants from a randomized, placebo-control trial of smoking cessation pharmacotherapies who achieved initial abstinence (N=1,106, 58% female). Participants completed up to 4 EMA assessments per day during the two weeks after their quit day. Predictors include baseline nicotine dependence (Heatherton, Kozlowski, Frecker, & Fagerström, 1991), craving (Welsch et al., 1991), negative affect (Watson, Clark & Tellegen, 1988), and whether an individual was assigned to a placebo, monotherapy or combination therapy condition. Time-varying effects of these predictors were estimated using logistic TVEM, which flexibly estimates the strength of associations between predictors and smoking lapse at various points in near-continuous time. Cravings were a significant predictor of smoking throughout the entire two weeks post-quit, whereas the impact of baseline dependence became non-significant by the second week, and the impact of negative affect increased over time. Individuals in the monotherapy and combination therapy conditions had decreased odds of smoking compared to placebo in the first week post-quit, but these differences were non-significant in the second week. These findings suggest that pharmacotherapies are more effective compared to placebo earlier in a quit attempt, when the impact of baseline nicotine dependence on smoking is stronger. Future cessation therapies may be more successful by providing additional support in the second week after quit attempt.
This research and the investigators were funded by NIDA grants R01-DA010075, S50DA019706, and 2T32DA017629-06A1 and M01 RR03186 from the General Clinical Research Centers Program of the National Center for Research Resources.
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POS2-44
PERSONAL HEALTH PERCEPTION IS ASSOCIATED WITH SUCCESS RATES OF SMOKING CESSATION
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Smoking is associated with increased morbidity and mortality. Multiple studies have been conducted to ascertain factors associated with smoking cessation. To our knowledge, patients' perception of their own health has not been measured. In a treatment seeking sample of 385 participants who received the 21 mg nicotine patch and placebo or naltrexone (25, 50, or 100 mg; O'Malley et al., 2006), we measured ratings of health through the SF-36 on all participants regardless of treatment group. We found an association between ratings of personal health perception on two items: “In general would you say your health is: Excellent, very good, good, fair, poor” and “I expect my health to get worse: Definitely true, mostly true, don’t know, mostly false, definitely false.” The relationship was significant by logistic regression for ratings of health (Wald=4.53, df=1, OR=1.04, 95% CI=1.02-1.07, p<.05). The percentages of subjects who quit by each health category rating are: Excellent 80% (16/20); very good 57.6% (9/158); good 56.8% (88/155); fair 50% (19/38); and poor 0% (0/3). This relationship was also found for expectations that health would worsen: (Wald=5.62, df=1, OR=0.81, 95% CI=0.88-0.97, p<.05). The percentages who quit by each rating of “health would worsen” are: Definitely true 36.1% (13/36); mostly true 53.6% (52/97); don’t know 61.5% (75/122); mostly false 70.9% (39/55) quit; definitely false 58.5% (38/65). We controlled for ratings of depression (feeling down for the past 4 weeks) and found that this did not affect the findings. These associations are interesting, as those patients with worse health would probably benefit the most from quitting smoking. Of interest, patient self-ratings of health status predict future mortality. These findings warrant replication. It will also be important to control for ratings of depression using a more rigorous measurement method. If these results are replicated, concerted efforts to help these smokers quit smoking may have important benefits.
This research was supported in part by NIH Grant R25DA02051.
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POS2-45
COMPARISON OF THE EFFECT OF MINDFULNESS AND COGNITIVE BEHAVIORAL THERAPY FOR SMOKING CESSATION ON PHYSIOLOGICAL RESPONSES TO SMOKING CUES AND CRAVING
Gladys N. Pachas, M.D.1,2, Zev Schuman-Oliver, M.D.1,2, Susanne S. Hoepnner, Ph.D.1,2, Elisabeth Grasser1, Jaclyn Daigneault1, and A. Eden Evins, M.D., M.P.H.1, 1Massachusetts General Hospital, Psychiatry, Center for Addiction Medicine; 2Harvard Medical School, Boston

Background: Susceptibility to relapse is influenced by negative affect, perceived stress, and exposure to environmental cues. Objective: To investigate the effect of Mindfulness Training for Smokers (MTS) and a standard of care cognitive behavioral therapy (CBT) based on the Freedom from Smoking on physiological responses to smoking cues and craving. Method: Thirty treatment-seeking smokers aged 18-65 who smoked ≥10 cigarettes/day, were randomized to eight two-weekly, ninety-minute group sessions of either MTS (n=14) or CBT (n=16), and participated in evaluation of physiological reactivity to smoking cues. Assessments of electrophysiological reactivity (skin conductance SC; heart rate HR; corrugator andzygomatic EMG) to smoking cues using the script driven imagery technique with smoking (SS) and neutral scripts (NS) and in vivo cues (IVC: a pack of participant’s brand choice) were collected pre (baseline) and post (end point) treatment. Self-report of craving was assessed with visual analog scales pre and post cue exposure. Results: As expected, script-driven imagery using personalized SS increased physiological reactivity compared to NS at baseline for HR, EMG and craving. Also as expected, there was a main effect for time from baseline to end point, independent of treatment assignment, indicating that both treatments reduced cue reactivity. Additionally, there was a time by treatment by script interaction, such that subjects assigned to CBT had significantly less EMG (corrugator) activation when exposed to SS after treatment compared to subjects assigned to MTS. For the IVC, craving self-report increased after exposure and then decreased from baseline to end point as a main effect of time. There was no time by treatment interaction for craving. Conclusion: Both CBT and MTS appeared to decrease cue induced physiologic reactivity and craving. Additionally, there was a greater reduction in corrugator activation, a phenomenon associated with negatively-valenced affective stimuli, in response to smoking-related cues in the CBT group.
Funding: NIAAA R03DA038999 (ZSO), Mind & Life Institute Varela Award Grant 2009-1-014 (ZSO), Harvard Medical School Dupont-Warren and Livingston Fellowships (ZSO).
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Understanding the Role of Cessation Fatigue in the Smoking Cessation Process

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Aims: To understand the dynamic process of cessation fatigue with respect to its average trend, effect on relapse, time-varying relations with craving and negative affect, and differences among genders and treatment groups. Design: Randomized placebo-controlled clinical trial. Participants received either placebo, monotherapy (bupropion SR, nicotine patch, nicotine lozenge), or combined pharmacotherapy (bupropion SR + nicotine lozenge, nicotine patch + nicotine lozenge). Participants: Data were collected from 1504 daily smokers who were motivated to quit smoking. The participants completed baseline assessments and ecological momentary assessments for 2 weeks post-quit. Findings: Cessation fatigue reduced the likelihood of 6-month post-quit abstinence (OR = 0.97, 95% CI (0.95, 0.99)), and was positively associated with craving and negative affect. After controlling for these two factors, average cessation fatigue increased over time. Compared to men, women experienced greater fatigue (t = -10.69, p<0.0001) and a stronger relation between fatigue and craving (t = -8.60, p<0.0001); men showed stronger relation between fatigue and negative affect (t = 5.73, p<0.0001). Cessation fatigue was most significantly reduced by combined pharmacotherapy (t = -13.4, p<0.0001), followed by monotherapy (t = -6.2, p<0.0001). Conclusions: Cessation fatigue was closely related to craving, negative affect, and cessation outcomes. Women reported greater cessation fatigue than men. Current treatments appeared to reduce fatigue and weaken its relations with craving and negative affect.

Poster Session 2 • Thursday, March 14, 2013 • 5:15 p.m.–6:45 p.m.
POS2-49  
**FACTORS INFLUENCING TOBACCO USE AND QUITTING IN INDIA**

Rajmohan Panda*, Divya Persai, and Manu Raj Mathur, Public Health Foundation of India

Tobacco consumption is on the rise in many developing countries including India. Although factors associated with smoking initiation and cessation has been investigated in many western countries, the only available data for India is on prevalence. This study investigates factors associated with smoking initiation and quitting. A cross-sectional study was conducted among 1150 tobacco users visiting public health facilities in twelve districts of Gujarat and Andhra Pradesh in India. Multi stage random sampling technique was used. Data was captured on patterns of tobacco usage, factors affecting tobacco use and predictors of quitting. About half of the respondents reported using tobacco. Peer pressure (43%) was reported by about half of respondents for initiation of tobacco use followed by experimentation (33%). Other factors responsible for initiation were tobacco use at home (27%) and curiosity (19%). About half of the respondents (43%) reported making quit attempts. The main factor responsible for quitting attempts was underlying health problems (94%). Setting an example for children (59%), family disapproval (56%), advertisements about the health risks of smoking (57%) and smoking restriction at public and work places (45%) were the other factors cited for making quit attempts. Respondents who reported information about health risk of smoking and who reported restriction in smoking at public and work places were 2.6 times (OR 2.6, CI 2.0-3.7) and 1.9 (OR 1.9, CI 1.4-2.6) times more likely to quit tobacco use respectively. The findings suggest that the main reason for tobacco initiation is peer pressure. Peer group education can be an effective tool to motivate tobacco users to quit tobacco. Designing interventions packages which has component of intensive cessation counselling can be adopted to motivate people in quitting tobacco use. All Health care providers should be trained in “brief interventions” so that all available opportunities to discuss health risks of tobacco use can be addressed at different levels of health care. Smoking restrictions at work and public places should also be rigorously implemented.

The project was funded through a grant given by Bill and Melinda Gates Foundation.

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POS2-50  
**HOSTILITY AS A PREDICTOR OF AFFECTIVE CHANGES DURING ACUTE TOBACCO WITHDRAWAL**

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Hostility—a personality trait reflective of cynical attitudes, a general mistrust of others, expressions of anger, and aggressive behavior—is associated with nicotine dependence and smoking cessation failure. Yet, the mechanisms linking hostility and smoking are not entirely clear. In this lab study, we tested a socio-affective model that purports that high-hostility individuals smoke to cope with maladaptive social emotions (i.e., anger and low friendliness), which become expressed and exacerbated during acute tobacco withdrawal. Adult smokers (n = 153, ≥ 10 cig/day) attended a baseline visit during which hostility, smoking, and other factors were assessed. Participants then attended two counterbalanced lab visits: (a) a deprived session following 16 hours of abstinence; and (b) a nondeprived session following ad libitum smoking. At both lab visits affect and withdrawal symptoms were assessed. Results were partially consistent with hypotheses. Higher baseline hostility predicted larger deprivation-induced increases in anger (β = .25, p = .002) but was not associated with deprivation-induced changes in friendliness (p = .45). Hostility also predicted greater deprivation-induced changes in other forms of negative affect (anxiety, depression, confusion; betas ≥ .20, ps ≤ .01) and withdrawal symptoms (beta = .16, p = .04). These effects persisted after statistically controlling for gender, nicotine dependence, and baseline negative affect. Other aspects of trait aggression outside of hostility (i.e., verbal aggression, physical aggression, anger) were not consistently associated with deprivation-induced changes in affect and withdrawal. These findings suggest that individuals with high hostility experience generalized exacerbations in several negative affective states during acute tobacco withdrawal that are not specific to social emotions. Increases in negative affect during tobacco withdrawal may motivate negative reinforcement-mediated smoking and could underlie dependence and relapse risk in high-hostility smokers.

This research was supported by National Institute on Drug Abuse Grants R01-DA026831 and K08-DA025041.

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POS2-51  
**MOTIVES FOR SMOKING AMONG EARLY STAGE SMOKERS**

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Multidimensional assessment of adolescent smoking is crucial to identifying individual differences in development of nicotine dependence. Although evidence suggests that nicotine dependence measures separately assess physiological and non-physiological aspects of dependence among adolescents, it is unknown if measures relate differentially to smoking motives. We sought to examine smoking motives in relation to two measures of nicotine dependence, the Fagerstrom Test for Nicotine Dependence (FTND), and the Hooked on Nicotine Checklist II (HONC-II). For both measures, we expected that those higher in nicotine dependence would smoke 1) less for positive reinforcement (PR) and 2) more for negative reinforcement (NR) motives. Data were drawn from a study on cue-elicited craving among occasional vs. daily adolescent smokers, ages 16-20 (N=107). Smoking motives were assessed with PR and NR subscales of the Michigan Nicotine Reinforcement Questionnaire (MNRQ). Daily smokers reported significantly greater NR motives than did occasional smokers (p<.001); there were no group differences in PR. The HONC-II showed a positive association to the MNRQ-PR (β = .42, p < .001; 18% of variance accounted for) while FTND was marginally significant (β = .20, p = .06; 4% of variance accounted for). Both the HONC-II (β = .67, p < .001; 75% of variance) and FTND (β = .66, p < .001; 31% of variance) were positively associated with MNRQ-NR. To further assess the relative contribution of PR:NR motives across levels of dependence, we calculated a ratio score for each participant’s PR to NR smoking motives. Occasional vs. daily smokers did not differ significantly by PR:NR ratio. Both HONC-II (β = .55, p < .001) and FTND (β = .34, p < .001) were negatively associated with PR:NR ratio, such that higher dependent smokers endorsed more NR smoking motives relative to PR motives. While both PR and NR motives increased as dependence increased, motives of higher nicotine dependent smokers were characterized by more NR, relative to PR. Results are consistent with our understanding of dependence, and provide further support for two common measures of nicotine dependence among early stage smokers.

Funding through NIDA grant K23 DA020482 (PI: Carpenter).

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POS2-52  
**COMBINING PHARMACOTHERAPY AND BEHAVIOURAL SUPPORT FOR SMOKING CESSATION—WHAT DOES A SYSTEMATIC REVIEW OF TRIALS TELL US ABOUT TREATMENT EFFECTS?**

Lindsay F. Stead* and Tim Lancaster, Cochrane Tobacco Addiction Group, Department of Primary Care Health Sciences, University of Oxford

Pharmacotherapies and behavioural support/ counselling, have both been clearly shown to assist smoking cessation. Trials of pharmacotherapies (PH) offer behavioural support/BS) to all participants, whether on active treatment or placebo. Trials of BS may use brief support, usual care (UC) or waitlist controls, or may offer PH to all participants. Neither type of trial directly estimates the effect of combined treatment modalities compared to brief advice or UC even though clinical guidelines typically recommend offering smokers a combination of PH and...
BS. Two new Cochrane reviews address the questions ‘What is the treatment effect of combined PH and BS versus brief advice/UC?’ and ‘What is the effect of more versus less intensive BS as an adjunct to PH?’ The first estimates that a combination of PH and BS increases the likelihood of cessation at 6 month or longer follow-up by about 80% (RR 1.82, 95% CI 1.66 to 2.00). The trials were undertaken in various populations and settings. Most provided BS from specialist counsellors. Despite clinical heterogeneity there was relatively little statistical heterogeneity, and subgroups (SG) did not alter estimates much. SG comparisons did not suggest that offering more sessions greatly affected treatment success but a dose response was more evident when take up of treatment components was highest. The second review found evidence of a small benefit of more intensive adjunct support (more or longer sessions), with an estimated RR of 1.16 (95% CI 1.09 to 1.24). Again there was little statistical heterogeneity. Estimates were similar for SGs using NRT, and bupropion. There were fewer trials of other PHs. In SGs grouping trials by the number of contacts to deliver BS, there was a slightly larger estimated effect in the SG of studies that offered >4 personal (telephone or face to face) intervention contacts and a control where the BS did not involve personal contact, but CIs overlapped with other SGs which all had similar estimates. Since the quit rate for controls was high, reflecting the benefit of PH, the small effect would still translate into an absolute increase in success of 2 to 4 percent. Funding by NHS National Institute for Health Research.

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**POS2-55**

**WHAT WORKS BETTER IN SMOKING CESSATION? COMPARATIVE REANALYSIS OF 14 COCHRANE-REVIEWS TOWARDS VARIOUS CESSATION TREATMENTS**

Stephan Muehlig* and Frederik Haarig

During the last 15 years hundreds of RCT’s have been conducted to determine the efficacy of various smoking cessation treatments and summarized in Cochrane meta-analyses. Due to different methodological characteristics (comparators, sample, effect sizes etc.) the results of these systematic cochrane reviews are not fully comparable. Furthermore, the reported effect sizes include no information about the actually attained abstinence rates. For this reason, we reanalyzed 14 Cochrane Reviews including n=654 and >330,000 participants regarding to 6- and 12 months continues abstinence rates and comparacive RR-values. The effect sizes (RR) vary remarkably: CBT (RR: 2.71), varenicline (OR: 2.31-2.57), bupropion (1.69), NRT (1.43-2.26), aversion therapy (OR: 2.01), hypnosis (OR: 1.56), individual counselling (RR: 1.39), telephone counselling (RR: 1.37), motivational interviewing (OR: 1.27), self help (OR: 1.21) and online cessation (inconsistent). The average 12-M-abstinent rate is lower than in heath care routine (OR: 1.56), individual counselling, intensive group therapy. Attendance tends to decline to approximately by half by the 6th week of treatment. Almost one sixth of the patients (18 %) have registered to the intensive group therapy program of which a mean 52 % have completed it with a mean abstinence rate of 39.5 % (range 11-57%). There was a reduction in the number of cigarettes in 57 %. We have followed up 50 % of the groups for up to 24 months and a few others up to 36 and 48 months. Abstinence and relapse rates range between 7-66 % and 7-60 % at 12 months, respectively; reduction and relapse rates between 6-7 % and 6-27 % at 24 months respectively; abstinence and relapse rates between 6-20 % and 6-27 % at 36 and 46 months respectively. Women tend to complete the intensive program more than men. CONCLUSIONS: Although we have a high drop-out rate, the intensive program has similar results to other programs and there are many possibilities for improvement. A more comprehensive analysis on the causes of drop out is guaranteed. Although contingency management is not common in this country it should be explored.

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**POS2-54**

**CHARACTERISTICS AND LONG-TERM RESULTS OF A TOBACCO SMOKING CESSATION CLINIC IN A PUBLIC HOSPITAL IN MEXICO**

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There are few public institutional Smoking Cessation Programs (SCP) in Mexico. The Smoking Cessation Clinic (SCC) at the University & Hospital Civil de Guadalajara (Jalisco), is one of the few public, university-sponsored SCP in the state and in the country and has attended over 1000 clients through its different programs in the past 5 years. AIM To analyse the results of SCP in our institution in a 36-month period and search for performance indicators. METHODS: We follow a combined Medical-Psychological program with a cognitive behavioral therapy and health education model which, in the intensive modality, includes eight 90-min group sessions; we analysed socio-demographic characteristics and success rates up to a 36 month follow up. RESULTS: In 5 years we have attended over 1000 clients receiving different modalities of therapy: brief intervention, individual counselling, intensive group therapy. Attendance tends to decline to approximately by half by the 6th week of treatment. Almost one sixth of the patients (18 %) have registered to the intensive group therapy program of which a mean 52 % have completed it with a mean abstinence rate of 39.5 % (range 11-57%). There was a reduction in the number of cigarettes in 57 %. We have followed up 50 % of the groups for up to 24 months and a few others up to 36 and 48 months. Abstinence and relapse rates range between 7-66 % and 7-60 % at 12 months, respectively; reduction and relapse rates between 6-7 % and 6-27 % at 24 months respectively; abstinence and relapse rates between 6-20 % and 6-27 % at 36 and 46 months respectively. Women tend to complete the intensive program more than men. CONCLUSIONS: Although we have a high drop-out rate, the intensive program has similar results to other programs and there are many possibilities for improvement. A more comprehensive analysis on the causes of drop out is guaranteed. Although contingency management is not common in this country it should be explored.

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**POS2-55**

**DEVELOPMENT OF QUERY TOOL FOR IDENTIFICATION OF SMOKERS FROM ELECTRONIC MEDICAL RECORDS**

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Hospitalization provides a unique opportunity for tobacco use interventions. Clinical interventions and research protocols can be improved by rapidly and accurately ascertaining the tobacco use status and other demographic characteristics of admitted patients. We report an automated method to query the electronic medical record (EMR) and capture and report smoking status and other demographic information relevant to tobacco use interventions. Mayo Clinic in Rochester, MN has implemented a nurse-administered protocol in which all patients admitted to one of two Mayo Clinic hospitals are asked by the admitting nurse about tobacco use and offered intervention services. Information from this protocol is included in the EMR (Centricity™-based) and is warehoused in an Enterprise Data Trust, a non-transactional information architecture that collects data from internal and external systems, including the EMR. To identify patients who might be eligible for a randomized trial evaluating the efficacy of a telephone quittline in hospitalized patients from our local region, we designed a query to capture and report self-reported status as a current cigarette smoker and local residence as specified by appropriate postal zip codes. During development, manual checking of the data was done while testing the query to validate the results and to improve query sensitivity. After preliminary validation, the query was implemented to run 5 times a day, reporting all hospital admissions who met the two query criteria to study personnel responsible for recruitment. In the first four months of implementation, 809 patients were identified by the query. Of those identified, 245 (30%) were approached for potential study participation. Of those approached, 236 (96%) were confirmed to meet the two query criteria. We conclude that these query tools can rapidly and efficiently identify patients who smoke cigarettes and who have specific demographic characteristics. The technology can also be used to capture data important for Federal meaningful use reporting requirements and Joint Commission tobacco use measures.

**Funding: ClearWay Minnesota.**

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STEPHEN M. HARDING, MD, M.P.H., University of Wisconsin, Madison

Background: Hospitalization provides a ‘teachable moment’ for tobacco cessation among patients who smoke. The Joint Commission (JC) recently implemented new core measures to systematically screen and offer treatment for tobacco dependence to all patients admitted to acute care hospitals. This study evaluated an inpatient tobacco treatment program at the University of Washington Medical Center (UWMC) and its partner county hospital, Harborview (HMC), implemented in conjunction with a new smoke-free hospital campus policy in May 2012. Methods: Hospital records for all UWMC and HMC patients 18 years and older admitted from May 31 to December 31, 2011 (n=22,306) were reviewed to determine rates of screening for tobacco use, smoking prevalence, and offer and acceptance of treatment (NRT and counseling). Analyses were conducted to assess differences in these rates among tobacco users at the two hospitals. Results: Over three-quarters (79%) of admitted patients were screened for tobacco use and 20% screened positive for current smoking (10% at UWMC and 31% at HMC). An offer of NRT was recorded for 77% of patient tobacco users, and counseling for 70%. Half (50%) of current tobacco-using patients accepted the offer of NRT and a quarter (26%) accepted counseling itself (38% of those who received NRT). Those who accepted NRT were more likely to be male, 35-44 years old, have public insurance and been diagnosed with a cardiovascular or respiratory disease, but no differences in race or ethnicity were found. Patients who accepted counseling were more likely to be between 35-44 years old and African American or Asian, but no differences were seen by gender, diagnosis or insurance. Conclusions: Despite the teachable moment that hospitalization provides for quitting tobacco, barely half of patients take advantage of any offered treatment, and less than 20% utilize both medication and counseling. Further research is needed to better understand barriers to and facilitators of offering and accepting inpatient treatment, and additional steps should be taken to strengthen compliance with JC tobacco measures in order to improve reach and effectiveness of the new program.

This project was made possible with funding from Public Health – Seattle & King County and the US Centers for Disease Control and Prevention’s Communities Putting Prevention to Work Initiative.

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POS2-57

PREDICTORS OF ATTRITION IN A RANDOMIZED CONTROLLED TRIAL OF A SMOKING CESSION INTERVENTION USING SELF-HELP AND QUITLINE SERVICES

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The goal of this study was to identify demographic and motivational predictors of attrition in smokers from a randomized controlled trial testing the effectiveness of the use of self-help materials as an adjunct to a state telephone quitline (QL). A total of 3,456 participants were recruited by the New York State Smokers’ Quitline (NYSSQL). Participants were randomized to usual care, which received the standard NYSSQL intervention, or one of two conditions that also received 8 self-help relapse prevention booklets (Forever Free) on different mailing schedules (all at once or distributed over 12 months). Participants provided follow-up data for a period of 24 months, with 1188 participants (34.4% of sample) dropping from the study prior to completion of the 24 month follow-up period. Survival analyses were conducted to determine predictors of attrition from a list of independent variables selected a priori—race, age, sex, income, education, motivation to quit, motivation to remain abstinent, and nicotine dependence (FTND). Results indicated that race, sex, age, and education were significant predictors of attrition across the entire sample. Minority racial status (OR = 1.30, p < .001), and having no education past a high school diploma (OR = 1.13, p < .001) were all significant risk factors, increasing the chance of dropout. Older age (OR = 0.98, p < .001) was a protective factor, improving odds of study completion.

Similar effects were seen across study arms, with the exception that minority racial status was not a risk factor for attrition in the group that received Forever Free booklets across a 12 month period. When race, sex, age, and education were entered into a single model that considered the entire sample, all 4 predictors remained significant (all p’s < .01). Findings are consistent with previous studies demonstrating a relationship between demographic variables and attrition, and they identify sub-populations of smokers who may require more intensive retention strategies. Limitations and future directions will be discussed.

This study was funded by NCI Grant R01 CA137357.

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POS2-58

COMPUTER AND OTHER ELECTRONIC AIDS FOR SMOKING CESSATION: A SYSTEMATIC REVIEW

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Introduction: We examined computer and other electronic aids for smoking cessation and/or reducing relapse. Data selection: Relevant primary studies were sought from a systematic search of relevant research databases from 1980 to December 2009. Reference lists of included studies and of relevant systematic reviews were examined to identify further potentially relevant studies. Research registries of ongoing studies were also searched, and further information was sought from contacts with experts. Review methods: A total of 66 randomised controlled trials (RCTs) and quasi-RCTs reported in 82 publications that evaluated smoking cessation programmes that utilise computer, internet, mobile telephone or other electronic aids in adult smokers were included. Pair-wise meta-analyses using random-effects models were carried out. Relevant studies of other design were analysed using a narrative synthesis of key themes that may influence the acceptability and usability of electronic aids. Results: Pooled estimates for prolonged [relative risk (RR) = 1.33, 95% CI 1.20 to 1.47] and point prevalence (RR = 1.15, 95% CI 1.07 to 1.22) abstinence suggested that computer and other electronic aids increase the likelihood of cessation compared with no intervention or generic self-help materials. There was no significant difference in effect sizes between aid to cessation studies and cessation induction studies. Conclusions: Computer and other electronic aids increase the likelihood of cessation compared with no intervention or generic self-help materials, but the effect is small. The effectiveness does not appear to vary with respect to mode of delivery and concurrent non-electronic co-interventions. The key source of uncertainty is that around the comparative effectiveness of different types of electronic intervention.

Funding: NIHR Health Technology Assessment programme.

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POS2-59

HOW DID CHANTIX™ INFLUENCE THE USE OF STOP SMOKING MEDICATIONS BY SMOKERS IN THE U.S.?

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Chantix™ (varenicline) was approved by the United States Food and Drug Administration as a prescription stop smoking medication in 2006. Data from the UK suggest that the introduction of varenicline did not substitute for use of other medication. Using data from the US ITC cohort, this study examines the impact of this association for US smokers. Specifically, this study examines whether the introduction of Chantix™ reduced the use of other cessation medications such as prescription Zolvan™ and nicotine replacement therapies changed after Chantix™ was introduced into the marketplace. This study also examines the characteristics of Chantix™ users in contrast to smokers using other stop smoking medications.
medications, both by prescription and over-the-counter. Our data show that between 2002 and 2010, the percentage of smokers reporting any use of a stop smoking medication in a quit attempt increased from 16% to 45%. Between 2002 and 2005, 26% of smokers in our survey reported having used any type of stop smoking medication. Between 2006 and 2010, 45% of smokers reported having used any type of stop smoking medication, with Chantix™ making up an increasing share of the group using a stop smoking medication. By 2010, among those using any stop smoking medication in a quit attempt, Chantix™ accounted for about 1/3 of the total, as did the nicotine patch. Chantix™ was the most commonly prescribed stop smoking medication used. After 2006, the percentage of smokers using prescription Zyban™ declined from 11% to 8%. These findings suggest that increased use of varenicline in the US did not appear to substitute for use of other smoking cessation medications.

This research was supported in part by National Cancer Institute Grants: R01CA100362, P50CA111236, and P01CA138389 and the Canadian Institutes of Health Research (57897, 79551).

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POS2-60 EVALUATION OF A REFINED, NATIONALLY DISSEMINATED SELF-HELP INTERVENTION FOR SMOKING CESSATION (QUIT KIT 2)
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Objectives: Stop smoking services combining behavioural support and pharmaceutical aids are undoubtedly effective in supporting quit attempts. However, it is widely accepted that barriers exist to accessing these services and so ways of providing more accessible support are needed. The current study assessed the impact of a nationally disseminated self-help intervention (Quit Kit 2) including nicotine replacement therapy (NRT) for smoking cessation, and the effect of using pharmacies for delivery. Methods: The kit contained practical behaviour change techniques (BCTs) for supporting quit attempts. Interviews were conducted with 2679 randomly-selected individuals to assess the impact of the kit on smoking behaviours and attitudes to the intervention. Results: The kit was well received; over two thirds of respondents reported that they found it helpful. Almost two thirds said the voucher for NRT was the main reason for requesting the kit. Those who redeemed the NRT voucher were more likely to report finding the kit helpful, that it increased motivation and confidence in quitting and that they would recommend the kit to others. Over two thirds reported attempting to quit having received the kit, with over a third successfully quitting for four weeks or more. Both making quit attempts and successfully quitting for four weeks or more were significantly more common in those collecting the kit from a pharmacy than in those who ordered the kit online, and were significantly associated with reports of using the quit journey wall chart, when controlling for the use of other BCTs. Making a quit attempt was also significantly associated with reports of redeeming the NRT voucher. Conclusions: A nationally disseminated self-help intervention may be successful in initiating quit attempts and for short-term abstinence. Collecting the kit from a pharmacy appeared to be significantly more effective for initiating quit attempts and short-term quitting, indicating that pharmacy delivery of the kit is worthwhile. The addition of NRT was a popular reason for people ordering the kit and redemption of the NRT voucher may increase quit attempts and abstinence.

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POS2-63 LONG-TERM EFFICACY OF CLICK CITY: TOBACCO — A SCHOOL-BASED TOBACCO PREVENTION PROGRAM
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Click City: Tobacco is an innovative school-based prevention program designed for students in 5th grade, with a booster in 6th grade. The program consists of 18 components delivered via networked personal computers in the classroom. Each component of the program targets an etiological mechanism predictive of future willingness and intentions to use tobacco and initiation of tobacco use, and each component was empirically evaluated prior to inclusion in the final program to assure that it changed the targeted mediating mechanism. Outcomes were assessed following the 6th grade booster, and one year later in 7th grade. This paper presents changes in targeted mechanisms and intention and willingness from 5th to 7th grade among students who participated in a randomized controlled efficacy trial of Click City: Tobacco. Twenty-six schools and their feeder elementary schools were stratified and then randomly assigned to implement the Click City: Tobacco program or continue with their usual health curriculum. Within Click City: Tobacco schools, 1168 students from 24 elementary schools and 13 middle schools participated, and within the Usual Curriculum schools, 1154 students from 23 elementary schools and 13 middle schools participated. All participating students completed a baseline assessment, a post-6th grade program assessment, and a 7th grade assessment. As compared to students in Usual Curriculum schools, students in schools who used Click City: Tobacco significantly decreased their intentions and willingness to use tobacco from baseline to the 6th
grade assessment and from baseline to the 7th grade assessment. Changes in targeted mechanisms were also greater among students in schools who used the Click City Tobacco Program. The program was most efficacious for students who were at high risk for using tobacco. Results demonstrate the long-term efficacy of Click City. Tobacco and suggest that experimentally evaluating components prior to including them in the program contributed to the efficacy of the program.

Funding: National Cancer Institute, CA098555.

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POS2-64
NETWORK GOVERNANCE AND TRUST: TRUST RELATIONS AND NETWORK ENGAGEMENT IN THE NORTH AMERICAN QUITLINE CONSORTIUM

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Trust is a fundamental concept for understanding collaborative relationships between organizations and a critical component of the network perspective, providing the “glue” that holds network members together. This research examines trust within the North American Quitline Consortium—a network spanning the US and Canada that provides tobacco cessation services to clients through phone-based counseling. Within NAQC, trust is especially important in relations between network members, who are the many state and provincial quitline organizations, and the network’s administrative organization, or NAO, whose role it is to facilitate the flow of information about evidence-based practices to enhance the efficacy of services for getting people to quit smoking. Low levels of trust between participating network organizations and the NAO is especially problematic for network governance, seriously undermining the capacity of the network to achieve its collective goals. To study network trust, data were collected in 2009 using a web-based survey of 186 of 277 individual respondents (67.1% response rate) who represented 85 of the 94 (90.4%) funders and provider organizations that made up the full NAQC network. Our primary analytical procedures were social network analysis and Qualitative Comparative Analysis. QCA enables non-linear analysis of data when there are a relatively small number of cases. We found that NAQC organizations with high NAO trust were either highly embedded in the network of relationships (network core members) but did not have high power or reputation, or they were not highly embedded in the network (periphery members) but highly engaged in the NAQC platform. In contrast, those NAQC organizations that did not have high NAO trust were either very powerful/high reputation, or not highly embedded in the network (peripheral) and not highly engaged in the NAQC platform. We explain the implications of our findings both for understanding network governance in general, and more specifically, for enhancing the role and impact of NAQC in its efforts to disseminate and facilitate the flow of practice information to improve smoking quit rates.

This research was funded by the National Institutes of Health National Cancer Institute grant R01CA128638.

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Funding: Federal, State, Commercial.

POS2-66
SELF-REPORTED HEALTH EVENTS AMONG QUITLINE CALLERS

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There is a clear causal relationship between smoking and many health conditions, such as heart disease, most cancers, respiratory illnesses, and reproductive problems (2004 SGR). Alere Wellbeing (formerly known as Free & Clear) has been providing the Quit for Life phone-based treatment for tobacco dependence for over 20 years, serving state quitline callers, large employers, health plans—enrolling over 358,000 tobacco users in 2011. The Quit for Life (Q4L) Program created a Health Event (HE) protocol in 2007. The primary goals of this protocol were to (1) systematically identify those callers reporting health events while receiving care; (2) provide support for Tobacco Treatment Specialist (TTS) to provide HE related information and referrals. A total of 41,929 HEs were reported by 31,129 participants (8.7% of all enrollees) between July 2010 and June 2011. Of these participants, 76.6% had only one HE, 16.5% had two or more HES, 4.6% had three HES, 1.7% had four or more HES. When HES were analyzed in relation to use of cessation medications, 9% of nicotine patch users reported a HE, making up 45% of total HES, and 28% of bupropion and varenicline users reported an HE, making up 14% of all HES. Of participants who filed HES, 19% report discontinuing their cessation medication. Quit rates (30 day point prevalence at 6 months) were substantially lower (~12% on average) among those smokers who discontinued medication after experiencing a HE compared to those who did not discontinue. The incidence of HEs between this sample and a similar analysis conducted during 2008 - 2009 showed no meaningful differences. Modifications to treatment protocols and Quit Coach support will be discussed to minimize unnecessary discontinuation of pharmacologic treatment and optimize treatment success.

Funding: Federal, State, Commercial.

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POS2-65
HOW MANY SMOKERS HAVE TRIED TO QUIT?

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Surveys suggest that most smokers want to quit, but many fewer actually make a quit attempt per year. However, the rate and frequency of quit attempts over an extended period is less clear. This study tracked the smoking behavior of 2,138 adult US smokers who were asked annually about their efforts to stop smoking over an 8-year period between 2002 and 2010. In 2002, 80.2% of smokers in the survey reported that they had “ever” tried to quit smoking. With successive survey waves additional smokers reported making a quit attempt, so that by 2010, 95.6% of the retained sample had reported making a previous quit attempt. Of the 1,329 participants re-interviewed in 2003, 36.5% (485/1344) reported making a quit attempt during the previous year year past year. Of the 844 persons who had not tried to quit, 516 were re-contacted in 2004 and of these 28.3% (146/516) had made a quit attempt in the previous year yielding a cumulative quit attempt rate of 64.8%. By 2010, only 20 of the 152 (13.2%) of the original smoker cohort that was re-surveyed reported not making any attempt to stop smoking over the preceding 8-year period. Among those who made at least one quit attempt, 30.5% were classified as no longer smoking in 2010 (i.e., not smoking for 6 months or longer) yielding an annual average quit rate of 3.8% for the retained cohort. Among the handful of smokers who reported never making a quit attempt in their lifetime, they were more likely to be older, smoke more cigarettes per day, and have a shorter time to first cigarette of the day compared to those who reported having made a quit attempt. The findings from this study underscore the addictive nature of smoking behavior and show that nearly all smokers are making efforts to stop smoking, but with little success.

This research was supported in part by National Cancer Institute Grants: R01CA100362, P50CA111236, and P01CA138389 and by funding from the Canadian Institutes of Health Research (57897, 79551), and National Health and Medical Research Council of Australia (265903, 450110, APP1005922).

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Funding: National Institutes of Health National Cancer Institute grant R01CA128638.

This research was funded by the National Institutes of Health National Cancer Institute grant R01CA128638.

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Funding: Federal, State, Commercial.
POS2-67
THE PRACTICES, THEY ARE A-CHANGING: CHANGES IN THE LEVELS OF IMPLEMENTATION OF QUITLINE PRACTICES IN NORTH AMERICAN QUITLINES 2009-2011

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Background: Tobacco cessation quitlines are effective at helping people quit using tobacco. Yet individual practices that make up quitline operations vary in degree of implementation by quitline and have varying levels of evidence to support their effectiveness at helping people quit, or increasing the reach of quitlines. For example, while 90% of US and Canadian quitlines have implemented fax referral systems to coordinate quitline referrals from health care providers, only 5% have implemented text messaging programs (NAQC annual survey data, 2010). This study examines 27 quitline practices, and examines changes in the degree of implementation of those practices over time. It also analyzes the relationships between implementation of individual practices, and the level of evidence for each practice regarding increasing reach or effectiveness (cessation rates). Methods: North American quitlines were surveyed in two consecutive years: 2010 and 2011 (n63, n65). Level of implementation for each practice was assessed for each quitline. Correlations were run between the number of quitlines reporting “high” or “full” implementation and level of evidence with respect to a practice increasing reach or effectiveness. Results: There was no relationship between the level of evidence for either reach or efficacy and the number of quitlines implementing the practice in either 2010 or 2011. 2011 showed a greater number of quitlines implementing the practice for almost all practices. When comparing 2010 to 2011, referral to health plans had the greatest proportion of increase out of all the practices. Conclusion: While no relationship exists between level of implementation of practices and level of evidence for practices, there may be additional factors that play a role in decision-making for quitlines, such as cost-effectiveness. In an environment of increasingly limited resources, quitlines may want to pay more attention to the levels of evidence each practice has, and how that relates to each quitline’s unique goals. Practices that assist quitlines with cost-sharing and diversifying funding sources may be those that are adopted most quickly in the near future.

The KIINC project is funded by Grant Number R01CA128638 from the National Institutes of Health to the Mayo Clinic Arizona.

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POS2-68
NEIGHBORHOODS AND NICOTINE DEPENDENCE

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Background: The purpose of this study is to examine the associations of neighborhood social and built (i.e., physical) environment with nicotine dependence. Data: Smokers aged 25-44 years living within the St. Louis Metropolitan area were recruited between 2003 and 2007. Among the 1,879 participants, 51.6% were determined to be nicotine dependent. Participants’ home street addresses were geocoded, and were spatially joined to the US 2000 census tract boundary shapefile in geographic information system (GIS). The US census tract boundary was used to define the neighborhood in which participants lived at the time of on-site interview. Methods: The 2005-2009 American Community Survey (e.g., percent below poverty level and percent unemployed) and GIS (e.g., convenience stores and liquor stores) data were used to measure the neighborhood social and built environment. Two separate robust principal component analyses were conducted to capture the neighborhood sociodemographic characteristics and neighborhood built environmental cues related to smoking and alcohol consumption. A series of Bayesian multilevel logistic analysis were conducted to examine the associations of neighborhood characteristics with nicotine dependence. Results: After controlling for sociodemographic characteristics at the individual level, smokers living in the most deprived neighborhoods had 3.30 (95% CI: 1.45, 7.63) higher odds of nicotine dependence relative to those living in the least deprived neighborhoods (i.e., affluent neighborhoods). On the other hand, smokers living in the most non-Hispanic black neighborhoods had 0.42 (95% CI: 0.22, 0.80) lower odds of nicotine dependence relative to those living in the least non-Hispanic black neighborhoods (i.e., predominantly non-Hispanic white neighborhoods). The neighborhood built environmental cues were not associated with nicotine dependence. Understanding the mechanisms that operate within the deprived and non-Hispanic black neighborhoods will allow us to identify the social determinants of nicotine dependence.

Funding: NCI, NIH, COGEND.

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POS2-69
IF YOU SPEND IT, WILL THEY COME? THE RELATIONSHIP BETWEEN QUITLINE SPENDING AND REACH, FY2011

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Background: Quitlines continue to play a prominent role in national tobacco control efforts, with the inclusion of the national 1-800-QUIT-NOW quitline portal number on proposed FDA graphic health warnings for cigarette packs, and the CDC’s National Tobacco Education Campaign featuring the number for three months in 2012. Yet quitlines continue to struggle with sustainability and obtaining adequate funding to meet the growing demand for services. Methods: Data from the FY2011 North American Quitline Consortium (NAQC) Annual Survey of Quitlines were analyzed. Budget figures for quitline services, medications, promotions, and outreach were used to calculate spending per smoker amounts for quitline services & medications, and quitline promotions & outreach. Reach was calculated based on the number of unique tobacco users calling the quitline added to the total number of referrals divided by the number of adult smokers in the state or territory (promotional reach), and based on the number of tobacco users receiving counseling or medications from the quitline (treatment reach). Results: Spending per smoker on promotions and outreach was moderately correlated with promotional reach (R=0.59). Spending per smoker on services and medications was strongly correlated with treatment reach (R=0.85). Discussion: There was a much stronger association between spending per smoker on services and medications and treatment reach (the proportion of adult smokers served by a quitline) than between spending per smoker on promotions and outreach and promotional reach (the proportion of adult smokers calling or referred to a quitline). In order to meet the CDC’s goal of serving 6% of tobacco users with counseling or medications, additional funding will need to be allocated to, or obtained by, quitlines. Additional research needs to be done to understand what factors are more strongly associated with promotional reach than spending per smoker on promotions and outreach efforts, including the types of promotions used, existence of strong community referral networks, and other factors.

The FY2011 NAQC Annual Survey of Quitline was funded by the Centers for Disease Control and Prevention, the American Lung Association, and NAQC Membership dues.

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POS2-70
EFFECTIVENESS OF THE HEALTH PROMOTIONAL BEHAVIORAL PACKAGE ON SMOKING CESSION

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Background: Tobacco is the foremost preventable cause of death and disease in the world today. Health professional in their unique position can educate people on adverse health effects of tobacco. In India, only 46% of smokers and 27%
of users of smokeless tobacco were advised to quit by a health care provider. The study aims to test the effectiveness of health promotional behavioral package on smoking cessation in India. Methods: The study was a community based intervention trial conducted to educate people about harmful effects of tobacco through a health promotion package. The study population consisted of over 100 males in the age group of 18-60 years using tobacco residing in semi-urban Rajasthan. Brief advice consisting of 5 A’s (Ask, Assess, Advice, Assist and Arrange) was given and motivational interviewing was done. Pre and post intervention knowledge level about tobacco and attitude towards tobacco use were compared using paired t test after an intervention period of 4 months. Chi-square test was employed to test the associations between variables of interest. Results: There was a significant increase in the knowledge level of people regarding health effects of smoking. The awareness of tobacco products had increased significantly (p<0.05). Number of subjects who identified heart, respiratory and oral diseases, immunity, cancer and stroke increased significantly. Post intervention there was a significant decrease in the number of subjects with common myths and misconceptions about tobacco smoking(<0.05). 3.5% of participants abstained from smoking for more than 7 days in the intervention area whereas none of the smokers quit in non intervention group. The mean number of cigarettes and tobacco products consumption per day decline significantly from 5.2(SD=9.7) to 1 (SD=0.00). Conclusions: Health promotion package of behavioral modification had a positive impact in reduction of per day consumption of smoking products. This package had further improved the quit rate without use of any pharmacological treatment. Health promotion, health education package and brief advice can motivate tobacco users to quit tobacco use.

No funding.

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POS2-71
A MORBIDITY AND MORTALITY REPORT FROM THREE TOBACCO TREATMENT TRIALS WITH SMOKERS WITH PSYCHIATRIC DISORDERS

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Context: Tobacco use and associated health consequences are significant for people with psychiatric disorders. Yet, tobacco trials tend to exclude smokers with mental illness with concern that quitting smoking may harm mental health recovery. Our recent tobacco trial in inpatient psychiatry had 2-fold greater confirmed abstinence in the treatment group (20% v 9%) at 18 mo relative to usual care and significantly fewer rehospitalizations. The treatment was tailored to motivation with availability of NRT. Aim: The current study reports on observed psychiatric life events of smokers with mental illness to aid researchers and practitioners in anticipating the issues encountered with this complex group. Methods: Data were summarized from three recent and ongoing tobacco treatment trials initiated in inpatient psychiatry in the San Francisco area. Serious adverse events (SAEs), assessed by self-report and EMR over 18-mo follow-up, were defined as ER visits, hospitalizations, or deaths. Participants (N=1059) were 52% male, 47% Caucasian, 85% single, with age M=39 (SD=13); 91% hospitalized involuntarily for suicidality (82%), homicidality (6%) or grave disability (10%); and diagnosed with unipolar depression (55%), bipolar (39%), and psychotic disorders (35%); 67% had alcohol/Illicit drug problems. 77% were hospitalized prior for mental illness. The sample smoked M=18 cigarettes/day (SD=11); 79% smoked within 30 min of waking. Results: A total of 2079 SAEs were recorded: 1388 rehospitalizations, 666 ER visits, and 25 deaths; 60% of the sample had an SAE, 48% were rehospitalized. Causes of death were: alcohol/drugs (7), suicide (7), tobacco related illness (8), homicide (2), and unknown (1). Two participants misused NRT: one applied 11 NRT patches, the other crushed and snorted NRT lozenges with pain medications. Only prior psychiatric hospitalization (OR=2.24, 95% CI: 1.64, 3.04) and psychosis symptom severity (OR=1.13, 95% CI 1.01, 1.26) predicted having an SAE. Conclusions: SAEs were frequent and unrelated to tobacco treatment or abstinence; instead they appeared characteristic of the relapsing and remitting nature of serious mental illness.

Funded by R01 MH083884, K23 DA018691 and P50 DA09253.

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POS2-72
EMPOWERING COMMUNITIES TO PROMOTE TOBACCO CONTROL AND CESSION

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Background: Curbing the insidious tobacco epidemic in developing countries requires a comprehensive multipronged tobacco control effort. It has been almost a decade since India has ratified the WHO Framework Convention on Tobacco Control and also enacted a national tobacco control (TC) law; however engaging communities in TC efforts has remained a searing challenge due to low level of awareness and an insufficient enabling environment. To address this gap in TC effort, a systematized community based TC and cessation model has been implementing through the project - Strengthening of Tobacco control Efforts through innovative Partnerships and Strategies (STEPS). Objectives: This paper describes the community-based interventions (CBIs) being piloted in India, to develop a need based TC and cessation model. The experiences from implementing this multi-component intervention are also underscored. Methods: The CBIs are a set of primordial activities under the project STEPS which are based on best practices in health behavior change; adapting them for TC. The CBIs have been implemented through a multi-stakeholder participation of State Governments, non-governmental organizations and community groups. Results: STEPS empowered and enabled the policy influencers in the social construct, facilitated the formation of Community against Tobacco (CAT) groups to bolster the implementation of TC laws. The activities further included bridging the information gap among masses, skill building community based Self-help Groups (SHGs), motivating tobacco users in the community to quit. The project has built capacities of civil societies, who implement these activities and concurrently organize community sensitization walks and health message dissemination using local resources. The regional media have been educated to underscore the TC activities and report violation of laws. Conclusion: The process evaluations support the mobilization of communities and indicate sustainable TC efforts. These interventions with contextual modifications might evolve as a powerful tool in preventing and reducing the tobacco attributable diseases in low and middle income countries.

Strengthening of Tobacco control Efforts through innovative Partnerships and Strategies (STEPS) is a three-year project funded by a grant from the Bill & Melinda Gates Foundation.

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POS2-73
TRENDS IN QUITLINE FUNDING, 2009-2012: IMPLICATIONS FOR CESSION SERVICES

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Background: Quitlines continue to play a prominent role in national tobacco control efforts, with the inclusion of the national 1-800-QUIT-NOW quitline portal number on proposed FDA graphic health warnings for cigarette packs, and the CDC’s National Tobacco Education Campaign featuring the number for three months in 2012. Yet quitlines continue to struggle with sustainability and obtaining adequate funding to meet a growing demand for services. Methods: Data from the FY 2009, 2010, and 2011 North American Quitline Consortium (NAQC) Annual Surveys of Quitlines were analyzed. Data from the 35 U.S. quitlines that reported both total quitline budget and total tobacco control program (TCP) budget for FY2009 – FY2012 were included in the analysis. Results: Total quitline budgets fell from FY2009 to FY2010, stabilized in FY2011, and fell again in FY2012 while TCP...
bargains. Quiltlines budgets represented 18% of TCP budgets in FY2009 and FY2010, but had increased to 28% of TCP budgets by FY2012. At the same time, the proportion of quiltline budgets coming from federal sources (including ARRA funding) doubled (9% in FY2009, 18% in FY2012). This suggests that while states have managed to protect quiltline funding in the face of cuts to other areas of tobacco control program budgets, quiltlines’ reliance on federal funding has grown over time. In addition, for the first time in FY2010, data were collected on the proportion of quiltline funding coming from state Medicaid programs. An average of 26.7% of tobacco users served by quiltlines report having Medicaid insurance. Comparatively, only 0.1% and 0.3% of quiltline budgets in FY2010 and FY2011 respectively came from state Medicaid programs. Conclusion: As the availability of stimulus funding for quiltlines ends, it is unclear whether states will be able to continue to protect quiltline funding. To do so, strategies for sustainability of quiltlines, including partnering with state Medicaid offices to obtain the 50% federal match for quiltline services, and development of public-private partnerships, will be critical. NAQC is currently focusing on both of these strategies.

Funding for the 2009, 2010, and 2011 NAQC Annual Surveys was provided by the Centers for Disease Control and Prevention, the Robert Wood Johnson Foundation, the American Cancer Society, the American Legacy Foundation, and NAQC membership dues.

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POS2-74
PERCEIVED BARRIERS TO ADOPTING AN ASIAN-LANGUAGE QUITLINE SERVICE AMONG COMMUNITY-BASED ORGANIZATIONS

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There is a large population of Asian smokers with limited access to cessation services because they are not fluent enough in English to use those offered by their state quitline. In 1993, California became the first state to add direct Asian-language services to its quitline. Seventeen years later, Colorado and Hawaii began to work with California to provide Asian-language services to their residents, with New York, Texas, and Washington adopting Asian-language services soon afterwards. In an attempt to understand the rate of progression of adopting an Asian-quitline service, this study assessed community-based organizations (CBOs) from different states that work with Asian communities in the US and examined their perceived barriers to the adoption of Asian-language quitline services. Representatives of the CBOs (N = 51) completed a self-administered survey on the need for cessation programs for Asian-language speakers. The perceived barrier most frequently cited was that federal/state agencies would not be willing to provide the funding required to establish an Asian quitline (82.4%). The second most frequently cited barrier was the belief that Asian-language smokers prefer face-to-face counseling over telephone-based programs (54.9%). At the same time, the majority (72.6%) of respondents stated they were extremely likely to recommend a telephone quitline to a cigarette smoker in their community, if such a service was available, just as much as they would recommend nicotine replacement therapy (NRT) (74.5%). Among those surveyed, respondents indicated that they were not likely to recommend that a cigarette smoker quit “cold turkey” (56.9%), which indicates a strong bias for quitting with the use of some form of treatment or aid. The results have implications for the upcoming national Asian quitline, which will provide counseling and a free 2-week nicotine patch starter kit to Asian-language callers. The results also indicate a need to work with CBOs to increase their understanding of the importance of both aided and unaided quit attempts, in order to improve the population cessation rate among Asian-language smokers.

This research was supported by a grant from the Centers for Disease Control and Prevention (R18 DP002106).

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POS2-75
ASIAN LANGUAGE QUITLINE: TRANSITION FROM CLINICAL TRIAL TO SERVICE OPERATION

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Though tobacco quitlines have been established in every state in the U.S., services for Asian-Americans who speak very limited English are scarce. In addition to lack of funding, there is concern whether recent Asian immigrants will respond to “talk therapy.” To address such concerns, the state quitline in California conducted a large randomized controlled trial with three Asian language groups: Chinese, Vietnamese, and Korean (N=2,277). The results showed that telephone counseling was efficacious with these groups: it doubled the rate of success compared to the control group (self-help group). Moreover, the intervention effect is significant for each of the three language groups. On the strength of these findings, CDC provided funding to disseminate California quitline services to Asian language speakers living in other states. Starting in January 2010, the Asian language services in California were made available for callers from other states, with a special focus on five states: Hawaii, Colorado, Washington, Texas, and New York. This study evaluated the outcome of the Asian language telephone counseling protocol when it is translated from a clinical trial to a service operation. In the service operation, smokers self-selected into counseling or self-help materials. Among those who opted for counseling, 50% were randomly chosen to be followed at 7 months post enrollment. Smokers from California (N=483) who chose counseling had a 6-month abstinence rate that mirrored the results from the efficacy trial (16.7% vs. 16.4% in intent-to-treat, and 19.9% vs. 20.0% in complete-case analyses). As a group, smokers from the other states (N=350) had higher abstinence rates: 22.5% from intent-to-treat sample, and 26.8% from the complete-case sample. Compared to the efficacy trial, this sample included more Korean speakers (57.7% vs. 37.2), more male smokers (19.8% vs. 10.0%), and older callers (>45 years 68.6% vs. 52.0%). These finding suggest that the dissemination process did not lead to a reduction in effectiveness. The implications of these results will be discussed in light of the CDC’s support of a new national Asian-language quitline service.

Supported by a grant from the Centers for Disease Control and Prevention (R18 DP002106).

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POS2-76
THE INDIGENOUS HEALTH WORKFORCE: AN UNDEVALUED RESOURCE FOR SMOKING CESSATION

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Recently in Australia and New Zealand, tobacco control activities have focused on high level population based approaches. Large graphic health warning labels on tobacco packaging and hard-hitting mass media campaigns to reduce tobacco use have been introduced alongside price increases on tobacco tax, and plain packaging for all tobacco products. However, special populations such as Indigenous peoples in Australia and New Zealand have been largely untouched by these strategies, with smoking prevalence rates still the highest in each country, with very little change over the past decade, compared to non-Indigenous smoking rates. Smoking cessation services that cater specifically for Indigenous populations although available, are often limited by resources and sufficient workforce. An approach that has been taken in the remote Kimberley region of Western Australia is to focus on the Indigenous health workforce many of who are also smokers. Workers receive training to offer smoking cessation support to smokers using pharmacotherapies, accessed from local remote or urban medical clinics. These front-line services are given without preaching, smokers are offered a “revolving door” to access further services and Smokefree policy goes hand in hand with cessation support. This is a humane and ethical response to the increasing social stigmatisation of smoking in both countries. Interventions should place smokers their families and communities firmly at the centre of all tobacco control planning, education, policy and services and should acknowledge the value of initiatives that are positive and strengths-based for Indigenous smokers. Education of all health staff, including Indigenous smoking cessation and Tobacco Action workers is an
POS2-77
COMPARISON OF WRITTEN MATERIALS AND MATERIALS PLUS COUNSELING IN PROMOTING SMOKING CESSATION AMONG LATINO EXPECTANT FATHERS: RESULTS OF THE PAREJAS PROJECT
Latinos smoke at a high rate, yet they receive assistance to quit less often than non-Latinos. To address this disparity, we targeted pregnancy as a teachable moment during which to promote cessation among Latino expectant fathers. Given minimal strategies have been effective at promoting cessation among Latinos, we compared written materials to written materials plus counseling. Counselors attempted to conduct 3 sessions with each father during pregnancy (1 face-to-face, 2 by phone). Counselors addressed smoking with fathers and nutrition and physical activity with pregnant partners and couples communication skills. For the Parejas randomized controlled trial, we recruited expectant fathers (n=343) via their pregnant partners who were receiving prenatal care at local health departments. Given many Latinos are non-daily smokers, to be eligible, fathers had to have smoked in the past 30 days. Two-thirds of expectant fathers had a 9th grade education or less, 68% spoke Spanish only, 77% had other children, and 68% smoked 5 cigarettes or less per day, with some smoking only some days in the past 30 days (88% had smoked in the past 7 days). When controlling for baseline 7-day point prevalence abstinence and other relevant covariates (i.e., nicotine dependence, frequency of drinking alcohol, first time fatherhood), we found high rates of cessation at the end of pregnancy, but no arm differences in 7-point point prevalence (33% vs. 33%, p=.94). We found a trend for arm differences in abstinence in the past 30 days (24% vs. 34%, p=.08 materials only vs. counseling, respectively). Among covariates, baseline 7-day point prevalence abstinence and frequency of drinking alcohol were related to cessation at the end of pregnancy. The Parejas project results show that providing written materials alone produced high 7-day point prevalence cessation rates, equal to when intensive counseling was provided. This is encouraging as written materials are easily disseminated. Interestingly, results show that providing written materials alone produced high 7-day point prevalence cessation rates, equal to when intensive counseling was provided. This is encouraging as written materials are easily disseminated. Interestingly, there was a trend for counseling to improve the 30-day cessation rate. It might be that materials alone were helpful, but the added counseling helped fathers create more sustainable change.
This project was funded by NCi grant: R01CA127307.
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POS2-78
CASE MANAGEMENT FOR SMOKING CESSATION AMONG LATINOS
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Despite the evidence that smoking cessation pharmacotherapy and counseling are effective for Latinos, notable service disparities exist between Latinos compared to non-Latinos White and Black. Latinos are less likely to know about cessation resources, receive advice to quit, participate in cessation programs, or utilize pharmacotherapy/counseling during quit attempts. The purpose of this pilot study is to examine the impact of case management on utilization of cessation resources and 6 month cessation among Latinos recruited through community-based methods. Methods: Smokers were randomized to either case management (CM) or control group. Participants in both CM and control received smoking cessation quit kits, including information about free/low cost cessation resources. Participants in CM also received telephone-based case management, which provided fax-referral to quit line, assistance in obtaining cessation medications, and follow up calls to troubleshoot barriers to resource use and cessation. Results: Of 52 Latino smokers, 27 were randomized to CM. Out of the 27 CM participants, 26% completed 2 CM sessions, 30% 3 sessions and 19% 4 sessions. At baseline, interest in cessation resources was very high: 74% reported interest in cessation medication and 70% in quit line. Across both groups the follow-up rate at six months was 62%. Six month self-report cessation rates were 15% (n=6/27) in the CM group and 8% (n=2/25) in the control group. In CM 26% used medication and 11% enrolled in the quit line; in control 8% used medication and 12% enrolled in the quit line. Participants in the control groups were more likely to report barriers to access medication (e.g. cost and very hard to access). Conclusion: The procedures proved to be highly feasible and Latino smokers were very interested in using pharmacotherapy and quit line to quit. Case management had higher quit rates compared to control and this difference may have been due to higher medication utilization. These findings warrant further development of these approaches and a large-scale test in a definitive trial.
This study was supported by funding from the National Heart, Lung, and Blood Institute of the National Institutes of Health [N1I1K01 CA136993-01A1, PI: Cupertino].
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POS2-79
THE RELATIONSHIP BETWEEN PERCEIVED ETHNIC DISCRIMINATION AND ASIAN/PACIFIC ISLANDER TOBACCO USE: ETHNIC VARIATIONS IN A COMMUNITY COLLEGE SAMPLE FROM HAWAII
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Little is known about the relationship between perceived discrimination and tobacco use across subgroups of Asians/Pacific Islanders (A/PIs). This study aimed to test the relationship between perceived discrimination and cigarette use among Native Hawaiians, Filipinos, and East Asians. We recruited 385 students who were East Asian (33%), Filipino (44%), or Native Hawaiian (21%). The mean age of the participants was 24.6 (SD= 3.4) and 67% of the participants were female. Results indicated that discrimination did not have a significant main effect on past 30-day cigarette use. Although Native Hawaiians tended to report higher levels of perceived discrimination, the differences in perceived discrimination were not statistically significant across ethnic groups. We found a statistically significant interaction effect of ethnicity on the relationship between perceived discrimination and recent cigarette use such that at higher levels of perceived discrimination, Native Hawaiians were significantly more likely to report cigarette use compared to East Asians or Filipinos (maximum likelihood parameter estimate for “Native Hawaiian ethnicity X discrimination” interaction term= 0.04; p < 0.05), controlling for age, gender, socio-economic status, marital status, and acculturation to the mainstream U.S. culture. This is the first finding suggesting that perceived discrimination may affect cigarette use differentially across A/PI subgroups. Some A/PI subgroups may have greater resources to cope with perceived discrimination than others. Future studies are needed to replicate the current findings and to develop interventions that would help socially disadvantaged A/PI subgroups to cope more effectively with perceived discrimination.
This study was funded by the University of Hawaii Cancer Center seed grant to P. Pokhrel.
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POS2-80
CHARACTERISTICS OF HOMELESS SMOKERS SEEKING CESSATION TREATMENT

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Although the prevalence of smoking among adults in the U.S. has declined to 20.6%, over 70% of homeless adults are current smokers. The purpose of this study was to characterize sheltered homeless individuals seeking shelter-based smoking cessation treatment in Dallas, TX. Participants were residents of the transitional shelter (i.e., required to sleep in semi-private rooms nightly until a more permanent residence is found) who smoked ≥5 cigarettes per day. Participants (N = 41; Mage = 49.4) were 63.4% male, 55% Black, and 35% White. The sample had an average income of $2901 during the past year, and 87.8% had earned a high school diploma. On average, participants reported 2.2 separate periods of homelessness in their lifetime, their first bout of homelessness began at the age of 41.6, and their current bout of homelessness began 18.3 months (median = 9.5) prior to study enrollment. The majority of the sample reported diagnoses of Major Depressive Disorder (78.0%) and Substance Use Disorders (51.2%), while 19.5% of the sample reported a Schizophrenia diagnosis. On average, participants smoked 17.6 cigarettes per day, had been smoking for 28.8 years, and reported 4.4 lifetime quit attempts of ≥24 hours. Of particular relevance for smoking cessation, participants reported daily exposure to an average of 43 smokers. Smoking dependence measures, measures of affect, measures of stress, and measures of social support were all comparable to other low income smoker populations. Importantly, while motivation for smoking cessation was similar to that of other smokers seeking cessation treatment, this homeless sample reported comparably low self-efficacy for quitting. Exposure to a remarkably high number of smokers, low self-efficacy for quitting, as well as an increased incidence of substance use disorders, depression, and schizophrenia all likely contribute to the historically poor smoking cessation success rates among the homeless. Information gleaned from this study will clarify which variables should be targeted in novel treatments that specifically address the needs of homeless smokers.

Funding for this research was provided by a PILOT grant from the University of Texas School of Public Health. Data analysis and presentation preparation were additionally supported through American Cancer Society grants MRSGT-12-114-01-CPPB (to MSB) and MRSGT-T10-041-CPPHS (to DEK).

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POS2-81
TOBACCO USE AMONG YOUNG WOMEN IN THE U.S.: DIFFERENCES BY RACE/ETHNICITY AND NATIVITY

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A growing body of research documents racial/ethnic disparities in US cigarette smoking. To date, few studies have examined the influence of nativity, in addition to race/ethnicity and gender, on current and ever use of cigarettes as well as other tobacco products. This study documents race/ethnic and nativity disparities by tobacco use and smoking status for US women aged 18-34, both unadjusted and adjusted for socioeconomic status. The Legacy Young Adult Cohort Study (N = 2,094) was used to examine gender specific tobacco use and smoking status differences between foreign-born Hispanics (N=248), US-born Hispanics (N=350), US-born non-Hispanic blacks (N=264), and US-born non-Hispanic whites (N=1232). Prevalence estimates and multivariable models of ever tobacco use, current tobacco use, and self-described smoking status (smoker, social/occasional smoker, ex-smoker/dried smoking & never smoker) were calculated for women. US-born Hispanic women, black women, and white women exhibit the highest levels of ever (56.1%; 53.6%; 55.3% respectively) and current (17.4%; 23.3%, 22.8% respectively) cigarette use compared to foreign born Hispanics (16.9% ever use; 3.9% current use), whom exhibit the lowest ever and current use of cigarettes and most other tobacco products. Foreign born Hispanic women are also the least likely to describe themselves as current smokers (1.5%) compared to the other groups (9.5%-14.0%). Controlling for socioeconomic covariates, current tobacco use is lower for foreign born Hispanic women (OR=0.6; CI: .02-.16) relative to whites. Social or occasional smoking is higher among US-born Hispanics (9.6%) and blacks (17.0%) compared to foreign born Hispanics (5.4%). Lower tobacco use among Hispanic immigrant women as compared to US-born Hispanic, Black, and white women may reflect different gendered cultural norms and acculturation processes among those born outside the US. Future studies must collect data on nativity to accurately capture differences in tobacco use by racial/ethnic group.

Funding: Legacy.

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POS2-82
MONITORING TRENDS IN CIGARETTE CONSUMPTION IN CURRENT DAILY SMOKERS

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Researchers rely heavily on self-reported average number of cigarettes per day (CPD) to identify individuals by smoking status, measure nicotine dependence, determine exposure to smoke toxics, and predict cessation success. However, this subjective measure is susceptible to recall bias, inaccuracy, and heaping (rounding CPD estimates to multiples of 5 or 10). A secondary data analysis was performed to compare non-treatment seeking smokers’ prospectively monitored daily cigarette intake with their retrospectively-reported CPD. Data were pooled from three laboratory studies with similar methods. In each study, smokers reported their number of CPD initially via telephone and then again in-person. Enrolled participants completed a 5-day experimental condition during which they smoked their own brand of cigarette ad libitum Mon-Fri, and returned cigarette butts on days Tues-Fri. Smokers’ (N=89; 58% male; 73% white) average self-reported CPD was 20.6±4.8 via telephone and 20.5±5.0 in-person. Whipple’s index (using multiples of 5 or 10 CPD) was 439.7 (88% heaping) for telephone reports and 413.8 (83% heaping) for in-person reports, indicating a very high preference for providing rounded CPD estimates. Modest correlations between self-reported CPD and butt counts on Days 2-5 (r’s = 0.38 – 0.52; ps<.01) were observed. Butt counts on at least one day of the 5-day period differed from self-reported CPD by <1 to 9 CPD for 41% of smokers and by ~10 or more CPD for 50% of smokers. Daily smoking behavior was also modestly consistent, as determined by intra-class correlation between butt counts for Days 2-5 (r = 0.58 [0.48 – 0.67]). Butt counts in multiples of 5 or 10 were observed for only 19-26% of smokers for Days 2-5, though differed across days by +/-5 to 9 CPD for 43% of smokers and by +/-10 or more CPD for 29% of smokers. Smoking behavior measured via butt counts was not subject to “heaping” as with self-reports, though revealed considerable variation in cigarette intake across days. Future work should examine whether butt count measurement reflects the inconsistent, but valid, nature of cigarette intake and explains the modest reliability of self-reported CPD.

No funding.

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POS2-83
FULL OF FLAVOR: AN ANALYSIS OF FLAVORED SMOKLESS TOBACCO SALES, 2005-2010

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Background: Although the Family Smoking Prevention and Tobacco Control Act made a landmark move in banning flavored cigarettes, flavorings in other tobacco categories such as smokeless tobacco (SLT) remain on the market. This
presentation describes trends in sales of flavored SLT in the US. Methods: We analyzed Nielsen’s convenience store Scantrack sales data from 2005 to 2010 to describe changes in SLT consumption and market share, including use of flavored SLT and related characteristics such as brand and cut/form. We present both trends observed for the US market overall and regionally using data from 30 metropolitan markets tracked by Nielsen. Results: Most snuff volume increased 57% nationally over the six year period, with sales of flavored snuff contributing to 60% of this overall growth. Flavored products made up 55% of the national market all years and in 2010 made up as much as 75-79% of certain regional markets such as Boston and St. Louis. In terms of flavor types, sales of wintergreen or mint styles consistently dominated the flavored market across all regions, however, preference for fruit flavored snuff varied, ranging from just 2.5% of the 2010 flavored market in cities including Portland and Seattle to between 20-26% in Philadelphia and New York. Although sales of flavored snuff increased by 65.5% overall between 2005-2010, sales of fruit flavored snuff increased only 27.6%, with 9 of the 30 markets showing a loss of fruity SLT sales (between 2-54%) during this time period. Sales of flavored snuff also varied by brand, with fruit flavored styles largely limited to Skoal, and these showing signs of decrease. With respect to form, a greater proportion of moist snuff sold in pouches was flavored (73%) versus those sold in long cut (67%) or fine cut (24%) styles. The market share for flavored pouch products in 2010 ranged regionally from 55.3% to 88.8%. Conclusions: Flavored products make up a significant proportion of SLT sales, which is significant given their potential to facilitate SLT use. Policies aimed at protecting young people from flavored tobacco should consider incorporating SLT into their measures.

This work was funded in part by Robert Wood Johnson Foundation’s Substance Abuse Policy Research Program, the National Cancer Institute, and the National Cancer Institute through the Cancer Institute of New Jersey (R01CA141661-S1, R21CA159160 and P30CA072720).

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POSP84

TOBACCO USE: EFFECT ON ORAL HEALTH PROFILE OF A GROUP OF PRISON INMATES

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Objectives: To determine the effect of tobacco use on oral health profile of inmates of the Nigerian prison in Enugu. Methods: The study involved 230 inmates. An interviewer-administered questionnaire was used to collect data on the demographic characteristics of the participants, oral hygiene methods, smoking habits and type of tobacco used. An intra-oral examination to determine their oral health status was done using the modified decayed missing and filled teeth (DMFT) index for caries status, and Community Periodontal Index of Treatment needs (CPITN) for the periodontal status. Statistical Package for Social Sciences software, version 15 was used to analyze data. Results: One hundred and twenty participants (52.2%) were current tobacco users. Thirty nine (32.5 %) had smoked for 6 to 10 years and 15 (12.5%) for more than 10 years. Ninety eight (82.7%) smoke cigarette only, 12 (10.0%) use smokeless tobacco alone whereas 10 (8.3%) use Indian hemp alone or in combination with any of the other two. Tobacco users had higher Mean Decayed Mising and Filled Teeth and Community Periodontal Index scores than non-users. Also, oral soft tissue lesions such as mucosal burn, oral leukoplakia-like lesions were found mainly in the tobacco users. Conclusion: Tobacco seemed to have a negative consequence on the oral health of the participants as users had worse oral health profile than non-users. The participants may benefit from interventional programs on tobacco cessation with the view to educate them on its effect on oral health and by extension, the general health.

No funding.

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POSP85

PERCEIVED HEALTH VULNERABILITY DURING FORCED ABSTINENCE FROM SMOKING IN PRISON

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Background: Smokers consistently identify health concerns as a major reason for quitting. This risk perception is not well understood in settings of complete forced abstinence such as correctional facilities. Understanding smokers’ risk perceptions under such bans and their experience post-release would have a significant impact on potential policies and interventions. Methods: Incarcerated adults (N=247) were enrolled who smoked prior to incarceration and were scheduled for release within eight weeks. Participants were asked about risk perception using five established measures of vulnerability: Future Precaution, Future Effectiveness, Relative Possibility, Future Possibility, and Current Vulnerability. Smoking status was assessed 3 weeks post-release. Results: Demographic variables were generally not related to risk perception. Smoking-related medical conditions, family history of smoking-related illness, age started smoking, stress, and depressive symptoms all had a significant association with various measures of vulnerability. Current and Future Vulnerability predicted smoking plans after release: participants more concerned about their current health favored smoke-free plans (OR=1.71) as did participants concerned about their future health (OR=1.09). Discussion: In a population undergoing forced abstinence from smoking, health-related concerns remain important. Further study is needed to confirm this association and use of specific measures to help in stratifying motivation for and likelihood of persistent cessation after forced abstinence.

This research was supported by grant 1R01DA024093-01A209 from NIDA.

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POSP86

EXPOSURE TO NEIGHBORHOOD VIOLENCE INTERFERES WITH MAKING A QUIT ATTEMPT AMONG SOCIOECONOMICALLY DISADVANTAGED SMOKERS

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Neighborhood disadvantage has been consistently associated with increased cigarette use. Less is known about the relation between personal/family victimization in one’s neighborhood and smoking cessation outcomes. The purpose of the current study was to describe the association between exposure to neighborhood violence and abstinence in a sample of socioeconomically disadvantaged smokers (N = 95) participating in a tobacco cessation treatment program at a safety net hospital in Dallas, TX. Data were collected as part of an ongoing study designed to evaluate the effectiveness of adjunctive financial incentives relative to a standard tobacco treatment program. Participants were predominantly single (43.2%), female (53.7%), African American (64.2%), and they smoked an average of 16.9 (SD=8.3) cigarettes per day (CPD), were 52.9 (SD=7.2) years of age and had a 31.6 (SD=9.6) year smoking history. Exposure to neighborhood violence was reported by 11.6% of the participants. Univariate logistic regression analyses were conducted to evaluate the associations between neighborhood violence and biochemically-verified point prevalence abstinence (< 24 hours post-quit) on the quit date, and biochemically verified 7-day point prevalence abstinence at 1, 4, and 12 weeks post-quit. All models controlled for treatment group, race, gender, and CPD. Analyses indicated that those who reported neighborhood violence were more likely to be non-abstinent on the QD (OR=8.763, p<0.006). However, the relationship between victimization and
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Cancer Society (MRSGT-12-114-01-CPPB to MSB and MRSGT-10-104-01-CPHPS to DEK) and University of Texas School of Public Health start up funds awarded to Drs. Businelle and Kendzor.

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POS2-87
POOR PHYSICAL AND MENTAL HEALTH ARE ASSOCIATED WITH NON-ABSTINENCE AMONG SOCIALLY DISADVANTAGED SMOKERS FOLLOWING A QUIT ATTEMPT

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Poor physical and mental health, especially depression, may be barriers to successful smoking cessation among socioeconomically disadvantaged smokers. The purpose of this analysis was to determine whether self-reported problems with physical and mental health were associated with non-abstinence among socioeconomically disadvantaged smokers participating in a smoking cessation intervention study at a safety net hospital in Dallas, TX. Participants were randomly assigned to Usual Care (UC) or UC plus incentives for quitting (Contingency Management [CM]). Participants (N = 84) were primarily female (56.0%), and married (46.4%) and had a median age of 45.5 years (range: 22-85). Participants were asked to report their smoking status at baseline, pre-quit, post-quit (4 weeks post-quit), and at 12 months post baseline. Pre-quit smoking status was not significant at any other time point. Findings suggests that neighborhood violence among socioeconomically disadvantaged smokers may interfere with making a quit attempt. Victims of neighborhood violence may need mental health treatment prior to and/or during a quit attempt in order to maximize the chances for success. Policies aimed at improving neighborhood conditions may also contribute to decreased smoking rates.

Acknowledgements: This work was supported by grants from the American Cancer Society (MRSGT-12-114-01-CPPB to MSB and MRSGT-10-104-01-CPHPS to DEK) and University of Texas School of Public Health start up funds awarded to Drs. Businelle and Kendzor.

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POS2-89
TRY AND TRY AGAIN: FREQUENCY AND PREDICTORS OF SMOKING CESSATION ATTEMPTS IN A SOCIOECONOMICALLY DISADVANTAGED SAMPLE

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Background: The number and length of quit attempts a smoker makes is positively associated with long term abstinence. Some research demonstrates that smokers from lower socioeconomic status make as many quit attempts as those from higher socioeconomic status but fail to convert these into long term abstinence. Little is known as to why this may be occurring. Furthermore, no research has included highly disadvantaged samples with the highest smoking prevalence rates. Therefore, it is important to explore the sociodemographic and psychological variables that may predict quit attempts within disadvantaged groups. This study aims to examine the number and length of quit attempts and the predictors of quit attempts within a disadvantaged sample. Methods: A cross sectional survey of smokers and ex-smokers attending a non-governmental social and community service organisation assessed number of previous quit attempts, along with sociodemographic and psychosocial variables. Univariate and multivariate analyses were carried out in the form of negative binomial
regression analyses. Results: In total, 300 smokers completed the survey (98% response rate). The mean age of participants was 40 years (SD = 11), 55% were female and 13% were Indigenous Australian. Participants experienced significant disadvantage, with 76% earning AUD$400 or less per week and 68% having left school before the age of 16. Half of all smokers (51%) had made a quit attempt within the past 12 months with the mean number of quit attempts being 2 (SD = 2). The most popular methods used to quit included willpower (50%), NRT (30%) and exercise (30%). Predictors of previous quit attempts will be discussed. Implications: These results demonstrate that individuals experiencing high levels of socioeconomic disadvantage are making attempts to quit. The predictors of these quit attempts have important implications for policy and intervention design and implementation.

This research has been funded by a grant from the National Health and Medical Research Council of Australia. Scholarship funding is also provided to LT from the Cancer Institute NSW Career Development Fellowship.

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POS2-90

THE ASSOCIATION BETWEEN NICOTINE DEPENDENCE AND ABSTINENCE ATTEMPTS AMONG SOCIOECONOMICALLY DISADVANTAGED SMOKERS DURING THE FIRST TWELVE WEEKS FOLLOWING A QUIT ATTEMPT

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The brief version of the Wisconsin Inventory of Smoking Dependence Motives (WISDM-37) is a multi-dimensional measure of nicotine dependence. The WISDM-37 is comprised of 11 subscales that characterize motives for smoking and level of tobacco dependence. The current analyses used data from the PREVAIL study, which was designed to test the efficacy of an adjunctive contingency management intervention in socioeconomically disadvantaged smokers who were seeking smoking cessation treatment at a safety net hospital in Dallas, TX. The purpose of this study was to determine if the WISDM total and subscale scores at baseline (1 week pre-quit) predicted abstinence in smokers during the first 12 weeks post-quit (i.e., quit date, 1, 4, and 12 weeks post-quit). Participants were primarily female (54.3%), and African-American (64.9%). All analyses controlled for race, gender, and treatment group. Results indicated that lower scores on the Social/Environmental Goads subscale (p < .015), Tolerance subscale (p = .028), and WISDM total score (p < .031), Primary Dependence Motives scale (p = .035) and Secondary Dependence Motives scale (p = .047) predicted biologically confirmed abstinence on the quit date (N = 94). Surprisingly, only the Social/Environmental Goads subscale consistently predicted biologically confirmed abstinence at the post-quit visits: Week 1 (p = 0.015, N = 90), Week 4 (p = 0.004; N = 84), and Week 12 (p = .012, N = 50). Lower scores on the tolerance subscale predicted abstinence at 1 week post-quit (p = 0.032). Notably, the Heaviness of Smoking Index did not predict abstinence at any time point. Overall, findings indicate that scores on the WISDM-37 are associated with abstinence on the quit date, and that a lower score on the Social/Environmental Goads subscale (i.e., social stimuli and contexts that invite smoking) is a robust predictor of abstinence over time among economically disadvantaged smokers participating in smoking cessation treatment. Thus, smoking cessation interventions for socioeconomically disadvantaged smokers may need to include a greater focus on coping with social situations involving smoking and other smoking-related cues.

This work was supported by grants from the American Cancer Society (MRSGT-12-114-01-CPPB to MSB and MRSGT-10-104-01-CHPSPS to DEK) and University of Texas School of Public Health start up funds awarded to Drs. Businelle and Kendzor.

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POS2-91

PREDICTORS OF VARENICLINE AND NICOTINE PATCH NON-ADHERENCE AMONG SOCIOECONOMICALLY DISADVANTAGED SMOKERS PARTICIPATING IN A SMOKING CESSATION TREATMENT PROGRAM

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Optimal adherence to pharmacotherapy is crucial to improving smoking cessation outcomes. Understanding the variables that influence non-adherence may allow clinicians to maximize the effectiveness of smoking cessation medications. The purpose of this study was to: (1) describe patterns of varenicline and nicotine patch adherence, and (2) determine predictors of non-adherence among socioeconomically disadvantaged smokers participating in cessation treatment. Data were collected as part of an ongoing pilot intervention study at a safety net hospital in Dallas, TX. Participants (N = 81) were mostly female (54.3%) and African American (65.4%). The mean education level was 12 years and 56.8% had an annual household income < $12000. Varenicline was prescribed to 33.3% of all participants and the patch was prescribed to 66.7%. Overall scores on the 4-point Morisky Medication Adherence Questionnaire (MAQ) indicated moderate initial adherence for both varenicline and patch users at 1 week (W1) post-quit (N=81; M=3.43 vs. 3.23). Mean adherence scores declined slightly, but did not differ by medication type at 4 weeks (W4) post-quit (M=3.14 vs. 2.84). Univariate linear regression was performed to identify predictors of varenicline and nicotine patch adherence, as measured by the MAQ purposeful non-adherence scale at W1 and W4 post-quit; covariates in all models included treatment group, race, gender, and cigarettes per day. Among varenicline users, experiencing more side effects and fewer years of education were predictors of non-adherence at W1 post-quit. Experiencing a greater number of side effects was the sole predictor of varenicline non-adherence at W4 post-quit. Among patch users, experiencing a greater number of side effects and having beliefs that medication is less necessary were predictors of non-adherence at W1 post-quit. Non-adherence at W1 post-quit was associated with patch non-adherence at W4 post-quit. All p values <.05.

Findings highlight several factors associated with medication non-adherence among varenicline and nicotine patch users which may be addressed in future treatment interventions.

This work was supported by grants from the American Cancer Society (MRSGT-12-114-01-CPPB to MSB and MRSGT-10-104-01-CHPSPS to DEK) and University of Texas School of Public Health start up funds awarded to Drs. Businelle and Kendzor.

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POS2-92

WILL CIGARETTE PLAIN PACKAGING WORK AMONGST HIGHLY SOCIOECONOMICALLY DISADVANTAGED SMOKERS? THE RESULTS OF AN EXPERIMENTAL STUDY

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Background: Packaging is a key marketing tool in the promotion of tobacco products. Evidence shows that packaging colours, branding imagery and logos impact on a consumer’s perceptions and experiences of a product. Previous research has demonstrated that progressively palier packaging for cigarettes that incorporates larger health warnings and fewer company branding elements are perceived as less attractive and are associated with cessation intentions. The effect of plain packs remains untested with severely socially disadvantaged individuals who have among the highest smoking rates. Methods: Clients attending a community service organisation for welfare support were invited to complete a computer touchscreen survey. A 2 (Winfield Blue 25 versus Ads Benson & Hedges Smooth 25) x 2 (branded versus plain) experimental cross-over trial was conducted using a touch screen computer tool to expose participants to one
randomly selected cigarette pack, which they were asked to rate on a number of pack, smoker and experience characteristics. A forced-choice question displaying branded-only or plain-only packs assessed purchase intention. Results: The survey response rate was 76%. A total of 400 smokers completed the survey (59% female; mean age 38 years). The smoking prevalence rate in this setting is 65% (daily and occasional). Most respondents had not completed high school, three-quarters had an income of less than AU$400/week, and 18% identified as an Indigenous Australian. In comparison to branded packs, plain packs reduced smoker’s ratings of ‘positive pack characteristics’, ‘positive smoker characteristics’ and ‘positive taste characteristics’. When only plain packs were displayed, the intention to not purchase any pack increased compared to the presentation of only branded packs. Conclusions: Plain packaging policies that strip tobacco products of most branding elements are likely to be successful in reducing cigarette brand attractiveness. Smoker’s ratings of ‘positive pack characteristics’, ‘positive smoker characteristics’ and ‘positive taste characteristics’ are likely to be successful in reducing cigarette brand image associations amongst severely disadvantaged smokers.

This study was conducted while the first author was at the University of Newcastle, supported by an Australian Postgraduate Award. This research was conducted with infrastructure support and project grant funding from the Hunter Medical Research Institute. B. Bonevski is supported by a Cancer Institute NSW Career Development Fellowship.

BACKGROUND: Homeless individuals have a 73% prevalence of cigarette smoking and high rates of premature mortality, but smoking-attributable mortality rates have never been reported in a U.S. homeless population. We used clinical, survey, and vital registry data to estimate smoking-attributable mortality in a cohort of homeless adults in Boston. METHODS: We cross-linked a cohort of 19,836 adults aged 35-64 years who were seen at Boston Health Care for the Homeless Program in 2003-08 with Massachusetts mortality files spanning the same years to determine the number of deaths due to 19 smoking-related conditions. We calculated smoking-attributable fractions (SAF) for each condition using smoking prevalence estimates from the nationally representative 2003 Health Care for the Homeless User Survey and relative risk estimates from the CDC. For each condition, we multiplied the SAF by the number of deaths to estimate smoking-attributable deaths.

RESULTS: Participants were observed for 62,300 person-years. 71% were <50 years old at the index observation, 73% were men, 45% were white, and 30% were black. Of 1,053 deaths among 35-64 year old adults, 160 were smoking-attributable, including 136 among men and 24 among women. The age- and sex-standardized smoking-attributable mortality rate in the homeless cohort (250.4 deaths/100,000 person-years) was 3.4-fold higher than in the Massachusetts population (72.6 per 100,000). The leading causes of smoking-attributable death were ischemic heart disease (n=50) and lung cancer (n=50). Other causes of smoking-attributable death included other heart disease (n=14), stroke (n=12), and chronic airways obstruction (n=9). CONCLUSIONS: Despite their young age, a substantial number of deaths among homeless adults are smoking-attributable. Addressing the high prevalence of cigarette smoking among homeless people has the potential to reduce the burden of premature mortality in this vulnerable population.

Funding: (1) National Institute on Drug Abuse, National Institutes of Health (Award Number K23DA034008), (2) Massachusetts General Hospital, and (3) Boston Health Care for the Homeless Program

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of the state and the micro-level of bars. At the level of practice, one message that 
radiates clearly is the need for greater awareness.  
This research was done while the first author was at Georgia State University.  
Funding source: Dekalb County Board of Health.  
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POS2-96  
USING SMART PHONES TO COLLECT MOMENTARY DATA AMONG  
SHELTERED HOMELESS SMOKERS  
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Despite the high prevalence of smoking among homeless individuals (i.e., over  
70% smoke), very little is known about the smoking characteristics and predictors of  
relapse in this population. This dearth of knowledge is largely due to the difficulty of  
studying this transient population. The purpose of this study was to determine the  
feasibility of using smart phones to collect real-time data of possible relevance to  
smoking cessation in a sheltered homeless population. Homeless smokers were  
eligible for this study if they smoked ≥ 5 cigarettes per day, were enrolled in a  
shelter based smoking cessation clinic, and had ≥ a 6th grade English literacy  
level. Ecological momentary assessments (EMAs) were collected via smart phone  
over a 14 day period (1 week pre-quit through 1 week post-quit). Participants  
completed 3 types of momentary assessments (i.e., daily diary, random, and event  
sampling [i.e., pre-quit smoking, post-quit urge, and lapse]). Daily diary (1 per day)  
and random assessments (4 per day) were prompted by the phone, while event  
sampling assessments were initiated by participants. Daily diary assessments were  
completed daily (30 minutes after waking), and all questions referred to the  
previous 24 hours. To date, 41 sheltered homeless individuals (mean age = 49.4,  
63% male, 55% Black, 35% White, mean years of education = 12.8) have been  
recruited into this study. On average, participants smoked 17.6 cigarettes per day  
and had been smoking for 28.8 years. Participants have reported few problems  
with using the smart phones. A total of 6 phones (14%) have been lost or stolen.  

Thus, we have EMA data on 35 individuals (86%). On average, participants who  
returned the phone completed 75% (median = 85%) of all prompted EMAs, and  
thus, we have EMA data on 35 individuals (86%). On average, participants who  
returned the phone completed 75% (median = 85%) of all prompted EMAs, and  
self-initiated an average of an additional 1.4 event sampling assessments on  
each day of the EMA period. Results of this experiment suggest that smart phone  
based EMAs can be a useful method of obtaining real-time real-world information  
about sheltered homeless smokers. Experience and insights gained in the  
collection of momentary data in sheltered homeless individuals will be discussed.  

Funding for this research was provided by a PILOT grant from the University of  
Texas School of Public Health. Data analysis and presentation preparation were  
additionally supported through American Cancer Society grants MRSGT-12-114-  
01-CPBP (to MSB) and MRSGT-10-104-01-CPHPS (to DEK).  
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01-CPPB (to MSB) and MRSGT-10-104-01-CPHPS (to DEK).  

POS2-98  
GENDER INEQUALITY AND HOUSEHOLD TOBACCO EXPENSES IN  
PAKISTAN  
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Introduction: Several studies suggest that limited household resources may  
necessitate tobacco use. Gender roles may explain this anomaly e.g. a male  
household member who is the breadwinner can prioritize tobacco purchase  
over other consumables; relationships rarely investigated before. This study  
assessed associations between tobacco expenses and gender role in household  
purchases in a low-income country. Methods: Study setting was Pakistan. Data  
on monthly household expenses and on tobacco were extracted from a nationally  
representative sample (N=15 512 households) interviewed in 2005-06. Tobacco  
products were either cigarettes or raw tobacco (e.g. chewed). Two logistic  
regression models were constructed where outcome variables were the proportion of  
tobacco expense in overall monthly household expenses; it was coded as  
“0” if they were < 3% and “1” if ≥3% on either cigarettes or raw tobacco. The  
main independent variable was a four category response about who decides the  
household purchases: (a) women herself, (b) male head of family, (c) male  
with other women, (d) male with other members during last year. Analyses were  
adjusted for household factors such as persons per household, male-female ratio,  
room occupancy, monthly income, and access to healthcare workers. Results:  
Nearly one third (35.2%) of all households spent on cigarettes and one in five  
(17.7%) spent on raw tobacco. Tobacco expenses accounted for 3.4% of average  
monthly household expenses in 15.4% (95% Confidence Interval [95%CI]=14.5-16.3)  
of all households. In 9.8% (95% CI = 8.8-10.7) of all households, tobacco-related  
expenses over 6% of the monthly expenses. Tobacco expenses were likely  
to be higher than ≥3% of the household expenses where male head of the family  
made decisions on household purchases including cigarettes (adjusted odds  
ratios OR=1.30, 95%CI=1.06-1.59) or raw tobacco (OR=1.72, 95%CI=1.11-2.65)  
compared to households where females made decisions. Conclusion: Gender  
inequalities might be contributing to high tobacco use in Pakistani households;  
findings to be carefully accounted in efforts for reducing inequalities as female  
empowerment itself could be a risk factor for tobacco use. No funding.  
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POS2-97  
ARE SEXUAL AND GENDER MINORITIES (SGM) STRESSED OUT AND  
SMOKING?  
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Missouri  
Smoking rates in the SGM community are higher than the general population.  
Several reasons for this statistic have been postulated, including using smoking as  
a maladaptive behavior to cope with stress. Characterizing stress as it relates to  
smoking status is important in order to design appropriate interventions.  
Participants completed a 29-item survey at five 2012 Pride Festivals in Missouri for  
the Out, Proud and Healthy (OPAH) Project. Questions about sexual orientation,  
gender identity, and transgender-transsexual status determined sexual and  
gender minority status. Smoking status used 2 standard tobacco use questions to  
classify individuals as current, former or never smokers. The 10-item standardized  
instrument, Cohen's Perceived Stress Scale (CPSS), asked about perceptions during  
the past week and higher scores indicate more stressed. Of the 5026  
respondents, missing data in CPSS (n=774) or 17 years old or younger (n=328)  
were removed leaving 3924 respondents for the analysis. Approximately 73% self- 
identified as SGM with 963 lesbians, 1129 gays, 480 bisexuals, 167 others, 120  
transgenders, and 1086 heterosexuals. Approximately 37% of the SGM population  
reported smoking compared to 22% of the MO residents. The published general  
population CPSS mean score for males was 12.1 (sd: 5.9) and for females 13.7, sd  
(6.6). The stress score was elevated at 15.2 (sd 6.4) for SGM males and 16.1 (sd  
6.5) for SGM female with current SGM smokers slightly higher (mean male 16.1;  
6d 6.6; female 17.3, sd 6.6). Although the analysis of variance test indicated stress  
level was significantly associated with smoking status but not SGM status, among  
the subgroups of SGM participants those classified as bisexual females, others,  
and transgenders were statistically significantly more stressed compared to  
Heterosexual, lesbian, gay and bisexual male attendees. Our findings are  
consistent with the literature showing elevated stress scores in smokers. Designing  
interventions or campaigns that treat the SGM community as homogeneous may  
reduce the effectiveness of interventions given our findings of variation in stress  
levels within the community.  
Funding: 11-0439-TRD-11 Grant from Missouri Foundation for Health.  
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POS2-99
TOBACCO USE AND CORRELATES IN A LARGE SAMPLE OF TRANSGENDER AMERICANS

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Research with the lesbian, gay, bisexual, and transgender community has consistently indicated significantly higher smoking rates than the general population. Additionally, however, the vast majority of these studies have very few, if any, transgender participants. The prevalence of tobacco use among the transgender population and potential psychosocial variables related to tobacco use in this group are virtually unknown. The aims of the present study were to assess the prevalence of tobacco use in a national sample of transgender people and to explore associations between tobacco use and psychosocial variables that may be unique to this special population. Method. Secondary analyses were conducted with data from a national sample of transgender individuals. The parent study was an internet-based HIV-risk reduction intervention targeting transgender individuals. The sample size was 1106, the largest individual sample of transgender individuals to date. Tobacco use was assessed with the NIDA Risk Behavior Assessment (RBA). Psychosocial variables included psychiatric symptomatology, stress related to stigma, gender role transition indicators, and alcohol and drug use. Results. The sample was predominantly Caucasian (80.3%) with a mean age of 32.8. Over 80% of the sample had some post-high school education. Tobacco use rates were high. Overall prevalence was 41%. Higher prevalence rates were found among the female-to-male (FtMs) subgroup (47.5%) than the male-to-female (MtFs) subgroup (36.1%). Unique to this population, experience of stigma was associated with tobacco use. For the FtM subgroup, tobacco use was associated with employment and housing discrimination while tobacco use was associated with sexual abuse/assault in the MtF subgroup. Tobacco use was associated with verbal abuse/harassment in both subgroups. The association of tobacco use with other variables and limitations of the study will be included in the presentation. Conclusions. Transgender persons are at high risk for nicotine dependence. Further research is warranted to better understand factors related to the acquisition, maintenance, and cessation of tobacco use in this special population.

This research was supported by NIH Grants R01-DA015269, R01-HD057595, R01-DA0205593, & P50-DA09253.

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POS2-100
DEFINING “HARD CORE” SMOKING IN THE UNITED STATES: A COHORT ANALYSIS

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Introduction: Considerable debate exists in the tobacco control community regarding whether the remaining population of smokers in the United States is "hardening," or becoming more addicted. Definitions of "hard core" smoking (HCS) offered to date have been based on cross-sectional surveys. We sought to better specify HCS by incorporating criteria for measuring and defining HCS based on conceptual models and data from a cohort analysis. Methods: The Assessing Hard-Core Smoking Survey collected data on 751 adult (ages ≥ 25 years) baseline cigarette smokers who responded to a national random-digit-dialed survey and completed a 14-month follow up interview (baseline response rate=45.7%; follow up completion rate=75.1%). Potential predictors included demographics, indicators of cigarette dependence, motivation to quit, quitting history, intention to quit, self-efficacy, relevant co-morbidities, and attitudes/feelings about smoking. The dependent variable was defined as being abstinent from cigarettes and other tobacco products for at least 30 days. Results: Multivariable analyses found that three factors best predicted abstinence: low dependence on the Heaviness of Smoking Index (RR=8.11, p<.0001), concern that smoking might shorten one’s life or that smoking might affect the health of others (RT=3.95, p=0.043), and not considering smoking as a main source of pleasure (RR=2.76, p=0.019). Additionally, serious psychological distress (as measured by Kessler’s K-6 Items) and binge drinking were negatively associated with cessation. Conclusions: These findings are consistent with commentaries that view HCS as compromising a person’s willingness and ability to quit. Survey researchers and federal officials, who conduct surveys on tobacco use, should consider similar measures for their survey instruments.

Funding: Robert Wood Johnson Foundation Innovators Combating Substance Abuse Program, and Legacy.

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POS2-101
INNER-CITY LOW-INCOME AFRICAN AMERICAN LIGHT SMOKERS: PERCEPTIONS OF CESSATION COUNSELING

Jennifer Warren, Ph.D, CTTS*, and Danielle Catona, M.A., Rutgers University

This research adds to our understanding of low-income African American light smokers’ experiences of cessation counseling. Nine focus groups (N = 57) were conducted. An iterative process of constant comparison was applied across focus groups’ statements. Chi-squared and independent t-tests were run to analyze survey data. Ages ranged from 26 to 62; 80.7% had a monthly income less than $2,400. Participants with a co-morbidity (71.9%) were more likely than participants without a co-morbidity to have been asked about quitting, and advised to quit. However, fewer than half of all participants reported provider recommendations to use cessation pharmacotherapy, try a quit smoking program, or have a follow-up. Co-morbid light smokers did not recall adequate cessation counseling even though health providers were trusted more than other sources regarding quitting smoking. Findings demonstrate the need for further study of cessation counseling among lower-income, urban African American smokers, particularly light smokers and those with co-morbidities.

Funding: School of Communication and Information Rutgers University

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POS2-102
ONE CIGARETTE IS ONE TOO MANY: EXAMINING THE EFFECTIVENESS OF AN ANTI-TOBACCO MEDIA CAMPAIGN TARGETING LIGHT SMOKERS


Adult smoking in New York City (NYC) declined from 21.5% to 14% between 2002 and 2010. Over this period the proportion of light daily smokers (smoking ≤10 cigarettes per day) and non-daily smokers (smoking on some days) increased significantly (light: 31% to 37%; non-daily: 31% to 36%). Research suggests that light and non-daily smokers are less likely to perceive that they are at an increased risk of suffering from a smoking-related illness. In 2012, the NYC Department of Health launched a novel hard-hitting media campaign that used direct language and graphic images to provide information about the potential health risks of light and non-daily smoking. To evaluate the ad, an online survey of 804 current NYC smokers (44% non-daily, 15% light daily, 41% heavy daily) was conducted a month after it aired. Viewers viewed the ad and completed measures of perceived effectiveness, health risk concerns and 30-day quit intentions. These outcomes were analyzed in separate regression models controlling for socio-demographic measures. Compared to non-daily smokers, light daily smokers rated the ad higher in perceived effectiveness (B = .95) but they were not different from heavy smokers. Learning something from the ad (B = 3.04) and negative emotional responses (B = .58) were also associated with perceived effectiveness. Afer viewing the ad, non-daily smokers were more likely to become concerned about health risks than heavy smokers (AOR=2.0, 95%CI=1.1-3.9). Perceived effectiveness was also positively associated with concerns about health risk (AOR=1.1, 95%CI=1.0-1.2). Thirty-day quit intention was positively associated with perceived effectiveness (AOR = 1.2, 95%CI=1.1-1.3) and learning something from the ad (AOR = 2.8, 95%CI=1.3-5.4). Taken together, these results suggest that the ad was effective. Light smokers perceived the ad as more effective relative to non-daily smokers, and higher ratings of perceived effectiveness increased concern about health.
risks and the motivation to quit. Viewing the ad made non-daily smokers more concerned about the health risks associated with smoking, suggesting the ad also conveyed important health information to this group of smokers.

No funding.

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POS2-103

NICOTINE REPLACEMENT USE DURING SMOKE-FREE PSYCHIATRIC HOSPITALIZATION: PROVIDER PRACTICES AND PATIENT UTILIZATION

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The American Psychiatric Association recommends banning smoking in hospitals and providing nicotine replacement therapy (NRT) to manage nicotine withdrawal. In the context of two tobacco treatment trials conducted in two San Francisco hospitals, we examined provider practices and patient utilization of NRT among psychiatrically hospitalized smokers. Participants (N=324, age M=40, SD=13; 61% male, 56% non-Hispanic Caucasian) averaged 19 (SD=7) on the Minnesota nicotine withdrawal scale and 19 cigarettes per day (CPD: SD=12); 77% smoked within 30 min of waking for a mean heaviness of smoking index (HSI) of 3.2 (SD=1.7). Few (18.5%) intended to quit smoking in the next 30 days. Most (73%) reported unit clinicians offered NRT directly upon admission; study staff offered NRT to the remaining 27% later, at baseline interview. Provider NRT practices did not differ by patient demographic, psychiatric, substance use, or tobacco characteristics. Half the sample (51%) opted to use NRT: 78% patch, 52% gum, and 51% both. Predictors of NRT use were being offered by unit staff directly upon admission (56% vs. 34%; p<0.01), belief that NRT provided a substitute to smoking (67% vs. 33%; p<0.01), and greater HSI score (M=3.6, SD=1.7 vs. M=2.8, SD=1.7; p<0.01) and nicotine withdrawal (M=20, SD=7 vs. M=18, SD=7; p<0.01). Intention to quit smoking was unrelated to NRT use. The ratio of NRT patch dose (mg) to CPD matched clinical recommendations (M=1.2, SD=7); yet, was inversely correlated with HSI (r=-0.66). Use of NRT gum in addition to patch was unrelated to HSI score (r=0.03) and more likely (61%) among those with a psychotic diagnosis vs. 41% for bipolar, 31% for unipolar, and 27% for other diagnoses; p<.05. Though a minority intended to quit, half the sample used NRT to manage withdrawal during a smoke-free psychiatric hospitalization. Improvement in the clinical management of patients’ nicotine withdrawal may be enhanced in inpatient psychiatry by offering NRT directly upon admission and increasing NRT dose for more heavily dependent smokers.

Funding: K23 DA018691, P50 DA09253, and T32 DA007250.

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POS2-104

PREVALENCE OF PARTICIPANTS USING QUITLINE SERVICES REPORTING A MENTAL HEALTH CONDITION

Robert Vargas1, Samara Serotkin1, Katrina Vickerman2, Terry Bush2, Kelly Carpenter2, and Ken Wassum1, 1Clinical and Quality Support, Alere Wellbeing; 2Research, Training, and Evaluation; Alere Wellbeing

The prevalence of Mental Health Conditions (MHCs) among tobacco users is almost double the prevalence of reported MHC’s in the general US population (44% vs 26.2%). State tobacco quitlines provide free, phone-based cessation counseling and have been proven to be an effective tool in helping people overcome dependence on nicotine and tobacco. Despite our knowledge that there is a higher prevalence of MHC’s among smokers in general, there is little published information describing rates of MHC’s among state quitline callers. There is a need to evaluate the reach of quitlines in this population, as well as examine whether callers with and without MHC’s differ on other important characteristics that may relate to eligibility for services or success in their treatment. This analysis includes 61,670 state quitline participants who were queried about six MHCs during their enrollment into quitline services. Forty-seven percent (46.6%) reported at least one MHC. Of the participants that reported a MHC, 42.1% reported one MHC, 28.1% reported two MHCs, and 30.8% reported three or more MHC’s. The three most frequently endorsed MHC’s were Depression (35.6%), Generalized Anxiety Disorder (22.6%), and Bi-Polar Disorder (11.4%). Participants reporting a MHC were almost twice as likely to report a co-occurring chronic illness (specifically Asthma, Coronary Artery Disease, Diabetes, and/or Chronic Obstructive Pulmonary Disease), at 55.9% compared to 29.6% among participants not reporting a MHC. Additional demographic and tobacco use data (age, gender, race, insurance status, ethnicity, dependence level, and education) for participants reporting and not reporting a MHC will be presented. The authors conclude that there is a need for a more standardized approach to the collection of MHC information in the interest of developing a clearer understanding of the population reporting mental health conditions and their use of quitline services. Implications for examining outcomes and improving treatment for this population will be discussed.

Funding: Federal, State, Commercial.

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POS2-105

MENTAL ILLNESS COULD ACCOUNT FOR SIXTY PERCENT OF TOBACCO WITHDRAWAL SYNDROMES: RESULTS FROM A REPRESENTATIVE, NATIONAL SAMPLE IN THE U.S.

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Previous research utilizing the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC), a representative survey of U.S. adults, found that mental illness was associated with reporting more nicotine withdrawal symptoms among smokers. These analyses did not adjust for co-morbid conditions, limiting interpretability. We utilized wave two NESARC data and generated mutually exclusive categories of mental illness among smokers: 1) no mental illness (n = 4,121), 2) externalizing disorder only (ED; substance use, borderline personality, or antisocial personality; n = 1,234), 3) internalizing disorder only (ID; major depression, bipolar, or anxiety; n = 1,145), 4) both internalizing and externalizing disorders (IED; n = 858), and 5) schizotypal disorder (SD; n = 575). We defined our outcome, withdrawal syndrome, using the 4 or more symptom DSM-IV cut-off. We calculated relative risk estimates for each category using a generalized linear model, adjusting for survey design, age, sex, income, and education, and specifying a log link function. We then calculated percent population attributable risk (PPAR) estimates based on relative risk. Lastly, we tested whether increased risk associated with mental illness was accounted for by cigarettes per day and nicotine abuse/dependence. Controlling for sociodemographics, risk was greater by approximately 40%, 144%, 242%, and 321% for those with ED, ID , IED, and SD, respectively (p < 0.001). PPAR ranged from 6.0% for ED to 20.9% for IED. Total PPAR for all mental illness was 60.7%. After controlling for dependence, the total PPAR decreased to 25.1%. In summary, smokers with ID, IED, and SD were at markedly greater risk of experiencing a withdrawal syndrome, while those with ED were at minimally increased risk. Mental illness accounted for approximately 60% of withdrawal syndrome diagnoses at the population level, and about one-third of this risk was unexplained by higher levels of abuse/dependence.

No funding.

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95.6% reported smoking tobacco during the past year. In terms of type of tobacco use, 90.2% reported smoking cigarettes and 27.4% smoked cigars. Preliminary analysis indicates that respondents who reported having a mental disability were more likely to have higher scores on the FTND than all other disability types. This is the first examination of higher nicotine dependence among this sub-population. Further statistical analysis will be presented depicting nicotine dependence and disability type. Results from this study can be used to guide clinicians and researchers in gearing tobacco cessation programs for PWD. No funding.

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POS2-108
CHANGES IN SMOKING OVER THREE YEARS FOR CURRENT AND FORMER DAILY SMOKERS WITH AND WITHOUT ALCOHOL AND SUBSTANCE USE DISORDERS
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Objectives: Little is known about the smoking cessation and smoking relapse behavior of adults with alcohol use disorders (AUDs) and substance use disorders (SUDs). The current study used longitudinal epidemiological U.S. data to examine changes in smoking behavior for adults with and without AUDs and SUDs. Methods: Participants were current or former daily cigarette smokers at Wave 1 of the National Epidemiologic Survey on Alcohol and Related Conditions who completed the Wave 2 assessment three years later (n=11,973; 46% female). Analyses examined the main and gender-specific effects of Current and Lifetime AUDs and SUDs on smoking cessation for Wave 1 Current Daily Smokers and smoking relapse for Wave 1 Former Daily Smokers. Results: Wave 1 Current Daily Smokers with a Current AUD (OR=0.70, 95% CI=0.55, 0.89), Lifetime AUD (OR=0.73, 95% CI=0.60, 0.89), Current SUD (OR=0.48, 95% CI=0.31, 0.76), or Lifetime SUD (OR=0.62, 95% CI=0.49, 0.79) were less likely to have quit smoking at Wave 2 than those without the respective diagnosis. Wave 1 Former Daily Smokers with a Current AUD (OR=2.26, 95% CI=1.36, 3.73), Current AUD (OR=7.97, 95% CI=2.51, 25.34), or Lifetime SUD (OR=2.68, 95% CI=1.84, 3.95) were more likely to have relapsed to smoking at Wave 2 than those without the respective diagnosis. The gender-by-diagnosis interactions were not significant suggesting that AUDs and SUDs exerted a similar influence of the smoking behavior of men and women. Discussion. Current and Lifetime AUDs and SUDs were associated with difficulty quitting smoking and Current and Lifetime AUDs and SUDs were associated with difficulty remaining abstinent from smoking after quitting. This work was supported by the National Institutes of Health grants R03-DA027052 (to AHW), P50-DA033945 (to SAM), and R11-DA024857 (to SAM); NIMH training grant T32-MH014235 (to CEP); Women’s Health Research at Yale; the Yale Cancer Center, and the State of Connecticut, Department of Mental Health and Addiction Services.

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POS2-110
RELATIONSHIP BETWEEN TOBACCO SMOKING AND ILLICIT DRUG USE AMONG THE YOUNG MEN IN URBAN SLUMS OF BANGLADESH
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Worldwide, rapid urbanization along with living in the informal settlements such as urban slum areas has posed a changing behavior of lifestyle among the youth. Urban slums are characterized by congestion, extreme poverty, insecurity, crime and hopelessness, and thus, offer a unique setting to study the relationship
between tobacco and its effect on illicit drug use among them in Bangladesh. The study used data from the nationally representative 2006 Bangladesh Urban Health Survey. Information of a total of 13,819 adult men, aged 15-59 years, was gathered from six administrative regions by stratified random sampling. Of the respondents, 1,576 young males aged 15-24 were from slum areas, which are the basis of the study. Simple frequency, chi-square tests and multivariate logistic regression analyses were performed using SPSS v17. Overall, the prevalence of current smoking was 42.3%. The prevalence of smoking cigarette and bidi was 41.4% and 3.1% respectively. The prevalence of illicit drug use was 9.1%. The predominant illicit drugs used by the youth were injecting drug or drinking alcohol, followed by ganja and tari. Current age, marital status, education, duration of living in slums, having symptom of sexually transmitted diseases (STDs) were significantly (p<0.05) related to smoking cigarette or bidi. The multivariable logistic regression analyses yielded significantly (p<0.001) increased risk of illicit drug use (OR=9.59, 95% CI=5.81-15.82) for any tobacco smoking. The risk of illicit drug use increased significantly (p<0.001) with the increased use of smoking. The urban slum dwelling youth with STDs symptom were also at significantly higher risk of illicit drug use (OR=1.74, 95% CI=0.87-3.50). The other factor influencing illicit drug use was education. The study revealed certain groups of slum dwelling young men are at higher risk of tobacco smoking and illicit drug use. The smokers and illicit drug users should be informed highlighting the adverse effects of tobacco smoking as well as the use of illicit drug through information, education and communication program.

No funding.

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POS2-111
PUFFING TOPOGRAPHY AND INTERPERSONAL BONDING BEHAVIOR OBSERVED AMONG RECOVERING DRUG ADDICTS VERSUS GENERAL SMOKERS

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Introduction: Smokers can inherently manipulate nicotine doses on a puff-by-puff basis. The character of smoking behavior may be determined by using complex forms of smoking topography in laboratory settings or by unobtrusively observing the time spent smoking a single cigarette, the number of puffs taken, interpuff intervals and smokers'behaviors. The purpose of this study was to observe and compare smoking topography and interpersonal bonding behaviors of a group of recovering drug addicts to that of a group of general smokers in a natural setting. Methods. Following a variable chemical substance detox/treatment period, Fairbanks addiction treatment patients spend 3-12 weeks in follow-up treatment in two groups: Partial Hospitalized Patients (PHP) and Intensive Outpatients (IOP). PHP and IOP form tight interpersonal bonds and friendships with each other. Patients are periodically released and they meet and smoke together at an approved outdoor smoking area. From a distance, PHP and IOP (20 men and 20 women) cigarette puffing behaviors were unobtrusively observed and recorded. Two calibrated investigators, using a stop watch monitored the exact time of lighting and the extinguishing of each cigarette. For each subject, the number of puffs taken was recorded and the interpuff interval was calculated. The same protocol was followed for a population of general smokers observed on the campus of Indiana University Purdue University in Indianapolis (IUPUI). Results. The mean interpuff intervals were IUPUI men: 25.2 seconds (SD 11.93); IUPUI women: 30.9 seconds (SD 16.0); Fairbanks men: 16.2 seconds (SD 6.21); and Fairbanks women: 21.1 seconds (SD 6.51). There was a statistically significant difference in interpuff intervals between the general smokers and the recovering addicts (p<0.001) and this effect was not dependent upon gender. Behavioral observations between general smokers versus recovering addicts were categorized and compared. Conclusion: Smokers who were recovering from chemical drug addiction smoked more intensely than the general smoking population and their smoking behaviors were often quite different.

No funding.

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POS2-112
RISK FOR SMOKELESS TOBACCO USE AMONG COCAINE USERS

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Individuals with an illicit drug use disorder are at increased risk for cigarette smoking compared to the general population (e.g., Richter et al., 2002; Agrawal, Budney, & Lynskey, 2012). While the greater prevalence of cigarette smoking among illicit drug users is well documented, fewer studies have examined the risk of smokeless tobacco use in this population. Kao et al. (2000) reported that among active duty military personal, age 18 to 25, males and females who reported illicit drug use also reported greater use of smokeless tobacco compared to the overall sample. The purpose of the present study was to examine whether cocaine use is a risk factor for use of smokeless tobacco in the US civilian population using data from the 2010 National Survey on Drug Use and Health, a multi-stage area probability sample. Prevalence of cigarette smoking and smokeless tobacco use in the past 30 days was compared among current cocaine users (i.e., those reporting cocaine use in the past 30 days) versus the general population. Respondents reporting cocaine use in the past 30 days were significantly (p < .001) more likely to report increased cigarette smoking (cocaine users: males = 79%, females = 79% vs. the general population: males = 26%, females = 22%) as well as use of smokeless tobacco (cocaine users: males = 16%, females = 6% vs. the general population: males 8%, females 1%). Overall, these results extend the observations reported by Kao et al. (2000) in military personal to the civilian population, demonstrate further that the elevation in risk is discernible among males and females, and demonstrate that it is on par with or stronger than the elevations in risk observed for cigarette smoking.

Funding: NIH T32 DA 007242.

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POS2-113
IMPACT OF INNOVATIVE SMOKING CESSATION INTERVENTIONS FOR HIV+ SMOKERS WHO ARE MULTIPLE TOBACCO PRODUCTS USERS

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Background: Multi-tobacco use is defined as cigarette and other tobacco consumption with either product used daily or nondaily. While concurrent use of different types of tobacco has been documented within the general population, less is known about multi-tobacco use among HIV+ smokers and its impact on smoking cessation efforts. Objective: To assess the impact of multi-tobacco use in a sample of HIV+ smokers participating in a cessation program. Methods: The study sample consisted of 474 HIV+ smokers enrolled in a two group randomized controlled trial: Usual care (UC), in which participants received brief provider advice to quit, self-help materials and access to nicotine replacement therapy (NRT) vs. Cell phone-based intervention (CPI), in which participants received all UC components plus a cell phone used to deliver proactive counseling. Using an intent-to-treat approach, we assessed the prevalence of 24-hour abstinence in both groups at 3-months after initiating the smoking cessation intervention. Results: The mean age of participants was 45 years (SD=8.1). The majority were male (70.2%), self-identified as African-American (76.2%), and reported sexual contact as the mode of HIV acquisition (70.8%). Overall, 21.6% of participants in the study sample were multi-users. Perceived discrimination, depressive symptoms, anxiety, HIV symptom burden, and lack of social support were significantly associated with multi-use. At the 3-month follow-up, 6.3% of mono users in the UC group reported 24-hour abstinence compared to 16.6% of mono users in the CPI group (p<0.001). None of the multi-users (0%) in the UC group reported 24-hour abstinence while significantly more multi-users in the CPI group (18.5%) were abstinent (p<0.001). Conclusion: HIV+ smokers who are multi-tobacco users are a unique population less likely to succeed in smoking cessation efforts. With intensive intervention, multi-users appear to have similar quit rates as mono users. However, multi- (vs. mono) users appear to have lower quit rates with a brief intervention. Therefore,
POS2-114
ENVIRONMENTAL TOBACCO EXPOSURE FOR INDIVIDUALS RECEIVING OUTPATIENT SUBSTANCE ABUSE TREATMENT

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Environmental Tobacco Smoke (ETS) has been linked to numerous health problems including heart disease and cancer (CDC, 2011; HHS, 2006). While research has examined tobacco use among individuals receiving treatment for substance use disorders, no studies have examined ETS exposure. This study administered Nondahl et al.’s (2005) questionnaire assessing ETS exposure and questions about home and work smoking prohibitions and norms regarding smoking to individuals receiving outpatient substance abuse treatment. Majority of participants (n = 267) were male (64%), African-American (69%), had less than a high school diploma (40%), were previous opioid users (55%), and current smokers (75%). Smokers were more likely to have less than a high school diploma than non-smokers (X²=5.437, p<.05). Eighty five percent of tobacco users significant others smoked as compared to 15% of non-smokers (X²=6.624, p<.05). Eighty five percent of non-smokers reported one hour or more of smoking was only allowed in certain areas, whereas 60% of non-smokers reported a non-smoking policy in their home and 18% reported smoking was allowed in certain areas. For homes allowing smoking, majority of participants (29%) estimated 10 - 20 cigarettes were smoked inside per day. Majority of participants were employed in blue collar and service industry jobs; among smokers, 49% reported an official work policy restricting smoking while 57% of non-smokers reported work-site restrictions. Despite lower overall exposure than that of smokers, 28% of non-smokers reported one hour or more of ETS exposure at work, 63% were subject to ETS within the last 7 days of the survey, and 62% experienced exposure in a social setting once a week or more. Identifying the extent of ETS exposure by examining home and work smoking policies, as well as smoking status of people in the shared environment can clarify the health risks of population sub-groups and help provide insight into the challenges individuals may face if they decide to stop tobacco use.

Funding: NIDA grants T32 DA07209 and U10 DA013304.

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POS2-116
TRENDS IN LIGHT AND INTERMITTENT SMOKING ACROSS ASIAN AMERICAN SUBGROUPS IN CALIFORNIA


Background: There is limited research that examines trends in light and intermittent smoking (LITS) for various Asian American/Pacific Islander (AAPI) subgroups. California has some of the largest populations of AAPI subgroups in the nation and, with the California Tobacco Surveys (CTS), has smoking data on these populations since 1990. Such rich smoking data allow for the examination of changes over time in LITS for AAPI subgroups. Methods: We combined the 1990, 1992, 1993, and 1996 CTS (pre-MSA) and the 1999, 2002, 2005, and 2008 CTS (post-MSA) in order to examine changes in LITS (<10 cigarettes/day or not smoking daily) before and after the 1998 Master Settlement Agreement among AAPI subgroups. Logistic regression models adjusted for age, gender, education level, language spoken at home, and current use of other tobacco products were fit to compare results for both time periods. Results: Pre-MSA, all AAPI subgroups examined had significantly higher proportions of LITS (49.2-64.4%) than non-Hispanic whites (NHW; 33.1%). Post-MSA, all groups experienced an increase in the proportion of LITS (11.7-52.9% increase), with NHWs showing the greatest percentage increase (52.9% change from pre-MSA to post-MSA). Pre-MSA, all AAPI subgroups examined had significantly more likely to be LITS compared with NHWs: Chinese (OR=3.3, 95%CI: 2.1-5.1), Filipino (OR=3.5, 95%CI: 2.7-4.6), Japanese (OR=2.0, 95%CI: 1.2-3.3), Korean (OR=3.2, 95%CI: 2.0-5.0), and other AAPI (OR=3.7, 95%CI: 2.8-4.9). Post-MSA, the direction of these relationships relative to NHWs were maintained but at lower magnitudes only for Filipinos (OR=2.2, 95%CI: 1.6-3.2) and other AAPIs (OR=3.7, 95%CI: 2.1-6.6). Chinese (OR=1.6, 95%CI: 0.8-3.1), Japanese (OR=1.6, 95%CI: 1.0-2.9) and Koreans (OR=1.5, 95%CI: 0.7-3.1) were no longer significantly more likely to be LITS compared to NHWs post-MSA. Discussion: Increased tobacco prevention and control efforts are needed to address the growing trend of LITS.
This is particularly important given the high levels among AAPIs and the increasing trend among NHWs.

This study was conducted at Claremont Graduate University with the support of NCI Grant #R03CA150559.

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POS2-117
OPENING THE BLACK BOX INTO THE MYSTERY OF LOW-LEVEL SMOKERS: RESULTS FROM STRUCTURED INTERVIEWS

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The proportion of smokers who smoke < 10 cigarettes a day and those who do not smoke daily is increasing. These smokers are often excluded from cessation trials and little is known about how to help these low-level smokers quit. We present preliminary results from structured interviews with 23 low-level smokers. Questions were framed from social cognitive theory and addressed self-efficacy, outcome expectations, motivation and barriers. We also explored smoker self-identity. We recruited participants via social media sites, flyers, advertisements in cold weather); however, in other ways, they struggle with smoking in many scheduled smoking patterns, (2) malleable prioritization of smoking, (3) that were unique to low-level smokers included: (1) conscious and controlled (for use of Nicotine Dependence and number of cigarettes smoked per day (r = 0.63, r = 0.757 (P < 0.001). the total score of the questionnaire showed significant correlation with carbon monoxide level, total score of Fagerstrom Test of Nicotine Dependence and number of cigarettes smoked per day (r = 0.63, r = 0.58 and r = 0.62, P < 0.001; respectively). Principal components analysis with orthogonal rotation yielded a single-dimensional model which includes all the items of QSU-Brief. Conclusions: The findings from the current validation study revealed that the Malay version of the QSU-Brief is a reliable and valid measure for the smoking urges and ready for use in clinical practice and research study.

No funding.

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Objectives: Craving for smoking is often considered as an important component in smoking dependence and the most prominent and bothersome symptom experienced during the abstinence attempt. The aim of the current study is to evaluate the psychometric properties of the Malay version of the Brief Questionnaire on Smoking Urges (QSU-Brief). Study design: Cross-sectional study. Methods: The Malaysian version of the QSU-Brief was created from the original English questionnaire according to the standard guidelines proposed for translation studies. In order to validate the Malay version questionnaire, a convenience sample of 133 subjects was collected. Cronbach’s alpha coefficient was calculated to assess the reliability. In order to assess the validity of the questionnaire, factor analysis and convergent validity was employed to validate the psychometric properties of the questionnaire. Results: Good internal consistency was found (Cronbach’s alpha = 0.82). The test-retest reliability for the questionnaire was presented an acceptable reliability and stability of the translated version with Spearman’s Rank Correlation Coefficient with r = 0.757 (P < 0.001), the total score of the questionnaire showed significant correlation with carbon monoxide level, total score of Fagerstrom Test of Nicotine Dependence and number of cigarettes smoked per day (r = 0.63, r = 0.58 and r = 0.62, P < 0.001; respectively). Principal components analysis with orthogonal rotation yielded a single-dimensional model which includes all the items of QSU-Brief. Conclusions: The findings from the current validation study revealed that the Malay version of the QSU-Brief is a reliable and valid measure for the smoking urges and ready for use in clinical practice and research study.

No funding.

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POS2-120

OPTIMUM CUTOFF VALUE OF URINARY COTININE DISTINGUISHING SOUTH KOREAN ADULT SMOKERS FROM NOnSMOKErs USING DATA FROM THE KOREA NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY (KNHANES) 2008–2010

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Background: The cutoff values distinguishing smokers from nonsmokers were mostly obtained from white population-based studies. According to the World Health Organization, nearly half of the world’s smokers are Asians. However, few studies have explored cutoff values among Asian populations, even though recent population-based studies have demonstrated that cutoff values can differ by race and ethnicity. Objectives: We established urinary cotinine cutoff values using a nationally representative South Korean adult population sample. Methods: Data were obtained from the Korea National Health and Nutrition Examination Survey (KNHANES) 2008–2010 with pooling sampling weights. Adult male and female participants (n=11,629) aged 19 years or more were included. Optimal cutoff values were determined by performing a receiver operator characteristic curve analysis. Results: We determined 164 ng/mL as the optimum urinary cotinine cutoff value for Korean adults with its highest correct classification rate of 95.0% (93.2% sensitivity, 95.7% specificity). The application of the value for female sub-populations aged 19–34, 35–54, and 55 or older provided sensitivities of 87.1%, 96.3%, and 93.8%, respectively, while maintaining specificity of 93% or higher. From the three female sub-populations by age, we obtained sensitivities and specificities ranging from 93.1% to 94.5% and from 92.8% to 97.0%, respectively. Conclusions: Our cutoff value should allow researchers conducting environmental epidemiological or clinical studies in South Korea and potentially in other Asian populations aged 19–34, 35–54, and 55 or older to provide valid and reliable sensitivity and specificity ranges, as well as higher exposure levels to secondhand smoke.

Support for this project was provided by Korea Research Foundation and Soonchunhyang University.

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POS2-121

FACTOR ANALYSIS, PSYCHOMETRIC PROPERTIES, AND VALIDATION STUDIES OF THE ALCOHOL-SMOKING INTERACTION EXPECTANCIES QUESTIONNAIRE

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Although it is widely recognized that alcohol and nicotine dependence co-occur at high rates, the mechanisms responsible for this association remain unclear. A number of candidate mechanisms have been considered, including common biological propensities, pharmacological interactions, and cross-drug conditioning processes. However, little is known about dual substance user’s expectancies regarding contemporaneous use. The Alcohol-Smoking Interaction Expectancies Questionnaire (ASIE) was developed to model dual substance user’s perceptions of these associations (Monti et al., 1995). Yet the psychometric properties of this measure have not been examined in detail. For the present report, the ASIE was administered to participants in two studies designed to examine the effects of combined alcohol and nicotine administration on craving to smoke and drink, as well as cross-cue reactivity. A factor analysis suggested the ASIE consists of three correlated factors: (1) Effects of smoking on alcohol use behavior, (2) Effects of alcohol on smoking behavior, and (3) Smoking to cope with drinking urges. Several items whose elimination would enhance the psychometric properties of the measure were identified. Results of Study 1 indicate that individuals with higher overall scores on the ASIE, indicating stronger beliefs that use of one substance affects use of the other, was associated with greater cross-cue craving on a laboratory-based pictorial cue reactivity task. Similarly, these individuals experienced greater cravings to smoke following co-administration of alcohol and nicotine. No such effect was observed for craving to drink. Results from Study 2 did not support an association between the ASIE and cross-drug attentional bias. Across both studies, overall scores were weakly correlated with both alcohol and nicotine dependence, but not usage variables. Taken together, these results suggest an awareness of cross-drug interactions amongst dual substance users, along with several ways in which these interactions may manifest. Further research will be needed to ascertain the impact of these beliefs on actual drug use.

Funding: NIH Grant R01 AA011157.

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POS2-122

NONDAILY SMOKING CESSATION MOTIVATION: SCALE DEVELOPMENT AND VALIDATION

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Despite recent successes in reducing overall tobacco consumption in the U.S., approximately 20.6% continues to smoke cigarettes, with up to 33% of smokers smoking nondaily (i.e., 1 to 29 days out of the past 30). Nondaily smoking is particularly common among young adults, with 19.9% reporting nondaily smoking. Given this important public health issue, it is important to develop measures that assess reasons or motivation for cessation specific to young adult nondaily smokers. Thus, the current study aimed to develop and validate a scale assessing motivation for norndaily smoking cessation, and examine its reliability, factor structure, and concurrent validity. We administered an online survey to 2,000 students at six Southeast colleges; 718 (35.9%) completed the survey. Analyses focused on the 105 nondaily smokers. In addition to items created for scale development, measures included sociodemographics, other measures of motivation and confidence/self-efficacy, past smoking/quitting history, readiness to quit, and perceived harm. The 15-item Nondaily Smoking Cessation Motivation Questionnaire (NSCM) had an average score of 56.95 (SD=24.33) and internal consistency (Cronbach’s alpha of 0.94). Factor analysis using principal components extraction with varimax rotation extracted three factors accounting for 76.8% of the variance: Controlled motivation, Autonomous motivation, and Amotivation. Concurrent and discriminant validity were documented. The items and subscales yielded through the creation of the newly developed NSCM behaved similarly to items created to assess motivation for other health behavior changes and were in line with Self-Determination Theory. Moreover, scale development drew from literature specifically focusing on young adult nondaily smokers and, thus, has face validity, which is critical in creating an instrument with high utility. Given this emerging problem and the lack of validated measures to assess factors associated with nondaily smoking, this assessment is important in informing intervention strategies and potentially for predicting cessation among young adult nondaily smokers.

This work was supported by the National Cancer Institute (1K07CA139114-01A1; PI: Berg) and the Georgia Cancer Coalition (Pl: Berg).

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POS2-123

INTEGRATING ECOLOGICAL MOMENTARY ASSESSMENT (EMA) AND GLOBAL POSITIONING SYSTEM (GPS) METHODS TO UNDERSTAND THE SOCIAL CONTEXT OF TOBACCO USE

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It is increasingly recognized that social exposure to tobacco use (visual and sensory cues) is associated with smoking norms and behaviour. However, data are limited on where and when social exposure to smoking occurs. We developed and piloted a protocol that used Ecological Momentary Assessment (EMA) and Global Positioning System (GPS) methods to collect over 40 days of real-time data on social exposure to smoking and tobacco use. Pilot data were collected by six adult daily smokers for seven consecutive days each, between January and March 2012. A mobile survey application recorded where and when participants used tobacco and saw or smelled smoking, the social and physical context of tobacco use, perceived social norms, smoking triggers, mood and urge to smoke. A GPS
BACKGROUND: Tobacco use is one of the biggest public health threats the world has ever faced. The present study aimed to translate and validate MNWS scale for practical clinical purposes among Malay speaking people. Design/Methods: A cross-sectional design was used to elaborate the study data. Adult smokers who attend the Quit Smoking Clinic in Penang General Hospital at Penang State, Malaysia were included in the study. The translation was done according to standard guidelines: Forward translation, back translation from Malay to English language, pretesting and cognitive interviewing, and preparing the final version of the Malay scale for the reliability and validity study. Eligible subjects were interviewed by expert counsellor with the use of structured questionnaire to overcome any non-response by those who had reading difficulties. The interview was performed at day 7 of subject’s quit smoking date. Internal consistency and homogeneity was used to test reliability of the Malay version of MNWS. Furthermore factor analysis and concurrent validity was employed to validate the psychometric properties of the scale. Results: The Malay version of MNWS scale has excellent reliability with Cronbach’s alpha of 0.91. The test-retest reliability for the scale were presented and an excellent reliability and stability of the translated scale with Spearman’s Rank Correlation Coefficient, r = 0.876 (P < 0.001). In addition, there was a significant positive correlation between carbon monoxide level, FTND total score and number of cigarettes smoked per day by MNWS total score (r = 0.72, r = 0.68 and r = 0.68, P < 0.001; respectively). A principal components analysis with orthogonal rotation yielded a uni-dimensonal model which includes all the items of MNWS. Conclusion: The Malay version of MNWS is reliable and a valid measure for withdrawal symptoms as well as the smoking urge and it is applicable for clinical practice and research study.

No funding.

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of smoke inhaled over the course of one day was accounted for by objectively assessed cigarette consumption. Participants who inhaled very similar volumes of smoke over the course of one day varied considerably in cigarette consumption. This underlines the importance of using precise, objectively assessed measures of tobacco exposure, and has key implications for epidemiology and genetic association studies, including large genome-wide association studies of smoking behaviour, which typically rely on retrospective self-report measures rather than precise, objective measures of tobacco exposure.

This study was conducted while the first author was a Ph.D. student at Cardiff University. Supported by a Wellcome Trust studentship to the first author (JW), and Wellcome Trust grant #086858 (MM).

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POS2-127

CONSISTENCY OF DAILY SMOKING AMOUNT IN DEPENDENT ADULTS

K.A. Perkins, N.C. Jao, and J.L. Karelitz, Department of Psychiatry, University of Pittsburgh, PA

Self-reported cigarettes per day (CPD) is a very common screening measure in smoking research, but consistency of CPD across days in dependent smokers may not be certain. Adult dependent smokers (N=357; 170 men, 187 women) reported "usual" CPD at screening and then prospectively self-monitored CPD on 3 consecutive days of one week during an ad lib baseline period. All were recruited for later tests of brief cessation medication effects in those with high or low interest in quitting smoking soon (within 3 months). Consistency was determined by intraclass correlation (ICC). Prospectively monitored daily CPD was generally consistent (ICC = 0.78), but CPD increased or decreased by 5 cigs/day or more in 40% of participants and by at least 10 cigs/day in 10%. CPD consistency was greater in dependent smokers and in women (vs. high) quit interest, but consistency tended to be greater in men with high (vs. low) quit interest. Retrospectively reported CPD (at screening) was generally consistent with the mean of prospectively monitored daily CPD, but 15% of participants differed by at least 5 cigs/day between methods, and digit bias was twice as likely with retrospective versus prospective CPD. Understanding variability in CPD may improve knowledge of dependence and factors that alter daily amount of smoking.

Supported by NIH Grants P50 CA143187 and DA031218.

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POS2-128

DOES PARTICIPATION IN A TOBACCO PREVENTION AND CESSATION PROGRAM AFFECT ALCOHOL USE BEHAVIORS?

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Adolescence is a critical period for the initiation of both alcohol and tobacco use, and the trajectories of alcohol and tobacco use are highly correlated. Adult dependent smokers (N=357; 170 men, 187 women) reported "usual" CPD at screening and then prospectively self-monitored CPD on 3 consecutive days of one week during an ad lib baseline period. All were recruited for later tests of brief cessation medication effects in those with high or low interest in quitting smoking soon (within 3 months). Consistency was determined by intraclass correlation (ICC). Prospectively monitored daily CPD was generally consistent (ICC = 0.78), but CPD increased or decreased by 5 cigs/day or more in 40% of participants and by at least 10 cigs/day in 10%. CPD consistency was greater in dependent smokers and in women (vs. high) quit interest, but consistency tended to be greater in men with high (vs. low) quit interest. Retrospectively reported CPD (at screening) was generally consistent with the mean of prospectively monitored daily CPD, but 15% of participants differed by at least 5 cigs/day between methods, and digit bias was twice as likely with retrospective versus prospective CPD. Understanding variability in CPD may improve knowledge of dependence and factors that alter daily amount of smoking.

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POS2-129

QUALITATIVE INTERVIEWS WITH SMOKERS FOLLOWING E-CIGARETTE SAMPLING AND WEBSITE VIEWING

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The prevalence of e-cigarettes (ECs) use continues to increase, as more smokers are becoming aware of these products. Understanding smokers' perceptions of ECs following initial use and after viewing popular EC brands websites may have important implications not only for individual smoker's health but for public health policy. Eighteen participants (67% female, 78% White, Mage=40.1y, Mcdp=17.9, Magerstrom=5.06) completed a qualitative interview after sampling 3 different EC brands and their own brand cigarette (OBC). While sampling each EC, participants were allowed to view printed website screenshot of the EC being sampled. An open-ended interview script was used for each participant. Interviews lasted approximately 45-60 minutes and were digitally recorded. Interview responses were analyzed for emerging themes which were both hand coded for inductive codes and using NVivo software. Codes were then categorized in a hierarchical system for use in a grounded theory approach. Overall themes included stress and stigma associated with tobacco use, motivations for cessation, and e-cigarette socio-economic and health perceptions. Stress and stigma: with the use of ECs, participants perceived intimate relationships would be improved by no longer having to mask the smell of smoke and professional opportunities would increase due to improved hygiene (smell of smoke on clothes, breath, and body). Motivation for cessation: participants expressed the belief that using ECs could help them quit smoking given that ECs reduced cravings significantly while also giving them an experience similar to smoking, Socioeconomic and health perceptions: noted large motivators of continued EC use were participants perception that EC use would likely lead to significant health benefits and cost savings over their OBC. Overall, this study indicates that just brief sampling and website viewing of 3 popular EC brands can lead to smokers perceiving the EC as having significant beneficial qualities affecting not only their health but their quality of life.

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POS2-130

USE OF ELECTRONIC CIGARETTES AMONG STATE QUITLINE POPULATIONS: PREVALENCE, DEMOGRAPHICS, AND QUIT STATUS

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Little is known about the prevalence of e-cigarette use, reasons for use, and whether e-cigarettes impact a user’s ability to successfully quit tobacco. Each year nearly 450,000 tobacco users call free state quitlines for help with quitting. Information regarding e-cigarette use among quitline callers is needed to better understand callers’ cessation-related behaviors and to inform how e-cigarettes should be addressed in treatment protocols. We evaluated e-cigarette use among tobacco users who received cessation services through one of five state tobacco
quiltlines. Surveys were administered by phone seven months after participants called the quitline. Participants were asked about their past and current e-cigarette use, reasons for using e-cigarettes, and current quit status. Among 1,233 respondents, 30.0% reported ever using an e-cigarette and 8.7% reported current use of e-cigarettes. The majority of e-cigarette users reported using or trying e-cigarettes for a short period of time (62.2% for one month or less). Notably, more than half reported using e-cigarettes to quit or cut down on tobacco use. Other reasons included: switched from other tobacco use when can't smoke, curious/ tried once, non-smoker safer and cost. Characteristics of e-cigarette users will be presented. Thirty-day point prevalence responder quit rates at the 7-month survey for current, past, and never e-cigarette users were 15.9%, 20.7%, and 30.9%, respectively; e-cigarette users (current or past) were significantly less likely to be quit for 30 or more days compared to participants who had never tried e-cigarettes (p < 0.01). This data shows that a significant proportion of state quitline participants reported using e-cigarettes and e-cigarettes are being used as cessation aids, despite the fact that the FDA has not approved them for therapeutic use. Policy and research implications of e-cigarette use will be addressed. For example, are tobacco users who quit other tobacco but still use e-cigarettes considered quit? Do treatment protocols, including NRT dosing, need to be altered to address e-cigarette use? Shouldquitlines provide treatment to e-cigarette users?

The five participating states provided funding for data collection. Alere Wellbeing sponsored the data analysis for this submission.

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POS2-131
THE EFFECT OF E-CIGARETTE SAMPLING ON SMOKING BEHAVIOR AND MOTIVATION AND CONFIDENCE TO QUIT SMOKING
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What effect e-cigarette (EC) use will have on smoking behavior and motivation and confidence to quit smoking is currently in question. To examine this question, we recruited 20 non-treatment-seeking smokers (80% white, 60% female, Mage=40.1y, Mcpd=18.6, Mfagerstrom=5.1), naïve to ECs, to participate in a three-phase, exploratory study. In phase 1 (Baseline), participants completed baseline demographic, smoking history, and smoking thoughts and behaviors questionnaires; phase 2 (Sampling) included sampling 3 different popular EC brands (bluCig, ProSmoke, and SmokeTip) and own brand cigarette (OBC), with pre- and post-measures of product liking/satisfaction and motivation/confidence; during phase 3 (ad libitum use), participants were sent home with a 1-week supply of their preferred EC and asked to use it ad libitum and then completed follow-up questionnaires 1-week post sampling. 16 participants completed all phases of the study. During sampling, on a scale from 1 “not at all” to 10 “very much”, OBC were rated as being the most liked/enjoyed (M=8.6, SD=1.8), satisfying (M=7.3, SD=3.3), and effective in reducing urges/cravings (M=8.7, SD=1.7), p<.05. Of the ECs, no significant differences were found between brands but generally bluCig was found to be the preferred brand across all three domains: like/enjoy [bluCig M=6.6 (SD=2.4), ProSmoke M=6.1 (SD=2.5), SmokeTip M=5.2 (SD=2.7)], satisfying [bluCig M=6.6 (SD=2.8), ProSmoke M=5.2 (SD=2.9), SmokeTip M=5.0 (SD=2.8)], and effective [bluCig M=7.2 (SD=2.1), ProSmoke M=6.2 (SD=2.4), SmokeTip M=6.1 (SD=2.4)]. bluCig was the brand that was selected by the most participants for the ad lib use phase (bluCig=63.2%, ProSmoke=26.3%, SmokeTip=10.5%).

EC sampling led to a significant increase (p=0.001) in “confidence to quit” smoking but not in “wanting to quit.” However, ad lib use of preferred EC brand for 1-week led to a significant increase in “wanting to quit” (p=0.01). Confidence to quit also continued to increase from end of sampling to end of ad libitum use, but it was not significant. Number of cigarettes per day decreased significantly (p=0.001) from baseline (M=16.5, SD=5.0) to end of ad libitum use (M=9.3, SD=6.7).

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POS2-132
A CROSS SECTIONAL STUDY OF TOBACCO AND OTHER DRUG USE BEHAVIORS IN ADOLESCENTS WHO SMOKE ELECTRONIC CIGARETTES AND CIGARETTES VS. CIGARETTES ONLY
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Electronic cigarettes are emerging tobacco products that are marketed as harm-reducing products and smoking cessation aids. The prevalence of e-cigarette use in adolescent populations is largely unknown. We ascertained whether adolescents who smoke e-cigarettes in addition to cigarettes (ECS) differ from cigarette smokers only (CS) in their tobacco and other drug use behaviors. We analyzed data from a cross-sectional survey of students attending 4 high schools in Connecticut and New York (n=3,912) in 2010. We collected information regarding current cigarette, e-cigarette, and other tobacco use. Alcohol, binge drinking and marijuana use was assessed in a subsample of students (n=1,957). We used multivariate linear regression to determine whether EC predicted use of a higher number of other tobacco products. Eleven percent of students reported current use of only cigarettes (n=421), and 1.4% (n=58) also reported current e-cigarette use. Only 0.4% (n=19) used e-cigarettes without cigarettes. The ECS and CS groups did not differ in their gender, grade, race, age of cigarette smoking initiation, days smoked cigarettes in past month, and cigarettes smoked per day. A larger proportion of ECS than CS reported current use of cigars (43.1% vs. 28.0%; p=0.002), bids/kretkes (13.8% vs. 2.9%; p=0.01), hookahs (31.0% vs. 8.8%; p=0.01), cigars (43.1% vs. 28.0%; p=0.02), and blunts (69.0% vs. 53.0%; p=0.02) but the two groups did not differ in their alcohol, binge drinking or marijuana use patterns. Only 5% (n=4) of all e-cigarette users did not use any additional tobacco products. Multivariate regression showed that ECS independently predicted use of a higher number of other tobacco products (ß=0.59, t=3.75, p=0.0002) when adjusted for gender, grade, race, days smoked cigarettes in past month, and cigarettes smoked per day. Adolescents who smoke electronic cigarettes in addition to cigarettes did not differ in their cigarette smoking frequency or intensity, marijuana, and alcohol use from adolescents who only smoke cigarettes. But, cigarette smokers who also smoke e-cigarettes were more likely to use other tobacco products.

Supported by NIH grant #K01DA026450.

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POS2-133
CONSUMER PERCEPTIONS OF ELECTRONIC NICOTINE DELIVERY DEVICES AS SMOKING CESSATION AIDS
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Background: Electronic nicotine delivery devices (ENDS; or e-cigarettes) have surged in popularity in recent years, however further research is needed to determine consumer perceptions of their acceptability as smoking cessation aids. The aim of this pilot study was to explore smokers’ perceptions of the effectiveness of using ENDS during a 2-week cessation attempt. Methods: After a laboratory-based study that had the advantage of familiarizing participants with use of the ENDS, smokers motivated to quit were provided with an e-cigarette and a 2-week supply of cartridges in the style (menthol or non-menthol) of their choice. They received two in-person behavioral counseling sessions and two telephone counseling sessions. At the end of the two-week quit attempt, in-depth qualitative interviews were conducted to assess the subjects' perceptions of the effectiveness of using ENDS as a cessation tool. Sessions were audio-recorded and the data transcribed and analyzed using a thematic approach. Results: Themes that emerged included lower perceptions of nicotine content compared to own brand cigarettes, a higher sense of control with regards to nicotine self-administration compared to other cessation mechanisms (e.g., nicotine gum, patch), and an ease of transition to the e-cigarette to assist with a quit attempt. Additionally, similarities between own brand of cigarettes and e-cigarettes generally included similar smoking patterns (in terms of duration and time of day), but participants found greater resistance to draw with the e-cigarette compared to conventional cigarettes, and reported that they often failed to provide the level of satisfaction

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POSTER SESSIONS

Poster Session 2 • Thursday, March 14, 2013 • 5:15 p.m.–6:45 p.m.

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pos2-134

USE OF ELECTRONIC CIGARETTES AMONG ADULTS ENROLLED IN A GROUP RANDOMIZED SMOKING CESSATION TRIAL IN APPALACHIAN OHIO

Amy M. Wermert, M.P.H.*, Nancy E. Hood, Ph.D., Sherry T. Liu, M.P.H., and Mary Ellen Wewers, Ph.D., The Ohio State University, College of Public Health

Electronic cigarette (ecig) use is growing in popularity. Little is known about the use of ecigs among adult smokers in Appalachian Ohio. The purpose of this study was to describe the use of ecigs among participants living in Appalachian Ohio enrolled in a group randomized cessation trial (n=467 participants) that included behavioral counseling and free nicotine replacement therapy (NRT) (i.e., 21 mg patch) over a 10 week protocol. Study eligibility criteria included: resident of a participating Appalachian county, 18 years or older, self-reported daily cigarette use, willing to quit in the next 30 days, no medical contraindication to NRT use, and if female, not pregnant. Data collection started in November 2010; items to assess ecig use were added to the existing survey in April 2012. As a result, ecig use was not collected for all participants. This abstract reports on a subset of the sample (n=252 participants) and includes data collected at baseline, 3, 6, or 12 months post-intervention. Of the subset of participants, 10% reported currently using an ecig every day or some days. Most ecig users were between 25-54 years old (54%), female (65%) and had more than a HS/GED education (50%). Most were not employed (69%) but had health care coverage (77%). Most ecig users were living at 200% below poverty (77%). For those interviewed post-intervention, 5.9% (n=15 participants) reported use of ecigs, primarily to assist in efforts to quit smoking. Most were using ecigs with nicotine (67%) and most believed that ecigs are less harmful than regular cigarettes (87%). The primary reasons given for ecig use included: “they make it easier for you to cut down on the number of cigarettes you smoke” (53%), “they might help you quit” (47%). These findings support previous studies that demonstrate ecigs being used as a smoking cessation aid. Limitations of this study include a small sample size and a homogenous study population (i.e., those trying to quit, living in Appalachia, Ohio). This study emphasizes the importance of continued research into the efficacy and safety of the use of ecigs as a long-term smoking cessation aid.

This study was conducted while the first author was at The Ohio State University. Supported by NIH grant # R01 CA129771.

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pos2-135

SMOKERS WHO TRY E-CIGARETTES TO QUIT SMOKING: ARE THEY SERIOUS ABOUT QUITTING?

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Electronic cigarettes or e-cigarettes are commonly marketed as smoking cessation aids and their popularity appears to be on the rise. But little is known about the characteristics of smokers who use e-cigarettes to quit smoking, including their motivation to quit, quitting self-efficacy, and experience with Food and Drug Administration (FDA) approved cessation aids. In this study, we tested the associations between smokers’ ever use e-cigarettes for cessation and their demographic characteristics (e.g., gender, ethnicity), motivation to quit, and other smoking- and cessation-related characteristics. Cross-sectional data were obtained from 1567 adult daily smokers in Hawaii using paper-and-pencil survey in 2010-2012, as part of a smoking cessation study. Participants represented 50% women, 21% Asian, 31% Native Hawaiian, 34% White, and 14% Other ethnicity. e-Cigarette use was significantly associated with age (OR= 0.98, 95% CI [0.97, 0.99]), Native Hawaiian ethnicity (OR= 0.68, 95% CI [0.45, 0.99]), motivation to quit (OR= 1.14, 95% CI [1.08, 1.21]), quitting self-efficacy (OR= 1.16, 95% CI [1.06, 1.36]), and the use of conventional cessation products or medications such as nicotine replacement gum (OR= 3.72, 95% CI [2.67, 5.19]) and Bupropion (OR=2.29, 95% CI [1.38, 3.79]). Our data suggests that smokers who use e-cigarettes appear to be serious about wanting to quit. Research is needed to clarify the effectiveness of e-cigarette use in smoking cessation. Clinicians and public health practitioners need to be prepared to clearly communicate the risks and benefits of e-cigarette use to smokers who are highly motivated to quit.

This study was supported by an R01 grant (# CA2079905) from the National Cancer Institute to T.A. Herzog.

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pos2-136

YOUNG ADULTS’ EXPOSURE TO PRO-SNUS AND PRO-ELECTRONIC CIGARETTE MESSAGES AND USE OF THESE PRODUCTS

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Objective: Young adults are experimenting with new tobacco products like snus and electronic cigarettes (e-cigarettes), and exposure to pro-snus and pro-e-cigarette messages may contribute to this phenomenon. We conducted the first analysis to examine young adults’ exposure to these messages and its association with trying these products. Methods: Young adults (ages 20-25) from the U.S. upper Midwest region were surveyed in 2009 and again in 2011 (n=2339). In 2011, participants were asked if they have received advertisements and coupons for non-cigarette products in the mail, have seen Facebook pages/groups and advertisements for snus and e-cigarettes, and have seen kiosks in shopping malls promoting e-cigarettes. Ever use of these products was assessed in 2011. Baseline tobacco use behaviors were assessed in 2009 (before these products were available nationwide). Using multivariate logistic regression models, we assessed characteristics associated with exposure to different types of pro-snus and pro-e-cigarette messages in 2011, and the associations between message exposure and ever use of these products in 2011. Results: Regarding snus, 8% and 7% of the participants had received advertisements and coupons for non-tobacco products in the mail, respectively; <1% had seen snus Facebook pages/groups or advertisements for snus. 14% of the participants had seen kiosk at shopping malls promoting e-cigarettes; 7% and 1% had seen e-cigarettes advertisements and pages/groups on Facebook, respectively. Male, less educated participants, those who had friends who smoke, tobacco users were more likely to have received advertisements and coupons for non-cigarette products in the mail (p<.05). For every additional type of exposure to pro-snus and pro-e-cigarette messages, there was a 79% and 96% higher odds that participants had used snus and e-cigarettes, respectively, adjusted for demographics, peer smoking and tobacco use behaviors (p<.05). Conclusions: Exposure to pro-snus and pro-e-cigarette messages were associated with experimenting with these products in our sample. Longitudinal studies are needed to confirm our findings.

This research was funded by the National Cancer Institute (R01 CA86191; J. Forster - PI).

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POS2-137
ELECTRONIC-CIGARETTES (E-CIGARETTES) IN GERMANY: A SMOKING CESSATION TOOL?
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Introduction: The use of an electronic cigarette (e-cigarette) resulted in some previous studies in reduction and cessation of conventional cigarette smoking. Therefore, this study aims to examine the reasons of using e-cigarettes instead of and in addition to conventional cigarettes in Germany. Furthermore it is determined to what extent e-cigarettes are used as a smoking cessation tool. Method: A cross-sectional study was conducted in April – May 2012 in Munich, Germany. The I-Change Model was used as theoretical framework and existing questionnaires were used to build up the present questionnaire. 320 Smokers participated in the study, divided in three groups: E-cigarette smokers (e-smokers) (33%), conventional cigarette smokers (c-smokers) (37%) and smokers of both cigarettes (b-smokers) (30%). Pearson Chi Square tests and analyses of variance were used to assess differences among the group of smokers on demographic variables, smoking behaviour and the constructs of the I-Change Model. Results: About half of the e-cigarette users used the e-cigarette in addition to c. cigarettes and the other half instead of c. cigarettes. It seemed that e-smokers and b-smokers had the same reasons for using e-cigarettes overall. E-cigarette users were most often men, were less addicted to nicotine and had a higher motivation to stop smoking than c-smokers. In addition, e-smokers reported a more positive health and had a lower carbon monoxide concentration compared to c-smokers. Furthermore, e-smokers had a more positive attitude towards e-cigarettes, a higher self-efficacy in terms of being abstinent from c. cigarettes in certain situations and a higher self-efficacy of using an e-cigarette instead of c. cigarettes. E-cigarettes were used more frequently if the social environment of a person vaporized as well or preferred the respondent to vaporize e-cigarettes instead of c. cigarettes. Discussion: The results confirmed most of the hypotheses and also important results of previous studies. In addition, a well-conducted randomized-control trial is needed to confirm the efficacy of e-cigarettes as a smoking cessation aid.

No funding.

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POS2-138
AWARENESS AND USE OF ELECTRONIC CIGARETTES AMONG COLLEGE STUDENTS IN NEW YORK STATE
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Electronic cigarettes (e-cigarettes) have been available in the United States for about five years. Recent studies have found that awareness and ever use of e-cigarettes among adults is increasing. To our knowledge, there are no published reports of e-cigarette awareness and use among college students in the United States. Some tobacco control advocates express concerns with e-cigarettes, including that e-cigarettes could be used as a starter product for younger or never smokers or they could delay cessation and result in a pattern of dual use of tobacco products. The objective of this study was to assess college students’ awareness, use, and perceptions of e-cigarettes. In October and November of 2011, we conducted a cross-sectional survey among 1,187 undergraduate students attending two public universities in New York State. Participants completed an online survey that included questions on demographics, cigarette smoking behavior, smokeless tobacco use, awareness and use of e-cigarettes, beliefs about the harmfulness of e-cigarettes, and interest in using an e-cigarette. The prevalence of current cigarette smoking was 10.5%, and the prevalence of smokeless tobacco use (including chewing tobacco, snuff, or snus) was 2.7%. Current cigarette smokers were more likely than non-smokers to have heard of e-cigarettes (86% vs. 71%, p<0.01), ever try an e-cigarette (47% vs. 5%, p<0.01), and use an e-cigarette in the past month (4% vs. 0.1%, p<0.01), respectively. Only one participant reporting daily use of the e-cigarette. The vast majority (97%) of college students perceived that e-cigarettes were either less harmful or no different in terms of harm when compared to regular cigarettes. Among participants who had not tried an e-cigarette, cigarette smokers were more likely than non-smokers to report they would be interested in trying an electronic cigarette (39% vs. 5%, p < 0.01). We found the majority of college students were aware of e-cigarettes. While ever use of e-cigarettes was much more common in current cigarette smokers than non-smokers, past month use was much less common in the sample overall, and daily use was rare.

No funding.

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POS2-139
A PROSPECTIVE RANDOMIZED CONTROL DESIGN STUDY TO EVALUATE LONG TERM SAFETY, ABSTINENCE, AND REDUCTION RATES IN SMOKERS NOT WILLING TO QUIT: THE ECLAT STUDY
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E-cigarettes are becoming increasingly popular with smokers worldwide. Carefully conducted research on e-cigarettes is urgently needed in order to ensure that the decisions of regulators, healthcare providers and consumers are based on evidence. We designed a prospective 12-month double-blind, randomized, controlled trial to evaluate smoking reduction, smoking abstinence and adverse events in 300 smokers not intending to quit experimenting 2 different nicotine strengths of a very popular brand compared to the non nicotine alternative from the same brand. Study Group A (n =100) used 7.2 mg nicotine cartridges, Group B (n =100) used 5.4 mg nicotine cartridges and Group C (n =100) was given no-nicotine cartridges. Study participants were invited to attend a total of 9 study visits during which number of cigarettes smoked, and eCO levels were measured. Smoking reduction and abstinence rates were calculated. Adverse events and product preferences were also reviewed. Lastly, classic and novel static and dynamic factors predicting abstinence and reduction rates will be investigated. A significant reduction (p<0.001) cig/day use and eCO levels from baseline was observed at each study visits in all 3 study groups. By and large, no difference between study groups was observed in terms of changes in cig/day use and eCO levels. A mean of 2.0 cartridges/day was used in each study group up to the 3-month time point, but falling thereafter. Smoking reduction was shown in 21% and 9% participants in group A, in 16% and 8% in group B and in 19% and 10% in group C, at 3- and 12-months respectively. Only minor and transient adverse events were reported, including mouth and throat irritation, and dry cough. They seem to attenuate over time. By and large, participants’ perception and acceptance of the product was positive. In smokers not intending to quit, the use of e-Cigarette decreased cigarette consumption and elicited enduring tobacco abstinence at 1-yr without causing significant side effects.

No funding.

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POS2-140
EFFECT OF ACCULTURATION ON WATERPIPE USE IN ARAB AMERICAN LINDA HADDAD, R.N., PH.D.1, OMAR EL SHAHAWY, M.D., M.P.H.1, SUKAINA ALZAYYOUTH, PH.D.2, 1Virginia Commonwealth University; 2Hasemite University, Jordan

Background: It is important to understand the disparities in water pipe smoking among Arab immigrant populations in USA. Moreover, the rate of tobacco use among immigrants may change with acculturation. The purpose of this study is to explore the waterpipe use patterns and the effect of acculturation among Arab
Americans in Richmond, Virginia. Methods: A sample of Arab immigrants (221) was recruited from Middle Eastern groceries, restaurants/lounges, and faith based organizations. Survey questionnaire included demographics, cigarettes and water pipe use. Eleven questions were used for the water pipe smoking; the questions ask about current level of water pipe use and situational characteristics of water pipe use. They also assess motivation and efficacy regarding quitting water pipe and cognitions and behaviors that support water pipe use. Results: The participants were males (55.6%) and females (45.2%). About 36% of participants were current water pipe smokers, only 13% were exclusive water pipe smokers One fourth (25%) of the water pipe smokers reported smoking on a daily basis. Initiation of water pipe smoking started between the ages of 18 (SD= 7) and 20 (SD= 10). The results indicated a strong positive relationship between the age moved to US and the magnitude of water pipe smoking on a daily and weekly basis. Furthermore, a strong association was found between having other family members and or friend visit for water pipe smoking. Conclusion family members and friends smoking water pipe are considered the most critical factor contribute to water pipe smoking in this population. There should be a water pipe smoking cessation programs designed specifically for this minority group. In order to be effective, these programs should include smokers and their family and friends as well.

**Funding:** Virginia Tobacco Settlement Foundation.

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**POS2-142**

**PATTERNS OF WATERPIPE USE AND ACCULTURATION AMONG ARAB AMERICANS**

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Background: It is important to understand the disparities in water pipe smoking among Arab immigrant populations in USA. Moreover, the rate of tobacco use among immigrants may change with acculturation. The purpose of this study is to explore the waterpipe use patterns and the effect of acculturation among Arab Americans in Richmond, Virginia. Methods: A sample of Arab immigrants (221) was recruited from Middle Eastern groceries, restaurants/lounges, and faith based organizations. Survey questionnaire included demographics, cigarettes and waterpipe use. Eleven questions were used for the water pipe smoking. The questions ask about current level of water pipe use and situational characteristics of water pipe use. Results: The participants were males (55.6%) and females (43.2%). About 36% of participants were current water pipe smokers, only 13% were exclusive waterpipe smokers One fourth (25%) of the water pipe smokers reported smoking on a daily basis. Initiation of water pipe smoking started between the ages of 18 (SD= 7) and 20 (SD= 10). Logistic regression analysis indicated there was evidence of significant positive relationship between the number of years lived in USA and number of waterpipe sessions within the last month. The slope (0.58) is positive and differs reasonable from zero (p-value= 0.0141). The regression line fits reasonably with R2= 12% with the total variability of the waterpipe frequency of use explained, and the estimated residuals were normally distributed. This means that for each additional year lived in the US, the number of waterpipe sessions smoked every month increases as well with an estimate equivalent to the slope. Conclusion: the findings suggest the there is a high use of waterpipe among Arab immigrants and among the smokers, their use of waterpipe increased as they stayed in the US. These findings are coherent with other research that showed negative acculturation in relation to smoking among different migrant ethnic groups.

**Funding:** Virginia Tobacco Settlement Foundation.

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**POS2-143**

**FORMATION, FILTRATION, AND COMPOSITION OF PARTICULATE MATTER IN MAINSTREAM HOOKAH SMOKE**

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Hookah (also known as narghile, shisha, and hubble-bubble) is a form of tobacco use originating in India during the 15th century and has since spread to various Middle Eastern and Mediterranean regions as well as western countries including the United States. The shisha tobacco is treated with ma’ssel, a sweet tasting paste. As users inhale, hot air vaporizes the tobacco, upon cooling the vapor forms particles or smoke. Recent years have shown increasing popularity of hookah smoking, especially among youth and college students. While cigarette smoke has been well characterized, information regarding hookah smoke is still lacking. Here, we investigate the processes involved in hookah particulate formation and filtration by varying puff duration, puff interval, heat source, filtration media, and shisha type while characterizing particle number density, size distribution, and composition. By looking at these parameters, the adverse health effects of hookah can be better identified.

**Funded by the Howard Hughes Medical Institute and the Davidson Research Initiative.**

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POS2-144  
CO EXPOSURE, AND PUFF TOPOGRAPHY AMONG JORDANIAN WATERPIPE TOBACCO SMOKERS: CORRELATION WITH LEVEL OF DEPENDENCE

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Waterpipe tobacco smoking is a significant threat to public health because of its wide spread among world populations. Yet, evaluation of its toxic load, smoking behavior and dependence producing properties are not well understood. In here. The Lebanon Waterpipe Dependence Scale (LWDS-11) was used to measure levels of dependence in current waterpipe tobacco smokers (n=128) who either received a score < 7 on the scale (Low LWDS-11 score group), or a score of > 13 (High LWDS-11 score group). Participants were abstained from smoking for 12 hours, and then allowed to smoke waterpipe in the laboratory until satisfied. Their Pre- and post- smoking CO levels, and puff topography measured were recorded. The mean smoking duration was 31.5±0.47 minutes, which resulted in a CO boost of 53.7± 6.7 ppm. Males smoked more intensely than females as evident by significantly larger smoke and puff volumes, and larger puff durations, which resulted in higher CO boosts. Additionally, participants in the high LWDS-11 score group had significantly more puffs and puffing time per session, shorter time between puffs, more frequent puffs per minutes and significantly higher CO boost. In conclusion, this is the first study to show correlation between waterpipe dependence score and CO exposure and puff topography measures. Both male smoker and those with high dependence score had more intense smoking habits, and more CO exposure, which could expose them for higher risk of health consequences associated with waterpipe smoking.

Funding: NIH.

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POS2-145  
IMPACT OF TOBACCO DISPLAY BANS: FINDINGS FROM THE INTERNATIONAL TOBACCO CONTROL FOUR COUNTRY SURVEY

Lin Li, Ph.D.1, Ron Borland, Ph.D.2, Geoffrey T. Fong, Ph.D.3, David Hammond, Ph.D.3, James F. Thrasher, Ph.D.1, and K. Michael Cummings, Ph.D.1. 1The Cancer Council Victoria, Australia; 2University of Waterloo, Canada; 3University of South Carolina, USA; 4Medical University of South Carolina, USA

This study examined the impact of point of sale (POS) tobacco marketing restrictions in Australia and Canada, in relation to the UK and the US where there were no such restrictions during the study period. The data came from responses of current smokers for four waves of the International Tobacco Control Four Country Survey, a prospective multi-country cohort survey (Waves 5-8, conducted in 2006(n=7307), 2007(n=6885), 2008(n=5887) and 2010(n=4593)). Logistic regression and Generalized Estimating Equations were used. In Canada and some states of Australia, where POS tobacco display bans had been implemented, smokers’ reported exposure to tobacco marketing at POS was markedly reduced over time. From 2006 to 2010, in Canada, the percentages noticing POS tobacco displays declined from 74% to 6% following the ban (adjusted odds ratio(AOR)=0.26,p<0.001); and reported exposure to POS tobacco advertising decreased from 40% to 14% (AOR=0.61,p<0.001). Similarly, in Australia, where bans came in later, noticing of POS displays decreased from 74% to 43% overall (AOR=0.67,p<0.001) (19% where banned, 55% where not banned but impending). By contrast, exposure to POS marketing in the US and UK remained high during the study period. In parallel, there were declines in reported exposures to other forms of advertising/promotion (e.g., billboards, gifts, competitions) in Canada (47%-30%,AOR=0.55, p<0.001) and Australia (33%-24%,AOR=0.85,p<0.001), but again, not in the US or UK. Reported purchase of non-usual brands because of noticing tobacco displays/advertising was highest in the US (over 16%), and declined from a lower level in Canada (11%-4%,AOR=0.58,p<0.001) and Australia (5%-3%,AOR=0.71,p<0.05), but did not change in the UK (around 7%,AOR=0.89,p=0.24). In 2010 survey we also found higher proportions of smokers in the US (7%) and UK (6%) spontaneously bought cigarettes when in a store for another reason than did their counterparts in Canada and Australia (2% and 4% respectively,p<0.001). These findings indicate that implementing POS tobacco display bans can be effective in reducing exposure to tobacco marketing, and may lead to less buying of unplanned cigarettes.

The research reported in this paper was funded by grants from the National Cancer Institute of the United States (P50 CA111326, P01 CA138399, and R01 CA100362), Robert Wood Johnson Foundation (045734), Canadian Institutes of Health Research (75897, 79551, and 115016), National Health and Medical Research Council of Australia (285903 and 450110), Cancer Research UK (C312/ A3728), Canadian Tobacco Control Research Initiative (014578), and the Ontario Institute for Cancer Research, with additional support from the Propel Centre for Population Health Impact, Canadian Cancer Society, and a Prevention Scientist Award from the Canadian Cancer Society Research Institute.

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POS2-146  
A PRACTICAL APPROACH TO IMPROVE ACCURACY OF RETAIL TOBACCO SALES VIOLATION RATES

A.H. Levinson* and J.L. Patnaik, University of Colorado, Denver

Introduction: United States federal law requires states to conduct random, unannounced inspections of retail tobacco sellers. The results of these compliance checks are used to estimate the proportion of retailers willing to sell tobacco to minors. Previous studies have found that the compliance check protocol tends to underestimate retailer violation rates (RVRs). Given that the RVR suffers from poor sensitivity, we decided to conduct two compliance checks per store in order to improve RVR accuracy. Methods: Minors attempted to purchase cigarettes at all known tobacco retail businesses within two urban counties and one rural-resort county in Colorado. Multiple visits to a store were separated by at least a day and occurred over different times of day. RVRs were calculated for first visits, second visits and either visit. Chi-squared tests and multiple logistic regression were used to test RVR associations to characteristics of minors, clerks, and transactions. Results: Between June 2001 and January 2012, 11 minors attempted to purchase tobacco a total of 1,049 times from 671 retail businesses. The RVR was 16.6% for first visits, 15.6% for second visits, and 25.3% combined. Results were similar across all three counties. Several factors were associated with higher RVRs, including minors who had more purchase attempt experience, minors who included a snack in their purchase, and minors who were not asked for identification. RVRs in our study were much higher than the 9.1% Colorado state rate reported with Synar data. Conclusion: More than one-fourth of retail tobacco businesses in this study illegally sold tobacco to a minor. Testing stores more than once within a few day time-period increased the retailer violation rate by 51% from 16.6% in first visits to 25.3%.

Funding: Colorado Division of Behavioral Services.

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POS2-147  
SNAPSHOT OF RETAIL TOBACCO MARKETING IN THE UNITED STATES 2010-2011

Jidong Huang, Ph.D., Dianne Barker, M.H.S.*, Frank J. Chaloupka, Ph.D., and Sandy Slater, Ph.D.

Point of sale is the least regulated tobacco marketing channel in the U.S. Given the evidence of the causal role of marketing in the tobacco epidemic and FDA’s recently-charged role in regulating tobacco product marketing, it is important to examine the current status of retail tobacco marketing in the U.S. This research address this topic using the observational data from af national sample of tobacco outlets focusing on the availability of various tobacco products, point-of-sale promotions and marketing. Cross sectional data were collected in 2010 in 154 sites (in 43 states) and in 2011 in 157 sites (in 42 states) surrounding a national sample of public 8th-, 10th-, and 12th-grade schools . For this study, sites were defined as the area from which the schools drew the majority of their students (the school enrollment zone). A random sample of retail outlets in each site were...
selected for observation. Our analyses revealed that close to 80% of the observed retail outlets sold tobacco products. Differences exist in availability across different types of tobacco products. Availability also differs within each product type across sites with different racial/ethnic compositions and income levels. Availability of electronic cigarettes, pipe tobacco, dissolvable tobacco products, and cigarrillos increased from 2010 to 2011. The percent of stores with promotions declined in 2011 in three promotional types (multi-pack discount, cents off coupon, and special price). Presence of promotions was higher in minority communities, presence of menthol cigarettes with special price was higher in communities with low-and-middle income levels. Cigarette and snus ads were ubiquitous in stores selling these products in 2010, however, a reduction was observed in those ads in 2011 across all sites regardless racial/ethnic compositions or income levels. This study provided insights on the current status of tobacco retail marketing and has important implications for policies targeting point-of-sale marketing.

Support for this project was provided by the Robert Wood Johnson Foundation as part of the Bridging the Gap: Research Informing Practice and Policy for Healthy Youth program; and by a National Cancer Institute-funded grant (Grant #IU01CA154246), titled “Monitoring and Assessing the Impact of Tax and Price Policies on U.S. Tobacco Use.” The Monitoring the Future study is funded by the National Institute on Drug Abuse. The opinions expressed here are those of the authors, and do not necessarily reflect those of the sponsors. None of the funding agencies played any role in study design; in the collection, analysis and interpretation of data; in the writing of the report; and in the decision to submit the paper for the conference.

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POS2-148
PRICE PAID PER PACK OF CIGARETTES AND QUANTITY OF CIGARETTES TYPICALLY PURCHASED

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The price of cigarettes is an important factor influencing smoking behaviors. This study examines trends in the reported price paid per package of cigarettes by adult smokers in the United States between 2002 and 2010. Data come from the ITC Study which tracked the smoking habits of approximately 2,000 adult (18 years of age and older) cigarette smokers surveyed annually. In 2002, the average reported price paid per package of cigarettes was $3.71 (range: 1.00 to 7.14). In 2010, the average price paid per package had increased to $5.36 (range: $1.18 to $14.00), with the sharpest increase in price paid per pack occurring in 2009-2010 corresponding to the increase in the Federal excise tax on cigarettes in April 2010. As cigarette prices increased, there was a shift in the quantity of cigarettes typically purchased by smokers. In 2002, 64.4% of smokers reporting purchasing their cigarettes by the pack, by 2010 this percentage had dropped 54.2%. Among those purchasing by the pack, the percentage reporting multi-package purchasing increased from 37.8% in 2002 to 50.3% in 2010. Smokers who scored higher on the heaviness of Smoking Index were more likely to report purchasing cigarettes by the carton and/or by multi-pack compared to those purchasing a single pack at a time. Older smokers tended to purchase by carton, while younger smokers purchased by the pack. Smokers appear to be responding to higher cigarette prices by changing the quantity of cigarettes typically purchased from packs to cartons and from single packs to multiple packs. These trends likely reflect increased price marketing by manufacturers to help customers cope with higher single package purchase prices.

This research was supported in part by National Cancer Institute Grants R01CA100382, P50CA111256, and P01CA138389 and funding from the Canadian Institutes of Health Research (57897, 79551).

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POS2-149
QUICK, DIRTY, AND CHEAP: CROWDSOURCING HARM PERCEPTIONS SURROUNDING AMERICAN SPIRIT CIGARETTE PACK DESCRIPTIONS


BACKGROUND: American Spirit cigarettes features pack descriptors such as “organic,” “100% additive-free,” and “100% US grown.” There are no published data on harm perceptions surrounding these pack descriptors. METHODS: Using Amazon Mechanical Turk (AMT), we collected survey data on harm perceptions of American Spirit cigarette pack descriptors “organic,” “100% additive-free,” and “100% US Grown.” AMT is a crowdsourcing tool often used for small, repetitive tasks such as photo tagging and is becoming increasingly popular in human subjects research. In this research, we asked AMT workers to respond to three separate surveys (N=500, N=1000, and N=1000), comparing original and altered American Spirit packs to each other and to Marlboro packs to estimate the relative impact of the above pack descriptors and evaluate whether further research using a representative sample was justified. Data was collected for $1500 in less than one week. RESULTS: Respectively, 54%, 62%, and 57% of respondents believed that the American Spirit packs with the descriptors “organic,” “100% additive free” and “holi“ organic, “100% additive-free,” and “100% US Grown” were less harmful than a pack of Marlboro cigarettes. Controlling for age, gender, and education, smokers rated American Spirit packs with “100% additive-free” and “100% US grown” approximately 0.13 points lower than a Marlboro pack on the harm perception scale compared to non-smokers. When comparing the American Spirit “100% additive-free” pack to the Marlboro pack, there was a 0.18 point increase on the harm perception scale with each year of increasing age. When deleting the pack descriptors, respondents continued to associate less harm with American Spirit cigarettes, though to a lesser degree. DISCUSSION: Pack descriptors, including “organic,” “additive-free” and “U.S. grown” may function as modified risk claims and decrease harm perception associated with cigarettes. The US FDA has the authority to restrict misleading health claims under the FSPTCA of 2009. AMT is a viable method to collect quick turnaround, low cost data for formative research, survey development, and “canary in the coal mine” emerging regulatory concerns.

No funding.

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POS2-150
ASSOCIATION OF YOUTH SMOKING OUTCOMES WITH THE DENSITY AND PROXIMITY OF TOBACCO RETAILERS AND RETAIL CIGARETTE ADVERTISING NEAR SCHOOLS


The objective of this project was to examine the density and proximity of tobacco outlets and retail cigarette advertising in school neighborhoods and their association with cigarette use and purchasing outcomes among a representative sample of Florida high school students. Data from 1,000 schools participating in the 2010 Florida Youth Tobacco Survey were combined with retail licensing data on the number and location of tobacco outlets and in-store observations on the quantity of retail cigarette advertising for stores within 1/2-mile of the schools. Logistic regression models controlling for individual, school, and neighborhood factors estimate the association of openness to smoking among never smokers, current smoking, and usual source of cigarettes being a store among high school students, with the density and proximity of tobacco outlets and the amount of retail tobacco advertising in school neighborhoods. Analyses were stratified by urbanicity (urban, suburban, rural) to examine differential effects based on population density of the school neighborhood. Overall, 17.1% (95% CI: 16.3-17.8%) of never smokers reported being open to smoking. Retailer density was marginally associated (p < 0.10) with openness to smoking among urban students (OR: 1.05, 95% CI: 1.00-1.10), but not suburban or rural. Current smoking was highest among rural students (16.6%) and lowest among urban students (11.0%). Neither retail density nor advertising were significantly associated with current smoking.
Overall, 24.7% (95% CI: 23.2-26.3%) of students reported a store as their usual source of cigarettes. Among suburban students, the number of retailers (OR: 0.82, 95% CI: 0.69-0.96), average ads per store (OR: 0.94, 95% CI: 0.87-1.01), and total ads (OR: 1.03, 95% CI: 1.00-1.06) within a 1/2-mile of a school were marginally associated (p < 0.10) with the usual source of cigarettes being a store. These results suggest that cigarette smoking and purchasing among Florida high school students is only weakly influenced by the number of tobacco outlets and advertising in school neighborhoods. Stronger predictors included age, living with a smoker, poor grades, and feeling depressed.

This study was conducted with funding from the Florida Department of Health, Bureau of Tobacco Free Florida.

POS2-151
DENSITY AND PROXIMITY OF TOBACCO OUTLETS TO HOMES AND SCHOOLS: RELATIONS WITH YOUTH CIGARETTE SMOKING

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This study investigates the associations among tobacco outlet density, proximity of tobacco outlets to youth homes and schools, and youth cigarette smoking across different geographic units (i.e., buffers) in 45 midsized California communities. The sample comprised 832 youth who were surveyed about their smoking behaviors. Inclusion criteria included both home and school addresses within the city boundaries. A spatially masked address for each youth’s home was created. Youth also provided information about their school locations. Observations in the 45 cities were conducted to document addresses of tobacco outlets. City- and buffer-level denormalized data were obtained from 2010 GeoLytics data. Multilevel linear regression analyses were conducted. Model 1 included 0.75-mile buffers around youth homes for tobacco outlet density and neighborhood demographics. Model 2 included 1.00-mile buffers around youth homes, Model 3 used 0.75-mile buffers around schools for tobacco outlets and neighborhood demographics, and Model 4 used 1.00-mile buffers around schools. Model 5 included the distance to the nearest tobacco outlet from youth homes and schools, as well as city-level demographics. All models were adjusted for youth gender, age, and race. Buffer sizes were created to be large enough to include at least one outlet per buffer but small enough to fall mainly within city boundaries. Results show that greater density of tobacco outlets within a 1-mile buffer of youth homes was significantly associated with higher frequency of smoking (beta (SE) 0.016 (0.005)) in Model 2, as was tobacco outlet density within a 0.75-mile home buffer (0.010 (0.004)).

Neither tobacco outlet densities around schools nor distance to the nearest tobacco outlet were significantly associated with individual smoking frequency. None of the neighborhood characteristics were associated with youth past-30-day smoking. Results will help to inform policymakers regarding how best to craft policies which understanding of the relative potency of different media channels is important to informing the ongoing public policy debate about how pro-smoking media should be regulated. In this study, a sample of 134 college students carried handheld computers for 21 days, recording their exposures to all forms of pro-smoking media during the assessment period; they also recorded the channel for that exposure. In addition, they responded to three random control prompts during each day of the assessment period. After each pro-media smoking exposure and after each random control prompt they answered questions that measured their risk of future smoking. The total number of pro-smoking media exposures across all participants and all media channel types was 1,112. Exposures were categorized into the following three channels: point-of-sale (66% of exposures), exposure to smoking in movies/on television (20%), and other locations (14% of exposures [e.g., 4% in magazines; 3% via internet]). Analyses focused on whether future smoking risk during point-of-sale exposures, via smoking in movies/television, and via other media channels differed from future smoking risk assessed at random control prompts. Results of linear mixed modeling indicated that participants had higher levels of future smoking risk following exposure to pro-smoking media at point-of-sale (p < 0.001) and via other media channels (p = 0.05) than at randomly sampled (control) moments. There was no difference between future smoking risk measured after exposure to smoking in movies/on television vs. at random prompts (p = 0.78). This study makes a unique contribution to understanding how different pro-smoking media channels contribute to smoking risk and suggests that there is merit to examining the relative contribution of individual pro-smoking media channels on behavior.

This research was supported by R21CA1237286.

POS2-152
ARE EXPOSURES TO CIGARETTE ADVERTISING AT POINT-OF-SALE RETAIL LOCATIONS MORE POTENT THAN EXPOSURES IN OTHER CHANNELS? A STUDY USING ECOLOGICAL MOMENTARY ASSESSMENT

William G. Shadel, Ph.D.,*. Steven Martino, Ph.D., Claude Setodji, Ph.D., and Deborah Scharf, Ph.D., RAND

Pro-smoking media messages can be conveyed through a variety of media channels, for example as paid advertising in magazines and at point-of-sale retail locations, or via portrayals of smoking in movies. More research is needed on whether different smoking media channels differently influence smoking because

POS2-153
EFFECTS OF TOBACCO ADVERTISEMENTS ON YOUTH ATTITUDES TOWARDS TOBACCO

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There is consistent scientific evidence that increased exposure to tobacco advertisements is associated with higher risk of tobacco behaviors and positive attitudes. Still, research on understanding the differential effects of tobacco advertisements on tobacco attitudes is still in its infancy. In this study, we examined the differing effects of tobacco advertisements on tobacco attitudes among youth non-smokers. We used data from the 2011 National Youth Tobacco Survey, a nationally representative sample of U.S. youth in grades 6-12. Analysis was restricted to youth who never tried smoking (unweighted N=127,595). Youth were asked how often they saw ads for tobacco products in magazines/newspapers or on the internet (responses dichotomized as sometimes/often vs. never/rarely). Logistic regression models were used to assess whether the effects of tobacco ads on attitudes differed by race, additionally adjusting for sex, age, and allowance. In multivariable models, exposure to internet ads (OR 1.5, 95% CI 1.2-1.8) and print ads (OR 1.4, 1.2-1.7) were associated with the belief that smoking makes people look cool and included a significant interaction of print advertising and race. Results indicate that the social norms of minority non-smoking youth are less affected by tobacco product advertisements versus Caucasian

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This research was supported by R21CA1237286.
counterparts. These findings may help to explain the lower smoking uptake of minority adolescents versus Caucasians. This study was conducted while the first author was at the Washington University School of Medicine. Supported by NIH K01 DA025733 (PCR), NIH R01 DA032843 (PCR), and NIH R01 DA031288 (RAG).

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POS2-154

SMOKING AND SMOKEOFLESS TOBACCO PREVENTION AND CESSATION (PROJECT CURBING): END-OF-TREATMENT AND LONGITUDINAL OUTCOMES

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Project CURBING is an online interactive, multi-media tool addressing the dangers of smoking and smokeless tobacco (ST) for rural and suburban high-school students. Individually tailored tracks are designed to help adopt a tobacco-free lifestyle. Five 30-min sessions were delivered during the first semester followed by 2 booster sessions during the next semester. A key innovation is social networking through an interactive blog. High-school students (N=1139) were recruited from 16 suburban and rural high schools in central and southeast Texas. Within a group-randomized trial, schools were pair-matched on size, location, and ethnicity, and randomized to intervention or standard care. POST-INTERVENTION: The post-intervention survey was completed by 400 students. Ninety-seven percent reported satisfaction with all aspects of the game. Over 80% reported that the materials increased their knowledge about tobacco use and were inspired never to start or to quit. Furthermore, 65% planned to share the game with family or friends. Participants were tested on their knowledge presented in specific modules. Over 75% reported that smoking, ST use, and secondhand smoke are harmful to one’s health. LONGITUDINAL OUTCOMES: At 18-month follow-up, there were 849 students (overall retention 74.5%), 380 in control and 469 in intervention. The mean age was 15 years (SD=0.7), 45% were male. The primary outcomes were smoking initiation/cessation. Using generalized linear mixed model regression adjusting for school effect, Cotinine-validated smoking initiation rates were not significantly different between intervention and control (12% vs. 9%). Those who were susceptible at baseline had significantly higher smoking initiation rates compared to non-susceptible participants (3% vs 11%, p<0.01). There was no effect of the intervention on smoking cessation or ST use. Although the program was overall positively received, no expected long-term behavior changes were achieved. Possible reasons for the negative outcomes include insufficient number of booster sessions, lack of bandwidth for the multimedia content-rich intervention program, and excessively long spacing between the sessions. The study was supported by a grant from the National Cancer Institute: R01 CA081934.

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POS2-155

PROACTIVE TOBACCO TREATMENT AND POPULATION-LEVEL CESSATION: A PRAGMATIC RANDOMIZED CONTROLLED TRIAL

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BACKGROUND: Boosting utilization of evidence-based treatments is a top national tobacco control priority. Proactive tobacco treatment integrates population-based and individual-level treatment and hence may increase the population impact of treatment. METHODS: We identified a population-based registry of current smokers (N=6400) from four Veterans Health Administration (VHA) facilities using the VHA electronic medical record, who were randomized to proactive care or usual care. The proactive care intervention combines: (1) proactive outreach and (2) offer of choice of smoking cessation services (telephone or face-to-face). Proactive outreach included mailed invitations followed by telephone outreach (up to 6 call attempts) to motivate smokers to seek treatment with choice of services. Because this study was testing proactive outreach, smokers were randomized prior to contact and a baseline survey was administered after randomization using a multiple-wave mailed questionnaire protocol. Outcomes from both groups were collected 12 months post-randomization from participant surveys and from VHA administrative databases. The primary outcome was population-level cessation at one year using a self-reported, 6-month prolonged smoking abstinence measure. RESULTS: The baseline survey response rate was 66% and the follow-up survey response rate was 67%. The population-level cessation rate at one year was 13.4% for proactive care compared to 10.9% for usual care (p=0.025). In generalized linear mixed model analysis, proactive care resulted in increased odds of population-level cessation, OR=1.274 (1.033, 1.571). In additional analyses incorporating multiple imputation to estimate missing outcome measures and adjusting for baseline group differences in age of smoking initiation, and length of periods of quit attempts, the effect of proactive care on population-level cessation persisted, OR=1.220 (1.002, 1.484). CONCLUSIONS: Population-based proactive tobacco treatment using proactive outreach to connect smokers to evidence-based telephone or in-person smoking cessation services is effective for increasing long-term population-level cessation rates. VA Health Services Research and Development (IAB-05-303).

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POS2-156

A RANDOMIZED CONTROLLED TRIAL OF MINDFULNESS TRAINING FOR SMOKERS

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BACKGROUND: A prior trial reported superior smoking outcomes (i.e., abstinence rates, cigarettes per day (CPD)) with Mindfulness Training for Smokers (MTS), compared with a standard cognitive-behavioral intervention for smoking cessation, Freedom from Smoking (FFS). Our aim was to replicate these findings in an independent sample. METHODS: Adults with nicotine dependence (n=54) who smoked 10 or more CPD were randomly assigned to 8 sessions of MTS (n=25) or FFS (n=29), provided in twice-weekly 90-minute group sessions. Group size was 3-7 subjects. Therapists were monitored for fidelity. Participants were asked to set a quit date after session 4. No study medications were provided. Primary outcomes were 7-day point prevalence abstinence during four monthly follow-up periods. Secondary outcomes were weekly CPD and mean CPD during follow-up. RESULTS: The groups were well matched for baseline demographic and dependence characteristics. Results of generalized estimating equation analysis of intent-to-treat point prevalence during follow-up showed no treatment effect (χ2(1)=3.67, p=0.056), and indicated stability over time. At month 4, abstinence rates were: 8% (n=2); FFS: 17% (n=5). For expired CO and mean CPD, using mixed models repeated measures during follow-up, there was no group difference between MTS and FFS (CO:F(1,42)=0.03, p=0.58; CPD:F(1,42)=0.02, p=0.90), but an increase over time in both groups (CO:F(1,49)=13.86, p<0.001; CPD:F(1,49)=13.82, p<0.001). This result was consistent when considering only those who did not reach abstinence during the treatment phase, (i.e., by month 1) (n=47); however, among this non-abstinent sub-sample, month 4 mean CPD rates were different (FFS: 9.2 CPD v. MT: 5.0 CPD, F(df=4,2, p<0.05)). CONCLUSIONS: Contrary to a prior study, this study did not demonstrate a superior effect for MTS over FFS on smoking abstinence outcomes. Small sample size, floor effect in abstinence rates due to heavier smoking, and observed group cohesion effects may limit the conclusions. Given contradictory pilot findings, a larger study of MTS is needed. R03 DA030899 (ZSO), Mind & Life Institute Varella Award Grant 2009-1-014 (ZSO), Harvard Medical School Dupont-Warren and Livingston Fellowships (ZSO); K24 DA030443 (AEE); KO1 DA027097 (BH).

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POS2-157  
EFFICACY OF RECRUITMENT IN A NOVEL SMOKING CESSATION PROGRAM

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Background: Over 20.8% of young adults smoke in the United States. Previous research found differences in the stage of change model for smoking and cessation success at 1- and 6-month follow-up. End-of-treatment abstinence was predicted by cigarettes per day (cpd) in young adults, which suggests that young adults' baseline daily cigarette use is associated with level of addiction and treatment attrition. Additional research has shown that individuals referred (intercept) to a quilton network by healthcare providers, were more likely to quit than individuals who were self-referred (Respond). The present study assessed subject attrition based on data from a novel cessation intervention for young adults. Methods: Young adults aged 18-30 were recruited through both contact methods. Subjects were randomized to either a usual or integrated smoking cessation treatment that included a binge-drinking component. Survival curves assessed subject attrition between Intercept vs Respond groups. Proportional hazard regression was used to assess subject attrition between recruitment methods after adjusting for treatment assignment, stage of change, and cpd. Results: 26/56 subjects were lost to follow-up. There were no differences between subjects groups. Of the total subjects, 48% were enrolled using 'Intercept' methods and 52% were recruited via 'Respond' methods. Subject retention differed between recruitment methods (p<.001). After adjusting for treatment condition and other factors, subjects in 'Respond' were 3.9 times more likely to attrition out of the study than 'Intercept' subjects. Moreover, subjects who were at the Pre-Contemplation/Contemplation stage of change were 2.2 times more likely to leave than subjects in the Preparation Stage. Additionally, subjects with greater cpd at baseline were 3.6 times more likely to attrition. Conclusion: An association was found between recruitment methodology after adjusting for significant variables. Future research should examine treatment completion and success rates compared to cessation program enrollment techniques. Cessation programs may need to focus on strategies based on observed smoking in the environment.

This study is being funded by the James and Esther King Research Program Grant #09KW-01. This study has Florida DOH IRB approval.

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POS2-158  
ENHANCING THE MEDICAL SCHOOL CLERKSHIP EXPERIENCE IN THE MSQ Trial: PRECEPTOR MODELING AND FEEDBACK TO TEACH TOBACCO DEPENDENCE TREATMENT COUNSELING TO MEDICAL STUDENTS

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Background: Physicians play a critical role in addressing tobacco use and should be trained to provide tobacco counseling (“5As”) during medical school. Modeling and providing feedback on the 5As by clerkship preceptors may influence medical students’ 5A practice. This study described the frequency of modeling each 5A and the provision of 5A feedback among clerkship preceptors. It also identified correlates of preceptor modeling and feedback, and examined if student tobacco counseling behavior was associated with preceptor modeling and feedback. Methods: Preceptors (N=56) from 10 U.S. medical schools completed surveys on their practice of modeling and providing feedback on tobacco counseling to medical students, as well as on their attitudes about tobacco counseling, self-reported counseling skills, tobacco counseling behavior, and clinic-based approaches to tobacco treatment (e.g., brochures). A 3rd year medical student matched with each preceptor reported on their own frequency of tobacco counseling behavior while working with their preceptor. Results: Preceptors “Very Often or Always” modeled most of the 5As [Ask (80.3%), Advise (85.8%), Assess (60.0%), Assist (55.4%), and Arrange (35.7%)], while a minority “Very Often or Always” provided 5A feedback [Ask (32.1%), Advise (28.6%), Assess (25.4%), Assist (29.7%), and Arrange (12.5%)]. Greater self-reported tobacco counseling skill (p<.001), intentions to model (p<.05) or provide counseling feedback (p<.05), and belief in personal effectiveness in teaching tobacco counseling (p<.001), were associated with greater modeling or provision of feedback. Use of displayed treatment brochures was associated with greater preceptor modeling (p<.10) and gender was associated with greater provision of feedback (p<.05; males>female). Preceptor modeling of prescribing tobacco pharmacotherapy and providing feedback in this area was associated with increased student reported counseling in Assist (p<.05), Arrange (p<.05), and in discussing pharmacotherapy (p<.05). Conclusions: Preceptor modeling and provision of feedback is associated with student tobacco counseling. Future research should examine this relationship prospectively.

Funded by the National Cancer Institute Grant R01CA136888 S1 to R. Hayes & J. Ockene.

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POS2-159  
IMPLEMENTING THE MAYO NICOTINE DEPENDENCE CENTRE MODEL IN THE CZECH REPUBLIC

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Introduction: In the CR (10,000,000 inhabitants, 40,000 physicians, 80,000 nurses, 2,100,000 smokers) still treatment of tobacco dependence is not a routine part of the daily health care practice. Methods: Description of education of physicians, nurses, successes and barriers in implementation of treatment of tobacco dependence. Results: Since 2005, a network of Centres for Tobacco-Dependent according to the model of the Nicotine Dependence Centre, Mayo Clinic, MN, USA in frame of a common project is implemented. So far, only one centre from 40 works full time for smokers only. The Society for Treatment of Tobacco Dependence helped to develop, run and analyze the web-based application for treatment evaluation, serving as electronic documentation as well (one-year follow up, CO-validated abstinence, Russel criteria), now with more than 7,000 patients are in the system. Twice a year a one-day meeting with updates for the staff in held. Evidence-based treatment methods are used. Since 2006, two billing codes can be used in those centres, all of them based in hospitals. Conclusions: Sharing experiences and international collaboration helps to disseminate good clinical practice.

Supported by the project AVMIS-KONTAKT ME09014.

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POS2-160  
A SINGLE SESSION OF HIGH-FREQUENCY REPETITIVE TRANSCRANIAL MAGNETIC STIMULATION (rTMS) OVER THE DORSOLATERAL PREFRONTAL CORTEX TRANSIENTLY REDUCES NICOTINE CUE CRAVING

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Background: Repetitive transcranial magnetic stimulation (rTMS) can non-invasively stimulate the brain and thus transiently amplify or block (knockout) behaviors mediated through a region. Several lines of evidence suggest that rTMS over the dorsolateral prefrontal cortex (DLPFC) can affect processes involved in nicotine addiction. We hypothesized that a single high-frequency rTMS session over the left DLPFC would reduce cue craving for cigarettes compared to a sham
TMS session. Methods: Sixteen non-treatment seeking, nicotine-dependent participants were randomized to receive either real high-frequency rTMS (10 Hz, 100% resting motor threshold, 5 second-on, 10 second-off for 15 minutes; 3000 pulses) or sham TMS over the DLPFC in two visits with a one week interval between visits. During each blind visit, the participants received simultaneous cue exposure before and after rTMS and rated their craving after each block of cue presentation. Results: Stimulation of the DLPFC with real, but not sham, rTMS reduced craving significantly from baseline (p = 0.018). When compared to neutral cue craving, the effect of real TMS on cue craving was significantly greater than the effect of sham TMS (p = 0.042). There were significant positive correlations between decreased subjective craving and FTND score (p = 0.031) and cigarette per day (p = 0.035). Conclusions: One session of high frequency rTMS (10 Hz) of the DLPFC significantly reduced subjective craving induced by smoking cues in nicotine-dependent participants. Further studies are needed to explore the use of rTMS as an aid to smoking cessation.

The study was funded by a Grant-In-Kind from MUSC and National Institute of Health Grant #R21DA026085 (KTB, MSG).

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**POS2-161**

**PILOT EVALUATION OF A DEDICATED INSTITUTIONAL TOBACCO CESSATION SERVICE FOR LUNG CANCER PATIENTS**

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OBJECTIVE: To describe the initial lung cancer patient population contacted by a dedicated institutionally supported tobacco cessation service at an NCI Designated Comprehensive Cancer Center and to describe the effectiveness of the cessation services provided for patients during cancer treatment and follow up. METHODS: The tobacco assessment and cessation service at Roswell Park Cancer Institute (RPCI) uses a structured evidence based tobacco assessment measure delivered by nursing through the electronic medical record (EMR). Patients who self-report tobacco use within the past 30 days are electronically and automatically referred to and contacted by a dedicated institutionally supported cessation service. Using a combination of the EMR, finance records, and tobacco cessation service notes, descriptive statistics were used to describe (1) the numbers of patients eligible for and interested in the service; (2) the demographic characteristics of these patients; and 3) the quit rates of these patients at screening, and 1st and 2nd contact by a tobacco cessation specialist. RESULTS: 660 new lung cancer patients were referred to the RPCI Tobacco Cessation Service from January 2011 through February 2012. Among these referrals, 19.3% were patients who reported quitting in the 30 days prior to assessment and the rest were current tobacco users. At first contact by the cessation service, 86.4% reported continued current tobacco use. Strikingly, only 2.8% of patients refused any cessation intervention. A second follow-up was performed an average of 32 days after the first successful contact with 23.0% of those contacted reported having quit. There were no statistically significant differences in demographic characteristics between those who were successfully contacted and those who were not able to be contacted or declined participation in the service. CONCLUSIONS: Data demonstrate that the RPCI tobacco cessation service can effectively generate a large mandatory referral base with high patient interest in cessation, and that cessation can be implemented and maintained in high risk cancer patients during cancer treatment and follow-up.

**Funding:** Roswell Park Alliance Foundation.

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**POS2-162**

**QUALITY OF MOTIVATIONAL INTERVIEWING COUNSELING AND SMOKING CESSATION AMONG PREGNANT SMOKERS**

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Motivational Interviewing (MI) interventions have promoted change among a variety of behaviors; however, MI cessation interventions for pregnant smokers have had mixed results. The inconsistency might be due to fidelity to MI counseling; yet, few have examined the relationship between quality of MI counseling and cessation. Our aim was to estimate the effect of quality MI counseling on cessation among pregnant women. This is a secondary analysis from the Baby Steps Trial, an open-label RCT of NRT in pregnancy. All women received up to 6 CBT counseling sessions during pregnancy; 2/3 received CBT + NRT. Counselors attended 40-hours of training and weekly supervision during the study. We used the Motivational Interviewing Treatment Integrity 2.0 (MITI) coding system to assess quality of counseling. The MITI includes 2 global scores (Empathy and MI spirit (1-7)) and 6 behavior counts (Giving Information, Open and Closed questions, MI adherent and Non-adherent behaviors, and Simple and Complex Reflections). We calculated the mean score across all sessions for the global scores and the sum scores for the behavior counts. Counts were then used to calculate quality indicators as outlined in the MITI 2.0. Overall, 68% of women were White, 68% were partnered, 48% had a partner who smoked, 39% had completed more than high school, and 83% were multiparous. Approximately one-third of participants received counseling that met quality benchmarks for Empathy (38%) and MI spirit (31%). Benchmark percentages for behavior count scores were: 11% for ratio of reflections to questions, 21% for open questions, 55% for complex reflections, and 14% for MI adherent behavior. Overall cessation rates were 18% (CBT+NRT) and 7% (CBT) (p < 0.04). Most women did not receive counseling that met MI quality benchmarks. Also, counseling that met quality benchmarks did not predict quitting smoking. More research is needed to determine if the quality of the MI counseling is vital to promoting cessation among pregnant women.

**This work was supported by the National Cancer Institute grant R01CA089053 and operated under IND #67,259.**

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**POS2-163**

**ELICITING “CHANGE TALK”: COMPARING MOTIVATIONAL INTERVIEWING AND HEALTH EDUCATION AS MOTIVATIONAL INTERVENTIONS FOR SMOKERS WHO ARE NOT YET READY TO QUIT**

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Motivational Interviewing (MI) has been shown to be effective for fostering health behavior change including quitting smoking. Evidence has emerged that the elicitation of “change talk” (i.e., any expression of interest or desire to change) may be an important mechanism through which MI has its effects. However, studies have generally not directly compared MI with alternative intensive motivational interventions. In this study we examined whether MI would be more effective and efficient than a matched duration health education (HE) intervention at eliciting desire to change in smokers not ready to quit. We used the Motivational Interviewing Skill Code (v. 2.1) to code the occurrence of change talk in baseline counseling sessions from the HE and MI arms of a randomized clinical trial. Participants were daily smokers with low motivation to quit recruited from the community (N=202; mean age = 45.9; 56% men; 69% Non-White). Efficiency was determined by coding the length of time it took for smokers to express desire to change either directly (i.e. using words such as “like, want, wish”) and/or indirectly (using language such as “It would be nice.”). Coders also assessed participants’ overall level of desire, commitment, and ability to quit smoking on a 7-point Likert scale. ICC’s (2.1 single measure, absolute agreement; N= 17 cases) revealed good reliability in coding (ICCs: .899 – .939). Results revealed that more smokers in the MI group expressed direct and total (direct and/or indirect) statements of
desire (54% vs. 28%; X2 (1, N = 202) = 14.07, p < .001 and 68% vs. 49%; X2 (1, N = 202) = .723, p < .01, respectively). Among those who directly expressed desire to quit it took a mean of 8.7 minutes in MI compared to 23.2 minutes for HE (F(1, 81) = 73.99, p < .001). Ratings of desire, commitment, and ability were not significantly different. Findings suggest that MI may be more effective and efficient than HE at eliciting expressions of interest in behavior change among smokers unmotivated to quit. Expression of interest in change is a potentially important counseling milestone as it allows counselors to focus on “how to quit” rather than “whether to quit.”

This research supported by the National Cancer Institute R01 DA025156 Varenicline (Chantix®) was provided by Pfizer through Investigator Initiated Research Support (#WS759405).

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POS2-164
MOTIVATIONAL RESPIRATORY BIOMARKER FEEDBACK CESSION INTERVENTION FOR LOW-INCOME PERSONS LIVING WITH HIV/AIDS WHO SMOKE: INTERVENTION PRE-TESTING RESULTS

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Persons living with HIV/AIDS (PLWHA) are a population in which factors associated with elevated smoking prevalence in the general population, including low income, are clustered. PLWHA smoke at a rate 2-3 times (45%-74%) that observed in the general population (20.6%). Smoking adds substantially to the morbidity and mortality of this population, and efficacious cessation interventions are needed. Respiratory symptoms and concerns are prevalent among PLWHA, but most HIV+ smokers are no more motivated to quit than smokers in general. We developed a one-session respiratory biomarker feedback intervention grounded in principles of motivational interviewing and Self-Determination Theory. We present preliminary data testing the experimental intervention with n = 9 HIV+ smokers to refine the intervention prior to the randomized trial. The experimental intervention entails assessment of alveolar carbon monoxide, respiratory symptoms, and lung age via spirometry (functional age of lungs), and feedback to participants in the form of a personal lung health report. Personal goals are elicited and through discussion participants are challenged to link valued goals to efforts to quit smoking. Warm handoff to the state quinline, education about medications, and information on HIV and smoking are provided as well. The sample was 67% male, African American (78%), and mean age was 47 (SD=7) years. Mean (SD) cpd = 12 (SD=7), and 78% smoked within 30 minutes of waking. In the post-intervention assessment, intention to quit smoking (score range 4-28) increased, M (SD) = 14.3 (8.3), to 23.2 (5.0), p < .01, and quitting self-efficacy (score range 4-28) increased significantly, M (SD) = 17 (7.3) to 22 (4.9), p < .05. Overall satisfaction with their experience was high; 89% were quite/extremely satisfied, 11% moderately satisfied with their experience, and 89% of the participants rated counseling quality as excellent. All but one (89%) accepted the offer for direct quitline referral. These pre-trial intervention testing results support the acceptability of the experimental intervention and a positive short-term impact on quitting motivation and self-efficacy.

This study was conducted at Memorial Sloan-Kettering Cancer Center. Supported by NCI grants #5U54CA-137788-03S1 and 3P30CA-008748-44S2.

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POS2-165
MOTIVATIONAL INTERVIEWING FOR ENCOURAGING QUIT ATTEMPTS AMONG UNMOTIVATED SMOKERS: A RANDOMIZED, CONTROLLED, EFFICACY TRIAL

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This study was supported by grant R01 CA133068 from the National Cancer Institute. Varenicline (Chantix®) was provided by Pfizer through Investigator Initiated Research Support (#WS759405).

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POS2-166
PRELIMINARY OUTCOMES OF AN OPEN-LABEL TRIAL OF BEHAVIORAL ACTIVATION SMOKING CESSATION TREATMENT FOR OLDER ADOLESCENTS

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Evidence suggests a significant percentage of adolescent regular smokers are interested in trying to quit smoking and frequently make attempts to quit, yet are unsuccessful in maintaining abstinence on their own. Despite a genuine desire to quit, there is an increasing incidence of smoking among older adolescents that runs counter to the overall trends of smoking reduction seen in the general population. Moreover, currently elevated depressive symptoms are highly comorbid with smoking behavior and dramatically reduce cessation rates. Thus there has been great interest in evaluating the potential for increased efficacy when smoking cessation interventions include components that target depressive symptoms specifically. This study presents preliminary data from an open-label trial comprised of a sample (n=18; 77% Caucasian, M = 19.6 years old; M=10.1 cigarettes per smoking day) of 18-21 year old daily smokers with elevated depressive symptoms (baseline BDI-II score ≥ 10), participating in a behavioral activation (BA) treatment for smoking paired with standard smoking cessation strategies including nicotine replacement therapy. BA is based in reinforcement theory and involves a systematic, structured approach to increasing positive behaviors and decreasing the frequency of depressed behavior. Results supported...
the initial efficacy of BA, including median attendance = 7 (of 8) sessions, 90% smoking reduction, and 11% relapsing to smoking within the first month post quit date. Additionally, after controlling for covariates (e.g., cigarettes per smoking day) GEE analyses indicated a significant decrease in depressive symptoms (Beta=0.33, SE = 0.15, p=0.03) and time-varying effect of self-reported activation (Beta= -0.13, SE = 0.07, p = .001) such that higher levels of activation co-occurred with lower levels of depressive symptoms throughout the treatment period. These initial results suggest this BA-based treatment is a promising intervention that may reduce smoking and elicit lower levels of depressive symptoms. Additional work is needed with a larger sample in an RCT to replicate results, and examine mechanisms of treatment effects.

Funding: R21 DA029445 (LM).

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POS2-167
SURVEY OF EXPERT RATINGS OF COMMONLY USED SMOKING CESSATION TIPS


Tips designed to help smokers to quit are widely available on the internet and in health education brochures. However, very little research has been conducted to help guide clinicians and health educators as to the most helpful tips. This study aimed to identify the brief pieces of advice (tips) that are perceived to be most helpful by experienced smoking cessation clinicians and researchers. An anonymous online survey of smoking cessation tips was sent via email to all members of SRNT, ATTUD, and to a list of mental health clinicians working on smoking cessation. The survey consisted of over 200 brief smoking cessation tips and included tips that have been widely used (e.g., in CDC publications or on the smoking cessation text messaging intervention that is currently available on smokefree.gov). We invited participants to rate each tip on a 0-4 scale and add comments. 297 participants (65% female) completed the survey. 56% were SRNT members, 36% were ATTUD members and their mean duration of smoking cessation experience was 12 years. 47% were ex-smokers. We found that several widely used tips were not rated highly by experienced smoking cessation clinicians, possibly because of questionable accuracy. For example, “Quitting smoking not only helps your lungs heal, but also improves your night vision” obtained a mean rating of 1.3. Tips we preselected as ‘bad advice’ obtained the lowest ratings. For example, “You well know when the time is right to quit. Don’t rush into it, but wait for the right moment,” obtained a mean rating of 0.99. Tips providing concrete advice to avoid or manage risky situations were rated most helpful. For example, “Think about the things in your life that can trigger the urge to smoke. Make plans on how best to manage these situations,” obtained a mean rating of 3.5. The smoking cessation tips provided in brief interventions and health education materials may be improved by focusing on tips rated most helpful by experienced clinicians and by ex-smokers.

Supported by internal funding from Penn State University.

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POS2-168
EFFECT OF CIGARETTE PACK DESCRIPTORS AND CIGARETTE PHYSICAL DESIGN ON PERCEPTIONS OF APPEAL, SENSORY RESPONSE, AND SMOKING BEHAVIOR

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The FDA has banned cigarette pack text descriptors, such as “light,” “low,” or “mild”, but non-text descriptors such as pack colors and chemoensory descriptor terms such as “smooth” are freely used and these may also influence perceptions of risk and appeal. Further, cigarette physical design features, such as high filter ventilation, may also influence smoker perceptions. The effect of reducing pack descriptors and filter ventilation, on smokers’ perceptions of appeal, sensory effects and health risks were assessed. METHODS: Participants (N=90) were current smokers whose brand of choice was Marlboro Lights/Gold. Using a factorial design, participants were randomized to receive a Marlboro Lights/Gold cigarette presented in one of three pack conditions (1) text descriptors; (2) no text descriptors, and (3) plain pack. All participants smoked two cigarettes, in counterbalanced order, with physical design variations: (1) filter blocked and (2) filter unblocked. Measures of nicotine effect, liking, sensory responses, health risk, and puffing topography were obtained for each cigarette smoked. RESULTS: Pack design and ventilation interacted to influence perceived smoking effect (p=0.007), with the ventilated cigarette producing greater perceived effect as pack descriptors were removed. Liking was affected only marginally (p=0.08). Pack design and ventilation also interacted to influence sensory perceptions of irritation, impact and taste (p≤0.039), with higher ratings observed on plain pack with blocked ventilation. Blocked ventilation produced significantly greater average puff volume, total puff volume and puff number, and total puff volume varied according to the type of cigarette pack presented (p=0.02). Risk perceptions were not influenced by variations in pack design or ventilation. CONCLUSIONS: Variation in filter ventilation interacts with pack descriptors to influence sensory response and product appeal, but not perception of risk, among “lights” smokers. Physical design features which promote appeal may be regulated by the FDA, and such features should be evaluated in the context of their accompanying product packaging.

Funded by National Cancer Institute grant R01-CA1-25224.

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POS2-169
DO PARENTS WHO SMOKE WANT THEIR CHILD’S PEDIATRICIAN TO ADDRESS THEIR SMOKING – AND DOES IT OCCUR?

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BACKGROUND: The pediatric visit provides a teachable moment for physician intervention on parental smoking. A barrier for some pediatrics is their perception that parents may react negatively or not be interested. METHODS: This analysis examines parental perceptions and receipt of intervention in 10 control practices in a national trial, Clinical Effect Against Secondhand Smoke Exposure (CEASE) in Pediatic Research in Office Settings (PROS) practices. Following a pediatric visit, 981 smoking parents across practices were initially enrolled through exit interviews; of these, 681 (69.42%) were reached for a 3 month telephone interview that included assessment of attitudes towards pediatrician intervention. Of the 681, 430 (63.1%) had an additional visit to the pediatric office since enrollment and were asked additional questions about interventions received. RESULTS: Most parents (83.3%) agreed that parents who smoke should be offered help at the pediatric visit, and that it was acceptable for their child’s doctor/health provider to talk to them about their smoking (55.5% very acceptable; 29.8% somewhat acceptable; only 3.7% not at all acceptable). Yet, few reported receiving an intervention: 24.8% were asked if they smoked and 21.3% were advised to quit, 31.1% were asked about and 29.4% were advised to have a smokefree home, and 24.1% were asked about and 23.8% advised to have a smokefree car. Only 11.7% received cessation materials, 7.5% discussed quit strategies other than medications and 9.6% were referred to a program such as a quitline. Regarding medications, 75.3% thought parents should be offered prescriptions for medications to help them quit at their child’s visit, though only 8.2% reported that medications were discussed. CONCLUSIONS: These results indicate a high level of interest by parents in receiving cessation interventions at the pediatric visit, but a very low level of intervention. Effectively engaging pediatricians in interventions for parents who smoke appears acceptable to parents and has potential for public health impact to reduce parental smoking and exposure of children to secondhand smoke.

Funded by the National Cancer Institute grant R01-CA127127 (Winickoff, PI), the National Institute on Drug Abuse, and the Agency for Healthcare Research and Quality. This study was also partially supported by a grant from the Flight Attendant Medical Research Institute to the AAP Julius B. Richmond, Center, and
the Pediatric Research in Office Settings (PROS) Network, which receives core funding from the HRSA MCHB (HRSA 5-UA6-10-001) and the AAP.

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POS2-170
THE ROLE OF TRAUMA EXPOSURE AND PTSD SYMPTOMS IN TOBACCO USE BEHAVIOR BEFORE, DURING, AND AFTER MILITARY DEPLOYMENT

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Military service members have a high prevalence of tobacco use and Posttraumatic Stress Disorder (PTSD). Individuals with PTSD have among the highest prevalence estimates for tobacco use. Few studies have examined the effect of military deployment on tobacco use or investigated associations between deployment trauma exposure, PTSD, and tobacco use. 2213 U.S. service members deployed in support of OEF/OIF (50.9% female; mean age=35.53; 74.2% Caucasian), reported on tobacco use pre-, peri- and post-deployment and completed the Deployment Risk and Resiliency Inventory and the PTSD Checklist. Tobacco use prevalence estimates were 37% pre-, 46% peri- and 31% post-deployment. Exposure to combat and harassment during deployment was associated with initiation of tobacco use during deployment (OR=1.48, 95% CI=1.24,1.77; OR=1.41, 95% CI=1.21,1.65). Tobacco use during deployment was associated with PTSD symptoms post-deployment (controlling for trauma exposure; T2=2.54, p<01). Post-deployment PTSD symptoms were related to post-deployment tobacco use (among tobacco users during deployment; controlling for combat experiences and pre-deployment tobacco use; OR=1.28, 95% CI=1.04,1.50). Tobacco use increased substantially during deployment and exposure to traumatic stressors may partially explain this increase. Tobacco use and PTSD may have a mutually detrimental relationship wherein deployment tobacco use is associated with increased PTSD symptoms post-deployment and post-deployment PTSD symptoms are associated with continued tobacco use. Tobacco cessation interventions for individuals with PTSD are indicated.

Funding: National Center for PTSD, Office of Mental Health Services, Department of Veterans Affairs.

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POS2-171
RADIATION ONCOLOGY PATIENT’S PREFERENCES FOR TOBACCO CESSATION TREATMENT

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Objectives: To gather information from Radiation Oncology patients on how to tailor a multidisciplinary smoking cessation and relapse prevention intervention. Methods: The authors used a purposeful sampling method of selecting patients seen in Radiation Oncology for structured open-ended interviews (n=12, 9 men, 3 women; mean age 54), to assist in developing a smoking cessation intervention that was tailored to meet the specific needs both of current smokers and recent ex-smokers undergoing radiation therapy. Separate interviews were conducted for current smokers and recent ex-smokers. Interviews were audio taped and transcribed verbatim. Prevailing themes were distinguished using methods of content analysis. Results: The major findings were: (1) Compared to the smokers, the recent ex-smokers were more likely to have been told about the adverse effects of smoking on radiation therapy. (2) Both groups questioned the sincerity of their health provider in helping them stop smoking. (3) Both groups felt that an individually tailored intervention given by and for radiation oncology patients would be helpful. Conclusions: Radiation Oncology patients who smoke or recently quit smoking have different expectations, needs and goals for tailored smoking cessation and relapse prevention strategies.

Y.I. Garces was supported by Mayo Clinic CR20 Funding.

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POS2-172
THE ROLE OF PROBLEMATIC ALCOHOL USE IN TERMS OF BARRIERS TO CESSATION AMONG DAILY SMOKERS

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It has been well established that there are significant associations between cigarette smoking and alcohol use. Indeed, smokers drink alcohol more frequently and in greater amounts than non-smokers (Kahler et al., 2008), resulting in significantly poorer health outcomes (Brett et al., 2009). Unfortunately, greater alcohol use also decreases the odds of successfully quitting smoking (Kahler et al., 2009). In fact, approximately one-fourth of smoking lapses during a quit attempt occur in situations where alcohol is consumed (Shiffman, 1982). As alcohol consumption has been found to be associated with increases in both smoking urges and smoking rate (Sayette et al., 2005), greater nicotine dependence and resulting withdrawal symptoms may be one reason why problematic alcohol use among smokers is associated with poorer cessation outcomes. Thus the purpose of the current study was to examine the predictive ability of problematic alcohol use in terms of nicotine dependence and perceived barriers to cessation among adult daily smokers. It was hypothesized that greater alcohol use problems would be predictive of greater nicotine dependence and addiction-related, but not internal or external, perceived barriers to cessation. Participants were 126 daily smokers (n = 88 males; Mage = 36.5, SD = 13.05) who smoked an average of 18.5 (SD = 6.7) cigarettes per day. As expected, after controlling for nicotine variance accounted for by gender, race, and smoking rate, alcohol use significantly predicted level of nicotine dependence (3.5% unique variance) and barriers to smoking cessation related to addiction (7.1% unique variance). Alcohol use did not significantly predict internal or external barriers to cessation. These findings suggest that smokers who report problematic alcohol use may have greater difficulty quitting smoking because of greater withdrawal symptoms as well as fears that they will experience strong urges and cravings for a long period of time. Thus, smoking cessation interventions for this population would benefit from greater emphasis on nicotine replacement therapy as a quit aid and cognitive restructuring targeting these quitting expectancies.

No funding.

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POS2-173
PRE-QUIT DEPRESSIVE SYMPTOMS, AFFECT AND QUIT DAY CESSATION AMONG DAILY SMOKERS

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Aim: Depressive symptoms and negative affect have been shown to predict poor smoking cessation outcomes. This study examined to evidence the effects of sequential pharmacotherapy with fluoxetine (20 mg.), a selective serotonin reuptake inhibitor (SSRI), for smoking cessation on depressive symptoms and negative and positive affect in the 8 weeks prior to a smoking cessation attempt, and to assess the effects on initial, 24-hour cessation outcomes. Method: Data reported are from a randomized, double-blind, placebo controlled trial of sequential fluoxetine treatment in 189 smokers with elevated depressive symptoms (CES-D > 6). Treatment duration was 16 weeks, including 8 weeks prior to quit day. Results: GEE models revealed that those in the fluoxetine condition, compared to placebo, reported significantly lower overall levels of depressive symptoms and negative affect in the weeks prior to quit day, controlling for baseline levels. Furthermore, a significant treatment X nicotine dependence interaction was found, such that...
smokers with higher nicotine dependence who received fluoxetine had the lowest negative affect during the pre-quit period. No treatment effects on overall levels of positive affect prior to quit day were found. With regard to 24-hour cessation outcome, no significant difference was observed between fluoxetine and placebo treatment, controlling for baseline variables. However, a significant treatment *X* nicotine dependence interaction effect on cessation outcome was found such that the negative impact of nicotine dependence on initial cessation success was not observed in the fluoxetine condition. Conclusion: Sequential fluoxetine treatment, as predicted, alleviated depressive symptoms as well as negative affect prior to a quit attempt. Although no overall difference in cessation success on quit day was observed between treatment conditions, findings suggest that especially for high dependent smokers with elevated depressed symptoms, fluoxetine treatment may help attenuate pre-quit aversive mood states and lead to higher rates of smoking cessation on quit day, the first important cessation milestone.

Supported in part by grant 1R01 DA023190 from the National Institute on Drug Abuse to R.A. Brown.

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### POS2-174

**SMOKING AND BREASTFEEDING: CHARACTERIZING THE RELATIONSHIP AND ITS PREDICTORS AMONG A SAMPLE OF SPONTANEOUS QUITTERS**


There is a strong association between smoking status and breastfeeding (BF), with smokers weaning earlier than non-smokers (Horta et al., 2001). The purpose of the present study was to provide a fine-grained characterization of the relationship between smoking status and BF among women who quit smoking during pregnancy (i.e., spontaneous quitters). We hypothesize that abstainers will BF longer than women who relapse in the postpartum (PP). Study participants were 118 women who were participating in clinical trials on preventing relapse. They received incentives contingent on sustaining abstinence or independent of smoking status through 12-week postpartum (see Higgins et al., 2012 for a review). All women were biochemically verified as being abstainers or smokers at 2-, 4-, 8-, 12-, and 24-weeks PP. Self-reported BF status was also collected at these time points. BF rates between smokers and abstainers were completed using chi-square analysis. Univariate and multivariate analyses were also conducted to examine variables associated with long-term BF and smoking abstinence. The percent of women BF at 2-, 4-, 8-, 12- and 24-weeks PP were 81, 72, 59, 50 and 30 among abstainers compared to 4, 4, 4, 6 and 11 among smokers (p < .05 for 2-12 weeks and p = .07 at 24 weeks). Regarding the univariate and multivariate analyses, higher education was significantly associated with sustained BF, older maternal age and fewer depressive symptoms were significantly associated with long-term abstinence, and only higher education was a predictor of both outcomes (all p < .05). This study confirms prior observations regarding a robust relationship between cigarette smoking and premature weaning that is evident within 2 weeks through 24-weeks PP. Younger, more depressed women are more likely to resume smoking and discontinue BF. Higher education appears to be a protective factor for continuing BF when examining as a single variable, as well as sustaining healthy behavior combinations such as BF and smoking abstinence. Improved interventions to prevent relapse back to smoking are likely to also increase BF.

Funding: R01DA014028 and T32DA007242.

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### POS2-175

**A PILOT FOCUS GROUP STUDY OF NURSING STUDENTS’ EXPERIENCE WITH SMOKING AND KNOWLEDGE OF ADDICTION**

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Healthcare providers, such as nurses, are in a position to help smokers quit. While, current nursing school curriculum includes health effects of smoking, it is helpful to understand nursing students’ knowledge of the processes of change to quit smoking. Using a non-experimental mixed methods design, a pilot study among a convenience sample of 161 undergraduate nursing students enrolled in a southeastern university was conducted. Smoking status among nursing students was assessed using a survey which included questions about current smoking; students were also asked if they would be willing to participate in a focus group. Data from the survey indicated that 77% were never smokers and 16% were former smokers; only 7% were current smokers. The present findings are based on themes identified from transcribed focus group data among never smokers (n=7) and former smokers (n=5). Focus group instrument included questions to assess knowledge about smoking cessation and quitting assistance to patients. In particular, among nursing students who never smoked there was less understanding of nicotine addiction, which may imply that these nurses may require further training about the various aspects and challenges patients may face when trying to quit smoking. Among former smokers, there was a better understanding of the processes of change and three themes were identified: motivators to quit, barriers to quit, and strategies used to quit smoking. Insights that emerged from this pilot study indicate innovative strategies to enhance nursing school curriculum to help nursing students have a better understanding of nicotine addiction and strategies to quit smoking. Additionally, focus group findings indicate that among former smoking nursing students, their own experience with quitting may guide practice and address gaps in nursing curriculum related to helping patients quit. Given this is a pilot study, further studies are needed.

Funding: Center for Disease Control and Prevention.

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### POS2-176

**ALLOPREGNANOLONE AND PERCEIVED STRESS DURING SHORT-TERM SMOKING CESSION**

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Background: Smokers report that the most common cause for relapse is stress. Allopregnanolone (ALLO) is a neuroactive steroid metabolized primarily from progesterone and may protect against both stress and drug abuse behaviors. Therefore, the purpose of this project is to examine the association between ALLO and perceived stress during short-term smoking cessation in a sample of premenopausal women. Methods: Study participants complete a controlled cross-over study in which they were randomized to complete two testing weeks in the follicular (F) menstrual phase followed by the luteal (L) phase or vice versa (L-F). The testing week consisted of two days of ad libitum smoking followed by four days of biochemically verified smoking abstinence. Blood samples were collected on the day before quit date and on the fourth day of smoking abstinence. Participants completed the Cohen Perceived Stress Scale (PSS) daily during the testing week. Descriptive statistics were computed to describe the study sample and ALLO levels. Linear growth curve models, adjusted for menstrual phase and testing order, were used to assess the effect of ALLO on PSS. Results: Participants (n=62) were, on average, 30.3±6.7 years old and smoked 12.5±4.9 cigarettes/day. The majority of participants were White (55%) and had at least a high school education (77%). Higher absolute levels of ALLO on the day before quit date were associated with lower levels of PSS on the day before quit date (β= -2.25, p<0.01), as well as with a greater change in PSS during smoking cessation (β= 0.79, p<0.01). Further, a significant, positive association between change in ALLO and change in PSS during smoking cessation was observed (β= 0.17, p<0.01).

Conclusion: Regardless of menstrual phase, higher absolute levels and less change in ALLO appear to be favorable during short-term smoking.
cessation. These seemingly different patterns of association may be associated with hormonal changes during smoking cessation. Additional research is needed to investigate the effect of this association on smoking cessation outcomes.

Funding: NIDA R01-DA08075, NIDA R36-DA032539 and the J.B. Hawley Award, University of Minnesota.

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POS2-177
THE RELATIONSHIP BETWEEN PERINATAL CIGARETTE SMOKING AND POSTPARTUM DEPRESSION: AN ANALYSIS OF PRAMS DATA

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This study examined the relationship between perinatal cigarette smoking and postpartum depression from a large national sample of women in the United States. Estimates of perinatal cigarette smoking and postpartum depression were based on data collected from the 2004-2008 Pregnancy Risk Assessment Monitoring System (PRAMS). The study sample consisted of 29,731 women who reported any cigarette smoking in the three months prior to pregnancy and for whom data on postpartum depression was available. Pre-pregnancy smoking was compared with postpartum smoking and categorized as quit/decreased and no change/increased. Postpartum depression was defined as present if the respondent answered "often" or "always" to the question "Since your baby was born, how often have you felt down, depressed, or sad?" Overall 50% of the women quit or decreased cigarette smoking during pregnancy and 17% reported postpartum depression. Overall women who quit or decreased smoking were significantly less likely to report postpartum depression compared to women who had no change or increased smoking (13% vs. 19%, p<0.001). After controlling for known confounders, women whose smoking increased or stayed the same had 1.21 times the odds of reporting postpartum depression (95% CI:1.11, 1.32) compared with women who quit or decreased. These findings suggest a link between perinatal cigarette smoking and postpartum depression that may inform smoking cessation interventions as well as the screening, prevention, and treatment of postpartum depression.

No funding.

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POS2-178
TIME-VARYING EFFECTS OF MOMENTARY POSITIVE AND NEGATIVE AFFECT ON SMOKING IN ADOLESCENTS

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Little is known about the most proximal (i.e., momentary) correlates of smoking behavior among adolescents who are in early stages of developing regular smoking behavior. Theoretical work on addiction has postulated that positive reinforcement of nicotine drives initial cigarette use, while negative reinforcement, via dependence symptoms, drives smoking behavior once regular patterns have emerged. The current work uses sophisticated time-varying effect models (TVEM) of ecological momentary assessment (EMA) data from 746 adolescents who were oversampled for recent-onset and light smoking and followed for 2 years. We examine the hypotheses that (1) higher negative affect precedes heavier smoking, and this relationship strengthens over time, and (2) higher positive affect follows heavier smoking, but this relationship weakens over time. TVEMs were run on week-long EMA data from each of 4 assessment waves taking place at baseline and 6, 15, and 24 months later, and were run separately on experimenters (<100 cigarettes/life and smoked in the past 90 days at baseline; N=594) and current smokers (>100 cigarettes/life and smoked in the past 30 days; N=152). Results showed that momentary negative affect immediately preceding smoking, and positive affect immediately following smoking, were both higher with increased amounts of smoking. For experimenters, the magnitudes of these associations remained stable across 24 months. However, the current smokers showed nonsignificant trends in the strengths of these relationships over the same period, such that increased smoking became more strongly associated with preceding negative affect, and more weakly associated with subsequent positive affect. Taken together, our results suggest that while TVEMs are a useful tool for capturing emerging relationships between mood and smoking, changes on small time scales may reflect sources other than the relationships of interest (e.g., self-censoring).

Supported by Project Grant R01 CA089262 (Mermelstein) from NCI, R01 DA022313 A2, R01 DA022313 S1 (Dierker), R21 DA029834-01 (Rose), and R21 DA024260, P50 DA010075 (Li) from the NIDA, and Center Grant P50 DA010075 awarded to Penn State University.

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POS2-179
SMOKING PATTERNS IN FIRST YEAR COLLEGE STUDENTS: TRENDS, CORRELATES, AND OUTCOMES

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Objective: Currently, young adults (18-24 years of age) are the age group with the highest prevalence of smoking in the US. Unlike older age groups, this age group frequently engages in light and intermittent smoking. It remains unclear how stable such smoking patterns are over time, or if they develop into daily, heavy smoking. This study describes patterns of smoking during the first year of college and links them to smoking outcomes 3 years later. Method: Incoming college students at 3 institutions (n=1,054, 3 cohorts) were recruited (43%) to complete online biweekly surveys of their daily substance use in the preceding week throughout the first year of college. Two cohorts also completed a survey at the end of college. Students who reported smoking at least 1 cigarette during the first year of college (25%) are included in this study (70% female, 74% White). Results: Group-based trajectory modeling (using SAS Proc Traj) on the number of smoking days per week identified five groups of smokers: ever triers (40%), late triers (12%), early triers (13%), occasional smokers (14%; 2-3 days per week), and frequent smokers (21%; 5-6 days per week). Daily-level analysis of the number of cigarettes smoked per day (zero-inflated Poisson models; 126 observations per person) indicated that these groups differed on several smoking characteristics, including cigarettes smoked per day, weekday smoking, smoking vis-à-vis alcohol use, and trends over time. By the end of college, frequent smokers were more likely than the other groups to be daily smokers (52.6% vs. 16.7% or less; OR=17.9 [3.9-74.5] compared to ever triers); ever triers were most likely to no longer smoke at all (77.5% vs. 50.0% or less; OR=7.5 [2.3-24.3] compared to frequent smokers). A substantial proportion of early triers (38%), late triers (33%) and occasional smokers (47%) continued to smoke on several days per week. Conclusions: While there was a diversity of smoking patterns, smoking behaviors remained relatively stable during the first year of college. Only frequent smokers were likely to be daily smokers by the end of college.

This study was supported by grants from the National Institute on Alcohol Abuse and Alcoholism (R01AA013970) and the National Institute on Drug Abuse grant (K01DA027097).

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POS3-1
DIFFERENCES BETWEEN SMOKERS AND DUAL USERS ON EXPECTANCIES FOR CIGARETTE SMOKING OUTCOMES
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Many individuals who concurrently smoke cigarettes and use smokeless tobacco products smoke cigarettes as their tobacco product of choice and use smokeless tobacco products when cigarette smoking is not permitted (e.g., indoors; McClave-Regan & Berkowitz, 2011). Further, smokeless tobacco products are commonly used as a method of harm reduction for smoking cessation when an individual does not want to give up tobacco completely, though this method is not always viewed as appropriate (Mejia, Ling, & Glantz, 2010). In fact, some researchers suggest that smokers, who turn to another tobacco product for smoking cessation purposes, could end up as dual users. Many cigarette smokers in the United States however, are unwilling to switch to smokeless tobacco as a means of harm reduction (Zhu et al., 2009). This desire to continue smoking without augmentation with smokeless tobacco implies a lack of interest in these products, as well as high positive expectancies for cigarettes. Thus, individuals who only smoke cigarettes may have stronger positive expectancies for cigarettes, compared to dual users, who are willing to use other forms of tobacco. The goal of the present study was to examine differences in smoking expectancies between dual users and smokers using the short form of the Smoking Consequences Questionnaire, by comparing mean subscale scores between groups. Results showed that significant differences were found between dual users and smokers on the Positive Reinforcement, Negative Consequences, and Negative Reinforcement subscales. There were no significant differences between groups on the Appetite/Weight Control subscale, F(1, 305) = 1.84, p > .1. Smokers had higher positive reinforcement expectancies compared to dual users, suggesting their reluctance to switch to smokeless tobacco products as a means of harm reduction, F(1, 305) = 4.34, p < .05. Dual users had higher expectancies for negative reinforcement from smoking. F(1, 305) = 8.82, p < .01, as well as higher expectancies regarding negative consequences that can occur from cigarette smoking, F(1, 305) = 4.98, p < .05, which may explain why these individuals chose to use smokeless tobacco as well.

No funding.

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POS3-2
THE ACUTE EFFECTS OF PHYSICAL ACTIVITY ON CIGARETTE CRAVINGS: EXPLORATION OF POTENTIAL MODERATORS, MEDIATORS, AND PHYSICAL ACTIVITY ATTRIBUTES USING INDIVIDUAL PARTICIPANT DATA META-ANALYSES
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A review revealed that a short bout of physical activity (PA) reduces Strength of Desire (SoD) and Desire to Smoke (DIS) by about 30% (Haasova et al 2012). The present study aimed to identify factors influencing this relationship, such as exercise intensity. Individual participant data (IPD) from 19 studies were included. One-stage IPD meta-analyses compared participants engaging in PA against controls, using post-intervention SoD and DIS with baseline adjustments. The cravings scales were extrapolated to 0-100% to facilitate interpretation of the results. Covariates including demographic and smoking characteristics were included in the analyses as potential predictors of reductions in cravings or moderators of the effect of PA. Baseline to post treatment changes in the Feeling of Desire (SoD) and Desire to Smoke (DtS) by about 30% (Haasova et al 2012). One-stage IPD meta-analysis of SoD (797 observations) yielded a mean difference in cravings compared to controls of -10.37 (-17.03; -3.72) for light, and -36.15 (-46.57; -25.73) for moderate intensity PA. Results for vigorous PA were similar to those for moderate PA. All intensities of PA are helpful in decreasing acute cigarette cravings, with moderate intensity PA offering increased benefit compared to light intensity; however, vigorous activity did not confer additional benefits.

The research was conducted with the support of internal institutional funds. The authors have received no other direct or indirect support, and none of the researchers have any connection with the tobacco or pharmaceutical industries or any body substantially funded by one of these organisations.

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POS3-3
EFFECTS OF SMOKELESS TOBACCO (SNUS) ADMINISTRATION ON EXERCISE ENDURANCE IN MEN
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There are anecdotal reports that some winter sport athletes used smokeless tobacco (Snus). However, there are no studies whether this is a socio-cultural habit or a sought psychobiological effect. The aim of this study was to investigate the effects of Snus (SS) on the perception of fatigue during an endurance exercise. The study was a double-blind placebo controlled (SP) crossover design study. We recruited 14 non-smokers (breath CO confirmed) men (age 22.8 ± 4.6 years; means ± SD). Subjects were studied during three sessions on cycle ergometer: experimental session 1 (EXP1) consisted on an incremental exercise test to determine VO2max (maximal oxygen uptake) and Wmax (maximal aerobic power output); EXP2 and EXP3 consisted on SS or SP administration followed by an exercise at 65%, Wmax until exhaustion. During the EXP2 and EXP3 the global rating of perceived exertion (RPE) was recorded, using the 15-point Borg scale every 5min until the end of the session. Blood samples were taken in order to assess nicotine plasma levels during the session. Detected plasma nicotine level was 7.31 ± 1.76 ng/ml (means ± SD) in 7 subjects for SS and 3.26 ± 0.12 ng/ml (means ± SD) in 3 subjects for SP. In three subjects nicotine was not detectable. Seven out 13 subjects cycled for longer during the SS vs. SP session: time to exhaustion was 60.4 ± 41.5 min after SS and 48.8 ± 19.4 min after SP; paired Student’s t-test showed that a 18.6% increase was not significant. RPE at 25%, 50%, 75% and 100% of exhaustion time increased during both session; however, no differences were observed between the two conditions. In conclusion, the study showed that SS does not change RPE compared to placebo condition; this means that the sought effect could not be an improvement of fatigue during an endurance exercise until exhaustion.

No funding.

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POS3-4
THE IMPLICATIONS OF CUE VALENCE IN AN ADOLESCENT AND ADULT NICOTINE STROOP STUDY
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Background: Attentional bias for smoking-related information has been implicated in the development and maintenance of smoking behaviour, but nicotine Stroop research has yet to examine the age related differences associated with attentional bias. Furthermore, the effect of cue-valence has yet to be clearly investigated in smoking Stroop research. This study aimed to examine attentional bias in the modified-Stroop task in older and younger current and never smokers, and to examine the impact that image valence has on attentional bias across all groups. Method: 86 smokers (15-18yrs: 30, 19-40: 56) and 96 never smokers (37, 59) completed a blocked pictorial Stroop task containing 7 smoking positive, 7
smoking negative, 7 general positive, 7 general negative, and 7 neutral images. Block, and image within block, sequences were randomised. Results: A2 (smoking status) X 2 (age) X 5 (image type) analysis revealed a 3-way interaction (p<.05). Smoker status analysis revealed an age by image interaction for smokers only. Planned comparisons revealed that adolescent and adult smoker RTs for smoking negative images (M=913.69; M=920.41 respectively), were significantly larger than neutral images (M=806.32; M=778.29). Similarly, adolescent and adult smoker RTs for general negative images (M=848.85; M=611) were also significantly larger than for neutral images. Between group t-tests for each image type separately revealed that adolescent smokers RTs were significantly larger than adult smokers for smoking negative, smoking positive and general positive images (p<.05). There were no differences for general negative and neutral images. Discussion: Adolescent and adult smokers show an attentional bias for smoking negative images that may be partly explained by a similar, albeit smaller bias for general negative imagery. Interestingly, younger smokers demonstrated larger RT’s for all smoking images, compared with older smokers, suggesting that smokers in the early phases of smoking are more drawn to environmental smoking cues than more experienced smokers. This result cannot be explained by cue valence alone as no between group differences emerged for general negative images.

No funding.

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POS3-5
NICOTINIC MODULATION OF COGNITIVE FUNCTION: CLINICAL UTILITY FROM ADHD TO ALZHEIMER’S DISEASE
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Nicotine has long been known to affect cognitive function. Recent advances allow for increase specificity of the domains of function that appear to be regulated by nicotinic acetylcholine receptor function. Deficits in executive function, decision making, impulsivity, attentional control, set shifting, and reward processing are seen in a range of psychiatric illnesses including ADHD and neurodegenerative diseases such as Alzheimer’s disease. This has led to the proposal that nicotinic receptor agonists may improve cognitive function and related clinical symptoms. Data from human studies examining the effects of pharmaceutical manipulations of nicotinic acetylcholine receptor function on cognitive functions will be presented. Relevant data from diverse clinical populations including ADHD, mild cognitive impairment, and Alzheimer’s disease will be presented to illustrate a potential role of nAChR receptors in cognitive deficits and behavioral control in these disorders. Nicotine and novel nicotinic agonists are associated with improvements in cognitive domains that are relevant for disorders including ADHD and Alzheimer’s disease. Cognitive benefits are seen with both acute and chronic drug administration suggesting the viability of targeting nAChR receptors therapeutically. Studies of nicotinic receptor antagonists further support nicotinic regulation of core cognitive processes in these psychiatric illnesses. These findings support the further study of therapeutic agents targeting nicotinic cholinergic receptors for treatment of cognitive and behavioral dysfunction in ADHD and Alzheimer’s disease.

Support for this research was provided by the National Institute of Mental Health (AP), the National Institute on Aging (PN), and NARSAD (AP).

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POS3-6
THREE MEASURES OF TOBACCO DEPENDENCE INDEPENDENTLY PREDICT CHANGES IN NEURAL STRUCTURE
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Studies have demonstrated moderate correlations between fractional anisotropy (FA, a measure of neural organization), and Fagerström Test for Nicotine Dependence (FTND) scores in various white matter brain structures (r=.52 to -.64). FA increases with smoking in adolescents, but in adult smokers FA declines with the progression of physical dependence. We examined correlations between FA and 3 measures of tobacco dependence: the FTND, Levels of Physical Dependence (PD), and the Hooked on Nicotine Checklist (HONC). Using a whole brain analysis, we compared white matter FA in 8 smokers and 10 nonsmokers and plotted the location of maximal correlation between FA and each dependence measure. FA trended higher in smokers than nonsmokers in the left dorsal anterior cingulate (ACC) (p=0.05). Among smokers, plots of the maximal correlation for all 3 measures fell within a very circumscribed area of the left dorsal ACC, showing excellent concordance of results across measures. The maximal non-thresholded correlation with FA was r=.78 for the FTND, -.83 for the PD, and -.85 for Levels of PD (p<0.05). The thresholded values were -92 for the FTND, -97 for the HONC, and -.97 for Levels of PD (p<0.05). These data establish the validity of all 3 dependence measures against a measure of neural structure. HONC symptoms are reported by one third of adolescents who have smoked 4 cigarettes in their lifetime and by 95% of those who have smoked 100 cigarettes. The rapid development of HONC symptoms implies that changes in neural density begin with the first cigarettes. This conclusion is supported by an MRI study showing a significant increase in tissue density in the cingulate cortex and a trend in the same direction in the nucleus accumbens and prefrontal cortex in rats that had received only 4 doses of nicotine, and by a rat study showing that nicotine exposure stimulated dendritic proliferation in the latter two structures.

Internal funding from the University of Massachusetts Medical School.

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POS3-7
A TEST OF THE SENSITIZATION-HOMEOSTASIS MODEL OF NEUROPLASTICITY IN ADDICTION
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Only a few intermittent exposures to nicotine are required to produce neuroplastic changes in the brains of rats and symptoms of tobacco dependence in adolescents. Ten years ago the sensitization-homeostasis model was presented at SRNT to offer a mechanism by which a brief exposure to nicotine might trigger addiction. The model holds that nicotine inhibits the neural network that produces craving, that neuroplastic adaptations develop quickly to counter the action of nicotine by stimulating the craving network, and that these neural adaptations continue to stimulate the craving network whenever a smoker goes too long without smoking, causing withdrawal-induced craving. The advent of resting-state functional connectivity (rsFC) MRI, which measures coordination of brain activity during rest, has made it possible to test this model. rsFC was examined in 8 smokers under 2 conditions, after an abstinence of 11 hours, and 15 minutes after smoking to satiety. Subjects rated their craving for a cigarette after each scanning period of abstinence. In lay terminology, smoking appears to hard-wire the brain with the intensity of craving. These data support the proposition that smoking spontaneously during withdrawal; and (4) rsFC in this circuit correlates well (r=.74) with the intensity of craving. These data establish the validity of all 3 dependence measures against a measure of nicotine dependence. FTND scores are reported by one third of adolescents who have smoked 4 cigarettes in their lifetime and by 95% of those who have smoked 100 cigarettes. The rapid development of FTND symptoms implies that changes in neural density begin with the first cigarettes. This conclusion is supported by an MRI study showing a significant increase in tissue density in the cingulate cortex and a trend in the same direction in the nucleus accumbens and prefrontal cortex in rats that had received only 4 doses of nicotine, and by a rat study showing that nicotine exposure stimulated dendritic proliferation in the latter two structures.

Internal funding from the University of Massachusetts Medical School.

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POS3-8  
FOUR NEW MEASURES OF TOBACCO DEPENDENCE OPTIMIZED FOR BIOLOGICAL RESEARCH  
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Biological research requires valid and reliable measures of the biologically-based aspects of dependence. Traditional dependence measures focus on behaviors (e.g., patterns of use), that can be constrained by sociocultural factors such as cost and restrictions on smoking. When dependence measures reflect non-biological factors, they are less suitable for biological research. We will present new data concerning new tobacco dependence measures that assess only biologically-based symptoms. The Levels of Physical Dependence (PD) is a 3-item instrument that assesses how subjects experience the urge to smoke that is triggered by withdrawal. It provides a quantitative measure of a person’s progression along 4 levels of PD. As all tobacco users progress through the 4 levels of PD in the same sequence, biological events associated with level 2 must precede events associated with level 3. This measure provides a unique and valuable time perspective to the interpretation of data. The Hooked on Nicotine Checklist assesses 10 symptoms of dependence. It’s excellent sensitivity and reliability allowed it to demonstrate a nearly perfect correlation (r=-.97) with changes in neural density that accompany the progression of PD. The Latency to Withdrawal (LTW) is a single item subjective measure of the length of time a person can forgo the use of tobacco before experiencing a withdrawal-triggered urge to smoke. Valid values for the LTW vary from minutes to weeks. The LTW is an important biological factor to consider in studying withdrawal and cue-induced craving and was critical to the success of our studies. Momentary Craving evaluates the strength of craving at the time of assessment. While there are valid multi-item measures of momentary craving, we found that a simple 100mm visual analog scale anchored at none and a ‘great deal’, produced fine-grained quantitative data that correlated well with neural activity (r=.75). By focusing on the subjective symptoms of dependence rather than the behaviors prompted by those symptoms, the measures discussed here are all universal measures, that is, they are valid for all forms of tobacco use and with tobacco users of all ages.  
Internal funding from the University of Massachusetts Medical School.  
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POS3-9  
A PILOT STUDY OF A MODIFIED ACCEPTANCE AND COMMITMENT THERAPY TOBACCO CESSATION TREATMENT FOR VETERANS WITH PTSD AND A HISTORY OF ALCOHOL USE DISORDERS  
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Veterans with both posttraumatic stress disorder (PTSD) and a history of an alcohol use disorder are likely to have high rates of smoking and difficulty with tobacco cessation. Veterans with current PTSD, in remission from an alcohol use disorder, and smoking ≥ 15 cigarettes/day participated in an open trial of Acceptance and Commitment Therapy for Veterans with PTSD and Tobacco Use (ACT-VPT). Participants attended 9 weekly individual counseling sessions and received 8 weeks of the nicotine patch. Participants were assessed with standard measures. Primary outcomes included expired-air carbon monoxide confirmed 7-day point prevalence abstinence and number of cigarettes/day at the end of treatment, as well as abstinence from alcohol use. Intent-to-treat analyses examined pre-treatment to post-treatment scores. At the end of treatment, 31% of participants were abstinent from smoking. At the one-month and three-month follow-up assessments, 31% and 7% were abstinent from smoking, respectively. Participants reduced from 26 cigarettes/day at baseline to 10 cigarettes/day at end of treatment (p<.001), 11 cigarettes/day at the one-month follow-up (p<.001), and 15 cigarettes/day at the three-month follow-up (p=.004). No veterans relapsed on alcohol during the study period. PTSD symptoms significantly decreased at both the one-month and three-month follow-ups. These results suggest that ACT-VPT is associated with high short-term tobacco outcomes for veterans with PTSD and a history of an alcohol use disorder.  
This material is based upon work supported by the Department of Veterans Affairs, Veterans Health Administration, VISN 1 Early Career Development Award to M.M. Kelly and VISN 1 MIRECC funding.  
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POS3-10  
IMPLEMENTING A MULTI-MODAL CURRICULUM TO IMPROVE TOBACCO DEPENDENCE TREATMENT SKILLS AMONG MEDICAL STUDENTS: THE MSQUIT TRIAL  
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Tobacco treatment training for use of the 5As in medical schools is limited and lacks a standardized or evidence-based approach. To address this gap the MSQuIT (Medical Students helping patients Quit Smoking) trial compares the effectiveness of a Multi-Modal Education (MME) approach (web-based course, a role play component, clerkship preceptor training by academic detailers (AD), and a booster session) to Traditional Education (TE) for increasing medical students’ tobacco treatment skills as measured by the Objective Structured Clinical Exam (OSCE). First year medical students responded to a baseline survey and will respond again in their 3rd year reporting on their tobacco coursework, treatment training, and knowledge and skills to conduct tobacco dependence treatment. In addition to the OSCE, the follow-up survey will measure self-reported tobacco treatment skills and tobacco treatment behavior. Using a pair-matched design, 10 U.S. schools were randomized to one of two conditions, TE and MME, to test the theoretically-based training program for medical students in years 1, 2 and 3. We report on the study design, the conceptual model of the MME intervention, and implementation of each intervention component as measured by the percent of students who participated in each. Intervention implementation measures include: the percent of students who participated in the web-based course, and in the role plays. We also examined the percentage of preceptors who were trained by ADs (i.e. Clerkship Directors). For each component we will discuss how we addressed implementation challenges in each medical school. Across the five intervention schools, 92% of students completed the baseline survey. Participation from the web-based course ranged from 62% to 100% across schools, and ranged from 56% to 100% for the student role-play. Preceptor participation in the Academic Detailing session ranged from 70% to 92%. The medical school setting is an important place to provide training for tobacco treatment. Guidelines for implementation need to be flexible so that they can fit within the context of each medical school, and leaders need to be committed to its implementation.  
Funded by the National Cancer Institute Grant R01 CA63688 to J. Ockene.  
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and self-confidence to help smokers quit smoking. We invited 10 Faculty from Universities in Egypt, Iraq, Jordan, Lebanon, Saudi Arabia, and United Arab Emirates. Although a majority replied with interest, only one faculty from Oman participated in our tobacco training. Implementing our training program required flexibility and additional planning, which will be discussed. Overall, all of the Omani nursing students registered in a Health Promotion course (N=20) completed the Rx for Change training offered online and the simulation. The practical simulation training was based on the SAs models (Ask, Advise, Assess, Assist, and Arrange). The majority of students were female (64%) with a mean age of 21 years. One student reported being a smoker. After completing the online training, 87% of the students were confident about their ability to help patients quit tobacco and Omani students’ self-reported skill to help patients quit using tobacco had improved post-training (t=4.8, p<0.001). Most students reported that the materials required to prepare for this training were helpful (95%) and that the role play simulation had helped them perform better in the future (70%). Overall, this collaborative study demonstrated that faculty from different world regions can collaborate in sharing undergraduate nursing program content to improve nursing students’ skills in helping smokers to quit.

No funding.

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POS3-12
CUMULATIVE ASSOCIATIONS OF 61 SNPS IN SEVEN NICOTINIC ACETYLCHOLINE RECEPTOR GENES WITH CIGARETTE SMOKING AMONG AMERICAN INDIANS: THE STRONG HEART STUDY

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Many studies reported an association between genetic polymorphisms in the nicotinic acetylcholine receptors (nAChRs) and smoking-related phenotypes (e.g., smoking quantity). However, most focused on single SNP or single gene analysis, which is less powerful in modeling the cumulative effect of multiple SNPs. We genotyped 61 tagSNPs from seven nAChRs genes in 3,665 American Indians recruited by the Strong Heart Study (SHS), the largest investigation of cardiovascular disease and its risk factors in American Indians (Ais). Smoking-related phenotypes included smoking status (ever vs. never smoker) and smoking quantity (person-pack-year, PPY). We first examined the association of each SNP with smoking using the family-based association test (FBAT), adjusting for age, sex, BMI, diabetes, physical activity and study center. We then performed a gene-based analysis by combining p-values of all SNPs within a gene using the truncated product method (TPM). Gene-family analysis was similarly done using p-values from the gene-based analysis. Two- or three-way gene x gene interaction was tested using the MBBDR package in R. Multiple testing was corrected using Bonferroni. Although many SNPs showed nominal association with either smoking status or PPY, only one SNP (rs3813567 in CHRNB4) showed a significant association with PPY after correction for multiple testing (p=1.6×E-4). We also identified two significant interactions (rs2236196 x rs17486278, and rs576776 x rs2236196, both p<1.0×E-5) for smoking status and PPY. Gene-based analysis indicated that CHRNB4 was significantly associated with smoking status (p=0.0001), whereas CHRNA2 and CHRNA4 were significantly associated with PPY (both p<0.0005). Gene-family analysis demonstrated that the nAChRs gene family was significantly associated with the two smoking phenotypes (both p<1.0×E-4). Sensitivity analysis indicated that the observed associations were not driven by the most significant SNP (i.e. rs3813567). Our results suggest that polymorphisms in the nAChRs gene family jointly contribute to smoking. These findings may provide valuable information for developing intervention programs on smoking cessation among AIs.

This study was supported by a seed grant from the Oklahoma Tobacco Research Center and NIH grants K01AG034259, R21HL092363, R01DK091369, U01-HL-65520, U01-HL-41642, U01-HL-41652, U01-HL-41654, and U01-HL-65521. Dr. Yang was partially supported by F50DA010075-16 from the National Institute on Drug Abuse.

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POS3-13
SEROTONIN TRANSPORTER AND RECEPTOR GENES SIGNIFICANTLY IMPACT NICOTINE DEPENDENCE THROUGH GENETIC INTERACTIONS IN BOTH EUROPEAN AMERICAN AND AFRICAN AMERICAN SMOKERS

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Pharmacologic studies have demonstrated a modulatory effect of nicotine on serotonergic signaling, primarily through genes encoding the serotonin transporter (SLC6A4) and the 5-HT3A subunit HTR3A and HTR3B. Thus, the functional state of these genes may alter the susceptibility to nicotine dependence (ND). In this study, we examined the impact of variations in the three genes on ND in 1366 individuals from 402 African American (AA) and 671 individuals from 200 European American (EA) nuclear families. The ND of each smoker was assessed with three commonly used measures: smoking quantity (SQ), Heaviness of Smoking Index (HSI), and Fagerström Test for Nicotine Dependence (FTND). Association analysis at the individual SNP level revealed marginal association of rs10160548 in HTR3A with SQ and HSI in AA, 5-HTTLPR in SLC6A4 with FTND in EA, and rs11066194 in HTR3B with FTND in the pooled sample. Additional haplotype-based association analysis revealed a few major haplotypes in HTR3A that were significantly associated with ND in the AA, EA, and pooled samples. However, none of these associations remained significant after correcting for multiple testing except for a haplotype G-C-C-T-A-T formed by SNPs rs1150226, rs1062613, rs33940208, rs1985242, rs2276302, and rs10160548 in HTR3A for the AA sample. Finally, we demonstrated significant interactions among variants rs1062613 and rs10160548 in HTR3A, rs1176744 in HTR3B, and 5-HTTLPR and rs1042173 in SLC6A4, affecting all three ND measures in the AA, EA, and pooled samples. Of these significantly interacting variants, rs1062613 in HTR3A and 5-HTTLPR and rs1042173 in SLC6A4 are known to modulate expression of the corresponding gene and rs1176744 in HTR3B to alter serotonin conductance by 5-HT3AB. Serotonergic signaling clearly plays a significant role in ND through interaction among variants in the genes encoding the serotonin transporter and receptors.

Supported by DA-012844.

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POS3-14
A COMPARISON OF CULTURALLY TAILORED CESSION INTERVENTIONS: DEEP VS. SURFACE-LEVEL CULTURAL ADAPTATION

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Background: Albeit it has long been suggested that, to be effective, smoking cessation programs be anchored in the norms, values, and experiences of cultural groups being studied, a review of culturally tailored intervention studies revealed that culturally tailored smoking cessation interventions had been limited at most to a surface level of cultural adaptation (i.e., use of therapists from the same ethnic group). The purpose of this study was to compare the effects of smoking cessation interventions on abstinence in Korean Americans between two levels of cultural adaptation. Method: This study is an RCT comparing the relative effectiveness of deep culturally tailored cognitive behavior therapy to surface-level culturally tailored brief counseling. Both arms received eight, weekly individualized
counseling sessions and nicotine patches. In addition to Korean language and Korean native therapist that were adapted in the surface-level cultural program, the deep cultural program integrated more than 10 Korean-culture specific elements associated with smoking. Primary outcome was biochemically verified 12-month prolonged abstinence. Results: Seventy-seven Korean immigrants who smoked 17 cigarettes per day on average (SD = 5.9) participated in this study. No difference was found between the two intervention arms in demographics and baseline smoking behavior. Using an intention-to-treat analysis, 35.9% of participants in the deep cultural arm and 10.5% of participants in the surface-level cultural arm had 12-month prolonged abstinence. Participants’ self-reported abstinence was biochemically verified with exhaled carbon monoxide and salivary cotinine tests. The overall survival of subjects who maintained prolonged abstinence was significantly higher in the deep cultural intervention arm than in the surface-level arm (log rank test, p = 0.003). Conclusion: The study is the first of its kind comparing a deep culturally tailored intervention with a surface-level one. It appears the efficacy of tobacco dependence treatment for a certain group largely depends on the level of cultural adaptation that the treatment has to be undertaken. Funding: NIH/NIDA (5K23DA021243).

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POS3-15
BLACK AND HISPANIC SMOKERS ARE LESS LIKELY THAN WHITES TO BE TOBACCO DEPENDENT

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Few studies have examined racial differences in the severity of tobacco dependence. There is a concern that racial differences in nicotine metabolism may confound the assessment of dependence when measures rely on the number of cigarettes smoked per day. We examined racial differences in tobacco dependence among current smokers in a nationally representative sample from the Social Climate Survey of Tobacco Control. Adult current smokers (n=256) from the probability-based Internet panel were assigned to one of four levels of physical dependence on tobacco based on a validated measure of their most advanced symptom of nicotine withdrawal: (1) no symptoms, (2) only a mild desire to smoke that can be ignored fairly easily, (3) an intrusive, persistent desire to smoke that is difficult to ignore, or (4) the dysphoric and urgent need to smoke to feel and function normally again. Racial differences were assessed with stepwise logistic regression controlled for gender, age, income, and education level. Sixty-one percent of white non-Hispanic smokers were assigned to the two most advanced levels (3 & 4), compared to 28% of black non-Hispanic and 43% of Hispanic smokers. White non-Hispanic smokers (n=196) were almost five times as likely as blacks non-Hispanic (n=32) or Hispanic smokers (n=28) to be assigned to levels 3 or 4; OR=4.76, 95%CI: 1.92-11.82, p<.001. These data suggest that there are strong racial differences in susceptibility to developing more advanced symptoms of physical dependence to tobacco that are not explained by age, gender, income or educational levels. Racial or ethnic differences in susceptibility to physical dependence are scientifically plausible given the strong genetic contributions to tobacco dependence.

The American Academy of Pediatrics Julius B. Richmond Center of Excellence, funded by grants from the Flight Attendant Medical Research Institute and the American Legacy Foundation.

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POS3-16
IS THE AGE AT THE FIRST VISIT THE PREDICTOR OF WEIGHT GAIN DURING SMOKING CESSATION?

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Background: Smoking cessation may be associated with weight gain due to combination of nicotine absence and other reasons. Current reasons is still insufficient. Methods: From the sample of 1,775 our patients with one year follow-up we analysed 607 successful abstainers (CO-validated continuous abstinence, Russell standard criteria), containing 52.1 % men (N=316) and 47.9 % women (N=291) with the mean age of 48 years (18-85). We assessed the age at the first visit as predictor of weight gain. Results: The mean weight gain after one year post-quit was 6.8 % or 5.1 kg (-2.3; +13.5) and post cessation weight gain occurred in 88.6 % of patients. Those more dependent (defined by Fagerström test of nicotine dependence, FTND≥ 5 points) gained more, +5.6 kg (-3.2; +15.4) compared to those with FTND<2 (-4.3 kg; 4.6; +19.1). Comparably, those smoking more cigarettes showed higher weight gain (Spearman correlation rs=0.185, p-value p<0.001). Differences in post-cessation weight gain according to initial physical activity were found between groups regular and irregular, e.g. +4 kg (-3.0; +11.0) vs. +6.2 kg (-1.4;+14.4) respectively, regular and at all, +4 kg (-3.0;+11.0) vs. +5.3 kg (-3.8;+15.7), then weekly +4.7 kg (-0.4;+11.8) and irregular +6.2 kg (-1.4;+14.4) respectively at the significance level α=0.05. No absolute difference was found according to the gender (Spearman correlation, p=0.803), but relative differences are statistically significant at the significance level α=0.05 (p=0.012). The mean age at the first visit was 48 years (SD ±14). (SD 34-52). Patients were divided into 4 categories according to their age (≤ 30 yrs, 31-50 yrs, 51-70 yrs and ≥ 71 yrs). At the significance level α=0.05 statistical significance of the differences in absolute weight gain according to age at the first visit was found as marginal (p=0.030), but relative difference did not show significant difference (p=0.253). Conclusion: We did not find the age at the first visit to be the predictor of post cessation weight gain. Those being more dependent, smoking more cigarettes per day or having low physical activity gain more. More research should be done in this field.

Supported by grant Amvis-Kontakt ME09014 and IGA MZ CR NT12170-5/2011.

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POS3-17
THE RELATIONSHIP BETWEEN PERSONALITY FACTORS AND SMOKING MOTIVATORS AMONG LOW-INCOME SUBSTANCE USERS

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Numerous studies report a link between personality factors and smoking behaviors, but few have examined the relationship between personality dimensions and motivating factors that underlie smoking maintenance. Further, this relationship has not been examined among low-income, minority substance users, a population at significant risk for both recalcitrant smoking and high rates of personality pathology. 70-90% of adults in residential substance use treatment facilities smoke. The current study aims to extend previous work which suggests a relationship among personality factors, psychopathology, and motivation to engage in smoking. We collected baseline data from a predominantly African-American (94%) sample of adults (15 females, 21 males, mean age=46, average daily cigarette smoking=6.5) in a residential treatment facility for substance use. Participants are enrolled in a larger randomized clinical trial of five sessions of behavioral activation (BA) combined with nicotine replacement therapy (NRT) targeting cigarette smoking, elevated depressive symptoms, and substance use. Participants were administered a measure of impulsive personality characteristics,
the UPPS Impulsive Behavioral Scale (UPPS), and a measure of smoking motivation, the Wisconsin Inventory of Smoking Dependence Motives (WISDM). Results indicate positive correlations among elements of smoking motivation and dimensions of impulsive behavior. Negative urgency was associated with both primary smoking dependence motives: craving (r=.53, p<.001), tolerance (.37, p=.03) as well as secondary smoking dependence motives: taste (r = .33,p<.04), negative reinforcement (r=.40, p<.01), weight control (r=.37, p=.05), and sensory properties (r=.43, p<.01). Lack of perseverance was associated with affiliative attachment (r=.38, p<.02), cognitive enhancement (r=.41, p<.01), craving (r =-.39, p=02), and positive reinforcement (r =-.33, p=.04). Results support established findings concerning the robust relationship between impulsivity and substance use, and highlight the importance of targeting low-income, minority substance users at risk for maintaining nicotine dependence.

This research is supported by the American Cancer Society grant RSGT-11-011-01-CPPD.

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**POS3-18**

**RACE/ETHNIC DIFFERENCES IN HELP-SEEKING SMOKERS**

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Previous research has identified race/ethnic differences in smoking cessation, with minorities less likely to quit. Little research, however, has focused on differences in psychosocial factors among white, Hispanic, and African American smokers interested in cessation. The purpose of this study was to determine whether race/ethnic differences exist among smokers seeking help quitting. Adult smokers (N = 417; n = 126 white; n = 132 Hispanic; n = 158 African American) completed measures of demographics, smoking history, depressive symptoms, and readiness to quit smoking prior to participating in an RCT testing the efficacy of personalized self-help materials. Results indicated that compared to whites and Hispanics, African Americans reported fewer years of education, were more likely to be older, single, have an annual household income of less than $10k, and to smoke menthol cigarettes. African Americans also reported greater nicotine dependence compared to both whites and Hispanics. We also found that Hispanics were younger, reported fewer years smoking and lower smoking intensity, but greater alcohol use intensity compared to whites and African Americans. Compared to whites, Hispanics reported lower nicotine dependence, but were more likely to smoke menthols. Results also demonstrated that after controlling for demographics and smoking history, African Americans reported greater depressive symptoms compared to whites, and lower readiness to quit compared to both whites and Hispanics. Help-seeking African Americans appear to have more risk factors that might predict difficulty achieving smoking abstinence compared to other racial/ethnic groups. Hispanics may have some protective factors, such as shorter smoking duration, but still require attention to alcohol substance users at risk for maintaining nicotine dependence.

Funding for this research was provided by the University of Texas Health Science Center, School of Public Health. Data analysis and presentation preparation were additionally supported through American Cancer Society grants MRSGT-10-104-01-CPPH and MRSGT-11-114-01-CPPB (to MSB).

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**POS3-20**

**DISCRIMINATION IS ASSOCIATED WITH NON-ABSTINENCE AMONG SOCIOECONOMICALLY DISADVANTAGED SMOKERS PARTICIPATING IN A SMOKING CESSATION PROGRAM**

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Socioeconomic disadvantage is associated with a reduced likelihood of smoking cessation; and interventions have had limited success in improving cessation rates in smokers of low socioeconomic status. Studies are needed to increase our understanding of the factors associated with non-abstinence among socioeconomically disadvantaged smokers participating in treatment. The purpose of the current study was to evaluate the influence of discrimination experiences on smoking cessation outcomes at 4 weeks post-quit among smokers enrolled in a safety net hospital cessation program; and who were also participating in a study designed to evaluate the effectiveness of offering adjunctive financial incentives for abstinence. Study participants (N=84) were primarily female (56%) and African American (66.7%). Participants smoked an average of 16.6 cigarettes per day and had been smoking for an average of 32 years. A total of 58.2% of participants reported an annual household income of < $12,000 per year, and 23.8% had not earned a High School Diploma/GED. Frequency of discrimination was measured with the 9-item Everyday Discrimination Scale (EDD). EDD items were rated on a 6-point (0-5) scale from never to almost every day (i.e., scores range from 0-45). The mean score on the EDD was 11.05 (SD=10.54) and scores did not differ by gender or race. The primary outcome variable was 7-day biochemically-verified point prevalence abstinence at 4 weeks post-quit. After controlling for average pre-quit cigarettes smoked per day and study treatment group, logistic regression analysis indicated that higher scores on the EDD were significantly associated with non-abstinence at 4 weeks post-quit (p=0.02, OR=1.06). Specific discrimination experiences that were associated with non-abstinence included: 1) people acting as if they are afraid of you (item 5, p=0.012, OR = 1.72), 2) people acting as if they think you are dishonest (item 6, p=0.02, OR=1.51), and 3) being threatened or harassed (item 9, p=0.036, OR=1.69). Findings suggest that discrimination may represent one type of stressor that interferes with smoking cessation among socioeconomically disadvantaged individuals.

Funding for this research was supported by the University of Texas Health Science Center, School of Public Health. Data analysis and presentation preparation were additionally supported through American Cancer Society grants MRSGT-10-104-01-CPPHS (to DEK) and MRSGT-11-114-01-CPPB (to MSB).

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**POS3-21**

**CAPITALIZING ON THE TEACHABLE MOMENT TO MOTIVATE SMOKING CESSATION AMONG PARENTS OF CHILDREN WITH ASTHMA AND PARENTS OF HEALTHY CHILDREN**

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Asthma exacerbation may present a teachable moment for parent smoking cessation. We tested (1) whether biomarker feedback on second hand smoke exposure (SHSe) motivates quitting in parents of children with asthma (ACs) vs. parents of healthy children (HCs) and (2) whether sustained intervention with additional SHSe feedback produces higher quit rates than minimal intervention. Eligibility criteria: smoking >=3 cigarettes/day and for ACs, a child with a recent asthma episode needing urgent care. Participants (n=569; 51% female, 51.7% Caucasian, child age M= 6.1 yrs) did not have to want to quit smoking to enroll. All received two home visits focusing on health education (Asthma for ACs, Wellness for HCs) and Motivational Interviewing (MI) for smoking cessation + feedback on SHSe (passive dosimetry). For aim
2, after the home visits, ACs were randomized to Enhanced (n=174; 6 MI calls for smoking cessation + second round of SHSe feedback) or Minimal (n=173; 6 contact control calls). Treatment exposure and assessment completion did not differ between groups (rates >90%). Smoking status was biochemically verified. For Aim 1, ACs had higher rates of 7 day ppa (16.8%) and 30 day ppa (13.5%) than HCs (7 day=7.3%; 30 day=4.2%; p's<.05) at follow-up, despite receiving the same intervention during the home visits. ACs reported lower SHSe in both the car and home than HCs (p's<.05). For Aim 2, Enhanced had higher 7 day ppa (20.3%) and 30 day ppa rates (18.8%) than Minimal (7 day=12.7%; 30 day = 11.3%, p's<.05; all available cases) at the end of the phone calls. At six months follow-up, Enhanced had higher 30 day ppa (14.7%) than Minimal (8.5%, p<.05) and lower asthma morbidity (p<.05). Enhanced had greater declines over time in objectively measured SHSe than Minimal (p<.02). Asthma exacerbations present a teachable moment to motivate parental cessation. Longer term interventions with additional biomarker feedback enhance success.

Supported by NHLBI R01 HL62165-05 to B. Borrelli.

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POS3-22
PREDICTORS OF A MOTIVATIONAL INTERVIEWING INTERVENTION WITH COLLEGE STUDENT TOBACCO USERS

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Background: Tobacco use among US college students remains a public health concern. Approximately 1 out of 4 smoke cigarettes, and 33% use some form of tobacco. Student use has prompted research in screening and brief intervention in university health centers; evidence suggests not all student tobacco users are receiving an intervention. USPHS Guidelines encourage use of Motivational Interviewing (MI), a patient centered counseling style, to boost patients' readiness to quit. The current study examined health center provider factors associated with the use of MI with tobacco users. Methods: A survey of clinicians (43% response rate) at 6 NC campus health centers was conducted as part of a study aimed to improve adherence to USPHS Guidelines for tobacco use. Seventy-one providers (91% women) reported on their use of MI for patients not ready to make a tobacco quit attempt, including nurses (56%), MDs (17%), and NPs/PAs (27%). Results: Only 1 out of 4 providers acknowledged that they “always” or “usually” use MI with students not ready to make a quit attempt; 77% reported using MI sometimes,” rarely,” or “never.” In bivariate analyses, we found that limited experience intervening with tobacco users as a barrier to assisting patients with cessation was associated with less frequent use of MI for tobacco users in the past month (OR=0.07, p=0.02). Clinicians reporting feeling “very” or “somewhat” confident in their ability to motivate patients to consider quitting were more likely to use MI (OR=8.0, p<0.01). Male providers, more often than females, engaged in MI with student tobacco users (OR=0.3, p=0.03). Multivariate analyses did not reveal statistically significant factors. Conclusion: Many college health center clinicians do not or infrequently use MI to intervene with patients using tobacco. Providers are more likely to employ MI if they feel confident that they can motivate users to quit, but perceived lack of experience as a barrier to helping student tobacco users is associated with less frequent intervention. Future work should address MI competency in health center providers.

Research reported in this abstract was supported by the National Cancer Institute of the National Institutes of Health under Award R01CA161664. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

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POS3-23
PEER INFLUENCE AND SELF-ESTEEM AS ASSOCIATED RISK FACTORS FOR ADOLESCENT CIGARETTE SMOKING

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Exposure to social peer groups in which smoking behaviors are met with approval have been consistently demonstrated to be associated with adolescent smoking (Kokkevi, Richardson, Florescu, Kuzman, & Stergar, 2007). However, Peterson, Buser, and Westbürg (2010) postulate that healthy levels of self-esteem may serve as a protective factor for youths against engaging in risky behaviors. For the current study, we examined the relationship between peer influence, self-esteem, and adolescent cigarette smoking patterns. It was hypothesized that higher perceived levels of cigarette smoking by peers and lower levels of self-esteem would be associated with higher levels of smoking in adolescents. The study utilized data obtained by the University of Michigan’s Institute for Social Research 2011 Monitoring the Future (MTF) survey of adolescent drug use, sampling about 46,500 eighth-, 10th-, and 12th-grade students in almost 400 schools nationwide (Lloyd, O’Malley, Bachman, & Schulenberg, 2011). The present study examined questions only pertaining to tobacco use and self-esteem in high school seniors (N = 1,933). A multiple regression analysis was used to test if self-esteem and perceived peer smoking predicted participants’ smoking behaviors. The results of the regression indicated that the two predictors explained 5.8% of the variance (R squared = .06, F (2, 1930) = 59.65, p < .001). Additionally, peer smoking significantly predicted respondent tobacco use (Beta = 8.54, p < .001), as did self-esteem (Beta = -6.52, p < .001). Regression analysis was also used to detect an interaction effect between perceived peer smoking and self-esteem, which significantly predicted participants’ tobacco use as well (Beta = 22.20, p < .001). These findings indicate that peer influence and self-esteem interact in such a way that they may serve as a risk factor for adolescent tobacco use. Future research efforts should target potential ways in which self-esteem may be utilized as a protective factor against peer pressure placing adolescents at risk to initiate smoking behaviors.

No funding.

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POS3-24
TRAJECTORIES OF COMPLIANCE AND ITS PREDICTORS IN A RANDOMIZED CONTROLLED TRIAL TESTING THE EFFICACY OF NICOTINE REPLACEMENT THERAPY AMONG ADOLESCENTS

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Several studies found that compliance to nicotine replacement therapy (NRT) is a necessary condition for achieving smoking cessation. Although previous studies examining the efficacy of NRT among adolescents demonstrated poor compliance, more detailed information about (the difference in) the course of compliance is lacking. Given the continued need to improve compliance rates and ultimately quit rates among youngsters, examination of factors associated with NRT compliance among adolescents is warranted. The present study identified compliance trajectories of adolescents, whereby potential time-invariant and time-varying predictors were included to predict these trajectories. Adolescents aged 12-18 years, smoking at least 7 cigarettes a day and motivated to quit smoking, were computer-generated randomly assigned to either a nicotine patch (n=182) or a placebo patch (n=180) condition. Participants attended an information meeting followed by a 6- or 9-week treatment. Compliance and predictors were measured using online questionnaires. A combination of latent class growth analysis and multinominal regression analysis was used to examine trajectories of compliance and its predictors. A total of 257 participants (age: 16.7 +/- 1.13 years, n=135 in the nicotine patch condition, and n=122 in the placebo patch condition) were eligible for analyses. Preliminary results found two latent compliance trajectories, which were labelled the ‘slow decreasers’ and the ‘quick decreasers’. Compared to the ‘quick decreasers’ the ‘slow decreasers’ smoked significantly more cigarettes per day and had significantly higher levels of motivation to quit smoking. Time-varying predictors that significantly affected compliance in both trajectories were relapse
back to smoking, side effects of NRT, perceived social support, and depressive symptoms. Our study showed that time-varying variables more than personality characteristics were associated with the course of compliance trajectories. Therefore, to enhance continued compliance among adolescents it is important to focus on compliance-related factors that vary during treatment period.

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POS3-25
PARENTAL INVOLVEMENT AND ADOLESCENT SMOKING
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Research on tobacco use in adolescents has confirmed parenteral monitoring as a protective factor against both current smoking status and early age of onset. It is well known that parental regulation of children’s behaviors when the parent is not physically present to supervise is important in deterring risky health behaviors. Nevertheless, it remains important to examine parents’ physical involvement in the child’s life as a means for deterring adolescent smoking. In the current study, we examined the following: (1) early adolescent (8th grade) responses (N=5,276) to the Monitoring the Future Survey (2011). Multiple regressions were conducted with parental involvement (i.e., how often parents limit television, how often adolescents talk to parents about their problems, etc.) as the fixed factor and either (1) difficulty in obtaining cigarettes, (2) age of smoking onset, (3) smoking status in past 30 days, as the dependent variables. Results indicated that parental involvement significantly predicted difficulty in obtaining cigarettes (β = -1.24, p <.001, 95% CI [.144 -.104]). Similarly, greater parental involvement predicted later age of onset (β = .192, p <.01, 95% CI [.171 -.213]) and fewer cigarettes per day in the last 30 days (β = -0.038, p <.01, 95% CI [.044 -.032]). These results support evidence that parental monitoring remains an important protective factor for adolescent smoking behaviors, parental involvement in the home may be equally as important. Future research should examine the most beneficial interactions between parents and early adolescents to deter smoking behaviors.

No funding.

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POS3-27
A RANDOMIZED CLINICAL TRIAL OF THE Efficacy OF EXTENDED SMOKING CESSATION TREATMENT FOR ADOLESCENT SMOKERS
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Introduction: Relatively few well-designed smoking cessation studies have been conducted with teen smokers. This study examined the effectiveness of extended cognitive-behavioral treatment in promoting longer-term smoking cessation among adolescents. Methods: Open-label smoking cessation treatment consisted of 10 weeks of school-based, cognitive-behavioral group counseling along with 9 weeks of nicotine replacement (nicotine patch). A total of 141 adolescent smokers in continuation high schools in the San Francisco Bay area were randomized to either 9 additional group sessions over a 14-week period (extended group) or 4 monthly smoking status calls (non-extended group). Intention-to-treat, logistic regression analysis was used to assess the primary outcome of biologically-confirmed (CO < 9 ppm), point prevalence abstinence at Week 26 (6-month follow-up from baseline). Results: At Week 26 follow-up, the extended treatment group had a significantly higher abstinence rate (21%) than the non-extended treatment group (7%); OR = 4.24, 95% CI: 1.20-15.02. Females also were more likely to be abstinent at the follow-up than males; OR = 4.15, 95% CI: 1.17-14.71. Conclusions: The significantly higher abstinence rate at follow-up for the extended treatment group provides strong support for continued development of longer-term, psychosocial interventions for adolescent smoking cessation.

This work was supported by the National Cancer Institute grant R01 CA 118035.

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decreased over the period of the study (0.12 to 0.07, which is quite observable via network maps and represents a functional shift in quitter communication. In addition, when all ties are considered, the network in year 1 was modestly centralized while in Year 3 the network became much more centralized (0.35 to 0.6). While the overall connectivity of the network declined somewhat over time, it is apparent that much of the strength of the network, at least in terms of the flow of information regarding services, is based on ties to the NAQ and through the contractual relationship between individual quitter funders and their providers. Once these two information connections are excluded, network density drops substantially, suggesting that both providers and funders are not reaching out to those in other states and provinces to send and receive service related information. This research was funded by the National Institutes of Health National Cancer Institute grant R01CA126838.

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POS3-29
QUIT AND WIN CONTESTS—IS QUITTING THE ONLY OPTION?

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PURPOSE: Comparable quit rates can be expected between smokers ‘reducing to quit’ vs. ‘quitting abruptly’ but smokers are rarely offered a choice as to which approach to use in tobacco control programming. For instance, Quit and Win contests traditionally provide the single option of an abrupt quit on a designated day. The addition of a reduction option may prove to motivate additional smokers to progress towards quitting. This study examines the smoking and quitting outcomes of young adults registered in a contest to reduce their smoking by 50%. METHODS: The 6-week wouldrather… contest was promoted at 42 Ontario, Canada post-secondary institutions in the 2010/2011 academic year. Young adult students registering online were invited to participate in a study that included an online survey at baseline and telephone interviews 1-month and 3-months following the contest start date. RESULTS: Of the 151 online registrants committing to reduce their smoking, 64 (50.8%) consented to participate in the study and 31 (40.4%) completed all measures. Analyses of 1-month data reveal 64.5% reduced their tobacco use by at least 50% for the first month of the contest. Three-month data show that all 64.5% sustained their reduction. In fact, 9.7% had reduced all the way to 0. Weekly consumption among reducers fell continuously from baseline (M = 40.47, SD = 40.65), to 1-month (M = 14.94, SD = 13.78) to 3-months (M = 9.25, SD = 10.93) suggesting a trajectory towards quitting even after the 6-week contest period had ended. SIGNIFICANCE: Giving young adult smokers the option to reduce their smoking may be a valuable strategy to increase cessation success in ‘quit and win’ contests. Translating research into practice may also increase enrollment and thus population impact of contests. Future research is needed to determine whether reduction is a valuable strategy for other interventions, including smartphone applications and self-help interventions, and if these findings can be replicated with a sample of adult smokers. A final research priority is to examine the long-term cessation outcomes of smokers ‘who commit to reduction.

This research was funded by the Ontario Ministry of Health and Long-Term Care.

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POS3-30
PROMOTING CESSION USING COLLEGE QUIT AND WIN CONTESTS: ACCEPTABILITY, REACH, AND EFFICACY

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Background: The prevalence of smoking among young adult college students is 34.2%. Developing and delivering appealing and effective smoking cessation interventions for young adults is critically needed. Quit & Win contests, in which smokers quit for a one-month period to win prizes, are simple to implement, easy to disseminate and may be well suited for college students. We report on the baseline demographic and tobacco-specific characteristics and quit rates among college students enrolling in a Quit and Win trial. Methods: In the fall of 2010 and 2011, a randomized, clinical trial was implemented at 2- and 4-year colleges in Minnesota (N = 658). Participants were required to abstain completely from tobacco for one month for the chance to win a $3000 prize. A follow-up survey was conducted online at the completion of the contest and again at 6-months post-enrollment. Urine verification was conducted at baseline and at all follow-ups to confirm quitting status. Results: Participants were 26 ± 8.0 years of age, 57.8% female and 86.2% White. Among participants, 61.1% were from 4-year colleges vs. 49.8% from 2-year colleges. Participants smoked 11.7 ± 4.3 CPD on 28.5 ± 3.9 days/month; 49.9% were nicotine dependent as measured by time to first cigarette <30 minutes; readiness to quit was 7.46 ± 1.99 on the Contemplation Ladder and 30.8% of the participants smoked menthol. Binge drinking in the past month was endorsed by 76.8% of participant. Only 45% reported that they would have tried to quit smoking even if they did not join the Quit and Win contest. Results indicate that 52% sustained 30-day point prevalence abstinence and 6-month prolonged abstinence was 24.1%. Conclusion: Quit and Win contests are acceptable to college students and appear to attract older, daily, light smokers who engage in more binge drinking. Quit and Win contests results in high rates of initial quitting with moderate rates of prolonged, sustained abstinence at 6 months. Given the relative ease and cost effectiveness of Quit and Win, colleges around the country might consider these programs as an effective method to launch abstinence campaigns.

Funding for this pilot study provided by the National Heart Lung and Blood Institute grant (R01 HL094183; Thomas, PI).

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POS3-31
HEAVINESS OF SMOKING INDEX AS A PREDICTOR OF TOBACCO cessation among state tobacco helpline Participants

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Background: Nicotine dependence is one of the primary determinants of tobacco cessation. Heaviness of smoking index (HSI) which is comprised of two items, time to first cigarette after waking (TTF) and number of cigarettes smoked per day (CPD), provides a continuous measure of nicotine dependence. Results of previous studies indicate inconsistent predictive validity of HSI. The aim of this study is to evaluate the predictive validity of HSI by examining the relationship between HSI score and tobacco cessation among state tobacco helpline participants. Methods: Longitudinal data from 1077 daily smokers who enrolled in the Oklahoma Tobacco Helpline (OTH) from July 2010 to November 2011 were used. Tobacco cessation was defined as 30 day abstinence from tobacco use at 7-month follow-up. HSI was calculated as a six point continuous score from TTF and CPD. We tested the hypothesis that lower HSI score at baseline would predict higher tobacco cessation. Univariate and multiple logistic regression analyses were conducted. Other covariates included in the analyses were sociodemographic factors, tobacco use characteristics, and helpline interventions. Results: At 7 month follow-up, 32.8% of participants reported 30 day abstinence...
from tobacco use. Mean HSI score at baseline was 3.23(sd 1.57) among men and 3.36(sd 1.65) among women. Continuous HSI score at baseline did not predict 30 day abstinence at 7-month follow-up (OR 0.95, 95%CI 0.87–1.02). Similarly, those with low HSI (0-1) were not more likely to quit tobacco use as compared to those with medium (3-4) or high (5-6) HSI (OR 1.00, 95%CI 0.70–1.44 and OR 0.78, 95%CI 0.50–1.20 respectively). There was no interaction between baseline HSI score and OTH intervention or participants’ characteristics. We also explored the predictive validity of the individual items of the HSI; neither TTF nor CPD predicted tobacco cessation. These findings were independent of the helpline interventions (number of calls and nicotine replacement therapy). Conclusion: These findings indicate that tobacco cessation might rely on other aspects/motives of dependence which are not effectively measured by HSI.

Funding: Oklahoma Tobacco Research Center.

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POS3-32

SMOKERS’ OPINION ABOUT THE METHODS INFLUENCING SUCCESSFUL SMOKE CESSATION

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INTRODUCTION: Despite improvements in tobacco control measures over the past several years, smoking prevalence of Hungary is among the highest in the world. Efforts to reduce tobacco use and support cessation are public health priorities in Hungary. The role of smoking cessation methods is well described in the literature, but knowledge of these methods among Hungarian smokers is unknown. OBJECTIVES: To measure the prevalence of smoking and cessation and to identify the perceived importance of different cessation methods (e.g. physician advice, will-power). METHODS: Data are from a population-based epidemiological study of adults’ tobacco prevalence, cessation, and their correlates (2011). An in-person national survey of 1,042 people (aged 18 years and over) included smoking status, smoking cessation, and attitudes towards tobacco control and cessation. Attitudes were measured on a scale 1-4, with 4 being the strongest factor affecting smoking cessation. Descriptive statistics and one-way ANOVA were used to analyze data. RESULTS: 33.8% were current smokers of which 43.0% wanted to quit, 25.4% did not and 25.4% were uncertain about quitting. Among current smokers, will-power was perceived to be the most important determinant of tobacco cessation (x=3.84), followed by social support, quitting of the world. Efforts to reduce tobacco use and support cessation are public health priorities in Hungary. The role of smoking cessation methods is well described in the literature, but knowledge of these methods among Hungarian smokers is unknown. OBJECTIVES: To measure the prevalence of smoking and cessation and to identify the perceived importance of different cessation methods (e.g. physician advice, will-power). METHODS: Data are from a population-based epidemiological study of adults’ tobacco prevalence, cessation, and their correlates (2011). An in-person national survey of 1,042 people (aged 18 years and over) included smoking status, smoking cessation, and attitudes towards tobacco control and cessation. Attitudes were measured on a scale 1-4, with 4 being the strongest factor affecting smoking cessation. Descriptive statistics and one-way ANOVA were used to analyze data. RESULTS: 33.8% were current smokers of which 43.0% wanted to quit, 25.4% did not and 25.4% were uncertain about quitting. Among current smokers, will-power was perceived to be the most important determinant of tobacco cessation (x=3.84), followed by social support, quitting of

POS3-33

PATTERNS OF RELAPSE AMONG CIGARETTE SMOKERS: RESULTS FROM THE CARDA LONGITUDINAL STUDY—1995-2010

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RATIONALE: There is very little information about long term relapse patterns for individuals trying to quit smoking. OBJECTIVE: To describe long-term prevalence of relapse and other smoking patterns by gender, race, age, and education level among a community-based cohort of young adults who were followed for 25 years. METHODS: Correlative Risk Development in Young Adults (CARDIA) is a community-based cohort of 5,115 men and women aged 18 to 30 years at baseline. We examined prevalence of cigarette smoking relapse among participants who were current, new, or former smokers at baseline. Examinations were conducted at eight time points with seven follow-up examinations over 25 years querying smoking, quitting, and relapse. RESULTS: About 30% of 1,682 ever (current, new, former) smokers at baseline relapsed (stopped smoking and started again) at least once during the 20-25 years follow-up span; 39% of former smokers at baseline relapsed as well as 26% of current and new smokers. About 49% of baseline current smokers who quit and relapsed were still smoking by the end of the study compared to 30% of baseline former smokers. Education was a strong predictor of unsuccessful quitting after relapse, with participants who had a high school degree or less (63.6%) being less likely to quit again after relapse than those with more than a college degree (31.4%). We found that smoking status at the beginning of the study (current, new, former) strongly predicted cessation by the end of the study; while more than 50% of current smokers at baseline were still smoking by the end of the study, only 29% of new smokers and 12% of former smokers were. CONCLUSIONS: There is a large and persistent disparity in successful quitting after relapse by education. Even though good strategies exist to encourage smoking cessation, there is a need for good and evidence-based strategies to prevent relapse among former smokers.

No funding.

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POS3-34

TAILORED EMAILS AS A STAND-ALONE STRATEGY FOR SMOKE CESSATION: EVIDENCE FROM A RANDOMIZED CONTROLLED TRIAL

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Tailored self-help smoking cessation print materials have been shown to be effective. Few studies, however, have examined the effectiveness of tailored self-help emails as a stand-alone strategy for smoking cessation. Smokers for the current study were recruited through the American Cancer Society’s website. Eligible smokers (n=365) were randomly assigned to one of three groups. Two of the groups received tailored emails before, on, and after their chosen quit date with (i) a Premium group receiving up to 30 tailored emails, and (ii) a Basic group receiving 3 to 4 tailored emails, each of which included a downloadable self-help cessation booklet. A control group received a single email with links to web-based smoking cessation resources. At 1, 3, and 6 months after enrollment participants completed an online survey of smoking behavior. At the 3-month follow-up interaction effects between group and baseline smoking were obtained for quit attempts and quit rates (7-day point prevalence). Lighter smokers (1-9 cpd) in the tailored email groups were more likely to have made a quit attempt in the preceding 3 months (100%) compared to those in the control group (63.6%) whereas among smokers of 10 or more cpd the proportion making a quit attempt was similar across groups. Among lighter smokers those in the Basic condition quit at higher rates (50%) compared with those in the control group (0%), whereas for
POS3-35  CANADIAN TOBACCO PACKAGING POLICY IMPACT ON THE MANAGEMENT AND PROMOTION OF PROVINCIAL QUITLINES – A QUALITATIVE STUDY
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INTRODUCTION: In June 2012, the Canadian federal government required the tobacco industry to use new versions of tobacco packaging warning labels which included for the first time a toll-free phone number to a national “quitline”. The quitline is a phone-based service that can provide smokers with free access to evidence based smoking cessation supports. Quitlines were first established in Canada in 2002; by 2005 all provinces were offering quitline services, supported financially by a mix of federal, provincial and NGO investments, differing by province. Other countries that have implemented similar policies have experienced exponential increases in volume of calls to their quitlines. In Canada there were no direct federal investments to provincial quitlines prior to the packaging policy change. This study sought to understand how this federal tobacco packaging decision impacted the management and operations of quitline services across the country. METHODS: Key informant semi-structured interviews were conducted with quitline managers and provincial government employees responsible for quitlines across Canada (n= 12) before the implementation of the tobacco packaging policy. Interviews were transcribed and analysed using Bryman & Burgess’ (1993) Framework Approach. RESULTS: Managers and Government respondents shared many concerns about the impact of this federal policy on the operation of their quitlines. Government respondents were primarily concerned with funding and sustainability issues of their operations, and the need to focus on strategic collaborations. Quitline Managers were primarily concerned with daily operations including strategy and marketing, and broad sustainability issues including financial and human resources. Both respondent groups were deeply concerned about issues of jurisdiction and governance/responsibility. There was universal agreement that this policy would impact their operations and additional resources were not provided to support this anticipated impact. DISCUSSION: This national policy has the potential to greatly increase awareness of quitline services; however, these policy decisions have deeply anticipated program impacts. Funding: Canadian Institute for Health Research (CIHR: Operating Grant- Population Health Intervention Research.

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POS3-36  A CRITICAL EXAMINATION OF THE RELATIONSHIPS BETWEEN INTENTION TO QUIT, QUIT ATTEMPTS, AND CESSATION
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BACKGROUND: Intention to quit and quit attempts are common study outcomes when cessation data are unavailable and/or when statistical power is inadequate. METHODS: We examined the relationship between intention to quit, quit attempts, and movement from daily-to-occasional-to-former smoking in two observations of a longitudinal sample of smokers (N=2185) using structural equation modeling. Smokers were aged 18-49 years and were drawn as a representative sample of 8 major media markets in 2008, with the follow-up occurring 6 months later. Examination of the AIC/BIC indicated that model fit was adequate. RESULTS: At follow-up, 2464 (87.5%) participants were current smokers, 272 (9.7%) were occasional smokers, and 79 (2.8%) were former smokers, with a substantial sample of Black smokers (16.7%). There was minimal mediation of intention to quit by quit attempts; however, there was a strong direct effect of intention to quit and a smaller effect of quit attempts on smoking outcomes. Controlling for cigarettes per day, menthol smoking status, race/ethnicity, sex, age, and education, a one-unit increase in intention to quit increased the odds of movement from daily-to-occasional-to-former smoking by about 78%. A one-unit increase in the number of quit attempts reported between baseline and first follow-up increased the odds of reducing smoking by 10%. DISCUSSION: It is often assumed that increased intention to quit will predict more quit attempts and thereby increase the likelihood of cessation. This mediating model did not hold, but there were direct effects on cessation. The results highlight the importance of considering these variables simultaneously and not as proxies for cessation.

No funding.

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POS3-37  CONNECT2QUIT: A RANDOMIZED, CONTROLLED TRIAL OF TELEMEDICINE VERSUS TELEPHONE COUNSELING FOR SMOKING CESSATION

Connect2Quit compares two models for treatment at a distance for rural smokers. Smokers (n=586) were recruited from 20 primary care and safety net clinics across Kansas and randomly assigned to receive 4 sessions of telephone counseling similar to quitline (QL) or 4 sessions of telemedicine counseling (TM). TM consisted of real-time video counseling, similar to Skype, delivered by computer/webcams located in clinic exam rooms in patients’ medical homes. The counseling content was the same across groups, employed a motivational interviewing/cognitive behavioral approach, and was available in Spanish and English. Both groups received identical materials and pharmacotherapy guidance to help participants select and obtain cessation medications. Outcome analyses used an intent to treat approach with missing cases coded as smokers. There were no significant baseline differences between groups. Follow-up was excellent (month 3—83%; month 6—86%; month 12—88%). The main outcome of biochemically-verified 7-day point prevalence at month 12 did not significantly differ between TM and QL at 12 months (9.8% vs 12%). Self-reported cessation did not differ between groups at any time point (month 3—23.2% vs 19.4%; month 6—20.3% vs 20.4% month 12—19.2% vs 22.2%), although analyses adjusting for covariates did find a significant difference in favor of TM at month 3. Potential treatment mediators include counseling adherence, counseling style, therapeutic alliance, and medication use. QL participants completed slightly more counseling sessions than TM (2.6 vs 2.4). External assessment of counseling fidelity found no significant group differences in style or content, moreover, therapeutic alliance did not differ significantly across groups. TM tended to use more cessation medications than QL (55.9% vs 46.1%, p<0.03); those in TM were significantly more likely to use varenicline. At 6 months, TM performed similar to QL; the early advantage for
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TM may have been due to greater use of more effective medications. Although quit rates were similar, each intervention had different advantages that could be considered when selecting the best mode of treatment for reaching rural smokers. Funding: National Heart Lung and Blood Institute (R01HL087643).

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POS3-38
TOBACCO CESSATION SERVICES IN EUROPE: THE ESCCAN PROJECT

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The eSCCAN project aims to federate tobacco cessation clinics in Europe to share and improve practices. Method: Identification of eSCCAN experts in 26 of the 27 European countries has allowed to organize meetings and internet communication to reach a consensus among the smoking cessation clinics in Europe and to specify their number. Results: The current estimate is that there is about 2500 tobacco cessation clinics in Europe. A minority of them are centers of advice to stop smoking without the possibility of prescription; a higher number is made of doctors’ offices or paramedics. The vast majority consists of smoking cessation clinics (Tobacco cessation clinics) with several health professionals and all facilities for smoking cessation. Examples of good and bad practices have been described on many topics such as rendezvous delays, that must be less than 3 weeks for a first appointment. Some definitions have met consensus as the definition of healing, and in particular the period which defines a successful cessation. While waiting to close the debate, the recommendation is to record the cessation at 3, 6 and 12 months, with a particular focus at 6 months. A code and a self-audit in 11 languages are available on the website for a first evaluation of the activity of the consultations that will enable future improvement. 267 consultations had yet completed the self-audit. Conclusions: The project provides real rapprochement eSCCAN knowledge to practices for smoking cessation in Europe that support in each country in Europe less than 10% of smokers, but disseminate knowledge and contribute to the assessment for teaching and research.

OFT project supported by a Grant from Pfizer Europe.

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POS3-39
WEIGHING THE EVIDENCE: CLASSIFICATION OF TOBACCO CESSATION QUITLINE PRACTICES ACCORDING TO TYPE OF EVIDENCE

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Tobacco cessation quitlines make decisions about which practices to include in the services they provide on a regular basis. Yet it is not always clear what level of scientific evidence exists for each practice provided. Knowing what types of evidence supports which quitline practices may help decision-makers determine which mix of practices is right for their quitline, especially in times of limited financial resources. Members of the Knowledge Integration in Quitlines (KIQNIC) research team conducted a literature review to gather information about the levels of evidence for each of the 23 quitline practices asked about in the annual KIQNIC survey (2009-2011). Each practice was classified according to the type of evidence found for it; efficacy – whether or not a practice increases quit rates, and reach – whether or not a practice leads to increased utilization of the quitline service. Each practice was assigned to one of the following evidence categories for efficacy and for reach: Practices were effective - as indicated by recommendations in either the PHS Guideline or a Cochrane Review; Practices with one or more peer-reviewed journal articles documenting their effectiveness, but not enough to generate conclusive findings with a meta-analysis; Practices recommended by a reputable organization, like the CDC, but which have very limited scientific support; Practices that do not have scientific evidence to support them. The findings show that levels of evidence vary across the different types of practices currently implemented by quitlines in North America. More research needs to be done to understand the connections between specific practices and outcomes of interest (e.g., increasing reach, increasing quit rates). The substantial lack of evidence about practices’ effectiveness for increasing reach suggests a specific area for future inquiry.

The KIQNIC project is funded by Grant #R01CA128638 from the National Institutes of Health to the Mayo Clinic Arizona.

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POS3-40
AWARENESS OF THE CDC’S ‘TIPS FROM FORMER SMOKERS’ CAMPAIGN AND SMOKING BEHAVIORS AMONG ADULTS IN APPALACHIAN OHIO

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Smoking remains a leading cause of preventable deaths in the United States. Evidence exists to promote the use of mass media campaigns to encourage smoking cessation. Little is known about associations between these campaigns and quitting behaviors of adult smokers in Appalachian Ohio. The purpose of this study was to examine associations between awareness of the CDC’s “Tips From Former Smokers” campaign and smoking behaviors among adults in Appalachian Ohio enrolled in a group randomized smoking cessation clinical trial. Interviews were conducted with consented adult participants from seven counties in Appalachian Ohio to verify whether participants had seen the CDC campaign, and to determine which ads they preferred from the campaign. Smoking behaviors observed included self-reported smoking status, number of quit attempts, number of cigarettes smoked per day, Fagerström Test for Nicotine Dependence score, and confidence in ability to quit. Differences between groups were measured using chi-squared tests for categorical variables and ANOVA for discrete variables. No significant differences were observed between smoking behavior outcomes for participants who saw the CDC ads (n=82) vs. those who did not see the CDC ads (n=54) for all smoking behaviors of interest. This suggests that there may be no associations between awareness of the ad campaign and smoking behavior outcomes. Participants reported that TV ads were more likely to be seen and recalled than all other types of advertising. This confirms the results of previous studies that demonstrated the effectiveness of TV advertising over other forms of advertising for anti-smoking mass media campaigns. This study highlights the importance of continued research into the impact of anti-smoking mass media campaigns on quitting behaviors. Limitations of this study include a small sample size and a homogenous study population (i.e. those trying to quit). The generalizability of these findings may be limited. Continued research in this field will help to develop future media campaigns that will have the greatest impact on quitting behaviors of smokers.

This study was conducted while the first author was at The Ohio State University College of Medicine. Supported by NIH grant #R01 CA129771, NIH grant #5P05CA105632, and a grant from the Department of Internal Medicine at The Ohio State University Wexner Medical Center.

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POS3-41
USING SOCIAL MEDIA TO ENHANCE TOBACCO DEPENDENCE EDUCATION

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This project was designed to assess the usage of social media applications by dental school faculty, to compliment tobacco dependence education and treatment. Dental educators have made great advances toward the implementation of tobacco
POS3-42
THE ROLE OF COCOA AS A CIGARETTE ADDITIVE: OPPORTUNITIES FOR PRODUCT REGULATION
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Aims: To investigate cocoa as a cigarette additive as it is referenced in the tobacco industry internal documents, including issues related to sensory and risk perception, promotion of dependence, and endorsement of product acceptability, as well as potential target markets. Design: The Legacy Tobacco Documents Library was used to identify documents relevant to research questions. Initial search terms were generated following an examination of published literature on cocoa, other cigarette additives, sensory and risk perception, and the use of cigarette design features to target specific populations. Further research questions and search terms were generated based on findings from the initial search terms. All relevant documents were reviewed. Findings: Cocoa is widely applied to cigarettes, and has been used by the tobacco industry as an additive since the early 20th century. Smoking can alter the sensory properties of cigarette smoke, including by providing a more appealing taste and aroma, and by decreasing the smoke’s harshness. Cocoa may contribute to improving the sensory characteristics of “low-tar” or “light” cigarettes. The levels of cocoa used in cigarettes are not uniform. Smoking may give smokers a more accurate understanding of product risk, and inhale more deeply or frequently. Eliminating cocoa as an additive from tobacco which has been shown to prompt smokers to modify their puffing behavior, and addition of cocoa to cigarettes may improve the sensory experience of smoking, on tobacco industry websites, it may serve other sensory purposes as well. Educators should consider using social media as an adjunct in teaching tobacco dependence treatment. Use of social media by practicing dentists could serve as an enhancement to treatment and help supplement the incompleteness of tobacco use interventions previously identified. No funding.

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POS3-43
ACTION TO STOP SMOKING IN SUSPECTED TUBERCULOUS (ASSIST) IN PAKISTAN: A RANDOMIZED, CONTROLLED TRIAL
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There is a strong causal link between tobacco smoking and tuberculosis incidence. Almost 20% of the total disease burden due to tuberculosis is attributable to tobacco use. Pakistan is one of the top ten high burden countries for both tuberculosis and tobacco use. We carried out a cluster randomized, controlled trial to assess the effectiveness of smoking cessation interventions in achieving six-month continuous abstinence among adult smokers suspected of pulmonary tuberculosis in the health centers in districts of Jhang and Sargodha, Pakistan. Health centers were randomized to: (a) intervention arm I - behavioral support plus bupropion (BS+); (b) intervention arm II - behavioral support only (BS); and (c) control arm - usual care plus a self-help booklet. Behavioral support comprised of two structured consultations (at a week’s interval) with a health professional, each lasting for 30 and 10 minutes respectively. Bupropion was given for a period of seven weeks in total, 75mg per day in week one and 150mg in the following six weeks. All patients were assessed for abstinence (verified by Carbon Monoxide test), one and six months after the quit date. Results were analyzed using log proportion and linear mixed models. A total of 45.4% (27/60) of those offered BS+ achieved six months’ abstinence compared with 41.0% (25/62) of BS and 8.5% (5/61) of usual care plus a self-help booklet. Both treatment conditions led to statistically significant relative risk (RR) of abstinence compared to usual care (RR (95% CI): 8.2 (3.7-18.2) for BS+ and RR (95% CI): 7.3 (4.3-16.1) for BS, respectively). The relative risk of abstinence for BS+ vs. BS (RR (95%CI): 1.1 (0.6-2.2)) was not statistically significant. The three trial arms were not well balanced for urban and rural population ratio. In addition we were not able to confirm treatment adherence for bupropion, use cotinine test for validating abstinence, or assess the effect of smoking cessation on TB outcomes. Behavioral support is effective in promoting cessation in smokers with suspected tuberculosis. The addition of bupropion did not improve abstinence rates substantially.

Funding: International Development Research Centre, Canada.

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POS3-44
USE, KNOWLEDGE, AND ATTITUDES TOWARD NICHETTE REPLACEMENT THERAPY AMONG SMOokers IN PUBLIC HOUSING
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Fewer than 25% of smokers use pharmacotherapy each year, and rates are even lower among minority and low-income smokers. We used both quantitative and qualitative data to examine knowledge, attitudes, and use of NRT among residents of public housing interested in quitting smoking. Baseline questionnaires were administered to 243 smokers enrolled in a community-based cessation trial. Questions included prior NRT use and satisfaction and the Attitudes Toward Nicotine Replacement Therapy (ANRT-12) scale. We also reviewed audiotapes of peer counselor encounters with 80 participants. 51% of smokers previously used pharmacotherapy; of these, 92% used NRT and 38% used medication. Black (34%) and Hispanic (36%) smokers were less likely to Whites (52%) to have ever used the nicotine patch. 35% of patch users were satisfied with the patch, while 30% reported that they had stopped using it because of side effects. Nicotine gum users were slightly less likely to have ceased use due to side effects (23%), but much less likely to say they were satisfied (13%). A high proportion of respondents to the ANRT-12 responded “don’t know” to the 6 knowledge questions (range 30-48%), indicating a lack of knowledge of indications for NRT. Prior users of NRT were much less likely to state that they did not know about its effects (range 17-35%) than those with no prior use (range 38-67%). Prior users were also less likely than non-users to be suspicious of NRT (32% vs. 51%) or concerned about side effects (54% vs. 74%), although levels of concern were high even among prior
users. Barriers to NRT use that emerged from analysis of audiotapes included the belief that mental weakness, not physical dependency, is the main barrier to quitting; nicotine as the main culprit in smoking; overreliance on anecdotal experience; wariness of side effects; and a preference for ‘natural’ rather than ‘chemical’ solutions. Smokers in public housing who were interested in quitting displayed a lack of knowledge about NRT that could interfere with a successful quit attempt. Results of the cessation trial will shed light on whether peer counseling can improve utilization and subsequent abstinence.

Funded by grants #1R01CA141587 and #3R01CA141587.

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POS3-45
DEPRESSIVE REALISM AMONG SMOKERS: A LONGITUDINAL ANALYSIS USING DATA FROM THE INTERNATIONAL TOBACCO CONTROL (ITC) FOUR COUNTRY SURVEY

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It has been suggested that those with depressive realism actually have a more accurate perception of reality (Alloy and Abramson, 1979). Specifically, those with borderline or moderate depression are less affected by positive illusions, locus of control, and optimism bias. In contrast, optimistic biases have been shown to be common phenomena among smokers (Fotuhi et al., 2012). The current study aims to examine the role that depressive symptoms have on smoking related beliefs. Longitudinal data from nationally representative samples of adult smokers in the International Tobacco Control (ITC) Four Country Survey from Canada, the United States, the United Kingdom, and Australia were used. We analyzed data from waves 5 (October 2006 to February 2007), 6 (September 2007 to February 2008), and 7 (October 2008 to July 2009). We created a measure of depressive symptoms by combining two questions: asking respondents whether they were (1) feeling down, depressed, or hopeless; and (2) whether they experienced loss of pleasure in their activities. We also created composite measures for (1) the frequency of thinking about smoking related consequences, (2) the level of awareness of the health consequences associated with smoking, (3) the level of awareness of warning label messages, and (4) the level of endorsement in risk-minimizing beliefs. Controlling for relevant demographic variables and Heavyness of Smoking Index (a measure of nicotine dependence that combines two categorical measures: cigarettes per day with time after waking at first cigarette of Smoking Index (a measure of nicotine dependence that combines two categorical measures: cigarettes per day with time after waking at first cigarette) reduced depression significantly predicted greater frequency of thinking about smoking (B = 0.15, t(6395) = 11.94, p < .001); greater awareness of smoking-related health consequences (B = 0.12, t(6395) = 7.24, p < .001); greater awareness of warning label messages (B = 0.09, t(6395) = 7.02, p < .001); and lower endorsement of risk-minimizing beliefs (B = -0.07, t(6395) = -5.52, p < .001). These findings point to the need to identify the role of depressive symptoms in understanding and predicting smoking cessation. Longitudinal analyses are discussed in the poster. The ITC Four-Country Survey is supported by grants R01 CA 100362 and P50 CA111236 (Roswell Park Transdisciplinary Tobacco Use Research Center) from the National Cancer Institute of the United States, Robert Wood Johnson Foundation (045734), Canadian Institutes of Health Research (CIHR)57897, 79551), National Health and Medical Research Council of Australia (265903, 450110), Cancer Research UK (C312/3276), Canadian Tobacco Control Research Initiative (014578), Centre for Behavioural Research and Program Evaluation, National Cancer Institute of Canada/Canadian Cancer Society. Student assistance was provided by the CIHR Frederick Banting and Charles Best Canada Graduate Scholarship and the CIHR Strategic Training Program for Tobacco Research.

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POS3-46
STATISTICAL ESTIMATION OF LUNG CANCER PROBABILITY CONNECTION WITH THE THREE MAIN RISK FACTORS (AGE, SMOKING HISTORY, AND COPD)

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Aim: The purpose of this research is to determine a well-defined group of persons at high risk of developing lung cancer who would benefit from an organised screening model. Method: In 2009, we studied 925 diagnosed lung cancer cases in Budapest, Hungary. We obtained patient’s age, sex, smoking history, COPD comorbidity, cancer stage at diagnosis, cell type and lung cancer therapy. We estimated lung cancer risk with a multivariate model among the study sample, and compared these data to epidemiological data of the general population in Budapest. results: The sample included 521 males and 404 females, who were on average 63 years of age (95%-50), 79% had a smoking history (68% current and 32% former smokers), with an average pack year index (PYI) of 33 (7%-20). COPD comorbidity was present in 44% of patients. Lung cancer risk was 2X higher among smokers; 2.4X higher among the >50 years old people; 4X higher among the strong smokers (PYI>40); 4.4X higher among COPD patients; 6.3X higher among the >50 years old strong smokers; 8X higher among among the strong smoker COPD patients and 13.5X higher among the patients with all three risk factors (age>50 years, PYI>40 strong smokers and COPD) versus the general population in Budapest. Conclusion: This high-risk group (age>50, PYI>40 and COPD) may be a good target group for a cost effective LDCT lung cancer screening model in Budapest, Hungary, where such screening infrastructure already exists for tuberculosis monitoring.

This survey was supported by the Fogarty International Center (Grant #1. R01-TW00792701-01).

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POS3-48
PARTNER INTERFERENCE IN INDIVIDUAL GOAL PURSUIT IS ASSOCIATED WITH INCREASED SMOKING

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Although previous research has established that people's smoking status is an important determinant of their marital partner's smoking status, most research has neglected other aspects of marriage that might influence smoking behavior. A growing literature demonstrates that people both enhance and interfere with their partner's ability to self-regulate in the service of individual goal pursuit. For example, people are more likely to achieve their goals over time when their partners are highly supportive (Brunstein, Dangelmayer, & Schultheiss, 1999). Yet, conflict can impair task completion (Baumeister, DeWall, Ciarocco, & Twenge). The ability to quit smoking is heavily dependent on people's ability to self-regulate, so the partner's interfering behavior likely plays a critical role in smoking cessation. The current research examines perceptions of the partner's interference in individual goal pursuit (unrelated to smoking cessation) as a predictor of smoking behavior in the first nine years of marriage. Data are from a sample of newlyweds couples assessed at six time points: at the time of marriage, and at the first, second, fourth, seventh, and ninth anniversaries. The current analyses focus on both partners in 333 “ever smoker” couples (i.e., couples in which at least one partner reported smoking during at least one assessment over the course of the study). Participants completed measures of perceived partner interference, smoking, and demographics through the mail at each time point. Data were analyzed using multivariate multilevel modeling. For both husbands and wives, greater perceived partner interference in individual goal pursuit in a given year was associated with a greater likelihood of being a smoker and increased quantity of cigarettes smoked per day during that year. This effect remained significant controlling for demographics, partner smoking status or quantity, and overall marital quality. The current research suggests that partners influence smoking behavior indirectly,
through mechanisms other than behavioral contagion and the quality of the relationship.

This research was supported by National Institutes of Health grants R21 DA034068 (PI: Derrick), R37-AA00922 (PI: Kenneth E. Leonard), and R01 AA016127 (PI: Testa).

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ASSOCIATION? A CASE-CONTROL STUDY FROM BANGLADESH

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POS3-49
SMOKING TOPOGRAPHY OF FACTORY MADE AND MAKE YOUR OWN CIGARETTES

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The recent increase in the price of Factory Made (FM) cigarettes has influenced the rise in use of Make Your Own (MYO) cigarettes. Along with price considerations, MYO smokers choose to smoke these cigarettes for a variety of reasons like taste preference, perception of being healthier than FM cigarettes, and as a method to smoke less. MYO smokers can be classified as either Roll Your Own (RYO: hand-rolled cigarettes with loose tobacco and a paper leaf) or Personal Machine Made (PMM: use of a machine to inject loose tobacco into a preformed cigarette tube). Three groups of regular smokers who exclusively smoked RYO (n = 32), PMM (n = 24) and FM (n = 20) cigarettes participated in the study. Subjects (62 male, 14 female) completed three laboratory visits where they smoked their own cigarettes ad lib (without restrictions), after verified overnight abstinence, and intensely (by smoking three cigarettes over a two hour period). Participants averaged 38 years of age and smoked an average of 18.3 (SD = 8.0) cigarettes/day. PMMs smoked significantly more cigarettes/day than RYOs and FMs (M[SD] = 22(10.7), 17(6.3) and 15(15.3) respectively (p<0.01)). Topography measures were similar across the three experimental conditions. Most notably, RYOs took significantly less time to smoke than PMMs and FMs (p < 0.01); in the ad lib condition, the time to smoke was 245s, 340s and 312s respectively, RYOs also differed from PMMs and FMs in number of puffs: M = 10, 16 and 13 (p < 0.001) respectively; and total puff volume: M = 581mL, 906mL and 740mL (p < 0.01) respectively. Smoking topography was most similar in PMMs and FMs as no significant differences were found in time to smoke: M = 340s and 312s; number of puffs: M = 16 and 13; average puff volume: M = 58mL and 59mL; puff duration: M = 1.9s and 1.9s; and puff velocity: M = 40mL/s and 38mL/s. However, PMMs of puffs: M = 16 and 13; average puff volume: M = 58mL and 59mL; puff duration: M = 1.9s and 1.9s; and puff velocity: M = 40mL/s and 38mL/s. However, PMMs did have a significantly greater total puff volume compared to both RYOs and FMs especially in the overnight abstinence condition (M = 915mL, 594mL and 656mL respectively (p<0.01)). This study suggests that smoking behavior differs among RYO, PMM and FM smokers; however, FM smoking behavior is most similar to PMM smoking.

This research was supported by a grant from the National Cancer Institute at the National Institutes of Health (1R01CA138973-01/5R01CA138973-02).

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POS3-50
SMOKELESS TOBACCO AND CORONARY HEART DISEASE: IS THERE ANY ASSOCIATION? A CASE-CONTROL STUDY FROM BANGLADESH

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Background: Most epidemiological studies exploring the association between smokeless tobacco (SLT) use and coronary heart disease (CHD) have been in Western populations, and have focused on SLT products used in those countries. Few studies come from South Asian countries. Our objective was to determine the association between SLT use and CHD among non-smoking adults in Bangladesh. More specifically, a matched case-control study of non-smoking adults aged 40–75 years was conducted in 2010. Incident cases of CHD were selected from two cardiac hospitals. Community controls, matched to CHD cases, were selected from neighbourhoods, and hospital controls were selected from outpatient departments of the same hospitals. The Rose Angina Questionnaire (RAQ) was also used to re-classify cases and controls. Results: We had 302 cases, 1208 community controls, 302 hospital controls. Current use of SLT was higher among community controls (38%) compared to cases (33%) and hospital controls (32%). Current use of SLT was not significantly associated with an increased risk of CHD when community controls were used (adjusted OR 0.87, 95% CI 0.63–1.18), or when hospital controls were used (adjusted OR 1.00, 95% CI 0.63–1.60), or when both control groups were combined (adjusted OR 1.00, 95% CI 0.74–1.34). Risk of CHD did not increase with use of individual types except gul, frequency, duration, past use of SLT products, or using the RAQ to re-classify cases and controls. There was a significant association between gul use and CHD when both controls were combined (adjusted OR 2.03, 95% CI 1.28–3.70). Conclusions: There was no statistically significant association between SLT use in general and CHD among non-smoking adults in Bangladesh. Further research on the association between gul use and CHD in Bangladesh along with SLT use and CHD in other parts of the subcontinent will guide public health policy and interventions that focus on SLT-related diseases.

Funding for this study was provided by the Discipline of Public Health, The University of Adelaide. Additionally, human resource and in-kind support for the research was also provided by the Institute of Epidemiology, Disease Control and Research, Dhaka, Bangladesh and the National Heart Foundation Hospital & Research Institute, Dhaka, Bangladesh. The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

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POS3-51
GENDER DIFFERENCES IN THE USE OF VERY LOW NICOTINE CONTENT CIGARETTES

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Reducing the nicotine content of cigarettes could improve public health by reducing national smoking levels; however, individual differences of responses to very low nicotine content (VLNC) cigarettes need to be considered. In particular, research suggests that men and women have different susceptibilities to the reinforcing properties of nicotine, such that men could be more sensitive to nicotine reduction strategies than women. The proposed study examined gender differences of responses to VLNC cigarettes. As part of a larger study (Hatsukami et al., 2010), adult smokers (N=46) who wanted to quit smoking were asked to smoke 0.05 mg nicotine yield cigarettes for 6-weeks. Changes in average daily cigarette use relative to baseline smoking were examined weekly. Latent growth curve models were estimated using Mplus. On average, cigarette use increased relative to baseline during the first week after switching to VLNC cigarettes (intercept = 1.78, p=0.007) and then decreased linearly over time (slope = -1.96, p=.002); however, curvilinear decreases were evident after taking gender into account. The change pattern differed between men and women, controlling for baseline cigarette use and study non-compliance. Women exhibited a faster initial decrease of cigarette use relative to baseline than men (linear slope: beta = -3.49, p=.001). Thereafter, the rate of decrease slowed for women relative to men (quadratic slope: beta = 0.65, p=.002). As a result, women initially appeared to benefit more from smoking VLNC cigarettes, but by Week 6 men (mean reduction =5.13 cigarettes) had achieved similar levels of cigarette reduction than women (mean reduction =5.73 cigarettes). To determine if the gender differences were due to withdrawal severity, assessed by the Minnesota Nicotine Withdrawal Scale, changes of withdrawal severity relative to baseline were examined as a time-varying covariate. Withdrawal symptoms did not predict cigarette use and the gender effect remained robust. It appears that VLNC cigarettes effectively reduce 

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smoking among men and women. Extended assessments are needed to examine if the slowing rate of change in women results in reduced long-term gains. Funding: National Institutes of Health P50 DA013333 & U54 DA031659.

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POS3-52 EXPLORING MODERATION OF GENDER DIFFERENCES IN RISK PERCEPTIONS AND SMOKING BEHAVIOR AND MOTIVATION AMONG A MULTIETHNIC SAMPLE OF ADULTS

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There is now considerable evidence that women and men differ in their risk perceptions (RP) of smoking. However, there is a dearth of research exploring how gender may affect the relationships between RPs and smoking behavior and quitting motivation across different ethnicities, including the Asian/Pacific Islander subgroups. The current study addresses this gap by examining whether gender moderates the effect of smoking-related RPs on rates of daily smoking, motivation to quit, intentions to quit, and self-efficacy to quit in a multi-ethnic sample of adult smokers in Hawaii. Participants were recruited from the community through newspaper advertisements as part of a larger NIH-funded study [N=1,346; 51% Female; M age=45 (SD = 13); M cigs/day=18 (SD =11)]. In particular, we compared the moderation effects across Caucasian (40% of the sample), Native Hawaiian (NH) (36%), and Asian (24%) adults. Results indicated that for the total sample, there was a significant moderation effect between gender and RPs for self-efficacy to quit (p < .05) and marginally significant effects for motivation to quit and intentions to quit (p<.10). Among the ethnic subgroup analyses, there was a marginally significant moderation effect between gender and RPs for cigarettes smoked per day among NHs (p<.10). There were also significant moderation effects between gender and RPs for motivation to quit and self-efficacy to quit among NHs and Caucasians (p<.05). The moderation effect between gender and RPs for intentions to quit was significant for Caucasians (p<.05) and marginally significant for NHs (p=.05). Thus, among NHs, similar to Caucasians, higher risk-perception was more strongly related to higher motivation to quit and greater self-efficacy and marginally related to fewer cigarettes smoked per day among males than among females. This is an important finding for the development of smoking cessation programs targeting NHs. NH women tend to show higher smoking prevalence than men and thus are in greater need of treatment. Our results suggest that enhancing RPs among NH women alone may not strongly impact their motivation to quit, self-efficacy or cigarette consumption.

This study was supported by an R01 grant (# CA2079905) from the National Cancer Institute to T.A. Herzog.

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POS3-53 SENSORY AND RISK PERCEPTIONS OF SECONDHAND SMOKE IN PUBLIC VENUES IN JORDAN

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BACKGROUND: In 2008, Jordan adopted smoke-free legislation to protect workers and the public from the dangers of secondhand smoke (SHS), but the public have not been complied with the law. To better understand low public compliance, this study aimed to establish whether sensory and risk perceptions arising from actual SHS exposure are related to general health beliefs on SHS among patrons of public venues in Jordan. METHODS: Smoking and non-smoking patrons (N=125) in attendance at 15 public venues of three categories: cigarette only, combined waterpipe and cigarette, and smoke-free were surveyed. Perceptions of air quality (smell, odor, irritation, smoke visibility, and exposure risk) and general SHS health beliefs were measured. Knowledge of and attitudes towards Jordan’s smoke-free legislation were also assessed. PM2.5, an index of SHS, was measured inside all venues to confirm and quantify the presence of SHS. RESULTS: While most participants regarded cigarette (87%) and waterpipe (88%) SHS as harmful to health, a high proportion of participants reported low perceived health risks associated with the air quality inside venues with cigarette (51%) and cigarette/waterpipe (64%) smoking. No differences in perceptions of health risk, smell strength, or irritation were observed across the three venue types. However, significant differences were seen in perceptions of pleasant smell (p=0.037) and smoke visibility (p=0.017). Strong support for the Jordanian smokefree law was reported among smokers (73%) and non-smokers (97%). PM2.5 levels within the non-smoking venues (13 ug/m3) were significantly lower than levels in cigarette (130ug/m3; p=0.028) and cigarette/waterpipe (135 ug/m3; p=0.009) venues. CONCLUSIONS: Patrons of public venues in Jordan reported low health risks associated with exposure to SHS, despite a high general belief that SHS is harmful to health. Compliance with SHS laws may be enhanced by reducing the dissonance between SHS knowledge and perceptions of risk and sensory effects through more effective health communication.

Funding: Action on Smoking and Health International.

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POS3-54 CHANGES IN IMPLICIT ATTITUDES TOWARD SMOKING

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Cross-sectional studies have shown that implicit attitudes toward smoking are associated with smoking status and level of smoking independent of explicit attitudes. Implicit attitudes may therefore be a valuable target for smoking cessation interventions. However, research is needed on whether and how implicit attitudes can be changed within the context of smoking cessation treatment. This study examined changes in implicit attitudes toward smoking in relation to 2 different motivational counseling interventions and a brief advice control group. Daily smokers (N = 183; 57% male; 63% African American) were recruited from the community and randomly assigned to one of three interventions (brief advice, health education, and motivational interviewing). They completed survey measures of demographics, explicit attitudes toward smoking (Pros and Cons of Smoking), and the Implicit Association Test (IAT) at baseline, month 3 (during intervention sessions), and month 6 (follow-up). The correlation between explicit and implicit attitudes was only significant at month 6 (r = .16, p < .05). Explicit attitudes toward smoking became more negative across time points (means at each time point were 2.93, -2.25, -3.32; F (2,360) = 31.240, p < .01) and implicit attitudes showed a similar pattern with marginal significance (mean D’s at each time point were -1.6, -.32, -.30; F (2,360) = 2.802, p = .06). However, examination of interaction effects suggests that the pattern of negative change did not differ across interventions for both explicit (F (4,360) = 1.363, p > .10) and implicit attitudes (F (4,360) = 1.270, p > .10). The results provide no indication that common motivational interventions might influence implicit attitudes toward smoking. More research is needed to confirm and understand factors associated with negative changes in implicit and explicit attitudes over time and to develop interventions that might impact implicit and explicit attitudes.

This study was supported by grant R01 CA133068 from the National Cancer Institute, and Pfizer provided Varenicline.

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Social capital has the potential to support the development of new frameworks for capital after adjusting for socioeconomic position. (OR=1.3, 95% CI=1.0-1.7). Times more likely to smoke inside their home against those belonging to high social cohesion and capital are 1.3 times more likely to smoke inside their home among respondents reporting low and high social capital (p <0.05). Results of the study were undertaken as a part of the grant received from Bill and Melinda Gates Foundation.

Univariate analysis was performed using the Chi-square test and conditional logistic regression models were used to investigate the associations between socio-demographic factors, social cohesion, social capital and smoking at home among tobacco users visiting primary health care facilities. The study followed a sequential exploratory mixed method design. Interviewer administered questionnaire was administered on 238 medical practitioners across 233 public health facilities and 75 in-depth interviews with senior health officials and health planners were undertaken. Majority of the respondents associate smokeless tobacco with respiratory problems and cancer. Other major health effects like cardio-vascular problems, oral diseases, and effects on reproductive and neonatal health were recognized by less than half of practitioners to be caused by smokeless tobacco. 10-19 years was identified as the most vulnerable age group to initiate smokeless tobacco use. The qualitative findings reinforced the fact and suggested that health officials regard people belonging to low socio-economic status and those belonging to a particular community to be vulnerable to smokeless tobacco use. Less than one-third of medical practitioners reported recording smokeless tobacco history of all patients. Two-third of the respondents (67%) was aware of Nicotine Replacement Therapy (NRT) and only one-third of practitioners (27%) were cognizant of interpersonal counselling as a tobacco cessation technique. Doctors record tobacco history mainly for patients suffering from specific diseases. This can be related to their incomplete knowledge of health effects of tobacco especially smokeless tobacco, lack of training and appropriate skills, and workload. There is a need of targeted approach for designing a context-specific communication package to equip medical practitioners with skills to communicate effective messages against smokeless tobacco.

No funding.

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POS3-56
ANALYSING THE IMPACT OF SOCIAL COHESION AND CAPITAL ON TOBACCO USE IN TWO HIGH BURDEN STATES IN INDIA


The degree to which an individual is interconnected and embedded in a community is vital for his health and well-being as well as for the health of the entire populations. This study investigates the associations between socio-demographic factors, social cohesion, social capital and smoking at home among tobacco users visiting primary health care facility in two high tobacco prevalence states of India. The study was conducted among users of primary health care facilities in the state of Gujarat and Andhra Pradesh (AP). A total of 1151 tobacco users aged 8-64 years were included in this study using multi stage random sampling method. Different dimensions of social capital like trust, norms and reciprocity were measured. Univariate analysis was performed using the Chi-square test and conditional logistic regression models were used to investigate the associations between socio-demographic factors, social capital with tobacco use and smoking at home. Tobacco use was higher among respondents reporting lower social capital score (56%). A significant difference was observed in making a quit attempt among the tobacco users belonging to low and high social capital scale (p<0.05). More than half of respondents reporting lower social capital reported smoke practices inside their home. Significant difference was observed among smoking practices at home among respondents reporting low and high social capital (p <0.05). Results indicate that respondents having lower levels of social cohesion and capital are 1.3 times more likely to smoke inside their home against those belonging to high social capital after adjusting for socioeconomic position. (OR=1.3, 95% CI=1.0-1.7). Social capital has the potential to support the development of new frameworks for understanding tobacco use behaviour in individuals, within a broad and complex social perspective. This study shows that lower levels social capital is significantly associated with tobacco use and smoking at home. More implementation research is required in order to develop a stronger conceptual understanding of various elements of social capital and how they operate in society to affect tobacco dependence and use.

Funding: Norwegian Institute for Alcohol and Drug Research.

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POS3-57
WHAT PEOPLE THINK MOST PEOPLE THINK ABOUT SMOKERS

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Objective: An increasing literature on stigma and denormalisation of smoking has emerged in the last years. Denormalisation has been discussed as a positive mechanism for public health at the societal level, but also as a having unintended consequences by increasing stigmatization processes at an individual level. The aim of the study is to explore perceptions of smoker stigma and the association between these perception and smoking status. Moreover, to investigate the association between perceived smoker stigma and the intention to quit smoking.

Method: We used data from Norwegian Monitor (NM) from the year 2011, N=4 000, age group 15 years and above. To measure perceptions of smoker stigma, we used two attitude statements; “Most people think less of smokers” (devaluation) and “Most people think smoking is a sign of personal failure” (failure), with response category disagree/agree. Intention to quit was measured on a no/yes format. Tree multiple logistic regression analysis were performed with the following dependent variables: devaluation and failure (model 1 and 2, controlling for age, gender and education), and intention to quit (model 3)smokers only, controlling for subjective health and nicotine dependence). Results: 58 % agreed in the devaluation statement, while 27 % agreed in the failure-statement. Model 1 showed that the odds ratio for supporting devaluation was higher for daily smokers (1.7) and recent quitters (1.4) compared to never smokers. There was no association between smoking status and perception of failure (model 2). In model 3 (quit intention), the odds ratio for having a quit intention was 1.7 for those who agree in the devaluation statement, while no significant relationship was found for the failure statement.

Conclusion: More than half of the respondents support the existence of smoker stigma by virtue of devaluation. Less support was found for smoking as a personal failure. Compared to non-smokers, both daily smokers and recent quitters hold stronger devaluation perceptions, possibly due to personal experience. Among smokers, those who support the existence of a smoker stigma are more likely to have quit intentions.

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POS3-58
PERCEPTIONS OF FEMALE SMOKING IN CHINA: FINDINGS FROM THE ITC CHINA SURVEY

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Female smoking prevalence in China is very low (less than 3%), but many experts predict that it will increase in the future due to increased tobacco marketing toward women. However, little is known about the current perceptions of women smoking in China. This study sought to examine the perception that female smoking is acceptable, among both male and female smokers and non-smokers in China. Data is from Waves 1 to 3 (2006-2009) of the International Tobacco Control (ITC) China Survey, a face-to-face cohort survey of approximately 800 adult smokers and 200 non-smokers in each of seven cities in mainland China.
Among smokers surveyed at the most recent survey wave (2009), women were almost twice as likely as men to agree that female smoking is acceptable (65% vs. 35%). Non-smokers of both genders were far less likely to agree, although among the non-smokers, women were still more likely than men to say that female smoking is acceptable (10% vs. 6%). This belief has increased over the three survey waves for smokers of both genders, though the increase has been larger for women. There were some differences in perceptions of female smoking by city, which will be discussed further in the paper. Of the female smokers who disagreed that female smoking is acceptable at Wave 3, almost half (47%) intended to quit within the next six months, compared to only 23% of female smokers who believe that it is acceptable for women to smoke. These findings demonstrate that the perception that female smoking is acceptable is increasing in China, though far more females than males believe that it’s okay for women to smoke. Among women smokers who believe female smoking is acceptable, the majority do not intend to quit smoking. These findings can inform interventions to prevent female smoking prevalence from increasing in China.

The ITC China Project is supported by grants from the U.S. National Cancer Institute (P50 CA111236) and the Chinese Center for Disease Control and Prevention National Tobacco Control Office. The corresponding author is supported by a Frederick Banting and Charles Best Canada Graduate Scholarships - Doctoral Award from the Canadian Institutes of Health Research.

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POS3-59 AN EXPLORATION OF SMOKELESS TOBACCO RISK-RELATED MESSAGES IN THE NEWS

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Introduction: Although some tobacco control professionals have argued that smokeless tobacco (SLT) can act as a less harmful smoking alternative, others note that such promotion may confuse the public and have harmful population level consequences. Though some studies have concluded that smokers are misinformed about the relative risks of SLT versus cigarettes, little research has examined the content of SLT-related information. This study aims to describe messages about SLT risk comparisons and other SLT “debate” issues potentially reaching the public through news stories. Methods: A content analysis was conducted on SLT-related news articles between 2006 and 2010 from top circulating national and state newspapers and select news websites. Articles were coded for the presence of risk messages comparing SLT to cigarettes and other debated perspectives about SLT, as well as the source of these messages within articles. Results: About 16% of news articles (n=677) included references to SLT as being or possibly being less harmful than smoking, messages that were more frequent in articles mentioning snus or dissolvable SLT. About 29% of articles included at least one “anti” SLT message, including variously phrased warnings that SLT is not a safe smoking alternative and also arguments about other potential consequences such as dual product use and youth uptake. About 12% included messages from both sides of the “debate.” Discussion: Although tobacco control professionals have not yet agreed on SLT’s role in harm reduction and reduced risk claims are still prohibited in SLT ads, messages about SLT’s reduced harm potential may be reaching the public anyway through news stories. Research should examine readers’ interpretations about varying information and perspectives about SLT presented in such stories and the potential impact of these on their SLT beliefs and trial intentions.

This work was supported in part by funding from the National Cancer Institute through the Cancer Institute of New Jersey (P30CA072720).

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POS3-60 COLLEGE STUDENTS’ INTEREST IN TRYING DISSOLVABLE TOBACCO PRODUCTS

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Background: Starting in 2009, dissolvable tobacco products (DTPs) in the form of strips, orbs, and sticks have been introduced by the major tobacco companies into test markets in the U.S. Very little is known about the appeal of this new generation of smokeless tobacco (SLT) products to potential consumers. Methods: We conducted a web-based survey of 3515 freshman students (64% response rate) at 11 NC and VA universities in fall 2010. Students who ever used SLT products, current smokers, and males were oversampled. The survey included a series of questions about DTPs, which were accompanied by pictures of the leading DTP products on the market (including Camel sticks, strips and orbs). Results: About 16% of news articles (n=677) included references to SLT as being or possibly being less harmful than smoking, messages that were more frequent in articles mentioning snus or dissolvable SLT (36.8%) and that were attributed within articles to public health professionals and researchers as frequently as to tobacco company representatives. About 29% of articles included at least one “anti” SLT message, including variously phrased warnings that SLT is not a safe smoking alternative and also arguments about other potential consequences such as dual product use and youth uptake. About 12% included messages from both sides of the “debate.” Discussion: Although tobacco control professionals have not yet agreed on SLT’s role in harm reduction and reduced risk claims are still prohibited in SLT ads, messages about SLT’s reduced harm potential may be reaching the public anyway through news stories. Research should examine readers’ interpretations about varying information and perspectives about SLT presented in such stories and the potential impact of these on their SLT beliefs and trial intentions.

This work was supported by Grant #R01CA141643 from the National Cancer Institute.

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POS3-61 PHYSICAL ACTIVITY AND SNUS: IS THERE A LINK?

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Purpose: According to Swiss customs authorities, the quantity of oral tobacco imported from Sweden was multiplied by 56 between 2004 and 2011. As snus is popular among young people practicing a sport activity in Scandinavian countries, the purpose of this study is to assess the link between physical activity and snus use among young Swiss men. Methods: Using baseline data from a Cohort Study on Substance Use Risk Factors (C-SURF), we first measured self-reported physical activity using the short form of the International Physical Activity Questionnaire (IPAQ). We categorized self-reported physical activity levels into low, moderate and high level. With the purpose of this study, we will assess whether snus users differ from non-users in terms of physical activity level. We performed a multivariate logistic regression analysis to test the association between snus use and physical activity level. RESULTS: Among the studied population, 477 (8.9%) had used snus during the last 12 months and 348 (73.0%) of them were in the high category of physical activity. 74.4% of snus users had also smoked in the last 12 months, whereas 46.3% of the nonsmokers had consumed cannabis in the last 12 months. Adjusted odds for snus use increased in a dose response association of 47% with a moderate level of physical activity (OR 1.47, 95% CI
1.01-2.13), and of 68% with a high level (OR 1.68; 95% CI 1.26–2.24). Conclusions: To our knowledge this is the first study that shows the association between snus use and high level of physical activity in a non-Scandinavian country. It might also indicate the exportation from Sweden to other countries of a particular marketing image which associates snus with sport activities. Finally, our results suggest that snus prevention programs focusing on physical activities may be needed.

Funding of this study was provided by a research grant by the Swiss National Science Foundation. This study was conducted while the first author was at the Department of Ambulatory Care and Community Medicine, University of Lausanne, Switzerland.

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POS3-62
PERCEPTIONS OF THE RELATIVE RISK OF ADDICTION BETWEEN SNUS AND CIGARETTES

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Background: Increasing public awareness of the relative risk of using different tobacco products is important from a harm reduction perspective. Studies have shown that the public is largely unaware of global differences in risks of harm to health between combustible tobacco and snus. We have little knowledge about perceptions of risk of particular diseases and of addiction. Aim: Explore smokers perception of the risk of addiction associated with use of snus versus cigarettes.

Methods: Pooled data from annual surveys (2008-2011) performed by Statistics Norway. Information on tobacco use, demographic background variables and perceptions of relative risk for specific diseases and nicotine addiction from regular snus use or smoking was collected. The sample for this study included 2681 ever smoking and/or snus users aged 15 – 79 years. 53 per cent of the sample was men, and the average age was 46.1 years. Results: &frasl;34; of current or former smokers and snus users believed that snus-users and smokers were running a similar risk of becoming addicted to nicotine. The remaining &frasl;14; was split into 19,1% who believed smokers were more at risk and 5,1% who believed the highest risk was that of snus users. Focusing on those who did not think both products gave the same risk, exclusive smokers were more inclined to think that smoking was more risky. However, even among snus users it was more common to believe smoking to give the higher risk. Compared to exclusive cigarette or snus users, those with current or former experience with both products were more inclined to believe that snus gave a higher risk for nicotine addiction. The exception was former dual users who had succeeded in quitting both products. This sub group was more inclined to think that smoking gave the higher risk of addiction. Discussion: Risk of addiction is likely to be one of the factors incorporated into tobacco users’ understanding of global differences in smoking and snus use. Perceptions that snus and cigarettes are equally addictive could be one contribution to explaining why smokers’ perceptions of global relative risk are often not in coherence with scientific knowledge.

This study was financed in its entirety by the Norwegian Institute for Alcohol and Drug Research.

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POS3-63
INFLUENCE OF EDUCATIONAL ATTAINMENT ON THE USE OF SNUFF IN WOMEN OF CHILD-BEARING AGE

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While most smokeless tobacco users are male, these products appear to be growing in popularity among women. Snuff, a high-nicotine smokeless tobacco product, may be perceived as a safe alternative to smoking because it does not expose users to carcinogenic products of combustion. There is evidence, though, that snuff use increases the risk of oral cancers in women (Winn et al., 1981), and adverse birth outcomes (Baba et al., 2012; Gunnerbeck et al., 2011) if used during pregnancy. Despite these health risks, few studies have examined snuff use among American women of child-bearing age, or the influence of education level, which is a known risk factor for smoking. Epidemiological evidence has shown that educational disparities in smoking emerged in the last half of the 20th century as smoking declined in the general population but increased in the least educated women (Chilcoat, 2009). In the present study, we began to characterize the influence of education on the prevalence of snuff use. We examined data from women of child-bearing age (25-49) obtained from the National Survey on Drug Use and Health (2000, 2010). Referring its growing popularity, the overall lifetime use of snuff increased from 3.1% to 5.7% between 2000 and 2010. Interestingly, increases were observed across all education levels. However, although no educational disparities were observed in the 2000 sample, education was a significant predictor of use in the 2010 survey (p < .05). Women with at least some college were more likely to have tried snuff than those with a high school diploma or less (6.2% vs. 4.6%). This finding mirrors those observed in a sample of Swedish women (Norberg et al., 2011), but contrasts with current patterns of smoking. Importantly, however, a parallel analysis of more recent use (i.e., in the past year) revealed the opposite pattern, with the highest rates reported by those with no high school diploma (0.63%), and the lowest by women with a college degree (0.12%). Although the number of recent users in this analysis was very small, the pattern may suggest a forthcoming shift in snuff use by education level akin to that observed for cigarette smoking in the last century.

Funding: NIH T32 DA 007242.

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POS3-64
SMOKELESS TOBACCO USE: WHAT DO BANGLADESHI PEOPLE THINK?

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Background: Despite scientific evidence about harmful effects of smokeless tobacco (SLT), it is widely used as an ingredient with betel-leaf in Bangladesh. Chewing SLT is a culturally acceptable behaviour, often encouraged in social gatherings. This study explored perceptions of Bangladeshi adults about effects of SLT use on health. Methods: Semi-structured interviews were conducted with 1812 non-smoking adults aged 40-75 years in Dhaka. Data were compared between SLT users and non-users regarding reasons for SLT use, factors associated with initiation and quitting, perceived harmful and beneficial effects. Results: About 40% participants were current SLT users or had used SLT in the past. Use of was jarda more common compared to sada-pata and gul. The majority of the exclusive SLT users were heavy and long-duration users. Family members’ influence was the main factor for initiation. The participants believed that Bangladeshi people continued using SLT primarily due to addiction (52%) and as a part of lifestyle (23%). The majority of participants (77%) did not mention any other benefits. However, SLT users considered SLT as a remedy for toothache (p<0.05). Almost all participants, both users and non-users, mentioned that SLT was harmful and causes heart disease, cancer, tuberculosis and other diseases. Doctors’ advice was the common motivating factor to quit among both successful and unsuccessful quitters. Conclusions: Health promotion interventions should highlight adverse effects of SLT use which would outweigh the perceived benefits, focus on specific SLT-related diseases, should consider addressing the role of family and the cultural context of SLT initiation and use.

Funding for this study was provided by the Discipline of Public Health, University of Adelaide. Additionally, human resource and in-kind support for the research was also provided by the Institute of Epidemiology, Disease Control and Research, Dhaka, Bangladesh, and the National Heart Foundation Hospital & Research Institute, Dhaka, Bangladesh.

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Blue-collar workers have high rates of tobacco use compared to the general population putting them at risk for nicotine addiction and tobacco related cancers. Concurrent use of multiple tobacco products, which is an increasing public health concern, has not been extensively examined in this high risk population. The purpose of this study was to examine demographic and substance use factors associated with exclusive smokeless tobacco use and dual users of both cigarettes and smokeless tobacco among blue-collar workers. Data from respondents who were classified as blue-collar workers based on self-reported job category (n=5,392) from the 2009 National Drug use and Health Survey (NSDUH) were used for this secondary analysis. Multivariate logistic regression models were used to examine demographic and substance use factors associated with exclusive smokeless tobacco use and dual use. An estimated 5.3 percent of U.S. blue collar workers were current, exclusive smokeless tobacco users and an estimated 4.2 percent of U.S. blue collar workers were current dual users of both smokeless tobacco and cigarettes. Significant factors related to exclusive smokeless tobacco use were gender, marital status, age, race, type of blue-collar occupation, current binge drinking and current marijuana use. Significant factors related to dual use were gender, marital status, age, race, type of blue-collar occupation, current cigar smoking, current binge drinking, and current illicit drug use. Rates of smokeless tobacco and dual use are high among blue-collar workers indicating a need for targeted, workplace cessation interventions in this population. These interventions should focus on targeting demographic and substance use factors that increase the risk for tobacco use in this population.

This study was conducted while the first author was at the University of Michigan. Supported by National Institute of Nursing Research # 5T32NR007073-19.

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POS-3-66
FDA REGULATORY AUTHORITY AND RESEARCH PRIORITIES: A LITERATURE REVIEW TO ELUCIDATE GAP IN SMOKELESS TOBACCO USE IN YOUTH TO DEVELOP FUTURE RESEARCH FUNDING AND INFORM RECOMMENDATIONS RELATED TO FDA REGULATION OF SMOKELESS TOBACCO PRODUCTS

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With new FDA regulatory authority and research priorities, previously understudied research questions are now poised for further investigation, including those related to youth initiation and use of smokeless tobacco (ST) and long term health effects to scientifically inform FDA regulation. To begin to answer these questions, the study team conducted a critical review of the scientific literature to cognize the current state of the field and to identify gaps. It was found that while over the past two decades significant declines in youth cigarette use have been achieved, use rates of ST have not seen similar declines; in fact, rates have held steady since 2000, particularly among young males. Among 10th grade males, prevalence of ST use in the past 30 days was 11.4% in 2000 and 13% in 2010; conversely, prevalence of cigarette use for this group was 23.8% and 15% respectively. Many studies on ST use among youth focus primarily on use by males, specifically white males. While recognizable, and not unimportantly, the largest group of ST users, behaviors of other groups, notably females and minorities warrant study. It was also found that studies of ST use among youth are limited by available data (e.g., longitudinal datasets) and analytic approaches (e.g., trajectory analyses). Overall, findings from this literature review indicate that while much is known about youth patterns of cigarette use over time, comparatively little is understood as to how ST use trajectories among youth begin, continue, and effect health outcomes in adulthood. Future research must seek to provide a deeper understanding of the context surrounding initiation and use of ST among youth, increased rates of ST use among some subgroups, and the historical disparity in use between groups. And, analyses must address how behavior affects health outcomes of ST users to those who do not use or who use other tobacco products, such as cigarettes. In addition to fully describing findings from this literature review, future analytic plans by the study team and other related research questions and future directions now possible given FDA’s new regulatory authority and research agenda will be discussed.

Funding: Battelle Memorial Institute

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POS-3-67
WHAT DO PEOPLE THINK ABOUT HARMFUL AND POTENTIALLY HARMFUL CONSTITUENTS IN TOBACCO PRODUCTS? THE LATEST FDA RESEARCH


The Food Drug and Cosmetic Act, as amended by the Family Smoking Prevention and Tobacco Control Act, requires FDA to put on public display in a manner that is “understandable and not misleading to the lay person” lists of harmful and potentially harmful constituents (HPHC) in tobacco products by brand and subbrand by April 2013. FDA conducted research to inform the development and communication of HPHC lists that will be made available to the consumer. Sixteen (16) focus groups were conducted in 4 U.S. cities with adolescent (13-17 years old), young adult (18-24 years old), and adult (25 years and older) tobacco users, as well as adolescents non-users that may be susceptible to tobacco use. The discussions revealed knowledge gaps in consumer awareness of the number and quantity of chemicals in tobacco products, the health conditions that have been linked to some of these chemicals and the source of those chemicals (e.g., the tobacco leaf, the smoke, additives). Using this information, six list formats were developed for inclusion in a large (n=3,150) experimental study. The study includes participants of an internet panel that are adolescent, young adult (18-24 years old), and adult (25 years and older) tobacco users and adolescents (13-17 years old) that may be susceptible to tobacco use. The study assesses comprehension of the information contained in the HPHC list and the effects that the HPHC list may have on risk perceptions and behavioral intentions related to tobacco use. This presentation will describe the results of the focus group research and any available data from the experimental study on the impact of HPHC lists on consumer comprehension and perceptions of tobacco products and their constituents.

Funding: FDA/Center for Tobacco Products.

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POS-3-69
PLAIN PACKAGING: MORE THAN THE SUM OF ITS PARTS

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International interest in plain packaging has grown since Australia’s decision to implement this policy. Plain packaging requires removal of brand imagery and adoption of a standard format - in Australia’s case, a dark green background on which brand names appear in a standardised font. Tobacco companies strongly oppose this policy; they argue it lacks proportionality and that less intrusive measures could achieve the same outcomes. This study tested whether larger health warnings alone or less radical brand removal measures achieved the same outcomes. This study tested whether larger health warnings alone or less radical brand removal measures achieved the same outcomes as the Australian plain pack. We used a 3 (Brand) * 2 (Warning theme) * 3 (Brand level) * 3 (Warning size) design and conducted a best-worst study with 1044 smokers and non-smokers between 18 and 30, drawn from a New Zealand online panel. Each respondent viewed six showcards featuring three options and identified the one s/he would be most and least likely to select if purchasing tobacco for themselves (smokers) or for a friend who wanted to quit (non-smokers).
The data were analysed using multinomial logit regression. Smokers were least likely to select and non-smokers most likely to select the Australian plain pack compared to the status quo (Hazard Ratio of -1.416 and 3.071, respectively, p<0.001). Similarly, smokers were least likely and non-smokers most likely to select packs with an 80% warning on them and a health theme rather than a social theme. Smokers found partially plain packs featuring a stylised logo against a dark grey background significantly more attractive than packs displaying no brand imagery at all (Hazard Ratio of .733, p<0.001), while non-smokers saw these as significantly less likely to promote cessation than fully plain packs (Hazard Ratio of 1.500, p<0.001). Further, plain packs with an 80% health warning featuring a health theme were more dissuasive than the status quo or plain packs with a 50% warning. The results show fully plain packages are significantly more dissuasive than options with smaller warnings or residual brand imagery and support the proportionality of the Australian policy.

The research was funded by the Health Research Council of New Zealand (Grant 09/095R).

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POS3-70 COUNTERING TOBACCO INDUSTRY INTERFERENCE FOR TOBACCO CONTROL SUCCESS
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The destructive insinuation of the tobacco industry in tobacco control policy has only recently been fully understood through internal tobacco industry documents and historical studies of their corrupting influence. For nearly 60 years the tobacco industry has used public relations, lies and strategic misdirection to limit tobacco control achievements and to continue their unethical business practices. The WHO FCTC includes Article 5.3 which calls for an end to interference in tobacco control by the industry, but how low and middle income countries should implement such action is often unclear. We illustrate how the Thai experience with tobacco industry interference and clear prohibitions of industry influence specified in FCTC Article 5.3 guidelines might address one type of interference, corporate social responsibility. Thailand is among the earliest Asian countries to feel the force of the industry’s influence because of trade disputes in the late 1980s. This provided Thailand important lessons of how to work against industry interests. These lessons have been researched through qualitative analysis of Thailand’s policy and action. Information from tobacco industry documents and specific policies and strategies used against the industry are illustrated and are applied to an examination of efforts against one of the industry’s latest strategies, corporate social responsibility. Past actions were implemented early, developed continually, and shifted from being reactive to proactive as state policy and practice developed. Essential features of successful tobacco control included monitoring tobacco industry activities, informing stakeholders of industry activities through multiple media channels, and coordinating actions that counter legislative and regulatory proposals, marketing efforts, and public relations activities including corporate social responsibility actions. Realizing that the industry seeks to undermine the very authority of state policy provides lessons about the exploitive and irresponsible nature of the industry that can serve to warn and enrage politicians and all policymakers to reject CSR and other fraudulent actions of the industry.

Funding: Tobacco Control Research and Knowledge Management Center.

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POS3-71 GRAPHIC WARNING LABEL FORMAT AFFECTS RECALL OF HEALTH INFORMATION
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The Family Smoking Prevention Control Act gave authority to the Food and Drug Administration to regulate tobacco products, including the requirement that cigarette packs and advertisements have larger, more visible graphic health warnings, although implementation has been slowed by litigation. To date, there has been little research to examine which of the proposed graphic warning labels (GWLS) might be most effective, or what features make them effective. Results from our previous work suggests a complex viewing pattern enhances correct recall, but was based on one GWL with congruent messages (text and graphic convey similar information). It is plausible that incongruent messages, ones where the text and graphic do not convey the same message, would be counterproductive. The current study investigates the effect of GWL features on health beliefs and recall of health relevant information using eye tracking technology to better understand how viewing patterns affect outcomes. Current daily smokers (n=60) attended two laboratory sessions separated by 5 days. Participants were randomized to view a series of GWLS that were congruent or incongruent in theme, while viewing patterns were measured. The main outcome measures were correct recall of health warnings and the 1800QuitNow telephone number, and eye tracking measures of dwell time and order of viewing. Correct recall of the warning labels was greater for the congruent condition compared to the incongruent condition at the end of the initial session and five days later (ps<0.04). Those with less education were more likely to be incorrect when viewing incongruent warning labels (p=0.01) than those with at least some college education or those viewing congruent graphic warning labels. Current recall of the 1800QuitNow number was better recalled when embedded in congruent GWLS than incongruent GWLS, and dwell time was significantly associated with correct recall. Results suggest that format and positioning of health relevant information in the GWL are important and can affect smokers’ understanding of risk and ability to recall useful information, such as the quit assistance telephone number.

This research was supported by National Institutes of Health grants: P20-CA095856, P50-CA143187, and R01-CA120594.

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POS3-72 WHAT CIGARETTE BRANDS ARE PEOPLE SMOKING AND HOW IS THIS CHANGING?
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This paper uses data from the ITC US adult cohort survey to examine the brand of cigarettes purchased by smokers between 2002 and 2010. The total number of cigarette brands reported by smokers in our sample decreased by 29% between 2002 and 2010, from 118 to 83. In 2002, the five most commonly reported cigarette brands by adult smokers in our sample included Marlboro (38.6%), Newport (9.6%), Camel (7.6%), Doral (5.7%), and Winston (4.0%). In 2010, the five most frequently reported brands were Marlboro (27.7%), Pall Mall (9.3%), Camel (6.6%), Newport (5.0%), and Misty (4.3%). In 2002, Philip Morris brands accounted for 47.1% of all brands reported by smokers in our sample, Reynolds/American/Brown & Williamson (RAI) brands accounted for 31.6%, Lorillard brands 10.7% and Liggett/Vector brands 1.3%. In 2010, RAI brands accounted for 36.2% of all brands reported, Philip Morris brands 35.1%, Lorillard brands 8.3%, and Liggett/Vector 3.8%. The percentage of smokers reportedly using discount brands increased from 22.9% in 2002 to 32.1% in 2010. Over the entire time period studied, brand preferences varied by age group and income levels with younger (those under age 40) higher income smokers more likely to report smoking a premium brand cigarette compared to a higher proportion of older and low income smokers reporting a discount brand. The findings from this study suggest that discount brands are increasingly dominating the US cigarette market.
and that previously popular premium brands such as Marlboro are declining and losing share to discount brands such as Pall Mall and Misty.

This research was supported in part by National Cancer Institute Grants: R01CA100362, P50CA111236, and P01CA138389 and by funding from the Canadian Institutes of Health Research (75897, 79551).

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POS3-73
A SURVEY OF MORE THAN 250 E-CIGARETTE BRANDS ON THE INTERNET
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Electronic Cigarettes (E-Cigarettes) are an emerging tobacco product with a large presence on the Internet. To compile a list of e-cigarette brands, we performed keyword searches on the three most popular US search engines (Google, Bing, and Yahoo!). Review sites which were found during this process were also used to add to the list of e-cigarette brands. Brand websites were examined for specifics about each product (composition of starter kits, flavor and nicotine strength options for cartridges and e-Liquid refills), ingredients in their products, claims about the product such as whether they were safer than conventional cigarettes. During the survey process, a cataloging system for starter kits was developed. Prices were recorded for all parts and kits. We identified over 60 discrete flavor categories and 27 different nicotine strengths across the more than 250 brands found through this search. A partial or, in some cases, full list of ingredients was found for 71.7% of brands, with the most common ingredients being nicotine, propylene glycol, and water. More than half of the brands (64%) explicitly stated that their product could not be used as a smoking cessation device, while 27.2% gave no information on the topic. Almost 9/10ths of brands (89%) claimed that their product was healthier or safer than a conventional cigarette, with only 1.8% stating that their product was not safer. Most brands (80.2%) advertised their products as being suitable for use in places where conventional cigarettes would be banned. Finally, 65.8% of brands claimed that their product would save the user money. The results of this study provide a good starting point for researchers when considering further studies on this emerging tobacco product.

This work was supported by a grant from the National Cancer Institute (5 U01 CA154280).

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POS3-74
LORILLARD BRANDS’ AVAILABILITY, PRICE, AND ADVERTISING: ASSOCIATION WITH NEIGHBORHOOD CHARACTERISTICS AT THE POINT OF SALE IN WASHINGTON, DC
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BACKGROUND: Few studies have examined the relationship between cigarette brand availability, advertising, price, and neighborhood characteristics across a diverse metropolitan area. The objective of the current study was to examine the association between neighborhood characteristics and marketing of Lorillard brands—especially Newport—in a census of Washington, DC tobacco outlets.

METHODS: A brief mobile phone-based survey was conducted at all Washington DC tobacco outlets (n=1,080) during fall-spring of 2010-2011. Fieldworkers photographed outlets’ exteriors and interiors using cellphone cameras and used interactive voice response (IVR) surveys to unobtrusively collect data. Descriptive and multilevel analyses examined the relationship between menthol and specifically Lorillard brand (Newport & Maverick) cigarette availability, price, advertising and neighborhood characteristics, with a special focus on % African American residents. RESULTS: Nearly all (92%) of tobacco outlets in DC sold Newport cigarettes; however, the adjusted odds of selling Newport cigarettes increased by 11% for every 10% increase in the percentage of African American block group residents after controlling for neighborhood and store characteristics. Ninety percent of exterior ads with the lowest price featured Lorillard brands Newport or Maverick; 59% of these ads featured Newport alone. Controlling for neighborhood and store characteristics, the incidence rate ratio for the number of exterior menthol ads increased by 13% for every 10% increase in the percentage of African Americans living in a block group. Displayed Newport price was 80 cents lower than non-displayed price, with displayed Newport price inversely related to percent African Americans living in a block group. DISCUSSION: Availability, exterior marketing, and lower price of Lorillard brands, especially Newport, were associated with higher concentrations of African American residents in a block group. Strengths and limitations of the data collection and analyses, as well as implications for FDA regulation of point of sale tobacco promotion will be discussed.

Funding was provided by Legacy and the Washington, DC Department of Health.

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POS3-75
GOOD AND BAD USE OF CIGARETTE PRICE INCREASES THE LAST 10 YEARS IN FRANCE
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Increasing the tobacco products price is a well-known tool to reduce tobacco consumption, which is recommended by WHO. The FCTC announces a 4% decrease of tobacco consumption for a 10% price increase (elasticity 0.4). The last decade France has experienced two opposite periods with two opposite effects. Method: We have compared cigarette price increase to the sales of cigarettes during the presidency of Chirac 2002-2007 and the presidency of Sarkozy 2007-2012. Results: In 2003 President Chirac implements the first cancer plan and, among 20 additional measures against tobacco, a 39% increase of tobacco taxes produce a high price increase in a short 18 month period. The price of Marlboro 20 cigarettes pack has increased of 1.4€. The number of cigarettes sold by year has dropped down from 82 billion to 54 billion (34% decrease). From 2007 to 2012 the influence of the tobacco industry lobbies has been strong in France, and cigarettes prices have increased 4 times of 8% and a new increase of 7% is anticipate in October 2012. These 32% increase of prices are managed by the tobacco industry, without any strong incitation to decrease consumption by the French government. As a result, the sales of cigarettes remain quite stable at 54 billion a year; nevertheless at the end of 2012 we will have a total increase of the price of Marlboro cigarettes pack of 1,6 €. Conclusion: The elasticity of the increase of price on consumption has been very high (0.87) when increase of price is driven by taxes and supported by a strong engagement of the government who had close the door to tobacco industry lobbying. The price elasticity is 0.07 when the increase of price is drive by tobacco industry and when tobacco lobbyists may be active anywhere at Presidency and financial ministry levels. The French example illustrate the efficacy of politician when the act closing the door to tobacco industry and the efficacy of tobacco lobbyists when the have the freedom to act. Article 5.3 of FCTC on interaction between tobacco industries on politicians is essential in developing countries but also in EU developed countries such as France, to explain evolution of tobacco epidemic.

No funding.

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POS3-76
TOBACCO DATA DECK: A DATA DISSEMINATION TOOL
Wanda Simon, M.S.*, and Gordon Reeve, Ph.D., Arkansas Department of Health

Introduction: The Arkansas Tobacco Data Deck project began in 2009. The purpose of the project is to compile tobacco, chronic disease, and health disparity related information from data sources available in Arkansas. The data deck provides statistical information on a variety of health behaviors and outcomes that put Arkansans at risk for premature death and disease. This resource has been used by various programs both within and outside the Arkansas Department of Health to graphically display health data in a user friendly format. Objectives: To develop and disseminate a tool which would provide the most up-to-date Arkansas tobacco related data to public health programs. Methods: A plan was devised to gather statistical information from a variety of available data sources that include Arkansas-specific data and make it available in one place. The information was stratified by demographic groups and disease and behavior categories. Updates are made throughout the year as new data are released. Results: Impacts of the new Tobacco Data Deck report have been: less frequent requests for tobacco related statistics and an increased awareness of the data available as a resource for assessing health behaviors and practices in Arkansas. Conclusion: Each state could benefit by compiling a similar data deck resource tool. The PDF format lends itself to not only easy-access and easy to understand graphs, but also slides that can readily be used for presentations, legislative briefs, factsheets, or other documents. The final document should be disseminated widely via the state website and partnering organizations.

No funding.

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POS3-77
TOBACCO-FREE WORLD: AN INNOVATIVE AND CREATIVE APPROACH FOR TOBACCO CONTROL
Vijay Bhasker*

Background: Littered cigarette butts are causing environmental contamination and also causing health hazard to humans and animals. Tobacco causes destruction of forests by cutting of trees to create a space for tobacco farming and to get wood for curbing of tobacco. Tobacco farming drains large amount of sub-soil water and tonnes of paper is used every year for wrapping cigarettes and Smokeless Tobacco products. Methods: Technology is my inspiration to start a non-profit organization, after a three-year study on tobacco control policies and its outcome, I have come out with a strategy for Tobacco control through innovative and creative awareness campaigns. Created multiple Innovative and Creative Posters highlighting how Tobacco causes Health and Environmental damage. Produced Creative Animated short films focused on Health & Environmental damage caused by Tobacco. Conducted Tobacco and Alcohol Awareness Sessions in various Schools, Colleges and Companies along with public awareness events. Created and hosted more than 200 websites on Tobacco Control for public awareness and information. Results: Gathered more than 3000 student volunteers and 2000 volunteers from different professional walks through multiple awareness camps and events. Our website on Tobacco control receives an average of 150 hits every day. Created more than 100 Social networking pages on Tobacco Awareness to target the youth. Conclusion: Tobacco epidemic is more than a matter of individual concern. Banning Tobacco is not just for us, but for this world and for everyone who has to live in this world after us. Need to produce more Innovative and Creative Animated short films, Posters, and Anti-Tobacco slogans for effective Tobacco Awareness focusing on Health and Environmental concerns. Need to educate, support, and mobilize a generation of young leaders to fight against Big Tobacco to create enduring change and unleash their potential as Change Makers and Change Agents of tomorrow.

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POS3-78
EXPENDITURE ON TOBACCO PRODUCT: USING ECONOMY FOR ADVOCACY
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Tobacco use is associated direct loss of resources for purchasing the product. In India, average monthly expenditure of the current smoker on cigarette is 399 INR and on bidi is 93 INR. Spending on tobacco products in low income households constitute 11% of their home expenditure which crowds out expenditures on education, clothing and food. Apart from health concerns saving money have been cited as a motivator to convince people not to smoke. This study quantified the savings owing to abstinence from tobacco use for advocacy purpose. Using economic principles, the monthly expenditure on tobacco was modeled as savings. Formula FV=IV*(1+RI/100)^nt (FV=Final Value, IV= Initial Value, RI=Rate of Interest, t= No of year, n= Number of times compounded in a year) was used to estimate the wealth generated from tobacco savings. The recent tobacco inflation rate of 4% and RI of 8.5% have been fixed for calculation purpose. The result of the economic model was compared with most trusted and high yielding public savings schemes in India. The wealth that could be generated from 300 rupees monthly savings on tobacco products at 5, 10 and 15 years time are rupees 31,594; 79,879 and 160,291 respectively. The equal monthly savings in provident fund would yield 28,813; 67,206 and 125,672 rupees at 5, 10 and 15 years respectively. The popular profitable life insurance scheme also would yield 14,178; 63,872 and 133,319 at similar time period with insurance coverage. Abstinence pays as the monetary value of savings on tobacco products is higher than other popular profitable investments in India. Health benefits serve as bonus. The money thus saved can be channelized for education of child, eating nutritious food and other important household expenses. The public advocacy message should include money saved on expenses of tobacco which may appeal the community.

No funding.

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POS3-79
A DISCOUNT YOU CAN'T REFUSE: PRICE MINIMIZATION BEHAVIORS AMONG U.S. ADULT SMOKERS
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Data from select states suggests that price minimization behaviors have been widely used among current smokers. These behaviors likely undermine the public health benefits from raising the cigarette excise tax. This study estimated the magnitude of these behaviors nationally by using data from CDC’s first National Adult Tobacco Survey. We also examined socio-demographic characteristics correlated with as well as the influence of tobacco use behaviors on smoker’s price minimization behaviors. The percentages of carton purchasers, coupon users, and respondents who purchased cigarettes from Indian reservations by socio-demographic characteristics and tobacco use behaviors were examined among the 16,542 current smokers who participated in the 2009-2010 National Adult Tobacco Survey, a national representative telephone-based survey of U.S. adults. Multivariate logistic regressions were used to assess the socio-demographic determinants and tobacco use behaviors associated with each of these three price minimization behaviors. Our estimates suggested that on average, 42.6% of current smokers used one of the three price minimization behaviors. The use of these three behaviors differs substantially by smokers’ socio-demographic characteristics and tobacco use behaviors, indicating that existing literature might not provide a full picture by investigating price minimization behaviors as a whole. Comprehensive policy interventions that can reach different sub-populations of current smokers need to be considered in order to reduce the prevalence of price minimization behaviors and to facilitate public health impacts of excise tax increases.

No funding.

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POS3-80
USING CIGARETTE PACK WARNINGS TO INFORM CONSUMERS ABOUT TOXIC TOBACCO CONSTITUENTS
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Background: Little research exists on how to inform consumers about the toxic constituents of tobacco and tobacco smoke or the effects that this knowledge has on smoking behavior. Mexico’s pictorial health warning labels (HWLs) on cigarette packs uniquely highlight toxic constituents and provide an opportunity for examining the impact of this communication approach. Objective: To determine changes in smokers’ knowledge of toxic constituents over time and the impact these changes have on quit intentions and behaviors. Methods: Data were drawn from the 4th and 5th waves of the ITC Mexico Survey, a population-based, longitudinal survey of adult smokers in seven Mexican cities. These waves occurred before (2010) and after (2011) implementation of pictorial HWLs with novel content on toxic constituents. The sample included smokers who were followed up for both waves (n=1510). Knowledge of toxic constituents (cyanide, ammonia, cadmium) were assessed individually and summed to create an index (range 0-3). In linear mixed effects (LME) models, the knowledge index was regressed on socio-demographics, smoking-related variables, and time. Logistic regression analyses were conducted to determine if individual-level changes in knowledge predicted intentions to quit, quit attempts, and quit success at wave 5. Results: The proportion of respondents who correctly endorsed toxic constituents increased over time (i.e., 14.3% to 35.8% for cyanide; 13.3% to 18.5% for ammonia; and 2% to 10.5% for cadmium). LME models indicated that the knowledge index changed over time and that higher levels of knowledge were associated with younger age, male, higher income, and intention to quit. Logistic regression models indicated that changes in knowledge about toxic constituents did not predict intention to quit, quit attempts or quit success. Conclusions: Pictorial HWLs in Mexico appear to have increased smokers’ knowledge of toxic constituents in the tobacco they consume; however, increases in this specific type of knowledge does not appear to have promoted smoking cessation. Other elements of HWL policies, as well as other policies, appear necessary to effectively promote cessation.

Funding: NCI (R01 CA167067), Mexican Council on Science and Technology (Salud-2007-C01-70032), Bloomberg Global Initiative, Union Against Tuberculosis and Lung Disease (Mexico 7-01).

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POS3-81
TRANSparency Mapping Project: A great Storytelling and Decision Making Tool

Introduction: In an attempt to better understand the interconnectedness associated with tobacco control deliverables/outcomes, tobacco prevalence, and highest return on investment (ROI), Arkansas Department of Health - Tobacco Prevention and Cessation Program (TPCP) developed the Transparency Mapping Project (TMP) to drive programmatic decisions and strategic planning. TPCP currently provides 32 community, 15 coordinate school health and 3 statewide sub-grant programs and a host of other public health initiatives; thereby creating a data-rich center and a plethora of opportunities to explore the impact of various program outcomes and its relative change to the ultimate goal of decreasing the State’s tobacco prevalence. The purpose of the TMP is to identify priority areas based on mapping and to ensure the State allocates funding effectively, and to improve communication with stakeholders and sub-grantees. Objectives: To create a pictorial representation of the data in order to analyze, interpret, and understand effectiveness of programming to reveal interconnectedness and to drive decision making. Method: Define the content areas to be mapped, gather information, insert data, print map on transparency sheets, and overlay each transparency sheet as needed to analyze the interconnectedness. Result: The impact of TMP was undeniable. TPCP and its stakeholders and programs have a better understanding as well as a clearer vision when it comes to strategic planning. TPCP was able to identify problems areas and drive for solutions. TPCP was able to allocate funding efficiently, and to ensure better return on investment. Conclusion: TMP has become an integral part of driving our strategic planning process, providing visualizations which greatly enhance our ability to tell the story. The purpose of TMP is to analyze, interpret, and understand data to reveal relationships and better decision making. Any health units or state can benefit by utilizing TMP. It can be tailored for different audiences/projects. Transparency mapping is a low cost tool and easy to implement.

TPCP receives MSA and CDC funding.

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POS3-82
THE NEW “PATHWAYS TO FREEDOM”: LEADING THE WAY TO A SMOKE-FREE COMMUNITY
Monica Webb Hooper, Ph.D., Elizabeth A. Baker, M.S., Norma Ford, B.S., Marcia D. McNutt, M.P.H., and Robert G. Robinson, Dr.P.H., University of Miami

Reducing tobacco-associated health disparities is a national priority. The Black community experiences higher rates of tobacco-attributable deaths than other communities. Needed are interventions that reduce barriers to access and utilize an evidence-based approach. This study (1) details the development of an innovative DVD-based cessation intervention, based on Pathways to Freedom (PTF), an established community competent smoking cessation guide; and (2) reports a qualitative intervention evaluation. The steps included documentary treatment development, expert interviews, script writing, production, and editing. Smokers (N=24) and key national stakeholders (N=14) completed semi-structured interviews examining intervention utility, format and content, and dissemination potential. Deductive content analyses were used to determine themes. We developed a 60-minute, evidence-based DVD including 4 sections: history of tobacco and African Americans, how to quit, relapse prevention, and community initiatives. Findings indicate that the DVD is high-quality, credible, and includes useful content and appealing images, music, and colors. Findings also support the use of the DVD for various literacy and acculturation levels, and suggest that it provides motivation, encouragement, increases cessation self-efficacy, fills a gap in service delivery, and is disseminable on a wide-scale. In conclusion, the new PTF-DVD utilizes technology as a vehicle for health promotion in the Black community, and is a stand-alone intervention that can be used in multiple settings, such as community health clinics, primary care, quitlines, cessation clinics, and seminars/workshops. The intervention is currently being tested in an RCT. Video clips of the DVD will be presented.

Funding: National Cancer Institute 5R21CA152590-02.

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POS3-83
REPORTED MUNICIPAL COSTS FROM OUTDOOR SMOKE-FREE BY-LAWS – THE ONTARIO EXPERIENCE
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INTRODUCTION: In 2006 all enclosed public and work places in Ontario were made smoke-free by the Smoke-free Ontario Act (SFOA). Numerous municipalities across the province have local bylaws that are more restrictive than the SFOA and ban smoking in a variety of outdoor environments including parks, beaches, patios doorways, and transit environment. There is limited evidence that documents the enforcement issues and costs associated with these bans. The current study measured reported financial impacts associated with the implementation and enforcement of smoke-free outdoor municipal by-laws including materials and staffing costs, and number of warnings or tickets issued.
THE EFFECT OF SMOKE-FREE LEGISLATION ON REDUCING EXPOSURE TO SECONDHAND SMOKE: DIFFERENCE ON GENDER AND SOCIOECONOMIC STATUS

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Background: On January 11, 2009, Taiwan expanded the smoke-free legislation aimed at eliminating secondhand smoke (SHS) in all indoor public places and workplaces. Purpose: To examine the policy impact on the SHS exposure in adult non-smokers, across gender and socioeconomic status. Methods: An annual non-smoker sample of about 13,000 to 14,000 people was drawn from cross-sectional nation-wide data from Taiwan Adult Tobacco Surveys (TATSs) from year 2005 to 2011. Logistic regression analysis was used to estimate the association between the 2009 smoke-free legislation and the exposures to SHS in homes and workplaces. Interactions with the year 2009 Act and socio-demographic factors were used to examine the effect of the year 2009 Act on reducing inequality of SHS risk across gender, education, and income. Results: The 2009 expanded smoke-free legislation showed a significant immediate impact on reducing the risk of SHS exposure in homes in 2009 (OR=0.76, 95%CI=0.68-0.84). In workplaces, significant reductions in the risk of SHS exposure were observed in 2009 (OR=0.49, 95%CI=0.39-0.61) and 2010 (OR=0.78, 95%CI=0.65-0.93). Non-smoking men were more likely to be exposed to workplace SHS (OR=2.10, 95%CI=1.93-2.28) but less likely to be exposed to home SHS (OR=0.83, 95%CI=0.78-0.89) in comparison with women. Nonsmokers with lower socioeconomic status were more likely to be exposed to SHS compared with those with higher socioeconomic status; this fact remained true both before and after year 2009. Conclusions: The enforcement of the expanded smoke-free legislation had a significantly immediate effect on reducing the risk of SHS for non-smokers. There was an inequality of risk protection against SHS exposure across gender and sub-population groups. These findings suggest that smoke-free policies should further enforce the smoking restriction to reduce the risk of SHS exposure constantly and to improve the risk protection of SHS among lower socioeconomic population. This research was funded by Bureau of Health Promotion, Department of Health, Taiwan, ROC.

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PROMOTING SMOKE FREE HOMES IN INDIA

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Introduction: Second-hand smoke (SHS) is responsible for over 600000 premature deaths annually, one third of these are among children. The rising smoking patterns in low and middle income countries (LMICs) is leading to a vicious cycle as youths exposed to SHS in homes are doubly likely to initiate smoking. The WHO- FCTC through its MPOWER strategy supports protecting people from SHS, but its implementation is weak in LMICs. This study explores the prevalence and perceptions of SHS in homes and the need to promote smoke free homes (SFH) in India. Methods: Data were obtained from a survey of 4838 households in 2011 from two leading tobacco-producing States of India; Andhra Pradesh and Gujarat. The questionnaire was structured in alignment with GATS and analysis has been drawn from SHS related questions from specific sections. Results: 27.8% of the households have people who smoke at home. Education level played an important role in smoking behavior independent of any tobacco control policy.

This research was funded by Bureau of Health Promotion, Department of Health, Taiwan, ROC.
providing evidence that family interventions promotes cessation; these are yet to be integrated into tobacco control efforts in developing countries like India. Strengthening of Tobacco control Efforts through innovative Partnerships and Strategies (STEPES) is a three-year project funded by a grant from the Bill & Melinda Gates Foundation.

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POS3-87
SECONDHAND SMOKE EXPOSURE IN NIGHT ENTERTAINMENT VENUES IN THAILAND EVEN AFTER A SMOKING BAN

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Thailand has implemented bans on smoking in nearly all public places including in transportation, transportation stations, government buildings, restaurants, bars and pubs, and other entertainment businesses. Though previous studies have shown good compliance in some indoor places, compliance is a continuing challenge in night entertainment and alcohol drinking establishments. In order to investigate these persistent dangerous exposures, we examined the results of fine particulate measurements in a total of 105 establishments. In 2006, 67 pubs, bars, discos and nightclubs were measured for PM 2.5 prior to the ban and in 2010, 38 after the ban in Bangkok. PM 2.5 is an indicator of secondhand smoke pollution that shows the levels of fine particulate matter of extremely small size (down to 2.5 microns) that are emitted in cigarette smoke. A sampling protocol developed for a PM 2.5 sampling instrument for real-time, unobtrusive sampling of fine particulate air pollutants was used. Each location was monitored for at least 30 minutes during times of usual business activity. Data recorded from the particulate sampling instrument was downloaded to a computer and later analyzed. In the 67 pre-ban night venues, the PM 2.5 levels ranged from 9 to 567 micrograms per cubic meter, averaging 147, or about six times the air quality standard of 25 micrograms per cubic meters set by WHO. Monitoring more than a year after the ban in these same kind of venues found that exposure levels dropped by 54% on average to 68 micrograms per cubic meter. Following the ban the range of exposure levels was much lower, from 7 to 260, but still unacceptably high, more than twice the WHO standard on average. Though levels were lowered, only no secondhand smoke exposure provides adequate protection. Implications are that simple observation of smoking, public signage, and removal of ash trays is insufficient when monitoring compliance in night entertainment venues, and a systematic monitoring of secondhand smoke exposure as an environmental danger is necessary to protect the public and reinforce the importance of strict compliance with smoke-free laws.

This research was funded by the Campaign for Tobacco Free Kids.

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POS3-88
THE IMPACT OF SMOKE FREE LAW ON ELECTRONIC CIGARETTES POPULARITY AND SALES IN POLAND

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Background: The amendment to the Act on Prevention of Negative Health Consequences of Tobacco Use was introduced in Poland on November 15, 2010, prohibiting smoking in almost all enclosed public places. Studies suggest that smoke-free laws are associated with decrease in smoking prevalence and increases in quit attempts. Electronic cigarettes (e-cigarettes) are battery-powered devices that deliver vaporized nicotine. They are promoted as a stop-smoking aid or as an alternative to conventional cigarettes. Aim of the study: This study investigates the impact of the smoke-free law on the popularity and time series of e-cigarette sales pre and post implementation of smoking-ban in Poland. Materials and methods: Polish-language Google searches conducted from January 2009 through May 2011 were analyzed. We used two key words: 'e-cigarette' and 'electronic cigarette'. Searches for each week were scaled to the highest weekly search proportion. The following search filters were applied: various country sub-regions, dates, and categories. Since it is unclear whether search queries indicate curiosity or shopping, we analyzed sale offers of e-cigarettes through the biggest Polish auction service allegro.pl. Results: Six months before the smoking ban the mean relative search volume of e-cigarettes was 20.6%±5.2%. Six months post implementation of the ban the mean value was 25.1%±8.0% (p>0.05). We recorded consistently higher numbers of e-cigarettes searches between January and March 2010 (74.7%±15.0%). We did not observe any significant changes in e-cigarette sales during six months after the introduction of the 2010 Polish smoke-free legislation (p>0.05). Conclusions: Real-time monitoring of Internet searches and sales of e-cigarettes can help assess the effects of public policies on popularity of the alternative nicotine products. Implementation of smoking ban in public places was not associated with increased popularity of e-cigarette in Poland.

No funding.

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may indicate that airway inflammation from chronic ETS exposure is at least partly reversible.

This work was supported by the Swiss Tobacco Prevention Fund (grant #09.002032).

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POS3-90
CHARACTERIZING SMOKING STATUS THROUGH DISCOUNTING: THE CONTRIBUTIONS OF TEMPORAL, SOCIAL, AND PROBABILISTIC DISCOUNTING ON SELF-REPORTED SMOKING STATUS

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Researchers have demonstrated a strong relationship between smoking status and temporal discounting. Smokers generally exhibit steeper discounting curves than non-smokers. However the relationship between various types of discounting (temporal, social and probabilistic) and smoking behavior is less clear. In this study 190 participants were recruited through Amazon’s Mechanical Turk. Participants were given tasks to measure discounting rates for temporal, social and probabilistic discounting of hypothetical outcomes. Median splits for each type of discounting were calculated, the higher half of the values were considered “steeper” scores. The number of these “steeper” scores was determined for each participant. Demographic characteristics, including smoking status, were also gathered. Proportions of smokers associated with numbers of “steeper” scores and combinations of discounting scores were examined. Participants were well educated, more than 85% having spent at least some time in college, 60% were female, and 41% reported being current or former smokers. Overall the number of “steeper” scores a participant exhibited was associated with smoking behavior. Those with “steeper” scores for all three types of discounting had a risk ratio of 1.54 (p<.05) for ever being a smoker as compared to those who had zero “steeper” scores. These differences were largely driven by temporal scores. If a participant had only one “steeper” score, and it was a temporal score, then there was a 57% chance they were a smoker compared to 22% or 20% for social and probabilistic scores respectively. Additionally, if a participant had any combination of “steeper” scores that did not include temporal (social, probabilistic or both) their chance of being a smoker was 32%, similar to the rate of those who had no “steeper” scores (33%). This study confirms earlier findings that temporal discounting is strongly associated with smoking status. Additionally these results suggest that other types of discounting may account for additional variance, but temporal discounting appears to be more highly associated with smoking status than either social or probabilistic discounting.

This work was supported in part by NIH grant T32DA070242 and a workforce development sub-award from Sandia National Laboratories, funded by the U.S. Department of Energy through Inter-Entity Work Order # M610000767.

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POS3-91
TOBACCO USE PATTERNS AND ACCULTURATION EFFECTS ON ARAB IMMIGRANTS IN VIRGINIA

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Background: It is important to understand the disparities in tobacco use among immigrant populations in USA. Moreover, the rate of tobacco use among immigrants may change with acculturation. The purpose of this study is to explore the tobacco use patterns and the effect of acculturation among Arab Americans in Richmond, Virginia. Methods: A sample of Arab immigrants (221) was recruited from Middle Eastern groceries, restaurants/lounges, and faith based organizations. There were two instruments used in the study along with other (Acculturation Indicators) that were compiled. Results: The participants were males (56.8%) and females (43.2%). 69% reported being current smokers; smoking rates were higher in men compared to women (67.6%, 32.2% respectively). Most of the smokers self-reported smoking on daily basis (81.3%). The average number of quit attempts were 2.2 (SD=4.7) and when participants were asked about their confidence in readiness to quit smoking on a scale of 0 to 10 the mean was 5.0 (SD=2.7). Older age when moved to the US and longer years living in the US were significantly associated with increase in daily smoked cigarettes (F = 3.4, p < .000). Further analysis of acculturation in relation to the risk of not considering quitting was performed using logistic regression. Longer years living in the U.S. (OR = 0.93, CI: 0.87, 0.98) and older age when moved to the US (OR = 0.93, CI: 0.88, 0.98) were significantly contributing to least number of quit attempts. Conclusion: Acculturation indicators measures in this study were found to be positively correlated with smoking prevalence among Arab Americans. The more they stayed in the US the more they smoked. These findings are coherent with other research that showed negative acculturation in relation to smoking among different migrant ethnic groups. To determine whether being in the US has negative acculturation “the increase in high-risk profiles as immigrants live longer in the U.S.” outcomes on smoking behavior or there is a tendency to stick to smoking norms of their originating countries is out of scope of the tools used in this study.

This study was supported by a grant award from the Virginia Tobacco Settlement Foundation.

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POS3-92
DUAL AND POLY-TOBACCO USE IN THE UNITED STATES, RESULTS FROM SEVERAL U.S. SURVEYS

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Dual and poly-tobacco product use may pose added risk factors of tobacco products. Previous studies have shown that among the specific groups studied, concurrent use of cigarettes (predominant tobacco product used) and other tobacco products ranges from 2%-9%, and that disparities in dual use exist by sex, race/ethnicity. This session will describe dual and poly-tobacco use by socio-demographics in the U.S. population. It will include analyses of several different data sources (NHS, NHANES, BEFSS, NSDUH, NATS, NYTS, YRBS) representative of the U.S. population in order to understand the prevalence of dual and poly-tobacco use (use of combustible products, use of non-combustible tobacco products, use of both combustible and non-combustible tobacco products). Predictors of dual and poly-tobacco use include socio-demographic factors such as age, race/ethnicity, education and the U.S. state where respondent lives. In addition to data on prevalence of dual and poly-tobacco use, we will provide information on specific tobacco products used and frequency of use of such products. Results presented will be useful for tobacco control scientists and practitioners in determining the magnitude of the problem of dual and poly-tobacco use.

This work is funded by the Centers for Disease Control and Prevention.

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POS3-93
THE IMPACT OF DUAL TOBACCO PRODUCT USE ON CESSATION AND RELAPSE

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Dual use of cigarettes and smokeless tobacco products may have significant implications for cessation and relapse. The dual tobacco users may be more dependent, have a harder time quitting, or may relapse at a higher rate, which has direct implications for assessment and treatment of this population of tobacco users seeking treatment. The outcomes of three studies for smokeless tobacco cessation in which there were a large number of dual users were reviewed to assess the impact of the participants’ dual tobacco use on cessation outcomes and relapse. One study involved over 600 patients at dental clinics and represents a public health intervention in the context of oral health care. The other 2 studies...
were web-based cessation interventions for smokeless tobacco users (ChewFree.com, MyLastDip.com) that enrolled 2500 and 1700 participants, respectively. The 3 and 6-month assessments were used to assess the impact of dual use on cessation outcomes. The dental office intervention found significantly lower rates of cessation and higher rate of relapse for participants who were dual users. Dependence at baseline was predictive of cessation. Significant relationships between dual use and lower levels of cessation were reported for the ChewFree.com study but not for the MyLastDip.com cessation program. Younger users (aged 14-25) may account for this lack of effect on cessation outcomes. In the study of more than 1700 young chewers who enrolled in the MyLastDip.com cessation program we observed that dual users had a significantly higher relapse rate compared to chewers. Our review of both our data and data from other studies show some inconsistent results in assessing the impact of dual use on cessation outcomes for chewers. However, the higher levels of measured dependence, often observed lower levels of cessation, and higher levels of relapse, are important factors in carefully assessing dual use among tobacco users seeking treatment and has implications for public policy in which new and novel tobacco products are promoted as harm reduction or cessation aids.

The research was supported by a grant from the National Cancer Institute - CA 118575.

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POS3-94
MARKETING STRATEGIES PROMOTING DUAL AND POLY-TOBACCO PRODUCT USE
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Dual use of cigarettes and other tobacco products has been increasing in recent years, particularly among young people. This may be due in part to tobacco industry responses to increased tobacco taxes and clean indoor air policies in the U.S. and in other countries, which include advertising messages promoting the use of smokeless tobacco products in addition to cigarettes. To identify promotional messages that may encourage dual use, we identified historical and current themes from print magazine ads, direct mail advertising, and branded websites for smokeless tobacco products and compared to themes identified in a formal content analysis of electronic cigarette retail websites sampled between May to July 2012. Results show that marketing of smokeless tobacco products, particularly snus and dissolvable tobacco products, has been explicitly targeted at smokers. Most marketing messages promoted temporary or situational use of smokeless tobacco, which may result in dual use of smokeless tobacco and cigarettes rather than complete switching from cigarettes to smokeless tobacco. Ad text and imagery contained both overt and subtle appeals to use the smokeless tobacco product when users were unable to smoke. Smokeless tobacco products bearing cigarette brand names and contests such as the "caramel pleasure switch challenge" that promote switching for several days may also encourage adoption and dual use of both products among smokers. Electronic cigarette companies also include appeals on their retail websites that may result in dual product use, such as promoting the product for circumventing clean indoor air laws and using the product in specific indoor environments (e.g., an office). Marketing that promotes dual or poly tobacco use patterns may exacerbate the total tobacco use burden and have negative public health impact due to effects on addiction, deterred quit attempts and decreased effectiveness of successful tobacco control policies.

This work was supported by grants R25T CA 113710 and R01-CA141661.

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POS3-95
RECEIPT AND REDEMPTION OF CIGARETTE COUPONS, PERCEPTIONS OF CIGARETTE COMPANIES, AND SMOKING CESSATION
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Objective: While cigarette coupons are a known cigarette marketing strategy, little is known about receipt and influence of these coupons on smokers. We examined the characteristics associated with receipt of cigarette coupons, and the influence of these coupons on smoking cessation. Methods: A Minnesota cohort of randomly sampled post-30-day smokers surveyed in 2008 was resurveyed in 2009, and those who quit smoking before 2009 were excluded in this analysis (total n=587). In 2009, participants reported receipt of cigarette coupons (yes/no), redemption of cigarette coupons (yes/no), their perceptions of cigarette companies, and their smoking status. Multivariate logistic regression models were used to examine the characteristics associated with receipt of cigarette coupons, and associations between receipt and redemption of these coupons and perceptions of cigarette companies and smoking status. Results: About 50% of the participants reported receiving cigarette coupons, and 80% of those redeemed these coupons. Female, younger, and heavier smokers were more likely to have received coupons (p<.05). Participants who received coupons were less likely to agree that cigarette companies lie, and more likely to agree that cigarette companies care about their health and try their best to make cigarettes safe (p<.05). More importantly, participants who used coupons (compared to those who did not receive them) were less likely to have stopped smoking in the past 30 days (adjusted odds ratio=0.16, 95% confidence interval=0.06, 0.60). Conclusions: This is the first study to demonstrate a negative association between cigarette coupon redemption and smoking cessation. Longitudinal studies are needed to confirm our findings and provide support for policies to prohibit the redemption of cigarette coupons.

This work was supported by ClearWay Minnesota (SM).

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POS3-96
SMOKERS’ PERCEPTIONS OF THE RELATIVE RISK OF SPECIFIC DISEASES FROM SNUS AND CIGARETTES
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Background: As shown in several studies, the public is largely unaware of the lower global risk associated with snus compared to that of combustible tobacco. The concept of global risk might be challenging, as respondents may have incorporated it factors other than actual health risks. We have little knowledge of perceptions of relative risks regarding specific diseases. Aim: Explore perceptions among hard core, daily and non-daily smokers of the relative snus-cigarette risk of cancer of lung, stomach, and oral cavity, and of cardiovascular disease. Methods: Pooled data from annual national representative surveys (2008-2011) performed by Statistics Norway. Information on tobacco use, demographic background variables and perceptions of relative risk for specific diseases from regular snus use or smoking was collected. The total sample included 2661 ever smoking and/or snus users aged 15 n 79 years old. 53 per cent of the sample was men, and the average age was 46.1 years. Results: All smoker groups overestimated the risk from snus use relative to the risk from smoking. For all diseases except lung cancer, the majority of smokers thought snus users were running the highest risk. For lung cancer, 20-30 per cent believed that snus use gave an equal or higher risk. There were significant differences in perceptions between smoker groups, with hard core smokers in general being a lot less inclined to believe that smokers were much more at risk. Discussion: Smokers overrate the risk of specific diseases from using snus relative to smoking, and hard core smokers overrate them more than others. Increased knowledge of the relative health risks might give smokers an incitement to switch to snus, and prompt current dual users to...
stop smoking completely. Awareness could be improved by tailoring information at targeted groups, for example via the health care system.

No funding.

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POS3-97
SUBSTANCE ABUSE TREATMENT STAFF ATTITUDES AND PRACTICES REGARDING CLIENT TOBACCO USE

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While nearly 80% of substance dependent individuals are nicotine dependent, smoking cessation is not routinely addressed during substance use disorder (SUDs) treatment. Previous studies have shown that few substance abuse treatment programs offer formal treatment for tobacco. Smoking cessation is generally not addressed for a variety of reasons, including staff perceptions that treating both tobacco dependence and other addictions is counter-productive, or that smoking is less harmful than other substances. Barriers include a lack of adequate staff training on tobacco and limited tobacco treatment resources. The purpose of this study was to determine the attitudes and practices of publically-funded, substance abuse treatment staff members in Virginia, regarding client tobacco use. Survey items were based on instruments used in two previous studies, as well as input from a work group of the Virginia Partnership for Tobacco Cessation, and cognitive testing to improve item clarity. The survey was sent to all staff in Virginia who either directly provided or managed delivery of publically-funded, outpatient or day treatment substance abuse and/or mental health services for adults. Data were analyzed for participants who served adults with substance abuse or co-occurring disorders (\( N = 983 \)). Participants were mostly female (77%), and were an average of 46 years of age (SD = 11.8). Ten percent were current tobacco users. Most participants (70%) worked in outpatient services and indicated their profession as counseling (43%) or social work (27%). Preliminary descriptive results include: a majority of staff think that tobacco cessation services should be offered (89%) and don’t interfere with treatment (69%), but many reported that tobacco cessation is not part of their agency’s mission (43%), and that providing tobacco cessation counseling is not an agency policy (47%). Further, most staff seldom/never provide tobacco counseling (65%), due to their clients not wanting to quit (46%), and not being trained in tobacco cessation (39%), among others. Implications for an organizational strategy to improve the delivery of tobacco cessation services will be presented.

This research was supported by Virginia Foundation for Healthy Youth grant #8520666.

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POS3-98
PUBLIC ATTITUDES TOWARDS THE TREATMENT OF NICOTINE ADDICTION

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There are differing views emerging about the merits of medicalising smoking cessation. The consensus from clinical trials is that a combination of pharmacological cessation aids and counseling is the most effective way to quit smoking. However, a number of commentators have expressed concern that the promotion of pharmacological cessation aids may encourage the belief that quitting smoking is difficult, reducing unassisted quit attempts, and overemphasising the treatment of individuals at the expense of using social influences to discourage smoking. In order to inform these debates, we need to explore the extent to which medical explanations of smoking have penetrated the everyday understandings of the public. This paper outlines the findings of qualitative semi-structured interviews with 55 Australians about their views on nicotine addiction and its treatment.

The sample included smokers, ex-smokers and those who had never smoked. An inductive approach was taken to content analysis. The results suggested that the medicalisation of nicotine addiction was far from complete. Participants often mentioned pharmacological cessation aids but usually in conjunction with alternative quit methods such as behavioural strategies and counselling. Unassisted quitting was frequently mentioned but there were mixed views about its effectiveness. Seeing a doctor was rarely recommended. Two central discourses were found in public explanations of nicotine addiction: (1) that smokers must have sufficient motivation for a quit attempt to be successful, regardless of the method used; and (2) the effectiveness of all methods “depends on the individual.” The implications of these findings for clinical practice and health promotion will be discussed.

This research was funded by an Australian National Health and Medical Research Council Australia Fellowship (Grant ID: 569 738) to W. Hall.

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POS3-99
GUTKA AND TAMBAKU PAAN USE AMONG SOUTH ASIANS: A FOCUS GROUP STUDY

Smokeless tobacco use is prevalent among South Asian immigrants, particularly in the form of gutka (sun-dried finely chopped tobacco, areca nut, slaked lime, catechu, flavorings and sweeteners) and tambaku paan (betel quid with tobacco). Smokeless tobacco has been classified by the World Health Organization as “carcinogenic to humans”, and smokeless tobacco use has been associated with oral and pancreatic cancers, periodontal diseases, cardiovascular disease, adverse reproductive outcomes in women, and aggravated asthma. However, despite these hazards and high penetration in South Asians, research pertaining to smokeless tobacco use in the immigrant South Asian communities is relatively under-studied. Smokeless tobacco use cannot be over-ruled because it may undermine tobacco cessation efforts. Thus, we examined (a) gutka and tambaku paan initiation and use patterns among South Asian immigrants, and (b) perceptions related to quitting and tobacco control. Six focus groups were conducted with a total of 39 South Asian adult gutka/tambaku paan users, in three different South Asian languages (Gujarati, Bengali, and Urdu). The majority of participants were male (87.2%), had lived in the U.S. for 10 years or more (61.5%), and used at least one form of smokeless tobacco product (66.7% used gutka, and 46.2% used tambaku paan). Participants reported that gutka and tambaku paan were readily available in neighborhood stores, and noted several factors that promoted gutka and tambaku paan initiation including social networks, perceived benefits, and curiosity. Due to awareness of low social acceptance of gutka and tambaku paan in the U.S., some participants discussed changing patterns of use following immigration. Finally, participants voiced perceptions related to quitting and tobacco control including the role of doctors/dentists and the U.S. government in discouraging gutka and tambaku paan use. The findings have several implications for improving tobacco screening and control efforts in the United States. Tobacco control among South Asians represents a global problem and this research informs the development of smokeless tobacco control strategies for this population.

This work was supported by Arnold and Arlene Goldstein Family Foundation Grant.

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POSTER SESSION 3 • FRIDAY, MARCH 15, 2013 • 5:30 P.M.–7:00 P.M.

POS3-100
DISENGAGEMENT BELIEFS IN GUTKA AND TAMBAKU PAAN USERS: A PRELIMINARY STUDY

Smita C. Banerjee*, Jamie S. Ostroff, Thomas A. D’Agostino, Sehrishi Bari, Mittali Khera, Sudha Acharya, and Francesca Gany

Gutka and tambaku paan (smokeless tobacco products used by South Asian immigrants) are carcinogenic to humans (and perceived as such), yet, one-fourth of South Asian immigrants report current use. This contradiction indicates that despite the knowledge of oral cancer risks from consumption of gutka and tambaku paan, South Asian users fail to alter behaviors. Cognitive dissonance theory provides the most convincing theoretical approach to help explain this contradiction. Cognitive dissonance theory states that individuals seek consistency among their cognitions (i.e., beliefs, opinions, behaviors). Inconsistent cognitions create psychological discomfort that motivates people to alter their cognitions to restore consistency. For example, to lower cognitive dissonance, a smoker might emphasize beliefs such as “I know non-smokers who got lung cancer”, thereby de-emphasizing the fact that smoking is a risk factor for lung cancer. Such forms of rationalizations are termed disengagement beliefs and are posited as critical facilitators of smoking that may be modifiable with targeted health communication messages. Therefore, to disentangle the gutka/tambaku paan health awareness yet continued use inconsistency, we conducted focus groups to identify disengagement beliefs. Six focus groups were conducted with South Asian adult gutka/tambaku paan users, in Gujarati (Indian immigrants), Bengali (Bangladeshi immigrants), and Urdu (Pakistani immigrants) languages. Four themes of disengagement beliefs emerged: (a) skepticism about the gutka/tambaku paan-cancer link, (b) perceived invulnerability to harm, (c) faith-based rationalization, and (d) acknowledgement of inconsistency; we conducted focus groups to identify disengagement beliefs. Participants from all countries expressed similar disengagement beliefs. However, the only difference that emerged was that participants from Pakistan and Bangladesh (but not India) discussed the faith-based rationalizations. In order to promote gutka and paan prevention and control efforts among South Asians, tailored interventions to counter relevant disengagement beliefs and heighten the discomfort between the dissonant cognitions represent a promising area warranting further attention.

This work was supported by Arnold and Arlene Goldberg Family Foundation Grant.

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POS3-101
ASSESSING PUBLIC OPINIONS ABOUT SMOKING POLICIES IN RESIDENTIAL BUILDINGS


New York City (NYC) has had a comprehensive tobacco control program in place since 2002. A survey of smokers and non-smokers was conducted to assess attitudes and inform community education efforts about tobacco control strategies. A random-digit-dial cross-sectional phone-survey of 1,440 NYC adult landline and cell phone users was conducted in 2012. Smoking regulations and attitudes toward tobacco control strategies in residential housing were assessed. The sample included 718 smokers and 727 non-smokers, and results were weighted to NYC’s 2010 smoking prevalence of 14%. Nearly half of respondents (47%) lived in a large multi-unit building with 10 or more units; 22% lived in a small multi-unit building with fewer than 10 units; and 31% of respondents lived in a home not attached to any other buildings. Respondents in large buildings (12%) were less likely to report having smoke-free building policies compared to those in small buildings (39%) and detached homes (60%). Overall, two-thirds of participants (64%) favor a policy that would require landlords to inform tenants if their building permits or prohibits smoking inside individual residences, and this did not vary by housing type (61% in large buildings, 68% in small buildings and 69% in detached houses). Non-smokers are more likely to favor a policy about disclosure of smoking rules than smokers (68% vs. 45%). Among all participants, 39% would pay more to live in a smoke-free building (33% in large buildings vs. 45% in small buildings and 43% in detached houses). Non-smokers are almost three times more willing to pay more to live in a smoke-free building than smokers (43% vs. 15%). In conclusion, detached houses and smaller apartment buildings were more likely to have smoke-free building policies than large multi-unit buildings with 10 or more units. Overall, support is high among New Yorkers for policies requiring landlords to inform tenants about building smoking policies.

This survey was funded by the Communities Putting Prevention to Work Grant.

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POS3-102
SETTING A RATIONAL PRICING STRUCTURE FOR NICOTINE AND TOBACCO PRODUCTS: RESULTS OF AN EXPERT PANEL STUDY

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Twenty-six of 40 invited tobacco harm reduction experts completed a survey on what factors should be considered in setting a price for tobacco and nicotine products. The aim was to explore the possibility of creating a rational pricing policy to encourage smokers away from cigarettes to less harmful products (LHPs) while minimising uptake among non-smokers. Most participants (92.3%) agreed that it was a good idea to use price to encourage smokers to use LHPs, with the remainder unsure. All supported encouraging use of medicinal nicotine products, followed by non-smoked recreational clean nicotine (N=25), low toxin smokeless tobacco (SLT) (N=23), electronic nicotine delivery systems (ENDS) (N=22), then very low nicotine content cigarettes (N=7). None wanted to encourage use of pipes or cigars. Desirable attributes of ENDS included: containing only medicinal quality nicotine (N=25), able to be used discreetly (N=18), being an acquired taste (N=11), not tasting like candy (N=7). Undesirable attributes included: being easy to consume a large quantity quickly (N=25), looks like candy (N=22), and taste appealing to young people (N=20). Participants were split on whether a cigarette-like appearance was good (N=6) or bad (N=6), half were unsure or thought it unimportant. Most favoured a large price discount for medicinal nicotine but split between a large and a small discount for ENDS and dissolvable SLT. Half felt snus should have a small discount. Five were uncertain about and six thought nicotine lollipops should be banned. Assuming that a cigarette pack costs $15, 82% of participants accepted a suggested price of $7.50 for medicinal nicotine (9% suggested lower prices and 9% gave no alternative price); 68% accepted $10 for non-smoked recreational nicotine (14% suggested lower) and SLT (9% suggested lower, 5% higher); 64% accepted $10 for ENDS (9% suggested lower, 5% suggested higher), and 27% accepted $10 for low nicotine cigarettes (9% suggested lower, 41% higher and 23% gave no alternative price). The idea of differential pricing was accepted and, apart from low nicotine cigarettes, the model we presented was considered appropriate.

This project was supported by an NHMRC Project Grant (GT1020123). CG is supported by an NHMRC Early Career Research Fellowship (G1701783) and WH is supported by an NHMRC Australia Fellowship (GT569738).

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POS3-103
THE RELATION BETWEEN NUMBER OF SMOKING FRIENDS, CHANGES IN NUMBER OF SMOKING FRIENDS, AND SMOKING CESSION OUTCOMES: FINDINGS FROM THE INTERNATIONAL TOBACCO CONTROL (ITC) PROJECT FOUR COUNTRY SURVEY

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Objective: Lower quit success rates among low socioeconomic status (SES) smokers may be partially explained by the higher number of smokers in their social context. This study tests (1) the relation between demographics and number of smoking friends, and changes in number of smoking friends over time, (2) whether smokers’ number of smoking friends and changes in their number

(2) whether smokers' number of smoking friends and changes in their number
of smoking friends over time are related to smoking cessation outcomes, and (3) how changes number of smoking friends are related to changes in smoking norms. Methods: Data were drawn from the 2002(T1) and 2003(T2) Waves of the International Tobacco Control Four Country Survey, a nationally representative random-digit dial longitudinal cohort survey of adult smokers in Australia, Canada, the United Kingdom, and the United States (N=6,321). All analyses (multiple and logistic regression) were weighted and adjusted for demographics and smoking behaviour. Results: Smokers from lower SES groups reported a higher number of smoking friends (income, p<0.0001, education, p<0.0001), and were more likely to gain and less likely to lose smoking friends between T1 and T2 (income, p=0.003, education, p=0.0004). There was no relation between number of smoking friends at T1 and quit attempts at T2 (p=0.87). However, smokers with fewer smoking friends at T1 were more likely to report a successful quit attempt at T2 (p=0.03). Smokers who lost smoking friends between T1 and T2 were more likely to attempt to quit (p<0.0001), and succeed in their attempt to quit at T2 (p=0.01). Changes in number of smoking friends between T1 and T2 were related to changes in subjective norms but not to changes in social norms towards smoking. Implications: Smoking cessation interventions should consider the challenges faced by smokers who live in contexts where smoking behaviour is heavily concentrated when attempting to quit, such as positive subjective norms towards smoking and frequent exposure to cues to smoke. Low SES smokers may be more likely to experience these challenges due to their higher number of smoking friends and lower likelihood of losing smoking friends.

Canadian Institutes of Health Research (57997, 115016), Robert Wood Johnson Foundation (045734), Cancer Research UK (C312/A3526), Australia Commonwealth Department of Health and Aging, Canadian Tobacco Control Research Initiative (014578), Canadian Institutes of Health Research Doctoral Research Award, NIHR Training Grant – R25 CA113710-07, Ontario Institute for Cancer Research Senior Investigator Award.

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POS3-104

HOSPITAL CONTROLS VERSUS COMMUNITY CONTROLS: CHOICE FOR A CASE-CONTROL STUDY IN BANGLADESH

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Background: Hospital controls and community controls can differ in a number of ways with the potential to introduce bias in case-control studies. We aimed to determine whether hospital controls could be used in case-control studies with minimal bias, where resource constraints limit recruitment of community controls. Methods: Hospital controls and community controls were compared in terms of socio-demographic and risk factor variables in a study of smokeless tobacco (SLT) use and coronary heart disease (CHD) in Bangladesh in 2010. Incident cases of CHD and hospital controls were selected from two cardiac hospitals. Community controls were selected from neighbourhoods of CHD cases. Results: We enrolled 302 cases, 302 hospital controls, and 1208 community controls. Distribution of age, gender, marital status, occupation, and socioeconomic status was similar between hospital controls and community controls. Compared to community controls, hospital controls were more educated, had higher rates of hypertension and reported more family history of heart diseases. But they reported relatively less physical activity. Current use of SLT was higher amongst community controls compared to hospital controls, but this was not a significant difference (adjusted OR 0.81, 95% CI 0.58-1.12). Current use of SLT was not associated with an increased risk of CHD when community controls were used (adjusted OR 0.87, 95% CI 0.63 to 1.19, p>0.05), nor when hospital controls were used (adjusted OR 1.00, 95% CI 0.63 to 1.60, p>0.05). Conclusions: There were significant differences between the two control groups but only on confounding variables which could be measured and adjusted for during multivariate analyses. For comparable future studies in resource-scarce settings, it is possible to enrol hospital controls with careful planning which are similar to potential community controls, whilst minimising selection bias.

Funding for this study was provided by the Discipline of Public Health, The University of Adelaide. Additionally, human resource and in-kind support for the research was also provided by the Institute of Epidemiology, Disease Control and Research, Dhaka, Bangladesh and the National Heart Foundation Hospital & Research Institute, Dhaka, Bangladesh. The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

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POS3-105

GLOBAL ADULT TOBACCO SURVEY (GATS) DATA AS A TOOL TO IMPROVE SMOKING CESSATION STRATEGIES IN BRAZIL

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The epidemic and associated disease burden of tobacco use is growing, particularly in low- and middle-income countries. Increasing the effectiveness of smoking cessation policies and programs may require greater consideration of the complexity of cultural and socioeconomic situations that shape the smokers’ universe. The purpose of this paper is to explore the association between educational level and “selected midpoints” linked to smoking cessation in Brazil. As part of the Global Adult Tobacco Survey (GATS) conducted in 2008, data were collected from a representative sample of adult smokers (N=7, 003). We calculated the proportion of smokers who made a quit attempt in the last 12 months previous to the survey, as well as the proportions of smokers who visited a doctor in the last 12 months and received advice concerning quitting smoking, stratified by educational level. A Poisson regression model was used to assess the relationship between school level and smoking cessation questions. After controlling for age and gender, there were no statistical differences in quit attempts by educational level. However, smokers who had, at least, some college education and attempted to quit in the last 12 months (N = 0.5 million, after sampling expansion) visited a doctor and received advice to quit smoking, respectively. 1.3 times and 1.7 times more often than illiterate smokers who tried to quit in the 12 months prior to the survey (N = 1.6 million, after sampling expansion)(p-values < 0.001). Although Brazil has been one of the most successful countries in reducing tobacco use and is the largest seventh economy of the world, disparities in health and education are still a major challenge for policymakers. Our results demonstrate that there is a niche to be explored to increase the population impact of tobacco control actions worldwide.

The GATS-Brazil was funded by the Brazilian Ministry of Health and the Bloomberg Foundation.

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POS3-106

PREVALENCE AND CORRELATES OF HARDCORE SMOKING IN INDIA: RESULTS FROM GLOBAL ADULT TOBACCO SURVEY (2010)

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Hardcore smoking (HCS) refers to inability or unwillingness of daily users to quit smoking. Continued heavy use of smoking products makes them prone to tobacco induced diseases. Though India has multiple estimates of smoking prevalence, there is little information on HCS epidemiology, which has bearing on tobacco cessation program. The objective of this study was to quantify the prevalence and associated factors of hardcore smoking in India. Global Adult Tobacco Survey data of India conducted in 2009-10 available in public domain was analyzed. HCS was defined as (1) current daily smoking, (2) no quit attempt in the past 12...
months of survey or last quit attempt less than 24 hours, (3) no intention to quit in next 12 months or not interested in quitting, (4) Time to first smoke (TTFS) within 30 minutes, and (5) Knowledge of smoking hazards. Additional estimates using different measure of component construct of HCS was made. The number of hardcore smoker among adult Indians is estimated to be 24.3 million (3.1%) comprising of 21.9% of current smokers. The prevalence varied from 8% to 31.7% with other definitions. The prevalence varied from 6.1% to 50.4% across different states. The logistic regression model suggests that typical Indian hardcore smokers are older males with poor education, either employed or student. Further our study indicated that TTFS is more sensitive measure of hardcore smoking than daily frequency of smoking products. Huge number (24.3 million) of hardcore smokers suggests urgent need for specific universal tobacco cessation program. Our study results also emphasize need for standard definitions of HCS. Also this study reveals that time to first smoke is more appropriate to assess nicotine dependence construct in community survey where use of myriad smoking product is prevalent.

No funding.

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POS3-107
INCONSISTENT AND INVALID RESPONSES IN GLOBAL ADULT TOBACCO SURVEY (GATS): RESULTS FROM THE GATS-INDIA (2009-10) DATA ON SMOKING PRODUCT USE
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Around 43% respondents in the GATS-India survey neither had formal education nor had completed primary education. Hence there is ample possibility of misunderstanding of questions leading to misreporting in the survey. Assessing inconsistent and invalid responses could verify the same. GATS-India survey was piloted only in 13 Hindi speaking states and 18 states having different languages, and culture was left out. This limits our understanding about myriad variety of local-made rolled cigarette in India. GATS-India data available in public domain was analyzed to assess inconsistency and non probability in responses. For the purpose of this study the analysis was limited to (1) daily smoker reporting nil use of any smoking product, (2) reporting of age at initiation of daily smoking as 0-6 years, (3) daily smoker reporting use of smokeless product or earlier mentioned smoking product in the 'other smoking product category', and (4) dual users of hand-rolled and manufactured cigarette reporting use of equal or higher number of manufactured cigarettes than hand-rolled cigarettes. Out of 9223 daily smokers, 292 (3.2%) reported their daily frequency of using smoking product as ‘0’. While considering age at initiation of daily smoking, 136 (1.7%) respondents reported that they have started daily smoking before the age of 7 years including infancy. Daily smokers who reported use of other smoking product, 143(86.14%) reported use of smokeless or earlier mentioned smoking products in the ‘other smoking product category’. Overall 78-3% (Male-72-5%, Female-90%) of dual users of rolled-cigarette and manufactured-cigarette, use either equal (47-6%) or higher (28-5%) number of manufactured-cigarette than rolled-cigarette. The study suggests that there are inconsistent and invalid data sets exist in the cleaned GATS-India data available in the public domain. Thus there is strong case for piloting of GATS survey instrument once again. Further as GATS-India data being directly entered in a handheld mobile data entry interface, the interface could be checked for internal consistency.

No funding.

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POS3-108
ADVANTAGES AND DISADVANTAGES OF A “SINKING LID” TOBACCO ENGAME STRATEGY
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Background: One possible supply-side strategy for the tobacco endgame is a government mandated “sinking lid” on tobacco supply. Here we aim to further consider the potential advantages and disadvantages of this strategy. Methods: We conducted an additional review of relevant literature and synthesised discussions among the authors and from a July 2012 workshop at the University of Michigan (Ann Arbor, USA). Findings: Likely strengths of the sinking lid strategy include: (i) that it provides a clear timetable and an unambiguous signal of a tobacco endpoint date; (ii) that supply reduction is likely to increase product prices, and there is very strong evidence that increasing price is a highly effective tobacco control intervention. Its feasibility is also supported by the growing international experience with, and political acceptability of, using quota and auction systems in other domains (e.g., greenhouse gases, other air pollutants, and for fisheries). The sinking lid strategy could also be combined with most other endgame strategies as per those detailed at the University of Michigan workshop (e.g., a regulated phase down in nicotine levels in tobacco products; or a smoker’s license system). The main disadvantages of the sinking lid strategy are that it would require a new law, and as with most other strategies, it would also be vulnerable to problems from illegal supplies and from corruption. Conclusions: The sinking lid strategy should be included as an option when investigating possible tobacco endgame strategies, though it might tend to be most applicable in particularly well-organized jurisdictions. This idea could benefit from further research such as studies in virtual worlds, and real-world testing on small island jurisdictions or closed systems such as military bases.

Funding: Some of the thinking was stimulated by a workshop at the University of Michigan School of Public Health. The workshop and travel to it (NW) was funded by the Robert Wood Johnson Foundation and American Legacy Foundation.

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POS3-109
LESSONS FOR THE TOBACCO ENGAME FROM PAST SUCCESSES WITH ELIMINATING OTHER HAZARDS: EXAMPLES FROM NEW ZEALAND
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Background: Achieving the New Zealand Government’s Smokefree 2025 goal is likely to require very well designed and appropriately resourced government efforts for a prolonged period. This suggests potential value in learning any lessons from past successes with eliminating hazards. We therefore reviewed relevant literature and reflected on past case studies that some of us have conducted previously (particularly infectious disease hazards and leaded gasoline). Findings: New Zealand has successfully eliminated certain infectious diseases (e.g., brucellosis, hydatids and polo) and disease vectors (e.g., the removal of the southern saltmarsh mosquito [SSM] from multiple locations). It has eliminated leaded gasoline and banned the importation of asbestos. It is a world leader in eliminating mammalian pests from offshore islands and has started on mainland campaigns, e.g., fenced “mainland islands” and eliminating deer from one large region (Northland). Relevant lessons for the tobacco endgame include: clear goal setting; sustained government commitment (e.g., decades for hydatids); sufficient and sustained resourcing (e.g., $70 million for successful mosquito [SSM] elimination); cross-agency collaboration (e.g., between agricultural and health sectors for hydatids and SSM); non-governmental organization activity (e.g., unloaded gasoline); use of mass media (eg, hydatids); appropriate use of new technologies (e.g., a vaccine for polo); and having an appropriate research infrastructure and surveillance systems (e.g., SSM and mammalian pests). Conclusion: As a developed island nation, New Zealand has achieved some impressive elimination successes in the
Past. Tobacco endgame planners could benefit from learning the lessons from all of these as they chart the path to the Government’s Smokefree Nation 2025 Goal. Funding: There was no funding support for this work.

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POS3-110
THE ARTICLE 8 OF THE WHO FRAMEWORK CONVENTION ON TOBACCO CONTROL FROM THE PERSPECTIVE OF THE RIGHT TO HEALTH AND WORKERS’ PROTECTION

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Background: The study presents an analysis of the compliance by the Brazilian Government with art. 8 of the WHO Framework Convention on Tobacco Control, the first international public health treaty negotiated under the auspices of the World Health Organization, whose objective is to protect present and future generations from the devastating health, social, environmental and economic consequences of tobacco consumption and exposure to tobacco smoke. Brazil was the second country to sign the treaty, in 2003, but only the 100th to ratify it, due to the strong lobby promoted by the tobacco industry. The analyses focus on the premises established under Art. 8 of the treaty that provides protection from exposure to tobacco smoke and requires that Parties adopt effective, administrative, legislative and other measures to protect their populations from the risks of secondhand tobacco smoke. Objective: The purpose of this paper is to explore some of the challenges related to the implementation of smoke-free environments in Brazil and discuss the perspective of achieving this right. Methods: It is an observational study that has used documents searched in Brazilian Congress, electronic library (SCIElo), related academic documents, online and printed media. Results: The study analysis starts with a discussion of the obligation established under article 8 of the treaty concerning protection from exposure to tobacco smoke. It also presents its Guidelines adopted in July 2007 by the Conference of the Parties. This study analyzes the Brazilian national legislation, the tobacco industry reaction against the implementation of this measure, the lawsuits and explores some challenges related to implementation of smoke-free environments in Brazil, and their effective integration into the Brazilian legislation, from the perspective of the Right to Health and Labor Protection. Conclusions: The study concludes that, since Brazil has ratified the treaty, it is mandatory to enact the urgent publication of a Decree which will enforce the Federal Law 12.546, enacted in December 2011. No funding.

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POS3-111
EVALUATING THE ROLE OF ACADEMICS IN INFLUENCING TOBACCO CONTROL POLICY

Rima Nakkaash1, Rima Alfii, Lina Torossian, Taghreed El Haji, and Joanna Khalil

Lebanon ratified the Framework Convention on Tobacco Control (FCTC) in 2005, and passed a tobacco control law in 2011. The American University of Beirut Tobacco Control Research Group (AUB-TCRG), a multidisciplinary group of researchers working since 1999 on generating tobacco control research, stepped up its advocacy efforts to inform tobacco control policy making in 2005. At that time, despite accumulating evidence regarding effective policies, the proposed law under discussion was weak. The group disseminated tobacco control research findings and lobbied with stakeholders to support stronger provisions. Their objective was (1) to catalyze the tobacco control policy debate and bring it to the forefront of the national agenda in collaboration with civil society (2) to ensure that an adopted law is in line with best evidence. The objective of this study was to solicit viewpoints and perceptions about the value and the role played by the academics in the advocacy campaign. Methods: A qualitative methodology was used. One semi-structured interview guide conducted with 16 key stakeholders who were involved in the advocacy campaign that led to the adoption of the law. Interviewees included members of parliament, civil society, media, and representatives of regional and international organizations. Results: Interviewees placed considerable importance on the role played by academics particularly in regards to the authority and credibility that they brought to the discussions. Almost all interviewees saw that the evidence disseminated contributed to changing positions and aligning the law with FCTC obligations. The contribution of media and civil society groups, and their interaction with academics was an added value. Interviewees acknowledged lack of political will and tobacco industry influence as barriers that slowed down the process. Conclusions: This research evaluates the contribution of academics to the campaign and their role in moving the tobacco control policy forward in Lebanon. Lessons learned from this campaign are intended to feed into future participation of academics in national policy dialogue.

This research was funded by the International Development Research Centre.

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POS3-112
CHANGES IN EFFECTIVENESS OF CIGARETTE HEALTH WARNINGS OVER TIME: FINDINGS FROM THE INTERNATIONAL TOBACCO CONTROL (ITC) POLICY EVALUATION PROJECT CANADA AND UNITED STATES SURVEYS, 2002–2011

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Objectives: Article 11 of the World Health Organization’s Framework Convention on Tobacco Control requires countries to implement health warnings on tobacco products. Article 11 advises countries to periodically rotate warnings; however, little is known about the consequences of not rotating warnings. This study investigates potential “wearout” of cigarette health warnings over a period of nine years in two countries that did not rotate their warnings: the US, where the small text-only warnings were in place for 17 years (1994) at the beginning of the study; and Canada, where larger pictorial warnings were implemented approximately one year prior to the study (2001). Methods: Data were drawn from national longitudinal cohort samples of smokers recruited using probability sampling from the International Tobacco Control (ITC) Project Surveys in Canada (N=5309) and the United States (N=6432). Changes in four measures of health warning effectiveness, and a composite index, the Labels Impact Index, were examined over eight waves of survey data (2002-2011). Generalized Estimating Equations methods were used in the analyses to properly account for the longitudinal design. Analyses were weighted and adjusted for demographics, smoking behaviour, and time-in-sample. Results: Analyses of the four measures of health warning effectiveness and the composite Labels Impact Index (LIli) indicated that the effectiveness of the Canadian and US warnings declined between 2002 and 2011, LIli: (Canada linear trend: p<0.01, US linear trend: p=0.22). The Canadian warnings showed greater declines in effectiveness during the study period compared to US, LIli: p=0.18. Despite the greater declines, the Canadian pictorial warnings were more effective than the smaller US text-only warnings throughout the study period, LIli: p<0.001. Implications: Pictorial health warnings are more effective than smaller text-only warnings. However, both types of warning decline in effectiveness over time. Health warnings on tobacco products should be changed periodically to maintain effectiveness.

Canadian Institutes for Health Research (57897,79551, and 115016), Robert Wood Johnson Foundation (045734), Cancer Research UK (C312/A3726, C312/ A6485, C312/A11039, C312/A11943), Australia Commonwealth Department of Health and Aging, Canadian Tobacco Control Research Initiative (014578), National Health and Medical Research Council of Australia (265903) and (450110), U.S. National Cancer Institute (P05 CA111236 and RO1 CA100362), Ontario Institute for Cancer Research (Senior Investigator Award), Ontario Institute for Cancer Research (Senior Investigator Award), Canadian Institutes of Health 197

Poster Session 3 • Friday, March 15, 2013 • 5:30 p.m.–7:00 p.m.
POS3-13
PERCEPTIONS OF PICTORIAL HEALTH WARNINGS AMONG ADULT SMOKERS AND YOUTH IN GERMANY

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Background: As part of their 2003 tobacco labeling directive, the European Commission provided a set of pictorial warnings for use by member states; however, only a minority have implemented pictorial warnings to date. Germany, the largest member state and a critically important jurisdiction for tobacco control, is among the countries that continue to require text-only health warnings on packages. The current study examined perceptions of pictorial health warnings with different themes, among adult smokers and youth in Germany. Methods: An experimental study was conducted online with adult smokers (n=623) and both smoking and non-smoking youth aged 16-18 (n=553) in Germany. Respondents were randomly assigned to view 5-6 warnings for each of two health effects (of 15). Warnings for each health effect included a text-only version, as well as pictorial warnings in the following themes: graphic depictions of health effects (body parts), “lived experience” of health consequences, symbolic imagery, and personal testimonials. Warnings were viewed individually, in random order, and rated on 1-10 scales for perceptions of various characteristics and outcome effectiveness. Linear mixed effects models were used to examine ratings of effectiveness (using an outcome index) by health warning theme, across the 15 health effects. Findings: Pictorial warnings were rated as more effective than text-only warnings (adjusted mean scores 5.4 and 3.6, respectively; p<0.001). Among pictorial warnings, those depicting graphic health effects (mean=5.9) were rated significantly higher than those featuring “lived experience” (mean=4.9; p<0.001) or symbolic imagery (mean=4.6; p<0.001); in addition, “lived experience” warnings were rated higher than symbolic (p<0.001). Adding “lived experience” content to graphic warnings (mean=6.0) was no more effective than graphic content alone (p=0.17). Adding testimonial information increased perceived effectiveness (p<0.001). Conclusions: The findings are consistent with previous research in other countries, and support the implementation of pictorial warnings, particularly those featuring graphic depictions of the health consequences of smoking. 

This research was funded by the National Institutes of Health (Grant #8P01 CA138-389-01; Effectiveness of Tobacco Control Policies in High vs. Low Income Countries), Additional support was provided by the Propel Centre for Population Health Impact, a Canadian Institutes of Health Research New Investigator Award (Hammond) and the Canadian Cancer Society Research Institute Junior Investigator Award (Hammond). 

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POS3-115
FIGHTING A FLAVOR MONSTERS INVASION: AN EVALUATION OF A TRUTH-BRANDED ANTI-TOBACCO MOBILE VIDEO GAME

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BACKGROUND: Tobacco is the number one cause of preventable death in the United States, killing more than 400,000 people every year. Most adult smokers tried their first cigarette before they turned 18 years old. Thus, it is essential to reach youth before they start smoking in order to end this epidemic. Today, youth spend a substantive amount of time playing games on mobile devices and so message delivery strategies must adapt to this evolving media landscape. The purpose of this study was to determine the dose of tobacco-related content that could be embedded in a mobile game (Flavor Monsters) without reducing engagement, length of play, and brand awareness. METHODS: In Phase 1 (quantitative), a cohort of 13-24 year olds were recruited from an online panel to complete a baseline survey, play Flavor Monsters on their smart phone devices and then complete a follow-up survey. 105 participants were randomized to play either a high or a low anti-tobacco messaging version of the game. Phase 2 (qualitative) included 6 online discussion boards (participants were grouped by age and version; n=31). During the discussion boards, participants were required to answer a set of questions each day over 4 days. In addition, Flurry analytics were utilized to compare game play drop-off by version. RESULTS: There were no differences between high dose players and low dose players in game engagement (p=0.49), in relating the Flavor Monsters logo with brand awareness (p=0.23) or in length of game play (p=0.10). Qualitative study findings indicate that high dose players were more likely to identify the underlying anti-tobacco message of the game compared to low dose players. DISCUSSION: This evaluation may be the first to test two versions of a mobile game with a health prevention message. Results suggest that youth could be receptive to a game with a high dose of anti-tobacco messaging if embedded appropriately into game play. There is a critical

POS3-114
RACIAL AND ETHNIC DIFFERENCES IN THE ASSOCIATION BETWEEN LOCAL TOBACCO POLICY AND YOUTH CIGARETTE SMOKING

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The current study investigates racial and ethnic differences in the association between local tobacco policies and youth smoking. The study is based on two annual waves of survey data from 1,272 youth in 50 mid-sized California cities. Each city was rated for the comprehensiveness of its local tobacco policies in five policy domains: (a) indoor clean air, (b) outdoor clean air, (c) smoke-free
need to advance the evidence base demonstrating the effectiveness of digital games and game technologies.

Funding was received through a CDC grant, 1H75DP003800-01.

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POS3-116 INTERNATIONAL TOBACCO CONTROL POLICY EVALUATION PROJECT (ITC PROJECT): SUMMARY OF RECENT FINDINGS

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The International Tobacco Control Policy Evaluation Project (the ITC Project) is a research collaboration of over 100 researchers across 23 countries, whose major objective is to evaluate and understand the effects of tobacco control policies of the WHO Framework Convention on Tobacco Control (FCTC). Longitudinal cohort surveys are being conducted (or have been conducted) in 23 countries, inhabited by over 70% of the world’s tobacco users of probability samples of smokers (in all countries, with a focus on cigarettes, but additional survey content for non-cigarette smoked products in countries where these are prevalent, such as bids in India and Bangladesh), smokeless tobacco users, and non-smokers (in the majority of countries). This presentation will highlight and summarize ITC findings across the domains of the FCTC, including recent findings on pictorial health warnings (including findings relevant to the U.S. and Uruguay, two countries where there have been legal challenges to pictorial health warnings), smoke-free laws, tax and price, and marketing bans. The new ITC Projects in Sub-Saharan Africa will also be described. The ITC Project has served as the model for a new international project—the International Alcohol Control Study—that will focus on measuring the impact of alcohol control policies in an initial five countries.


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POS3-117 UNDERSTANDING RESEARCH-BUILDING TRAJECTORIES: THAILAND AS AN EXAMPLE

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In low- and middle-income countries (LMICs) over the past two decades locally relevant tobacco control research has been scant. Experience shows that tobacco control measures should be based on sound research findings to ensure that measures are appropriate for local conditions and are likely to have an impact. Research should address tobacco control priorities to ensure ongoing learning and the production of knowledge. The purpose of this study was to document and analyze the development of tobacco control research capacity in Thailand and the impact of research on Thai tobacco control measures. Various methods including a review of past and current policy, qualitative interviews with key tobacco control advocates, and an analysis of research productivity are used to characterize the trajectory of research development in Thailand. Over two decades, Thai tobacco control advocates have used five steppingstones to success: (1) adapting foreign research to inform policymaking and lobbying for more support for domestic research; (2) attracting foreign funding agencies to support small-scale research and capacity building; (3) participating in multi-country research and capacity building programs; (4) using collaborative experiences to demonstrate the need for domestic support of locally relevant research; and (5) maintaining an unwavering commitment to research while being vigilant to ensure continued research support. The evolution of tobacco control research in Thailand foreshadows future developments and innovations in Thailand that can also serve as an example to other LMICs.

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POS3-118 POLICY RESEARCH, ADVOCACY AND BUILDING CAPACITIES A ‘THREE WAY STRATEGY’ FOR EFFECTIVE IMPLEMENTATION OF FCTC – EXPERIENCE FROM PROJECT ‘STEPS’ IN INDIA

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High prevalence of tobacco use in India contributes to an increase in tobacco attributable cancer deaths, which are avoidable. To counter this pandemic, FCTC recommends evidence based measures which are also reflected in the Indian tobacco control law (COTPA). The project, ‘strengthening of tobacco control efforts through innovative partnerships and strategies’ (STEPS) envisions strengthening implementation of FCTC, COTPA and the National Tobacco Control Programme (NTCP). To generate research evidence to support tobacco control policy and build capacity of the law enforcers, NGOs and other stakeholders to ensure effective compliance with the provisions of FCTC and COTPA to strengthen NTCP. Observational research was undertaken in 6 districts each in two states of India (Andhra Pradesh and Gujarat) to monitor compliance with smokefree law, protection of minors from exposure to tobacco and pictorial health warnings on all tobacco products. Based on the results advocacy campaigns were designed to sensitize key stakeholders. Parallel efforts were made to build capacity of the enforcement officials and NGOs to advance tobacco control. There was near absolute non-compliance with COTPA. To strengthen enforcement new partnerships and collaborations were forged with all stakeholders at the state and district level. Constant advocacy efforts by NGOs at the community level supported enforcement. About 2000 law enforcers were trained at district and sub-district level along with constitution of District Advisory Committees and Community Against Tobacco (CAT) Groups to streamline and monitor COTPA implementation. Additionally, National Service Scheme (NSS) volunteers and youth monitor hospitality venues to ensure smokefree restaurants and hotels. These efforts were well received by the administration, community and the media. Enforcement strategies supported by research, community level advocacy and sustained capacity building efforts ensure effective implementation of FCTC mandates and help in reducing the burden of tobacco. Along with the official enforcement agencies, formation of community-level bodies has been critical to law enforcement.

The work is supported by the Bill and Melinda Gates Foundation.

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India is facing the greatest brunt of tobacco use with more than 1 million people dying every year due to tobacco related diseases. The Government has enacted a comprehensive tobacco control law albeit sporadic enforcement. Limited technical capacity and resources at the state and district level act as the major roadblock for tobacco control in India. Channelizing these essential resources to states and districts is crucial. Health Related Information Dissemination Amongst Youth (HRIDAY) implemented this project in five Indian states with the major thrust of activities being on promoting effective government-NGO partnership at national, state and district levels to boost enforcement of the Indian tobacco control law. A detailed annual work plan was developed for each state for the two years with planned capacity building, advocacy with policy makers and implementers and effective engagement with media to ensure implementation of COTPA provisions. Needs assessment was carried out at state and district level supported with pre and post intervention compliance to evaluate and monitor enforcement. Greater interest and buy in from governments to enforce tobacco control laws at state and district level. Nearly 1700 law enforcers and NGO personnel oriented to tobacco control law and its enforcement mechanism. Education and Police Department collaborated with Health Department to enforce provisions of COTPA. Education Departments extend support to prevent youth form exposure to tobacco and police officials committed to ensure smokefree public places. The project emphasised on the responsibility of government, NGOs, policy-makers, and implementers for advancing tobacco control at all levels. Inter-departmental coordination with effective NGO support is crucial for any programme. Regular capacity building efforts and booster trainings ensure sustainability and the level of engagement of the enforcement officers. Media is a key partner in generating mass support and acceptability of a programme at the grassroots level.

The work was supported by the Bloomberg Initiative to Reduce Tobacco Use.

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POS3-120
ASSESSMENT OF THE IMPACT OF A BAN ON PHARMACY SALE OF TOBACCO PRODUCTS: LESSONS FROM MASSACHUSETTS

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BACKGROUND: New tobacco control policies have been introduced in some U.S. jurisdictions which restrict tobacco product sales in pharmacies. This study aimed to outline the scope of pharmacy involvement in a state-wide tobacco market by assessing the availability and range of tobacco products sold in Massachusetts pharmacies. METHODS: Public listings of licensed pharmacies and tobacco retailers in Massachusetts were examined to determine the proportion of pharmacies licensed to sell tobacco, and the proportion of tobacco retailers that possessed a pharmacy license. Telephone interviews were conducted with a random sample (n=70) of pharmacies that held a tobacco license, to assess the availability and range of tobacco products for sale. The availability of NRT products was assessed as a comparison. RESULTS: The majority of pharmacies in Massachusetts possessed a tobacco license (69%), and pharmacies made up 9% of licensed tobacco retailers. Among pharmacies that reported selling tobacco (90%), cigarettes were the most available tobacco product for sale (100%), followed by cigars (69%), little cigars/cigarillos (66%), moist snuff (53%), pipes tobacco (49%), roll-your-own tobacco (34%), snus (14%), dissolvable tobacco (11%), and electronic cigarettes (2%). Nearly all pharmacies that sold tobacco offered the nicotine patch (100%), gum (100%), and lozenge (98%) CONCLUSIONS: In Massachusetts, a tobacco-free pharmacy policy would affect a majority of pharmacies and remove a wide range of tobacco products from store shelves. Further, nearly one in ten tobacco retailers would be eliminated by a ban on tobacco sales in Massachusetts pharmacies.

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POS3-119
AWARENESS TO ACTION THROUGH MULTI-CANAL ADVOCACY FOR EFFECTIVE TOBACCO CONTROL IN INDIA: ADVANCING TOBACCO CONTROL IN FIVE INDIAN STATES

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India has the greatest percentage of smokers in the world. Tobacco related diseases are the leading cause of death. Tobacco control policies enacted in India have been sporadic and enforcement limited. Limited technical capacity and resources at the state and district level act as the major roadblock for tobacco control in India. Channelizing these essential resources to states and districts is crucial. Health Related Information Dissemination Amongst Youth (HRIDAY) implemented this project in five Indian states with the major thrust of activities being on promoting effective government-NGO partnership at national, state and district levels to boost enforcement of the Indian tobacco control law. A detailed annual work plan was developed for each state for the two years with planned capacity building, advocacy with policy makers and implementers and effective engagement with media to ensure implementation of COTPA provisions. Needs assessment was carried out at state and district level supported with pre and post intervention compliance to evaluate and monitor enforcement. Greater interest and buy in from governments to enforce tobacco control laws at state and district level. Nearly 1700 law enforcers and NGO personnel oriented to tobacco control law and its enforcement mechanism. Education and Police Department collaborated with Health Department to enforce provisions of COTPA. Education Departments extend support to prevent youth form exposure to tobacco and police officials committed to ensure smokefree public places. The project emphasised on the responsibility of government, NGOs, policy-makers, and implementers for advancing tobacco control at all levels. Inter-departmental coordination with effective NGO support is crucial for any programme. Regular capacity building efforts and booster trainings ensure sustainability and the level of engagement of the enforcement officers. Media is a key partner in generating mass support and acceptability of a programme at the grassroots level.

The work was supported by the Bloomberg Initiative to Reduce Tobacco Use.

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POS3-121
ELECTRONIC CIGARETTES IN CANADA: PREVALENCE OF USE AND PERCEPTIONS AMONG YOUNG ADULTS

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Background: Electronic cigarettes (e-cigarettes) are a type of potentially reduced exposure product (PREP) that deliver vaporized nicotine without the harmful chemicals and carcinogens found in tobacco smoke formed during pyrolysis. E-cigarettes containing nicotine are prohibited for sale in Canada, although e-cigarettes without nicotine are widely available for sale and are becoming increasingly prominent. To date, there is very little evidence on prevalence and patterns of use of e-cigarettes in Canada. Methods: A sample of 1,211 young adults aged 16-30 (456 smokers and 755 non-smokers), were recruited from an online panel of Canadians. After viewing an image of an e-cigarette, respondents answered questions regarding use and perceptions of e-cigarettes. Results: Close to half of young adults (43.6%) had seen e-cigarettes advertised or for sale. A total of 16.0% reported “ever tried” e-cigarettes (32.8% smokers vs. 5.9% non-smokers); 5.7% reported use in the past 30 days (13.8% smokers vs. 1% non-smokers). Approximately 13.7% reported purchasing e-cigarettes from: “regular” stores in Canada (69.4%), the internet (33.3%), sources outside of Canada (8.3%), and other sources (6.9%). Although 77.2% of all respondents perceived e-cigarettes as at least somewhat harmful to their health, approximately half (48.5%) reported at least some interest in trying e-cigarettes. Among smokers who had tried e-cigarettes, between 77.5% and 81.0% indicated “yes” or “maybe” to using e-cigarettes as an alternative or replacement for cigarettes or as a cessation tool. A total of 11.9% of e-cigarette “ever users” reported side-effects of use. Among previous users, only 9.5% were “not at all likely” to recommend e-cigarettes to their friends. Conclusions: Despite a ban on the sale of e-cigarettes containing nicotine in Canada, awareness of e-cigarettes among young adults is quite high. Approximately one third of young adult smokers reported trying e-cigarettes, with evidence of use among non-smokers. Future research should examine the content and design of e-cigarettes in Canada to determine compliance with the ban on nicotine.

This research was supported by the Canadian Institutes of Health Research Training Grant in Population Intervention for Chronic Disease Prevention: A Pan-Canadian Program (Grant #: 53893) (Czoli), the Ontario Tobacco Research Unit Ashley Studentship for Research in Tobacco Control (Czoli), the Ontario Graduate Scholarship (Czoli), the Propel Centre for Population Health Impact, a CIHR New Investigator Award (Hammond), and a Canadian Cancer Society Research Institute Junior Investigator Research Award (Hammond).

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POS3-122
AWAERENESS, TRIAL, AND CURRENT USE OF ELECTRONIC CIGARETTES: FINDINGS FROM ITC FOUR COUNTRY SURVEY
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Background: Electronic cigarettes (e-cigarettes) initially emerged in 2003 and have since become widely available globally, particularly over the internet. Purpose: Because e-cigarettes are relatively new, data on usage patterns are limited. The current study examines patterns of e-cigarette awareness, trial, use, and product-associated beliefs among current and former smokers in four countries. Methods: Data come from Wave 8 of the International Tobacco Control Four-Country Survey, collected from July 2010 to June 2011 and analyzed through to June 2012. Respondents included 5,939 current and former smokers in Canada (N=1,581), US (N=1,552), UK (N=1,325), and Australia (N=1,513). Results: Overall, 47% were aware of e-cigarettes (US: 73%; UK: 54%; Canada: 40%; Australia: 20%); 7.6% had tried e-cigarettes (16% of those aware of e-cigarettes); and 2.9% were current users (3% of triers). Awareness of e-cigarettes was higher among younger, non-minority smokers with higher incomes who were heavier smokers. Prevalence of trying e-cigarettes was higher among younger, non-daily smokers with a high income and among those who perceived e-cigarettes as less harmful than traditional cigarettes. Current use was more likely among both non-daily and heavy (20+ cigarettes per day) smokers. Nearly 81% reported using e-cigarettes because they were considered less harmful than traditional cigarettes, 75.4% stated that they used e-cigarettes to help them cut down, and 85.1% reported using e-cigarettes to help them quit smoking. Conclusions: Awareness of e-cigarettes is high, especially in countries where they are legal (i.e., US and UK). Because trial was associated with non-daily smoking and a desire to quit smoking, e-cigarettes could potentially serve as cessation aids once enforceable product standards are developed and efficacy and safety are firmly established. Future research should evaluate whether e-cigarette use effectively reduces the number of cigarettes smoked and/or improves cessation efforts and how the marketing of these devices influences usage patterns among both tobacco users and nonusers.

The ITC Four Country Project was supported by the U.S. National Cancer Institute (RO1 CA100362 and P01 CA138389), Canadian Institutes of Health Research (79551 and 115016), National Health and Medical Research Council of Australia (450110, APP1005922), Cancer Research UK (C312411943), Ontario Institute for Cancer Research (Senior Investigator Award to GTF), and Canadian Cancer Society Research Institute (Prevention Scientist Award to GTF).

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POS3-123
PREVALENCE OF VIOLENCE AGAINST WOMEN IN FEMALE SMOKERS ATTENDED IN A SMOKING CESSATION PROGRAM AT PRIMARY CARE LEVEL IN BUENOS AIRES CITY: A CROSS SECTIONAL STUDY
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International researches have related female smoking with different psychosocial determinants as unstable employment situation, anxiety, depression and Violence Against Women (VAW)among others. Women who smoked are twice as likely to report VAW. Also, it is associated with more cigarettes consumption and less success in quitting. In Argentina, VAW prevalence at primary care level is 44%. But, there is not local data about prevalence among female smokers. Our objective was to assess the prevalence of VAW in female smokers receiving tobacco dependence treatment at a primary care setting. Also, to assess the prevalence of nonpsychotic mental disorders (anxiety, depression and somatic symptoms)and self perception of health status and compared these outcomes between female smokers with and without VAW. Methods: A sample of 194 female smokers was chosen systematically from the smoking cessation unit. Two instruments were implemented: the first explored VAW (developed by International Planning Parenthood Federation) and the second explored non psychotic mental disorders (Self Reporting Questionnaire-20 or SRQ-20, developed by WHO). They had been validated locally. Demographic data and perception of health status were also evaluated. Results: All women agreed to participate. The median age was 54(IQR 46-60), 53.6%(CI 95% ± 7.02%)were not married and 73.7%(CI 95% ± 6.25)had children. The median year of education was 12(IQR 12-16). There were no significant differences between groups. Lifetime prevalence of VAW was 68.6%. Emotional and physical violence were the most reported types: 89.3% and 48.1%, respectively. The prevalence of non psychotic mental disorders was 49%. Women with a positive SRQ-20 test were 3.6 times (CI 95% 1.7-7.5)and women with an unstable employment situation were 2.5 times (IC 95% 1.1-7.7)more likely to report VAW adjusted for age, marital status and education. Conclusions: The VAW prevalence in this sample of female smokers were higher than founded at primary level and associated with a positive SRQ-20 test and an unstable employment situation. But, more data is needed to generalize our conclusions to others female smokers.

This study was funded by grant “Carrillo-Oñativia” 2010, National Health Ministry, Argentina.

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POS3-124
PERSONALITY DISORDER CHARACTERISTICS AND CIGARETTE SMOKING AMONG DRUG ABUSERS IN METHADONE MAINTENANCE TREATMENT
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Between 77% and 93% of drug abusers on methadone are tobacco smokers. The high prevalence of smoking among drug abusers may be accounted for by personality disorder characteristics, known to be prevalent among drug abusers and also associated with smoking. To determine how personality disorder characteristics are associated with smoking behavior and quit attempts among drug abusers in methadone treatment, we surveyed 29 individuals on methadone treatment and asked them about their smoking behavior. Study participants also completed the Millon-Clinical Multiaxial Inventory-II, and exhaled carbon monoxide (CO) was measured. Participants were recruited with flyers and by approaching individuals in methadone clinic waiting areas. Participants’ mean age was 40 (SD=10.4), and 78% were female. Almost all (90%) were daily smokers, and participants smoked a median of 7 (IQR=3.5-16) cigarettes per day. Thirty-five percent had clinically significant Cluster A (paranoid, schizoid, or schizotypal) personality traits; 81% had clinically significant Cluster B (antisocial, borderline, narcissistic, or histrionic) personality traits; and 58% had clinically significant Cluster C (avoidant, dependent, obsessive-compulsive) personality traits. Expired CO levels had a significant positive relationship with apathy and masochistic and delusional characteristics. Number of cigarettes smoked per day had a significant negative relationship with dramatic personality traits. Number of quit attempts had a significant positive association with schizoid and narcissistic personality characteristics and negative association with inept self image and being interpersonal paradoxical. The positive relationship between CO and borderline characteristics and negative relationship between number of quit attempts and borderline characteristics approached statistical significance (p<0.07). Confidence in ability to quit smoking had a significant negative relationship with apathy and negativistic, masochistic, and borderline characteristics. These findings suggest that personality disorder characteristics should be considered when addressing smoking among those on methadone.

Funding supported by NIDA grant #K23DA025049.

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POS3-125
CHALLENGES IN USING OCCASIONAL CONFINEMENT DESIGNS IN CLINICAL STUDIES OF POTENTIAL MODIFIED RISK TOBACCO PRODUCTS
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DRAFT guidance issued by the US FDA on modified risk tobacco product (MRTP) applications includes the FDA's expectation that clinical studies are conducted that investigate the levels of biomarkers of exposure (BoE) and biomarkers of biological effect (BoBE). We present data from 3 studies that have collected measures of tobacco smoke exposure either through ambulatory or occasional clinical confinement design. The first study followed a group of 1011 smokers of a single cigarette brand in Germany, over a period of three years, where a variety of measures including 24hr urinary nicotine were taken every six months. The second study was a 6-week single-centre, single-blinded, randomised controlled switching study with occasional clinical confinement, conducted in Germany, with 250 smokers and 50 non-smokers that measured changes in BoE following a switch from conventional cigarettes to reduced toxinant prototype (RTP) cigarettes. The third study was also an occasional clinical confinement study with a switch to a RTP cigarette, but over a 6-month period and inclusion BoE and BoBE. Data from these studies indicate some significant challenges with ambulatory and occasional confinement designs, including subject retention. In the first study 547 subjects remained after 3 years, but much fewer attended all timepoints. Changes in smoking behaviour possibly influenced by the study design have been found. In the second study there was a distinct increase in consumption on the last day in clinic, and some subjects reported that increased consumption in the third study was due to the provision of free cigarettes.

All three studies considered in this paper were entirely funded by British American Tobacco, a tobacco manufacturer.

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POS3-126
HARM REDUCTION AND CESSATION EFFORTS AND INTEREST IN CESSATION RESOURCES AMONG SURVIVORS OF SMOKING-RELATED CANCERS
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Despite the well-established risks associated with persistent smoking, many cancer survivors who were active smokers at the time of cancer diagnosis continue to smoke. In order to guide the development of tobacco cessation interventions for cancer survivors, a better understanding is needed regarding post-diagnosis quitting and harm reduction efforts. Thus, we examined these efforts and interest in cessation resources among cancer survivors who self-identified as current smokers at the time of diagnosis. We conducted analyses of survey participants (n=54) who were current smokers at the time of cancer diagnosis and were continued smokers at the time of assessment. We also conducted semi-structured interviews (n=21) among a subset of those who either continued to smoke or quit smoking post cancer diagnosis. Among survey participants, 22.2% had ever used behavioral cessation resources and 66.7% had used pharmacotherapies, while 62.8% had interest in future use of behavioral cessation resources and 75.0% had interest in pharmacotherapies. In terms of harm reduction strategies since cancer diagnosis, 20.4% switched cigarette brands, 53.7% decreased cigarette consumption, 14.8% switched to only smoking on some days, 24.1% switched to lighter tar cigarettes, and 55.6% limited how much they smoke to decrease their health risks from smoking. Semi-structured interview data revealed various strategies used to aid in smoking reduction and cessation as well as variability in preferences for cessation resources. In summary, we found high rates of harm reduction use and high interest in cessation resources. However, our sample indicated low confidence in quitting, and only 23% of our sample reported a quit attempt in the past year, while national statistics indicate that roughly 40% of smokers have tried to quit smoking in the past year. These findings illustrate that cancer patients who are not fully abstinent or not actively attempting to quit may still be motivated to reduce the risks of smoking by engaging in harm reduction strategies and remaining open to the idea of using cessation resources in the future.

This research was supported by the Emory University Winship Cancer Institute Kennedy Seed Grant (Pl. Berg) and the Georgia Cancer Coalition (Pl. Berg). Dr. Carpenter was supported by a Career Development Award from NIDA (K23 DA020482)

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POS3-127
THE PREDICTIVE PERFORMANCE OF CRAVING FOR CATEGORIZING NICOTINE DEPENDENCE
Lisa J. Germeroth, M.S.* Jennifer M. Wray, M.S., Julie C. Gass, M.S., and Stephen T. Tiffany, Ph.D., University at Buffalo, SUNY

It is often accepted that craving has diagnostic utility in clinical assessments, and as such, has been proposed as a criterion of nicotine dependence in DSM-V. It is unclear, however, how the content of craving assessments influences its diagnostic performance. This study investigated the diagnostic performance of individual items and subgroups of items on the 32-item Questionnaire on Smoking Urges (QSU) as a function of item wording, craving intensity, and item stability. Nicotine dependence was assessed using the Wisconsin Inventory of Smoking Dependence Motives (WISDM), Nicotine Addiction Taxon Scale (NATS), and Fagerström Test for Nicotine Dependence (FTND). The QSU was administered on 6 occasions; the first 5 sessions were each one week apart and the final session was 8 weeks after Session 5. Craving scores were calculated as averages across all six administrations. Participants were 250 smokers (M age = 25.9) representing varying smoking levels. Receiver-operating characteristic (ROC) curves and area under the curve (AUC) statistics indicated that the QSU total craving score was effective in discriminating nicotine dependence across all measures, but that individual QSU items and subgroups of items varied in their discriminative ability. There was no difference in the AUCs between specific items using the terms urge and crave, but there were significance differences in (1) the discriminative performance of items assessing intentions to smoke relative to those assessing desire to smoke, (2) craving items reflecting more intense craving relative to items reflecting less intense craving, and (3) items reflecting negatively reinforcing effects relative to positively reinforcing effects of smoking. Craving showed the strongest diagnostic utility when dependence was assessed using the WISDM in comparison to the NATS and the FTND. The stability of craving items was positively associated with the discriminative performance of craving. Overall, the findings suggest that craving items representing intense states of desire and highly stable craving levels maximally discriminated nicotine dependence.

This research was funded by an NIH grant to S. Tiffany (R01 CA120412).

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POS3-128
A COMPARISON OF METHODS FOR ASSESSING CIGARETTE USE IN NON-DAILY SMOKERS
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An increasingly large subset of individuals who smoke cigarettes are not regular, heavy users, but methods for accurately characterizing levels of smoking and smoke exposure in non-daily smokers have not been evaluated rigorously. For example, the traditional retrospective quantity-frequency measures of smoking may not accurately capture variable patterns of smoking behavior in non-daily smokers. This study was designed to 1) evaluate different self-report approaches to the assessment of smoking behavior in a sample of non-daily smokers, 2)
compare the number of cigarettes smoked over a 28-day period to biomarkers of nicotine exposure (hair levels of nicotine and cotinine), and 3) determine the best combination of smoke exposure data (i.e., smoking topography) and self-reported smoking behavior to predict the exposure biomarkers. Individuals who smoked 1-29 days of the past 30 and no more than 15 cigarettes on an average smoking occasion were recruited to participate in the study. Participants attended six study sessions over the course of three months and completed various assessments during each of these visits. Self-reported number of cigarettes smoked over the first 28 days of the study was assessed at Session 5 via two Quantity Frequency measures, a Graduated Frequency measure, and a Timeline Follow Back interview. In addition, half of the participants were randomly assigned to a Daily Report condition that required participants to report at the end of each day the number of cigarettes smoked in the previous 24 hours. Biomarkers of smoking behavior, including hair nicotine and cotinine levels, were collected from each participant. Preliminary analyses demonstrate strong correlations between Daily Report and Timeline Follow Back (r=0.95, p<.0001), Graduated Frequency (r=0.79, p<.0001), and Quantity Frequency (r=0.79, p<.0001) methodology. A modest relationship was seen between self-report data and hair nicotine and cotinine levels. Implications regarding the characterization of non-daily smokers, self-report assessment of non-daily smoking, and the use of hair biomarkers in this sample will be discussed.

**Funding:** National Cancer Institute (R01 CA120412).

**CORRESPONDING AUTHOR:** Jennifer Wray, MA, University at Buffalo, sample will be discussed.

**POS3-129 ATTENTION-DEFICIT HYPERACTIVITY DISORDER (ADHD) AND SMOKING DEPRIVATION EFFECTS**

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Introduction. Identifying relations of Attention-Deficit Hyperactivity Disorder (ADHD) symptom dimensions to individual facets of the tobacco withdrawal syndrome could inform the development of cessation treatments for smokers with ADHD symptoms and elucidate the mechanisms linking ADHD and regular smoking. This study examined the unique relations of inattention (IN) and hyperactivity-impulsivity (HI) symptom dimensions of ADHD to a variety of tobacco withdrawal symptoms. Methods. 132 adult smokers self-reported ADHD symptoms experienced over the past 6 months at a baseline visit. At two subsequent experimental sessions (one following overnight tobacco deprivation and one nondeprived; order counterbalanced), participants completed measures of tobacco withdrawal symptoms, mood, and desire to smoke. Results. Higher levels of IN and HI symptoms were both associated with larger deprivation-induced increases in anxiety/tension, eating, and anger (Ps < .01). After controlling for the covariance between IN and HI, associations with IN were no longer significant and only HI retained incremental associations with some deprivation effects (Ps < .01). Conclusions. ADHD symptoms are associated with more severe exacerbations in withdrawal symptoms caused by abstinence. In comparison to IN, HI appears to confer greater risk for abstinence-induced symptom exacerbation across a more diverse variety of tobacco withdrawal manifestations, which could be an important mechanism of ADHD smoking comorbidity. These findings suggest the need for clinical interventions designed to target the unique and potentially more severe withdrawal profiles experienced by smokers with high-levels of ADHD symptoms.

**Funding:** R01DA026851 (Leventhal); K23DA03302 (Bidwell).

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**POS3-130 SMOKING STATUS PREDICTS SEVERITY AND OUTCOME FOR OUTPATIENT ALCOHOLICS: FINDINGS FROM PROJECT MATCH**

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The prevalence of smoking is as high as 80% among treatment-seeking alcoholics (Kalman et al., 2010). Smoking status predicts treatment outcome; being a non-smoker at treatment entry is associated with abstinence from alcohol 7 years later (Hintz & Mann, 2007) and current nicotine use has a negative impact on alcohol treatment outcome (Mason & Lehert, 2009). Walitzer and Dearing (2012) documented that current smoking among treatment-seeking alcoholics was associated with greater severity of alcoholism and less treatment involvement relative to nonsmokers and former smokers. The present analyses utilize the Project MATCH outpatient sample (Project MATCH Research Group, 1993) to examine whether treatment-seeking alcoholics who currently smoke (71%) differ from never-smokers (8%) and former-smokers (21%) in terms of pretreatment alcohol severity, age of alcohol problem onset, treatment participation, and drinking outcomes. 807 patients (28% women) in the Project MATCH outpatient arm provided reports regarding pretreatment smoking status and alcohol use (percent days abstinent [PDA], drinks per drinking day [DDD]), drinking consequences, and age of alcohol problem onset. Patients were followed for 12 months after treatment end (n = 742); PDA and DDD were collapsed during the follow-up period to derive outcome variables. At pretreatment, alcoholic former smokers reported significantly lower DDD (d = -.42) and fewer negative alcohol consequences (PDA = -28 to -84) relative to alcoholic smokers. Further, the former smokers also reported a significantly older age of alcohol problem onset relative to alcoholic smokers (d = .36, .49). Former smokers completed more treatment relative to current smokers (d= -24) and never smokers (d= .30). In terms of drinking outcomes, the pattern of findings was mixed; although the former smokers reported a nonsignificant trend toward lower DDD during follow-up (d = -.29), PDA was significantly lower (d= -.26) relative to current smokers. Generally, never-smokers’ scores fell between those of the current and former smokers’. Smoking status appears to be an important predictor of alcoholism severity and outcome.

**Funding:** NIAAA.

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**POS3-131 RESPONSE INHIBITION TRAINING MODIFIES RELAPSE RELATED OUTCOMES**

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Response inhibition, a form of behavioral impulse control, is the ability to inhibit behavioral responses to salient approach cues. Poor behavioral control is associated with increased craving and stranger positive and reinforcing smoking expectation during abstinence. Improving behavioral impulse control may affect relapse-related risk factors. This pilot study examined an ecological intervention to modify smoking related impulse control. Daily smokers (n = 25) were assigned to an experimental (n = 10) or control (n = 15) condition. At T1, participants completed a lab based cue-induced craving task and an approach-avoidance task (AAT; a measure of implicit approach and avoidance motivation in response to smoking stimuli). They then carried hand-held computers for one week. They were prompted to complete retraining tasks 7 times per day. For the task, smoking and non-smoking pictures were paired with a letter and presented on the screen. If the letter was a consonant, participants clicked on the screen if the letter is a vowel they inhibited a click. In the experimental condition, 90% of inhibit responses were paired with smoking pictures. Vowels and consonants were equally distributed across pictures in the control condition. Participants were paid $0.07 per correct response. Following training (i.e., at T2), participants returned to the lab and completed the AAT and craving task again. There was a significant Condition x Time interaction (p < .05) predicting avoidance motivation. Relative to T1, training was associated with increased implicit avoidance motivation at T2 for the experimental group (p < .05) but not the control group (p > .10). There was an increase in approach motivation from T1 to T2 that did not vary by group (p > .05). Finally, cue-induced craving was marginally lower in the training condition at T2 (p = .10). These results suggest that implementing response inhibition training in
real-time may have positive effects on smoking related outcomes. However, the findings should be tempered by the fact that approach motivation increased across conditions. Further research is needed to determine the impact of this training on smoking cessation. Portions of this research were funded by a National Institute of Drug Abuse grant (R01 DA021677) to C. Gwaltney and a research excellence award from the Brown University Department of Psychiatry and Human Behavior to R. Dvorak.

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POS3-132
HEAVINESS OF SMOKING INDEX IS GOOD FOR PREDICTING SMOKING RELAPSE MAINLY IN THE FIRST MONTH OF A QUIT ATTEMPT

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The Heaviness of Smoking Index (HSI) is a widely used behavioural measure of nicotine dependence and has been shown to be a strong predictor of short-term smoking relapse among those who quit. More recently, however, its utility for predicting long-term smoking relapse has been questioned. This paper examined systematically the utility of the HSI for making prediction of smoking relapse that occurs over different time windows in the first two years of quitting. Analyses were conducted on two related samples drawn from the first 7 waves (2002-2009) of the International Tobacco Control Four-Country Survey, an annual cohort telephone survey of adult smokers in Canada, United States, United Kingdom, and Australia. The first sample consisted of 7136 daily smokers who had made a quit attempt by the next follow-up survey (called baseline-smoking sample) and the second consisted of 1237 ex-smokers (baseline-quit sample). Generalized estimating equation models were used to examine the association of HSI and its two components (cigarettes smoked per day [CPD] and time to first cigarette of the day [TTFC]) with smoking relapse that occurs over different time intervals (<1 week, 1 week to 1 month, 1-3 months, 3-6 months, 6-9 months, 9-14 months & 14-24 months). The results indicated that of the baseline-smoking sample, their HSI, CPD and TTFC scores strongly predicted relapse within the first month of quitting (<1 week: OR=1.00, 1.26, 1.28 for HSI, CPD & TTFC, respectively, all p's < .001; 1 week-1 month: OR=1.07, 1.13 & 1.09, respectively, all p's < .01) but beyond which their predictive power diminishes with increasing length of quitting (1-3 months: OR=1.00, .98 & 1.01, respectively, all p's > .05). For the baseline-quit sample consisting of mainly longer term quitters, their pre-quit HSI, CPD and TTFC scores were found to be no longer predictive of subsequent relapse. Taken together, these findings suggest that the HSI and its two components, as a measure of nicotine dependence, are most useful for predicting relapse that occurs within the first month of quitting, and beyond which other aspects of nicotine dependence may be more important in determining quit outcomes.

Supported by multiple grants including R01 CA 100362 and P50 CA111236 (Roswell Park Transdisciplinary Tobacco Use Research Center) and also in part from grant P01 CA138389 (Medical University of South Carolina, Charleston, South Carolina), all funded by the National Cancer Institute of the United States, Robert Wood Johnson Foundation (045734), Canadian Institutes of Health Research (57897, 79551), National Health and Medical Research Council of Australia (265903, 450110, APP1005922), Cancer Research UK (C312/A3726), Canadian Tobacco Control Research Initiative (014578); Centre for Behavioural Research and Program Evaluation, National Cancer Institute of Canada/Cancer and Social Cancer Society.

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POS3-133
PROGNOSTIC VALIDITY AND ACCURACY OF MULTIDIMENSIONAL VERSUS SINGLE-ITEM CRAVING MEASURES FOR PREDICTING SMOKING RELAPSE

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Background: Research suggests that craving to smoke is a predictor of smoking relapse. Craving can be assessed by multiple item or multifactorial scales or by single items. However, no systematic comparisons of their prognostic validity or accuracy have been published. Methods: The French language versions of the 12-item Tobacco Craving Questionnaire (FTCQ-12) and the single craving item on the Minnesota Nicotine Withdrawal Scale (MNWS) are brief, valid, and reliable self-report measures of tobacco craving. In this second study, we analyzed data from French smokers (N=310) with smoking related health disorders and enrolled in the Adjustment of DOses of Nicotine in Smoking Cessation (ADONIS) trial (Clinicaltrials.gov Identifier: NCT00235313). We estimated prediction models for each measure and compared their ability to distinguish correctly participants who relapsed from those who did not at follow-up periods ranging 1-7 weeks apart. Results: Adjusted for all potential confounders the sum of Expectancy (factor 2) and Purposefulness (factor 4) of the FTCQ-12, the FTCQ craving risk score, and MNWS craving were valid predictors of smoking relapse, at endpoints measured 1-7 weeks apart although their prognostic validity decreased progressively. Prognostic accuracy of FTCQ craving risk score was greatest at 1-2 weeks follow-up compared to only 1 week for MNWS craving. Sensitivity for FTCQ-12 craving and MNWS craving was 85% and 53%, respectively. Conclusions: Craving to smoke is a major predictor of relapse. FTCQ craving risk score consisting of 5 questions suggests a relapse process involving urges and desires in anticipation of the positive benefits of smoking linked with intent and planning to smoke. Findings also suggest that FTCQ-craving risk score is a better screening test than MNWS craving. Future treatments should target craving, expectancy and purposefulness to smoke to reduce likelihood of relapse after a quit attempt.

No funding.

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POS3-134
NEURAL SUBSTRAVES OF WORKING MEMORY DEFICITS DURING NICOTINE WITHDRAWAL

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Smoking cessation is associated with subtle working memory deficits that predict subsequent relapse. Prior neuroimaging studies have produced conflicting results with respect to the neural mechanisms underlying these effects. To elucidate neural substrates of these deficits, we acquired two blood-oxygen-level dependent (BOLD) functional magnetic resonance imaging (fMRI) scans in 63 treatment-seeking smokers performing a visual N-back task on two separate occasions: smoking as usual and after 24 hours of biochemically confirmed abstinence (order counterbalanced). Abstinence (versus smoking) led to reduced BOLD signal change in the 3 a priori regions of interest (ROIs): medial frontal/cingulate gyrus and right and left dorsolateral prefrontal cortex (all ps ≤ 0.001). BOLD signal in the these three regions was positively associated with cravings and exceeded 24 hours of biochemically confirmed abstinence (order counterbalanced). Abstinence (versus smoking) led to reduced BOLD signal change in the 3 a priori regions of interest (ROIs): medial frontal/cingulate gyrus and right and left dorsolateral prefrontal cortex (all ps ≤ 0.001). BOLD signal in the these three regions was positively associated with cravings and exceeded 24 hours of biochemically confirmed abstinence (order counterbalanced). Abstinence (versus smoking) led to reduced BOLD signal change in the 3 a priori regions of interest (ROIs): medial frontal/cingulate gyrus and right and left dorsolateral prefrontal cortex (all ps ≤ 0.001). BOLD signal in the these three regions was positively associated with cravings and exceeded 24 hours of biochemically confirmed abstinence (order counterbalanced). Abstinence (versus smoking) led to reduced BOLD signal change in the 3 a priori regions of interest (ROIs): medial frontal/cingulate gyrus and right and left dorsolateral prefrontal cortex (all ps ≤ 0.001). BOLD signal in the these three regions was positively associated with cravings and exceeded 24 hours of biochemically confirmed abstinence (order counterbalanced). Abstinence (versus smoking) led to reduced BOLD signal change in the 3 a priori regions of interest (ROIs): medial frontal/cingulate gyrus and right and left dorsolateral prefrontal cortex (all ps ≤ 0.001). BOLD signal in the these three regions was positively associated with cravings and exceeded 24 hours of biochemically confirmed abstinence (order counterbalanced). Abstinence (versus smoking) led to reduced BOLD signal change in the 3 a priori regions of interest (ROIs): medial frontal/cingulate gyrus and right and left dorsolateral prefrontal cortex (all ps ≤ 0.001). BOLD signal in the these three regions was positively associated with cravings and exceeded 24 hours of biochemically confirmed abstinence (order counterbalanced). Abstinence (versus smoking) led to reduced BOLD signal change in the 3 a priori regions of interest (ROIs): medial frontal/cingulate gyrus and right and left dorsolateral prefrontal cortex (all ps ≤ 0.001).
experience during early abstinence. This neurobehavioral profile warrants further investigation as a potential biomarker of relapse risk.

This research was supported by NIH grants P50 CA143187 and R01 DA026849 to C.L. M.F. is supported by NIH training grant T32 GM008076.

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POS3-135

RESTING STATE CONNECTIVITY: RELATIONSHIPS BETWEEN DEFAULT MODE NETWORK, ADDICTION-RELATED BRAIN REGIONS, AND ABSTINENCE INDUCED CRAVING

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Introduction: Multiple studies have highlighted brain regions that are associated with cue elicited craving in addicted smokers, but relatively few have evaluated associations between self-reported craving and resting state functional connectivity (rsFC). Recent research has suggested that rsFC may afford several methodological advantages to investigate neurobiological substrates of the maintenance of smoking behavior. Notably, associations between withdrawal symptoms and functional connectivity of the “default mode network” (DMN) could provide a clearer understanding of drug craving and/or ruminative thoughts about use. The present study examined rsFC between the DMN and other networks including addiction-related brain regions. In addition to evaluating connectivity between these networks, dual regression was employed to investigate associations between the DMN and other voxels in the brain that are related to abstinence induced craving.

Method: Data was obtained from 50 right-handed, abstinent adult smokers. Individual resting state data was subjected to serial independent component analysis (ICA) using FSL MELODIC. Resulting components were visually inspected to identify the DMN as well as networks containing regions associated with addiction (e.g., limbic and prefrontal regions). Self-reported craving was assessed prior to the beginning of the scanning protocol. Dual regression was used to extract component network time courses and participant-specific spatial maps corresponding to the DMN were probed in voxel-wise linear model contrasts using FSL software. The present study investigated associations between self-reported craving and resting state functional connectivity between the DMN and other voxels in the brain that are related to abstinence induced craving.

Results: Preliminary results demonstrated significant correlations between DMN and addiction-related networks. Coupling between the DMN and networks/regions related to reward processing was also associated with self-reported craving.

Conclusions: Investigation of rsFC in the DMN and networks associated with addiction has the potential to provide considerable insight into systems level influence of intrinsic craving during abstinence. These results are important to gain a better understanding of intrinsic craving that likely relates to the experience of a quitting smoker.

Funding: R03 DA029675.

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POS3-136

SEVERITY OF MENOPAUSAL SYMPTOMS AND NICOTINE DEPENDENCE AMONG POSTMENOPAUSAL WOMEN SMOKERS

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Cigarette smoking has antiestrogenic properties, which may worsen the symptoms and health risks associated with menopause. In the present study, we hypothesized that menopausal symptoms would improve with smoking abstinence. Postmenopausal smokers (N = 104) were assessed with the Kupperman Menopausal Index of symptoms and smoking-related indices of nicotine dependence, cotinine level, daily smoking rate, and length of time smoking. Participants were 67% Caucasian and 33% African-American. Mean age was 52.3(7.8) years, mean follicle stimulating hormone (FSH) level was 42.8(26.7) ppm, mean body mass index (BMI) was 27.4(6.2) kg/m², mean daily smoking rate was 20.3(11.5) cigarettes/day, mean Fagerström Test for Nicotine Dependence (FTND) was 6.4(2.1), and mean carbon monoxide was 23.8(13.0) ppm. Mean baseline Kupperman Index score was 19.7(12.5), with 11% of women reporting severe symptoms of menopause, 27.9% moderate, and 19.2% mild. The majority of participants (56.5%) were on hormone replacement therapy (HRT).

Linear hierarchical regression analysis with Kupperman scores as the dependent variable and predictors of age, race, BMI, FSH, and HRT entered on the first step, and daily smoking rate, number of years smoking, FTND, and cotinine level entered on the second step was significant for the second step of the model (p=.006), R2 change=.18, p=.003). FTND (β=.48, p=.001) and cotinine levels (β=.27, p=.02) significantly predicted Kupperman scores. Among participants (n=96) who achieved abstinence for 2 weeks in a cessation intervention, FTND explained less variance in Kupperman scores (β=.34, p=.05), cotinine was no longer significant, and BMI (β=.34, p=.02) and age (β=.28, p=.05) showed greater influence on Kupperman scores. At 3 months postcessation, FSH became the sole predictor (β=.61, p=.04). The shift over time in which menopausal symptoms become less influenced by smoking-related variables through cessation and more influenced by factors such as BMI and FSH levels will be important in informing cessation interventions with this population of smokers.

Funding: National Institute of Aging.

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POS3-137

ANTECEDENTS AND CONSEQUENCES OF SMOKING IN ATTENTION-DEFICIT/HYPERACTIVITY DISORDER USING ECOLOGICAL MOMENTARY ASSESSMENT

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Attention-Deficit/Hyperactivity Disorder (ADHD) commonly persists into adulthood and is an independent risk factor for cigarette smoking. Smokers with ADHD differ from non-ADHD smokers in many respects (e.g., higher prevalence rates of smoking). Relatively little is known, however, about what places those with ADHD at higher risk for smoking. One area proposes that those with ADHD smoke to improve attention and regulate negative affect. Existing research on smoking following discernible patterns in certain contexts is limited by retrospective reporting methods. The overall goal of this study was to examine the impact of smoking antecedents and consequences of smoking on ADHD symptoms and mood among cigarette smokers with ADHD (n = 17) in the context of everyday life by utilizing ecological momentary assessment (EMA) methods over a seven day observation period. Generalized estimating equations contrasted 1,232 smoking and 622 nonsmoking occasions. ADHD smokers were more likely to smoke when urge to smoke (p < .0001), negative affect (p = .0009), distress (p = .01), boredom (p = .004), stress (p = .002), worry (p = .008), and restlessness (p = .0002) were elevated. In addition, given that ADHD smokers were more likely to smoke in environments in which they experienced nervousness (p = .003) and frustration (p = .03), we conducted a post-hoc analysis involving only these situations. Accordingly, hyperactive-impulsive ADHD symptoms were more likely to be elevated and precede a smoking episode in situations that were frustrating (p = .01). Pre- and post-smoking ratings were also compared to assess the consequences of smoking. Participants reported a statistically significant reduction in urge to smoke (p < .001), negative affect (p = .027), stress (p = .002), hunger (p = .021), inattentive ADHD symptoms (p = .022), and hyperactive-impulsive ADHD symptoms (p = .004). These findings have implications for the role of affect regulation and ADHD symptoms in smoking maintenance among those diagnosed with ADHD, in addition to the role of EMA as a clinical assessment tool.

This research was supported by Grant R03DA029694 (J.T. Mitchell).

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**POS3-139**

A PILOT OF SCREENING, BRIEF INTERVENTION, AND REFERRAL FOR TREATMENT (SBIRBT) IN NON-TREATMENT SEEKING SMOKERS WITH HIV


Introduction: PLHIV have higher rates of smoking and lower motivation to quit smoking; thus to impact smoking rates, cessation interventions need to be acceptable to a wider range of PLHIV smokers as well as feasible to implement in a busy clinical setting. The purpose of this study was to evaluate the acceptability, feasibility, and effects of a Screening, Brief Intervention, and Referral for Treatment (SBIRBT) model in an HIV/AIDS clinic among a sample of PLHIV. Methods: PLHIV smokers (N = 40) were randomized at baseline, irrespective of their self-reported discrete smoking cessation motivation status, to receive either 8-weeks of combination nicotine replacement therapy (NRT) in conjunction with brief counseling (SBIRBT framework) (n = 23) or usual care (n = 17). Smoking outcome measures included cigarettes smoked per day, nicotine dependence, smoking urge, and smoking withdrawal symptoms. Results: The SBIRBT intervention appeared to be acceptable and feasible, and produced medium to large reductions in cigarettes smoked per day, nicotine dependence, smoking urge, and smoking withdrawal symptoms. For example, craving and nicotine withdrawal symptoms, even for smokers not ready to quit within 6 months. Conclusions: Findings provide preliminary support for the integration of an SBIRBT model in an HIV/AIDS clinic setting to screen and provide active treatment to all smokers, regardless of readiness to quit smoking. Given the high prevalence and incredible health burden of continued smoking in this population, identifying brief and effective interventions that are easily translated into clinical practice represents an enormous challenge that if met, will yield significant improvements to overall patient outcomes.

Dr. Cropsey was supported by grant R01CA141663 and the funding from this study was provided by the Centers for AIDS Research (CFAR). Dr. Hendricks was supported by grant R34DA019396. Dr. Carpenter was supported by grant K23DA020482.

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**POS3-140**

ARTERIAL PHARMACOKINETICS OF ORALLY INHALED NICOTINE FROM A NOVEL NICOTINE INHALER DEVICE

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AIM: To determine the pharmacokinetic (PK) profile of a single dose of nicotine using a novel nicotine inhaler device. BACKGROUND: Medicinal nicotine is available in a variety of presentations, although systemic nicotine is generally delivered more slowly and via a different route of administration compared to a cigarette. Improvements in smoking cessation rates achieved by such products are modest. METHODS: This Phase I, single-blind study determined the tolerability and PK of inhalated nicotine via a novel nicotine inhaler device at three doses of nicotine: 0.028%, 0.056% and 0.084% w/v (low, medium and high). Corresponding nicotine doses were 0.22, 0.44 and 0.67 mg. Subjects (n=18) were randomized to two of three dose levels on a single study day (1 puff/15 s). Radial arterial blood sampling was performed at various intervals up to 300 min post inhalation to investigate the rapidity of nicotine delivery to the systemic circulation. Craving was assessed using a visual analog scale (VAS) and the Brief Questionnaire of Urges Desire to Smoke and Relief from Negative Affect scores and average pain did not significantly change from prequit to postquit (prequit mean (M) = 72.8, postquit M = 77.6; Wald = 1.37, p = .24), nor did average pain (prequit M = 52.1, postquit M = 54.5, Wald = .71, p = .40). At postquit, significant (p < .05) positive correlations were found between Minnesota Nicotine Withdrawal Scale scores and maximum (r = .51) and average pain (r = .57), and Questionnaire of Smoking Urges Desire to Smoke and Relief from Negative Affect scores and average pain (r = .45 and r = .47). Center for Epidemiological Studies – Depression symptoms did not significantly correlate with maximum or average pain at prequit or postquit. Pain sensitivity did not predict 2-month smoking abstinence outcomes. Results indicate that laboratory-induced pain sensitivity did not change during acute smoking abstinence but greater nicotine withdrawal and tobacco craving were associated with increased pain sensitivity. Future research can study the effect of abstinence on naturalistic indices of pain sensitivity and moderators of change in pain sensitivity during abstinence.

Funding: P50 DA13334, K05 AA014715, T32 DA007238.

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**POS3-141**

EFFECT OF SMOKING ABSTINENCE ON PAIN SENSITIVITY

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Nicotine produces hypoalgesia, and higher pain in response to the cold pressor test (CPT) is associated with increased urge to smoke and greater risk for smoking relapse. Increased pain sensitivity during smoking abstinence may serve as a potential mechanism underlying the association of pain and smoking relapse, yet how pain sensitivity changes during abstinence has not been explored. This is an analysis of secondary data among a subset of treatment-seeking smokers who received behavioral counseling and contingency management to aid cessation but did not receive pharmacotherapy. Of the 33 participants who completed the CPT at prequit (i.e., 5–7 days before quitting) and 4 days postquit, 27 were biochemically-confirmed abstinent (carbon monoxide < 10ppm) for 4 consecutive postquit days and were included in this analysis. During the CPT, participants submerged their dominant hand in 3–4°C ice water for 90 seconds and rated their pain (scale = 0 – 100) every 15 seconds. Indices of pain sensitivity included maximum pain and average pain ratings. Generalized estimating equations revealed that maximum pain did not significantly change from prequit to postquit (prequit mean (M) = 72.8, postquit M = 77.6; Wald = 1.37, p = .24), nor did average pain (prequit M = 52.1, postquit M = 54.5, Wald = .71, p = .40). At postquit, significant (p < .05) positive correlations were found between Minnesota Nicotine Withdrawal Scale scores and maximum (r = .51) and average pain (r = .57), and Questionnaire of Smoking Urges Desire to Smoke and Relief from Negative Affect scores and average pain (r = .45 and r = .47).

Funding: Kind Consumer Ltd.

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**POS3-142**

THE ADVANTAGES OF MULTIPLE IMPUTATION FOR ANALYZING RANDOMIZED CLINICAL TRIALS IN SMOKING INTERVENTION RESEARCH

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The traditional approach to managing missing outcome data in smoking intervention research is to either report results from responders only or to apply an ‘intent-to-treat’ model for which missing data is presumed to be evidence of smoking. Both approaches have severe statistical and interpretive limitations. Developments in managing missing data using multiple imputation (MI) now provide opportunities to analyze data from randomized clinical trials with missing data across multiple assessments. In this study, we applied various MI approaches to data from Brandon et al. (2012) assessing the efficacy of ‘Forever Free Baby & Me’ booklets versus a usual care condition for pregnant women who had self-quitted due to the pregnancy. All data from 504 women were acquired via mailed surveys. Demographic, smoking history, partner/family, anxiety/depression, and pregnancy data were acquired at baseline (while pregnant). Smoking behavior, partner smoking behavior, partner support ratings, and anxiety/depression data were acquired at 1, 8, & 12 months post due date. About 10% of outcome data (7-day point prevalence) were missing with many patterns of missing data. Primary cues, suggesting potential to confer additional benefits in smoking cessation through a more holistic approach to craving reduction.

Funding: Kind Consumer Ltd.
analyses were performed using generalized estimating equations (GEE) to assess treatment effects on smoking status post-delivery. Results from responders only and ‘intention-to-treat’ approaches were compared with results from different MI approaches. Unlike analyses based on responders only or ‘intention-to-treat’, MI approaches revealed treatment effects and moderators of treatment effects. For example, one approach following a missing at random assumption, a Markov Chain Monte Carlo method, revealed a significant interaction of assessment, treatment condition, and income level (less vs. greater than $30K/Year; P<.03). Follow-up analyses showed treatment effects at 8 and 12 months for lower income women, but not for higher income women. An analysis further incorporating a non-ignorable missingness influence (i.e., missing suggests smoking using a small effect size) produced a similar, significant 3-way interaction. These results highlight the value of MI for managing missing outcome data in intervention research.

Funding: National Cancer Institute grant R01 CA83706.

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POS3-143
TEXT MESSAGE INTERVENTIONS FOR SMOKING CESSATION: A REVIEW
Grace Kong, Ph.D.*, Daniel Ellis, B.A., Deepa Camenga, M.D., and Suchitra Krishnan-Sarin, Ph.D., Yale University School of Medicine

Smoking cessation interventions delivered via text messaging on mobile phones may enhance motivations to quit smoking. The goal of this narrative review is to describe the characteristics of text message-based smoking cessation interventions. Studies that used primarily text messaging to deliver smoking cessation intervention and published in English in a peer reviewed journal were identified through searches in Medline, PsychINFO and Scopus. All articles were coded by two independent raters to determine eligibility and extract data on sample characteristics and intervention-related themes. Fifteen studies described nine text message interventions for smoking cessation. Four interventions targeted adults, four adolescents/young adults, and one pregnant women. All interventions used text messages during the active quit phase, six during the preparation phase and five during the maintenance phase. The numbers of text message sent and duration of the phases varied. All used motivational messages, six behavioral change techniques, and eight individually tailored messages. Six interventions offered other smoking cessation tools in conjunction with the text message intervention. Three interventions resulted in improved smoking abstinence rates in the intervention condition compared to the control. Text messaging-based interventions utilize a variety of techniques and target a range of populations. However, more rigorous studies are needed to determine specific components of the text message interventions that can establish long-term efficacy.

Supported by the National Institute on Drug Abuse at the National Institute of Health. Grant # P50 DA09421, R01 DA02624.

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POS3-144
INITIAL EFFECTS OF BUPROPION ON NEGATIVE AFFECT AND INFORMATION PROCESSING DURING ABSTINENCE
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Bupropion increases ability to abstain from smoking during a quit attempt, likely due to partial relief of withdrawal. We examined whether bupropion would attenuate withdrawal and the decline in cognitive performance due to abstinence on the first day of a quit attempt. Subjects were 22 adults who smoked at least 10 cigs/day, met DSM-IV dependence criteria, and intended to quit permanently within the next 3 months. All were recruited for a within-subjects cross-over test of the effects of bupropion versus placebo on ability to abstain during each of two separate short-term attempts to quit smoking. Withdrawal (via MNWS), negative affect (NA, via the Mood Form), and a working memory task (N-back) were assessed on 3 occasions: after ad lib smoking baseline and after abstaining overnight (CO<10 ppm) while on bupropion (150 mg b.i.d.) and while on placebo, each during the first day of a 5-day quit attempt period. (Those unable to abstain prior to this testing during one or both quit periods were excluded from analyses.) The medication conditions each followed a week of dose run-up and were administered double-blind and in counter-balanced order. Compared to placebo, bupropion attenuated the increase in NA, F(1,21)=6.63, p<.02, but not overall withdrawal, F(1,21)=2.75, p=.11. Bupropion vs. placebo tended to improve processing efficiency (reduced reaction time) for working memory performance, F(1,21)=2.58, p=.07 (difference between 2-back vs 0-back). In exploratory GEE analyses combining both medication conditions, we found that greater attenuation of the NA and withdrawal increases on quit day 1 (Wald X2=21.80 and 12.08, resp., both p<.001), and a trend toward faster reaction time (Wald X2=5.19, p=.07), were related to more subsequent days of abstinence during each quit period. These preliminary results suggest that bupropion may attenuate decrements in smoking abstinence on the first day of a quit attempt, and that these effects may predict ability to stay quit.

Supported by NIH Grant P50 CA143187.

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POS3-145
OPTIMIZING CARBON MONOXIDE CRITERIA TO CONFIRM 24-HR ABSTINENCE
K.A. Perkins, J.L. Karelitz, and N.C. Jao, Department of Psychiatry, University of Pittsburgh, Pittsburgh PA

Smoking cessation is often verified biochemically by CO levels below 9 ppm, but some who have smoked within 24 hrs may be misclassified as abstinence by this criterion. Thus, a more stringent CO cutoff may improve the accuracy of cessation verification. Adult dependent male and female smokers (N=261) prospectively recorded each cigarette smoked and provided CO on 5 consecutive days during each of two separate week-long attempts to quit smoking. Participants were recruited for studies involving cross-over tests of the effects of medication (nicotine patch or varenicline) versus placebo on ability to initiate 24-hr abstinence. All had either a high or low interest in permanently quitting smoking within 3 months and were randomized to the presence or absence of daily ($12) monetary reinforcement of abstinence. Total accuracy of sensitivity to detect smoking (83%) plus specificity to verify abstinence (87%) was optimal at a CO criterion for abstinence below 5 ppm, compared to below 9 ppm (sensitivity of 60%, specificity of 97%). Overall CO detection of sensitivity and specificity was higher in those with high vs. low quit interest, but monetary reinforcement of abstinence made no difference. In sum, results indicate a CO criterion about half that typically used in clinical research may optimally validate 24-hr cessation and reduce misclassification of smokers as "abstinent."

Supported by NIH Grants P50 CA143187 and DA031218.

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POS3-146
COLLEGE HEALTH PROVIDERS’ TOBACCO CESSATION COUNSELING PRACTICES
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Background. The USPHS clinical practice guidelines, Treating Tobacco Use and Dependence, recommend screening for tobacco use at every visit. For tobacco users, the guidelines advise the “5A’s” (ASK about tobacco use, ADVISE to quit, ASSESS readiness to quit, ASSIST in quitting, ARRANGE follow-up). College health centers provide the majority of students’ healthcare needs, placing them in a unique position to target tobacco use. Goals of this study were to assess college health providers’ practice of and barriers to the 5A’s. Methods. Seventy-one providers from 6 N.C. colleges completed a self-administered
survey (43% response rate) as part of an intervention to increase adherence to the USPHS Guidelines. Respondents were female (91%), nurses (57%), NPs/ PAs (26%) and MDs (17%). Results. Few respondents had received training on treating tobacco use, where, different activities were expected to be adequately familiar with the USPHS Guidelines. Asking patients about tobacco use was common (72%), but only half (58%) reported advising patients to quit or assessing readiness to quit (51%). Few reported asking patients by brief counseling (30%) or referral to a quitter (28%). Barriers to assisting patients in quitting included: lack of time, parents being more involved in quitting than patients, and patients’ lack of motivation to quit. In multivariable analysis nurses were less likely than physicians to advise patients to quit (AOR=0.07, CI=0.01-0.83), but more likely to assist with quitting (including brief counseling, motivational interviewing, referral to quitter; t=2.18, p<.05). Those who reported patients’ other problems were more immediate (t=3.14, p<.05) and those less experienced with tobacco intervention (t=2.34, p<.05) were less likely to assist. Conclusion. Most providers ask about tobacco use, but only half advise patients to quit or assess willingness to quit; even fewer assist in quit attempts. Lack of assistance was associated with believing patients had more immediate concerns and lack of experience intervening. Future work should focus on training providers to use the 5A’s and encouraging providers to connect patients’ tobacco use to their chief complaint.

Research reported in this abstract was supported by the National Cancer Institute of the National Institutes of Health under Award Number R21CA161564. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

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**POS5-147**

**BRAIN MECHANISMS ASSOCIATED WITH REGULAR SMOKING AND WITH RISK FOR REGULAR SMOKING: A COTWIN-CONTROL STUDY IN MONOZYGOTIC TWIN PAIRS**

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**POS5-148**

**THE ABILITY OF PLASMA COTININE TO PREDICT TOBACCO EXPOSURE IS ALTERED BY DIFFERENCES IN CYP2A6: THE INFLUENCE OF GENETICS AND SEX**

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Cotinine, the major metabolite of nicotine, is routinely used as a biomarker of tobacco exposure. Cotinine levels are particularly useful as cigarettes per day is a weak measure of tobacco exposure, because of variability in how cigarettes are smoked. It has been assumed that variability in the relationship between cotinine levels and tobacco exposure is random among smokers, but some evidence suggests this relationship may differ systematically between different groups of smokers. Cotinine is enzymatically formed and metabolized by CYP2A6. Individuals with slower CYP2A6 activity, for example those with CYP2A6 gene variants, males, and African Americans, have higher cotinine levels than predicted by their cigarettes per day. We investigated the mechanism and the impact of variable CYP2A6 activity on the relationship between cotinine and tobacco/carcinogen exposure. Methods. Caucasian nonsmokers (n=181) received an infusion of deuterium-labeled nicotine and cotinine to study the effect of CYP2A6 genotype and sex on cotinine formation (fractional conversion from nicotine) and removal (cotinine clearance) pharmacokinetics. In a separate study of Alaska Native smokers (n=163) we evaluated the ability of plasma cotinine to predict tobacco and carcinogen exposure. Results. CYP2A6 genotype and sex (estrogen induces CYP2A6) influenced cotinine clearance to a greater extent than cotinine formation. The ratio of cotinine formation to clearance was 1.31 and 1.12 in CYP2A6 reduced and normal metabolizers (P=0.01), respectively, and 1.39 and 1.12 in males and females (P=0.001), respectively. Compared to those with normal activity, the cotinine level associated with a particular level of nicotine intake was higher in those with slower CYP2A6 activity, resulting in a 25% or greater overestimation of nicotine and carcinogen intake. Conclusion. The relationship between the biomarker cotinine and tobacco and carcinogen exposure varies substantially between those with variable CYP2A6 activity including individuals with different CYP2A6 genotypes within a certain race, between racial groups with distinct prevalences of CYP2A6 reduced activity genotypes, and between the sexes.

Funding: NIDA and NCI (UL1 RR024131, NARCH III U26IHS300012, UHSN261200700462P, CA114609, DA02227, DA022353, DA020830, DA012353 and DA11170) CIHR (MOP84671 and TMH 109787).

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**POS5-149**

**SMOKING CESSATION COUNSELING: PHYSICIAN’S USE OF THE “5R’S” IN USUAL PRACTICE**

Sofie L. Champassak, Delwyn Catley*, Sarah Finocchiaro-Kessler, Maghen Farris, Maniza Ehtesham, and Kathy Goggin

The U.S. Public Health Service Clinical Practice Guideline recommends that physicians provide tobacco cessation interventions to their patients at every visit. While many studies have examined the extent to which physicians implement the
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POS3-150
RELATIONS OF PSYCHOMOTOR RESTLESSNESS AND AGITATION TO SMOKING CHARACTERISTICS IN A COMMUNITY SAMPLE OF CIGARETTE SMOKERS

Jordan Wong, B.A., and Adam M. Leventhal, Ph.D., University of Southern California

Psychomotor restlessness and agitation (PMA; unintentional motor activity stemming from mental tension manifested as fidgeting, pacing, and hand-wringing) is present in several psychiatric disorders and is a putative endophenotype of depression. Extant data illustrates a relation between clinically-significant PMA and smoking in psychiatric patients. Yet, little is known about: (a) reasons for PMA-smoking relations, and (b) the role of subclinical PMA in smoking in non-psychiatric patients. This study examined cross-sectional associations of PMA-smoking relations, and (b) the role of subclinical PMA in smoking in non-psychiatric patients. Yet, little is known about: (a) reasons for PMA-smoking relations in a non-psychiatric sample, this study illustrates that positive affect enhancement smoking expectancies. As the first investigation attempts, degree of negative affect reduction smoking expectancies, and degree with retrospective reports of level of withdrawal symptoms during previous quit severity, both trait PMA and recent PMA symptoms were positively associated with recent PMA were administered along with measures of smoking characteristics. These findings shed light upon smoking patterns associated with PMA, elucidate possible motivations underlying smoking in PMA (i.e., negative affect reduction, withdrawal relief), and may inform smoking intervention on approaches for individuals with elevated PMA.

Support: This research was supported by National Institute on Drug Abuse Grants R01-DA026831 and K08-DA025041.

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POS3-151
A SMOKING INTERVENTION AMONG PEOPLE WITH PSYCHOTIC DISORDERS—RESULTS FROM A RCT

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People with severe mental disorders (SMD) have much higher rates of smoking and other cancer risk factors compared to the general community. To our knowledge, this is the first RCT to evaluate the effectiveness of a multi-component intervention addressing smoking as well as multiple health behaviours among people with a SMD. The Healthy Lifestyles Project was a randomized control trial aimed at addressing multiple behavioural health risk factors. Participants diagnosed with psychotic disorders residing in the community who were smoking 15 or more cigarettes per day (CPD) were randomly assigned to either a multi-component face-to-face intervention addressing multiple health risk behaviours or to a largely telephone delivered intervention addressing smoking only. There were 8 weekly, 3 fortnightly and 6 monthly sessions scheduled, of approximately 60 minutes duration in the face-to-face condition and 10 minutes in the telephone condition. Nicotine replacement therapy was provided. At baseline, participants (N=235, Mean age=41.6 years, 59% male) were smoking on average 28.6 (SD=15.3) CPD. CO verified point prevalence abstinence (last 7 days) was 16% (n=13) at 15 weeks and 13% (n=9) at 12-months for the face-to-face condition and 17% (n=15) and 13% (n=9) respectively for the telephone condition. At 15 weeks and 12-months, participants still smoking reduced their mean (SD) CPD for both the face-to-face to 10.8 (14.6) and 6.5 (12.1) and telephone interventions 11.4 (12.1) and 6.0 (11.4), p<.001 for both time points. No significant differences were found in smoking outcome between the face-to-face and a largely telephone-delivered intervention. Face-to-face (focused on multiple health risk behaviours) and telephone-delivered interventions (focused on smoking) are feasible and effective among people with severe mental disorders.

This study was conducted while A. Baker was at the University of Newcastle. It was funded by the Australian National Health and Medical Research Council.

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POS3-152
RANDOMIZED TRIAL OF BRIEF ALCOHOL COUNSELING FOR HAZARDOUS DRINKING SMOKERS CALLING A TOBACCO QUITLINE

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Tobacco quittines are an easily accessible, efficient, and effective means for delivering cessation services. Daily smokers are at heightened risk for hazardous drinking, alcohol abuse and dependence, and poorer tobacco quit outcomes have been well-documented among heavy drinkers. In light of the evidence that brief alcohol interventions can significantly reduce alcohol consumption, quittines represent a unique opportunity to improve smoking abstinence by targeting alcohol reduction. We conducted a randomized clinical trial comparing: (1) practical counseling plus smoking cessation print materials added to standard care (PC + SC condition) to (2) alcohol intervention counseling + alcohol-focused print materials added to standard care (AI + SC condition) with hazardous drinking smokers (N=1,948) who called the NY State Smokers’ Quitline (NYSSQL) for assistance in quitting smoking. Cessation coaches at the NYSSQL were trained to provide both the alcohol intervention and the practical counseling. All counseling sessions were recorded, and approximately 20% of the (n=400) audio recordings were evaluated by 7 blind tape raters trained on a fidelity manual of rating items (ICCs ranging=.81-.99). We found excellent discrimination between the 2 conditions. For the main smoking cessation outcome of 7-day point prevalence abstinence at the 7-month follow-up survey, a statistically significant effect favoring the AI + SC group (26.2%) as compared with the PC + SC group (20.4%) was found [OR = 1.39; 95% CI = 1.03 to 1.87; p<.05]. This finding suggests that adding brief alcohol counseling to a quittine’s standard smoking cessation treatment promotes increased cessation rates for hazardous drinking smokers. If replicated, alcohol interventions for use by quitline coaches could be disseminated to quittines across the country. This would provide a low-cost method for increasing the effectiveness of a moderate-intensity intervention for smoking cessation that has the potential to reach millions of smokers.

This research was supported in part by National Cancer Institute Grant R01-CA140256 and the NYS Department of Health.

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POS3-153
EARLY LAPSES IN A CESATION ATTEMPT: LAPSE CONTEXTS, CESATION SUCCESS AND PREDICTORS OF EARLY LAPSE

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Understanding the process of relapse is critical to developing effective smoking cessation treatment and preventing the personal and societal costs of smoking. The goal of this research is to extend our understanding of early lapse contexts (within 8 weeks of quitting) by using more comprehensive assessments of context, a contemporary sample, and sophisticated analytic techniques. Participants from a randomized controlled smoking cessation trial who quit smoking for at least 24 hours (N=1034) and then subsequently lapsed (N=551) completed baseline assessments of demographics and tobacco dependence, a daily smoking calendar to determine latency to lapse and relapse (7 consecutive days of smoking), and an assessment of initial lapse context (affect, location, activity, interpersonal, cigarette availability). Latent class analysis was used to analyze the six context constructs; logistic regression and Cox regression were used to relate context to cessation outcomes. Early lapsing was related to worse long-term cessation outcome relative to those who were continuously abstinent for the first 8 weeks. Cigarettes were easily available in almost 75% of lapses. Latent class analysis revealed five distinct initial lapse context classes: (1) Talking, With Friends, Angry; (2) Social; (3) Alone; (4) With Spouse, Angry; and (5) With Smoking Spouse. Initial lapse contexts and lapse context classes were differentially related to cessation outcome and to baseline predictors, including age, gender, and tobacco dependence factors. Early sustained abstinence is key to long-term cessation success. Certain lapse contextual factors can be predicted prior to a cessation attempt and such information could be used to target cessation treatment to address initial lapse risk factors.

This research was conducted under a research agreement with GlaxoSmithKline (GSK).

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POS3-154
THE EFFECT OF COMT VAL158MET GENOTYPE ON COGNITIVE DYSFUNCTION PRODUCED BY SMOKING ABSTINENCE DIFFERS IN SCHIZOPHRENIA VERSUS CONTROLS

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Background: Polymorphisms in the catechol-O-methyltransferase (COMT) gene have been linked with cognitive performance and tobacco dependence vulnerability and relapse. Cognitive dysfunction and tobacco addiction are both associated with a diagnosis of schizophrenia. Moreover, smokers with schizophrenia suffer more severe cognitive dysfunction during smoking abstinence and cognitive deficits are associated with smoking cessation failure. This study examined the effect of the COMT genotype on the cognitive dysfunction produced by smoking abstinence in schizophrenia and control smokers. Methods: Smokers with schizophrenia (n=27) and control smokers (n=28) enrolled in a study to examine the effects of cigarette smoking and the nicotinic acetylcholine receptor antagonist mecamylamine hydrochloride on cognitive performance were genotyped for the COMT Val158Met polymorphism. Neuropsychological assessments were performed at smoking baseline, after overnight abstinence and after smoking reinstatement. Results: Cognitive data collected in the placebo week showed that on a diagnosis level, overnight abstinence induced a deficit in visuospatial working memory (VSWM) in smokers with schizophrenia but not healthy controls [F(2,49)=4.1, p=0.048]. There was a significant effect of COMT genotype [F(2,49)=3.2, p=0.050] and a genotype x diagnosis interaction [F(2,49)=3.42, p=0.041] on the impairment in VSWM produced by smoking abstinence. Both control and schizophrenia smokers with a Val/Val genotype (n=11 and n=13) experienced greater abstinence-induced VSWM impairment than their Met/Met counterparts (n=7 and n=5). Similar to the Val/Val group, Val/Met heterozygotes with schizophrenia (n=9) also exhibited VSWM deficits during abstinence; control heterozygotes (n=10) did not. Discussion: These data suggest that the cognitive impairments induced by smoking abstinence are influenced by COMT genotype and that this effect differs by psychiatric diagnosis. Understanding the genetic underpinnings of cognitive dysfunction in schizophrenia could guide the development of smoking cessation medications and cognitive enhancers for this population of difficult to treat tobacco smokers.

This work was conducted at Yale University, New Haven, CT, USA. It was funded by grants R01-DA-14038, R01-DA-13672 and K02-DA-16611 from the National Institute on Drug Abuse (to TPG), and a National Alliance for Research of Schizophrenia and Depression Young Investigator Award (to TPG), and the Chair in Addiction Psychiatry at the University of Toronto (TPG).

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more likely to be current users than those who believe it not at all acceptable. Age of first use questions were analyzed to uncover students who previously never smoked a cigarette or the waterpipe (n=736) and went on to experiment with the waterpipe (n=85). All 85 students went on to smoke a cigarette, 36.5% went on to become less than daily smokers, and 10.6% daily smokers. Among students who did not experiment with the waterpipe (n=651), only 5.1% went on to smoke a cigarette, 0.8% became less than daily smokers and none daily smokers. In addition to the community college being a high risk environment for waterpipe use, concerns about waterpipe use leading to nicotine dependence appear warranted. This study was supported by a Huldia Crooks Dissertation Award, Loma Linda University.

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POS3-157 MENTHOL CIGARETTE AND MARIJUANA USE AMONG ADOLESCENTS
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Despite the association between cigarette smoking and marijuana use among adolescents, little is known about the relationship between menthol cigarette smoking and marijuana use. Menthol cigarette smoking among adolescents has increased in recent years and it is associated with greater addictive potential and adverse health outcomes. Thus, we examined the relationship between menthol cigarette and marijuana use among high-school aged adolescents using two studies. Study 1 examined a school-wide survey data in a high school in CT (n=896; 18% current smokers) and Study 2 examined baseline data of high-school aged, treatment-seeking, daily cigarette smokers (n=157). In Study 1, 41% of current smokers reported primarily smoking menthol cigarettes and 32% of all high school students reported past 30-day marijuana use. In Study 2, among daily smokers, 62% reported menthol cigarette use, and 69% reported past 30-day marijuana use. In Study 1, multivariate-adjusted logistic regression models indicated that compared to non-menthol cigarette smoking, menthol cigarette smoking among current smokers was associated with lifetime marijuana use (OR=4.45; 95% CI: 1.47-13.46) but not with past 30-day use. In Study 2, among daily smokers, compared to non-menthol cigarette smoking, menthol cigarette smoking was associated with past 30-day marijuana use (OR=2.34; 95% CI: 1.13-4.85). The significant association between menthol cigarette and marijuana smoking among adolescents underscores the need to conduct research to understand factors that promote co-occurring use of these substances.

This work was supported by the National Institute on Drug Abuse at the National Institutes of Health, grant #150 DA09421, R01 DA0264.

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POS3-158 PROVIDER-DELIVERED TOBACCO DEPENDENCE TREATMENT TO MEDICAID SMOKERS: RESULTS OF A FEASIBILITY TRIAL
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Background: The smoking prevalence is 48% among Medicaid enrollees in the Appalachian region of Ohio, which is more than twice the state estimate. The objective of this project was to test the feasibility of a physician office-delivered smoking cessation intervention targeting smokers enrolled in Medicaid in Ohio Appalachia. Methods: A group-randomized trial was used to pilot test the intervention in 8 physician offices (4 intervention and 4 control). Intervention physicians were given a 2-hour educational session on how to incorporate brief counseling into practice. Control physicians were given the clinician’s version of the Clinical Practice Guideline and information about the Ohio Outline. The goal was to recruit 30 Medicaid smokers from each office as they came in for an appointment. Intervention clinic smokers were offered 12 weeks of nurse-delivered telephone counseling. Evaluation included self-report measures of abstinence at week 12.

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cessation counseling. Control clinic smokers were given information about the Ohio QuitLine. The outcomes assessed at 3 months included abstinence, 24-hour quit attempts and use of pharmacotherapy. Self-reported quitters were asked to provide a saliva sample by mail for cotinine analysis. Following convention, those who did not complete the 3-month assessment were counted as smokers who did not use pharmacotherapy or attempt to quit. Results: A total of 214 Medicaid smokers were enrolled (99 intervention, 115 control). In the intervention arm, 58% of participants enrolled in telephone counseling. At 3 months, 58% of intervention and 64% of control participants had at least one quit attempt, 34% of intervention and 46% of control participants self-reported using pharmacotherapy, and 24% of intervention and 16% of control participants self-reported abstinence (all not significantly different). Only 11% in the intervention and 3.5% in the control groups were confirmed quitters (not significantly different). Conclusion: It is feasible to implement a tobacco dependence treatment program in Medicaid offices. Smokers were not necessarily interested in quitting at baseline; however, over half made at least one quit attempt, over one-third used pharmacotherapy and over half enrolled in counseling.

POS3-159
A PILOT TEST OF AN INTERVENTION TARGETING PHYSICIAN DELIVERY OF CESSATION COUNSELING

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Background: Physician delivered advice to quit smoking has been shown to produce an increase in abstinence rates. The objective of this project was to pilot test an intervention designed to increase the prevalence of physician-delivered counseling to quit smoking to Medicaid-enrolled smokers. Methods: A group-randomized trial was used to pilot the intervention in 8 offices (4 intervention, 4 control). Intervention physicians were given a 2-hour interactive educational session on how to incorporate brief counseling into practice. The theoretical framework was the Theory of Planned Behavior, with constructs attitudes, perceived behavioral control and normative beliefs. Control physicians were given the clinician version of the Clinical Practice Guidelines and quitline information.

The goal was to recruit 30 Medicaid smokers from each clinic as they came in for an appointment. One week following recruitment, smokers were called by the study nurse and asked questions about whether the physician offered brief counseling and quit assistance. Physicians were administered a questionnaire at baseline and following completion of recruitment that asked questions about their counseling behavior using the TPB framework. Results: A total of 214 Medicaid smokers were enrolled (99 intervention, 115 control) and 197 completed the one-week follow-up. At one week, 68% of intervention and 58% of control smokers reported being asked about tobacco use, 69% of intervention and 63% of control smokers reporting being advised to quit, and 30% of intervention and 56% of control smokers reported receiving a prescription for pharmacotherapy (p<0.01). Across both groups, at the end of participant recruitment physicians were more likely to report that counseling takes time away from important tasks and less likely to say that it was not out of their control (p<0.05). Conclusion: There was little difference in outcomes between physicians who received the extended intervention versus those who received the brief intervention. Both groups improved their perceived behavioral control following the study. Interestingly, more smokers in control clinics received a prescription for pharmacotherapy.

POS3-160
SMOKING BEHAVIOR AND TOXICANT EXPOSURE AFTER EXPERIMENTALLY SWITCHING FROM FACTORY MADE TO SELF-MADE CIGARETTES

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In the U.S. and abroad there has been a dramatic increase in the use of self-made cigarettes. Most of these smokers formerly smoked factory made (FM) cigarettes and switched to make-your-own (MOY) in response to price increases. The comparative behavior changes and toxicant exposure associated with switching from FM to MOY cigarettes have not been evaluated. In this four-visit study, six FM smokers experimentally switched to exclusively smoking cigarettes they made themselves by using a machine to inject loose tobacco into preformed filtered cigarette tubes (personal machine made [PMMI] – a type of MOY – for 15 days. Participants (4 men, 2 women) reported no previous PMM use. At Visit 1 (V1), their usual FM cigarette was smoked ad lib through the CReSS puff topography instrument; heart rate (HR), carbon monoxide (CO), and blood were taken before and after smoking. They were shown how to make PMMs using a machine, tobacco, and tubes provided by the lab. They then exclusively smoked PMMs for 14 days. At each of the 3 subsequent lab visits (all 4 days apart), they made 5 PMMs and smoked one through CReSS. Physiological and biochemical measures were taken before and after smoking, and a smoking behavior questionnaire was administered. Participants reported to continue smoking an average of 22 cigarettes per day, regardless of cigarette type. They became efficient producers of PMMs as evidenced in the reduced time to make 5 PMMs in the lab (377 sec at V1 to 211 sec at V4). Visual analog scales showed most found it easy and enjoyable to make and smoke PMMs. Compared to the V1 FM cigarette, the PMMs were smoked faster and with more puffs, averaging higher puff volumes and velocities. Participants averaged a slightly higher HR boost (8 bpm) and lower CO boost (5 ppm) with PMMs compared to FMs (4 bpm and 7 ppm, respectively). If given a choice, they would have preferred FMs at V2, but had no preference at V4. Of participants contacted for a 1-month follow-up, none continued smoking PMMs. This preliminary study demonstrated FM smokers can readily adopt PMM preparation and smoking while exposing themselves to toxicant levels similar to those seen after FM smoking.

This research was supported by a grant from the National Cancer Institute at the National Institutes of Health (R01CA138973-01/SR01CA138973-02).

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POS3-161
EXAMINING THE EFFECTS OF SMOKING EXPECTANCY ON NEURAL AND BEHAVIORAL RESPONSES TO REWARD IN NICOTINE-DEPRIVED SMOKERS

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Addiction is characterized by a blunted response to non-drug rewards, particularly when drugs are accessible. Animal studies indicate that there are large individual differences in the extent to which non-drug rewards are devalued when drugs are available and that several clinically relevant aspects of addictive behavior are predicted by this individual variability. We examined whether similar effects are observed in humans. After abstaining from smoking for 12-hrs, 44 smokers performed a monetary feedback task while fMRI data were collected. Prior to the task, all participants were informed that they would not be permitted to smoke during the 2-hr study. Halfway through the task, one group of participants was reminded that they would not be able to smoke during the study (control group), while the other group was told that the initial instructions were mistaken and that they would be able to smoke shortly (expectancy-shift group). Both groups then completed additional runs of the task, after which they were removed from the scanner. Subsequently, the expectancy-shift group was given the chance to earn additional money by delaying smoking. As predicted, the expectancy-shift group exhibited a significantly smaller response to reward in the striatum after being informed that they would be able to smoke, relative to when
smoking was not anticipated. Further, striatal responses to reward were strongly related to the length of time that expectancy-shift participants delayed smoking to earn money after being removed from the scanner. Unexpectedly, participants in the control group also demonstrated a reduction in the striatal response to reward after being reminded that they could not smoke during the study, perhaps because the instructions increased their level of frustration. Taken together, these findings are consistent with the idea that smoking expectancy may dampen sensitivity to non-drug rewards, but suggest that other factors may produce similar effects. Results provide preliminary evidence that variability in the neural responses to reward under high-risk conditions may serve as a sensitive biomarker for vulnerability to relapse in smokers.

Funding for this study was provided by NIDA Grant R03DA029675.

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**POS3-162**

**COMT VAL158MET MODULATES SUBJECTIVE RESPONSES TO INTRAVENOUS NICOTINE AND COGNITIVE PERFORMANCE IN ABSTINENT SMOKERS**

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The COMT Val158Met (rs4680) polymorphism has been studied for many psychiatric phenotypes including nicotine addiction. We examined the influence of the COMT Val158Met on subjective, physiological, and cognitive effects of intravenous (IV) nicotine use in a sample of African American (AAs) (n=56) and European American (EAs) (n=88) smokers. All study participants were given saline followed by 0.5 and 1.0 mg/70 kg doses of nicotine, administered 30 minutes apart following overnight abstinence from smoking. Smokers with the Val/Val genotype, compared with those carrying the Met allele, reported greater subjective drug effects in response to nicotine including the rating of “Feel Drug Strength,” “Feel Bad Effects,” “Feel Anxious,” and Feel “Sedated.” Val/Val genotype was associated with more severe withdrawal symptoms in smokers following overnight abstinence. Women with the COMT Val/Val variation had greater cigarette craving and irritability than men with either Val/Val or Met carrier. Smokers with the Val/Val genotype performed better in the math test. Furthermore, in AA smokers Val/Val genotype was associated with higher blood pressure values compared with those carrying the Met allele. These findings are first to suggest that COMT Val158Met variation may also affect subjective drug effects to nicotine and withdrawal severity. Our findings provide potential mechanisms by which COMT Val158Met variation may influence nicotine dependence and treatment outcomes. Results from this study support the rationale of pharmacologically inhibiting COMT to aid with smoking cessation among Val/Val genotype smokers.

This research was supported by the Veterans Administration Mental Illness Research, Education and Clinical Center and NIH grants R03 DA027474, K12 DA006167 (AH); and R01 DA26890 and R01 DA12849.

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**POS3-163**

**PILOT STUDY OF A MOOD MANAGEMENT INTERVENTION FOR SMOKING CESSATION IN ADULTS WITH BIPOLAR DISORDER**

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Background: Cigarette smoking is 2 to 3 times more prevalent among adults with bipolar disorder than in the general population, and rates of successful quitting are low. Targeted interventions designed to address common barriers to quitting in this group should improve quit rates. This pilot study was the first to examine a targeted mood management intervention for smoking cessation in smokers with bipolar disorder. Its aims were to determine feasibility of study design, intervention efficacy, and participant satisfaction with treatment. Methods: Ten adults with bipolar disorder (mean age=44, SD=13; 70% men) who smoked at least 10 cigarettes per day and were not currently experiencing symptoms of mania or depression were enrolled. All participants received 8 weeks of open-label nicotine patch and 12 weekly, 60-minute individual counseling sessions designed to increase cognitive-behavioral skills in mood management, reduce substance use, and increase medication adherence. Results: Recruitment took place over 11 months. Eligibility criteria were modified several times to enhance recruitment feasibility. Participants rated the intervention as at least moderately helpful (M=3.3 out of 4), and there was excellent retention of participants through end of treatment (90%). Components of the intervention reported to be most helpful were therapist support and standard tobacco intervention strategies. Several participants reported anecdotally that they did not see a connection between smoking and mood, suggesting a potential problem with intervention credibility. Two participants (20%) achieved CO-verified, 4-week prolonged abstinence at end of treatment. Conclusions: Recruitment was challenging, but the vast majority of participants completed the treatment and found the intervention helpful. Standard elements of counseling (vs. targeted elements) were regarded as most helpful. The quit rate was modest but consistent with other studies involving smokers with psychiatric disorders. Given the lack of uniform support for the credibility and helpfulness of the targeted components of this intervention, investigation of alternative approaches is under way.

This study was conducted while the first author was at the University of Cincinnati College of Medicine. The work was supported by a grant from the National Institute on Drug Abuse (#K23DA026517, to JHL), and by the Department of Veterans Affairs.

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**POS3-165**

**ELECTROPHYSIOLOGICAL ASSESSMENT OF CONSUMER ACCEPTABILITY OF ELECTRONIC NICOTINE DELIVERY SYSTEMS (ENDS)**

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Background: Despite drastic increase in awareness and use, scientific evidence is inconclusive on the efficacy of electronic nicotine delivery systems (ENDS), better known as “e-cigarettes.” The aim of this study was to determine the abuse liability potential of ENDS in a sample of smokers using event-related brain potentials (ERPs). ERPs provide a convenient and objective index of regional cortical arousal that can be associated with varying levels of nicotine administration. The primary ERP component of interest was the parietal P3b, as this component has previously been linked to addiction liability. Methods: In this within-subjects study, cigarette smokers, during four separate laboratory visits, smoked ENDS, ENDS placebo, their own brand cigarettes, and ‘sham’ smoked their own brand cigarette in a Latin-square order. During smoking sessions, ERPs elicited by stimuli presented in the context of a two-stimulus oddball task were recorded. ERPs were recorded immediately before and after smoking, as were subjective measures (relief of craving/withdrawal). Results: Preliminary results suggest that the P3b component of the ERP was elevated following smoking ENDS, but not participants’ own brand of cigarette. However, the P3a component, an index of the involuntary orienting of attention, appeared to be increased following smoking own brand but not ENDS. Thus, there appears to have been a double dissociation between which of these ERP components were affected by ENDS or cigarettes. Conclusions: These preliminary findings suggest that ENDS may produce qualitatively different neurocognitive effects as compared to cigarettes. This suggests that product acceptability of ENDS and cigarettes may be determined by different cognitive mechanisms.

This study was conducted while the first author was at the University of Maryland. Supported by NIH/NIDA grant #5R21DA030622.

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POS3-166
SUBJECTIVE RESPONSE TO NICOTINE BY MENSTRUAL PHASE AND DEPRESSIVE SYMPTOMS STATUS
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Introduction: The majority of women who attempt to quit smoking relapse within a few days. The goal of this analysis was to explore the association of two relapse risk factors (menstrual phase and depressive symptoms) on nicotine tolerance. Methods: Women, ages 18–40, who smoked at least 5 cigarettes/day and had regular menstrual cycles were recruited to participate in a controlled cross-over study. At screening, study participants were stratified into no depressive symptoms (NDS) or depressive symptoms (DS) groups based on the Patient Health Questionnaire-9 and the Composite International Diagnostic Interview. Participants then completed two lab sessions on the fourth day of smoking abstinence during the follicular (F) and luteal (L) phases. During the lab session participants self-administered 2mg of nicotine via nasal spray (Time 0 and 95 minutes) and completed a series of Visual Analog Scale (VAS) assessments (Time -30, 5, 20, 30, 60, 95, 110, 120, and 150 minutes). Random intercept models were used to measure the effect of menstrual phase and depressive symptoms status on VAS outcomes. Results: Participants (n=189) were, on average, 29.8±7.6 years old. The NDS and DS groups were similar in terms of baseline characteristics except for cigarettes/day (NDS: 14.3±6.4 vs. SDS: 11.7±5.4; p<0.002). We observed a significant phase by NDS group interaction such that those in the NDS group reported a significantly greater ‘Head Rush’ after the second dose of nicotine nasal spray during the F phase compared to the L phase, whereas those in the DS group did not have a menstrual phase difference in ‘Head Rush’ (p<0.0165). No other significant differences were observed by phase or depressive symptoms status. Conclusion: Among NDS women, the F phase may be associated with experiencing a greater sensation upon a repeated dose of nicotine. The lower tolerance in F phase could play a role in smoking relapse. This was not seen in the DS group. Additional research is needed to confirm this finding and investigate how it may impact risk for relapse.
Funding: NIDA R01-DA08075.
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POS3-167
THE IMPACT OF STIMULUS EXPECTANCIES AND NICOTINE PHARMACOLOGY ON CIGARETTE CRAVING
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Objective: Nicotine is often credited as the sole factor responsible for the reinforcing properties of cigarette smoking. Yet, evidence indicates that various non-pharmacological factors (e.g., expectancy) are also attributable to smoking reinforcement. This study used a balanced placebo design to examine the relative contribution of pharmacological and psychological components on smoking’s reinforcing properties. Methods: Fifty-two adult smokers (32 male) completed one laboratory session following 12 hours of smoking abstinence. Participants smoked a cigarette upon arrival at the lab, and were randomly assigned to one of four groups in which they consumed a lozenge that did or did not contain nicotine and were told (rightly or wrongly) that they had consumed nicotine. Participants were exposed to a neutral video cue (clips of hair cuts) and a smoking-cue video. Craving and mood were assessed with visual analogue scales and the Questionnaire of Smoking Urges-Brief Version before and after cue exposure and lozenge consumption. Results: The relative impact of psychological (stimulus expectancies) and pharmacological (nicotine) factors on the reinforcing properties of smoking appear experimentally separable. Participants who expected nicotine, regardless of whether it was administered, reported decreased craving and intention to smoke (p<0.05). Participants who received nicotine, regardless of expectancy, reported reduced jitteriness and anxiety (p<0.05). Participants who expected and received nicotine reported decreased withdrawal symptoms and increased heart rate compared to those who did not expect nicotine or did not receive nicotine, and those who neither expected nor received nicotine (p<0.05). Finally, receiving and/or expecting nicotine did not significantly reduce craving following smoking cue exposure. Conclusions: Findings suggest that psychological and pharmacological factors play a role in smoking behavior, representing important mechanisms in the reinforcement of smoking. Additionally, it was observed that the nicotine lozenge, a form of nicotine replacement therapy, was not effective in reducing cue-induced craving.
This study was funded by a discovery grant from the Natural Sciences and Engineering Research Council of Canada.
Funding: R01DA14002 & U54DA031659 (Tidey); T32 DA016184 (AhnAllen).
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POS3-168
ACUTE EFFECTS OF VERY LOW NICOTINE CONTENT CIGARETTES ON COGNITION IN SMOKERS WITH AND WITHOUT SCHIZOPHRENIA
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Persons with schizophrenia continue to smoke at alarmingly higher rates than the general population. Decreasing nicotine levels in cigarettes marketed within the United States is being considered by the FDA as a strategy to reduce smoking rates. Examining the acute impact of smoking cigarettes with very low nicotine content (VLNC) on cognition provides initial information on how reducing nicotine levels in cigarettes may affect smokers. In this 2x2 within subject design, smokers with schizophrenia (SS) and nonschizophrenic control (CS) completed laboratory sessions in which they either smoked their usual brand (UB) or very low nicotine content cigarettes (VLNC) combined with placebo (PLA) or 42 mg nicotine (NIC) patches for 5 hours. Next, they underwent cognitive testing that assessed visual sustained attention, visual memory, and processing speed. Total enrolled participants (SS, n = 29; CS, n = 28) completed certain measures including the Conners’ Continuous Performance Test II (CPT II) and Cambridge Neuropsychological Test Automated Batteries (CANTAB) subtests (Delayed Matching to Sample (DMS), Rapid Visual Information Processing (RVIP), and Simple Reaction Time (SRT)). As expected, SS exhibited slower reaction time and accuracy than CS across multiple domains (p’s < .05). VLNC, versus UB, cigarettes resulted in slower hit reaction time (CPT-II, p = .001) but overall exhibited comparable impact on cognition to UB. VLNC+NIC, versus VLNC+PLA, improved hit reaction time (CPT-II, p = .01; RVP, p = .01; SRT, p < .05), total hits (RVP, p < .01), detectability (RVP, p < .01), and percentage of commission errors (SRT, p < .01). In this acute administration study, results suggest that reducing nicotine in cigarettes has some interference on cognitive functioning in SS and CS with reversal of impairment evident on processing speed and sustained attention following augmentation with high-dose nicotine patch. Further examination of how reducing nicotine content in cigarettes may affect smokers over a longer term period of administration is needed.
Funding: R01DA14002 & U54DA031659 (Tidey); T32 DA016184 (AhnAllen).
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POS3-169
CIGARETTE SMOKING DOES NOT AFFECT NEUROCognition IN COCAINE- OR METHAMPHETAMINE-DEPENDENT INDIVIDUALS
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Aims: It has previously been reported in controls that cigarette smoking is associated with deficiencies in executive functioning, learning, episodic memory, processing speed, and working memory. The primary aim of this study was to evaluate whether cigarette smoking impacts neurocognitive functioning in cocaine (coc) or methamphetamine (methyl)-dependent volunteers. Methods: Participants completed a demographic/drug use questionnaire and completed the following neurocognitive assessments: Continuous Performance Task (a measure of attention), Dual N-Back (a measure of working memory), Hopkins Verbal Learning
POS3-170
ANHEDONIC DEPRESSIVE SYMPTOMS PREDICTS SMOKING ESCALATION IN ADOLESCENTS PARTICULARLY AMONG BOYS

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Depression is symptomatically heterogeneous and can be parsed into several unique symptom dimensions, which appear to have unique etiologies and accordingly may play distinct roles in smoking behavior. Yet, little is known about the course of different dimensions of depressive symptoms to risk of smoking escalation in adolescence and whether risk of smoking carried by depressive symptom dimensions vary by gender. This study examined the extent to which four depressive symptom dimensions (Negative Affect [sadness, anxiety, and distress], Somatic Features [appetite, psychomotor, and sleep irregularities], Anhedonia [low positive emotions and diminished pleasure], Interpersonal Problems [poor social adjustment]) measured at age 14 predicted smoking escalation across the subsequent two years. Data were drawn from a longitudinal study of health behaviors in a predominantly Hispanic sample of Los Angeles area high school students (N = 1367, 71% Hispanic), which had three annual waves (9th, 10th, and 11th Grades). All four symptom dimensions measured at baseline (age 14) were modeled as simultaneous predictors of smoking escalation using latent growth curve models. Results showed that anhedonia significantly predicted increases in number of smoking days in the past 30 (slope: Beta = .12, p < .05) and cigarettes smoked per smoking day in the past 30 days (slope: Beta = .21, p < .05). Gender moderated the relation of baseline anhedonia to smoking escalation, such that the associations were more robust among boys in comparison to girls. Baseline negative affect, somatic features, and interpersonal problems were not significantly associated with smoking escalation. These results suggest that of the various dimensions of depressive symptoms, anhedonia may play an important role in increasing risk of more frequent and heavy smoking across mid-adolescence, particularly among boys. These findings could help to clarify the underpinnings of the depression-smoking relation in adolescents, assist in identifying teens most at-risk of future smoking, and inform the development of novel smoking prevention programs that target affective sources of smoking risk.

Funding: National Institute on Drug Abuse Grants R01-DA026831, K08-DA025041, and R01-DA016310.

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POS3-171
SMOKING CHARACTERISTICS, CIGARETTE DEMAND, AND READINESS FOR CHANGE PREDICT IMPLICIT AND EXPLICIT SMOKING ATTITUDES

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The Cigarette Purchase Task (CPT) is a subjective measure of motivation (demand) for cigarettes from a behavioral economics perspective that examines cigarette consumptions as a function of escalating prices. This perspective can complement the motivation for quitting smoking that readiness for change offers to provide a more thorough assessment of smokers’ motivation for smoking. Motivation is an important influence on explicit attitudes about smoking, but perceived characteristics of a smoker’s habit, however little is known about how these factors influence less conscious implicit attitudes. The aim of this study was to examine how smoking characteristics, demand for cigarettes, and motivation for change are related to implicit and explicit smoking attitudes. Participants were 124 daily smokers (data collection still ongoing) who completed an online survey that measured characteristics of their smoking, motivation to change as measured by the Contemplation Ladder, decisional balance considerations (Pros and Cons for smoking), and demand for cigarettes (CPT), before completing the Smoking Implicit Association Test (IAT). Multiple regression analyses were conducted to predict the Pros and Cons for smoking (separately) and implicit smoking attitudes.

Greater motivation for change (t=5.87, p<.001) and a lower breakpoint (price at which cigarette consumption would be zero: t=-1.95, p<.05) predicted higher Cons of smoking, while less time to first cigarette (t=2.13, p<.05) predicted higher Pros of smoking. Smoking being permitted inside one’s place of residence (t=2.29, p<.05) predicted more negative implicit attitudes about smoking. Although correlations in design, results suggest that different dimensions of smoking and motivation for smoking are differentially associated with the smoker’s decision making and attitudes.

No funding.

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POS3-172
THE EFFECT OF AN ACUTE BOUT OF EXERCISE ON SMOKING TOPOGRAPHY

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Exposure to the elements of cigarette smoke is associated with health consequences. Exercise has been shown to be a potential adjunct to smoking cessation. The rate of cigarette consumption is the common gauge of exposure; but, the way a person smokes a cigarette (i.e., smoking topography; ST) is also significant. Considering methodological limitations associated with previous work, this pilot study aimed to examine the effect of an acute bout of exercise on smoking topography subsequent to a temporary period (18hrs) of smoking abstinence. Using a stratified randomization scheme, forty-three adult smokers (female = 34, Mage = 43.14 years, FTND = 4.96, mean 18.3 cigarettes per day) were assigned to a 10-minute moderate intensity exercise (defined as 40-68% of heart rate reserve) or passive sitting condition. Participants provided baseline smoking data immediately postcondition. The primary outcome variables included: puff count, puff volume, puff duration, inter-puff interval (IPI), and total duration. A 2 (condition) x 2 (time) repeated measures ANOVA revealed no interaction effects (p > 0.05) for any of the ST variables (effect sizes ranged from 0.03 to 0.11). Despite a strong methodological design, the present study provides the first randomized controlled trial evidence that exercise does not have an effect on ST. Although there is ample evidence that exercise attenuates cravings and tobacco withdrawal...
specialist hospitals in eastern Nigeria over the 10-year study period. We noted all symptoms during abstinence, the efficacy of acute exercise as a strategy to modify smoking behavior is not supported by this study.

No funding.

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POS3-173
SMOKING BEHAVIOR PATTERNS OVER A THREE WEEK PERIOD IN AN EXERCISE-AIDED SMOKING CESSATION PROGRAM

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Lung cancer is the leading cause of cancer death in Canadians. Smoking topography (ST), a key facet of smoking behavior, can be objectively measured by quantifying variables such as puff volume, velocity, and duration. ST can estimate exposure to carcinogens from cigarette smoking. Research has shown that compensatory behavior occurs when individuals reduce daily cigarette consumption (CPD). The objective of this study was to investigate whether natural reduction in CPD affects ST in women participating in the Getting Physical on Cigarettes trial (GPOC; an exercise-aided smoking cessation program; NCT01305447). Female adult smokers (n = 91, mean age = 41.21, mean years smoked = 23.7), attended breath carbon monoxide (CO) readings, smoking history questionnaires, and ST using the CReSS Pocket. These assessments were completed at baseline and week 3 (targeted quit date set for the beginning of week 4). The data suggest that participants naturally decreased CO (p < 0.05, β=0.131) and CPD (p < 0.05, β=0.467) from baseline to week 3. To determine whether changes in CO and CPD reductions influence ST, linear regression analyses were performed on change scores of CO, CPD, and ST. Namely, ST variables were entered as predictors and CO and CPD served as dependent variables into the model. For CPD reduction, the linear regression model explained 11.8% of the variance, with change scores of puff volume (β = 0.268, p < 0.05) and puff duration (β = 0.501, p = 0.075) making significant independent contributions. This indicates that a reduction in CO is related to reductions in puff volume and increases in puff duration. For reduction in CPD, the linear regression model explained 24.9% of the variance, with change scores of number of puffs (β = -0.437, p < 0.05) and peak flow rate (β = -1.054, p < 0.05) making significant independent contributions. This reveals that a reduction in CPD is related to an increase in number of puffs and flow rate. These findings demonstrate that compensatory smoking does occur with natural CPD reduction leading up to a quit attempt for women in GPOC. Elucidating the role of exercise as a harm reduction strategy is warranted.

Funding: Canadian Cancer Society.

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POS3-174
PREVALENCE AND PATTERN OF TOBACCO USE AMONG ORAL CANCER PATIENTS IN EASTERN NIGERIA: TEN-YEAR CLINICAL STUDY

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Background: Worldwide, oral cancer is a serious cause of morbidity and mortality and its incidence varies widely according to geographical location. In India, cancer of the floor of the mouth accounts for 50% of all cancers and 5% of all cancers in the United States due to cultural variations and habits. We postulate that tobacco use in different forms may be risk factor to developing oral cancer in the Nigeria environment. Objectives: To determine the prevalence and pattern of tobacco use amongst oral cancer patients in eastern Nigeria and identify the trends in the number of cases associated with its use in different forms.

Methods: We recorded all oral cancers cases seen in four specialist hospitals in eastern Nigeria over the 10-year study period. We noted all the information on these patients. The focus was on oral habits, use of tobacco, life style and socio-demographic data. Carcinoma of the gum, tongue, floor of the mouth, palate and other parts of the oral cavity (International Classification of Diseases [ICD], 9th revision, rubrics 141, 143–145) made up the oral cancer cases studied. We converted the information obtained to relative values for generation of statistics analysis. Results: One hundred and Sixty-nine cases were recorded. Ninety-two males (54.4%) and 77 women (45.6%) were affected giving a male-to-female ratio of 1:2.1. The most common site was other sites of the oral cavity (antrum/palate and buccal mucosa). One hundred and eighteen (70%) gave history of tobacco use. Most of the patients came from lower economic class of the society. Smokeless tobacco accounted for 78% used in different forms. Conclusion: Tobacco use in different form other than smoking may be a risk factor to developing oral cancer. The fact that this risk factor is modifiable emphasizes the need for increasing awareness among the general public and policy makers as a first step in the prevention of its use and abuse. As we know of no previous descriptive study of tobacco use amongst oral cancer patients in the Sub-Saharan Africa, we undertook a 10-year study in eastern Nigeria to indentify the trends in the number of cases.

No funding.

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POS3-175
ADHERENCE AND FIDELITY TO TOBACCO DEPENDENCE TREATMENT AMONG HIV-INFECTED SMOKERS

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There is a high prevalence of smoking among HIV-infected persons, with estimates ranging from 47% to 80%. In addition, malignancies and cardiovascular and pulmonary diseases have emerged as major causes of morbidity and mortality for this population. As these illnesses are associated with tobacco use, and because of the high smoking prevalence, tobacco use has become an important target for prevention and reduction of disease burden among HIV-infected persons. The United States Public Health Service Clinical Practice Guideline, Treating Tobacco Use and Dependence, recommends effective tobacco dependence treatment for all smokers. However, in order to be successful, smokers must adhere to the prescribed interventions. To address tobacco dependence more effectively, an improved understanding of factors associated with successful tobacco dependence treatment among HIV-infected smokers is necessary. The purpose of this study was to examine tobacco dependence treatment adherence and fidelity and their influences on tobacco abstinence. The study’s overall objective was to examine longitudinal changes in lung function among HIV-infected smokers who quit smoking; all participants were exposed to an intensive intervention in order to achieve the highest number abstinent. HIV-infected smokers who were at least 18 years old, smoked at least 5 cigarettes per day, and were interested in quitting in the next 30 days were enrolled (n=247). Participants received a 12-week tobacco dependence treatment intervention that included pharmacotherapy and weekly telephone counseling. Younger age and non-white race were associated with lower adherence to pharmacotherapy. Younger age, non-white race, and increased monthly binge drinking were associated with lower adherence to telephone counseling. Adherence to tobacco dependence treatment resulted in higher biochemically-confirmed tobacco abstinence rates at 3 months. The percentage of confirmed abstainers was 19% at 3 months. Development and testing of tailored interventions specific for HIV-infected patients that improve adherence to evidence-based tobacco dependence treatment is warranted.

This work was supported by the National Institutes of Health, R01HL090313-01, “Smoking Cessation and the Natural History of HIV-Associated Emphysema” and Award Number UL1RR025755 from the National Center For Advancing Translational Sciences.

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POS3-176
CHARACTERISTICS AND PERCEIVED INTERVENTION NEEDS OF PARENTS SEEKING TO REDUCE HOUSEHOLD SECONDHAND SMOKE

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Background: Secondhand smoke (SHS) exposure is a highly preventable public health threat that disproportionately burdens young children from low income communities. Despite substantial increases in the number of smokefree households over the past decade, home smoking bans are less likely among African American families and those with lower education. Moreover, there is little information available on actual home smoking practices among these groups.

OBJECTIVE: To tailor smokefree home interventions to the needs of low income, minority families, current home smoking behavior and attitudes were assessed.

METHODS: N=109 primary caregivers (mean 30.0 years; 94% female) of children aged 0-6 years, enrolled in a smokefree home intervention, were surveyed. Participants were recruited from low income, predominantly minority communities in Boston, Lawrence and Worcester, Massachusetts. RESULTS: Participants' racial/ethnic backgrounds included: 35% Latino, 33% black and 31% white. Most (65%) participants were unemployed, and 58% had a high school education or less. Most homes (61%) had less than two resident smokers, while 39% reported 2-3 smokers. Child health problems (past 30 days) included bronchitis (19%), asthma (17%), cough with phlegm (43%), ear infections (27%), and absences from childcare (42%). A daily mean of 17.4 (SD=8.5) cigarettes were smoked in the home by caregivers, other household members or visitors. Smoking occurred less often in internal rooms such as a living room (17%) or kitchen (20%), compared with external spaces such as a porch (35%), or front or back steps (31%). Participants strongly agreed that a smokefree home would enhance children's health, help the home smell better, reduce guilt or worry, and reduce fire risk.

CONCLUSIONS: Adverse child health outcomes and a high degree of concern about SHS exposure were observed. Culturally sensitive, tailored interventions should enhance motivation for change by addressing concerns about children's health. The perceived benefits of a smokefree home, enhancing strategies already used to reduce household SHS, and negotiating with other household members should be addressed.

Funding: National Institute for Minority Health and Health Disparities grant R24-MD-002772.

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POS3-177
DIMENSIONS OF TOBACCO DEPENDENCE AND SMOKING-RELATED EXPECTANCIES AMONG HOMELESS AND HOUSED SMOKERS

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INTRODUCTION: Smoking prevalence among the homeless remains high. Homeless smokers are less likely to quit smoking and are at a heightened risk of smoking-related diseases relative to housed smokers. The mechanisms underlying tobacco use among homeless smokers, however, are not well understood. METHODS: Smokers of at least 10 cigarettes/day were recruited from the San Francisco Bay Area and completed the Nicotine Dependence Syndrome Scale, the Wisconsin Inventory of Smoking Dependence Motives, the Smoking Consequences Questionnaire-Adult, and the Smoking Abstinence Questionnaire. Scale scores were compared between homeless (n = 136, 53% male, 41% White, age M = 43.3, cigarettes/day M = 19.2), and housed (n = 268, 55% male, 43% White, age M = 41.1, cigarettes/day M = 17.8) smokers. RESULTS: Relative to housed smokers, homeless smokers were more likely to report: their social environments promote smoking (p < .001, d = .41); they prioritize smoking over other activities (p = .006, d = .36); and they expect quitting smoking to alter their experience with coffee (p < .01, d = .25). Further, they were less likely to report: the taste and sensory effects of smoking (p = .03, OR = .73); encounters with nonsocial smoking cues (e.g., “sights and smells”; p = .04, d = - .20); and they expect smoking to confer negative social consequences (p = .04, d = -.19). The groups were similar on all other tobacco dependence and expectancy scales. DISCUSSION: Homeless individuals’ smoking behavior may be driven more by their social environments and lack of other reinforcers and less by the avoidance of negative affect, traditional features of dependence (tolerance and craving), and cue reactivity. Obtaining secure housing is a central need. To address disparities among the homeless in tobacco use and related morbidity and mortality, additional consideration should be access to non-smoking social outlets and adaptive reinforcers that are prioritized over smoking.

This study was supported by the NIDA grants F32 DA024482 and P50 DA09253, as well as the State of California Tobacco-Related Disease Research Program grant 16FT-0049.

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POS3-178
PREDICTORS OF ABSTINENCE GOAL AMONG NON-TREATMENT SEEKING SMOKERS

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INTRODUCTION: Smokers’ self-reported abstinence goals are robust predictors of smoking status. Specifically, those who have a goal of permanent and total abstinence are more likely to quit smoking than those who have no goal or intermediate goals (e.g., reduced or intermittent use, abstinence for a limited period of time). However, research has not yet determined the factors that predict abstinence goals. It is therefore unclear how to promote a goal of complete abstinence among smokers, and thus increase the probability of cessation.

METHODS: This cross-sectional study examined concurrent predictors of abstinence goals as measured by the Thoughts About Abstinence Questionnaire (Hall, Havassy, & Wasserman, 1990) among a sample of non-treatment seeking smokers (N = 507). RESULTS: 21% (n = 107) of participants reported a goal of complete abstinence, whereas 79% (n = 400) reported some other goal. Univariate analyses revealed a number of correlates of abstinence goals, including income, marijuana use, cigarette dependence, smoking dependence motives, tobacco use expectancies, and abstinence-related expectancies. Multivariate analyses revealed that stronger expectancies that quitting would occasion gains in social functioning (p = .01, OR = 1.35), stronger beliefs that one has lost volitional control over cigarette use (p = .02, OR = 1.31), and a weaker drive to smoke for the taste and sensory effects of smoking (p = .03, OR = .73) predicted a goal of complete abstinence. DISCUSSION: Abstinence goal is a multifaceted construct. Interventions seeking to move smokers’ goals toward complete abstinence should attempt to emphasize the social profits of cessation, accentuate the addictive and compelling nature of tobacco dependence, and address the fact that many smokers find tobacco use pleasurable to the senses.

This study was supported by the NIDA grants F32 DA024482 and P50 DA09253, as well as the State of California Tobacco-Related Disease Research Program grant 16FT-0049.

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POS3-179
THE EFFICACY OF CYTISINE IN HELPING SMOKERS QUIT: SYSTEMATIC REVIEW AND META-ANALYSIS

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Significance of the review: There is evidence that cytisine is an effective medication for helping smokers to quit. The key question, which this review and meta-analysis aims to address, is whether there is sufficient evidence available to
warrant licensing the drug, or whether more work is needed. Aim of the review: A systematic review and meta-analysis was undertaken of the literature assessing the safety and efficacy of cytisine in smoking cessation. Methods: The Cochrane Library database, CINAHL, Embase, Medline, PsycINFO and reference lists of included studies were searched from their earliest records to July 2012. All studies examining the efficacy of cytisine on smoking cessation were included and clustered by design. Only controlled trials were included in the meta-analysis. Two reviewers independently screened potential studies and assessed their methodological quality. Data were entered into two separate meta-analyses, which considered the longest follow-up and the strictest definition of outcome from all available studies and outcomes of 6 months or longer from studies which validated self-reported abstinence biochemically. Results were combined using a random effects model. 12 statistic was used to examine heterogeneity. Results: The presentation will describe the results of five cohort studies and eight controlled trials, which were identified from the original search, including two recent trials, which used modern methodology including strict Russell Standard outcome criteria. It will provide details of the assessment of adverse events including serious adverse events (SAEs), the pooled risk ratio for the strictest definition of abstinence, the longest follow-up and the risk ratio for two trials, which validated self reported abstinence. Conclusion: Evidence will be presented on the efficacy and safety of cytisine for smoking cessation and how this compares with other currently licensed treatments. Recommendations will be made regarding any fast tracking of the licensing of cytisine as a smoking cessation medication.

No funding was received for this review and meta-analysis.

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POS3-180 SAFETY AND TOLERABILITY OF A NOVEL NICOTINE INHALER DEVICE: RESULTS FROM A SIMULATED TEST MARKET STUDY

AIM: A simulated test market study was conducted to gather consumer data from participants after using a novel nicotine inhaler device. The evaluation of safety and tolerability is presented. BACKGROUND: Many smokers are unable or unwilling to quit using existing interventions. This device has been developed to address the behavioural aspects of the smoking ritual, together with rapid nicotine delivery and respiratory sensory cues. DESIGN: This multicenter, randomised, open-label study assessed the acceptability of a novel nicotine inhaler device. Healthy subjects aged at least 18 years who were current smokers (at least 5 cigarettes/day) were enrolled (N=602). Subjects were issued with a supply of test product containing the following nicotine doses: novel device – low, 0.22 mg per charge (N=198); novel device – medium, 0.45 mg per charge (N=207); or Nicorette Inhalator, 15 mg per cartridge (N=197). Subjects completed a product market research questionnaire at baseline, and after 3 and 6 days of use. Adverse events (AEs) were captured in a systematic but non-specific way, from diaries, and by asking at each visit: “Have you felt unwell, experienced any symptoms, or taken any medication since your last visit?” RESULTS: The proportion of subjects reporting at least one AE was 44%, 49% and 52%, and the most common AEs were the same for each product: cough (13.6%, 19.3% and 13.7%), oropharyngeal pain (6.1%, 7.7% and 14.2%) and headache (7.1%, 6.8% and 8.6%) for the low- and medium-dose novel device or Nicorette Inhalator, respectively. All cases of cough were reported as mild and resolved on discontinuation of treatment. CONCLUSIONS: The AE reports were those expected with an orally inhaled medicinal nicotine device and were similar in type, severity and frequency to those reported with the Nicorette Inhalator. The lower rates of oropharyngeal pain with the novel device may represent differences in aerosol generation, resulting in reduced impact of droplets at the back of the mouth/throat. Whilst this requires further study, the similarity of the new device’s tolerability profile to that of the established Nicorette Inhalator is reassuring.
Funding: Nicoventures Ltd.

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POS3-181 CAN BEHAVIORAL SMOKING CESSATION INTERVENTIONS WORK FOR ADOLESCENTS WITH LOW EDUCATIONAL STATUS? RESULTS FROM A GERMAN EFFECTIVENESS STUDY
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Background: Adolescents with low educational status are particularly at risk for smoking and have a low probability of smoking cessation. This study analyzes the effectiveness of the smoking cessation intervention losgelost implemented in German lower educational track schools. Methods: In a multi-center, non-randomized, controlled intervention study, 56 professionals (health care providers, social workers) were trained in a youth specific smoking cessation manual. Trainers held recruitment sessions for 5260 students in 53 intervention schools. In total 273 currently smoking program participants (11-19 years) from 42 intervention schools and 240 current smokers from 10 control schools were included in the study. At follow-up six months after the intervention, 65% of the sample was successfully contacted. Results: At the end of the program, 35.9% of participants successfully stopped smoking (ITT analysis). At the end of the aftercare interval, four weeks post program, 23.6% reported they were still smoke-free. At the end of the follow-up interval of six months, 14.3% of participants reported smoking abstinence (30-day prevalence). Compared to the control group and controlling for baseline smoking intensity, dependence, quit motivation, intention, and prior quit attempts, participation in the program was a significant predictor of smoking abstinence at follow-up (adj. OR = 2.55, 95% CI 1.10 – 5.92, p<0.05). In an additional multilevel regression analysis among program participants, male gender, empathy of the trainer, and school size significantly predicted abstinence at follow-up. Conclusions: Adolescent smokers participating in the smoking cessation losgelost have a higher likelihood of smoking cessation than smokers in the control group. The achieved quit rate is comparable to other internationally reported smoking cessation interventions for adolescent smokers. Behavioral smoking cessation interventions can be effective for adolescent smokers with low educational status, who belong to an especially vulnerable population.

This study was conducted on behalf of the German Federal Center for Health Education (BZgA).

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POS3-182 SMOKING STATUS CONFIRMATION BY PROXY: VALIDATION IN A SMOKING CESSATION TRIAL
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Background: Biochemical confirmation of self-report is the gold standard of evidence for abstinence in smoking cessation research, but difficulty in obtaining samples may bias estimates of quit rates. Proxy confirmation (PC) has been validated for use in estimating smoking prevalence, but not in cessation trials. We assessed the feasibility and validity of PC in a cessation trial for hospitalized smokers. Methods: We enrolled 402 daily cigarette smokers during a hospital admission. Before discharge patients were asked to name 3 proxies who could confirm their smoking status at follow up. Patients provided self-reported (SR) 7 day tobacco abstinence by telephone follow up at 3 months post-discharge. Those quit by SR were asked to mail a saliva sample for biochemical confirmation (BC). Patients received incentives of $20 for survey completion and $50 for returned samples. We called proxies for all those with SR to obtain PC. We compared rates of agreement between SR and PC using chi-squared tests. Quit rates were calculated with missing data indicating smoking. Results: All patients were able to name ≥1 proxy. SR was obtained for 316 patients (79%), of whom 50% (157) reported being quit. Proxies were reached for 270/316 (85%). Proxies confirmed 110/137 (80%) of SR quits but falsely reported abstinence in 34/133 (26%) of SR smokers (73% agreement). Agreement was higher when proxy was spouse/partner (85% vs. 69%, p=0.017) or household member (81% vs. 66%, p=0.014) and when patients reported continuous abstinence since discharge (85% vs. 67%, p=0.002). Samples were received from 59/157 (38%) of SR quitters. Abstinence was biochemically confirmed in 81% of analyzed samples (43/53) and
84% of those with PC (37/44). PC was biochemically validated in all cases where proxy was spouse/partner (N=7) or household member (N=12). Estimated quit rates were 39% for SR, 27% for SR+PC, 11% for SR+BC and 29% for SR+BC or PC. Conclusion: Proxy confirmation was easier to obtain than saliva samples, but proxies over-reported abstinence. Spouse/partners and household members may be better proxies than other informants but are not available for all patients. Funded by the National Heart, Lung, and Blood Institute award 5K24 HL04440-07 to Dr. Rigotti.

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POS3-183
INTEGRATING A BEHAVIORAL SLEEP INTERVENTION INTO SMOKING CESSATION TREATMENT FOR SMOKERS WITH INSOMNIA: RESULTS OF A PILOT STUDY
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Sleep disturbance is common among cigarette smokers and predicts smoking cessation failure. Therefore, we investigated whether provision of a sleep intervention might bolster cessation outcomes among this vulnerable group. This randomized, pilot clinical trial compared cognitive-behavioral therapy for insomnia (CBT-I) in addition to standard smoking counseling to standard counseling alone. Smokers with insomnia (N=19) who were seeking smoking cessation treatment were randomly assigned to receive 8 sessions over 10 weeks of either: (1) CBT-I + smoking cessation counseling (CBT-I+SC) or 2) smoking cessation counseling alone (SC). Counseling commenced 4 weeks prior to a scheduled quit date; nicotine patch therapy was also provided for 6 weeks starting on quit date. Of the 19 recruited, 17 (8 M, 9 F) started treatment (7 CBT-I+SC; 10 SC). SC participants were significantly more likely to quit on quit day than CBT-I+SC participants (6/10, 60% vs 0/7, 0%; p=.04). However, most participants had difficulty initiating and maintaining smoking abstinence, regardless of condition. 7-day point prevalence abstinence rates at end of treatment (CBT-I+SC:1/7; 14.3%; SC:2/10, 20%) and follow-up (CBT-I+SC: 1/7, 14.3%; SC:0/10, 0%) were low for both conditions. Among participants who remained in treatment by quit date (n = 16), a greater percentage of those in CBT-I+SC (6/10, 60%) reported a decrease in total sleep disturbance by quit date than those in SC (6/10, 60%) (Cramer’s V=.45, med to large effect size). Change in total sleep disturbance scores, however, was not associated with the likelihood of initiating or maintaining abstinence from smoking. The study suggests that while behavioral interventions may improve sleep among smokers with insomnia (N=19) who are seeking smoking cessation treatment, it remains to be determined whether these changes to large effect size). Change in total sleep disturbance scores, however, was not

POS3-184
MINOR TOBACCO SMOKE CONSTITUENT DOSING CAN MODIFY NICOTINE SELF-ADMINISTRATION IN RATS
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There are over 4000 known chemical compounds present in tobacco smoke. Of these numerous chemicals, nicotine has long been considered to be the primary reinforcing agent that causes addiction to tobacco in humans. However, in laboratory settings, nicotine has been shown to be only moderately reinforcing. Indeed, when other drugs of abuse studied in animal models of addiction are taken into consideration (i.e., cocaine, morphine etc.), nicotine is viewed as a comparatively weak reinforcer. This evidence is in direct contrast to the high incidence of tobacco addiction in the human population. This has driven research to determine whether other compounds found in tobacco may contribute to its addictive properties. A variety of compounds in tobacco have been found to act on neural systems, including dopaminergic, serotonergic and cholinergic pathways. Two compounds found in tobacco which have been shown to act on the nervous system are the monoamine tyramine, and the minor alkaloid anabasine. We assessed the effects of acute administration of these compounds on i.v. nicotine self-administration in young adult female Sprague-Dawley rats (0.03 mg/kg/infusion, FR1). Doses for each compound were administered via s.c. injection 10 min prior to the sessions, using a repeated measures, counterbalanced design. Each self-administration session lasted 45 min. Administration of anabasine (0.02-2 mg/kg) resulted in a significant biphasic effect on nicotine self-administration. Treatment with 0.02 mg/kg of anabasine trended toward an increase in the number of nicotine infusions during self-administration sessions while treatment with 1 and 2 mg/kg caused reductions of infusions. Tyramine pre-treatment over the dose range of 0.3-3 mg/kg was not found to alter nicotine self-administration. These data show that low doses of anabasine may contribute to the reinforcing effects of tobacco. Higher doses may be useful for reducing smoking. This work may help explain the disparity between nicotine’s modest effects seen in the laboratory and the high incidence of tobacco addiction in the human population, and could potentially lead to better treatment alternatives. This research was supported by P50 grant DA DA027840 from NIDA.

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POS3-185
NICOTINIC INVOLVEMENT IN NEURAL CIRCUITS UNDERLYING COGNITIVE FUNCTION: THERAPEUTIC OPPORTUNITIES
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Nicotinic acetylcholine receptors are found in a wide variety of brain areas. They located in neural circuits critical for a range of cognitive functions including attention, learning and memory. Declines in nicotinic receptors in the frontal cortex and hippocampus such as seen in Alzheimer’s disease and related aging-related neurodegenerative disorders are related to cognitive impairment in these disorders. Drugs affecting nicotinic receptors including nicotine and other nicotinic agonists have been shown many studies to significantly improve cognitive function and reverse cognitive impairments. Groups of smokers such as people with schizophrenia and attention deficit hyperactivity disorder appear to smoke tobacco as a form of self-medication to improve cognitive function. They smoke at double to triple the general population rate. To make headway in reducing smoking in these heavy smoking groups, a successful avenue may be to address their need for nicotinic medication so that they do not self-medicate in the particularly deadly fashion of tobacco smoking. In addition, treatment with nicotine or other nicotinic ligands could provide effective therapeutic treatment for other groups with cognitive impairment such as people with Alzheimer’s and Parkinson’s disease and related disorders. Experimental animal studies as well as clinical studies have demonstrated the effects of nicotine improving attention, learning and memory. The neural systems involved in these effects are dispersed throughout the brain. Prominent areas involved include the frontal cortex, hippocampus, amygdala, thalamus and ventral tegmental area. Nicotinic receptors are key points of control in the neural circuits passing through these areas. Nicotinic interactions with muscarinic acetylcholine, dopamine, norepinephrine, serotonin, histamine, GABA and glutamate systems in these neural circuits are important for nicotinic effects on cognition. Nicotinic treatment can provide an important avenue for therapy reversing cognitive dysfunction. This could help with smoking cessation in groups who appear to smoke for cognitive improvement as well as for other groups who have cognitive dysfunction.

Research supported by NIH Grants DA011943, DA027840, DA027990, MH064494 and AG022462.

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ORALLY ADMINISTERED SAZETIDINE-A, AN α4β2 NICOTINIC RECEPTOR DESSENSITIZING AGENT, CAUSES PROLONGED REDUCTION OF NICOTINE SELF-ADMINISTRATION IN FEMALE RATS

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Subcutaneous (SC) injection or infusion of Sazetidine-A, an α4β2 nicotinic receptor desensitizing agent, has been shown in several of our earlier studies to significantly reduce IV nicotine self-administration in rats. In the current project, we studied whether sazetidine-A (0, 0.3, 1 or 3 mg/kg), orally (PO) administered 30 minutes before the start of a 45-minute session (FR1) would also be effective in reducing nicotine-self-administration (IV 0.03 mg/kg/infusion) in young adult female Sprague-Dawley rats (N=20). In addition, the time-effect function of oral sazetidine-A on nicotine self-administration (1, 2, 4 and 23 hours after dosing) was tested. The oral dose-effect function showed that oral sazetidine-A caused a significant (p<0.025) linear dose related reduction in nicotine self-administration. Both the 1 mg/kg (p<0.025) and the 3 mg/kg (p<0.05) doses caused significant decreases in nicotine self-administration. In the time-effect function study, there was a significant main effect of sazetidine-A (p<0.025) in reducing nicotine self-administration. There was no apparent lessening of effectiveness of sazetidine-A (3 mg/kg) given PO 1, 2, 4 or 23 hours before the onset of the 45-minute nicotine self-administration session (N=14). These studies show that, as with SC injection, oral sazetidine-A significantly reduces nicotine self-administration and that the effectiveness of oral sazetidine-A treatment does not diminish over the course of the day of administration. These results support the promise of sazetidine-A for development as a smoking cessation aid and suggest that it could be effective with once daily oral administration.

This project was supported by Grant DA027990 from NIH. Sazetidine-A was developed by KJK and YX at Georgetown University, which holds the patent on the compound.

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POS4-1
PRIMING A RESTRAINED MENTAL SET IN ABSTINENT SMOKERS REDUCES TOBACCO SEEKING
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Background: Response inhibition—the ability to inhibit a dominant or pre-potent response—can be measured in the laboratory using computerised tasks such as stop signal and anti-saccade. It is frequently reported to be impaired in smokers, particularly in the abstinent state, and can predict relapse during a quit attempt (Powell et al., 2010). This study aimed to prime a restrained response set in abstinent smokers by asking participants to focus on either successful inhibition (restraint group) or rapid responding (disinhibited group) during performance on a stop-signal task—a technique that has previously been used successfully with social drinkers (Jones et al., 2011). It was hypothesised that those in the restraint group would demonstrate reduced cigarette-seeking behaviour on a subsequent concurrent choice task. Methods: Thirty one smokers (21 female; mean age: 27 years) abstinent overnight, were randomly allocated to either the restraint or disinhibited group during performance on the stop signal task before rating their desire to smoke and completing an instrumental learning task in which different keyboard responses are associated with points nominally exchangeable for chocolate or cigarette reward. Results: Relative to the disinhibited group, participants in the restraint group subsequently exhibited reduced preference for cigarettes over chocolate in the concurrent choice task. There was no effect of the restraint manipulation on desire to smoke. Conclusions: These findings concur with previous observations in social drinkers (Jones et al., 2011) and suggest that priming a restrained state in abstinent smokers can impact on cigarette seeking behaviour without influencing the underlying desire to smoke. If replicated, these findings suggest that methods for enhancing inhibitory control may prove efficacious in improving smoking cessation rates.
No funding.
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POS4-2
SINGULAR AND COMBINED EFFECTS OF VARENICLINE AND NALTREXONE FOR THE TREATMENT OF HEAVY DRINKING SMOKERS
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Background: Heavy-drinking smokers constitute a sizeable and treatment-resistant subgroup of smokers. In consideration of this comorbidity, this study combines two pharmacotherapies with demonstrated efficacy for smoking (varenicline; VAR) and drinking (naltrexone; NTX). Methods: Daily smokers (≥10 cigarettes per day) who met NIAAA guidelines for heavy drinking (N=130) were randomized to one of four medication conditions: (1) VAR (1mg twice per day) alone; (2) NTX (25mg once per day) alone; (3) VAR+NTX; and (4) placebo. Measures of craving, withdrawal, and subjective reward were sequentially assessed following: (a) 12h of smoking abstinence, (b) a loading dose of alcohol, and (c) smoking a cigarette. Ten participants in each condition (n=40) were also enrolled in a functional neuroimaging study in which a visual cigarette craving task was administered. Results: Analyses following the dose of alcohol revealed an effect of NTX on negative mood and tension, as well as a VAR+NTX effect on cigarette refusal as compared to monotherapies and placebo (ps<.05). Analyses following the first cigarette of the day revealed an effect of VAR and VAR+NTX in reducing positive mood and vigor. VAR+NTX also attenuated alcohol and cigarette high, as compared to placebo (ps<.05). Further, the VAR+NTX group drank and smoked significantly less than the placebo group over the titration period (ps<.05). Neuroimaging craving task analyses contrasting the placebo group with the monotherapies revealed distinct yet partially overlapping patterns of activity attenuation for the VAR only group (regions include the insula, thalamus, and caudate) and the NTX only group (including the insula, putamen, caudate, and inferior frontal gyrus). Contrastimg with the placebo group, the VAR+NTX group revealed greater and more wide spread attenuation in regions such as the OFC, insula, thalamus, and caudate. Conclusions: These results suggest a more global combined effect of the medications on behavioral and neural mechanisms of VAR, NTX, and their combination, for the treatment of heavy-drinking smokers.
Supported by R03DA030698 and by a grant from the California Tobacco Related Disease Research Program (TRDRP)
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POS4-3
TRANSCRANIAL DIRECT CURRENT STIMULATION (TDCS) AS AN ADD-ON TO STANDARDISED BEHAVIOURAL THERAPY FOR TOBACCO DEPENDENCE—A PLACEBO-CONTROLLED, DOUBLE-BLIND STUDY
Background: The changes in attention and cognitive performance that result from direct current stimulation of different brain regions have been known since the 1960s and investigated in many studies since then. Our group was able to show improved performance in an n-back procedure (memory test to assess working memory) after tDCS (Keester et al; 2010) Proof of this effect in healthy controls leads to the assumption that IDCs increases activity in neuronal networks in tobacco dependent patients and thus increases attention and concentration abilities, which will in turn increase the probability that smoking cessation during behavioural therapy will be successful within a predetermined period (1, 3, 6 and 12 months). Methods: Stimulation is performed with a DC stimulator MC. The location of stimulation is anode over the left dorsolateral cortex (DLPFC), corresponding with F3 (in 10-20 EEG system); cathode over the right temporal cortex with an intensity of 2 mA. The total duration is a constant stimulation for 20 minutes. The stimulation time schedule for each participant is a total of 7 times over 6 weeks. The stimulation is followed by a 90-minute session of the ‘Smoke-free programme’, a standardised behavioural therapy of the Institute for Therapy Research (Gradl, S. Kröger, C., 2008) Evaluation scales which are used are Edinburgh Handedness Test; Comfort Rating Questionnaire; Fagerström Test and Questionnaire on Smoking Urges. As an additional evaluation, at the start of the stimulation and at four follow-up appointments salivary cotinine (a degradation product of tobacco) and the carbon monoxide content of expired air are measured. Additional we perform two fMRT s (at baseline and at the end of study) to examine the effects of anodal IDCs of the left (DLPFC) in tobacco dependence. Results and Conclusion: Our sample size estimation is between 20-36 participants. Actually about half of the planned participants have passed through our study. We are planning to finish the study in January 2013. Data will be analysed with a multivariate analysis of covariance (MANCOVA).
No funding.
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POS4-4
PATIENTS’ AND HEALTHCARE PROFESSIONALS’ VIEWS ON A SPECIALIST SMOKING CESSATION SERVICE DELIVERED IN A UNITED KINGDOM HOSPITAL
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Background: Hospital admission provides an opportunity to promote smoking cessation. However, implementing interventions into routine clinical practice remains a challenge. As part of a randomised control trial in a United Kingdom teaching hospital, eighteen wards were allocated, in a cluster randomised design, to deliver systematic smoking cessation interventions to all admitted patients who smoked, or to deliver usual care. This study explored patients’ and healthcare professionals’ (HCPs) views of the specialist smoking cessation service, where the intervention delivered one-to-one Behavioural support and pharmacotherapy, and appropriate follow-up to patients wishing to quit. Methods: Semi-structured interviews were conducted with patients (n = 30) and HCPs (n = 27). Interviews were audio-recorded, transcribed verbatim and analysed using thematic analysis.
Results: Smoking cessation support in hospital was insufficient and ineffective, where HCPs admitted that discussions generally fail to go beyond ascertainment of smoking status, or were dependent on their judgements of who would benefit most. Delivery via a specialist cessation service rather than reliance on inpatient ward staff was favoured by patients and HCPs because the former had the time and expertise to provide support promptly. Patients highlighted that little effort was required on their parts, where most admitted that they had not been offered support they would have either tried to quit alone, or would not have attempted due to the cost of pharmacotherapy. Although the content of the service was rated highly, timing of delivery and improved co-ordination between service staff and inpatient ward staff was discussed as matters to address. Conclusions: Initiating smoking cessation support during an inpatient stay via a specialist service, rather than reliance on HCPs may help to ensure support is provided consistently. Further research is required to consider timing of service delivery that ensures co-ordination and communication between hospital staff and service personnel.

This abstract presents independent research commissioned by the National Institute for Health Research under its Programme Grants for Applied Research funding scheme (RP-PG-0608-10020). The views expressed in this abstract are those of the author(s) and not necessarily those of the NHS, the NIHR, or the Department of Health.

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POS 4-5
ATTENTIONAL BIAS MODIFICATION IN SMOKERS TRYING TO QUIT: A LONGITUDINAL STUDY

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Background: Smokers exhibit an attentional bias (AB) for smoking-related cues (SRC), whereas former smokers show negative AB to this kind of stimulus. Attentional Bias Modification (ABM) to avoid SRC may be a valuable addition to existing cognitive-behavioral programs. This study investigated if either one or three sessions of ABM would reduce AB for SRC in smokers in treatment to quit. Method: Smokers (n = 67, 45±12 years-old) who did not intend to quit performed a standard 144-trial visual probe task, in which pairs of SRC and non-SRC had random stimulus onset asynchronies (SOAs = 50, 500 and 2000 ms). After that, ABM groups engaged in four weekly sessions of group cognitive-behavioral therapy to stop smoking. They were randomly allocated to one of three ABM training: three sessions of ABM (ABM 3); two sessions of sham-ABM and one session of ABM (ABM 1); and three sessions of sham-ABM (ABM 0). A post-test evaluation was performed 24h after the last session of ABM, and the follow up evaluations were performed one, six and twelve months after ABM.

Results: Smoking, wishing or not to quit, had similar AB for SRC, the last session of ABM, and the follow up evaluations were performed one, six and twelve months after ABM. Results: Smokers, wishing or not to quit, had similar AB at baseline [M=27; p=0.05] in all SOAs. In post-test, ABM groups showed a decrease in AB, which was then negative (M=31; F (1,63) = 32.22; p = 0.0001). Also, the longer the SOA, the stronger the avoidance to SRC in post-test (M=12 in SOA50ms, M=31 in SOA 500 and M=49 in SOA 2000) (F (1,26) = 3.78; p = 0.052). At post-test and one-month follow-up, ABM 3, but not ABM 1, presented a stronger negative AB than ABM 0 in all SOAs. This difference was not seen in the six-month or twelve-month follow ups. Conclusions: Smokers in treatment develop a conscious avoidance to smoking-related cues as seen in longer SOAs. In addition, three session of ABM produced a more efficient avoidance to SRC and maintained this avoidance longer than the control group, meaning that number of trials of ABM may be important for lasting effects.

Funding: CAPES / Brazil.

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POS 4-6
REAL-TIME SURVEILLANCE OF THE POINT-OF-SALE ENVIRONMENT: UTILIZING A MULTIMODAL DATA COLLECTION SYSTEM TO CAPTURE EMERGING TRENDS IN TOBACCO INDUSTRY ADVERTISING

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BACKGROUND: Research among young adults and African-Americans demonstrating the increasing popularity of LCCs has been accumulating for the past decade, yet strategies used to market to these populations at retail have not previously been documented. This study examines LCC marketing in the retail environment and differences in marketing by neighborhood demographics utilizing a multimodal real-time mobile phone-based surveillance system. METHODS: The surveillance system incorporated interactive voice recording, photo, web, SMS and geolocation data to allow for rapid assessments of retail marketing of LCC’s in all 750 tobacco-selling outlets in the District of Columbia. Multivariate models examined the odds of LCC availability, the number of storefront exterior advertisements and price per cigarillo for Black & Mild packs in relation to neighborhood demographics. RESULTS: LCCs were available in 80% of outlets, with 60% selling single-pack LCCs and 95% selling flavored versions. Twelve percent of stores had exterior LCC advertising. The average price per cigarillo for the lowest-priced pack of Black & Mild was $0.91. For each 10 percentage point increase in the proportion of African American residents, the odds of LCC availability increased by 26% (95% CI = 1.14, 1.40) and price per cigarillo decreased by $0.02 (CI = -0.02, -0.01). Having a higher proportion of African American and young adult residents was associated with more exterior LCC advertising. DISCUSSION: Findings of broad LCC availability, including single sales and flavored versions, likely reflect differential regulation of cigarettes as compared with cigar products. Higher availability of LCCs, lower prices in African American communities and greater outdoor advertising in minority and young adult neighborhoods may establish environmental triggers to smoke among groups susceptible to initiation and long-term addiction. Real-time surveillance of the retail environment using new technologies is critical in the context of a dynamic marketplace and evolving tobacco regulations. Funding was received by the DC Department of Health.

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POS 4-7
COGNITIVE EFFECTS OF TRANSDERMAL NICOTINE AND TOBACCO SMOKING: A DIRECT TEST OF THE COGNITIVE SELF-MEDICATION HYPOTHESIS IN SCHIZOPHRENIA

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Background: More frequent and heavier tobacco smoking among people with schizophrenia (PSZ) is commonly believed to reflect self-medication of cognitive deficits. The idea that the cognitive-enhancing effects of nicotine are a primary motivator of tobacco consumption in PSZ and that smoking cessation would deprive PSZ of these beneficial effects may explain some hesitation among providers to pursue smoking cessation interventions in PSZ. The purpose of this study was a direct test of the cognitive self-medication hypothesis. Methods: In three counterbalanced test sessions, 17 PSZ and 17 healthy control subjects (HCS), all smokers, were tested under ad libitum smoking conditions, or 3.5 hours after stopping smoking and receiving a nicotine (14 mg/24 hrs) or placebo patch. Results: The groups matched on smoking severity. Reaction time and response accuracy on computerized attention tasks was improved by transdermal nicotine relative to placebo, with intermediate performance by ad libitum smoking. These effects were of similar size in both groups and did not reflect remediation of functions disproportionately impaired in PSZ. Although more PSZ reported that the need to concentrate affected their smoking, this was not reflected by real-world behavior in that these PSZ did not optimize their nicotine intake in the ad libitum smoking session to meet the cognitive demands. The self-reported ability to concentrate varied as a function of drug condition in HCS but not in PSZ, suggesting insensitivity of PSZ to subjective nicotine-derived cognitive benefits.
POS4-8
REDUCED ACTIVITY CYP2A6 GENE VARIANTS ARE ASSOCIATED WITH REDUCED LUNG CANCER RISK AMONG AFRICAN AMERICAN EVER-SMOKERS

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BACKGROUND: We investigated the association of variation in the nicotine/nitrosamine metabolism gene, CYP2A6, with the risk of developing lung cancer among African American cigarette smokers, a typically light smoking population at a high risk for lung cancer. Previously among European American smokers, we showed that reduced/null activity CYP2A6 gene variants trended towards an association with lower lung cancer risk (OR 0.78; 95% CI 0.56-1.10) overall and significantly among those smoking less than 20 cigarettes per day (CPD) (OR 0.63; 95% CI 0.41-0.97). METHODS: Herein, we genotyped African Americans for reduced/null activity CYP2A6 alleles in a lung cancer case-control study nested within the Southern Community Cohort Study. Controls were matched to incident lung cancer cases by age, gender, menopausal status and recruitment site. We restricted this analysis to ever-smokers (n = 445; median CPD = 10; IQR 9-20) and grouped participants by CYP2A6 genotype into predicted reduced or normal metabolism groups (46% and 54%, respectively). Lung cancer risk was estimated through conditional logistic regression modeling. RESULTS: CYP2A6 reduced versus normal metabolizers had significantly lower lung cancer risk (crude OR 0.81; 95% CI 0.40-0.93), and the association remained after adjusting for cigarette pack-years (OR 0.55; 95% CI 0.35-0.88). We found a significant interaction between CYP2A6 and pack-years (P = 0.05), which appeared to be driven by a greater difference in cancer risk by CYP2A6 genotype at lower pack-years. Median split analyses indicated that the CYP2A6-lung cancer association was significant among the lighter smokers: adjusted ORs 0.35, 95% CI 0.14-0.85 for ≤10 CPD and 0.63, 95% CI 0.25-1.55 for >10 CPD, but risk was not higher among shorter than longer duration smokers. CONCLUSIONS: As CYP2A6 was not directly associated with CPD or duration, reduced nitrosamine (or nicotine) metabolism may contribute to lower lung cancer risk among CYP2A6 reduced metabolizers. Given the high prevalence of reduced activity genotypes (close to 50%), our findings support CYP2A6 as an important genetic risk factor among African American smokers.

This work was supported by the Endowed Chair in Addiction for the Department of Psychiatry (R.F.T.), CIHR (MOP8-474 and TMH109787 to R.F.T., Doctoral Research Award to C.A.W.), NIH (R01 CA092447 supporting the Southern Community Cohort Study and U01 DA020830 to R.F.T.), Centre for Addiction and Mental Health and the Canada Foundation for Innovation (#20289 and #16014 to R.F.T.), the CAMH Foundation and the Ontario Ministry of Research and Innovation.

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POS4-9
PRIOR SMOKING CESSATION ATTEMPTS AMONG HIV-POSITIVE SMOKERS

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Understanding the determinants of quitting smoking is essential to designing and improving smoking cessation interventions. Among HIV-positive populations—a group with a disproportionately high prevalence of smoking and that bears a significant burden of smoking-related morbidity—relatively little is known regarding this topic. The present study explored a variety of characteristics, both individual and social environmental, and their potential association with prior smoking cessation attempts among a sample of HIV-positive cigarette smokers. Data for these analyses came from the BEACON study, a NIDA-funded longitudinal study aimed at examining social environmental (i.e., support network and informal care giving) influences on former and current drug users’ HIV medication adherence and health outcomes. Data came from the 6-month time point, and the sample included 269 individuals who were current smokers. Descriptive statistics and logistic regression analyses were used to describe the associations. In adjusted logistic regression analyses, several characteristics were found to be significantly associated with prior smoking cessation attempts. In terms of individual level characteristics, older age (age 45-49: aOR=3.26, 95% CI=1.53-6.91; age 54-65: aOR=2.69, 95% CI=1.19-6.05) and non-black race (aOR=3.85, 95% CI=1.31-11.34) were both positively associated with prior cessation attempts. Additionally, characteristics of the social environment, particularly dyadic-level characteristics, such as having a main Supporter who smokes (aOR=1.77, 95% CI=1.04-3.05), having a main Supporter who is interested in quitting smoking (aOR=2.12, 95% CI=1.21-3.72), and having a main Supporter who has made prior quit attempts (aOR=2.44, 95% CI=1.24-4.71) were associated with prior cessation attempts. Overall, this research suggests that both individual- and social environmental-factors may play a role in this aspect of the quitting process. Findings may have implications for the development and continued improvement of smoking cessation interventions.

This work was supported by F31 DA033873 (Pacek), R01 DA032217-02S1 (Latkin), and R01 DA019413 (Knowlton).

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POS4-10
MATERNAL SMOKING DURING PREGNANCY AND INFANT INFECTIOUS DISEASE OUTCOMES

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Background: Maternal smoking is associated with infant respiratory infections and with increased risk of low birthweight (LBW) infants and preterm birth. This study assesses the association of maternal smoking during pregnancy with both respiratory and non-respiratory infectious disease (ID) morbidity and mortality in infants. Methods: We conducted two retrospective case-control analyses of infants born in Washington State from 1987-2004 using linked birth certificate, death certificate, and hospital discharge records. The first analysis assessed morbidity—infants hospitalized due to ID within one year of birth (47,404 cases/48,233 controls). The second assessed mortality—infants who died within one year due to ID (627 cases/2,730 controls). Results: Maternal smoking was associated with both hospitalization (Adjusted Odds Ratio (AOR)=1.52; 95%CI: 1.46, 1.58) and mortality (AOR=1.51; 95%CI: 1.17, 1.96) due to any ID. In subgroup analyses, maternal smoking was associated with hospitalization due to a broad range of ID including both respiratory (AOR=1.69; 95%CI: 1.63, 1.76) and non-respiratory ID (AOR=1.27; 95%CI: 1.20, 1.34). Further stratification by birthweight and gestational age did not appreciably change these estimates. In contrast, there was no association of maternal smoking with ID infant mortality when only LBW infants were considered. Conclusions: Maternal smoking was associated with a broad range of both respiratory and non-respiratory ID outcomes. Despite attenuation of the mortality association among LBW infants, ID hospitalization was found to be independent of both birthweight and gestational age. These findings suggest that...
full-term infants of normal weight whose mothers smoked may suffer an increased risk of serious ID morbidity and mortality. This study (MJL) was supported by NIH training grants (CA009229 and CA009657) and a pilot grant (UL1 DE019852).

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POS4-11
ASSESSING ATTITUDES, KNOWLEDGE, AND BEHAVIORS OF TOBACCO USE ON CAMPUS PRE- AND POST-SHOWING OF THE FILM, 'ADDICTION INCORPORATED'

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Background: Health is an integral component of a vibrant university community that is conducive for learning. Tobacco use in any form, active, and/or passive, is a significant health hazard. The purpose of this study was to assess tobacco use on the campus of a northeastern university, to identify knowledge of the effects of tobacco, and attitudes regarding a tobacco free campus. In addition, we tested the effect of showing the documentary, "Addiction Incorporated." Methods: A pre and post-test design was utilized. We developed a 24-item survey adapted from the "Leave the Pack Behind" questionnaire. This survey was administered to 187 attendees including students, faculty, and community members (mean age 24 years, 78.6% female, 91% full time students, 37% third year undergraduates, 26.7% live on campus, 77% non-smokers). Analysis of data utilized Chi Square, t-test, and ANOVA. Results: Respondents estimated that 36% of students used tobacco products, and that the average number of cigarettes smoked per day was 5.5. Eighty three percent would be proud to have a tobacco-free campus and 89% think it provides a healthy work and study environment. However, 72% think it infringes on tobacco users choices and 75% believe this policy is too hard to enforce. Post-test analyses (N = 113) indicate that viewing the film significantly improved students’ knowledge of tobacco’s addictive properties, and its governmental regulation as well as attitudes about some aspects of a campus tobacco-free policy. Only 57.5 % of students stated that courses on campus address tobacco issues. Conclusions: Findings indicate that implementing a tobacco-free policy on this northeastern campus is supported; however, a multi-disciplinary approach is imperative. Increasing awareness, involving stakeholders, including students and community members would be necessary. A showing of "Addiction Incorporated" was the first step in increasing knowledge and support.

Binghamton University’s Academic and Faculty Development Fund.

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POS4-12
THE EFFECTS OF ACUTE EXERCISE ON TOBACCO CRAVINGS AND WITHDRAWAL SYMPTOMS IN PREGNANT WOMEN

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Background: Cigarette smoking during pregnancy is common and is associated with numerous repercussions to the health of the developing fetus. Although abstinence early in pregnancy will produce the greatest benefits to the fetus and expectant mother, quitting at any point during pregnancy can yield benefits. Behavioural support in conjunction with pharmacotherapy is most effective for this population. However, many women are concerned and reluctant to use pharmaceutical aids due to unknown safety and efficacy. A plethora of research and multiple systematic reviews have shown that a bout of exercise minimizes cravings and tobacco withdrawal symptoms (TWS) after a temporary period of abstinence in male and female smokers, but these findings have not been replicated in pregnant smokers. Thus, the objective was to examine the effect of 20 minutes of exercise on cravings and TWS among inactive pregnant smokers, undergoing temporary abstinence. Methods: Twenty-eight female smokers (Mage = 23.12 years, M weeks pregnant = 19.58, FTND = 2.7, M 8.5 cigarettes/day, M hours abstained = 16.98) were randomized to a 20min of light-moderate intensity exercise (EC; n = 15, 35-55% of heart-rate reserve) or passive sitting (PC) condition. Cravings and TWS were assessed immediately before (baseline), during (at 10min), immediately post, and at 10, 20, and 30min post-result. Conditions: A (2) condition x 6 (time) repeated measures ANOVA revealed that the EC condition significantly (p<0.05) reduced cravings (η2=0.50) compared to the PC condition across time. Nonsignificant trends were evident favoring the EC condition over time for TWS: depression (η2=0.41), irritability (η2=0.31), stress (η2=0.25), difficulty concentrating (η2=0.21), and restlessness (η2=0.19). Conclusions: Consistent with previous research, this study reveals that in pregnant smokers, a bout of exercise is associated with a reduction in cravings and similar patterns exist for TWS. Therefore, exercise may have the potential to help eliminate tobacco use during pregnancy.


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POS4-13
IS BRAIN DERIVED NEUROTrophic FACTOR (BDNF) ASSOCIATED WITH SMOKING INITIATION? REPLICATION EffORT IN A LARGE POPULATION SAMPLE

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Background: Brain derived neurotrophic factor (BDNF) is the most prevalent growth factor in the central nervous system having a key role in helping to support the survival of existing neurons as well as in the growth and differentiation of new neurons and synapses. There is evidence for the involvement of this growth factor in addictions and mental disorders, including depression. Recently, The Tobacco and Genetics (TAG) Consortium published genome-wide association (GWA) meta-analyses which identified altogether eight SNPs associated with smoking initiation. The most robustly associated variant was the Val66Met (rs2235191). Here, we aimed to replicate this finding in a large population-based sample and to test whether the association is independent of depression. Methods: Our sample was drawn from the Finnish population-based FINRISK Survey (n=26,647 with genotype and phenotype data). The BDNF Val66Met (G/A) variant was genotyped using standard protocols of iPLEX Gold technology on the MassARRAY System (Sequenom, San Diego, CA, USA). Smoking initiation phenotype was defined as ever smoking versus never smoking. The association between the gene and ever smoking was modeled using logistic regression adjusted for age and sex. Further, we adjusted the analysis for depression. This was depression diagnosed or treated by physician during the past 12 months. The allele main effects were modeled assuming an additive effect. In the FINRISK data the major (Val) allele frequency was 0.84. Results: The major (Val) allele increased the risk of being lifetime ever smoker (OR=1.07; 95%CI 1.01-1.12; p=0.01). When depression, which had a significant association with smoking (OR=1.49; 95%CI 1.37-1.62; p<0.001), was added to this model the association of the gene remained almost similar (OR=1.06; 95%CI 1.01-1.12; p=0.01). Further, when depressed individuals were excluded, the association of the gene remained significant (OR=1.06; 95%CI 1.01-1.12; p=0.02). Conclusions: In the Finnish population data we replicated earlier reported association of the BDNF gene and ever smoking. Interestingly, our data suggest that this association is independent of depression.

This work was supported by the Sigrid Juselius Foundation (JK), the Academy of Finland Center of Excellence in Complex Disease Genetics (JK) and the Finnish Cultural Foundation (TK).

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POS4-14
SMOKING AND QUITTING AMONG THE HOMELESS IN NOTTINGHAM, UK: A QUALITATIVE STUDY
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Background: Tobacco smoking is the single largest preventable cause of disease and premature death in the developed world and a major contributor to health inequalities. Among homeless people, smoking rates are estimated to reach up to 90% in those sleeping rough. This study aims to explore smoking and quitting related behaviours, experiences and attitudes as well as knowledge of smoking risks, nicotine dependence and confidence and motivation to quit. Method: Face to face semi-structured interviews were conducted with 15 purposively sampled homeless or vulnerably housed smokers in a Nottingham harm reduction service. Data was analysed using thematic analysis. Results: Findings demonstrated that homeless smokers did not have a good depth of knowledge around smoking risks or acknowledgement of potential impacts on their health. The participants were generally highly dependent smokers with 13 participants having an HIS score greater than 4. This dependency, alongside economic constraints, appeared to trigger high risk smoking behaviours such as sharing cigarettes and smoking discarded and low quality contraband tobacco. The majority of those interviewed had the motivation and confidence to quit in the future, but some described a lack of encouragement by health professionals and staff in homeless services. Conclusion: Homeless smokers are a high risk group of smokers. They engage in riskier smoking practices compared to the general smoking population due to fairly unique social interplays and poor economic resources, coupled with significant dependence, leading to high risk behaviours. Opportunities to provide tailored cessation services for homeless smokers in the UK are currently being missed. The development and assessment of targeted interventions and best practice models appears important.

Funding was received from the Division of Epidemiology and Public Health, University of Nottingham.

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POS4-15
WOULD REMOVING MENTHOL CIGARETTES FROM THE MARKET HAVE IMPLICATIONS FOR SMOKING CESSATION?
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The 2009 U.S. Family Smoking Prevention and Tobacco Control Act banned flavored cigarettes, with the exception of menthol. In 2011 the Food and Drug Administration (FDA) Tobacco Products Scientific Advisory Committee (TPSAC) stated, “removal of menthol cigarettes from the marketplace would benefit public health in the United States,” yet no regulatory action has been taken. This study examines prevalence of menthol cigarette smoking, menthol-cigarette smokers’ behavioral intentions if menthol cigarettes were not sold, and associations between demographic, smoking, and contextual factors with smoking intention among current menthol cigarette adult smokers 18 years and older. This study uses the 2010-11 U.S. National Cancer Institute-sponsored Tobacco Use Supplement to the U.S. Census Bureau’s and Bureau of Labor Statistics’ Current Population Survey data on 27,611 current smokers. There were 7456 current menthol smokers among non-Hispanic Black, female, and 18-24 year old smokers, respectively. Thirty eight percent of menthol smokers reported that they would quit smoking cigarettes and not use any other tobacco product if menthol cigarettes were no longer sold. Non-Hispanic Blacks and females were significantly more likely than non-Hispanic Whites or males, respectively, to state this choice. Those reporting general attempts to quit or interest in quitting had higher odds ratios (ORs) for quitting intentions in the absence of menthol cigarettes. Those with a primary history of smoking menthol cigarettes and all but the most dependent smokers had higher ORs, while use of other tobacco products and lack of a smoke-free home rule had lower ORs. Results suggest in the absence of menthol cigarettes, many smokers would make the choice to quit all tobacco use especially females and non-Hispanic Blacks who have higher rates of menthol cigarette smoking. This study gives further support to the TPSAC recommendation.

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POS4-16
PSYCHOLOGICAL ATTITUDES PREDICT SMOKING CESSATION OVER TIME IN THE WOMEN’S HEALTH INITIATIVE (WHI)
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Background: Low levels of optimistic attitudes and high levels of cynical attitudes toward others independently predict morbidity and mortality in WHI participants. At study entry, smokers were less optimistic and more cynical than nonsmokers. The present analysis examines whether optimism and/or cynical hostility affected future smoking behavior among smokers. Methods: 10,242 WHI smokers at study entry completed the Life Orientation Test-Revised (assessing optimism/pessimism (LOT-R)) and the Cook Medley cynical hostility subscale (both scores divided into quartiles). Multivariable mixed model logistic regression assessed self-reported smoking status (Y/N, ascertained by questionnaire) at 1, 3, 6 years after study entry, adjusted for baseline factors: age; ethnicity; education; insurance status; region; body mass index; cardiovascular disease, diabetes, cholesterol, or hypertension; any alcohol use; physical activity; smoking pack years. Results: Women were 61.0 years old (SD 6.8) and smoked 28.9 pack years (SD 22.2). Over 6 years, 35.7% had quit smoking. The least (vs. most) optimistic women were less likely to be high school graduates, physically active, white, insured, or to consume any alcohol (all p≤0.001). They were more likely to report diabetes, hypertension, and obesity (all p≤0.001) and greater pack-years (p=0.025). Least optimistic women were 33% less likely to quit smoking over time (OR=0.67 [0.56-0.81], p<0.001), which held after adjustment (OR=0.72 [0.59-0.88], p=0.012). The least (vs. least) cynical hostile women closely resembled the least optimistic women on all factors. The most cynical women were also less likely to quit smoking over time in unadjusted (OR=0.58 [0.48-0.70], p<0.001) and adjusted models (OR=0.60 [0.49-0.74], p<0.0001). Conclusions: The least optimistic and most cynical women were less likely to quit smoking over time. These findings underscore the role of psychological attitudes in longitudinal smoking behavior among older adults. More research is needed to investigate whether cessation programs tailored for attitudes are helpful, as well as the extent to which attitudes are modifiable to assist in smoking behavior change.

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POS4-17
UNASSISTED SMOKING CESSATION IN ARGENTINA
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Background: Pharmacotherapy to help smokers to quit is one of the most cost-effective medical interventions available, but it favors the increasing medicalization process: using drugs or health professionals to help patients stop smoking. In contrast, a large percentage of people who permanently stop smoking succeeded
without any form of assistance. In Argentina 90% quit smoking without assistance although there are few studies focused on reasons, motives and strategies that enable unassisted cessation. Objective: To describe motivations, facilitators and barriers involved in the process of unassisted smoking cessation in Buenos Aires. Methods: In 2011 and 2012, 30 qualitative semi-structured interviews were carried out with women and men over 18 years old who have stopped smoking without any help, in the province of Buenos Aires. Analysis was based on grounded theory. Results: The participants were 50% women with a mean age of 36 years old, most participants had completed high school or more years of formal education. The reasons mentioned by almost all interviewees were the desire of: improving health, feeling free of tobacco dependence, being pregnant or planning pregnancy and their children, who sometimes were the ones who asked their parents to quit smoking. The facilitators were: thinking about benefits brought by quitting smoking, the creation of smoke-free places, having family and friends support and recognition of and quitting at the same time with some friends or family members. The main obstacles in the process were being in smoke-allowed places, withdrawal symptoms and fear of not being able to quit. Finally, the main strategies reported by the interviewees were: “cold turkey”, will power and being convinced they wanted to stop. Conclusion: Since unassisted cessation is the most successful method used by ex-smokers in Argentina, health authorities should emphasize its effectiveness in population-based communication. At last, since smoke-free places were one of the most important facilitators in the process of unassisted cessation, it should be considered for enacting and enforcing legislation to promote these environments.

This study was funded by grant International Development Research Center de Canada - IDRC.

**POS4-18**

**PERINATAL SMOKING STATUS: DEVELOPMENT AND PILOT TESTING OF AN ASSESSMENT TOOL**

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Purpose/Background: Among the barriers to successful implementation of smoking cessation interventions, especially in the pregnant population in the clinical setting is the lack of a systematized method to identify the smoker. The self-report assessment tools that do exist were either not tested for reliability and validity, are based on data collected decades ago, or are not tailored to the pregnant population. The purpose of this study, therefore, was to develop and test a reliable and valid tool. Methods: In order to measure content validity, a literature review was conducted. A survey of 15 leading experts in the research field of smoking cessation across the nation then provided “best practice” items to be included in the tool. In a follow-up survey these same experts ranked the items for inclusion. One focus group of 12 local experts/health care providers reviewed the items and two focus groups of 10 pregnant smokers assessed appropriateness of items and clarity of questions. The 22 item tool was then administered to all pregnant women electronically via iPads at their first prenatal visit in an urban clinic and urine samples were sent for cotinine assay. Results: Pilot study data of 51 participants (100% Medicaid insured, 64% single marital status, 64% education high school or less) found that 33% had cotinine values indicating active tobacco use; 27.4% with very active use (>500mg/ml). Data on survey items that best predict smoker status showed that questions about past tobacco use and about knowledge of tobacco’s effects on the fetus and child were significantly associated. Further analyses will use an iterative item analysis that maximizes Cronbach’s alpha to winnow the number of items, and factor analysis will confirm the retained items. Implications: These findings will be utilized to influence perinatal health care policy regarding evidenced-based care regarding tobacco use assessment and intervention.

Binghamton University. Academic and Development Fund.

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**POS4-19**

**THE LINK BETWEEN CHILDHOOD ABUSE AND CIGARETTE SMOKING: DEPENDENCE, WITHDRAWAL, AND TOBACCO CESSION**

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Introduction: Those with a history of childhood abuse are more likely to smoke cigarettes than those without a history of abuse. Mechanisms underlying this greater prevalence are unclear. We examined whether smokers with a history of physical, emotional, or sexual abuse experienced greater levels of nicotine dependence and more severe withdrawal. We also compared quitting motives, quit attempts, and likelihood of successful tobacco cessation between those with and without a history of abuse. Methods: We analyzed data from a two-wave, national, random-digit-dial survey of adult cigarette smokers (n=751). We used mediation analyses to examine whether smokers with a history of abuse exhibited greater levels of dependence and more severe withdrawal, and whether this was accounted for by serious psychological distress (SPD). We also examined whether associations between abuse and quit attempts were mediated by quitting motives, and whether associations between abuse and cessation success were mediated by withdrawal severity. All estimates were adjusted for sociodemographic variables and co-morbid substance use. Results: At the first wave, all three types of abuse were directly or indirectly associated with greater dependence. Among those who made a quit attempt between the two waves of data collection (n=368), all three types of abuse were associated with more severe withdrawal symptoms (p < 0.05). These associations were only partially mediated by SPD. All three types of abuse were significantly positively associated with quitting motives, which was in-turn significantly positively associated with quit attempts (p < 0.05). The association between abuse and cessation success was mediated by withdrawal symptom severity. Conclusions: The greater prevalence of smoking found among those with a history of childhood abuse may be explained by heightened vulnerability to nicotine dependence and withdrawal, and may be partially due to co-morbid mental illness. Smokers with a history of abuse are motivated to stop using tobacco, but may be less likely to successfully quit due to greater levels of psychological distress, dependence and withdrawal.

No funding.

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**POS4-20**

**IMPLEMENTATION OF A CAMPUS-WIDE TOBACCO-FREE POLICY**

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Purpose: To assess the needs and feasibility of introducing a tobacco-free policy in an upstate New York university. Background: Despite the vast knowledge regarding tobacco use and its harmful effects on health and wellness, many college students continue to use tobacco products. According to the latest national statistics of 2010; an estimated 20.1% of young adults ages 18-24 continue to smoke cigarettes. Methods: A comprehensive evaluation process was implemented. Interviews were conducted with various key personnel on campus to identify stakeholders and existing resources. Results of the American College Health Association –National College Assessment Survey (last available in 2007) were evaluated and a recent survey of attendees at the film, Addiction Incorporated, was administered. Results: A tobacco-free sub-committee was formed under the “Interdisciplinary Tobacco Use Research Program” (ITURP) for further assessment of attitudes toward tobacco use and its effects on this campus community. This group then facilitated the formation of a university wide committee for a “Healthiest Campus” initiative with expectations to incorporate a tobacco-free campus policy. Analysis of the 2007 American College Health Association –National College Assessment Survey found that only 12.7% of this university population had received information from their university regarding tobacco use and prevention. Attendees (N = 187) at the film estimated that 36% of students used tobacco products, 86% would be proud to have a tobacco-free campus, but...
72% felt it infringes on tobacco users choices and 75% believe this policy is too hard to enforce. Conclusion/Implications: Further assessment of this university is needed via surveys and focus groups aimed more specifically at tobacco users of this university community. In order for implementation of a tobacco-free policy to be successful it must have both fundamental and institutional support. Then this campus can earn the title; “Healthiest Campus.”

Binghamton University; Academic and Faculty Development Fund.

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POS4-22
PREDICTORS OF WATERPIPE USE IN A SAMPLE OF JORDANIAN SCHOOL STUDENTS

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Introduction: Tobacco use is one of the major causes of mortality and morbidity worldwide. Numerous researchers have indicated the alarming increase in a different method of tobacco use which is known as waterpipe especially among youth living in the Eastern Mediterranean region. The purpose of this paper is to examine the predicting factors for waterpipe use among a sample of Jordanian school students. Methods: A cross-sectional study in Zarqa governorate, Jordan, was conducted in the spring of 2012 to explore the problem of tobacco use among adolescent. Zarqa Governorate is located at the central region of Jordan and is home to 15% of Jordan’s population. A total of 1050 questionnaires were randomly distributed in 11 public schools in the governorate three educational districts. These participants were randomly recruited from the 8th, 10th, &12th grades. Results: Of the 1050 students participated in the study a,1,000 (95.2%) were included in the study (489 boys and 511 girls, median age 15 years). Current waterpipe use in the study population was (30.7%), daily use was (26.6%), and previous month use was (36%). Girls composed twofold of boys waterpipe use. Students (23.1%) believed that smoking waterpipe help them in making friends particularly girls. Parent’s attitude toward waterpipe use, being a girl, knowing a classmate who smokes cigarettes, and feeling of inability to get “going” were all significant factors to predict waterpipe use by adolescents. Twenty percent of students are expecting to continue waterpipe smoking in the future. Conclusions: Prevalence of waterpipe smoking appears to be alarming among study participants primarily among girls. Waterpipe use is becoming a commonly acceptable behavior among adolescents especially girls. Evidence-based prevention and cessation programs are immensely needed to prevent the initiation of or reduce waterpipe smoking, as well as address co-occurring problem behaviors, to decrease the health risks associated with use among adolescents. Gender specific designed prevention and cessation programs should be directed toward female students to decrease and prevent the problem of waterpipe smoking among them. This study was funded by The Hashemite University, Zarqa, Jordan.

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POS4-23
TOBACCO USE AMONG INCARCERATED WOMEN IN KALOCSA PRISON, HUNGARY

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Background: There is very little information regarding tobacco-use behaviour among female inmates, especially outside the United States. We propose to fill this gap through a survey of inmates in the Kalocsa prison for women, located in southern Hungary. Methods: The study was conducted in the spring 2012. 181 prisoners completed a brief, self-administered questionnaire to obtain the following information: tobacco use behaviour before and during incarceration, knowledge of cessation strategies, quit attempts and future plans to quit, exposure to secondhand smoke, and inmate demographics. Results: Smoking prior to incarceration was more than twice that of the general Hungarian population (78.5%). Prevalence increased after imprisonment to 84.0%, suggesting the negative impact of incarceration on smoking habits. In addition occasional smokers prior to incarceration (3.7% of all smokers, n=163) increased the amount they smoked after imprisonment. Quit attempts were 63.9% among this population of female inmates. Unlike the general population, only 26.6% indicated that they plan to quit in the future. Further, only 1 person out of 8 non-smokers was exposed to SHS. Conclusions: Observations showed that correctional populations are characterized by very high rates of smoking. Provider and policy initiatives should
Second hand smoke (SHS) exposure is a health hazard and there is no safe level of exposure to tobacco smoke. Hotel workers in Nigeria may be at increased risk of exposure to SHS as Nigeria has not yet passed a law promoting smoke free workplaces despite several efforts to do so. This study sought to assess the knowledge, SHS exposure and attitudes towards smoke free policies among hotel workers in an urban local government area (LGA) in Lagos Nigeria. A cross sectional study design was employed using pre-tested interviewer administered questionnaires from 263 consenting hotel workers in 27 randomly selected hotels in the LGA. More than half of the respondents were female (60.8%). Mean age was 28.2±6.3 years. Majority (75.3%) spend more than 12 hours a day in the workplace. A considerable proportion (65.8%) of the respondents had never taken any form of tobacco in their lifetime. Most of them (91.3%) had heard of second hand smoke, 74.8% of which felt it was harmful to their own health. More than 80% were aware that SHS is linked to cancers, heart disease and asthma. Almost all (98.3%) had been exposed to SHS in the workplace, 84.7% of whom are exposed on most days of the week. Despite the relatively high awareness of the dangers of SHS, less than half (38% & 44.1%) thought that smoking should be banned in restaurants/clubs and public places respectively. Nevertheless, many of them (84.4%) would prefer to work in a smoke-free environment. These workers are regularly exposed to SHS in the workplace and most of them prefer to work in smoke-free environments. Despite this, their support for smoke free policies is relatively low. Policies to protect this group of workers must be put in place and programs to enhance their support for these policies should be considered.

No funding.

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SELECT TOXICANT YIELDS AND SALMONELLA MUTAGENICITY OF MAINSTREAM SMOKE EMISSIONS FROM CANADIAN “SUPER SLIM” CIGARETTES

Rebecca M. Maertens, M.Sc.*, Nemanja Mladjenovic, B.Sc., Evelyn C. Soo, Ph.D., and Paul A. White, Ph.D., Health Canada

Recently, cigarettes with a super slim design have entered the Canadian market, and these thinner cigarettes have the potential to be erroneously perceived as less harmful. The objective of this study was to examine the yields of select toxicants as well as the mutagenic activity of mainstream smoke from 5 brands of super slim cigarettes with different design features, as compared to reference cigarettes and a Canadian best seller. Mainstream smoke was generated under ISO and Canadian best seller conditions and analyzed for select toxicants using Health Canada Official Test Methods. Mutagenicity of the smoke condensates was evaluated using the pre-incubation version of the Salmonella mutagenicity assay. The standard test strain TA98 was employed, as well as the metabolically enhanced YG1041 and YG5185, which show increased sensitivity to nitroarenes/ aromatic amines and PAHs, respectively. The levels/yields of the majority of the selected toxicants in the super slim condensates (microgram/ cig) were lower in comparison to the Canadian best seller and reference cigarettes. However, levels of ammonia and the phenols were consistently similar or higher in the super slim brands. Although the toxicant yields were mostly comparable across the 5 super slim brands, the levels of the tobacco specific nitroarenes (particularly NNN) were notably higher in brands containing the mixed tobacco blend. Overall, lower mutagenic activity (revertants/ microgram total particulate matter) was observed for super slim brands containing Virginia flue-cured tobacco as compared to the Canadian best seller and reference cigarettes. However, in cases where the super slim cigarettes contained a mixed tobacco blend, comparable or greater mutagenicity was observed. Comparative examination of the mutagenicity and emissions from super slim cigarettes contribute to an improved understanding of the relationship between product design and potential mutagenic hazard of mainstream smoke. It should be noted that these analyses did not consider human exposure, hazard or risk. Therefore, based on this work, the super slim cigarette should not be considered ‘less harmful.’

Funding for this study was provided by Health Canada.

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SECONDHAND SMOKE EXPOSURE LEVELS IN OUTDOOR HOSPITALITY VENUES: A QUALITATIVE AND QUANTITATIVE REVIEW OF THE RESEARCH LITERATURE

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Background: Secondhand smoke (SHS) is a rich source of suspended particulates and is a significant contributor to total particulate load. Indoor smoke-free air
laws have substantially improved indoor air quality, but as jurisdictions implement indoor smoke-free legislation, outdoor areas of such locations may become more commonly cited sources of SHS. This study considers the evidence on whether outdoor smokers present in hospitality venues inhale high enough to potentially pose health risks, particularly among employees. Methods: Searches in PubMed and Web of Science resulted in the selection of 16 studies that reported measuring any outdoor SHS exposures (particulate matter (PM) or other SHS indicators). The SHS measurement methods were assessed for inclusion of extraneous variables that may affect observed levels or the corroboration of measurements with known standards. Using the data obtained from both experimental and observational studies in the peer-reviewed literature, estimates of excess PM2.5 exposure levels were calculated to approximate the above-background PM2.5 exposures that may be experienced by employees working at typical smoking-allowable outdoor hospitality venues. Results: The magnitude of SHS exposure, measured as PM2.5, depends on the number of smokers present, measurement proximity, presence of partial enclosures, and wind speed and direction. After accounting for average ambient PM2.5 levels, calculated 24-hour excess PM2.5 exposures of full time waitstaff exposed to SHS in outdoor environments could average 5.8 to 17.8 micrograms per cubic meter, resulting in annual excess PM2.5 exposures of approximately 4.0 to 12.2 micrograms per cubic meter under variable smoking conditions. Conclusions: Although highly transitory, these findings suggest that outdoor SHS exposures could occasionally exceed annual ambient air quality exposure guidelines, potentially leading to increased risk of adverse health effects among both employees and waitstaff at hospitality venues. Personal monitoring studies of waitstaff may be warranted to corroborate these modeled estimates.

Funding for this research was provided to author SC by the Sax Institute, NSW Australia. Funding was also supported, in part, to author ASL by Award Number R25CA113951 from the National Cancer Institute. The content is solely the responsibility of the authors and does not represent the official views of the National Cancer Institute or the National Institutes of Health.

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POS4-28
MENTHOL AND ARTIFICIAL SWEETENERS INCREASE ORAL NICOTINE INTAKE IN MICE

Lu Fan1,*, Seth Taylor2, Boyi Liu3, Aiwei Sui3, John B. Morris3, Marina R. Picciotto3, R25CA113951 from the National Cancer Institute. The content is solely the responsibility of the authors and does not represent the official views of the National Cancer Institute or the National Institutes of Health.

Background: The tobacco industry is increasingly marketing flavored, non-cigarette tobacco products, such as dissolvable tobacco products, which contain characteristic combinations of menthol, other flavor additives and high levels of artificial sweeteners. The flavor composition of dissolvable tobacco products, currently not regulated by FDA, is very similar to breath lozenges and candy products and may modify consumption behavior. These products may appeal specifically to adolescents, who may then be tempted to initiate the consumption of nicotine products. Menthol, nicotine, sweeteners and other flavors exert complex effects on the peripheral neuronal systems mediating flavor perceptions (somatosensory, olfactory and gustatory), and on metabolism. We recently showed that menthol inhibits the respiratory irritation response to tobacco smoke in rats, suggesting that menthol facilitates smoke inhalation. It is unknown whether menthol, or the artificial sweeteners contained in dissolvable tobacco products (xylitol, sorbitol, sucralose) modify oral consumption of nicotine. Methods: The two-bottle choice test and cotinine serum level measurements were used in mice to determine whether 1) menthol modulates oral consumption of nicotine and 2) whether the presence of sweeteners (sorbitol, xylitol and sucralose) affects oral nicotine intake in mice. Mice were provided choice solutions from 6pm-10am each day, with water available for the rest of the day to prevent any dehydration. Results: We observed that menthol (0.005%) and sweeteners (2% xylitol, 2% sorbitol, 0.01%-1% sucralose) significantly increased oral nicotine (10 microgram/ml) consumption. Specifically, mice consumed 57% more mentholated nicotine solution than nicotine alone, and 32-51% more sweetened nicotine solution than nicotine alone. Conclusions: Menthol, likely through its cooling and counterintert effects, diminishes oral nicotine aversion in mice, thereby facilitating the consumption of higher amounts of nicotine. Sweeteners such as xylitol, sorbitol and sucralose, also increased nicotine consumption, possibly through acting on sweet taste receptors. Supported by grants R01 ES015966 (from NIEHS to S.E.J.), R01HL105635 (from NHLBI to S.E.J. and J.B.M.) and R01 DA14241 (from NIDA to MR).

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POS4-29
SOCIOECONOMIC AND COUNTRY VARIATIONS IN CROSS-BORDER CIGARETTE PURCHASING AS TOBACCO TAX AVOIDANCE STRATEGY: FINDINGS FROM THE INTERNATIONAL TOBACCO CONTROL (ITC) EUROPE SURVEYS

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Background: Tobacco taxation is one of the most effective policy measures to discourage tobacco use. However, the effectiveness of national tax policies in the European Union (EU) may be attenuated by the open borders which allow smokers to import cigarettes for personal use from other EU countries. As cigarette prices differ between EU countries, smokers are tempted to buy cheaper cigarettes across the border. Little is known about socioeconomic differences in tobacco tax avoidance as few studies have used individual-level data. The aim of the current study is to describe socioeconomic and country variations in cross-border cigarette purchasing in six European countries. Methods: Cross-sectional data from adult smokers (n = 7,873) from the International Tobacco Control (ITC) Surveys in France (2006/7), Germany (2007), Ireland (2006), Netherlands (2008), Scotland (2006), and the rest of the United Kingdom (2007/8) were used. Respondents were asked whether they had bought cigarettes outside their country in the last six months and how often. Results: In French and German regions bordering countries with lower cigarette prices, 24% and 13% of smokers respectively reported purchasing cigarettes frequently outside their country. In non-border regions of France and Germany and in Ireland, Scotland, the rest of the United Kingdom, and the Netherlands, frequent purchasing of cigarettes outside the country was reported by only 2% to 7% of smokers. Smokers with higher levels of education or income were more likely to purchase cigarettes outside their country. Frequent purchasing of cigarettes outside the country was also more common among younger smokers, daily smokers, heavier smokers, and smokers who did not plan to quit smoking. Conclusions: Cross-border cigarette purchasing is more common in European regions bordering countries with lower cigarette prices and is more often reported by smokers with higher education and income. A reduction in price differences between EU countries by increasing taxes in countries with lower cigarette prices together with reducing the number of cigarettes that can be legally imported may help to decrease cross-border purchasing.

The ITC Europe surveys were supported by grants from the French Institute for Health Promotion and Health Education, the French National Cancer Institute (France wave 1), the Netherlands Organisation for Health Research and Development (the Netherlands wave 1), German Federal Ministry of Health, Dieter Mennekes-Umweltstiftung and Germany Cancer Research Center (Germany wave 1), U.S. National Cancer Institute R01 CA90955 (Ireland wave 3), Cancer Research UK C312/6465 (United Kingdom wave 5), NHS Health Scotland RD05 and Flight Attendants’ Medical Research Institute (Scotland wave 3). G. Fong is supported by the Roswell Park Transdisciplinary Tobacco Use Research Center (P50 CA111236, R01 CA100362, and PO1 CA138389); Robert Wood Johnson Foundation (045734); U.S. National Cancer Institute (R01 CA123516); Canadian Institute of Health Research (57897 and 79551); a Senior Investigator Award from the Ontario Institute for Cancer Research (57897 and 79551); Robert Wood Johnson Foundation (045734); and the Roswell Park Transdisciplinary Tobacco Use Research Center (P50 CA111236, R01 CA100362, and PO1 CA138389); Robert Wood Johnson Foundation (045734); U.S. National Cancer Institute (R01 CA123516); Canadian Institute of Health Research (57897 and 79551); a Senior Investigator Award from the Ontario Institute for Cancer Research and a Prevention Scientist Award from the Canadian Cancer Society Research Institute. This paper is a deliverable within the SILNE Project ‘Targeting socio-economic inequalities in smoking: Learning from natural experiments by time trend analyses and cross-national comparisons’. The SILNE Project is funded by the European Commission through FP7 HEALTH-F3-2011-278273.

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Poster Session 4 • Saturday, March 16, 2013 • 12:15 p.m.–1:45 p.m.
POS4-30
NATURAL HISTORY OF ATTEMPTS TO STOP OR REDUCE SMOKING: A PROSPECTIVE STUDY

John R. Hughes, James R. Fingar, Shelly Naud, Laura J. Solomon, John E. Helzer, and Peter W. Callas

Background: We previously published two small (n < 40 Ss), short (< 1 month) prospective, natural history studies of the day-to-day process of quitting smoking. The current study is a larger (n= 152), longer (3 months) replication test. Methods: Smokers who intended to quit in the next 3 months called in nightly to an Interactive Voice Response System to report intentions to smoke or stop the next day, cigs/day, quit attempts, and reduction attempts. No treatment was provided. Results: 127 participants made 88 quit attempts that lasted a full day, and 323 quit attempts that lasted less than a day. The large majority (65%) of intentions to not smoke the next day were not followed by a quit attempt. Most smokers (60%) had multiple (and often rapid) transitions among smoking, abstinence or reduction episodes. The majority of quit attempts (72%) were not planned. The duration of unplanned quit attempts was shorter than that of planned quit attempts (1 vs 25 days). The large majority of quit attempts (66%) did not last a day and most lapses (60%) lead immediately to daily smoking. Reducing smoking by > 50% was as common as abstinence (427 vs 411 episodes) and was unrelated to the start or end of a quit attempt. Conclusions: These results replicate our prior work that cessation is a more chronic and complex process than current theories and treatments assume. Our prospective results replicate prior retrospective results that spontaneous quit attempts are common, but contradict results that spontaneous quit attempts are as successful as planned quit attempts. Our results are consistent with recent descriptions of a much greater amount of quitting activity than previously thought (Borland et al, Addiction 107:673) and are consistent with descriptions of a chronic/complex model of cessation (Baker et al, Ann Behav Med 41:92) that suggest multiple targets for treatments (e.g., prompting quit attempts, preventing lapses, preventing relapses, and prompting reduction to lead to cessation). Further research using population-based or special populations (e.g. adolescents) is needed to test the generalizability of our findings.

Funding: NIH grant DA-0259089.

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POS4-33
FINANCIAL INCENTIVES TO PROMOTE SMOKING ABSTINENCE IN PATIENTS DIAGNOSED WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE

Mollie E. Patrick*,1, Andrew C. Meyer2, Charlotte Teneback3, Anne Dixon3, Leigh Ann Holterman4, and Stacey C. Sigmon1,2, 1Department of Psychology, University of Vermont; 2Department of Psychiatry, University of Vermont; 3Department of Pulmonary Medicine, University of Vermont; 4Department of Biostatistics, University of Vermont

Background: Chronic obstructive pulmonary disease (COPD) is a serious respiratory illness that is predominantly caused by cigarette smoking. While smoking cessation is identified as the most effective intervention to reduce COPD-related morbidity and mortality, rates of cessation among COPD patients are notoriously low. We have an ongoing pilot study investigating the initial efficacy of a brief behavioral intervention for promoting smoking abstinence in patients diagnosed with COPD. Methods: Participants must report smoking >10 cigs/day and have a diagnosis of COPD and chronic airflow obstruction (post-bronchodilator FEV1/FVC <70%). All participants receive a brief educational session on the importance of smoking cessation, attend the clinic daily for 14 days and provide both breath CO and urinary cotinine samples at each visit. Participants are randomized to one of two experimental groups: the Contingent group earns voucher-based incentives ($362.50 max) delivered contingent upon biochemically-verified smoking abstinence and the Noncontingent group receives vouchers independent of smoking status. Results: Thus far, seven participants have been randomized (Contingent, n=4; Noncontingent, n=3). Participants on average are 55 years old, 66% male and report smoking 15 cigs/day. While abstinence is generally high for both groups, there is a trend toward greater biochemically-verified smoking abstinence among Contingent vs. Noncontingent participants (68% vs. 50% negative samples, respectively; p=.11). Conclusions: Our preliminary analyses suggest that this incentive intervention may be effective in producing initial abstinence among smokers with COPD. By March 2013 we will have a more complete dataset from this study (n=20) which will include primary smoking abstinence outcomes as well as measures of nicotine withdrawal, craving and self-reported changes in pulmonary symptomatology. Overall, this study is positioned to provide the first strong demonstration that smokers diagnosed with COPD can quit smoking and may be used to develop a longer-term smoking cessation intervention for this challenging population of smokers.

Funding: NIDA T32 DA007242.

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INVESTIGATING THE EFFECTIVENESS OF PICTORIAL HEALTH WARNINGS IN MAURITIUS: FINDINGS FROM THE ITC MAURITIUS SURVEY

Annika C. Green, M.P.H.1,2, Geoffrey T. Fong, Ph.D.1, Pete Driezen, M.Sc.1, Anne C.K. Quah, Ph.D.1, and Premduth Burhoo, M.Res.1, 1University of Waterloo; 2Mauritius Institute of Health

BACKGROUND: Pictorial warnings have been shown to be effective in informing people about the harms of smoking and in motivating smokers to quit. However, nearly all of the evidence on pictorial warnings comes from high-income countries. In 2009, Mauritius became the first African country to implement pictorial warnings. AIM: To evaluate the impact of pictorial warnings on smokers’ perceptions and behaviours in Mauritius. METHODS: Data came from Waves 1, 2, and 3 of the ITC Mauritius Survey, a representative national sample of 600 smokers conducted April-May 2009 (6 months prior to the implementation of pictorial warnings), Aug–Oct 2010 (10-12 months after implementation), and June–July 2011 (21-23 after). Key indicators of warning effectiveness were examined across the 3 survey waves in Mauritius, including salience (noticing, reading closely), thoughts about health risk, motivation to quit, and forgoing a cigarette because of the warnings. We tested (1) whether the indicators increased after introduction of pictorial warnings, and (2) whether there was ‘wear-out’ at second follow-up. RESULTS: Analyses showed that after the introduction of pictorial warnings, the Label Impact Index, a weighted average of indicators, increased significantly (p<0.001). From Wave 1 to Wave 2, all indicators increased including noticing (58 – 82%), looking closely at warnings (30 – 52%), and thinking about health risks ’a lot’ (13 – 38%). However, all indicators either levelled off or slightly decreased from Wave 2 to Wave 3. The percentage of smokers who said that the warnings made them ‘a lot’ more likely to quit remained at 24% from Wave 2 to Wave 3. The percentage of smokers reporting avoiding the warnings (a positive indicator of effectiveness) increased from 13% to 39% at Wave 2, and then fell to 22% at Wave 3. CONCLUSION: Pictorial warnings led to significant increases in effectiveness in Mauritius, as they have in all high-income countries where they have been evaluated. However, there was evidence of wear-out after 2 years, supporting the FCTC Article 11 Guidelines that governments should revise their warnings to maintain their effectiveness.

Surveys were conducted in Mauritius and analyses were conducted at the University of Waterloo. Funding was received from the International Development Research Centre (Waves 1 and 2), Bill and Melinda Gates Foundation (Waves 1 and 2), Mauritius Ministry of Health and Quality of Life, Canadian Institutes of Health Research, Bloomberg Global Initiative, Ontario Institute for Cancer Research, World Lung Foundation.

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Context: The decline in smoking has become stagnant at the population level among adults in the US over the past decade. The reason for this is not known. One possibility is that the proportion of smokers with conditions that are barriers to successful smoking cessation, such as depression and anxiety disorders, has increased. Objective: The goal of this study was to determine whether and to what degree the proportion of smokers with depression and anxiety disorders in the US adult population has increased over time, and whether these trends differ between men and women. Design: Survey. Setting: US adult population. Participants: Data were drawn from the National Comorbidity Survey (NCS; 1990) and the National Comorbidity Survey-Replication (NCS-R; 2001), which are epidemiologic surveys representative of the US adult population. Main outcome measure: A chi-square test was used to determine the difference between the prevalence of depression and anxiety disorders among daily smokers in 1990 and 2001. These analyses were also run stratified by gender. Results: The prevalence of depression and all anxiety disorders was statistically significantly higher in 2001 compared with 1990. The most prominent increases were among panic attacks, panic disorder, specific phobia and GAD. Conclusions: The proportion of smokers with depression and anxiety disorders appears to have increased from 1990 to 2001. Future studies that can examine these trends by assessing mood and anxiety disorders among varying levels of smoking and up to the present time are needed next. If these results are replicated, it may be that efforts at reducing the smoking prevalence further will only be successful if tobacco control/smoking cessation takes these factors into account.  

No funding.

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SMOKING DEPENDENCE ACROSS THE SMOKING SPECTRUM IN A TRI-ETHNIC SAMPLE

Taneisha S. Buchanan, Ph.D.1,2, Lisa Sanderson Cox, Ph.D.2, Nicole L. Noll, Ph.D.1, Carla J. Berg, Ph.D.1, Hongfel Guo, Ph.D.1, Ken Reischow, Ph.D.1, and Jasjit S. Ahlawat, M.D., M.P.H., M.S.1, 1University of Minnesota Medical School; 2University of Kansas School of Medicine; 3Emory University School of Public Health; 4University of Michigan School of Public Health

Background: Nondaily smokers (NDS) comprise 22% of current US smokers and ethnic minorities are disproportionally represented. Nicotine dependence among NDS is poorly understood. The Brief Wisconsin Inventory of Smoking Dependence Motives (WISDM) is a 37-item multi-dimensional measure of smoking dependence that assesses smoking motives categorized into Primary Dependence Motives (e.g., cravings) and Secondary Dependence Motives (e.g., weight control). The goal of this study was to examine differences in smoking dependence by smoking level and to determine whether there were racial and ethnic differences. Methods: Participants were 2,376 smokers recruited using an online panel research company. Sampling was stratified to obtain equal numbers of participants by race/ethnicity and smoking level and found significant interaction effect (p<0.001). While scale scores for the WISDM total, Primary Dependence Motives scale, and Secondary Dependence Motives scale were comparable across racial and ethnic groups, Latino NDS...
endorsed marginally higher smoking motivations than African Americans and Whites across subscales. Conclusions: Consistent with prior research, the results indicate that smoking dependence as measured by the WISDM is higher among heavier smokers, but that NDS are in fact endorsing measurable dependence. The overall pattern of results is similar for African Americans, Latinos, and Whites with statistically significant but small differences among Latinos. 

This project is funded by Pfizer’s Global Research Awards for Nicotine Dependence (Ahluwalia). Dr. Ahluwalia is supported in part by the National Institute for Minority Health Disparities (NCMHD/NIH - P20MD003422).

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### POS4-37
**FINANCIAL INCENTIVES TO SUSTAIN SMOKING ABstinence IN OPIOID-MAINTAINED PATIENTS**


Background: Approximately 90% of patients receiving methadone or buprenorphine for opioid dependence smoke cigarettes. Despite this, little progress has been made in developing effective treatments for this challenging group of smokers. Two prior studies by our group demonstrated that an intensive 2-week behavioral intervention produced significant smoking abstinence in this group (Dunn et al., 2008, 2010). We are now conducting a longer-duration trial aimed at sustaining the abstinence achieved in those initial weeks. Methods: During Weeks 1-2 of this 12-week trial, subjects attend the clinic daily and earn voucher-based incentives for biochemical evidence (breath CO, urinary cotinine) of smoking cessation. At the end of Week 2, subjects are randomized to either an Extended Contingent (vouchers contingent on smoking status) or Extended Noncontingent (vouchers independent of smoking status) group for the remaining 10 weeks. We hypothesize that continued reinforcement of abstinence will be necessary to sustain the abstinence achieved in the initial weeks of the cessation effort. Results: Thus far, 51 subjects have completed the trial (33 yrs old, 41% male). At the end of Week 2, 65% of subjects are abstinent. During Weeks 3-12, there is a trend toward the Contingent group achieving greater smoking abstinence than the Noncontingent (46% vs. 29% smoking-negative samples, respectively, p=0.15). Similar patterns are evident in self-reported cigs/day, mean expired CO and urinary cotinine levels. Conclusions: Consistent with our prior studies, this intervention is producing relatively high levels of smoking abstinence during the initial two weeks following the quit attempt. Preliminary data suggest that ongoing reinforcement of abstinence may be necessary for sustaining the initial smoking abstinence achieved, though there does appear to be a subset of patients who can avoid relapse following a brief but intensive smoking intervention. Full data from the completed trial will be presented at the March 2013 meeting, including analyses of baseline characteristics which may predict individuals who need brief vs. extended treatments for smoking cessation.

Funding: R01 DA019550, T32 DA07242.

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### POS4-38
**COTININE AND TOBACCO-SPECIFIC CARCINOGEN EXPOSURE AMONG NONDAILY SMOKERS IN A COMMUNITY SAMPLE**

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Background: Nondaily smoking has increased among current US smokers in the past decade. Among current smokers, 25.6% of African Americans, 38.5% of Latinos, and 21.7% of Whites smoke nondaily. While there has been a growing body of research on nondaily smoking, little is known about levels of exposure to tobacco toxiquents among nondaily smokers. Methods: We examined levels of cotinine and the carcinogenic tobacco-specific nitrosamine NNAL in urine in community participants who took part in focus groups and completed a brief survey. Results: Participants were 29 African Americans, 4 Latinos, and 25 Whites who smoked at least one cigarette on 4-24 days in the past 30 at the time of eligibility. The majority of participants were male (55%) and the mean age was 42 (SD = 10). Participants averaged 3.3 (SD = 2.1) cpd on days smoked; smoked an average of 13 (SD = 6) days in the past 30 days, and had been smoking nondaily for 10.5 (SD = 10.5) years. 17% smoked within 30 minutes of waking, 46% used other forms of tobacco (e.g., hand-rolled cigarettes, cigars, cigarillos) in the past 30 days. Mean levels of creatinine-normalized cotinine were 791ng/mg (SD = 915) and NNAL 264pg/mg (SD = 420), with cotinine detected in 53 of 57 nondaily smokers (one participant provided insufficient urine for this analysis) and NNAL detected in 55 of the 58 nondaily smokers. Associations between the biomarker data and smoking characteristics were evaluated using Spearman’s rank correlation analysis. Urinary NNAL and cotinine were correlated, r = 0.84. NNAL was correlated with cpd, r = 0.38, and cotinine with cpd, r = 0.33 (all p values <0.05). Number of days smoked in the past 30 was not associated with any biomarker levels. Conclusions: While there was large individual variability in biomarker levels, our findings demonstrate that nondaily smokers are exposed to significant levels of carcinogens. This community sample had higher levels of exposure to NNAL than previous research with college student nondaily smokers. Thus, in determining level of health-related risk among nondaily smokers, researchers should attend to demographic factors that may influence overall intake and exposure.

This project is funded by Pfizer’s Global Research Awards for Nicotine Dependence (Ahluwalia). Dr. Ahluwalia is supported in part by the National Institute for Minority Health Disparities (NCMHD/NIH - P20MD003422).

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### POS4-39
**SMOKING HARM REDUCTION AMONG NONDAILY SMOKERS: A CLUSTER ANALYSIS WITH A TRI-ETHNIC SAMPLE**

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Background: Nondaily smokers (i.e., smoking only on some days of the month) comprise 22% of US current smokers. However, no empirically supported smoking cessation intervention exists for this population. This study identified clusters or subgroups of nondaily smokers based on various psychological and behavioral characteristics, in particular harm reduction motivations and behaviors. Methods: Participants were 1,201 nondaily smokers (smoke <25 days in the past 30) recruited using an online panel sample. Equal numbers of African American, Latino, and White smokers were recruited and 55.8% were female. Hierarchical cluster analysis was performed using four items assessing use of smoking harm reduction strategies (limiting number of cigarettes, limiting number of cigarettes each day, smoking only some days, and switching brands to reduce health risks). Results: The pseudo F statistic indicated that the best model fit had 2 clusters. The two clusters were compared on smoking history and health behaviors (e.g., diet and alcohol use) using Chi-square tests and t-tests. We titled one the harm reducing cluster as they had significantly higher scores on all four smoking harm reduction items. Cluster 2 was more likely to smoke mainly with others and when they consumed alcohol. The harm reducing cluster had greater perceived risk of developing smoking-related disease (e.g., lung cancer), was more likely to consume 3 or more servings each of fruits and vegetables daily, and exercised for longer periods of time. Interestingly, participants in the harm reducing cluster also indicated that the price of cigarettes influenced them to smoke less and increased their desire to quit. Additionally, African American and Latino participants were more likely to belong to the harm reducing cluster than cluster 2. Conclusions: These findings suggest that nondaily smokers who limit their intake to reduce the harms of smoking perceive higher risks of smoking and engage in other health promoting behaviors. Interventions for nondaily smokers should address their
underlying motivation for limiting their cigarette intake and the context of their smoking.

This project is funded by Pfizer's Global Research Awards for Nicotine Dependence (Ahlawatia). Dr. Ahlawatia is supported in part by the National Institute for Minority Health Disparities (NCMHD/NIH - 1P60MD003422).

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POS4-40
A DOUBLE-BLIND RANDOMIZED CONTROLLED TRIAL EVALUATING THE EFFICACY OF ATTENTIONAL RETRAINING ON ATTENTIONAL BIAS AND CRAVING IN SMOKERS ATTEMPTING CESSION
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Background: Smokers show attentional bias, meaning they attend preferentially to cigarettes and related cues. Attentional bias may contribute to craving and failure to stop smoking. Modified visual probe tasks have been used in laboratory studies to manipulate attentional biases for smoking cues, although these procedures have not been applied in smoking cessation programmes. We conducted the first trial to examine the efficacy of multiple sessions of attentional retraining (AR) on attentional bias, craving, and abstinence in smokers attempting cessation.

Methods: Adult cigarette smokers (N=118) were randomized to a modified visual probe task with AR or placebo training (PT). Training began 1 week prior to quit day and was delivered weekly for 5 sessions. Both groups received 21mg transdermal nicotine patches for 8–12 weeks and withdraw-orientated behaviour support for 7 sessions. Primary outcomes included the difference in attentional bias reaction time measured at baseline and 4-weeks post-quit. Urge to smoke was measured weekly using the Mood and Physical Symptoms Scale (MPSS). The secondary outcome, prolonged abstinence, was measured and biochemically validated at each session. Results: The sample smoked a mean of 20.6 (SD=9.2) cigarettes/day and mean FTND=5.5 (SD=2.3). Post-training bias scores were lower in the intervention than control group (mean difference=-7.9ms), though this did not reach statistical significance (p=0.19). After adjusting for baseline bias scores, no significant main effects or interactions were found by group/abstinence status (p=0.17). Mixed-effects linear regression analyses indicated that from quit-day to 4-weeks, craving was lower in abstinent smokers who received AR than PT but this was not statistically significant (b=0.25, 95% CI=-1.41, 0.91, p=0.67). There was no significant difference in the proportion of smokers achieving prolonged abstinence at 4-weeks (RR=0.97, 95% CI=0.67, 1.40). Conclusions: Multiple sessions of AR using a modified visual probe task had no effect on attentional bias, craving and abstinence outcomes. The findings call into question the clinical value of AR procedures for treatment-seeking smokers.

This work was supported by a National Institute for Health Research Doctoral Research Fellowship (DRF-2009-02-15) to R.Begh. This study was conducted while the first author was at the University of Birmingham.

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POS4-41
BROAD APEAL OF ELECTRONIC CIGARETTES IN THE SMOKER POPULATION CONTRASTS WITH RELATIVELY LOW APPEAL OF SNUS
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Background: Since 2006 when RJ Reynolds and Philip Morris started promoting snus, there has been considerable research directed at snus and its controversial status as a potential harm reduction strategy for cigarette smokers. Studies of snus trial have been published, showing robust interest primarily among young adult male smokers, but little has been learned about the rate of progression to regular use. Electronic cigarettes, which appeared on the American market at about the same time as snus, have received much less attention. We carried out a population-based study in 2011 and 2012 in the two US metropolitan areas where the Camel and Marlboro Snus have been available the longest. The survey included questions on trial and current use of electronic cigarettes, allowing us to compare the appeal of both of these novel tobacco products at the population level.

Methods: Data are from a telephone survey of a dual frame, representative address-based sample of 3364 adults in Indianapolis and Dallas/Fort Worth, supplemented by a mail survey of 1796 adults for whom no phone numbers could be obtained. Results: Among males, snus trial was slightly higher than e-cigarette trial (29.9% vs 22.7%); but current use of snus was only half that of current e-cigarette use (4.2% vs 8.6%). Among females, trial of snus is only one third that of e-cigarettes (8.5% vs 25.5%; p<0.05) and while almost no females are current snus users, 6% of female smokers reported current use of e-cigarettes. There is a clear age gradient for snus trial and use among male smokers with younger men much more receptive to snus than older. For e-cigarette use, smokers 50 to 65 years of age show the highest rates of current use. Conclusions: Smokers seem more receptive to adoption of e-cigarettes than snus. The very different demographic profile of snus and e-cigarette users suggests different motivations for use. These findings underscore the importance of devoting more attention to the e-cigarette phenomenon in the future.

The research was supported by a grant from the National Cancer Institute.

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POS4-42
FACTORS INFLUENCING THE TOXICANT CONTENT OF ELECTRONIC CIGARETTE VAPOR: DEVICE CHARACTERISTICS AND PUFF TOPOGRAPHY
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Background: "Electronic cigarettes" (ECIGs) heat a nicotine-containing solution to produce a vapor for inhalation. There is considerable variability in device characteristics and puff topography and each of these factors may be related to vapor toxicant content. Method: We investigated the role of device voltage and puff duration on vapor toxicant content. We examined total particulate matter, nicotine, and volatile aldehyde emissions from 15 consecutive puffs of V4L™ ECIG cartridges (16 mg/ml nicotine) while varying device voltage (3.7 vs 5.2 volts) and machine-produced puff duration (1.8 vs 3.6 s). We used a puff velocity of 38.8 m/s and 10 s interpuff interval (Goniewicz et al., 2012). In another study, we investigated a non-cartridge ECIG use method that involves dripping nicotine-containing liquid directly onto a heating element and inhaling the resulting vapors. We measured aldehyde emissions from dripping 3 drops of e-liquid (16 microL, similar to the amount of e-liquid consumed in 15 e-cig puffs) onto a 300 C heater surface. Results: The higher voltage tripled vapor nicotine content, and doubling puff duration doubled nicotine content. We also found that longer puffs resulted in greater cartridge temperatures, and that, for a given puff duration, higher puff velocities resulted in lower temperatures. Dripping liquid onto a heater surface produced more than 200 micrograms of formaldehyde, compared to 0.03 micrograms for 15 puffs of an ECIG cartridge (V4L™cartridge, topography of Goniewicz et al., 2012). We also measured 2-20 fold greater emissions of other aldehydes (9 species in total). Conclusions: Overall, these results demonstrate that device characteristics (e.g., voltage), puff topography, and use behavior (i.e., "dripping") can influence vapor toxicant content. Indeed, these findings suggest that ECIG aficionados who take longer duration, slower puffs (Hua et al., 2011) are working to obtain higher nicotine doses and that those who drip liquid directly on the heater (McQueen et al., 2011) risk significant exposure to formaldehyde that is a human carcinogen and is associated with COPD in conventional tobacco product users.

This work was supported by USPHS grants R01CA120142 and R01 DA025659.

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POS4-43
CREDIBILITY BELIEFS TOWARDS NICOTINE REPLACEMENT THERAPY AND EXERCISE AS CESSATION AIDS IN WOMEN ATTEMPTING TO QUIT SMOKING

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Background: Despite the array of cessation aids available to smokers, minimal research has been dedicated to examining smokers’ beliefs about the credibility of such treatments. Previous research has shown that patients’ beliefs regarding the credibility of psychotherapy are important predictors of treatment outcome for various health concerns. The objectives of this study were (1) to examine successful quitters’ beliefs over time regarding the credibility of Nicotine Replacement Therapy (NRT) and exercise as quit-smoking aids and (2) to assess whether treatment credibility beliefs predict final smoking status outcome.

Methods: Participants consisted of a subsample of female smokers (N = 146) in a 14-week exercise and NRT cessation program (Getting Physical on Cigarettes, NCT01305447). Credibility beliefs were collected at baseline (before starting the exercise program), week five of regular exercise (one week after quitting smoking and starting the 21 mg patch) and week 14 (end of the exercise and NRT program). Results: Among those who successfully quit smoking at week 14 (n = 51; CO < 6 ppm), a 2 (exercise vs. NRT) by time (baseline, week 5, and week 14) repeated ANOVA showed that credibility scores for both exercise and NRT significantly increased over time, F(2, 99) = 16.14, p = .001, ηp2 = .246; however, no group by time interaction effects were found F(2, 99) = 1.05, p = .424, ηp2 = .021. ANOVAs showed that only exercise credibility assessed at week five predicted smoking status at the end of the program, F(1, 107) = 8.195, p = .005. Neither exercise nor NRT credibility beliefs assessed at baseline predicted smoking status (p > .05). Conclusions: Overall, these findings suggest that credibility beliefs towards exercise and NRT as cessation aids increase over time and that exercise is perceived to be as credible as the nicotine patch among women who have successfully quit smoking. Furthermore, exercise, and not NRT, credibility beliefs predict smoking cessation status.

This study is supported by the Canadian Cancer Society Research Institute (#019676).

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POS4-44
EXPOSURE TO TOBACCO RETAIL OUTLETS AND SMOKING INITIATION AMONG PUBLIC HIGH SCHOOL STUDENTS IN NEW YORK CITY

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Background: Accumulating research suggests that exposure to tobacco products and marketing in retail settings is associated with increased odds of smoking experimentation among adolescents. Few studies have examined the exposure-initiation relationship using large samples from urban areas that are racially diverse. This study was designed to estimate the relationship between exposure to tobacco retail outlets and smoking initiation in a diverse urban setting.

Methods: Data came from the 2011 NYC Youth Risk Behavior Survey (YRBS), a population-based, self-administered survey of over 10,000 public high school students in New York City. Respondents indicated how many days a week they visit store types that sell tobacco and whether they had tried smoking for the first time in the previous 12 months. Measures of social norms, living with a smoker, risk-taking behavior and socio-demographic characteristics were also collected. Logistic regression analyses were conducted to estimate the exposure-initiation relationship and test for effect modification while controlling for covariates.

Results: The predicted probability of smoking initiation increased from 7.7% for 0 days a week exposed to tobacco retailers to 16.0% for exposure 7 days a week. The odds of initiation were significantly higher among adolescents exposed to tobacco retail outlets 2 days or more a week compared with those exposed less often (AOR = 1.41, p<0.01). The results did not vary by race. There was a significant interaction between retail exposure and risk taking indicating that the relationship between exposure and initiation attenuated as risk taking increased (AOR = 9.0, p<0.01). Among students with no history of risky behaviors, frequent retail exposure predicted 33% higher odds of initiation; at high levels of risk taking, frequent retail exposure was not associated with initiation. Conclusions: These results are consistent with past research showing that frequent exposure to tobacco marketing in retail settings is associated with increased odds of initiation. Reducing exposure to tobacco retail marketing could play an important role in curtailting smoking among adolescents.

No funding.

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POS4-45
OPINIONS OF SMOKERS WITH A MENTAL HEALTH ILLNESS TO HARM REDUCTION STRATEGIES FOR THEIR SMOKING

Renee Bittoun*, Melinda Barone, Emma L. Elcombe, Colin Mendelson, and Nick Glozier

BACKGROUND: The aim of this study to identify the opinions of smokers with a mental illness towards the use of Nicotine Replacement Therapy (NRT) for harm reduction. Smokers with mental illness appear as motivated to quit as smokers without but their outcomes are poorer. Alternative interventions for these smokers have been limited to advising tobacco intake reduction which often leads to compensatory smoking. An untested approach is to use NRT while continuing to smoke as a harm-reduction strategy which may also act as a ‘gateway to quitting’. Smoking reduction with NRT increases long-term cessation among smokers though this has not been studied in those with mental illnesses. In this pilot study we aimed to evaluate whether the provision of information regarding alternative NRT use might influence attitudes towards engaging in a harm reduction program.

METHODS: Smoking patients attending a mental health outpatient clinic voluntarily participated in this research (N=43). Informed Consent was obtained and anonymity assured. Participants were asked four questions evaluating their knowledge of NRT with respect to its safety, harm reduction, health and financial benefits. In addition, participants were given information about alternative NRT use as a harm-reduction strategy which may also act as a ‘gateway to quitting’. Smoking reduction with NRT increases long-term cessation among smokers though this has not been studied in those with mental illnesses. In this pilot study we aimed to evaluate whether the provision of information regarding alternative NRT use might influence attitudes towards engaging in a harm reduction program.

METHODS: Smoking patients attending a mental health outpatient clinic voluntarily participated in this research (N=43). Informed Consent was obtained and anonymity assured. Participants were asked four questions evaluating their knowledge of NRT with respect to its safety, harm reduction, health and financial benefits. In addition, participants were given information about alternative NRT use as a harm-reduction strategy which may also act as a ‘gateway to quitting’.

Conclusions: Smokers may not recognise all the options to smoking cessation available. By educating smokers with a mental illness in the concomitant use of NRT as a potential ‘gateway to quitting’, this study indicates an increased likelihood of these smokers changing their attitude to such an intervention and the possibility that this group of smokers may achieve higher successful cessation rates if offered this option.

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POS4-46
QUITTING TOBACCO IN SUBSTANCE ABUSE TREATMENT IMPROVES OUTCOMES

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Background: Although the prevalence of tobacco use in those in substance abuse treatment is known to be quite high, most treatment programs do not address tobacco. An outcome study of a tobacco-free, 90-day inpatient, dual diagnosis treatment program was undertaken to determine treatment success. Men and women, ages 18-65, having failed multiple other treatment programs, are referred to this program; 88% with nicotine dependence. Methods: Between January 2009 and December 2011 231 patients were treated in the program. All patients completing the program were invited to enroll in a yearlong follow-up study consisting of monthly phone contact with the patients and their probation officer or case manager to assess recovery from substance abuse and mental illness. Results: 185 patients (80%) successfully completed the 90-day program. There was no difference between gender, race, age, primary drug dependence...
diagnosis, or primary psychiatric diagnosis and program completion. Tobacco use during treatment and plans to use tobacco after treatment were variables that were significantly associated with program non completion (p<.01). Of the 179 eligible for the study, 154 (86%) enrolled. By December 2012, 140 (91%) completed the year follow-up. At the beginning of treatment 120 (86%) were using tobacco daily. At the end of the year this decreased to 102 (73%). Patients who were not using tobacco were more likely to not relapse to other drugs or alcohol (p<.01). Patients who made the decision to stay quit from tobacco after treatment were significantly more likely to remain continuously abstinent from drugs and alcohol throughout the year (p<.03). Conclusions: This study demonstrates that tobacco use is highly correlated with relapse to alcohol and other drugs and addressing tobacco in treatment as seriously as and in the same fashion as all other drugs, improves outcomes and moves people in their stage of change regarding tobacco use.

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POS4-48
KNOWLEDGE ABOUT HEALTH EFFECTS OF CIGARETTE SMOKING AND QUITTING AMONG UNIVERSITY STUDENTS: THE IMPORTANCE OF TEACHING NICOTINE DEPENDENCE AND TREATMENT IN THE MEDICAL CURRICULUM

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Background: Medical advice and assistance help smokers to quit but little attention has been paid to tobacco dependence in the curricula of medical schools. Administering a questionnaire addressing tobacco dependence we showed that 4th year Italian Medical Students (MS) have limited knowledge about the issue (Grassi et al., 2012). Here we assessed: i) consistency of our previous results, by administering the questionnaire to a new group of 4th year MS; ii) improvement of student knowledge on tobacco dependence 1-year following an educational intervention; iii) whether non MS of the same age have different perceptions and knowledge about smoking compared to MS. Methods: The study was conducted on 859 MS, on 122 and 107 students attending Architecture and Law schools, respectively. Students were asked to complete a 60-item questionnaire. Two scores were computed: Score 1 assessed knowledge of the epidemiology of smoking and related risks, and benefits of cessation; Score 2 assessed knowledge of tobacco dependence treatments and their effectiveness. A score of less than 60% indicated insufficient knowledge. Results: Self-reported smoking prevalence was higher among Architecture (26%) and Law (26%) students compared to MS (16%). Overall, 67% of students reported they wanted to stop smoking with no differences between groups. MS had limited knowledge of the epidemiology of smoking, attributable morbidity and mortality, and the benefits of stop smoking, since 70% of them had a total score 1 less than 60%. Knowledge of clinical interventions, perceived competence in counseling and treating smokers was also insufficient, as 76% of MS achieved a total score 2 of less than 60%. MS who had previously been exposed to an educational intervention, improved their knowledge since the percentage of subjects who scored less than 60% dropped from 70% of the previous year to the present 55%. Almost 90% of law and architecture students scored less than 60%. Conclusions: Our data confirm MS’s knowledge about smoking compared to MS. Methods: The study was conducted on 859 MS, on 122 and 107 students attending Architecture and Law schools, respectively. Students were asked to complete a 60-item questionnaire. Two scores were computed: Score 1 assessed knowledge of the epidemiology of smoking and related risks, and benefits of cessation; Score 2 assessed knowledge of tobacco dependence treatments and their effectiveness. A score of less than 60% indicated insufficient knowledge. Results: Self-reported smoking prevalence was higher among Architecture (26%) and Law (26%) students compared to MS (16%). Overall, 67% of students reported they wanted to stop smoking with no differences between groups. MS had limited knowledge of the epidemiology of smoking, attributable morbidity and mortality, and the benefits of stop smoking, since 70% of them had a total score 1 less than 60%. Knowledge of clinical interventions, perceived competence in counseling and treating smokers was also insufficient, as 76% of MS achieved a total score 2 of less than 60%. MS who had previously been exposed to an educational intervention, improved their knowledge since the percentage of subjects who scored less than 60% dropped from 70% of the previous year to the present 55%. Almost 90% of law and architecture students scored less than 60%. Conclusions: Our data confirm MS’s knowledge about smoking compared to MS. The study has been supported by a grant from Sapienza University of Rome.

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POS4-49
SUBSTANTIAL REDUCTION IN EMISSION OF SELECTED CARBONYLS AND VOLATILE ORGANIC COMPOUNDS FROM ELECTRONIC CIGARETTES COMPARED TO TOBACCO CIGARETTES

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Significance: Electronic cigarettes (ECs) are purported to deliver nicotine vapor without any toxic substances generated from tobacco combustion. However, using ECs involves heating a nicotine solution to high temperatures. This may induce chemical reactions which result in the possible formation of carbonyl compounds (CCs) and volatile organic compounds (VOCs). Many CCs and VOCs are common tobacco-specific toxicants with proven carcinogenic and cardio toxic properties. Aim of the study: The aim of the study was to quantify and compare the levels of selected
CCs (formaldehyde, acetaldehyde, acrolein, acetone, propanal, butanal) and VOCs (benzene, toluene, ethylbenzene and ortho-, meta-, para-xylene) in EC nicotine refill solutions, vapors generated from ECs, and mainstream smoke from tobacco cigarettes. Six commercially available nicotine refill solutions for ECs (Chic Group Ltd. Poland) were examined. Three solutions contained a mixture of propylene glycol and glycerin (Veolia brand) as a solvent for nicotine, while the other three contained only propylene glycol (Mild brand). Thirtypuffs were taken using an automatic smoking machine. Mainstream smoke was generated from a3R4F reference tobacco cigarette. CCs were extracted from vapor and smoke to solid phase with 2,4-dinitrophenylhydrazine, and analyzed using HPLC/DAD. VOCs were absorbed on activated carbon and analyzed with GC/MS. Results: Traces of acetaldehyde were detected in all examined EC solutions (0.081±0.042 μg/mL). Acetaldehyde was found in all EC vapors (0.153±0.116 μg/30 puffs), but at levels more than a thousand-fold lower than in tobacco smoke. Formaldehyde and acrolein were only found in vapors generated from glycerin-based solutions (0.116±0.022 and 0.110±0.190 μg/30 puffs) and in tobacco smoke (12 and 32-fold higher levels, respectively). None of the examined VOCs were detected in the vapors, while all were found in tobacco smoke. Conclusions: In contrast to tobacco smoke, the vapors generated from ECs do not contain VOCs. Exposure to CCs from ECs is significantly reduced compared to tobacco smoke and may be attributable to the glycerin content in the nicotine refill solution.

The study was supported by research funds received from Chic Group LTD, manufacturer of electronic cigarettes in Poland, and paid to the Institute of Occupational Medicine and Environmental Health.

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POS4-50

LONG-TERM PATTERNS OF CIGARETTE SMOKING THROUGH MIDDLE ADULTHOOD: THE CARDIA STUDY

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Background: The decline in smoking prevalence since the late 1960s has been well-documented, with 19.0% of U.S. adults smoking in 2011. While the prevalence of smoking has been closely monitored, little attention has been paid to long-term patterns of smoking. Methods: This study examined patterns of smoking prevalence has been closely monitored, little attention has been paid to long-term patterns of smoking. Methods: This study examined patterns of smoking prevalence has been closely monitored, little attention has been paid to long-term patterns of smoking. Different patterns in the trajectory groups unique to each cohort tended to converge at Year 25 despite the three trajectories over 20 years and then decreased (5% of cohort) and a group whose probability of smoking decreased steadily over 25 years (10% of cohort). The three trajectories common to both cohorts were a no/low probability smoking group (62% of young cohort, 63% of older cohort) and a high probability smoking group (6% of young cohort, 10% of older cohort). Common to both cohorts were a no/low probability smoking group (62% of young cohort, 63% of older cohort) and a high probability smoking group (62% of young cohort, 63% of older cohort) and a high probability smoking group (6% of young cohort, 10% of older cohort). The two trajectories unique to the young cohort were a group whose probability of smoking escalated over 20 years and then decreased (5% of cohort) and a group whose probability of smoking decreased steadily over 25 years (10% of cohort). The three trajectories common to both cohorts were a no/low probability smoking group (7% of cohort), an early cessation group (i.e. high probability of smoking at Year 0 but a sharp decrease by Year 10; 5% of cohort) and a delayed cessation group (i.e. high probability of smoking at Year 0 but a steeping decrease primarily beyond Year 10; 7% of cohort). Cumulative smoking exposure, as defined by pack years, among the trajectory groups unique to each cohort tended to converge at Year 25 despite differing longitudinal smoking patterns. Conclusions: Similarities in cumulative exposure may mask different long-term patterns of smoking. Different patterns in early adulthood may warrant different treatment strategies. Supported by NIH contracts N01HC-95005, N01HC-48047, N01HC-48048, N01HC-48049, and N01HC-48050.

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POS4-51

ACCULTURATION AND GENDER AMONG LATINO NONDAILY, LIGHT, AND MODERATE TO HEAVY SMOKERS

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While overall rates of smoking in the U.S. remain flat, the prevalence of light and nondaily smokers continues to increase. Approximately two thirds of Latino smokers are nondaily or light smokers. There is an inverse association between acculturation and smoking prevalence in women such that higher smoking prevalence has been reported among more acculturated Latinas, while this relationship has not been seen among Latino men. However, to date, acculturation and gender have not been examined in relation to levels of smoking in Latino men and women. Objective: To assess the association between acculturation and smoking levels across gender among Latino smokers. Methods: 786 Latino smokers completed a survey administered through an online panel research company. We used two indicators of acculturation: language preference (ARMSA II) and country of origin. Results: Of 786 participants, 54% were female, 86% were born in the U.S., 66% completed at least some college, and 92% reported speaking English very well. 51% were nondaily smokers, 24% were light daily smokers (<10 ctp), and 25% were moderate-heavy daily smokers (≥10 ctp). Language preference and country of origin were statistically associated with smoking levels for Latinos; this relationship differed by gender. Latino males with a higher English language preference were more likely to be nondaily smokers, however, for Latina women there was no relationship for language preference and levels of smoking. Women born in the U.S. were more likely to be nondaily smokers, however, no relationship between birthplace and levels of smoking for men was found. Conclusion: Due to the heterogeneity of Latinos in the U.S., understanding tobacco use and levels of smoking across gender and acculturation is critically needed to inform strategies to reduce tobacco-related disparities, morbidity and mortality in this underserved population.

Funding: This project is funded by Pfizer’s Global Research Awards for Nicotine Dependence (Ahluwalia). Dr. Ahluwalia is supported in part by the National Institute for Minority Health Disparities (NCIM/ONI-1P60MD003422).

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POS4-52

ASSESSMENT OF SMOKING STATUS, TOBACCO DEPENDENCE, AND CUE REACTIVITY: DIAGNOSTIC TOOLS FOR PRACTICE AND FOR IMPLEMENTATION RESEARCH

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Background: The availability of individual smoking status information may tailor the therapy which could increase the success rate of prevention of relapse to smoking. Present study investigated for the first time the outcome of assessment tools at smoking cessation units at Khartoum, Sudan. Methods: Initially, smoking status and tobacco dependence assessments were set up followed by investigations on the outcomes under which smokers are prone to relapse, in order to better define individual strategies for coping to risk situations. This was done using questionnaires of demographic profile, Smoking status, Fagerstrom Test for Nicotine Dependence in smokers (FTND) and smokeless tobacco users (FTND-ST) and cue-reactivity profile. Carbon monoxide from smokers was measured using Bedfont smokerlyzer. One way ANOVA and student’s t-test were used for analyses. Results: Majority of the smokers found very difficult to give up the first cigarette in the morning. Higher percentages of smokeless tobacco users placed their first dip within five minutes after they wake up in the morning. Smokeless tobacco users showed higher dependence than tobacco smokers. Both showed less craving in restricted condition within all the three risk situations (after having breakfast, after having lunch/dinner at home, after having lunch/dinner at restaurant). Craving differences were found to be high between the smoking environment (other people smoking vs. no other people smoking). No difference in the craving was observed in the social condition (with others vs. alone). This
is a practical evidence of cue elicited craving in accordance with previous lab experiments on cue reactivity.

No funding.

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POS4-53
ANALYSIS OF SMOKING PREVALENCE AND cessATION INTERVENTIONS AMONG WISEWOMAN PARTICIPANTS BY RACE AND ETHNICITY FROM 2008 TO 2012
Isam Vaid, Ph.D., M.P.H.*, Deborah Borbely, M.S., and Kaha Ahmed, M.P.H., Division of Heart Disease and Stroke Prevention, CDC

Background: This analysis is an in-depth look at cigarette smoking across 21 Well Integrated Screening and Evaluation for Women Across the Nation (WISEWOMAN) Programs that focus on women aged 40-64 years. Between July 1, 2008 and June 30, 2012, WISEWOMAN provided 170,319 CVD screenings to 125,096 low-income women, 46% of whom are of racial and ethnic minorities. Approximately 89% of participants have at least 1 of the 5 major risk factors for CVD. Of note, non-Hispanic Blacks had the highest prevalence of hypertension and obesity at 59% each yet their smoking prevalence was lower than that of American Indian and Alaska Natives, and non-Hispanic Whites. Objectives: (1) To present the scope of cigarette smoking and secondhand smoke exposure in the WISEWOMAN population. (2) To discuss the CVD risk profile of smokers vs. non-smokers. (3) To highlight key approaches and results achieved to address cigarette smoking. Methods and Results: The overall prevalence of smoking among WISEWOMAN participants is 27%. Of all the participants who were American Indian/Alaska Natives, 41% were smokers, and similarly 35% of non-Hispanic Whites were smokers, 27% of all non-Hispanic Blacks were smokers, 9% of all Hispanic participants were smokers, and 4% of all Asian and Pacific Islanders were smokers. Of cigarette smokers, 37% had hypertension, 29% had high cholesterol levels, 39% were obese, and 13% had diabetes. Program guidance emphasizes approaches to cigarette smoking cessation which includes quit line referrals, related loop back mechanisms, community referrals, and reducing secondhand smoke exposure. Over the first 4 years, there were 16,304 quit line referrals. Among smokers there were 1,623 more referrals to quit lines in year 2 compared to year 1. About 7% of non-smokers were exposed to secondhand smoke while at home. While, among hypertensive non-smokers, this figure was 10%. Conclusions: WISEWOMAN employs multiple approaches to promote smoking cessation and education on the CVD risks of smoking, and has noted progress in quit line referrals. At the 5 year mark WISEWOMAN will present detailed trend data to highlight addressing cigarette smoking among its women. WISEWOMAN is a CDC program within the Division of Heart Disease and Stroke Prevention. This program is funded directly by appropriations from the United States Congress. 

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POS4-54
THE SKINNY ON SMOKING
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Background: Many studies have reported that young women smoke to control their weight. The literature also finds that sexual and gender minority (SGM) women smoke at higher rates and are heavier than heterosexual women. This study aims to explore the relationship between weight, weight-related variables, smoking, and sexual orientation in college women. Methods: Data were from the fall 2010 National College Health Assessment survey, which included 39 campuses nationwide that utilized a random sampling technique. Descriptive and univariate statistics were used to compare heterosexual and SGM women. T-tests of mean BMI and chi-square tests of characteristics were calculated. Odds ratio and 95% confidence intervals from logistic regression models were used to estimate factors associated with the likelihood of smoking. Results: A total of 18,440 women were included in the final analysis, of which 1,078 identified as SGM. Compared to heterosexual women, SGM women were less likely to have a healthy BMI of 25.0 lb/in2, to meet the national physical activity guidelines, and had a higher mean BMI (p<0.0001). In addition, SGM women were twice as likely to be obese with a BMI≥30 lb/in2 (20% vs 10%) and were twice as likely to have smoked in the past month (28% vs 14%) (p<0.0001). All women smokers were significantly more likely to have a BMI greater than 25 lb/in2 compared to non-smokers (p<0.0001). However, there were no significant differences in BMI classification among smokers by sexual orientation. In the logistic regression model, covariates (at p<0.0001) of smoking included: sexual orientation (OR=2.55), occasional alcohol use (OR=17.35), daily alcohol use (OR=50.09), and age (OR=0.87). Conclusions: SGM college women are heavier than heterosexual women and smoke at twice the rate. The differences in weight may be better explained by sexual orientation, physical activity, health, race, and age than by smoking status. Being overweight or obese did not predict smoking. These findings indicate that college women who smoke are heavier than those who do not smoke. Interventions to improve SGM women’s health should address both weight and smoking.

No funding.

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POS4-55
EFFECT OF TRAINING PARADIGM ON ACQUISITION OF NICOTINE SELF-ADMINISTRATION AND SUBSEQUENT REINFORCEMENT
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Nicotine self-administration (NSA) is a well-established model of smoking behaviors where the mechanisms underlying nicotine dependence can be investigated. Our goal was to examine the effect of dose and training history on acquisition of NSA. Most studies have used food training prior to NSA. However, when doses at the peak of nicotine’s dose-response curve (0.015 and 0.03 mg/kg) are used, virtually all animals acquire NSA, making it difficult to assess factors which influence acquisition and subsequent nicotine reinforcement. In retrospective analyses of separate experiments, food trained (FT) rats were compared to those spontaneously trained (SP). A higher proportion of rats met acquisition criteria in the FT rats compared to SP: 56% vs. 38% at 0.00375 mg/kg, 88% vs. 40% at 0.0075 mg/kg, 88% vs. 86% at 0.015 mg/kg and 88% vs. 100% 0.03 mg/kg. FT rats showed an inverted “U” dose-response curve for active lever presses and infusions while SP rats showed lower active lever presses, infusions and a flatter inverted “U” curve; FT rats had higher PR breakpoints than SP at all doses. These differences suggested that food training strengthened responding for nicotine. However, there were differences in the study designs used for FT and SP groups. Therefore, a direct comparison was conducted: rats in FT or SP underwent FR1 and FR2 for 5 days each trained with 0.0075 mg/kg nicotine then underwent PR for 5 days at 0.0075, 0.015 mg/kg and then 0.03 mg/kg. Rats underwent extinction and then reinstatement (cue and nicotine at 0.15 and 0.3 mg/kg). Acquisition differences were replicated, where 100% of FT rats and only 60% SP rats met criteria (p<0.05). In rats that acquired NSA, responding for nicotine was not different nor did they differ in PR breakpoints or in cue and nicotine-induced reinstatement. Together, these results suggest that (1) food training in combination with different design parameters affects acquisition and NSA behavior, and (2) food training alone can facilitate acquisition of self-administration but does not alter nicotine’s reinforcing effect.

We acknowledge the support of the Endowed Chair in Addiction for the Department of Psychiatry, CIHR grant MOP97751, NIDA grant DA029160, Centre for Addiction and Mental Health and the Canada Foundation for Innovation (#20289 and #16014), the CAMH Foundation and the Ontario Ministry of Research and Innovation.

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POS4-56
EXPLORERS, NRT SEEKERS, AND ACTIVE MEMBERS: WHO QUITS TOBACCO AFTER ENROLLING IN AN ONLINE CESSATION PROGRAM?
Katherine Rehorst, B.S.∗1, Lija Greensseed, Ph.D.1, Clint Boots, M.A.1, and Michelle Walker, B.S.1, Professional Data Analysts, Inc.; North Dakota Department of Health

Background: Online tobacco cessation programs have potential to reach broad audiences; however, evidence for effectiveness of such programs is mixed. To investigate the usefulness of programs for different groups of users of the ND QuitNet program, a North Dakota Department of Health statewide cessation program operated by Healthways, Inc., were examined in relation to enrollment characteristics, 7-month quit outcomes, satisfaction, and program utilization. Methods: Web enrollees were classified based on logins and NRT shipments: "Explorers" logged in once but received no NRT, n=159; "NRT Seekers" logged in minimal times needed to receive NRT, n=116; and "Active Members" logged in beyond what is needed to enroll or obtain NRT, n=143. Data sources include enrollment and 7-month cumulative utilization data collected by Healthways and 7-month follow-up data collected by Fred Hutchinson Cancer Research Center. The survey response rate was 43% and quit rates are reported for survey responders. Chi-square analyses were conducted to examine differences between the groups. Results: The three groups are demographically similar except NRT Seekers are more likely to be uninsured than Explorers or Active Members (p=0.01). There are, however, several significant differences between the groups’ outcomes. NRT Seekers have the highest quit outcomes 7-months post enrollment (29% 30-day point prevalence quit rate) which is significantly higher than Explorers (15%, p=0.004) and similar to Active Members (22 %, p= 0.258). This is despite Active Members significantly higher use of web program features such as discussion forums, quit date wiz, and medication guide. Conclusions: These findings suggest those who utilize a web cessation program primarily to receive NRT have better outcomes than those who utilize web programs at lower levels, but similar outcomes to those who use it more actively. This suggests the effectiveness of web programs is associated with their role in distributing NRT. Further investigation is warranted to determine what specific web program components drive positive outcomes and how programs can be designed to achieve desired outcomes.

This study was supported by Professional Data Analysts, Inc. in collaboration with the North Dakota Department of Health.

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POS4-57
THE PROMIS SMOKING INITIATIVE: NICOTINE DEPENDENCE ITEM BANK
Maria O. Edelen∗1, Joan S. Tucker1, William G. Shadel1, Brian D. Stucky1, Li Cai2, and Mark Hansen2, 1RAND Corporation; 2University of California, Los Angeles

Background: Nicotine dependence is a core construct in smoking research and clinical practice and is thought to be important for determining adult smokers’ ability to quit and respond to treatment. However, because nicotine dependence can be measured using many different scales, each of varying length and psychometric strength, it is difficult to know which assessment tool to use. This poster addresses this issue by describing analyses conducted to develop and evaluate item banks to assess nicotine dependence. Methods: Using data from a large sample of daily (N = 4,201) and nondaily (N = 1,183) smokers, we conducted a series of Item Factor Analyses, Item Response Theory analyses and differential item functioning analyses (according to gender, age, and ethnicity) to arrive at a unidimensional set of nicotine dependence items for daily and nondaily smokers. We also evaluated performance of short forms and computer adaptive tests (CATs) to efficiently assess nicotine dependence. Results: A total of 32 items were included in the nicotine dependence item banks; 22 items are common across daily and non-daily smokers, 5 are unique to daily, and 5 are unique to nondaily. For both daily and non-daily smokers, the nicotine dependence item banks are strongly unidimensional, highly reliable (0.97 and 0.97, respectively), and perform similarly across various subgroups (e.g., gender, age, and race and ethnicity). Short forms common to daily and non-daily smokers consisted of 8 and 4 items (reliability = 0.91 and 0.81, respectively). Results from simulated CATs are presented. Conclusions: This research provides a new set of items that can be used to reliably and efficiently assess nicotine dependence. Nicotine dependence can be assessed on the basis of this item bank via one of the short forms, by using CAT, or through a tailored set of items selected for a specific research purpose. Future work will provide additional validity evidence and scoring crosswalks from the nicotine dependence scores to legacy measures such as the Fagerstrom Test for Nicotine Dependence, Questionnaire of Smoking Urges, and Wisconsin Inventory of Smoking Dependence Motives.

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POS4-58
THE PROMIS SMOKING INITIATIVE: NICOTINE DEPENDENCE ITEM BANK
William G. Shadel∗1, Maria O. Edelen1, Joan S. Tucker1, Brian D. Stucky1, Li Cai2, and Mark Hansen2, 1RAND Corporation; 2University of California, Los Angeles

Background: Nicotine dependence is a core construct in smoking research and clinical practice and is thought to be important for determining adult smokers’ ability to quit and respond to treatment. However, because nicotine dependence can be measured using many different scales, each of varying length and psychometric strength, it is difficult to know which assessment tool to use. This poster addresses this issue by describing analyses conducted to develop and evaluate item banks to assess nicotine dependence. Methods: Using data from a large sample of daily (N = 4,201) and nondaily (N = 1,183) smokers, we conducted a series of Item Factor Analyses, Item Response Theory analyses and differential item functioning analyses (according to gender, age, and ethnicity) to arrive at a unidimensional set of nicotine dependence items for daily and nondaily smokers. We also evaluated performance of short forms and computer adaptive tests (CATs) to efficiently assess nicotine dependence. Results: A total of 32 items were included in the nicotine dependence item banks; 22 items are common across daily and non-daily smokers, 5 are unique to daily, and 5 are unique to nondaily. For both daily and non-daily smokers, the nicotine dependence item banks are strongly unidimensional, highly reliable (0.97 and 0.97, respectively), and perform similarly across various subgroups (e.g., gender, age, and race and ethnicity). Short forms common to daily and non-daily smokers consisted of 8 and 4 items (reliability = 0.91 and 0.81, respectively). Results from simulated CATs are presented. Conclusions: This research provides a new set of items that can be used to reliably and efficiently assess nicotine dependence. Nicotine dependence can be assessed on the basis of this item bank via one of the short forms, by using CAT, or through a tailored set of items selected for a specific research purpose. Future work will provide additional validity evidence and scoring crosswalks from the nicotine dependence scores to legacy measures such as the Fagerstrom Test for Nicotine Dependence, Questionnaire of Smoking Urges, and Wisconsin Inventory of Smoking Dependence Motives.

Funding: R01DA026943.

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POS4-59
SEX-SPECIFIC EFFECTS OF THE BDNF VAL66MET POLYMORPHISM ON THE HPA AXIS AND BEHAVIORAL AFFECT FOLLOWING CHRONIC NICOTINE TREATMENT AND WITHDRAWAL
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Smoking is responsible for over 400,000 deaths a year in the United States and is the leading cause of preventable death. However, despite the numerous health risks, less than 10% of quit attempts result in continuous abstinence for one year. A better understanding of the molecular mechanisms underlying nicotine addiction will help re-tailor pharmacotherapies for improved cessation rates. Brain-derived neurotrophic factor (BDNF), a member of the neurotrophin family, is increased during nicotine treatment in the mesolimbic reward circuit and further upregulated during withdrawal from nicotine. A common SNP in the translated region of the BDNF gene substitutes a valine (val) for a methionine (met) amino acid and are underway to replicate these findings in an independent sample, establish test – retest reliability, and evaluate the bank scores’ sensitivity to change over time. Future research will also include development of scoring crosswalks from traditional smoking measures to the new item bank scores (e.g., FTND to Nicotine Dependence).

Funding: R01DA026943.

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acid (Val66Met) and reduces activity-dependent secretion of BDNF. The met/met genotype is present in 5% of the US population, and has been independently associated with anxiety, depression and substance abuse. As BDNF provides trophic support to dopamine neurons its role in drug addiction is critical however, the relationship between the Val66Met SNP and nicotine dependence remains unknown. We are examining a mouse model of this polymorphism (BDNF met/met) and its role in mediating neuroendocrine changes and behavioral affect following chronic nicotine treatment and withdrawal. Our findings show that the mouse equivalent Val/met SNP elicits behavioral and molecular changes seen during chronic nicotine (18mg/kg/day) and 24-hour withdrawal in a sex-specific manner. Female mice homozygous for the met allele (BDNF met/met) show an increased anxiety-like state that is exacerbated by chronic nicotine treatment. Following 24-hour withdrawal from nicotine female BDNF Met/Met mice show a decreased anxiety-like state and decreased immobility in the FST compared to saline. Lowered CORT levels are associated with this decreased immobility. In contrast, male (BDNF met/met) mice display the expected anxious-like response to chronic nicotine and no behavioral affect is seen during 24-hour withdrawal. This study suggests that further investigation of the polymorphism could identify gender-specific vulnerability to nicotine addiction, and the need to personalize cessation therapy.

Funding: T32-GM-008076.

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**POS4-60**

**DEVELOPMENT AND EVALUATION OF AN EFFECT REGULATION TREATMENT FOR SMOKING CESSATION AMONG PREGNANT SMOKERS**

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The desire to regulate negative affect is an important motive underlying cigarette use among pregnant smokers. Interventions for these smokers have largely consisted of low-intensity interventions; however, despite their cost-effectiveness, they achieve only modest success rates. More intensive interventions are needed, particularly for pregnant smokers with higher levels of negative affect. The present study developed and pilot tested an affect regulation intervention to promote smoking cessation among pregnant smokers. Participants (N = 67) who smoked at least one cigarette per day were recruited prior to 24 weeks gestation to participate in 8, one-hour smoking cessation treatment sessions. All participants received a cognitive-behavioral smoking intervention; in addition, half received an affect regulation treatment (ART) and half a health and lifestyle control (HLS) intervention. Participants completed pretreatment, and 2-mo, 4-mo and 6-mo post-quit assessments. Participants in the ART condition smoked significantly fewer cigarettes per day in the 7 days prior to assessment at 2-mo post-quit assessment as compared with the HLS condition [t(41) = 2.05, p = .047] and marginally significantly fewer at 4-mo [t(40) = 1.93, p = .061]. Results of analyses examining 7-day point-prevalence abstinence indicated that for the full sample, smoking decreased from baseline over the 3 post-quit periods (Cochran’s Q: X2(3) = 14.73, p = .002). Fisher’s Exact tests indicated that the ART condition had significantly greater rates of abstinence at the 2-mo (p = .054) and 4-mo (p = .033) assessments. Within the ART condition, there were significant increases in abstinence over time [Cochran’s Q: X2(3) = 13.13, p = .004] and McNemar’s tests indicated that significant increases in abstinence were maintained from pretreatment to 2-mo (p = .016), 4-mo (p = .002) and 6-mo (p = .016) whereas among the HLS condition, no significant changes occurred from pretreatment to the 3 post-quit assessments. Overall, the results indicate that the ART intervention is a promising treatment for initiating and maintaining smoking abstinence among pregnant smokers.

Funding for this study was provided by NIDA grant # R01 DA021802 and the NIH Office of Research on Women’s Health.

**POS4-61**

**ANTI-NICOTINE IMMUNIZATION ALTERS BRAIN NICOTINE ACCUMULATION IN CIGARETTE SMOKERS**

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The prevailing hypothesis on the benefits of anti-nicotine vaccination assumes that anti-nicotine antibodies form slowly dissociating complexes with nicotine and decrease nicotine brain accumulation. However, the antibodies may also increase the capability of blood to transport nicotine from the lungs and change its distribution in body tissues, which would be dependent on the stability of the nicotine-antibody complex (Kd and T1/2 dissociation). This study was performed in 29 smokers (210 cigarettes/day) who received 4 vaccinations each with 0.1 mg NIC002 in Alum (Novartis Pharma AG). The first PET scan was performed before the first vaccination and the second at two weeks after the last vaccination. The subject’s head was scanned over 6 min after inhalation of a single puff of smoke from a cigarette containing 11C-(S)-nicotine. The anti-body binding capacity (bound/free nicotine ratio, B/F) and apparent Bmax and Kd were assessed using a 3H-(S)-nicotine and ultrafiltration. The primary results: 1) The vaccine was safe and well tolerated; 2) Vaccination resulted in a statistically significant but highly variable increase (CV=88%) in serum binding capacity of nicotine B/F = 0.18 ± 0.03 (mean ± SE, n=29, p<.001); 3) In 10 participants with the highest B/F values vaccination produced a reduction (p<.05) in brain nicotine Cmax and AUC (0-6min) values by 15±6% and 15±7%, respectively; 4) In contrast, for 10 participants with intermediate B/F values vaccination produced increases (p<.03) in Cmax and AUC values (by 18±7% and 18±7%, respectively) and 30±10% increase (p<.01) in the initial rate of accumulation; 5) The Kd values for binding nicotine with post-vaccination serum were almost two times higher in the group with intermediate vs. the group with the highest B/F values (600±140 nM vs. 310±50 nM, p<.05); 6) The nicotine interaction with monoclonal antibodies (Kd 20nM) was characterized by a T1/2 dissociation ca. 50 sec. These results suggest that anti-nicotine immunization can produce divergent effects on brain nicotine accumulation during smoking. Direction and extent of the effect are dependent on the quality (affinity) and quantity of the produced antibodies.

This study was supported by NIDA Grant # RC2DA028948 and Novartis Pharma AG.

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**POS4-62**

**THE PROMIS SMOKING INITIATIVE: PERCEIVED RISKS ITEM BANKS**

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Background. Perceived risks of smoking include both health concerns (e.g., experiences of fatigue and shortness of breath, and fears of developing emphysema or heart trouble), and psychosocial concerns (e.g., appearing unattractive to others, feeling less respected by friends and family). Both forms of perceived risks are related to nicotine dependence and may be important predictors of a smoker’s willingness to make a quit attempt, and thus are important to assess in a reliable and valid manner. This poster describes analyses conducted to develop and evaluate item banks to assess (1) the perceived health risks of smoking, and (2) the perceived psychosocial risks of smoking for daily and non-daily smokers. Methods: Using data from a large sample of daily (N = 4,201) and non-daily (N = 1,183) smokers, we conducted a sequential series of item factor analyses, unidimensional item response theory analyses, and assessments of differential item functioning (DIF) across various subgroups (gender, age, and ethnicity) to develop item banks for daily and non-daily smokers. We also evaluated performance of short forms and used simulated computer adaptive tests (CATs) to assess the utility of the item banks and to aid in the construction of the short forms. Results: For both daily and non-daily smokers, the unidimensional item banks (ranging from 21-24 items) are DIF-limited and highly reliable (0.93–0.96). Brief, six-item short forms for use with both types of smokers also show good reliability (0.85-0.87). Adaptive tests for daily and non-daily smokers achieved reliabilities of 0.89 or higher using on average 5.3 to 6.7 items (depending on bank and smoker type) when the maximum test length was 10 items. Conclusions: This research
POS4-63
THE PROMIS SMOKING INITIATIVE: PERCEIVED BENEFITS ITEM BANKS

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Background: Smokers report a number of positive benefits of smoking. These include affective (e.g., relaxation upon smoking) and hedonic (e.g., positive sensory effects), social effects (e.g., feeling more comfortable in social settings), and coping effects (e.g., stress reduction). These subjective experiences may be indicative of the positive reinforcing features of smoking that may be missed upon quitting and thus lead to relapse. Valid and reliable assessments of the extent to which smoking is used for its affective/hedonic, social, and coping effects can help inform treatments and identify smokers who are most likely to need certain types of assistance once they quit. This poster describes analyses conducted to develop and evaluate item banks to assess these three types of perceived benefits of smoking for daily and non-daily smokers. Methods: Using data from a large sample of daily (N = 4,201) and non-daily (N = 1,183) smokers, we conducted a series of Item Factor Analyses, Item Response Theory analyses and differential item functioning analyses (DIF, according to gender, age, and ethnicity) to arrive at unidimensional sets of items for daily and non-daily smokers to assess the affective/hedonic benefits, social benefits, and coping benefits of smoking. We also evaluated performance of short forms and computer adaptive tests (CATs) based on these item banks to efficiently assess these domains. Results: For both daily and non-daily smokers, the unidimensional item banks (ranging from 15-21 items) are DIF-limited and highly reliable (0.90-0.97). Short forms for use with both types of smokers (ranging from 4-6 items) also show good reliability (0.77-0.86). Adaptive tests for daily and non-daily smokers achieved reliabilities of 0.88 or higher when the maximum test length was 10 items. Conclusions: This research provides a new set of items that can be used to reliably and efficiently assess smokers’ perceived affective/hedonic, social, and coping benefits of smoking, which can be assessed on the basis of the item banks via one of the short forms, by using CAT, or through a tailored set of items selected for a specific research purpose.

Funding: R01DA026943.

POS4-65
THE ASSOCIATION OF LONE MOTHERHOOD WITH SMOKING CESSION AND RELAPSE, AND THE MEDIATING ROLE OF SOCIOECONOMIC STATUS, SOCIAL SUPPORT, AND MENTAL HEALTH: PROSPECTIVE RESULTS FROM AN AUSTRALIAN NATIONAL STUDY

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Objectives: The aims were to examine the association of lone-motherhood with smoking cessation and relapse, and to investigate the extent to which this association is mediated by socioeconomic status, social support, and mental health. Methods: We used data from 10 yearly waves (2001 to 2010) of the Household Income and Labour Dynamics in Australia (HILDA) survey. In the cessation analysis, we included only lone mothers and partnered mothers (665 unique individuals with 2619 observations across the 10 waves) who were smokers in the first of any two consecutive waves. An individual was considered to have quit smoking if she was a smoker in one wave and ex-smoker in the next wave of the survey. In the relapse analysis, we include only lone mothers and partnered mothers (559 unique individuals and 2878 observations across all the 10 waves) who were an ex-smoker in the first of any two consecutive waves. An individual was considered to have relapsed if she was an ex-smoker in one wave and a smoker in the next wave of the survey. Results: The crude odds of smoking cessation was 33% smaller among lone mothers than partnered mothers (OR: 0.67; 95% CI: 0.51-0.88; p = 0.004). This effect did not change appreciably after controlling for socioeconomic status, social support, and mental health. The crude odds of relapse was 200% greater among lone mothers than partnered mothers (OR: 5.00; 95% CI: 2.22-4.06; p < 0.001). This effect was attenuated to a 61% difference after controlling for socioeconomic status, social support, and mental health (OR: 1.61; 95% CI: 1.13-2.30, p = 0.009). Discussion: Compared to partnered mothers, lone mothers were less likely to quit smoking and more likely to relapse. Socioeconomic status, social support, and mental health played no mediating role in the association of lone motherhood and cessation, but played a notable role in mediating the association with smoking relapse. While efforts to reduce the smoking prevalence among lone mothers should focus on their material deprivation, availability of social support, and addressing mental health issues, other factors unique to the lives of lone mothers also need to be taken into account.

No funding.

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POS4-66
OCCLUSION VARIATIONS IN OBESITY, SMOKING, HEAVY DRINKING, AND NON-ADHERENCE TO PHYSICAL ACTIVITY RECOMMENDATIONS: FINDINGS FROM THE 2010 NATIONAL HEALTH INTERVIEW SURVEY

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Objective: The aim of this study is to examine the most recent prevalence of obesity, heavy alcohol consumption, smoking, and leisure time physical activity across occupations. Methods: Data from the 2010 National Health Interview Survey was used. Analysis was limited to adults, 18 years and older (n=27,157). Logistic regression was used to calculate adjusted prevalences of obesity, morbid obesity, current smoking, heavy alcohol consumption, and adherence to physical activity (PA) recommendations. Results: The highest prevalence of obesity, and morbid obesity was among those in the community and social services occupations. The highest prevalence of smoking was among those in healthcare support occupations, heavy drinking was observed in the construction and extraction occupations, and non-adherence to PA recommendations was among those in the farming, fishing and forestry occupations. Occupational categories with high prevalence of obesity and current smoking were different from the categories observed in previous studies. Conclusion: With changing economic conditions changes in the occupational variations of certain risk factors may occur and policies and programs directed toward these risk factors have to re-focus to adapt to the changes. At the same time, some existing policies and programs need to be re-evaluated in the wake of consistent prevalence of certain risk factors in the same occupational categories. No funding.

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POS4-67
DEVELOPMENT OF A METHOD FOR THE DETERMINATION OF 4-(METHYLNITROSAMINO)-1-(3-PYRIDYL)-1-BUTANONE IN DUST USING LIQUID CHROMATOGRAPHY/TANDEM MASS SPECTROMETRY

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Dust has been identified as a major source of environmental contaminants including pesticides, aromatic hydrocarbons(PAHs), several metals, and other chemicals of human health concern. Since secondhand smoke is complex mixture of toxic chemical, there has been no standardized method to measure environmental tobacco smoke (ETS) quantitatively. 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone (NNK), a tobacco specific nitrosamine found only in tobacco products. The ability to monitor biomarker concentrations is very important in understanding ETS. In this study, an efficient and sensitive method for the analysis of NNK in dust was developed and validated using liquid chromatography tandem mass spectrometry. Dust was collected with filter paper soaked in MeOH. Extraction of dust sample were diluted to 100mM Ammonium Acetate and extracted with dichloromethylene. Our calibration curves ranged from 25 to 104 pg/ml. Excellent linearity was obtained with correlation coefficient values between 0.9996 and 1.0000. The limit of detection (LOD) was 5 pg/ml (S/N ≥ 3) and retention time was 10 min. Limit of quantification (LOQ) was 25 pg/ml, acceptance criteria were rate of 98-103% (80-120% at levels up to 3xLOQ) as well as coefficient of variations (CV) of 2.8%. Accuracies determined from dust samples spiked with four different levels of NNK ranged between 92.1 and 114 %. Precision of the method was found to be acceptable (5% of CV). Recovery rates of the whole analytical procedure at low, medium, and high levels were 105.7-116.5% for NNK. No carry-over effects during LC-MS/MS analysis were observed for NNK.

This manuscript summarises the scientific evidence on the use of markers to measure ETS.

Funding: Number: 1310060-1, Department of Laboratory Medicine, National Caner Center Hospital, Goyang, South Korea.

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POS4-68
IMPUISIVITY AND NICOTINE DEPENDENCE IN ADULT SMOKERS

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Background: Previous studies have demonstrated a significant relationship between impulsivity and smoking-related outcomes (e.g., initiation, cessation); however, fewer studies have examined impulsivity and nicotine dependence, and this extant work has primarily utilized adolescent and young adult populations without substantial consideration of potential demographic moderators of this relationship. Furthermore, impulsivity is a multi-faceted construct and is assessed using a wide range of self-report and behavioral measures, thereby contributing to considerable heterogeneity in the literature with regard to this association. Therefore, the current study sought to examine the link between four dimensions of impulsivity and nicotine dependence in a community sample of adult smokers. Method: A community sample of 1100 adult smokers provided demographic information and self-reported data on nicotine dependence, as measured by the FTND, and four dimensions from the UPSS impulsivity measure: Negative Urgency, (lack of) Premeditation, (lack of) Perseverance, and Sensation Seeking. Results: Simultaneous multiple regression analysis revealed that the four UPSS impulsivity dimensions significantly accounted for 10% of the variance in FTND scores. Only Negative Urgency and Sensation Seeking emerged as significant predictors, such that higher self-reported Negative Urgency and lower self-reported Sensation Seeking were uniquely associated with higher levels of nicotine dependence (p<.001). In addition, the association between Sensation Seeking and nicotine dependence was moderated by both race and age (p<.001). Conclusions: Findings with regard to Negative Urgency support previous research demonstrating a positive relationship with nicotine dependence. Results with regard to the negative association between Sensation Seeking and dependence are novel, however, in that previous studies have typically demonstrated either a positive or null relationship between these variables. Potential explanations for this finding, as well as the importance of consideration of race and age in understanding the link between impulsivity and nicotine dependence, are discussed. Funding: Robert Wood Johnson Foundation National Institutes of Health.

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POS4-69
THE EFFECT OF A SCHOOL-BASED INTERVENTION PROGRAM ON KNOWLEDGE, ATTITUDES, AND BEHAVIOR OF WATERPIPE SMOKING IN QATAR: A PILOT STUDY

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Background: The increasing rate of waterpipe use by adolescents in the Arab world (Lebanon, Egypt, Morocco, Syria, UAE and Qatar) is perceived to be an epidemic. According to the 2007 Global Youth Tobacco Survey, 38.3% of 13-15 years old students, in Qatar, use tobacco products including waterpipe. To date, and despite the increasing prevalence of waterpipe use among youth, and its documented health effects, no intervention to delay or prevent initiation has been evaluated. A pilot study was conducted in Qatar to test for the impact of a waterpipe prevention program on controlling the use of waterpipe by 7th and 8th graders. Methods: Seven schools (253 students) were included in the study: 4 assigned to the intervention group and 3 to the control. The theoretically-based intervention was implemented during school time and included 8 sessions; 3 sessions on knowledge about the hazardous effects of waterpipe, cigarette and smokeless
tobacco (sweika) and 5 skill building sessions including refusal skills, decision making skills and media interpretation skills. Knowledge-related, attitudinal, and behavioral outcomes were measured through a self-administered survey conducted at both pre and post intervention. Results: At baseline students in both intervention and control groups had similar demographic characteristics including age, gender and nationality as well as similar tobacco use behaviors including cigarette, waterpipe and sweika smoking. At post-test and compared to pretest, there was no significant change in either group in cigarette and waterpipe smoking initiation or cessation. However, there was a significant increase in waterpipe and cigarette knowledge scores as well as in the general attitude and perceived severity scores among the intervention group compared to the control group. Conclusions: The study demonstrated the feasibility of doing such an intervention in schools in Qatar. The intervention succeeded in increasing knowledge and perceived severity of the hazardous effects of cigarette and waterpipe use. More time is needed and different procedures (i.e. at the policy level) need to be implemented to observe effective change in smoking behavior.

This research was funded by Qatar Foundation under Qatar National Research Fund for the National Priority Research Program.

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**POS4-70**

**SMOKERS' RATING OF ELECTRONIC CIGARETTES: WOULD MORE SMOKERS QUIT IF ELECTRONIC CIGARETTES WERE ON SALE?**

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BACKGROUND: Nicotine electronic cigarettes (NECs) were illegal to sell or advertise in New Zealand during 2012, where 17% of adults smoke tobacco cigarettes daily. METHODS: Smokers age 18 and over who purchased their own cigarettes were recruited on worksites and by newspaper publicity; 343 were interviewed face to face in four cities and rewarded with a voucher for $15 (NZ$; 1 NZ$ = 0.85 USD) and a chance to win an electronic tablet. Participants completed the Cigarette Purchase Task (CPT; MacKillop et al., 2008) in which they reported how many cigarettes per day they would smoke at various price points. Then they sampled an NEC and rated preference for it against their own brand on a 10-point scale. The NEC used was SafeCig 18mg (SafeCig LLC, Los Angeles), notionally priced at $5 per day. RESULTS: Participants smoked a mean 14.9 cigarettes per day (cpd) and spent $8.72 daily on cigarettes, 33% paying $0.38 per roll-your-own (RYO) tobacco cigarette, 67% paying $0.72 per factory-made (FM) cigarette. After 3 puffs from the NEC, smokers liked it 83% as much as their own brand: average preference ratings for NEC and own brand were 6.26 and 7.51, respectively. If cigarettes cost $0.70 each, smokers estimated they would smoke 14.5 cpd, but only 7.08 cpd if they could buy NECS (t[125] = 15.39, p < .001). Using NECs, 31.6% said they would quit smoking their own brand completely. If cigarette price doubled to $1.40, 59.5% of smokers estimated they would quit, and another 11.1% would quit by using NECs if NECs were on sale. Those continuing to smoke at this price would smoke 10.63 cpd; but if NECs were on sale, would smoke 6.34 cpd (t[125] = 4.29, p < .001). CONCLUSIONS: If cigarettes cost $0.70 each (20% above the mean 2012 price), and NECs cost 36% of this ($5 a day), three in ten smokers (14.5 cpd) would switch to NECs at a saturating particulate concentration of 10mg/m3. Menthol (52 ppm) should have facilitated irritant inhalation by a supra-saturating smoke concentration (31.8 mg/m3). The inhibitory effect of menthol was blocked by pretreatment of mice with a selective TRPM8 inhibitor, AMG2850 (15mg/kg). Conclusions: Menthol effectively inhibits the respiratory irritation response to tobacco smoke in the mouse through activation of TRPM8 ion channels in airway-innervating sensory neurons. Activation of TRPM8 likely excites sensory nerve fibers that exert central inhibitory effects on inputs from irritant-activated chemosensory neurons. This inhibitory effect may increase smoke inhalation and exposures to nicotine, thereby facilitating initiation of smoking and nicotine addiction.

Supported by grants R01HL105635 and R01HL105635S1 (from NHLBI to S.E.J. and J.B.M.). AMG2850 was kindly provided by Dr. N. Gavva, Atenogen (Thousand Oaks, CA).

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**POS4-71**

**MENTHOL BLOCKS RESPIRATORY IRRITATION RESPONSES TO CIGARETTE SMOKE VIA TRPM8 RECEPTOR PATHWAYS**

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Background: Menthol cigarettes are increasingly popular among adolescents who initiate smoking. Tobacco smoke causes respiratory irritation by activating chemosensory nerve endings lining the airways. In a recent study in mice we demonstrated that inhalation of menthol strongly inhibited respiratory irritation responses to individual vaporized tobacco smoke irritants such as acrolein, acetic acid and cyclohexanone. This inhibitory effect of menthol was reversed when mice were treated with an antagonist of TRPM8, a receptor for menthol in airway sensory neurons. Thus, menthol, through activation of TRPM8, may reduce the aversive properties of irritants and facilitate irritant inhalation. The aim of our present study is to examine whether L-menthol, the menthol isomer added to tobacco products, affects respiratory irritation responses to tobacco smoke, a complex mixture of vaporized irritants and particulates. Methods: L-Menthol vapor was generated by flash evaporation and mixed with sidestream smoke generated (CH Technologies) from 2RAF reference cigarettes. Mice were exposed to combinations of L-menthol and smoke in a nose out plethysmograph (Buxco) and the duration of braking recorded as a measure of sensitivity to irritation. Results: L-menthol, with an apparent EC50 of 22ppm, effectively inhibited the respiratory irritation response to tobacco smoke at a saturating particulate concentration of 10mg/m3. Menthol (52 ppm) also inhibited irritation by a supra-saturating smoke concentration (31.8 mg/m3). The inhibitory effect of menthol was blocked by pretreatment of mice with a selective TRPM8 inhibitor, AMG2850 (15mg/kg). Conclusions: Menthol effectively inhibits the respiratory irritation response to tobacco smoke in the mouse through activation of TRPM8 ion channels in airway-innervating sensory neurons. Activation of TRPM8 likely excites sensory nerve fibers that exert central inhibitory effects on inputs from irritant-activated chemosensory neurons. This inhibitory effect may increase smoke inhalation and exposures to nicotine, thereby facilitating initiation of smoking and nicotine addiction.

Supported by grants R01HL105635 and R01HL105635S1 (from NHLBI to S.E.J. and J.B.M.). AMG2850 was kindly provided by Dr. N. Gavva, Atenogen (Thousand Oaks, CA).

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**POS4-72**

**THE ROLE OF CRF1 RECEPTORS AND KAPPA OPIOID RECEPTORS IN THE ESCALATION OF NICOTINE INTAKE**

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Background: The neurobiological mechanisms underlying escalation of tobacco smoking have not been investigated to date as no animal model exhibited stable escalation of nicotine intake. We have recently demonstrated that rats given extended access (21h/day) to nicotine self-administration on an intermittent schedule (24-48h between sessions) showed a robust escalation of nicotine intake, associated with increased responding under fixed and progressive ratio schedule of reinforcement. Methods: Using this novel model, we examined whether the CRF-CRF1 system, and the dynorphin-KOR system are implicated in the escalation of nicotine intake. We have recently demonstrated that rats given intermittent schedule or after escalation has been established.  Results: Central infusion of the specific CRF1 antagonist R121919 (0, 1, 5, 25 µg) following self-administration on an intermediate schedule that led to the escalation of nicotine intake. Another group of rats received s.c injection of either vehicle or the long-lasting KOR antagonist NorBNI (30 mg/kg, s.c) prior to the initiation of the intermittent schedule or after escalation has been established. Results: Central infusion R121919 dose dependently attenuated nicotine self-administration after escalation has been established. NorBNI delayed the escalation of nicotine self-administration but had no effect on nicotine intake after escalation. Conclusions: These findings confirm that the CRF1 and the KOR receptor are involved in the escalation of nicotine intake and may have important clinical implications. As the CRF-CRF1 system and the dynorphin-KOR system are implicated in the behavioral and physiological manifestations of drug withdrawal, these results
support the postulation that escalation of nicotine intake may be heavily dependent on its ability to alleviate the aversive symptoms of withdrawal. This research was supported by the Tobacco-Related Disease Research Program from the State of California (grant 1TRF-0035), the Pearson Center for Alcoholism and Addiction Research, and the National Institute on Drug Abuse.

CORRESPONDING AUTHOR: Nicola Stanczyk, PhD Student, P.Debyeplein 1, Research and Development (grant #: 20011007).

POS4-73
RECRUITMENT STRATEGIES FOR SMOKERS TO PARTICIPATE IN A WEB-BASED COMPUTER TAILORED (CT) SMOKING CESSATION INTERVENTION

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Background: The objective of this study was to explore the effectiveness of four different recruitment strategies aimed to recruit smokers from different Dutch socio-economic groups for a web-based computer tailored (CT) smoking cessation intervention. Methods: Respondents who were motivated to quit within 6 months, who were aged over 18 and who completed the baseline questionnaire were included in the study. 632 respondents were randomized to one of the two experimental conditions (video-based CT or text-based CT) or the control condition (generic text-based advice). After 6 months quit attempts and 7-day point prevalence abstinence were assessed. T-tests and Chi-square tests were conducted to explore differences between the differently recruited samples. Logistic regression analysis was used to investigate whether mode of recruitment had an effect on quit attempts and smoking abstinence. Results: Smokers recruited via GP practices (N=144) were less educated compared to smokers recruited via the ‘other recruitment’ (N=213) and GP’s were older compared to the other two strategies, r=13.826, p=0.009 and high addicted respondents recruited via newspaper advertisements were significantly less likely to have made a quit attempt compared to respondents recruited via the GP practice (OR=334, p=0.035). Female smokers recruited via newspaper advertisements were also less likely to be abstinent compared to respondents recruited via the GP (OR=337, p=0.005). Conclusions: Although recruitment via internet and newspaper advertisement resulted in a larger number of smokers and was lower priced, the GP recruitment attracted more lower educated smokers who were more likely to quit than smokers recruited via the other strategies. Therefore, recruitment via GP practices might be an effective strategy in reaching LSES smokers.

This work was supported by ZonMW, the Netherlands Organisation for Health Research and Development (grant #: 20011007).

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POS4-74
SMOKING IN CARS: FINDINGS FROM A LARGE SCHOOL-BASED STUDY IN ENGLAND

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Background: Being exposed to second hand smoke is associated with an increased risk of mortality and morbidity in children. Two main sources of exposure to second hand smoke for children are in the home and family car. The aim of this study was to estimate the proportion of children exposed to smoking in cars in a large city in England, and to identify factors that are associated with children’s exposure to smoking in cars. Methods: We used data from a large school-based survey in Nottingham (UK) carried out in 2012 including a sample of more than 4000 children aged 11-16. Smoking in cars was investigated using two questions: whether smoking is allowed in the family car and how often a child travels in a car where smoking is allowed. Smoking in cars was investigated in relation to demographic variables, school year, deprivation, smoking rules in the home, smoking among family members and friends, and ever-smoke affecting logistic regression. Results: Approximately 12% reported that smoking was allowed in their family car and 35% that they travelled in a car where smoking is allowed at least sometimes. If extrapolated to population figures for England, this translates into around 486,000 who live in the families where smoking in cars is allowed, and 1.34 million who travel in a car where smoking is allowed. Smoking in the family car was more likely to be reported by children from more disadvantaged families, if one or both parents are smokers, if smoking is allowed in the main home, and if children have friends who smoke. These factors, and having a sibling who smokes, were also associated with an increased risk of traveling in a car in which smoking is allowed at least sometimes. Respondents exposed to smoking in the car were also more likely to have ever smoked (Adjusted odds ratio 1.59, 95% CI 1.18-2.14). Conclusions: Exposure to tobacco smoke in cars was relatively common among secondary school children, and was strongly related to social disadvantage. Measures to prevent exposure are therefore indicated to help to reduce ill-health, health inequalities and smoking experimentation.

Funding: This study was originally supported by Cancer Research UK, Nottingham City PCT and the UK Centre for Tobacco Control Studies, with core funding from the British Heart Foundation, Cancer Research UK, Economic and Social Research Council, Medical Research Council, and the Department of Health under the auspices of the UK Clinical Research Collaboration.

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POS4-75
A TEST OF MODERATED MEDIATION EXAMINING NICOTINE DEPENDENCE, NEGATIVE AFFECT, AND NEGATIVE AFFECT REDUCTION SMOKING EXPECTANCES AND MOTIVES

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Background: Although nicotine dependence is related to increased problems in quitting and a variety of forms of mood-based psychopathology, little work has explored the relationship between nicotine dependence and mood-relevant beliefs about the consequences of smoking. This limitation is unfortunate, as contemporary views of nicotine dependence suggest that this construct may reflect various motives for smoking. One such motive that has been linked to mood-based vulnerability is negative affect reduction. The present study used path analysis to examine the relationship between nicotine dependence and negative affect reduction expectancies, and negative affect reduction motives. Method: The present study examined the baseline data of 376 daily smokers (mean cpd=18.0; 46.9% female) participating in a larger clinical trial comparing the efficacy of two smoking cessation treatments. We analyzed conditional indirect effects models using Hayes' Process Macro for SAS for the following variables: nicotine dependence (FTND scores), negative affect (PANAS-NA), negative affect reduction smoking motives (RFS-NA), and negative affect reduction expectancies (SCQ-NR/NA). Results: Tests of moderated mediation found a significant direct effect of the FTND (nicotine dependence) on the RFS-NA (negative affect reduction smoking motives). The relationship between the FTND and RFS-NA was mediated by the PANAS-NA (negative affect), and indirect effects of FTND on RFS-NA was moderated by the SCQ-NA/NR (negative affect reduction expectancies). The moderated mediation relationship was such that the mediating effect of the PANAS-NA was stronger the greater the individual’s SCQ-NA/NR scores. Conclusions: The present cross-sectional findings suggest that more dependent smokers are more likely to endorse smoking to reduce negative affect, particularly those with greater negative affect reduction outcome expectancies. Future research should examine these variables prospectively to determine their temporal relationship and how they relate to smoking behavior and smoking cessation outcomes.

Work on this project was funded by NIMH Grant 1 R01 MH076629-01 awarded to M.J. Zvolensky.

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POS4-76  
FACTORS ASSOCIATED WITH USE OF MENTHOLATED CIGARETTES AMONG SMOKERS IN NIGERIA  
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Background: Studies in the United States have demonstrated association between mentholated cigarettes and socio-demographic and smoking patterns especially among African Americans. However, limited research has been conducted about use of mentholated cigarettes in other countries with significant population of blacks. The purpose of the current study was to assess factors associated with the use of mentholated cigarettes and smoking patterns among male smokers in Lagos, Nigeria. Study participants were all male because cigarette smoking among females is uncommon in Nigeria. Methods: A total of 299 male volunteer residents of Iki-Araba Sabo area of Lagos completed a cross-sectional survey that included questions on smoking initiation, smoking patterns, cigarette brands, preference for mentholated or non-mentholated cigarettes. Results: Mean age of study sample was 33.7 (SD ± 10.4). The prevalence of smoking among youth below the age of 18 years was 26.4%. Average age of smoking initiation was 21.1 (SD ±7.1). Nearly all (97%) of the smokers reported that they smoke daily. Nearly one-fifth (19.4%) of the smokers preferred mentholated cigarette brands, 11.3% of which reported a ‘calming’ effect as the main reason for smoking. Nearly one-fifth (19.4%) of the smokers preferred mentholated cigarettes among other forms of smokeless tobacco (OR= 3.06, 95% CI: 1.13-8.39), and use of other forms of smokeless tobacco (OR=0.13, 95% CI: 0.04-0.37). Conclusion: This study indicates a preference for mentholated cigarettes among younger smokers in this population and would inform the development of smoking cessation interventions tailored for this population.

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POS4-77  
ABSTINENCE AND USE OF COMMUNITY-BASED TREATMENT AFTER A MOTIVATIONAL INTERVENTION FOR SMOKING CESSATION AMONG ADULTS WITH SEVERE MENTAL ILLNESSES  
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Background: Approximately 60% of people with severe mental illnesses (SMI; i.e., schizophrenia or severe mood disorders) smoke. Although they report wanting to quit, most do not use smoking cessation treatment. Motivational interventions improve treatment initiation but follow-up cessation outcomes have not been reported in this group. Here we report naturalistic treatment use, abstinence outcomes, and predictors of abstinence after a web-based motivational intervention in 123 adults with SMI. Methods: We consented 142 unmotivated SMI smokers who received services at a large mental health center; 131 were assessed at baseline and used one of two similar motivational interventions with education about cessation treatments; 123 were assessed again at six-month follow-up. The primary outcome, one week of continuous abstinence, was measured with the Timeline Follow-back method. Chart review and clinician report provided records of use of cessation treatment, which were affirmed by participant self-report. The Colorado Symptom Index and the Brief Assessment of Cognition in Schizophrenia were used to measure baseline symptoms and cognition. We used logistic regression models to assess covariates of abstinence. Results: Among the 123 smokers, 36% (45) initiated treatment. Among those who attended any behavioral treatment, the average number of counseling sessions attended was five (SD=4). Over the six months of follow-up, 29% (36) attained at least one week of smoking abstinence. Attaining abstinence was significantly related to level of education (OR=1.3, CI=1.1-1.6) and any use of quit smoking medications or counseling (OR=4.6, CI=2-10.9). Attaining abstinence was not associated with baseline cognition scores, psychiatric symptoms or other demographic and clinical variables. Rates of relapse were high: 7% (8) reported continuous abstinence confirmed by breath CO at 6-months. Conclusions: These data suggest that motivational interventions lead to initiation of cessation treatment available in community mental health settings, and that use of treatment is the strongest predictor of abstinence from tobacco products in smokers with SMI.

This research is funded in part by the U.S. Department of Education, National Institute on Disability and Rehabilitation Research; and the Substance Abuse and Mental Health Services Administration, Center for Mental Health Services and Consumer Affairs Program, under Cooperative Agreement #H133B100028. This research was also supported by the Bristol-Myers Squibb Foundation.

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POS4-78  
SELF-REPORTED QUIT RATES AMONG USERS OF A NATIONAL TEXT MESSAGE BASED CESSATION PROGRAM: EARLY DATA FROM THE NATIONAL CANCER INSTITUTE’S SMOKEFREETXT  
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Background: The rapid proliferation of mobile technology has significantly changed the health communication landscape. Increasingly, mobile technologies are being leveraged to deliver health behavior interventions, in ways not previously possible. A growing body of literature has demonstrated the immense potential for mobile phones as a platform for the delivery of smoking cessation interventions. In December 2011, the Community Preventive Services Task Force recommended mobile phone-based interventions for tobacco cessation based on sufficient evidence of effectiveness in increasing tobacco use abstinence among people interested in quitting. The recommendation was based on a comprehensive review of published studies of mobile phone-based cessation interventions, the majority of which were conducted outside of the United States. Further research is needed to assess the impact of mobile phone-based cessation interventions on cessation outcomes, particularly within the United States. Methods: In July 2011, the National Cancer Institute launched SmokefreeTXT, the first evidence-informed text message based cessation program available to U.S. smokers who want to quit. The program provides encouragement, advice, and tips to help smokers stop smoking for good. Users receive cessation support messages for up to two weeks before and six weeks after their quit date. Data on user characteristics and self-reported abstinence is collected at regular intervals over the course of the program. Results: An intent-to-treat analysis of cessation outcomes was conducted using data from a total of 13,145 SmokefreeTXT profiles. Self-reported quit rates at the one, three and six month follow-ups were 11.25%, 9.76% and 4.86%, respectively. Conclusions: Quit rates among SmokefreeTXT participants suggest that the text messaging program was effective in promoting successful cessation. The intervention increased self-reported abstinence rates well above those typically observed among individuals who attempt to quit smoking without medication or other assistance. These preliminary data provide further evidence of the immense potential for texting as a method to improve cessation outcomes.

Funded by NCI Contract No. HHSN261201000010S.

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POS4-79  
KEEPING UP WITH THE TOBACCO INDUSTRY: MONITORING PRO-TOBACCO INFLUENCES  
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Background: Pro-tobacco influences are any factors that directly or indirectly promote tobacco use. Monitoring these influences is critical to fully evaluate the progression of comprehensive tobacco control programs. Tobacco control policies, programs, and services can be seen as positive vectors that work to ‘push down’ tobacco use prevalence, while pro-tobacco influences are the negative vectors
that drive prevalence up through, for example, promotion, packaging, and price discounts. Objectives: To identify indicators of pro-tobacco influences and to highlight case studies that exemplify these indicators relevant to the Ontario context. Methods: We examined indicators identified by the Ontario Tobacco Research Unit, literature searches, and other jurisdictions with comprehensive tobacco programs. We also conducted an environmental scan of organizations with a history of monitoring pro-tobacco influences including the Centers for Disease Control and Prevention, the US Surgeon General, and the World Health Organization. Through this process, we identified 30 potential indicators. We then took into consideration feasibility, frequency and quality of available data, as well as utility for interpreting tobacco control efforts. Results: We identified 16 key indicators, grouped into the following seven categories: Tobacco Agriculture & Production; Distribution & Consumption; Availability; Price; Product & Package Innovation; Marketing & Promotion; and Partnerships & Corporate Activities. We report three illustrative case studies that underscore the importance of monitoring pro-tobacco influences: industry tactics around flavored cigarillos; changing market share of cigarettes relative to other tobacco products; and promoting light and mild cigarettes without using prohibited labels. Conclusions: To fully understand progress in tobacco control, it is necessary to take into account both the positive and negative forces. Monitoring pro-tobacco influences is important for surveillance, interpretation of tobacco control results, and feeding back information to stakeholders. The tobacco industry is continuously adapting to our efforts and we cannot ignore this opposing force.

This research is funded by the Ontario Tobacco Research Unit through the Ontario Ministry of Health and Long-term Care.

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POS4-80
DEMOGRAPHIC AND PSYCHOSOCIAL CORRELATES OF WATER PIPE USE AMONG COLLEGE STUDENTS

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Background: Waterpipe smoking has become increasingly popular among college students over the past few years. While much is known about factors that influence other tobacco products such as cigarettes, very little is known about the determinants of waterpipe use. The aim of this study was to explore whether demographic and psychosocial variables are related to waterpipe smoking among college students. Methods: A web-based survey was conducted among college students to assess the correlates of waterpipe smoking. The study was voluntary and students, 18 years or older regardless of smoking status, were eligible. Results: The sample consisted of 745 respondents, of which there were 71.3% females and 28.7% males, with mean age of 20 years. Racial distribution of the sample was largely white (67.5%), the rest being Asian (14.4%), Black (13.4%), American Indian (1.2%), and biracial (2.3%). Ever use of waterpipe was reported by 57.0%, of whom 12.1% had used it in the past 30 days. Current use of cigarette and cigar were reported by 14.9% and 4.2% of the students respectively. In a fully adjusted model, the risk of ever smoking waterpipe was higher among cigarette smokers (AOR=5.89, CI: 3.61-9.61) and cigars smokers (AOR=2.27, CI: 1.38-3.74). Having a friend who smoked waterpipe (AOR=2.6, CI: 1.6-4.2) and the perception of low likelihood of getting addicted while smoking waterpipe in groups (AOR=2.25, CI: 1.41-4.6) increased the risk of waterpipe smoking. Participants with high levels of self efficacy to resist waterpipe smoking were less likely to ever smoke waterpipe (AOR=.97, CI: .96-.98). Conclusions: The results highlight the popularity of waterpipe smoking among college students and underscore the need for more research on this growing trend. Understanding patterns of predictors of waterpipe use among college students is critical in developing effective prevention and treatment interventions.

No funding.

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POS4-81
IDENTIFICATION OF MOTIVATIONS AND BARRIERS FOR TOBACCO USE AMONG PATIENTS UNDERGOING HEMATOPOIETIC STEM CELL TRANSPLANT

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Background: Patients undergoing HSCT may incur serious repercussions associated with tobacco use after transplant, such as increased risk of mortality, complications, and comorbid medical conditions. As a step towards understanding and reducing tobacco use in this population, the current study examines possible motivators and barriers towards cessation among HSCT patients being evaluated for transplant using Social Cognitive Theory and Protection Motivation Theory. Methods: Participants completed a pre-transplant survey (n=496) at time of their clinical evaluation. Theory relevant motivators and barriers to cessation were queried. Results: Participants were predominately partnered (81%), white/Non-Hispanic (95%), men (58%), aged 19-75 years (M = 55.8, SD = 11.9). Seventy-seven percent of participants received an autologous transplant. Approximately, 15% of participants used tobacco within the past year (n>74) and 6% of these individuals used tobacco within the past seven days. Tobacco users predominately reported smoking cigarettes (39%) at the rate of 10 or fewer each day (69%). Participants reported protecting health (89%) and setting an example for their children (42%) as their primary reasons for tobacco cessation. Stress (30%) and enjoyment from smoking (10%) were identified as primary barriers to quitting. Twenty-eight percent of individuals stated there were no barriers to quitting. Conclusions: These findings utilize existing theory to help identify potential targets for smoking cessation interventions among tobacco users undergoing HSCT. Tobacco interventions are largely unaddressed in the HSCT literature. Based on our findings, emphasis on theoretical constructs focusing on perceived health benefits and benefits to children may be helpful. Stress management and positive mood induction intervention components may also be helpful.

This study was funded by NIH grant KL2 RR 02415.

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POS4-82
SCANNER STRESS CORTISOL PROLACTIN AND HEART RATE DIFFERENCES IN OPRM1 A118G TOBACCO SMOKERS

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Background: Scanner stress produces a wide range of emotional and physical reactions including blood cortisol release. Furthermore, there are many single nucleotide polymorphisms (SNPs) of the mu opioid receptor gene (OPRM1) of which A118G (rs1799971) is especially important in modulating cortisol release. OPRM1 A118G is also a genetic factor in drug abuse including heroin, alcohol and tobacco smoking. The hypothesis for the present research was that tobacco smoking effects on cortisol and prolactin release are quantitatively different in AA vs AG/GG (GG) smokers undergoing positron emission tomography (PET) scanner stress. Methods: Twenty two young adult healthy male smokers were recruited for PET studies in which they had to lay supine, head restrained in the scanner for about 4 hours. During two separate 90 min PET scans with [11C]carfentanil and [11C]raclopride the overnight abstinent smokers smoked denicotinized (denic) and avnic cigarette smoking. Venous plasma nicotine, cortisol and [11C]raclopride the overnight abstinent smokers smoked denicotinized (denic) and avnic cigarette smoking. Venous plasma nicotine, cortisol and prolactin were measured periodically. Ten mL of venous blood were taken for genotyping OPRM1 A118G carriers. Results: Similar increases in nicotine levels were obtained in both the OPRM1 AA and *G smokers. After denic smoking peak mean ± SE nicotine levels were of 3.9±0.44 and after avnic smoking 16.9±1.49 ng/mL. Although plasma nicotine levels were similar, the AA carriers before and after smoking avnic cigarettes had greater cortisol levels than the *G carriers. In contrast prolactin levels after avnic smoking in the *G alleles were similar to the AA carriers. However, 49 to 95 min after avnic smoking the *G carriers had greater prolactin levels. Heart rates/min were greater in the AA than the *G carriers before and after avnic smoking. Denic cigarette smoking had negligible effects. Conclusions: Overnight abstinent tobacco smokers under PET scanner stress in...
the morning over a 4 hour period differ in pre and post avnic smoking increases in venous plasma cortisol.

Supported by UM Psychopharmacology Research Fund 361024.

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POS4-83
RESULTS FROM FEMALE PATIENTS IN A TOBACCO CESSATION UNIT IN ALBACETE UNIVERSITY HOSPITAL DURING 2008 AND 2009

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Aim: Review the results analyzed in a Tobacco Cessation Unit during 2008 and 2009. Material and Methods: Retrospective descriptive analysis of the results obtained from female patients who were attended in a Tobacco Cessation Unit from January 1st in 2008 to December 31 in 2009 and the subsequent follow-up to complete a year. Results: 299 of 559 patients were females (46,3%), mean age 44,12 years (SD 10.07) and mean cigarettes/day 24,78 (SD 1,54). Mean Fagerström 7,12 (SD 2.04) and mean Richmond 8,05 (SD 1,54). Respiratory comorbidity, 20,5% (10% asthma, 8,1% COPD, 5.4% OAHS and 1.2% HOT). Psychiatric comorbidity, 47,1% (43,2% depression and/or anxiety). CVRF: 23,6% dyslipidemia, 6,9% HT and 6,2% DM. Of 259 female, 135 (52,12%) did not attend the second consultation. 35,5% without treatment, 45,9% NRT or bupropion and 18,5% varenicline. Success among non-psychiatric females compared psychiatric (16,1% vs. 6,6%, p<0,017). Those who were treated pharmaco logically, greater success s.s. among who used varenicline (24,5%) compared to NRT (15,3%), bupropion (14%) or no treatment (1,1%), p<0,001. Overall of the 259 females, treatment success in 30 (11,6%); if we do not consider those who did not attend the second consultation, of 124 females who were treated, percentage rises to 24,2%. Conclusions: 1. Females showed moderate-severe nicotine dependence and high motivation 2. Severe comorbidity, especially psychiatric, respiratory and CVRF. 3. Greater success s.s. among non-psychiatric ones compared psychiatric. 4. Greater J. Campbell, M.D.1,2, and Stephanie S. O'Malley, Ph.D.1,3, 1Yale University School of Medicine, Psychiatry, 1Long Wharf Drive, New Haven, CT 06511, United States, Phone: 203-974-5725, Fax: 203-974-5790, Email: jolomi.ikomi@yale.edu

POS4-85
CHARACTERISTICS REGARDING CIGARETTE RELIGHTING BEHAVIORS AMONG TREATMENT SEEKERS: IMPLICATIONS FOR TOBACCO DEPENDENCE TREATMENT AND POLICY

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Background: During the recent economic downturn, trends towards fewer cigarettes smoked per day have emerged along with the practice of extinguishing and relighting cigarette “butts”. Data indicate that smokers who engage in relighting increase their risk of lung cancer and chronic bronchitis. Few studies have characterized factors related to relighting cigarettes and none have explored this behavior in those seeking tobacco treatment. This study describes treatment-seeking patients who extinguish and relight cigarettes and examines the implications on tobacco treatment and policy. Methods: Cross-sectional sample of 496 consecutive patients at a specialty tobacco treatment program in New Jersey. Results: Forty-six percent of the sample reported relighting cigarettes. These subjects smoked significantly fewer cigarettes per day (CPD) (16 vs. 20), despite similar levels of dependence (FTND: 5.2 vs. 4.9) and exhaled CO values (20 vs. 19 ppm). Significantly higher rates of relighting were found among females, African-Americans, and smokers who are divorced, widowed or separated. Additionally, having a high school degree or less and being unemployed, sick, or disabled were significantly related to relighting behaviors. Relighting was more prevalent among smokers with shorter time to first cigarette, fewer CPD, menthol smoking, and waking at night to smoke. In multivariate analyses, female gender remained a significant predictor of relighting, as was lower education and unemployment/disabled status. Conclusions: Extinguishing and relighting cigarettes is an important and rather unexplored smoking behavior. As expected, characteristics related to economic factors (lower education and employment) were related to more relighting behaviors, but surprisingly, women were also more likely to relight cigarettes than men. Possible explanations warrant further discussion. The implications for tobacco treatment include the impact on pharmacotherapy dosing and unique counseling implications for triggers and interventions. Policy makers need to be aware of this phenomenon and the implications of reduced consumption with no appreciable reduction in exposure to toxins.

No funding.

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UNIQUE INPATIENT VARIABLES AS PREDICTORS OF ABSTINENCE FOR HOSPITAL PATIENTS RECEIVING SMOKING CESSATION INTERVENTION


Background: Hospital initiated tobacco cessation treatment coupled with follow-up after discharge increases abstinence. Other known predictors of abstinence include level of tobacco dependence, gender and age. The impact of other variables unique to inpatients not commonly reported include circumstances of admission, length of stay, and insurance coverage. Oregon Health & Science University (OHSU) Tobacco Cessation Consult Service provides inpatient tobacco cessation treatment. A quality improvement analysis was done to identify unique inpatient predictors of abstinence among our inpatients. Objectives: To identify unique inpatient predictors of abstinence after discharge among patients seen by the OHSU Consult Service. Methods: Data from patients discharged between January 2011 and August 2012 (N=781) and completing a 2-week follow-up phone call were analyzed to determine the relationship between circumstances of admission, length of stay, and insurance coverage and self-reported abstinence. Results: Of 781 patients agreeing to follow-up 523 (67%) were reached. Of these, 59% of patients admitted for urgent care reported abstained compared to 44% with planned admissions. Patients with hospital stays 8 days or greater were twice as likely to be abstinent as patients admitted for 2 days or fewer. Uninsured patients were as likely to be abstinent as Medicaid patients (40% and 41% respectively). Commercially insured patients were most likely to be abstinent (56%). Conclusions: A sudden health crisis (urgent admission) and serious illness (length of stay) are unique inpatient predictors of abstinence. Lack of insurance is not a deterrent to quitting although patients covered by their employers (commercially insured) are more likely to quit.

The OHSU Smoking Cessation Consult Service is funded by OHSU Hospitals. This analysis was supported by the OHSU Division of Pulmonary & Critical Care Medicine.

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SECONDHAND SMOKE EXPOSURE OF YOUNG ADULTS IN A DEVELOPING COUNTRY: A JORDANIAN CASE

Roula Ghadban, R.N., M.S.N.*, and Linda Haddad, R.N., Ph.D., FAAN

Secondhand smoke (SHS) exposure is a potentially preventable environmental pollutant. Therefore, it remains a major global public health concern that is totally preventable. In this descriptive cross-sectional design was used to assess SHS exposure, knowledge, attitudes, and avoidance behaviors, as well as policy agreement towards SHS among young adult university students in the northern part of Jordan. A proportional convenience sample of 800 university students from three governmental universities participated in this study. They completed two questionnaires: the household SHS exposure questionnaire and the knowledge, attitudes, and avoidance behaviors toward secondhand smoking questionnaire. Findings showed that SHS exposure among non-smoker university students was 96%. In addition, the mean hours of exposure per day was 4.64 hours (SD=4.28), and the mean days of exposure per week was 5.14 days (SD=2.1) even though they were very knowledgeable about the dangers of SHS exposure. Our results suggest that even though a student has knowledge of the dangers of SHS and good avoidance behaviors, he or she is unable to avoid SHS because the students reported high hours of exposure. Advocacy for the right interventions to avoid exposure to SHS should be initiated for Jordanian society as a whole.

Funding: Jordan University of Science and technology Deanship of research and Virginia Commonwealth University School of Nursing.

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TRENDS IN WATER PIPE USE AMONG ARAB AMERICANS IN RICHMOND METROPOLITAN AREA

Roula Ghadban, R.N., M.S.N.*, and Linda Haddad, R.N., Ph.D., FAAN, Virginia Commonwealth University

The purpose of this study is to investigate the prevalence and determinants of Water Pipe use and to identify barriers to stop using water pipe among Arab Americans. As the America’s fastest growing immigrant, this group is of great concern to the health care providers because Middle East Arab adults have the highest smoking rates in the world. The smoking of water pipes in the U.S. has been increasing over the last few years. This practice has gained momentum through the trendy use of water pipes by immigrant populations, particularly Arab Americans. A convenient snowball sampling method was used to recruit 221 self-identified Arab Americans living in the Richmond Virginia metropolitan area. Both men and women in this sample had higher rates of water pipe smoking (56.6%, 40.2% respectively) than the age- sex- matched U.S. population. Majority of waterpipe smokers in the study had the desire to quit, made attempts, but they were not informed of the resources that could have helped them stop water pipe smoking. Lack of awareness of resources could indicate either Arab Americans’ limited access to health services or these resources exist but are not culturally and linguistically tailored to Arab Americans. After controlling for demographic and background variables, findings from the logistic regression analysis showed that smoking a waterpipe with one close friend (P=0.004) and initiating waterpipe smoking at an early age (P=0.003) were two significant predictors for continuous use.
of water pipe. These findings suggest that a culturally tailored health education should not only include adult for how to stop waterpipe smoking but also prevention of smoking for youth Arab Americans.

Funding: Virginia Tobacco Foundation.

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POS4-90
THE WHEN AND EXACTLY WHERE OF SMOKING: A COMBINED EMA/GPS PROOF OF CONCEPT STUDY

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Ecological momentary assessment (EMA) is a research method by which participants complete self-report electronic surveys on mobile electronic devices in their natural environments. Over the last two decades, EMA research has provided a rich assessment of the contextual, situational and psychological factors associated with a wide range of behaviors including smoking, alcohol use, eating and physical activity. Despite this rich database, which includes information regarding the temporal distribution of behaviors (i.e. smoking) and the generic contexts in which they occur (e.g. at a bar), this information has not been linked to specific locations in space. Such location information, which can now be easily acquired from global positioning satellite (GPS) tracking devices, and linked to EMA data, could provide unique information regarding the space-time distribution of behaviors and new insights into their determinants. In a proof of concept study, we assessed the feasibility of acquiring and combining EMA and GPS data from adult smokers during a 7 day assessment period. Participants were amenable to GPS tracking with 10 out of 11 agreeing to carry a GPS logger in addition to a personal digital assistant (PDA) used for acquiring EMA data. In addition, participants were highly compliant with instructions to carry and charge the GPS logger—80% carried the device for at least 6 of the 7 days. A total of 804 smoking entries were recorded on the EMA device. GPS and EMA data were merged and then processed and analyzed using geographical information system (GIS) software (ArcGIS). Visual inspection suggested that the spatial distribution of smoking behavior and self-reported urges to smoke varied widely across individual smokers. Quantitative metrics (e.g. centrality of smoking) derived from network analyses were also used to characterize smoking behavior in sum. The results of this proof of concept study suggest that EMA+GPS assessment is feasible and can provide novel insights into smoking behavior. We conclude by discussing how EMA+GPS might be used to study the ecology of smoking and other risk behaviors and make recommendations for future research and analysis.

This work was supported by the National Institute of Drug Abuse (NIDA R03 DA029694 to J.T.M.).

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POS4-91
A PILOT TRANSLATIONAL STUDY OF SAMPLING NRT FOR CESSATION: IS MOTIVATION NECESSARY?

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Background: Although the majority of smokers are ambivalent about quitting in the near future, few treatments target unmotivated smokers. Most existing interventions are instead based on the belief that active treatments should only be distributed to smokers interested in quitting, a largely untested assumption. Methods: We conducted a pilot clinical trial (N=150) of smokers recruited from across South Carolina. We assigned smokers currently motivated to quit to receive a 2wk supply of patch and lozenge + quitline referral (Group A), and randomly assigned unmotivated smokers to receive the same 2wk supply of NRT + quitline referral (Group B) or a quitline referral only (Group C). Participants were tracked via telephone for 3-months. Results: Significant pairwise differences between all groups emerged with regard to incidence of 1) any quit attempt (Group A: 77%, Group B: 40%, Group C: 18%, p < .05), and 2) any 24-hr quit attempt (Group A: 62%, B: 32%, C: 16%, p < .05). Participants in Group A (19%) reported a significantly higher incidence of floating abstinence (any 7-day period of non-smoking) than did participants in Group C (6%, p = .04), but not Group B (17%, p = .80; Group C vs B: p=.08). At Month 3, Group A (17%) and Group B (15%) had a nonsignificantly higher incidence of 7 day point prevalence abstinence than Group C (5%). Most participants in Groups A (92%) and B (79%) used NRT medication (non-significant differences), whereas most in Group C did not (8%, p < .05). No significant group differences emerged for use of other pharmacologic or behavioral support. There were significant time x group interactions for motivation and confidence to quit, as well as for cigarettes per day, suggesting general improved outcomes such that Group A>B>C. Conclusion: Providing NRT samples was efficacious at engaging both motivated and unmotivated smokers to use evidence-based methods of quitting. This suggests that while motivation may be sufficient it is not necessary to engage smokers in the cessation process. Sampling NRT is a novel and easy-to-use strategy that may represent a promising approach for improving the otherwise stagnant rate of quit attempts.

Funding through the Hollings Cancer Center and NIDA grant K23 DA020482 (PI for both: Carpenter).

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POS4-92
AN EXAMINATION OF RELATIONSHIPS BETWEEN LABORATORY MEASURES OF DIFFERENT ASPECTS OF CYGARETTE ADDICTION

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Studies of drug users have shown that different behavioral paradigms can be employed to examine the reinforcing effects of nicotine, compulsive cigarette-seeking behavior, and the effect of cigarette cues. We examined the relationship between these paradigms and their association with craving. Participants were 32 adult smokers (M age=40; 53% female). Participants sampled nicotine (nic) and denicotinized (denic) cigarettes. Participants completed a forced-choice procedure for nic or denic puffs and an operant response task in which they responded under a progressive ratio schedule for puffs from the nic or the denic cigarette. Participants completed a cue reactivity task with a neutral and a smoking cue. Self-reported craving was assessed throughout all study sessions on a 100-point visual analog scale. In the forced-choice, participants chose nic (M=19.0, SD=6.0) more than denic puffs (M=4.9, SD=6.0), p<.001. Participants also completed more operant response ratios for nic (M=2.9, SD=2.4) than denic cigarettes (M=2.0, SD=2.1), p<.05. No correlation was found between these two tasks. Participants reported greater increases in craving to the smoking cue (M=7.4, SD=17.2) than the neutral cue (M=0.0, SD=11.0), p<.01. There was a correlation between smoking-cue craving and the response ratios completed for the denic cigarettes, r=38, p<.05. Baseline levels of craving were correlated with response ratios for nic cigarettes, r=40, p < .05. The lack of an association between forced-choice and operant response tasks suggests some disassociation of cigarette-seeking behavior from nicotine reinforcement. Smoking craving responses suggest that the identification of different subgroups of smokers might have implications for effective treatment choices. Perhaps individuals who crave in response to smoking-related cues might benefit from denic cigarettes as a treatment, allowing them to engage in the compulsive behavior while discontinuing use of nicotine. Smokers who crave more generally may respond best to treatments related to the drug effects themselves, such as nicotine replacement therapy.

Funding: National Institute on Drug Abuse-Intramural Research Program.

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**POS4-93**
SUBJECTIVE EFFECTS WHEN SMOKING HOOKAH EQUIPPED WITH “HARM REDUCTION” ACCESSORIES

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Recent studies on subjective effects of hookah have focused on before-and-after hookah smoking or comparisons of hookah to cigarette smoking. What is not known is whether “harm reduction” accessories result in different subjective effects after smoking hookah. Using a research grade hookah equipped with two accessories advertised to reduce harm, we compared subjective effects of smoking across three configurations: standard with charcoal (Charcoal), standard with charcoal equipped with bubble diffuser (Bubble), and standard no charcoal equipped with electric coal (Electric). We conducted a crossover study of 36 experienced hookah smokers using three configurations and collected responses on four questionnaires: Direct Effects of Tobacco (DET) scale, Hughes-Hatsukami Withdrawal (HHW) scale, Direct Effect of Nicotine (DEN) scale, and Questionnaire for Urges to Smoke (QSU). Participants rated significantly higher (p<0.05) higher on the DET scale after smoking Charcoal or Bubble configuration than Electric for Satisfy, Pleasant, Taste good, Calm, Dizzy, and Sleepy. There were no significant differences in these items between Charcoal and Bubble configurations, indicating that charcoal may be key to hookah smoking satisfaction. The bubble diffuser is advertised to promote increased smoke filtration resulting in less nicotine and a “smoother more flavorful” smoke. Participants rated significantly higher for Awake, Reduce Hunger, and Sick after smoking Bubble than Charcoal or Electric configuration. The DEN scale, participants showed significantly higher increase in Nauseous, Dizzy, and Lightheaded items when smoking Charcoal or Bubble than Electric configuration. This is likely due to the high carbon monoxide exposure associated with charcoal heating. On the HHW scale, participants showed similar, decreased scores for “Urges to smoke a hookah” and “Craving a hookah/nicotine” across all three configurations. Participants rated a significantly higher increased Drowsiness score using Charcoal configuration, which was significantly different from the score using Electric configuration. No significant differences were observed on the QSU scale across all configurations.

Funding for this project was provided by an award from NIH-National Cancer Institute (R01 CA133149, Clark) and a sub-award from University of Maryland School of Public Health to Battelle Memorial Institute.

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**POS4-94**
MEASURING COLLEGE STUDENT SMOKING CESSATION EXPECTANCIES

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Background: Little is currently known regarding characteristics and predictors of college student smoking cessation efforts. Examination of anticipated consequences of quitting can serve to elucidate the smoking cessation process. The present study reports on initial psychometric evaluation of a measure of college student smoking cessation expectancies. Methods: Qualitative instrument development procedures yielded a 30-item instrument, with responses on a 5-point. The measure was administered as part of an online survey to 1429 college students who smoke (63% female; 37% White, 31% Hispanic, 27% Asian, ages 18-24). Results: Confirmatory factor analyses suggested adequate fit for positive and negative constructs (TLI=0.96; RMSEA=0.08) with further segmentation into 4 subscales yielding marginal improvement in fit (TLI=0.97, RMSEA=0.08). The 2-factor solution included 15 positive (loadings range=0.49-0.83; alpha=0.91) and 15 negative expectancy items (loadings range=0.60-0.86; alpha=0.87). Likelihood ratio testing of nested graded response models revealed significant Differential Item Functioning (DIF) across respondents with different levels of smoking behavior, whereby infrequent smokers (quitting (.426), and intention to quit (.260). The negative expectancy scale score was significantly negatively related (all p’s <.001) with intentions to quit (-.352), confidence in quitting (-.476), and duration of most recent quit attempt (-.336). Conclusions: Initial support is provided for the structure and construct validity of this measure of college student smoking cessation expectancies. To our knowledge this is the first measure of its type designed for college students. Future research will investigate its utility for predicting smoking cessation.

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**POS4-95**
IDENTIFYING POTENTIAL THEMES FOR A YOUTH-FOCUSED SMOKING PREVENTION MASS MEDIA CAMPAIGN: A THEORY-DRIVEN AND EMPIRICAL APPROACH

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Background: According to theories of behavioral prediction, a given behavior occurs when there is a strong intention to perform the behavior. In turn, intentions are determined by beliefs about the behavior. Consistent with these ideas, Hornik and Woolf (1999) identified three criteria for selecting promising beliefs to be targeted in behavior change campaigns: the belief should not be held by a substantial number of people; should be strongly associated with intentions; and should reasonably be able to be addressed by a campaign message. In this study, we applied the first two criteria to identify promising target beliefs for a smoking prevention campaign. Methods: In an online survey of 761 13–17 year old non-smokers, we measured 165 smoking-related beliefs (specific campaign targets) grouped into 21 broad campaign themes. We also measured intentions to use tobacco over the next year (calculating the proportion with no intention to use tobacco: 68%). Cross-tabulations of each belief and no intention to use tobacco were used to generate the potential percent to gain for each belief. Percent to gain quantifies both the strength of the association between the belief and the intention and the size of the population that does not already endorse the belief (and so could be influenced by a campaign). Results: Campaign themes were ranked from highest to lowest average percent to gain to identify promising and unpromising themes. We present rankings for all 21 themes. The two most promising themes related to the effects of smoking on health and on social popularity. The two least promising themes related to the prevalence of smoking and the health effects of specific harmful ingredients. Within each theme, specific beliefs were also ranked and we present the most and least promising belief within each theme. Conclusions: Mass media campaigns play an important role in efforts to prevent youth smoking. We present a theory-driven and empirical approach to campaign development, which indicates that some potential campaign themes–and some specific beliefs within each theme–would be more promising than others as the target of a youth smoking prevention campaign.

This research was supported by the National Cancer Institute of the National Institutes of Health under Award Number P20CA095856. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

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**POS4-96**
SUBJECTIVE RATINGS OF CIGARETTE-RELATED, EMOTIONAL, AND NEUTRAL IMAGES IN CURRENT SMOKERS, SMOKERS RECEIVING SMOKING CESSATION TREATMENT, AND NEVER-SMOKERS

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Background: Smoking-related cues and affective experiences induce cravings for tobacco and might contribute to relapse in smokers trying to quit. Here we sought to determine whether smoking cessation treatment would affect subjective ratings.

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of emotional, neutral and cigarette-related stimuli. Methods: Smokers (N=238) and
never-smokers (N=47) rated pictures on valence and emotional arousal using the
Self Assessment Manikin (SAM). SAM ratings were collected from 67 smokers before
starting smoking cessation treatment and from 171 smokers taking placebo (PLA, N=52),
bupropion (BUP, N=61) or varenicline (VAR, N=58) for approximately
8 weeks. Each participant viewed a set of 96 pictures, which comprised six
semantic categories: unpleasant high arousal (UH; mutilations), unpleasant low
arousal (UL; sad scenes), pleasant high arousal (PH; erotic couples), pleasant low
arousal (PL; romantic couples, food, landscapes), neutral (NEU) and cigarette-
related (CIG). Results: Valence. Never-smokers rated CIG pictures as significantly
less pleasant than smokers in all groups (all ps < .05). Smokers receiving BUP or
VAR treatment rated CIG pictures as less pleasant than smokers before
treatment (all ps < .01). Never-smokers and smokers receiving BUP or VAR rated
CIG pictures as less pleasant than NEU pictures (all ps < .0001). Furthermore, all
groups of smokers (but not never-smokers) rated CIG pictures as significantly
more pleasant than UL pictures (all ps < .01). Arousal. All groups rated CIG pictures
less arousing than PH pictures (all ps < .001), but only smokers receiving VAR and
never-smokers rated CIG pictures less arousing than PL pictures (all ps < .01). Only
smokers receiving BUP or VAR rated CIG pictures less arousing than UH pictures
(all ps < .001). Smoking abstinence had no effect on the results. Conclusions: Our
findings show that smoking cessation treatment might change the way smokers
respond to cigarette-related stimuli. Individuals who received smoking cessation
medications rated cigarette-related stimuli as less pleasant than current smokers.
Thus, the diminished subjective pleasantness of cigarette-related cues might be
one mechanism that helps smokers quit.

This study was conducted at the University of Texas MD Anderson Cancer
Center. Supported by the National Institute on Drug Abuse through grants
1R01DA017073-01 and R21DA026544 to P.M. Cinciripini, and a grant from The
University of Texas MD Anderson Cancer Center Duncan Family Institute for
Cancer Prevention and Risk Assessment to J.D. Robinson.

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POS4-97
PREDICTORS OF RETENTION IN THE POWER TO QUIT SMOKING
CESSATION CLINICAL TRIAL FOR HOMELESS SMOKERS
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Background: Smoking prevalence in homeless populations is strikingly high at
70% or greater yet little is known about effective smoking cessation interventions
for this population. Among the barriers cited for this lack of cessation research in
homeless subjects are the challenges of retaining homeless individuals in clinical
trials. The Power to Quit (PTQ) project assessed the efficacy of motivational
interviewing (MI) in combination with the nicotine patch. The purpose of this paper
was to determine predictors of successful retention of homeless smokers in the
PTQ study. Methods: 430 homeless smokers were randomized into 2 groups
to receive either 6 sessions of MI or Brief Advice to quit smoking. All participants
also received 8 weeks of 21mg nicotine patch. Baseline assessments included
demographic information, shelter status, smoking history, motivation to quit
smoking, substance abuse, and psychiatric co-morbidities. Univariate analysis
was used to determine factors that were associated with treatment completion
and study completion followed by multivariate analysis to determine significant
predictors of retention. Results: 76% of participants completed week 8 and 75%
completed week 26 follow-up visits. Multivariate analysis revealed that week 8
retention was positively associated with older age, having health care coverage,
and not an excessive drinker. Week 26 retention was also positively associated
with older age, being homeless for greater number and longer episodes of
homelessness, higher depression score on Patient Health Questionnaire-9, and no
recreational drug abuse. Conclusions: Our results indicate that homeless smokers
are interested in quitting smoking and willing to enroll and stay in a clinical trial.
Further, participants with psychiatric co-morbidities and those with greater number
and longer episodes of homelessness had higher retention rates, which suggests
that retention strategies employed may have worked better for these groups.
Attention to factors associated with higher retention rates could improve long-term
retention and these factors should be incorporated into future studies in homeless
populations.

This work was supported by a grant from the National Heart Lung and Blood
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POS4-98
WHAT PREDICTS EARLY SMOKING MILESTONES?
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BACKGROUND: Despite advances in understanding the predictors of
smoking onset among young experimenters, more precision is still needed to
determine whether the patterns of predictors differ across early smoking
milestones. Therefore, the goal of the present study was to use a sample of
early adolescents to examine predictors of two key (and potentially distinct) early
smoking milestones: first puff and first cigarette. METHODS: Data came from an
ongoing, prospective, web-based project examining psychosocial factors related
to adolescent substance use. At Time 1 (T1), the sample was composed of 1,023
Rhode Island middle school students (52% female, 24% non-White, M age = 12.2).
T1 measures included hypothesized risk and protective factors, as well as current
smoking. Follow-up surveys at six and twelve months included questions about
recent smoking behavior; reports from these follow-up surveys were merged to
create a measure of smoking in the twelve months since baseline (T2 smoking).
RESULTS: At T1, 90 adolescents (9%) reported having ever puffed a cigarette
and 38 (4%) reported having ever smoked a whole cigarette. In addition, 45
adolescents transitioned from not having a puff at T1 to having their first puff by
T2; 32 transitioned from not having a cigarette at T1 to having their first
cigarette by T2. A series of logistic regressions indicated that these T1-T2 transitions to first
puff and first cigarette were primarily predicted by T1 environmental factors: peer
smoking, availability of cigarettes, and socioeconomic status. Further, a first puff
by T1 was the strongest predictor of first cigarette transition. Attentive parenting
(e.g., control and support) predicted a lower likelihood of first cigarette transition,
but was not related to first puff transition. Gender, grade, and race/ethnicity were
not significant predictors. CONCLUSIONS: For early adolescents, factors related
to cigarette availability were critical predictors of two key smoking milestones: first
puff and first cigarette. Although attentive parenting was not protective against a
first puff transition, it was protective against a first cigarette transition.

This work was supported by NIAAA grant R01AA016653 and NIDA grant T32
DA016184.

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POS4-99
NICOTINIC ACETYLCHOLINE RECEPTOR REGULATION DURING NICOTINE
WITHDRAWAL IN MICE
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Receptor binding in rodents and fMRI imaging studies in humans show up-regulation
of neuronal nicotinic acetylcholine receptors (nAChRs) following chronic
cocaine administration that persists into abstinence. However, the causal
relationship between behavioral withdrawal symptoms and nACHR up-regulation
is yet to be fully characterized. We have examined the impact of compounds that
differentially effect nAChR up-regulation to determine if up-regulation is necessary
for alleviation of withdrawal induced anxiety in mice. Animals were treated for two
weeks with chronic nicotine via osmotic minipump and then for one week with the
alpha4beta2 nicotinic acetylcholine receptor partial agonists ABT-089 (0.769mg/
kg/day) or Sazetidine-A (1.8mg/kg/day). ABT-089 and Sazetidine-A both alleviated
anxiety-like behavior during withdrawal from nicotine in the novelty induced
hypophagia (NIH) paradigm. Following behavioral testing brains were harvested
and analyzed for changes in nAChR binding. Results: ABT-089 failed to
alleviate the withdrawal induced hypophagia of NIH, whereas Sazetidine-A
alleviated NIH. This work was supported by a grant from the National Heart Lung and Blood
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Furthermore, both nicotine and Varenicline are associated with reduced anxiety in rodents (Turner et al., 2010), however, this work suggests that receptor up-regulation is not necessary to mitigate withdrawal induced anxiety-like behavior. In addition, ABT-107, a ligand that targets the alpha7 subtype of nAChR and does not up-regulate receptors also alleviates anxiety during withdrawal. Information obtained from this work will further our understanding of the functional relevance of nicotinic receptor up-regulation, specifically if this is necessary for the reduction of withdrawal symptoms. Together, these data will contribute to the rationale development of smoking cessation aids.

Funding: P50-DA-02585.

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POS4-100
TOBACCO USE AMONG ADULTS INITIATING TREATMENT FOR HIV IN RURAL UGANDA

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BACKGROUND: HIV-infected persons in resource rich countries have a high prevalence of tobacco use but little is known about tobacco use by HIV-infected persons in resource limited countries, where 80% of smokers and 97% of people with HIV live. We measured patterns of tobacco use among adults with HIV in a region of Uganda with low tobacco use prevalence (men=11% and women=3%, 2011 Demographics and Health Survey). METHODS: We studied participants in the Uganda AIDS Rural Treatment Outcomes study, a prospective cohort of adults initiating antiretroviral therapy (ART) in Mbarara, Uganda from 2005-2011. Pre-ART data include demographic traits, education, occupation, tobacco use (current [past 30 day use], lifetime use) and alcohol use (AUDIT-C). Tobacco use was self-reported at follow-up each 3-4 months. We used log-binomial regression to assess correlates of tobacco use, adjusting for age, gender, education and occurrence of incidence functions to assess tobacco cessation (no use at 2 consecutive visits) and incidence over time. RESULTS: Among 496 subjects, the median age was 35 years (range:18-75), 69% were women, 50(10%) were current tobacco users including 20% of men and 6% of women (p<0.001). Tobacco prevalence was higher among adults with alcohol problems than without (22% vs.6%, p=0.0001), and use was associated with lower education (< primary school: adjusted prevalence ratio (APR)=3.7; 95% confidence interval (CI)=2.2-6.1, primary school: APR=2.6; 95%CI=1.4-4.9 vs. secondary) and work as a laborer (APR=2.8; 95%CI=1.2-5.0 vs. professional/service worker). Median follow-up was 3.5 years, 33% of tobacco users quit by 6 months (95% CI=21-48%), 65% by 5 years (95% CI=50-78%) and 2% initiated use (95% CI=1-5%). CONCLUSIONS: Similar to resource rich settings, adults with HIV in rural Uganda had a higher prevalence of tobacco use than the general population and use was associated with less education, lower status jobs, and alcohol use. After initiating ART, few started using tobacco and most quit, suggesting entry into care might be a teachable moment. Factors associated with cessation should be explored and leveraged to further reduce tobacco use in this population.

Dr. Kruse was supported by grant #T32HP12706-03-00 from the Health Resources and Services Administration for the Harvard General Medicine Fellowship. Dr. Rigotti was supported by grant #K24-HL08860.

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POS4-101
TOBACCO ENDGAME IN HONG KONG: PUBLIC SUPPORT FOR TOTAL BAN ON SMOKING

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Background: Hong Kong has a very low smoking prevalence (11.1% daily smokers) and stringent tobacco control measures including comprehensive smokefree legislation and tobacco advertisement prohibition, yet tobacco tax is still low (68% of retail price). Recently, tobacco control advocates have called for tobacco endgame in Hong Kong to reduce smoking prevalence to less than 5% by 2022. Methods: The Hong Kong Family and Health Information and Trends Survey (FHiTs), which is under the FAMILY (A Hong Kong Jockey Club Initiative for a Harmonious Society) project, was conducted in 2012 using a random telephone-based survey among 1537 adults aged 18+ with 73.9% response rate. Opinion towards totally banning tobacco sale, usage and possession, and timing (years) for a total ban of tobacco sale were collected. Smoking status was classified as current smoking (daily or occasional smoking), ex-smoking and never smoking. All data were weighted by sex and age from 2011 census data. Results: There were more non-smokers and people with higher socioeconomic position than the general population. Of all interviewees, 10% were current smokers and 7.3% were ex-smokers. Most never-smokers (73.8%), ex-smokers (63.0%) and nearly half of current smokers (44.7%) supported any forms of total ban on tobacco. Among current-smokers, 51.5% supported banning tobacco sale, 45.3% support banning tobacco use and 26.8% supported banning tobacco possession. The corresponding prevalence were 49.4%, 38.3% and 28.8% in ex-smokers, and 36.1%, 12.5% and 7.1% in current smokers. The prevalence of supporting a total ban on tobacco sale within 10 years in never-smokers, ex-smokers and current smokers were 65.6%, 55.3% and 42.1%, and after 10 years, 6.4%, 8.6% and 6.2%, respectively. Conclusions: A total ban on smoking was supported by majority of the Hong Kong general public, and current smokers and ex-smokers showed less but substantial support. Most supporters agreed with a total ban on tobacco sale before 2022. Tobacco endgame policy, including large tax increase, smoking cessation services and plain packaging should be implemented in Hong Kong quickly as in other countries (e.g., New Zealand).

The Hong Kong Jockey Club Charity Trust.

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POS4-102
CHARACTERIZATION OF PLASMA NICOTINE PROFILE FROM A SINGLE USE OF TWO PROTOTYPE ORAL TOBACCO PRODUCTS IN ADULT SMOKERS

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Introduction: Cigarette smoking is the most hazardous form of tobacco consumption. The efforts to reduce smoking related harm, through prevention and cessation can be complemented by making available to adult smokers (AS) tobacco products that are lower on a continuum of risk. Approximately 30% of AS are seeking alternatives to cigarette smoking. Altria Client Services has developed an oral, spit-free, chewable and non-dissolvable product containing ~1.5 mg tobacco-derived nicotine, currently sold by Nu Mark LLC, in a lead market (Verve™ disc). The objective of this study was to characterize plasma nicotine profiles following a single use of two prototypes in AS. Methods: This research study utilized a randomized, single-blind, 2-period crossover design. The protocol was approved by an Institutional Review Board and signed informed consent was obtained. AS (n=18) of 10 or more cigarettes per day, who were generally healthy and 21-65 years old (no more than 60% of either gender), were randomly assigned to use one of the two study products containing USP grade tobacco derived nicotine (Product A=1mg, Product B=2mg). The products consisted of a polymer matrix, embedded with a non-tobacco cellulose fiber and flavors. Subjects were allowed to use the product in the mouth as desired for 30 minutes. Periodic blood samples were collected for plasma nicotine analysis. Vital signs, physical examinations, and adverse events (AEs) were noted for the study participants. Results: The baseline-adjusted geometric mean Cmax was 1.40 (range 0.46,2.4)
ng/mL and 2.51 (range 0.669,3.83) ng/mL and the geometric mean AUC0-t was 2.76 (range 0.669,3.83) ng/mL and 2.51 (range 0.669,3.83) ng/mL and the geometric mean AUC0-t was

**POS4-103**

**TUS-CPS LINKAGES FOR RESEARCH AND POLICY-MAKING**

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The Tobacco Use Supplement to the Current Population Survey (TUS-CPS) is a National Cancer Institute survey of tobacco use and policy information that has been administered triennially as part of the U.S. Census Bureau’s and Bureau of Labor Statistics’ Current Population Survey (CPS) since 1992; most recently in 2010-2011. TUS-CPS data are available for public use. Drawn from a large nationally representative household sample, the TUS-CPS is a key source of data on smoking, other tobacco use, cigarette price, health care provider advice, attitudes, and policy. It contains information on about 230,000 individuals (180,000 self-respondents) within a given survey period. Data are used to monitor progress, conduct research, evaluate programs, and examine health disparities in tobacco control. One unique feature of the TUS-CPS is its ability to provide national, state, and some local-level estimates. Other unique features are the ability to link to social, economic, time-use, voting, health insurance, and other risk factor data from the CPS and other CPS supplements. For example, linkage of TUS-CPS data to the CPS March Annual Social and Economic Supplement allows access to outcome data from the National Longitudinal Mortality Study (NLMS), including cancer incidence, cause-specific mortality, and Medicare co-morbidity, treatment and cost data. The presentation will demonstrate practical applications of the TUS-CPS data emphasizing these unique linkages and the opportunity to use the large NLMS dataset with over 400,000 TUS-CPS respondents matched to mortality data through 2002 (about 600,000 expected when 2010 match is completed).

*No funding.*

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**POS4-104**

**PRELIMINARY VALIDATION OF AN ABBREVIATED 14-ITEM VERSION OF THE WISCONSIN INVENTORY OF SMOKING DEPENDENCE MOTIVES**

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Background: The 88-item Wisconsin Inventory of Smoking Dependence Motives (WISDM-88) measures tobacco dependence across 13 theoretically derived smoking motive subscales. The subscales of the WISDM-88, as well as the shortened Brief WISDM-37 have exhibited good psychometric qualities and have proven useful in identifying important dimensions of nicotine dependence. In this study we aim to further shorten the WISDM to provide a measure of smoking dependence motives for contexts in which participant time may be limited. Methods: Data were obtained from a subsample of 573 young adults (54.6% female; 71.9% white; mean age of 21.4; average rate of smoking of 4.87 cigs/day) participating in the fifth year of a longitudinal investigation of smoking. All participants reported smoking within the prior 30 days. We assessed subscale reliability, validity, and model fit using confirmatory factor analysis (CFA) with data from the 5 year wave, and data from the sixth year assessment wave is used to demonstrate predictive validity. Prior to data collection, fifty four items were dropped from the WISDM. The fourteen remaining items were selected as theoretical predictors of relevant nicotine use outcomes. These items were selected from seven of the WISDM subscales including: automaticity, craving, loss of control, tolerance, taste, cognitive enhancement, and affective enhancement (negative reinforcement), with two items included from each subscale. Results: Correlations between subscale items for the 7 subscales ranged from .80 for automaticity to .90 for cognitive enhancement. Consistent with other validations of the WISDM, CFAs indicated that a 7-factor model fit our data better than a single factor model. Validity of the 13 item WISDM was examined through a series of multiple regressions with a measure of cigarettes per day and other measures of nicotine dependence including the Fagerstrom Tolerance Questionnaire, Hooked on Nicotine Checklist, Nicotine Dependence Syndrome Scale, and DSM-IV Nicotine Dependence. Conclusions: These analyses provide initial evidence supporting the use of an abbreviated 14-item WISDM when participant assessment burden is a concern.

*This work was supported by grant P01 CA98262 (PI: Mermelstein) from the National Cancer Institute.*

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**POS4-105**

**MAPPING REVIEW OF COMPLIANCE WITH, ENFORCEMENT, AND IMPACT OF CAR SMOKING LAWS INTERNATIONALLY**

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Background: Tobacco smoke pollution (TSP) is a major environmental health hazard causing morbidity and mortality. Over recent years, several jurisdictions have passed laws restricting smoking in cars but these have not been reported widely in the academic literature. We carried out a mapping review to assess current car smoking laws internationally. Methods: Interviews were carried out with 26 stakeholders – 22 from jurisdictions having car smoking laws and four without. Results: Stakeholders were from 10 countries: Canadian participants were from 10 provinces, six different states in the US, two each from Australia and New Zealand, two from Africa (Mauritius and South Africa), three from Europe (Cyprus, Sweden and Switzerland) and one from Bahrain. Of jurisdictions with a smoking law, one country had a law applying to any smoking in cars irrespective of age (Mauritius), the remainder had an age limit varying between 12 and 18 years, most commonly 16 years. We identified no comprehensive robust evaluations of car smoking laws. Overall, car smoking laws were perceived to be straightforward and attracted widespread stakeholder and public, including smoker, support. Car smoking laws were seen as an extension of smoke-free public place legislation required to offer total protection from involuntary TSP in cars, particularly for children. Education and self-enforcement were important, but opportunistic legal action through law enforcement officers, typically police, was believed to be an essential deterrent. Making violations a primary, rather than secondary, offence was preferred and on-the-spot fines/fixed penalty notices believed to increase enforcement efforts. Levels of fines varied widely, averaging £100, sometimes supplemented by points on the licence; enforcement penalties often increased with repeat offending. Conclusions: Car smoking laws have been introduced to enable complete protection from TSP in cars, with a focus on protecting children. Such laws were popular, with education and enforcement perceived to be important to ensure compliance. To date, they have not been robustly evaluated.

*Funding: DH Policy Research Programme, England, UK.*

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POS4-106
A POPULATION-BASED SURVEY OF TOBACCO USE WITHIN A MODEL CHRONIC DISEASE PROGRAM IN BRAZIL
A. Paula Cupertino*, Arise Galil, Tatiane Campos, Eliane Banhato, Erica Crufinel, Fernando Colugnati, Marcus Bastos, and Kimber P. Richter

Purpose: There is a global epidemic of chronic disease. Tobacco use compounds the morbidity and healthcare costs of this epidemic. This study describes exposure to environmental tobacco smoke, patterns of tobacco use, and predictors of tobacco use among patients treated at large model chronic disease clinic in the public health care system in Brazil. Methods: We conducted a population-based survey of all patients attending the clinic for a 2-month period. Survey items were derived from the Brazilian version of the WHO Global Adult Tobacco Survey (GATS) and other widely used and validated measures. Results: Our response rate was 99.8% (1261/1253); of these, 53.7% were women, 85.6% had less than a middle school education, and the mean age was 53.7 (SD=10.9). Most (66.6%) patients had hypertension, 65.2% had diabetes and 39.1% had chronic kidney disease. One third (31.4%) of patients had at least one smoker in the household and 20.2% had hypertension, 65.2% had diabetes and 39.1% had chronic kidney disease. 

POS4-107
DEPRESSION AND TOBACCO USE AMONG CHRONIC DISEASE PATIENTS WITHIN THE HEALTHCARE SYSTEM IN BRAZIL
A. Paula Cupertino*, Eliane Banhato, Tatiane Campos, Arise Galil, Fernando Colugnati, Marcus Bastos, and Kimber P. Richter

Background: Depression is prevalent among patients with chronic diseases and among smokers. Depression may be associated with the prevalence of smoking among patients with chronic disease; if so, these patients with multiple co-morbidities might require new treatment approaches. The purpose of this study is to describe the association of depression and smoking prevalence among patients treated at an outpatient chronic disease clinic in the public health care system in Brazil. Methods: We conducted a population-based survey of tobacco use in a model public outpatient clinic for chronic diseases in Brazil. Over 2 months, all patients were invited to participate in a survey to define the prevalence of smoking. Smokers were invited to complete an additional brief survey designed to describe their tobacco use and smoking levels. Depressed was assessed by PHQ II short version, validated in Brazil.

POS4-108
ACCUMULATION OF MATERIAL AND LIFESTYLE PROBLEMS AMONG DAILY SMOKERS, NON-DAILY SMOKERS, AND NON-SMOKERS IN NORWAY IN 1995 AND 2011: A DESCRIPTIVE ANALYSIS
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Background: Findings from international studies suggest that smokers have become more marginalized. Little is known about accumulation of problems amongst non-daily and daily smokers in Norway. We examine whether the accumulation of material problems and lifestyle problems among these groups has changed between 1995 and 2011. Methods: Data from repeated cross-sectional surveys conducted in 1995 and 2011 by IPSOS MMI were used. The sample was representative of Norwegian adults 16 years and older (N=3504 in 1995, 3999 in 2011). 12 problem indicators were applied: ‘divorced/widowed’, ‘primary education’, ‘not employed’, ‘low income’, ‘worse off than average subjective economic situation’, ‘no NGO memberships’, ‘never out with friends’, ‘not happy’, ‘fattalistic view’, ‘never/seldom exercise’, ‘often drink alcohol’ and ‘never/seldom breakfast’. Changes within the groups over time and differences between daily smokers (DS), non-daily smokers (NDS) and non-smokers (NS) were assessed using chi square analyses. Accumulation of problems was studied using correlation analysis (Pearson’s R) and an additive index. Results: Most indicators showed stable or improved conditions over time for all groups, including DS. For most indicators, NDS did not differ from NS. Problem indicators tended to accumulate at the individual level. This applied to all three groups. There were more and stronger correlations among DS and NDS than among NS at both time points. Even if the overall level of problems was lower in 2011, the total accumulation of problems was more prominent among smokers than non-smokers at both time points. Differences in total accumulation between DS and NDS were small, but significant. Conclusion: Material and lifestyle problems decreased from 1999 to 2011, also among DS. The tendency for problems to accumulate was maintained, being more marked among smokers (esp. DS) at both time points. This suggests a continuous need to consider the total situation of the individual when targeting smokers in tobacco prevention.

This study was funded by Norwegian Institute for Alcohol and Drug Research.

POS4-109
A QUALITATIVE EVALUATION OF AN EXPLORATORY TRIAL TO EVALUATE THE EFFECTS OF A PHYSICAL ACTIVITY INTERVENTION TO SUPPORT REDUCTION AMONG DISADVANCED SMOKERS NOT READY TO QUIT: EXERCISE ASSISTED REDUCTION THEN STOP (EARS)
T.P. Thompson*, C. Greaves2, and A.H. Taylor1, 1Sport and Health Sciences, University of Exeter, Devon, UK; 2Exeter Medical School, University of Exeter, Devon, UK

Background: The aims were to qualitatively: identify the (1) acceptability of trial methods, (2) acceptability of the intervention and possible adaptations, (3) components of the intervention perceived as effective; and (4) examine treatment fidelity in relation to the planned intervention as described in an intervention manual within the Exercise Assisted Reduction then Stop (EARS) intervention. The quantitative findings from this pilot RCT with N=99, are reported elsewhere at the SRNT conference. Methods: Three sources of data were incorporated: (1) audio recordings of consultation sessions of intervention delivery (n=36); (2) semi-structured interviews with participants delivering the intervention (n=3) early and late in the trial. Sampling was purposive to cover a range of baseline and outcome characteristics. The Dreyfus system was used by two
behaviour change experts for assessing practitioners' skill in delivering each of the
twelve intervention processes for assessing intervention fidelity. Participant and
practitioner interviewers were transcribed and organised using a thematic analysis
to provide a descriptive level overview of views and experiences. Results: Overall
the trial methods were acceptable for the participants and the practitioners with
scope for refinement. On the whole the intervention was acceptable but notable
potential improvements were identified. Self-monitoring, individual tailoring of
approaches, and the process of engagement were identified as the most prominent
problems which could improve fidelity. Intervention fidelity was found to be
acceptable, but highlighted the need to modify the training of practitioners to
address processes of engaging social support, supporting identity shifts and the
integration of physical activity which were less well delivered. Interpretation: The
data supported the intervention as it was delivered, and also highlighted aspects of key components which could be improved to support more effective multiple
behaviour change in future research.

The study received full UK NHS ethical approval (LREC #10/H0106/59), is
registered as a clinical trial (ISRCTN 136837944) and was funded by a grant from
the national Institute of Health Research (Health Technology Assessment; HTA
#07/778/02)

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POS4-110
THE INFLUENCE OF MOTIVATION LEVEL TO QUIT AND NICOTINE
DEPENDENCE ON SMOKING CHARACTERISTICS AND SUSCEPTIBILITY TO POLICY AND INTERVENTIONS

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Background: Research has stressed the importance of a two-dimensional
approach (motivation/nicotine dependence) in encouraging smokers to quit. This
study explored the characteristics of smokers who were low/highly motivated
(LM/HM) and low/highly dependent (LD/HD), in order to identify any group
differences and methods to encourage a greater shift in motivation to quit.
Methods: 448 smokers were recruited through two GP surgeries in Nottingham, by
means of a postal survey designed to gather data on smoking characteristics and susceptibility to intervention. For analysis, participants were grouped into one of four motivation/dependence groups based on their Motivation to Stop Scale and Heaviness of Smoking Index scores: LM/LD, LM/HD, HM/LD, and HM/HD. Results: Chi square analyses revealed that LM/HD smokers smoked because they liked being a smoker (18.1%) more than other smokers (LM/LD: 5.2%, HM/LD: 1.0%, HM/HD: 3.1%). LM/HD (60.3%), LM/HD (75.3%) and HM/HD smokers (60.9%) all reported disliking smoking because it smells more than LM/ HD smokers (41.1%). All groups wanted to quit due to a friend/family becoming ill from smoking (LM/HD: 15.5%, LM/HD: 26.8%, HM/HD: 20.3%) more so than LM/LD smokers (3.4%); suggesting that health-based policies and interventions may be ineffective for LM/LD smokers. LM/HD (9.0%), HM/HD (42.3%), and HM/ HD smokers (38.3%) all wanted to quit to become happier more so than LM/LD smokers (6.9%); suggesting that an emphasis on the emotional benefits of quitting for LM/LD smokers may increase their motivation to quit. The biggest barrier to quitting was previous quit attempt failure, more so for HM/HD (52.6%) and LM/LD smokers (34.5%). Personalised lung test feedback was deemed to be an effective policy by groups HM/HD (55.7%), HM/HD (50.8%), and LM/LD (50.0%), more so than KM/HD (34.5%). Conclusions: Group
differences were apparent between LM and HM smokers, which were further
modulated by dependence levels. Policies and interventions need to consider the
combined motivation/dependence matrix in order to target methods to increase
motivation to quit in more smokers.

Funding: UKCTCS, ESRC.

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POS4-111
IS SMOKING RELATED TO STAGE OF DIAGNOSIS OF PROSTATE CANCER?

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Background: Limited information exists regarding the effects of smoking on prostate cancer (PC). Recent studies have demonstrated a relationship between smoking at the time of diagnosis and an increased risk of overall, cardiovascular disease and PC specific mortality. The objective of this study was to determine if an assocition exists between smoking status and PC stage of diagnosis.

Methods: The Florida Cancer Data System was used to obtain data from 81,628 men diagnosed with PC between the years 2001 and 2009 of which 13% currently
smoked, 39% were former smokers and 48% never smoked. Most men had localized (89%) PC at diagnosis stage compared to 11% with an advanced (regional/distant) stage. Univariate and multivariate logistic regression models were fitted to stage of PC presentation (advanced vs. localized) with smoking status (never, former, current) as the main predictor and further adjusted for sociodemographic factors such as age, race, Hispanic ethnicity, education level, marital status, insurance status, income level and urban/rural residence. Analyses were also stratified by race. Results: Current smokers were more likely to present with advanced disease than never smokers (OR 1.45, 95% CI 1.37 – 1.55). After adjusting for sociodemographic factors, this association remained (OR 1.33, 95% CI 1.25 – 1.42). Former smokers were less likely than never smokers to present with advanced disease in both the unadjusted (OR 0.89, 95% CI 0.85 – 0.94) and adjusted analyses (OR 0.93, 95% CI 0.88 – 0.97). In analyses stratified by race these associations remained significant except among Blacks, where former smokers showed no statistical difference in PC stage presentation compared to never smokers. Conclusions: An association between smoking status and presentation of advanced PC disease exists. Interestingly, former smokers were less likely to present with advanced disease than never smokers; however, this association was not present among Blacks. These findings are consistent with other studies and may be explained in part by cancer screening behaviors. Additional research is warranted in this area to determine whether these associations are causal.

No funding.

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POS4-112
SURVEY OF THE KNOWLEDGE, PERCEPTIONS, AND ATTITUDES ABOUT TOBACCO HARM REDUCTION AMONG HEALTHCARE PROFESSIONALS IN THE UK AND SWEDEN, INCLUDING THEIR UNDERSTANDING OF THE RISKS OF NICOTINE AND THE KEY FACTORS ASSOCIATED WITH THE HEALTH RISKS OF SMOKING

 Sudhanshu Patwardhan* and Marina A. Murphy, British American Tobacco

Background: Declines in smoking prevalence in the UK (45% in 1974 and
20% in 2010) and other countries seem to have plateaued. Reducing prevalence
further will probably require a broader harm reduction approach than traditional
prevention and cessation initiatives, one possibly including substituting cigarettes
with reduced-risk tobacco and nicotine products. It is largely cigarette smoke
toxicants that cause most smoking-related diseases - not nicotine. In the UK in
October 2012, the National Institute of Clinical Excellence issued draft guidance
recommending the use of nicotine products as either a complete or partial substitute
for tobacco smoking. Healthcare professionals (HCPs) are well placed to advise
on the use of nicotine. We undertook a survey of HCPs in the UK and Sweden
to investigate their knowledge, perceptions and attitudes about tobacco harm
reduction, including their understanding of the risks of nicotine and the key factors
associated with the health risks of smoking. Here, we present the results for the
general practitioners (GPs). Methods: On the basis of preliminary interviews, we
designed an online quantitative questionnaire to assess knowledge, perceptions and
attitudes on various aspects relating to tobacco and nicotine products in those
countries. Results: Of the 747 HCPs who completed the survey, 220 were GPs
(100 in the UK, 120 in Sweden). Most advocated a 'complete cessation' approach
to tobacco use, rather than broader harm reduction strategies. Some held
both current smokers and former smokers, in addition to non-smokers. This gives a much better basis to identify the potential genetic factors in tobacco dependence than most of the previous studies on this topic. Methods: The study subjects were genotyped for CYP2A6*2 (rs1801272, *4 (gene deletion), *9 (rs2839943), *12 (hybrid), and *12x2 (gene duplication) alleles, and for CYP2D6*5 (deletion) and *2xN (duplication) alleles. Besides genotype information, the metabolism capacity of nicotine of the study subjects is well characterized by these analyses based on the previous knowledge on the genotype-phenotype correlation. The genotyping analyses were performed by TaqMan PCR based methods using commercially available Drug Metabolism Genotyping and Copy Number Variation Assays. The statistical evaluations are performed by SPSS software. Results: Based on our results, the poor metabolism related genotype of CYP2A6 increases the risk of becoming a persistent smoker. The impact of CYP2D6 in this context is currently under statistical evaluation and the first results of these analyses will be presented at the meeting. Conclusions: Enlightening of genetic factors affecting smoking behavior is anticipated to help in finding more efficient ways to reduce smoking. Identification of the particularly prone individuals would help in this, e.g., by enabling more focused smoking prevention actions.

**Funding:** Juho Vainio Foundation, The Research Foundation of the Pulmonary Diseases.

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## POS4-115
**PLACE AND CRAVING FOR COCAINE, HEROIN, AND TOBACCO: AN ECOLOGICAL MOMENTARY ASSESSMENT STUDY**

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**Aims:** Various conditioning theories and traditions of substance abuse treatment suggest that place is an important factor in substance use, maintenance, and relapse. The present study uses Ecological Momentary Assessment (EMA) to examine this issue based on self-report of location and craving for heroin, cocaine, and tobacco. Methods: Outpatient methadone-maintained cocaine and heroin users (N=114) completed self-report measures on handheld electronic devices during prompts provided randomly throughout the day. These reports included ratings of heroin, cocaine, and tobacco craving on a four-point scale and reports of location using twelve predefined options. SAS Proc Mixed was used to compare craving ratings based on location. Results: Compared to any other location, the highest average craving reported was for “at or near cop spot” for cocaine, F(1,37)=62.13, p<0.001, heroin, F(1,35)= 14.72, p=0.005, and tobacco, F(1,36)=5.57, p=0.023. Heroin craving was significantly lower at home than other locations, F(1,109)=3.05, p=0.049. There was a trend for tobacco craving to be lower at home, F(1,109)=3.63, p=0.0529, but there was no difference for cocaine, F(1,109)=1.02, p=0.3159. At another’s home, participants reported significantly higher craving for cocaine, F(1, 79)=35.32, p<0.001 and heroin, F(1,79)=6.32, p=0.0140, but not for tobacco, F(1,79)=0.35, p=0.5537. Conclusions: Preliminary evidence based on self-report of place suggests associations of location with drug craving. These results are unique in using EMA to assess associations between craving and reports of place, but are limited by the use of self-report of places. Future research combining EMA with Global Positioning System (GPS) devices will address this limitation.

**This research supported by the Drug Dependence Epidemiology Training Grant (NIDA T32 DA007292) at the Johns Hopkins Bloomberg School of Public Health, (D. Furr-Holden, Director), and by the Intramural Research Program of the National Institutes of Health, National Institute on Drug Abuse.**

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## POS4-114
**FUNCTIONAL POLYMORPHISMS IN CYP2A6 AND CYP2D6 GENES AND SMOKING BEHAVIOR**

Emmi M. Tiili, M.Sc.*, and Ari P. Hirvonen, Ph.D., Finnish Institute of Occupational Health

**Background:** CYP2A6 is the most important metabolizer of nicotine. Due to the polymorphisms of CYP2A6 gene, individuals differ considerably in the CYP2A6-related nicotine metabolism capacity. CYP2D6 gene polymorphisms have also been considered to have, although less clear, impact on nicotine metabolism. These gene variations may therefore have notable effects on smoking behavior. In agreement with this, previous studies have indicated that inherited factors modify both the probability of smoking initiation and the ability of smoking cessation. Most of the results from these studies have, however, been based solely on comparisons between current smokers and non-smokers. We studied this issue further in 1230 Caucasians of Russian origin. The study population consisted of
POS4-116
FACTORS RELATED TO ABSTINENCE IN A STATEWIDE IN-PERSON TOBACCO CESSATION INITIATIVE
Lija Greenseid, Ph.D.**, and Rebecca Lien, M.P.H.†, and Lauren Porter, Ph.D., M.P.H.*
Professional Data Analysts, Inc.; †Florida Department of Health

Background: In person, group cessation classes can provide intensive treatment of tobacco dependency, however public funding of such initiatives requires a balance between effectiveness and reach. This evaluation study compared the effectiveness of two group cessation curricula to determine whether program intensity or other factors were most important to successful tobacco cessation. Methods: This evaluation used data from 1,370 Florida tobacco users who received tobacco treatment counseling between July 1, 2011, and February 28, 2012. There were two intervention formats available to participants: a 6-session counseling program (n=1,178) and a 1-2 session short-course (n=192). Self-reported 30-day point prevalence abstinence from all tobacco was measured on a telephone or mail survey 7-months after the first group session. The overall survey response rate was 54.2%. A logistic regression model was used to identify baseline characteristics and program utilization variables that were multivariate predictors of tobacco abstinence. Results: Among survey respondents, 36.0% of participants in the multisession format and 30.3% of participants in the short-course format reported being abstinent from tobacco at 7-months, however these differences were not statistically significant in bivariate or multivariate analyses. The model identified three baseline variables that were associated with tobacco abstinence: stage of readiness, time to first cigarette upon waking, and quit confidence. Additionally, program completion and support from friends and family were positively related to abstinence, while presence of mental health issues was negatively associated with abstinence. Conclusions: Program format (multisession vs. short-course) is less important than ensuring participants complete the full program and receive social support. Efforts should be made to encourage completion of tobacco cessation group programs and to address mental health issues which affect successful cessation from tobacco.

This program evaluation was sponsored by the Florida Department of Health, Bureau of Tobacco Free Florida.

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POS4-117
FACTORS AFFECTING EMPLOYMENT-BASED HEALTH INSURANCE COVERAGE FOR SMOKING CESSATION TREATMENTS IN ONTARIO, CANADA
Farzana Haji, M.Sc.*†, Robert Schwartz, Ph.D.**,‡*, Alexey Babayan, Ph.D.*, Christopher Longo, Ph.D.,* and Roberta Ference, Ph.D.*†, ‘Ontario Tobacco Research Unit, Dalla Lana School of Public Health, University of Toronto; ‘Centre for Addiction and Mental Health; ‘DeGroote School of Business, McMaster University

Background: Insurance coverage for evidence-based smoking cessation treatments (SCT) has been shown to promote their use and reduce smoking rates. Studies conducted primarily in the US have identified factors influencing employers’ decisions regarding the design and scope of health insurance benefits, including SCTs. In Ontario, Canada, where the publicly funded healthcare does not provide SCTs, a supplementary coverage is provided through employer-sponsored benefit plans. However, little is known about the extent of SCT coverage by Ontario employers, and more specifically, the barriers and facilitators to insuring SCTs. An exploratory study was conducted to examine the decision-making process to identify factors influencing employers’ decisions about the coverage of SCTs. Methods: Key informant interviews with 8 employers (auto, retail, banking, municipal, and university industries), 4 health insurers, 2 government representatives and 3 advisors/consultants. Document review (benefit plans, organizational guidelines for health insurance) Results: The most commonly cited factors influencing decisions about benefit plans, including coverage of the SCTs, were benefit costs, return-on-investments (ROI), participant utilization of services, and expert opinions from advisors/consultants. The importance of an organizational philosophy supporting the health and wellness of its employees was also mentioned as a factor. Lack of Canadian-specific ROI with regards to SCTs and lack of information on employee demand for SCTs were identified as the key barriers to insuring the SCTs. Further, key informants pointed to a lack of government regulations that would offer incentives for employers to cover SCTs. Conclusion: The findings are consistent with the literature about decisions by employers to purchase coverage for SCTs. Providing employers with evidence-based and Canadian specific information on ROI, and adopting favorable regulations or incentives can be important measures to promote the coverage of SCTs by employers.

Funding: Canadian Institutes of Health Research.

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POS4-118
THE IMPACT OF EXTENDED PRE-QUIT VARENICLINE ON BEHAVIORAL ECONOMIC INDICES OF SMOKING REINFORCEMENT IN SMOKERS’ NATURAL ENVIRONMENT
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Background: Preliminary data suggest that extending the duration of pre-quit varenicline therapy yields reductions in smoking and improves abstinence (Hajek et al., 2011; Hawk et al., 2012). These findings suggest that extended exposure promotes extinction of smoking reinforcement. Considering multiple influences on smoking, additional measures of reinforcement are needed to test the extinction proposal. This report examines data from a cigarette purchase task (CPT: e.g., MacKillop et al., 2008), a questionnaire based in behavioral economics. Methods: Participants were 52 treatment-seeking smokers (see Hawk et al., 2012). The CPT requires participants to report the number of cigarettes they would purchase and consume across various prices. The CPT was assessed repeatedly in the natural environment via a handheld device during a 1-week baseline (no medications) and a 3-week run-in period involving randomization to varenicline or placebo. The primary measure of reinforcement in the CPT is elasticity, which reflects the slope of the consumption-price function. Intensity (cigarettes ‘purchased’ when free) and breakpoint (price that suppresses all consumption), were also assessed. Results: Groups did not significantly differ on CPT parameters at baseline. During the drug manipulation phase, elasticity tended to increase (p = .11), but there was no evidence of the hypothesized increase in elasticity among the varenicline group relative to placebo, p > .19. Results for demand intensity paralleled those observed for elasticity. Breakpoint did not vary by time or group. Conclusion: CPT reinforcement parameters were not significantly altered by varenicline in treatment-seeking smokers. In contrast, smoking behavior (CPD, CO) from the same participants was reduced by varenicline (Hawk et al., 2012). These conflicting data suggest the need for greater attention to the construct validity of smoking reinforcement, particularly in treatment-seeking samples, for whom treatment mechanisms are most relevant.

This research was funded in part by a 2008 Global Research Award for Nicotine Dependence, an independent, investigator-initiated research project awarded to M.C. Mahoney, sponsored by Pfizer, and a grant from the National Institute on Drug Abuse (R21 DA019653) awarded to S.T. Tiffany.

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POS4-119
BEYOND CALLS AND MINUTES: QUITLINE UTILIZATION PATTERNS AND OUTCOMES IN A FIVE-CALL PROGRAM

BACKGROUND: Research has established that tobacco cessation quitlines offering multiple proactive calls provide an effective intervention. However, many participants aren’t utilizing the programs as intended. This study explores how participants use a five-call program with NRT and the various factors associated
with program use. Previous quitline studies limit the examination of program use to number of calls and minutes. We expand program use to include timing of calls and distribution of NRT. In addition, we explore which program use groups best predict quitting. METHODS: Minnesota’s QUITPLAN Helpline offers a five-call program with four weeks of NRT. Data were collected from participants enrolling in services between September 2011 and April 2012. Data sources include baseline enrollment, program use, and outcome data from a program evaluation study. Both data analysis and subject matter expertise were used to derive cut points for ten program use groups; the groups vary by program use intensity. RESULTS: Individuals who set a quit date (p < .001) were more likely to complete the full program as intended. Individuals with low confidence in their ability to quit (p < .001) were less likely to receive any coaching and were more likely to over use the program. Individuals with mental health issues (p = .003) and chronic health conditions (p < .001) were more likely to both under and over use the program. After collapsing the ten groups into five major groupings necessitated by small follow-up samples, individuals who complete the program as intended had the highest quit rates while those in lower and highest intensity program use groups had lower quit rates (p = .081). CONCLUSIONS: The factors associated with program use are helpful in identifying potential barriers to completing the full program. This information could be used by quitlines to target groups that appear less likely to fully utilize the program. Limitations include small cell sizes for calculation of quit rates in some of the program use groups. In the future, we wish to validate the findings of this study with data from another quitline.

This program evaluation was funded by ClearWay Minnesota.

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POS4-120
LINGUISTIC AND MOTIVATIONAL PREFERENCES FOR AN EXERCISE INTERVENTION AMONG FEMALE SMOKERS TREATED FOR DEPRESSION


BACKGROUND: Depressed female smokers are a particularly treatment-resistant population. Depressive symptoms are associated with poorer cessation outcomes and females are more likely than males to experience depression. Yet, smoking treatment studies typically exclude those with clinical depression. Exercise interventions are a promising approach for smoking and depression; however, recruiting participants may pose challenges. In this study we explored motivations for participation in exercise interventions among female smokers treated for depression and whether different types of recruitment language might enhance recruitment and retention. We also explored differences in program preferences between those currently and not depressed at the time of survey completion. METHODS: 465 adult men and women seen in Primary Care at a medical center in Southeast Minnesota for depression over approximately the past 5 years completed an Exercise Program Survey (EPS). Of these respondents 54 (12%) were current female smokers who comprise the sample for the current analysis. The EPS was a three-page measure assessing preferences for an exercise program including characteristics of the exercise coach, depression descriptors, and the Patient Health Questionnaire 2-item version. RESULTS: Of the 54 women, 37% reported current depression; 92% were Caucasian and 82% were between the ages of 25 and 54 years. No significant differences were detected between those with and without current depression in preferences for intervention descriptors, exercise coach traits, or motivational factors, and 55% reported they were not even moderately likely to seek programs described as "vigorous" or "intense." Conversely, 63% were "quite a bit" to "extremely" likely to seek an intervention described as "realistic," and/or "fun," 60% reported desiring a supportive and enthusiastic coach, and 75% preferred that an exercise program both energize and help manage depression. CONCLUSION: Though there were no significant differences in preferences by current depression, the reach and efficacy of such interventions for female smokers with depression history may rely to some extent on its packaging.

This study was supported by Mayo Clinic NIH relief funds, DA30791.

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POS4-121
SMOKING CESSATION AND THE SOMALI POPULATION: INSIGHTS FROM INTERVIEWS AND FOCUS GROUPS

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Background: Minnesota is the home of nearly one third of the total Somali population in the United States, estimated at around 100,000. A recent study of tobacco use among Somali adults in Minnesota revealed smoking prevalence of 44% among Somali men compared to 16% of the general male population in Minnesota during the same timeframe. Culturally-tailored cessation programs are a suggested solution. Purpose: The purpose of this study is to investigate attitudes and beliefs about smoking and smoking cessation among Somalis to inform the development of culturally-tailored cessation interventions. Methods: 12 interviews were conducted in Somali with Somali key informants including health professionals(50%), community leaders (40%) and religious leaders (10%). This sample consisted of 70% male respondents between the ages of 30 and 69. Three focus groups were conducted with self-identified Somali male smokers. Focus groups were all conducted in Somali and English. Key informant interviews and focus groups were audio recorded, transcribed, translated and analyzed thematically using NVivo. Results: Results indicate there is a limited awareness in the Somali community about health risks associated with smoking, as well as a strong social influence on smoking. Health, finances and family were most common reasons to quit smoking. Religion was referenced as a protective factor against smoking; however, willpower and desire to quit were associated with success of cessation, followed by advice from a doctor and family support. Nicotine gum was perceived as a potentially successful cessation method. Linguistically appropriate literature and public awareness of health risks for Somali smokers could be effective. Many informants suggested media, namely television, as an effective avenue for disseminating smoking cessation information. Conclusions: To reduce smoking related disparities in the Somali community, smoking cessation and prevention interventions developed for Somalis should incorporate the protective role of religion and family support, with dissemination of linguistically-appropriate education about health risks of smoking. NRT can be offered as a facilitator.

This project is supported in part by the University of Minnesota Center for Health Equity, 1P60MD003422 for the National Institute on Minority Health and Health Disparities.

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POS4-123
JUST PICTURE IT: EXPLORING THE INFLUENCE OF EXERCISE IMAGERY ON CIGARETTE CRAVING AND WITHDRAWAL BEHAVIORS
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Background: Cigarette smoking is one of the most preventable causes of death in the world (WHO, 2002) and is associated with various physiological (Doll et al., 2004) and psychological (Shiffman & Jarvik, 1976) health concerns. One potential avenue to reduce smoking behaviour is exercise engagement. Ussher and colleagues (2008) acknowledge that an acute bout of exercise can contribute to reductions in psychological withdrawal during short-term abstinence. Given imagery can evoke physiological responses (Lang, 2007) similar to exercise; use of exercise imagery may have the potential to moderate negative consequences of smoking dependency. Therefore we examined the effectiveness of exercise imagery on smoking craving and withdrawal after a short period of abstinence.

Method: Males (n=12) and females (n=17) who regularly smoke (12.4 cigarettes/day) were randomized into one of three treatment groups: exercise imagery, acute exercise, or control. Following a period of smoking abstinence (15 hours), participants completed a variety of questionnaires including the Mood and Physical Symptoms Scale (West & Hajek, 2004) pre- and post-treatment. Results: With respect to withdrawal symptoms, a 3 (group) x 2 (time) repeated measures MANOVA revealed no significant effect for time (partial eta squared=.56) for all three conditions. Follow-up examination of change scores indicated the exercise group reported significant differences on tension (p=.05 for imagery) and anxiety (p=.01 for imagery; p=.04 for control). Analysis of craving scores indicated a significant effect (partial eta squared=.43) for time only. Conclusion: Results suggest that all participants experienced a reduction in smoking behaviour after treatment. A change in reported score does suggest imagery may be useful in reducing craving and withdrawal behaviour when exercise is not feasible. However, these findings support that actual exercise engagement provides more effective benefits for some withdrawal symptoms than merely picturing exercise activity.

No funding.

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POS4-124
INFLUENCE OF REINFORCER MAGNITUDE ON SMOKING’S REINFORCEMENT ENHANCING EFFECTS
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We recently confirmed findings from animal research that nicotine may enhance reinforcement from sensory rewards in the environment that are unrelated to nicotine, indicating reinforcement enhancing effects. In the current study, we used a fully within-subjects design to examine differences in reinforced responding for a sensory reward due to: 1) two different modest amounts of nicotine intake via cigarette smoking after overnight abstinence, and 2) three different levels of preference for music reward, or no reward (i.e., reinforcer magnitude). Dependent smokers (n=23) engaged in 3 sessions, each after overnight smoking abstinence (>12 hrs; CO50 ppm) and involving 4 trials assessing reinforced responding via progressive ratio (PR50%) for 30-sec clips of high, moderate, or low preference music and total NIC clearance for T carriers. However, POR*28 contributed little to the overall variation in NIC/COT (<1% in smokers; 1% in non-smokers) and NIC AUC (<1% in non-smokers), after controlling for the large contribution of CYP2A6 genotype. Moreover, in smokers (N=528) and non-smokers (N=63) with genetically reduced CYP2A6 activity, POR*28 did not alter IC/COT and NIC AUC, and did not affect in vitro NIC metabolism (Km, Vmax, Vm/Km) in Caucasian livers (CC, N=34; CT, N=23; TT, N=5). CONCLUSIONS: The findings suggest the POR*28 T allele may modestly increase CYP2A6 activity in some circumstances. However, as POR*28 does not appear to contribute meaningfully to the overall variation in NIC and COT metabolism, it is unlikely to alter smoking behaviors or the utility of COT as a biomarker.

We acknowledge the support of the Endowed Chair in Addictions for the Department of Psychiatry (RFT), CIHR-CCSD (MJC), CIHR grants MOP86471 and TMM-109787, NIH grants DA020830 and CA091912, CAMH, the CAMH Health Research Institute, Centre for Addiction and Mental Health, Department of Pharmacology and Toxicology, University of Toronto; Division of Clinical Pharmacology and Experimental Therapeutics, Department of Medicine, Biengineering and Therapeutic Sciences, University of California, San Francisco; Department of Preventive Medicine and Public Health, University of Pittsburgh, Department of Medicine and Center for Health Equity, University of Minnesota Medical School

BACKGROUND: Large variability exists in rates of CYP2A6-mediated nicotine (NIC) and cotinine (COT) metabolism, altering smoking behaviors and the utility of COT as a biomarker, respectively. P450 reductase (POR) is essential for CYP-mediated drug metabolism; here we asked if genetic variation in POR contributes to variation in NIC or COT metabolism. CYP2A6 inactivates NIC to COT, and COT to 3’-hydroxycotinine (3HC), and the ratio of these metabolites is used as a marker of CYP2A6 activity. METHODS: African Americans and African Canadians (N=1415) were genotyped for POR*28 (C>T; A503V), a common non-synonymous SNP that affects drug metabolism in a CYP- and substrate-specific manner. NIC and COT metabolism were compared across POR*28 genotype groups. RESULTS: The POR*28 allele frequency was 17.5%, and genotype distributions were in Hardy-Weinberg equilibrium. In smokers with genetically wildtype CYP2A6 activity, mean 3HC/COT was 1.3-fold higher in the POR*28 TT group (N=16) relative to the POR*28 CT+CC group (N=479; 0.588 vs. 0.449; p=0.02). Among non-smokers with genetically wildtype CYP2A6 activity that received 4 mg oral NIC, the POR*28 CT+TT group (N=17; vs. POR*28 CC group, N=48) displayed higher mean 3HC/COT (0.181 vs. 0.027) and trended toward lower NIC area under the curve (AUC, 904 vs. 1325 ng/mL*min; p=0.227) suggesting modestly faster CYP2A6 activity and total NIC clearance for T carriers. However, POR*28 contributed little influence on the overall variation in 3HC/COT (<1% in smokers; 1% in non-smokers) and NIC AUC (<1% in non-smokers), after controlling for the large contribution of CYP2A6 genotype. Moreover, in smokers (N=528) and non-smokers (N=63) with genetically reduced CYP2A6 activity, POR*28 did not alter IC/COT activity. This study’s findings suggest that just one cigarette after abstinence is sufficient for reinforcement enhancing effects and suggest that such enhancement is greater as magnitude of a reward’s reinforcing efficacy increases.

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POS4-126
PRESENCE OF LITTLE CIGAR AND CIGARILLO SMOKING CONTENT ON YOUTUBE: A CONTENT ANALYSIS
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Little cigars and cigarillos, flavored tobacco products that are smoked like cigarettes, are among the fastest growing tobacco products in the United States, especially among young adults. Young adults often visit social media websites, which may be a source of exposure to pro-tobacco content. We examined the presence of little cigar and cigarillo smoking content on a popular social media site (i.e., YouTube). Understanding the little cigar and cigarillo content promoted on YouTube may inform communication strategies that convey information about their harmfulness to young adults. Little cigars, cigarillos, and the names of two leading brands were terms used to retrieve the top 20 videos on YouTube by relevance and view count searches. Eliminating duplicates, 120 videos were independently coded by three researchers for the prevalence of little cigar/cigarillo smoking, messages, and themes. The majority (88.9%) of videos positively portrayed little cigar/cigarillo smoking. Little cigar/cigarillo smoking was found in 77.3% of the videos. Smoking with others (26.3%), music (25.3%), smoking tricks (18.9%), and romance/sex (10.5%) were the most common video themes. Compared to cigarettes, positive consequences of little cigars/cigarillos smoking included better taste and smell; pharmacological effects of smoking; longer burn time; social benefits, and healthier perceptions. Negative consequences included short-term health outcomes (i.e., headaches). Over twenty percent (21.8%) of individuals in the videos altered their little cigar/cigarillo by removing its inner lining in a process called “hyping” or “freaking” to reduce negative health risks associated with smoking the product. Approximately 27.6% of the individuals in the video sample reported their intention to continue to smoke little cigars/cigarillos in the future. The opportunities and challenges inherent in using social media as a modality to deliver anti-little cigar/to continue to smoke little cigars/cigarillos in the future. The opportunities and challenges inherent in using social media as a modality to deliver anti-little cigar/tobacco deprivation, and some of the attention deficits observed early in withdrawal.

Supported by the NIDA Intramural Research Program.

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POS4-128
MESSAGE THEMES: Communicating Information About E-Cigarettes to Adolescents and Young Adults
Daniel Ellis, B.S.*, Grace Kong, Ph.D., Deepa Camenga, M.D., Dana Cavallo, Ph.D., and Suchitra Krishnan-Sarin, Ph.D., Yale University School of Medicine

Tobacco marketing contributes significantly to the use of tobacco products by adolescents and young adults. Understanding how to communicate the risks of e-cigarettes to this vulnerable population is an important priority of the FSPCTA. The goal of this study is to develop and test messages conveying information about e-cigarettes to high school and college students. We conducted 8 focus groups (4-8 participants each) with male and female smokers and non-smokers within a high school and a local college in CT. We asked participants to create 2 messages: an appealing message to promote use of e-cigarettes and an unappealing message to prevent use. Two independent raters coded the themes of the messages and determined the frequency of each theme. We identified 10 content themes: cost, smell, flavor, health, comparative perceptions to cigarettes, convenience, quitting cigarette smoking, social acceptance, addiction, and e-cigarette constituents (e.g. water vapor). The most common appealing message content themes reported by smokers were convenience (19.0%; can smoke anywhere) and comparison to cigarettes (15.5%; safer than cigarettes). Health (13.8%; better for your lungs), constituents (13.8%; can recharge and smoke more), smell (13.8%; no nasty smell) and flavor (13.8%; tons of new flavors) were equally endorsed. The most common themes reported by non-smokers were health (19.7%; a way to smoke without the cancer), comparison to cigarettes (17.3%; they look like the real thing) and cost (17.3%; save money in the long run). The top three unappealing themes were similar among smokers and non-smokers: health (25.2%; risk of cancer), comparison to cigarettes (22.3%; more harmful than cigarettes) and constituents (16.4%; questionable chemicals). The message content themes did not differ between high school and college students, but the frequency in which they appeared differed. This study presented novel data on the message themes that can be used to communicate information about e-cigarettes to adolescents and young adults.

Funding: P01 DA09421.

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POS4-129
IN VITRO TESTING USING HUMAN INDUCED PLURIPOTENT STEM CELL-DERIVED CARDIOMYOCYTES TO PREDICT TOBACCO SMOKING-RELATED HEART DISEASES
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Smoking causes coronary heart disease, the leading cause of death in the United States. Although about 30% of coronary heart disease deaths are related to smoking; it may take decades of smoke exposure before the ultimate adverse outcomes occur. Improved in vitro systems for predicting adverse health outcomes back. Repeated measures ANOVA was used to determine main effects and interactions; post hoc comparisons were made using Fisher’s LSD. AB smokers reported increased withdrawal symptoms and tobacco craving throughout the 8 days, whereas scores on the MNWS and TCQ were unchanged from baseline for the DENIC and NIC groups. The AB group, compared to DENIC and NIC, had slower response times (RT) on Logical Reasoning, n-Back, and RVIP; this decrement returned to baseline after 48 hrs. However, both DENIC and AB groups had slowed RT at 24 hrs on the DMS task. There were no significant effects on accuracy. These results suggest that components of tobacco smoke other than nicotine attenuated self-reported withdrawal symptoms observed during 8 days of tobacco deprivation, and some of the attention deficits observed early in withdrawal.
from tobacco use are needed to assist the evaluation of new tobacco products. It is hypothesized that the stem cell model can identify cellular biomarkers predictive of the onset of disease. Human induced pluripotent stem (iPS) cells can differentiate into functional cardiomyocytes, which express cardiac-specific genes and proteins and possess electrophysiological and biochemical properties resembling human cardiomyocytes. In this study, we compared four mainstream cigarette smoke condensates (CSCs) in human IPS cardiomyocytes with unique endpoints. All CSCs reduced the cell viability using established cytotoxicity assays, including lactate dehydrogenase (LDH) release for cytotoxicity, and ATP concentration for general cell health. 96-well plates with interrogated electrode arrays were used to assess the phenotypic changes of iPS cardiomyocytes (impedance and the rhythm contraction). Treatment with all CSCs resulted in dose-dependent changes in the beat rate and the amplitude of the impedance measurement. Overall, CSC generated under ISO condition was more toxic than the "intense" condition. This in vitro system shows that iPS cardiomyocytes represent a promising in vitro model to predict smoking induced cardiac toxicity and study smoking associated heart diseases.

Funding by FDA E070447.11.

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POS4-130
CUSTOM MENTHOLATION OF COMMERICAL CIGARETTES FOR RESEARCH PURPOSES

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Menthol cigarettes are particularly favored by youth and certain ethnic/racial minorities, and growing evidence suggests they are starter products for adolescents, impede cessation, increase relapse following cessation, and may undermine social justice via incessant targeted marketing of these products to communities of color. Menthol cigarettes may also contribute to differences in the health effects of smoking in certain ethnic groups; however, for various reasons, previous efforts to link menthol cigarette use to increased tobacco-related disease risk have been inconclusive. To study menthol exposure, cigarettes that differ only in menthol content are required, and these are not commercially available. We report here our work to prepare cigarettes that differ only in menthol content. Initially, we developed an extraction and analysis method to simultaneously recover nicotine from 2.6-4.6 mg/g menthol and 17.8-19.5 mg/g nicotine, consistent with previous reports. A brand of commercial non-menthol cigarettes, selected to match the tar, nicotine and ventilation of a popular menthol brand, was subjected to direct vapor condensates (CSCs) in human iPS cardiomyocytes with unique endpoints. All CSCs reduced the cell viability using established cytotoxicity assays, including lactate dehydrogenase (LDH) release for cytotoxicity, and ATP concentration for general cell health. 96-well plates with interrogated electrode arrays were used to assess the phenotypic changes of iPS cardiomyocytes (impedance and the rhythm contraction). Treatment with all CSCs resulted in dose-dependent changes in the beat rate and the amplitude of the impedance measurement. Overall, CSC generated under ISO condition was more toxic than the "intense" condition. This in vitro system shows that iPS cardiomyocytes represent a promising in vitro model to predict smoking induced cardiac toxicity and study smoking associated heart diseases.

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POS4-132
SMOKING AS INDEPENDENT RISK FACTORS FOR POST-OPERATIVE DELIRIUM IN THE ELDERLY: PROSPECTIVE INVESTIGATION IN THE PERI-OPERATIVE SETTING

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Background: The incidence of post-operative delirium (POD) in non-cardiac surgery ranges from 5% to > 50% and in cardiac surgery from 13.5% to 41.7%. In both settings smoking was found to be an independent risk-factor for POD. Aim of this study was to estimate the independent association of current smoking with POD in patients ≥ 60 years undergoing elective surgery. Methods: After ethical committee approval and written informed consent the study was conducted between 03-2009 and 10-2010 in a tertiary university hospital in Germany. Smoking status (never, former and current smoking [light smoking ≤ 10 cigarettes / day and heavy smoking > 10 cigarettes / day]) and alcohol consumption were evaluated during the premedication visit. Peri-operative parameters (surgical time, American Association of Anaesthetists (ASA) score, operative site) as well as POD (defined as ≥ 2 points in the Nursing Delirium Screening Scale at least one time within 7 days post-operative on ward) were evaluated by trained study personnel. Multivariate analysis was by logistic regression analysis, adjusted for relevant covariates. Results: Out of 1288 included patients 914 (71.0%) had complete data on all covariates and POD. The mean age was 69.7 years and 496 (54.3%) were males. Overall 379 (41.5%) were never-smokers, 413 (45.2%) were former smokers and 122 (10.3%) were current smokers. Median operation time was 3.8
and the rate of early cessation (until week 12). Methods: Patients attending the study of a smoking cessation treatment offered at an outpatient clinic for patients with chronic disease (arterial hypertension, diabetes and chronic kidney disease), system, with a focus on primary care. The aim of this project is to describe a pilot provide access to free cessation medication through Brazil's universal health care an evidence-based tobacco control plan designed to deliver group treatment and The Instituto Nacional do Câncer (National Cancer Institute/INCA) implemented world, it is also a world leader in public health approaches to tobacco control. PATIENTS WITH PUBLIC HEALTH SYSTEM IN BRAZIL EVALUATING SMOKING CESSATION AMONG CHRONIC DISEASE POS4-134 COMBINATION VARENICLINE/BUPROPION TREATMENT BENEFITS MALE NRT-NONRESPONDERS Jed E. Rose* and Frederique M. Behm, Duke University Medical Center Our previous research describes an adaptive smoking cessation treatment strategy in which smokers receive nicotine patch treatment 2 weeks before a target quit date. After 1 week, the reduction in ad lib smoking while wearing patches is assessed using expired air CO; this measure predicts subsequent abstinence. In the adaptive treatment procedure, smokers who are characterized as NRT “non-responders,” whose CO declines ≤50% from baseline, receive rescue treatment using prescription medications (varenicline or bupropion). In a prior study, switching NRT non-responders to varenicline was found to increase abstinence rates by approximately 10% relative to remaining on nicotine patch alone. The present study recruited 222 NRT non-responders and randomized them to receiving varenicline+bupropion vs. varenicline alone, using a double-blind design. Treatment was initiated 1 week before the target quit date and continued until 11 weeks post-quit. The primary outcome, abstinence at 8-11 weeks post-quit, showed a substantial enhancement with the combination treatment for male smokers: 49% for the combination vs. 18% for varenicline alone (based on 94.5% of outcome data collected thus far), whereas no benefit was observed for female smokers (28% for the combination vs. 32% for varenicline alone: sex X treatment interaction P<0.01). The treatments were well tolerated. These results further support the use of adaptive treatment strategies for NRT non-responders, and suggest that male NRT non-responders may benefit by switching to combination varenicline/bupropion treatment. Further studies should explore potential mechanisms that account for the sex difference in response of NRT non-responders to combination varenicline/bupropion treatment. Funding: National Institute on Drug Abuse, Philip Morris USA. POS4-135 HEALTH CARE WORKERS' KNOWLEDGE, ATTITUDES, BELIEFS, AND PRACTICES ON TOBACCO USE IN SEVEN ECONOMICALLY DISADVANTAGED COMMUNITIES IN THE DOMINICAN REPUBLIC Michael G. Prucha, B.A.1, Scott McIntosh, Ph.D.1, Susan Fisher, M.S., Ph.D.1, Nancy Chin, Ph.D., M.P.H.1, Ann Dozier, R.N., Ph.D.1, Kelly Thevenet-Morrison, M.S.1, Emily Weber, B.A.1, Heather Holderness, B.A.1, Deborah Ossip, Ph.D.1, Zahira Quijones de Monegro, M.D., M.P.H.1, José Javier Sánchez, M.D.1, Sergio Diaz, M.D.1, and Arisleyda Bautista, M.R.H.1, ’University of Rochester Medical Center; ’Pontificia Universidad Catolica Madre y Maestra; ’Centro de Atención Primaria Juan XXIII BACKGROUND: Global tobacco use continues to increase despite tobacco control efforts most notably in developed nations, as the focus of tobacco companies has shifted to low and middle-income countries (LMICs). The Dominican Republic (DR), a Caribbean LMC, is unique as the only nation in the Western Hemisphere which has not signed the Framework Convention on Tobacco Control. Concerted national efforts against tobacco use, including health care worker(HCW) interventions, have been lacking. Research has shown that even brief HCW interventions (<3 minutes) significantly increase tobacco cessation among patients (Stead, 2008). METHODS: Survey data were collected in 7 participating communities in the larger “Proyecto Doble T2” trial (Ossip, Pi). In each community all HCWs were targeted for anonymous, self-administered survey (n=107). Descriptive data on knowledge, attitudes and practices of HCWs regarding tobacco cessation are provided. RESULTS: Self-reported tobacco use among HCWs in these communities was quite low (0.9%). Although asking about tobacco use at every patient encounter remains the best practice guideline (Fiore, 2008) only 48.6% of respondents asked “always,” even though 85.05% of respondents “strongly agree” that HCWs should routinely ask about tobacco use. Likewise, 82.24% of those surveyed “strongly agree” that HCWs should routinely help patients to quit, while only 52.34% reported “always” helping users to quit. Beliefs about the effect of tobacco use varied from 94.39% “strongly agreeing” that smoking is harmful to health to only 41.12% “strongly agreeing” that smoking increases risk of otitis media in children. CONCLUSIONS: These preliminary data identifying the absolute difference between beliefs and practices are a start to understanding influences on intervening with tobacco users by HCWs in the DR. A quantitative summary of knowledge level is also helpful to illuminate the need for further education related to tobacco use and intervention practices. Further research will examine the factors related to HCWs asking about tobacco use at each visit in order to help focus education and policy efforts to support this public health cause. The project was funded by the National Cancer Institute at the National Institutes of Health, grant number NCI R01 CA132950 (Ossip, Pi). The project described in this submission was also supported by the University of Rochester CTSA award number T1L RR024135 from the National Center for Research Resources and the
Tobacco dependence remains a massive public health problem, as nearly 20% of adults are smokers. Pharmacotherapeutic interventions are being actively promoted to increase effectiveness of smoking cessation efforts. However, current pharmaceutical cessation aids have low success rates and adverse effects with long-term use. One of the factors contributing to low quit rates is smoking relapse. We recently showed that AT-1001, a potent and selective antagonist of the α3β4 nAChR, decreased responding to nicotine in the rat self-administration paradigm, while having no effects on food responding. The α3β4 nAChR is present in highly localized areas in the brain but recent genome-wide association studies in humans suggest an involvement of the α3β4 nAChR in tobacco dependence. In this study, we used the self-administration model to test whether AT-1009, another potent and selective α3β4 nAChR antagonist from the same series, could reduce, not only stable self-administration of nicotine, but also reinstatement of nicotine-seeking behavior, a model of relapse. Adult male SD rats (n=19) were trained to lever press for a food pellet and then allowed to self-administer nicotine (30 µg/kg/inj) at a fixed-ratio 5 schedule with a 20 second timeout period. After reaching stable responding, 7 rats were pretreated with 0, 0.75, 1.5 or 3 mg/kg (s.c.) of AT-1009 in a randomized within-subjects design. The remaining animals (n=12) underwent extinction training after establishing stable nicotine self-administration. Once extinguished, rats were pretreated with 0, 0.75, 1.5 or 3 mg/kg (s.c.) of AT-1009 in a randomized within-subjects design and subsequently reinstated with nicotine-associated cues and yohimbine, a pharmacological stressor. RESULTS: AT-1009 dose-dependently reduced responding for nicotine. Importantly, AT-1009 also dose-dependently reduced reinstatement of nicotine-seeking behavior. CONCLUSIONS: Our results suggest that not only is the α3β4 nAChR antagonism a viable approach for tobacco cessation treatment but also for prevention of relapse. Highly selective and potent α3β4 nAChR antagonists such as AT-1009 may be developed as medications for smoking cessation.

This work was supported by NIDA Grant R43DA053374.

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POS4-137
DEVELOPMENT OF ADOLESCENT RECEPTIVITY TO TOBACCO ADVERTISING AND SMOKING INITIATION

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Each day, an estimated 3800 adolescents smoke their first cigarette. In the US, initiation risks are higher among poor families, single parent homes, and youth exposed to tobacco use at home. The Population Assessment of Tobacco and Health (PATH) Study will assess initiation of tobacco use among youth and associated factors. Familial influences are important during the time when never-smoking youth are first cognitively susceptible to experiment. This “susceptibility” period is also influenced by exposure to tobacco industry marketing. Among adolescents who have never smoked, receptivity to tobacco advertising has been shown to predict future cigarette smoking. Receptive adolescents readily identify favorite ads and report willingness to use a tobacco branded product. Less is known about the role of parent-child interactions in shaping the developmental course of receptivity. In a 6-wave longitudinal US cohort (n=1036) of adolescents aged 10-13, mixed-effect regression models related development of receptivity to tobacco advertising and risk for tobacco use in subsequent waves of assessment. Among never-smoking adolescents, there were significant increases in receptivity over time (p<0.001), with receptivity in the previous year more than doubling the odds of smoking in subsequent years (AOR=2.11; 95%CI: 1.31-3.41; p<0.002). Mental health status (p<0.05), peer/familial smoking (p's<0.05), and positive smoking attitudes (p<0.03) related to increased receptivity over time, reports of parent-child interactions to prevent tobacco use were protective (b=-0.13; SE=0.06, p<0.05) and lower levels of parental monitoring (b=0.02, SE= 0.01; p<0.03) were associated with increased receptivity to advertising over time. These results suggest the importance of familial factors in shaping the impact of tobacco advertising on risk for smoking initiation. Results from this study will help inform the PATH Study questionnaire development and analysis.

Support: This project has been funded in whole or in part with Federal funds from the National Institute on Drug Abuse, National Institutes of Health, and the Food and Drug Administration, Department of Health and Human Services, under Contract #HHSN271201100027C. Funding for the primary data collection was provided by National Cancer Institute grant CA093982, an American Legacy Foundation grant, and Tobacco Related Disease Research Program grants 17RT-0068 and 15RT-0238 from the University of California.

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POS4-138
PERCEPTIONS OF HOOKAH USE AMONG ADOLESCENTS AND YOUNG ADULTS: A QUALITATIVE STUDY

Grace Kong, Ph.D.*, Deepa Camenga, M.D., Dana Cavallo, Ph.D., and Suchitra Krishnan-Sarin, Ph.D. Yale University School of Medicine

Although rates of hookah use are generally low, recent reports suggest that adolescents and young adults are highly susceptible to uptake and use hookah. There is paucity of data describing the perceptions, attitudes and beliefs about the risks and harms associated with hookah use among adolescents and young adults. Understanding these factors may inform the regulation of this and new tobacco products. Thus, we conducted a qualitative study using 8 focus groups with high school and college students stratified by smoking status and gender to assess knowledge, motivation, use, comparative perceptions to cigarettes and perceptions of risk of hookah use. The transcripts of the focus groups were examined using thematic analysis. The themes did not differ between high school and college students. Most participants were aware of hookahs and how they were used and generally viewed it as being positive (“cool,” “trendy”) and appealing because of availability of various flavors. Participants reported seeing hookah on social media such as Facebook and used them at local hookah bars. The majority of smokers reported having used hookahs and non-smokers reported either having tried or being willing to try it. Perceptions of health risks and addiction potential varied. Some viewed hookah use as a healthier alternative to cigarette smoking (smokers found it less harsh on the throat than cigarette smoking), but others felt that the health risks were equivalent to cigarette smoking. Some smokers felt that hookah use was less habit forming than cigarette smoking because of the effort needed to use. All groups reported concerns of hygiene and the spread of diseases from sharing the mouth piece. The focus group findings suggest that adolescents’ and young adults’ perceptions of hookah use is generally positive and easily accessible. Interestingly, even non-smokers shared similar positive views, suggesting the need to better regulate this tobacco product to prevent tobacco initiation.

Funding: P50DA09421.

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POSTER SESSION 4 • Saturday, March 16, 2013 • 12:15 p.m.–1:45 p.m.

**POS4-139**

**DISPARITIES IN ASSESSMENT OF RISK FOR TOBACCO INITIATION: SURVEILLANCE OF SENSATION SEEKING AMONG U.S. ADOLESCENTS**

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Individual differences in sensation seeking (SS) are associated with initiation of tobacco use, higher initial sensitivity to nicotine, higher levels of tobacco use, and difficulty with cessation. Delivery of public health prevention campaigns targeting youth with SS has been complicated by observed differences in the reliability of SS surveillance indices among racial/ethnic subgroups. With a renewed focus on instrumentation and re-evaluation of the consistency of tobacco-related risk conveyed by SS, this study presents a thorough evaluation of 5 items from the Zuckerman Kuhlman Personality Questionnaire (ZKPQ-SS) across Black, Hispanic, and Non-Hispanic White racial/ethnic subgroups using data from the National Comorbidity Survey of Adolescents (NCS-A), a cross-sectional nationally representative survey of 10,123 adolescents, 13-17 years of age. Methods based in item-response theory documented statistically significant differences in the item functioning (DIF) of each SS item among black adolescents. Black adolescents were more likely to endorse ‘a life of travel...change and excitement’ (NCDIF=0.22, G2=383.7, p<0.01) and less likely to endorse ‘do things that are a little frightening’ (NCDIF=0.12, G2=360.8, p<0.01). Regression models confirmed the strong association of SS with smoking initiation (AOR=1.79, 95%CI:1.6-2.0, p<0.01) and levels of tobacco dependence (AOR=1.74, 95%CI:1.5-2.0, p<0.01). Risk for tobacco initiation (AOR=0.65, 95%CI:0.48-0.87) and dependence (AOR=0.59, 95%CI:0.49-0.72, p<0.01) among ever-smokers, was consistently lower among blacks than non-Hispanic whites. When compared to non-Hispanic whites, levels of SS among black adolescents were less strongly related to initiation of smoking (race*SS=-0.21, SE=0.10, p< 0.04) and levels of tobacco dependence (AOR=1.74, 95%CI:1.5-2.0, p<0.01). Risk for tobacco dependence among ever-smokers from the ZKPQ-SS items may weaken the predictive utility for identifying risk for smoking initiation among black adolescents.

Support: This project has been funded by American Legacy Foundation.

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**POS4-140**

**PREDICTIVE AND EXTERNAL VALIDITY OF A PRE-MARKET STUDY TO DETERMINE THE MOST EFFECTIVE PICTORIAL HEALTH WARNING LABEL CONTENT FOR CIGARETTE PACKAGES**

Liling Huang, M.P.H.¹,², James F. Thrasher, Ph.D.¹, David Hammond, Ph.D.¹, and Jessica L. Reid³, ¹University of South Carolina; ²University of Waterloo

Background: Studies examining pictorial health warning label (HWL) content for cigarette packs have primarily used designs that do not allow determination of effectiveness after repeated, naturalistic exposure. This research aimed to determine the predictive and external validity of a pre-market evaluation study of pictorial HWLs with differing content. Methods: Data were analyzed from two sources: 1) a pre-market convenience sample of 544 adult smokers who participated in field experiments conducted in Mexico City in July 2010, before pictorial HWL implementation in September 2010; and 2) a representative sample of 1765 adult smokers who participated in the ITC-Mexico survey after pictorial HWL implementation. Participants in both samples rated the six HWLs that appeared on Mexican cigarette packs, and also ranked 5 to 7 different HWLs for one of seven different health topics: one text-only warning and multiple pictorial warnings with various representational styles (graphic health effects, lived experience, symbolic images, and testimonials). Ratings were combined into a single effectiveness scale (alpha=.79–.90, done for each HWL). Unadjusted and adjusted linear mixed effects (LME) models were used to test the relative effectiveness of the six HWLs that appeared on cigarette packs. LME was also used to assess how dependent they may be. Further results and implications will be discussed.

No funding.

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**POS4-141**

**CHARACTERISTICS OF ADOLESCENT SMOKING CESSATION PROGRAM DROP-OUTS**

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Background: Though teen smoking cessation programs are available, their success is often limited; some programs report quit rates of <30% (Pierce & Gilpin, 1996). Attrition is a major contributor to cessation failure; some programs face drop-outs rates as high as 67% (Turner et al., 2004). Identifying factors which contribute to cessation program drop-out may translate into improved quit rates. The present study examined differences between drop-outs and completers of a school-based cessation program. Method: Participants (N=8834) were teen smokers aged 14-19 enrolled in the Not-On-Tobacco (NOT) cessation program. Independent samples t-tests compared program drop-outs (n=1911) versus completers (n=6923) on baseline reports of gender, age, cigarettes per day (CPD), dependence, and quitting motivation and confidence. Results: Drop-outs were older, smoked more CPD on both weekdays and weekends, and were more likely to be male than completers, p's<.05. Drop-outs were also less likely to report smoking for “behavioral” reasons (e.g., smoking enjoyment is due to behaviors such as lighting or holding a cigarette), p<.05. Interestingly, there were no differences between drop-outs and completers on nicotine dependence, quitting confidence, or quitting motivation. Conclusions: Whereas dependence may predict cessation failure and relapse (Zhou et al., 2009), no differences in dependence existed among drop-outs versus completers. Additionally, there were no differences in quitting motivation or confidence. In contrast, both weekday and weekend CPD did discriminate between drop-outs and completers. This suggests that teens, especially males, who smoke more CPD regardless of dependence, may be at highest risk of dropping out of a cessation program. Greater CPD may reflect that smoking plays a more significant role in the lives of these individuals – they may spend a greater amount of time engaging in smoking behaviors. These results suggest that interventions may reduce attrition by identifying those whose smoking behaviors occupy a greater proportion of their time, regardless of how dependent they may be. Further results and implications will be discussed.

No funding.

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**POS4-142**

**SWITCHING BETWEEN MENTHOL AND NON-MENTHOL CIGARETTES IN THE ITC4 US COHORT**

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Background: The purpose of this study was to evaluate menthol/ non-menthol cigarette switching among adult smokers in a longitudinal cohort of US smokers. METHODS: Participants were a nationally representative longitudinal

No funding.
sample of smokers 18+ years of age in the US who were interviewed approximately annually as part of the International Tobacco Control Four Country Survey (ITC-4) between 2002 and 2010 (N = 8016). Each respondent was classified as being a menthol or non-menthol smoker at each wave based on their reported current brand smoked. Switchers were defined as those who smoked on two consecutive waves but reported a difference in menthol or non-menthol brands between waves. Respondents’ reasons for switching and associations between switching and time to first cigarette, number of cigarettes smoked per day, and quit attempts were evaluated using generalized estimating equations. RESULTS: Overall, 27% of smokers smoked menthol cigarettes during the study period. African Americans, females, and 18-24 year olds were more likely to smoke menthol cigarettes than their counterparts. Switching cigarette types between survey waves was very uncommon, with only 2% of non-menthol smokers switching to menthol cigarettes, and only 8% of menthol smokers switching to non-menthol cigarettes. Regardless of the direction of the switch, cigarette price and cigarette taste were the most common reasons for switching. There were no strong associations between switching (in either direction) and time to first cigarette, number of cigarettes smoked per day, or quit attempts. CONCLUSIONS: Results from this adult cohort of current smokers indicate that switching to/from menthol cigarettes is uncommon, and is not associated with changes in subsequent quitting behavior. However, key limitations of this study include the lack of data on smoking initiation among young people and details on smoking topography among smokers. These results are one component that will inform the Public Assessment of Tobacco and Health (PATH) survey to understand the effects of menthol cigarette use on cessation and public health.

This project has been funded in whole or in part with Federal funds from the National Institute on Drug Abuse, National Institutes of Health, and the Food and Drug Administration, Department of Health and Human Services, under Contract No. HHSN272201100027C. Major funders of the ITC Four Country Survey include US National Cancer Institute (P01 CA113326, P01 CA133839, R01 CA100362, R01 CA125116), Canadian Institutes of Health Research (57897, 79551, and 115016), National Health and Medical Research Council of Australia (265903, 450110, and 1000922), Cancer Research UK (C312/A3726, C312/A6465, and C312/A11039), Robert Wood Johnson Foundation (045734), and Canadian Tobacco Control Research Initiative (014578).

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POS4-143
DISTRESS TOLERANCE AND SMOKING STATUS: DIFFERENCES BETWEEN SMOKERS, FORMER SMOKERS, AND NEVER SMOKERS
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Background: Cigarette smoking is one of the leading causes of preventable disease worldwide, and yet over 19% of adults in the US smoke, with even higher rates in some other countries. Frustration Tolerance (FT) and negative affect have been identified as important predictors of smoking status, with smokers having lower levels of FT and higher levels of negative affect than never smokers. Few studies have evaluated these characteristics in former smokers. This study compared scores on both objective and subjective measures of FT as well as negative affect across smokers, former smokers, and never smokers. Methods: Eighty-six participants with a mean age of 43.9 (SD=11.2) (47.7% African American, 41.9% Caucasian; 46.5% female) were recruited from the DC metro community using convenience sampling. A smoking status survey was completed to classify participants as smokers (N=27), former smokers (N=11), or never smokers (N=48). Never smokers persisted significantly longer on the MTT (1634.2, SD=862.8) than did smokers (M=1046.6, SD=850.2; p<0.001) or former smokers (M=1112.0, SD=815.0; p=0.045). There was no significant difference between smokers and former smokers (p=0.943). Conclusions: These findings support prior research that found differences in FT between smokers and never smokers. It further indicates that former smokers exhibit levels of objective frustration tolerance more similar to those of smokers than to never smokers. Future research could examine FT as a factor in smoking initiation and longitudinal studies could shed light on the effects of FT on smoking cessation.

American University Mellon Award (GR), College of Arts and Sciences, Provost Office, Dissertation Research Award, Spring 2011 (BA)

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POS4-144
A NOVEL HEATED TOBACCO CIGARETTE SYSTEM: RESULTS OF PRELIMINARY CHEMICAL TESTING AND ANALYSIS
Vikram Kumar1, Jay Kumar1, Joseph McClernon2, and Thangaraju Murugesan3, 1Siva Scientific, Inc., Yorba Linda, CA; 2NeuroAnalytics, LLC, Durham, NC

Aims: We report on the chemical testing and analysis of a prototype of a novel heated tobacco cigarette system (HTCS). The HTCS works by heating tobacco at temperatures below the point at which pyrolysis occurs, thereby producing a vapor potentially devoid of many of the constituents found in the smoke of conventional cigarettes (CCs). Methods: Evaluation of a number of the physical (e.g., particle size) and chemical (e.g. nicotine content) characteristics of a novel HTCS was made using a standard puffing regimen and chemical analysis techniques. The HTCS was tested by heating tobacco rods from four commercially available cigarettes, and comparing to values obtained by conventionally burning those same cigarettes. Results: Assessment of heating element and surrounding tobacco temperatures indicated stable attainment of temperatures of approximately 400 °C and 200 °C in the heating element and tobacco respectively. The heating of four different commercial cigarettes with the HTCS resulted in mean nicotine levels in a range between 18.77 and 42.8 µg/puff (conventional burning = 131.73 to 342.88 µg/puff). The results of gas chromatography with nitrogen phosphorus detection (GC-NPD) revealed substantial reduction in total ion chromatography peaks for HTCS versus CC. Finally, the mass median aerodynamic diameter (MMAD) of vaporized particulate matter from the HTCS was measured to be 0.55µm. Conclusion: The results of this initial assessment of a novel heated tobacco cigarette system indicate delivery of an aerosol achieving significant levels of nicotine at particle sizes similar to CC, but substantially reduced levels of non-nicotine constituents as indicated by GC. Future in vivo and in vitro is warranted to assess the biological activity of this novel HTCS and its potential to reduce harm from smoking in humans. This research was funded by Siva Scientific, Inc.

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POS4-145
SMOKING SUSCEPTIBILITY AND PHYSICAL ACTIVITY AMONG ETHNICALLY DIVERSE PREADOLESCENTS: DOES PEER SMOKING IN THE SOCIAL NETWORK MEDIATE ASSOCIATIONS?
Cassandra A. Stanton, Ph.D.1, Krista B. Highland, Ph.D.1, Kenneth Tercyak, Ph.D.1, Melissa Napolitano, Ph.D.2, and Kimberly Horn, Ed.D.1, 1Georgetown University Medical Center; 2George Washington University

Evidence suggests that youth who engage in regular physical activity (PA) smoke cigarettes at lower levels than their sedentary counterparts. Peer smoking has also robustly been associated with smoking susceptibility. The purpose of this study is to examine whether youth who are physically active report fewer smoking peers in their social network and in turn are less susceptible to smoking uptake. School-based self-report surveys were collected to examine these associations among eighth graders (N=458; modal age 14 years; 55% female; 16% White, 33% Black, 36% Hispanic; 63% with foreign-born mothers) in two low-income ethnically diverse urban middle schools. In addition to the Smoking Uptake Continuum and YRBS PA item (# days out of past 7 with 60+ minutes of moderate/vigorous PA), students nominated their 5 closest friends and reported whether they believed the friend had ever smoked. SEM with bootstrapping tested the relationships between PA, % peer smokers (%PS), smoking susceptibility (intentions to smoke), smoking experimentation (puff or ever smoked), and controls (age, race, US-born). Among boys, higher PA was associated with lower %PS (p=0.017). For both boys and girls, lower %PS was associated with lower susceptibility (p<0.001) and experimentation
(p<.001). For boys, %PS marginally mediated the relationship between PA and smoking experimentation (p=0.066) and susceptibility (p=0.056). Taken together, boys who report more PA tend to report having social networks with fewer smoking friends and that path at a lower risk for smoking uptake. The present model advances the robust literature relating peer smoking with susceptibility and extends it by utilizing an SEM to show that, for boys, PA is protective. Girls in this multivariate sample had lower levels of PA (M=3.38 days) than boys (M=4.15 days; t=3.40, p<.001), perhaps leaving them at higher risk for smoking uptake overall. Health promotion interventions that promote PA among urban middle school students may be effective at deterring smoking uptake, particularly among boys.

This study was conducted, in part, while the first author was at Brown University. Supported by NCI grant K07 CA095623-01A1.

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POS4-146
PRESENCE OF HOOKAH SMOKING CONTENT ON YOUTUBE
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While cigarette use has steadily declined, hookah tobacco use is rapidly expanding in the U.S. Hookah tobacco use often begins in young adulthood, with point prevalence estimates of ever use range between 10% to over 40% among young adults. Tobacco smoking is often promoted on social media sites (e.g., YouTube). Understanding the hookah content promoted on YouTube may inform health communication strategies that convey actual information about their harmfulness and addictiveness to young adults. We examined the characteristics and message content of a sample of hookah-related videos found on YouTube. The terms hookah, waterpipe, narghile, and shisha were used to retrieve the top 20 videos on YouTube by relevance and view count searches. Eliminating duplicates, 115 videos were independently coded by three researchers for the prevalence of hookah smoking, messages, and themes. The majority (96.5%) of videos positively portrayed hookah smoking. Over three-fourths (79.1%) of the videos appeared to be "homemade" or generated by the individual(s)/actor(s) in the video. Over 22% of the videos were instructional/"how to" videos that demonstrated how to set up and smoke a hookah pipe. Roughly 20% of the videos featured a review of a hookah tobacco brand. Though most of the videos in our sample included an actor (73.9%), 20.9% included 2-3 actors. The majority of the actors in the videos were male (73.9%) and white (87.8%). Approximately 78.3% of the actors smoked a hookah in the videos; 12.2% were shown sharing their hookah with another actor. Hookah smoking tricks (36.5%), music (35.7%), and smoking with others (22.6%) were the most commonly portrayed themes in the videos. Actors in our video sample endorsed the following reasons for smoking a hookah: enjoying its taste and smell (15.7%), enjoying the "buzz" of smoking (10.4%), and it is a healthier alternative to cigarette smoking (3.5%). Of the actors who smoked a hookah in the videos; 12.2% were shown sharing their smoking with others. Hookah smoking tricks (36.5%), music (35.7%), and smoking with others (22.6%) were the most commonly portrayed themes in the videos. Actors in our video sample endorsed the following reasons for smoking a hookah: enjoying its taste and smell (15.7%), enjoying the "buzz" of smoking (10.4%), and it is a healthier alternative to cigarette smoking (3.5%). Of the actors who smoked a hookah in the videos; 12.2% were shown sharing their smoking with others.

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POS4-147
WEB-BASED SMOKING PREVENTION AND CESSATION INTERVENTION FOR COLLEGE STUDENTS: RESULTS FROM A PRE-TEST
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Background: Feasibility testing of Evolve, a smoking prevention and cessation program for college students is presented. This intervention program is an expansion of our current Project SUCCESS—a smoking cessation program for college students based on in-person counseling with health feedback, computer-based sessions, and nicotine replacement therapy. Results indicated those in the SUCCESS arm were twice as likely to be abstinent at one-year follow-up compared to those using self-help in the control arm. In Project SUCCESS, 50% of participants reported being depressed and 18% reported moderate to heavy alcohol use at baseline. These risk factors were not adequately addressed in the program. In Evolve, new treatment modules that addressed depression and alcohol use were integrated. Because smoking initiation occurs among young adults, a prevention module was added to Evolve. Methods: Using a pre-post cohort design, participant recruitment, retention and program usability were examined. Results: University students (n = 32), aged 18 to 35 years joined the study. One third were female and two thirds were Caucasian. In the cessation arm, 13 smokers were followed for 9-12 weeks whereas in the prevention arm, 19 nonsmokers were followed for 8-9 weeks. Outcomes indicated that smokers quit smoking during follow-up, with all but 3 relapsing at the final interval. Nonsmokers in the prevention arm remained abstinent. Eighty percent of participants visited the Evolve website. Those in the prevention arm were more likely to visit the depression and alcohol modules than for smokers. Smokers interested in quitting, and who were at high risk for depression and problematic alcohol use did not access the modules. Introductions to the depression and alcohol-use modules on the website were revised using more user-friendly strategies. Conclusions: Results provide support for the feasibility of conducting a randomized controlled trial planned for Evolve in the near future.

Enhanced Smoking Cessation Program for University Students, R01 CA069425, NIH/NCI, 2/2/1999-2/28/2013, NCE.

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POS4-148
A RANDOMIZED DOUBLE-BLIND PLACEBO-CONTROLLED CLINICAL TRIAL OF VARENICLINE FOR SMOKELESS TOBACCO DEPENDENCE IN INDIA
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Background: The prevalence of smokeless tobacco use is about 20% in India and it is associated with a range of serious health problems including oral cancers. Varenicline, the most efficacious medication for tobacco smoking and an excellent medication for smokeless tobacco products in Scandinavia, was evaluated for the first time in India using a placebo-controlled randomized design. Methods: This trial, implemented at the All India Institute of Medical Sciences, in New Delhi, randomized 237 individuals attending dental clinics for routine care to 12 weeks of either placebo (n = 118) or varenicline 1mg BID (n = 119). All participants received 6 sessions of behavioral counseling for smokeless tobacco dependence. Participants were biochemically verified to be smokeless tobacco users and non-tobacco smokers at the start of the study. End-of-treatment 7-day point prevalence abstinence (using an intent-to-treat analysis) was the primary outcome and safety and tolerability were evaluated. Results: Self-reported abstinence was significantly greater for varenicline (43%), vs. placebo (31%; OR = 1.82, 95% CI: 1.05-3.16, p = .03). Biochemically-confirmed abstinence was greater for varenicline vs. placebo (25.2% vs. 19.5%), but this was not statistically different (OR = 1.44, 95% CI: 0.77-2.71, p > .05). The most frequently reported side effects were sleep problems (6.4%) and nausea/gastrointestinal problems (6.3%). No serious adverse events were reported, there were no varenicline effects on blood pressure, and no incidence of suicide or suicidal ideation, during treatment. There were no significant differences in the rate of stopping or reducing placebo vs. varenicline (4.2% vs. 8.4%, p > .05). Conclusions: This trial provides only partial outcome and safety and tolerability were evaluated. Results: Self-reported abstinence was significantly greater for varenicline (43%), vs. placebo (31%; OR = 1.82, 95% CI: 1.05-3.16, p = .03). Biochemically-confirmed abstinence was greater for varenicline vs. placebo (25.2% vs. 19.5%), but this was not statistically different (OR = 1.44, 95% CI: 0.77-2.71, p > .05). The most frequently reported side effects were sleep problems (6.4%) and nausea/gastrointestinal problems (6.3%). No serious adverse events were reported, there were no varenicline effects on blood pressure, and no incidence of suicide or suicidal ideation, during treatment. There were no significant differences in the rate of stopping or reducing placebo vs. varenicline (4.2% vs. 8.4%, p > .05). Conclusions: This trial provides only partial side effects were sleep problems (6.4%) and nausea/gastrointestinal problems (6.3%). No serious adverse events were reported, there were no varenicline effects on blood pressure, and no incidence of suicide or suicidal ideation, during treatment. There were no significant differences in the rate of stopping or reducing placebo vs. varenicline (4.2% vs. 8.4%, p > .05). Conclusions: This trial provides only partial side effects were sleep problems (6.4%) and nausea/gastrointestinal problems (6.3%). No serious adverse events were reported, there were no varenicline effects on blood pressure, and no incidence of suicide or suicidal ideation, during treatment. There were no significant differences in the rate of stopping or reducing placebo vs. varenicline (4.2% vs. 8.4%, p > .05). Conclusions: This trial provides only partial

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Poster Session 4 • Saturday, March 16, 2013 • 12:15 p.m.–1:45 p.m.
POS4-149

EFFECTS OF VERY LOW NICOTINE CONTENT CIGARETTES IN COMBINATION WITH NICOTINE PATCH ON SMOKING BEHAVIOR AND WITHDRAWAL

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Background: Previous studies have shown that switching smokers to reduced nicotine content cigarettes leads to reduced smoking, minimal compensation, and no greater exposure to toxicants than usual brand cigarettes. Based on these studies, we hypothesized that very low nicotine content (VLNC) cigarettes would reduce the reinforcing value of cigarettes, and in combination with nicotine patch (NP), would reduce smoking rate and withdrawal symptoms compared to either product alone. Methods: Adult smokers were recruited for a randomized, parallel arm study. After a 2 week baseline period smoking usual brand cigarettes, subjects were randomized to one of the following conditions for 6 weeks: 1) VLNC (0.55-0.77 mg nicotine yield), n=79; 2) 2.1 mg NP, n=80; or 3) combination of VLNC+ NP, n=76. Withdrawal symptoms and carbon monoxide (CO) were assessed at each clinic visit, and product use was assessed daily. Although subjects were provided 6 weeks of additional behavioral treatment and were follow-up up to 36 weeks, the focus of this presentation was the 6 week product assignment period. Results: Subjects in the VLNC + NP group smoked significantly fewer assigned cigarettes during the treatment period compared to those in the VLNC group beginning at week 1 (Wk 6: 11.4±7.6 vs. 16.2±10.2, p<.01). The reduced smoking rate of the VLNC+NP group resulted in significantly lower CO levels compared to the VLNC group. Withdrawal scores following cessation from usual brand cigarettes were significantly lower in the VLNC+NP group than NP group (p=0.008), but not significantly lower than the VLNC group. Conclusions: Subjects receiving the combination of VLNC and NP had significantly lower withdrawal scores compared to NP, smoked fewer assigned cigarettes and had lower CO levels than the VLNC group. Therefore combining nicotine replacement with VLNC may be a beneficial treatment approach.

Funding: National Institutes of Health R01 DA025958 and U01 DA031659.

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POS4-150

USE OF POTENTIALLY REDUCED EXPOSURE PRODUCTS (PREPS) AND ASSOCIATIONS WITH QUITTING ACTIVITY AMONG CIGARETTE SMOKERS IN THE IT4C US COHORT

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Background: Preliminary results indicate that cigarette smokers are unlikely to use SLTP or AC more likely to attempt to quit smoking (during the interval in which they used the product) than those who did not (OR=1.26, 95%CI=98-162; OR=1.28, 95%CI=93-1.74, respectively), but users who used the products (SLTP or AC) to quit were not more likely to succeed in quitting (OR=0.79, 95%CI=38-1.67, OR=0.40, 95%CI=16-97, respectively). CONCLUSIONS: While PREPs may have the theoretical potential to reduce morbidity and mortality caused by cigarettes, preliminary results indicate that cigarette smokers are unlikely to use them, and those who do use them do not experience a quitting advantage. PATH should further evaluate nonsmokers’ use of PREPs.

This project has been funded in whole or in part with Federal funds from the National Institute on Drug Abuse, National Institutes of Health, and the Food and Drug Administration, Department of Health and Human Services, under Contract #HHSN27201100027C. Major funders of the ITC Four Country Survey include US National Cancer Institute (R01 CA111326, R01 CA138398, R01 CA100362, R01 CA125116), Canadian Institutes of Health Research (57897, 79551, and 115016), National Health and Medical Research Council of Australia (195903, 450110, and 1005922), Cancer Research UK (C312A/3726, C312A/6465, and C312A/A11039), Robert Wood Johnson Foundation (045734), and Canadian Tobacco Control Research Initiative (041578).

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Background: Obesity has been linked to addiction, yet studies have not directly examined whether co-morbidities between obesity and addiction are associated with differential activation of the neural systems of reward. The current research used functional magnetic resonance imaging (fMRI) to examine the brain responses to food and smoking cues in healthy weight (HW) to overweight (OV) smokers to investigate how co-morbidities may impact reward processing. Methods: Seventeen HW (Body Mass Index [BMI] 18.5 - 25 kg/m2) and 15 OV (BMI > 25kg/m2) smokers were enrolled and included in the fMRI analysis. Participants completed two scans while passively viewing food and animal pictures and two scans while passively viewing pictures of people smoking and engaged in daily activities. All pictures were blurred with a Fast Fourier Transform so as to be unrecognizable. Results: Smokers showed a activation of reward processing brain regions including the medial prefrontal cortex (MPFC), orbitofrontal frontal cortex (OFC), insula and caudate when viewing food images compared to non-food images. Moreover, all smokers showed activation in the MPFC and superior frontal gyrus (SFG) when viewing smoking compared to non-smoking cues. The MPFC, SFG, and OFC showed greater activation to smoking compared to food images. The number of cigarettes smoked per day correlated with brain activations in the SFG (p<.01). No group differences were found between HW and OV participants while viewing food or smoking images. Discussion: The results showed increased activations in reward areas to food cues and smoking cues among smokers. However, brain responses did not differ based on whether or not an individual was OV vs. HW. Comorbidity of smoking and obesity do not seem to alter brain responses to food and smoking cues. Moreover, the SFG, which is involved in goal directed behavior showed that smokers who smoked more cigarettes per day showed less activation to food cues compared to smoking cues. Together these results indicate that smoking behaviors rather than weight have the largest influence on brain responses to smoking and food cues.

Funding: NIH R01 DA030868; NIH R00 DA025163.

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POS4-152  
**GENDER DIFFERENCES IN CIGARETTE ABSTINENCE RATES IN A STUDY COMPARING THE USE OF VERY LOW NICOTINE CONTENT CIGARETTE ALONE OR IN COMBINATION WITH A 21 MG NICOTINE PATCH TO THE USE OF THE PATCH ALONE**

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Background: While smoking is harmful for both men and women, women smokers have a higher relative risk of developing tobacco-related cardiovascular disease than men smokers, and lung cancer has surpassed breast cancer to become the leading cause of cancer death in women. Women are also less successful at quitting than men. Researchers have hypothesized that women may receive more reinforcement from non-nicotinic factors such as behavioral smoking cues and are therefore less aided by traditional nicotine replacement. Very low nicotine content (VLNC) cigarettes, which provide the sensory cues for smoking but not nicotine at reinforcing levels, are a promising means to reduce smoking behavior, facilitate abstinence and to lead harm reduction, perhaps especially for women. Methods: In a randomized, parallel arm, between-subjects design, the effects of a VLNC cigarette used alone or combined with a 21 mg nicotine patch were compared with the use of the patch alone on cigarette abstinence. Of 316 regular smokers smoking ≥10 cigarettes per day (CPD), 235 were randomly assigned to: 1) a 0.05 to 0.06 mg nicotine yield cigarette (n=79); 2) a 21 mg nicotine patch (n=80); or 3) a combination of the patch and the VLNC cigarette (n=76). Each group received 6 weeks of treatment, an additional 6 weeks of behavioral treatment and 3 follow-up visits. Use of non-study products did not disqualify participants. Tobacco and nicotine use self-report and carbon monoxide (CO) were assessed at each visit. Urinary cotinine was assessed at baseline and weeks 2, 6, 12, 24 and 36. Results: CO and cotinine verified continuous abstinence rates at end of treatment (Week 12) varied significantly by treatment group and gender (p=0.029 for the interaction), with females showing higher abstinence rates than males in the VLNC cigarette condition (17.0% vs. 3.1%) and combination condition (14.0% vs. 6.1%) and males showing higher rates of abstinence in the patch alone condition (20.6% vs. 8.7%). Conclusions: Results of this study suggest VLNC cigarettes may aid in reducing smoking behavior and facilitating abstinence; therefore reducing harm and improving public health, particularly in women.

Funding: National Institutes of Health R01 DA025598.

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POS4-153  
**PARENTAL PERCEPTION OF THE ASSOCIATION BETWEEN HOME SECONDBAND SMOKE (SHS) EXPOSURE AND CHILD’S HEALTH**

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Second hand smoke (SHS) exposure is a recognized cause of cardiovascular disease and cancer in adults and respiratory disease in children. In spite of this, approximately one-third of children in the United States live in a home where cigarette smoking is permitted. African American children suffer disproportionately from the consequences of SHS exposure with higher rates of sudden infant death syndrome and asthma. A novel approach to encourage the adoption of home smoking restrictions is to provide parents with biomarker feedback documenting their smoking significantly increases how often their child got sick. Our results indicate that children living with a smoking parent are exposed to detectable levels of nicotine. The majority of mothers enrolled in our trial do not think that their smoking directly affects their children’s health. Future research may need to address this gap in knowledge if reductions in child exposure to home SHS are the aim.

Funded by the National Center On Minority Health And Health Disparities (P60MD003422, Ahluwalia, PI)

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POS4-154  
**BASELINE FACTORS ASSOCIATED WITH ENGAGEMENT AND PATIENT-RATED ADHERENCE IN THE INTERVENTION ARM OF THE CONNECT TO QUIT (CTQ) RANDOMIZED TRIAL FOR SMOKING CESSATION**

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Engagement in and adherence to treatment are critical for successful smoking cessation. Both may be improved by use of patient-centered treatment programs. The Connect to Quit (CTQ) study intervention (INT) is a long-term (2+ year) coordinated, flexible, tailored chronic-care based approach to smoking cessation among low-income (< $36K/yr) veterans in care at all levels of readiness to quit. We explore factors associated with participant engagement in and adherence to the INT. CTQ is a cluster-RCT testing coordinated care (INT) vs. usual care. Binary variables were created for number of completed interventions (Low engagement = 0-1; Engagement = 2+) and mean self-rated adherence scores (Low-Adherent = 0-3; Adherent = 3+ on a 5 point Likert Scale) for INT participants enrolled for 6+ months. Adherence was rated only for visits in which the CTQ coordinator and participant co-formulated a plan. Logistic regressions assessed sociodemographic, substance use, and health-related baseline factors associated with engagement and adherence.202 participants have been enrolled in INT for 6+ months: 52% African American, 45% white, 4% other. 147 (73%) engaged in CTQ (mean # completed interventions=3.07; SD=2.31). 111 (55%) participants completed interventions where self-rated adherence scores were collected. 51 (46%) were adherent (mean=3.23; SD =1.23). Engagement was associated with higher total Social Support Survey Instrument (SSSI) scores (OR = 1.50, p<0.03). Adherence was more likely among those who reported having a partner (OR = 4.08, p<0.02), using illicit drugs within past 6 months (OR = 2.69, p<0.04) and having a household income of 25K – 36K (ref) vs. 12K to 25K (OR = 0.62, p<0.05). Most participants engaged in CTQ, indicating high willingness to accept assistance with cigarette smoking. Participants with more social support were more likely to engage. Even among these low income veterans, higher income predicted greater adherence to the INT. Surprisingly, substance use also predicted higher adherence. As follow-up continues additional data will become available to explore adherence to INT long term.

Drs. Tindle, Shiffman and Moore’s efforts were supported by National Institutes of Health and the National Cancer Institute - R01CA141596. Ms. Mitchell-Milan’s effort was supported by the National Cancer Institute - 3R01CA141596-03S1. This study was supported by the Center for Health Equity Research and Promotion, Department of Veterans Affairs. The views expressed here are those of the authors and do not represent those of the Department of Veterans Affairs or the United States Government.

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DO AS I SAY NOT AS I DO: PARENTAL MONITORING AND TEEN HEALTH RISK

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Funded with Federal funds from the National Institute on Drug Abuse, National Institutes of Health, and the Food and Drug Administration, Department of Health and Human Services, under Contract No. HHSN271201100027C.

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POS4-157
ASSESSING LANDLORDS’ EXPERIENCES AND OPINIONS ABOUT SMOKING RULES IN MULTUNIT RESIDENTIAL BUILDINGS

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Background: Nationally, many landlords are voluntarily implementing rules around smoking in multifamily residential buildings. Further, jurisdictions have introduced or adopted laws requiring landlords of multifamily housing to disclose their rules on smoking to prospective tenants. Methods: A survey of New York City owners and managers of multifamily residential properties (landlords) was conducted to assess current smoke-free residential building rules and landlord knowledge and experiences related to smoke-free policies. A random sample of 1,007 landlords completed the mail and phone survey in 2012. Results: One third (33%) of landlords reported having smoke-free rules in individual units, and 68% of them have specified the rule in tenants’ leases. More than three quarters (77%) considered secondhand smoke moving between apartments a tenant health issue, including 83% of landlords with smoke-free unit rules and 74% of others. Most landlords (67%) favored a law requiring landlords to inform new tenants if smoking is allowed or prohibited inside individual units and other property, including 82% of landlords with smoke-free unit rules and 59% of those without smoke-free unit rules. Although personal dwellings are not covered by public smoke-free air regulations, most landlords (89%) believed individuals have a legal right to living spaces free of secondhand smoke exposure, including 93% of those with smoke-free units and 87% of those without. Conclusion: One-third of NYC landlords have existing smoke-free rules, and the majority of landlords with and without smoke-free rules agree that secondhand smoke transfer is a health concern for tenants. Overall, landlords support laws requiring disclosure of building smoking status to tenants. Community Transformation Grant# 5U58DP003689-01.

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POS4-158
BARRIERS & OPPORTUNITIES: DELIVERING PERSONALIZED MEDICINE FOR SMOKING CESSATION IN PRIMARY CARE

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Background: Smoking cessation remains a challenge for scientists, physicians, and patients alike. Genetic technology has revealed unique biological pathways and drug-metabolizing genes associated with successful cessation. This new innovation provides predictive power that could one day be integrated into clinical practice. This study examined the unique perceptions and barriers to clinical integration of personalized medicine for smoking cessation among a sample of urban primary care providers. Previous research found that calling a test "genetic" is a barrier to physicians using new technologies. This study further evaluated
test preference in a modern context. It was hypothesized that the providers would be more likely to recommend the test described as “metabolic biomarker” versus “genetic.” Methods: A within-subject, cross sectional design compared the intention to use scores for both tests among a sample (n=42) of urban primary care providers recruited at professional conferences and seminars in the Los Angeles area. Both hypothetical scenarios were presented to all participants in an online survey. Based on this data, we are addressing our primary research question herein. Secondary aims for the sample are currently being conducted and will identify more specific associations with intention to use. Results: Providers were more likely to offer the metabolic biomarker test to patients than the genetic test (75.83% versus 70.83%). Using a paired t-test, the P value equaled 0.0789, which is not quite statistically significant. Additional analyses help identify specific predictors of using such tests (specific physician and innovation characteristics, current practices, and patient demo- and psychographics). Conclusions: Results will help inform future health professional education & help shape clinical practice guidelines. This may speed the rate of dissemination and uptake of these new technologies, thus improving smoking cessation outcomes in patients. Future research should investigate the impact of public policy & provider education on the utilization of innovative cessation approaches involving biomarkers and genetics.

The project described was supported by the National Center for Research Resources and the National Center for Advancing Translational Sciences, National Institute of Health, through Grant Award Number TL1RR031992. The content is solely the responsibility of the authors and does not necessarily represent the official view of the NIH. M. Lancaster is a TL1 Trainee awarded under the TL1 (Pre-doctoral) Training Award through Southern California Clinical and Translational Science Institute at University of Southern California, Keck School of Medicine.

POS4-159
EXAMINING ATTENTIONAL BIAS FOR SMOKING CUES WITH A MANUAL AIMING METHODOLOGY

A. Hsin*, G. Faulkner, and L. Tremblay

Background: Attentional bias (AB) is a cognitive processing bias that substance users exhibit for addiction-related stimuli. Specifically, the stimuli acquire incentive salience and may grab the attention of experienced users. This bias influences underlying processes of substance-seeking behaviour, craving, and relapse. Recently, AB has been explored mainly with eye-tracking technology. However, there are some methodological limitations with the use of eye-tracking to measure AB that can be circumvented with manual aiming (MA). Additionally, MA provides a unique measure of AB which have not yet been explored to our knowledge. The purpose of this feasibility study was to explore a novel method, manual aiming (MA), to assess AB. Methods: A visual dot-probe paradigm, which has been used in the past to assess for AB, was modified to include components of MA. Participants completed this task while their eye and limb positions in space were monitored and tracked. To measure AB, reaction time (RT), movement time (MT), and limb trajectory (LT) was assessed and compared between a group of non-smoking control and abstaining smokers of at least three hours. Results: A 3 (probe) x 2 (accompanying image) x 2 (group) mixed design ANCOVA, controlling for age, did not find differences for RT and MT. However, when assessing the peak delta limb position in the x-axis relative to a control/neutral condition, there was a significant main effect for accompanying image in the left direction (p < 0.05). Significant interaction effects were also observed for probe and accompanying image (p < 0.05). Smokers tended to deviate more in their movement trajectory when presented with an accompanying image that was either smoking related or appeared to be smoking related. Conclusion: The MA paradigm allows for assessment of different properties of AB in addition to the standard RT including MT and LT. Deviations from normal pathways could be the result of online trajectory amendment in movement after onset and this could be reflective of changes in attention locus as movement progresses. By assessing LT, MA offers further insight into AB for smoking cues.

This study was funded by the Ontario Tobacco Research Unit.

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POS4-160
THE EFFECT OF POLYTABacco USE ON SMOKING CESSATION OUTCOMES AMONG PARTICIPANTS IN AN ONLINE CESSATION INTERVENTION

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As restrictions and taxes on cigarettes increase and indoor smoking laws become ubiquitous, non-cigarette, alternative tobacco products may become a larger part of the U.S. tobacco market. A growing percentage of U.S. smokers are using alternative tobacco products, which may make smoking cessation harder for those trying to quit. This study will examine the impact of polytobacco use on cessation outcomes among a population of adult smokers who are enrolled in an online smoking cessation program. In January, 2011, a sample of 1,033 adult registrants were recruited from BecomeAnEX.org, a web-based smoking cessation intervention, and followed at 1, 3, and 6 months. Polytobacco use was defined as smoking cigarettes in addition to past 30 day use of an alternative tobacco product, including cigars, cigarillos or little cigars (LCCs), e-cigarettes, snus, dissolvable, and chewing tobacco, snuff or dip. Logistic regression was used to determine the association between polytobacco use and quit attempts, and 7- and 30-day abstinence. Results from the 3 and 6 month follow-up survey are presented here (n=498). A total of 37.5% of the sample had used any alternative tobacco product in the past 30 days at either the 3 or 6 month follow-up survey, and the products most often used were e-cigarettes (22%) and LCCs (15.3%). Past 30 day users of alternative tobacco product were mostly female (67.7%), ages 25-44 (72%), White, non-Hispanic (46.6%) or Black, non-Hispanic (25.4%), had a high school education (49.1%) or completed some college (28.9%) and were employed (60.6%). Controlling for covariates, both 7- and 30-day abstinence were less likely at the 6 month follow-up in those who had used an alternative tobacco product in the past 30 days at either the 3 or 6 month follow-up (OR 0.27, p=0.01 and OR=0.20, p<0.01, respectively). Past 30 day use of alternative products was associated with a decreased likelihood of staying quit among smokers seeking treatment in an online smoking cessation intervention. Including content that addresses alternative tobacco product use on such sites—along with other resources and support—may improve smoking cessation outcomes in such interventions.

Funding: Legacy.

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POS4-161
EFFECTS OF INDIVIDUAL NICOTINE METABOLISM RATES ON NEUROCognitive EFFECTS OF NICOTINE ABSTINENCE

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Background: Chronic nicotine exposure leads to neurobiological changes, and nicotine withdrawal is associated with a decline in cognitive performance as well as cravings for cigarettes. Faster metabolism of nicotine has been associated with increased risk of relapse among smokers trying to quit. Methods: We examined relationships between individual nicotine metabolite ratio (3'-hydroxy cotinine/ cotinine; NMR) and brain activation during an n-back task assessing working memory performance and a cue reactivity task. Seventy-three treatment-seeking smokers completed these tasks during blood-oxygen-dependent (BOLD) fMRI scanning on two separate occasions: one session while smoking as usual, and one following 24 hours of nicotine abstinence. Results: Fast metabolizers (NMR above the median) displayed less deactivation of default mode network regions (posterior cingulate cortex and ventromedial prefrontal cortex) during the N-back task in abstinence compared to the smoking session, but showed no significant decrement in performance. In contrast, slow metabolizers (NMR below the median) displayed less activation in task-positive regions (bilateral DLPFC) in

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abstinence versus smoking, as well as abstinence-induced performance deficits. During the cue task, there were significant NMR by session interactions in the left anterior insula and left midtemporal gyrus: fast metabolizers showed greater BOLD activation in response to smoking cues compared to neutral images during the abstinent session compared to smoking, while in slow metabolizers these regions were more reactive during the smoking session than during abstinence. Conclusions: These data suggest that the neurobiological mechanisms which maintain smoking behavior may be very different in fast and slow metabolizers of nicotine.

This research was supported by NIH grants P50 CA143187 and R01 DA026849 to C.L. M.F. is supported by NIH grant T32 GM008076.

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POS4-162
DEPRESSIVE SYMPTOMS AND SUSCEPTIBILITY TO SMOKING AND SPIT TOBACCO USE AMONG RURAL AND SUBURBAN ADOLESCENTS

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Background: Depression plays an important role and cigarette smoking behavior in adolescence; although the direction of causality remains unclear. Despite a well-established literature on the co-occurrence of smoking and depression in adults, there is less information addressing this association among adolescents, particularly among rural youth who use spit tobacco and may experience greater tobacco and mental health-related disparities. Methods: Using logistic regression analyses, the current study examined factors associated with depressive symptoms and investigated whether depressive symptoms were associated with susceptibility to smoking and quit smoking use, while controlling for demographic and risk factors. Tenth-grade non-smokers (N=1082) and non-spit tobacco (N=1116) users, who were part of a baseline sample of a clinical trial evaluating an interactive, multimedia smoking and spit tobacco curriculum (Project CURBING) for low-SES rural and suburban adolescents were included in the study. Results: The sample contained 515 non-depressed participants and 591 depressed respondents. Rural and children of married parents were significantly less likely to be depressed; while, older adolescents, females, and those with a greater number of detentions were significantly more likely to be depressed. Hispanic background, number of out-of school suspensions, low decisional balance, best friend smoking, and having seen messages promoting smoking in movies were predictors of smoking susceptibility. After correcting for other covariates, depressed status was a significant predictor of smoking susceptibility (t (718) = 1.86, p = .063). Conclusions: Given that over 50% of the sample reported to depressive symptoms, these results have important implications for prevention efforts to decrease tobacco use initiation among underserved rural and suburban populations.

This study was funded by the National Cancer Institute (grant 5R01 CA081934-09 awarded to A.V. Prokhorov).

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POS4-163
PAIN IS ASSOCIATED WITH INCREASED SMOKING IN CANCER PATIENTS WHO TRY TO QUIT SMOKING

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Background: There is emerging evidence that smokers are motivated to smoke in order to help manage their pain. However, little research has examined the role of pain in smoking among smokers trying to quit. This daily diary study examined how pain influenced daily cigarette use among 35 cancer patients with pain enrolled in the Tobacco Treatment Program (TTP), a comprehensive smoking cessation program offered at MD Anderson. Methods: Daily diary assessments were collected at the end of each day for a 2-week period, beginning at the time of enrollment in the smoking cessation program. Participants entered responses into a handheld computer device. Pain experienced throughout the day was measured on a scale from 1 to 5, from “no pain” to “pain as bad as you can imagine.” Smoking was defined as the number of cigarettes smoked throughout the day. Results: Participants had an average age of 53 (SD=10.3). Cancer type for the 35 participants was as follows: breast (32%), head and neck (32%), thoracic (28%), and lung (8%). Linear multilevel modeling was used in analysis of data. The dependent variable was the number of cigarettes smoked each day. Greater pain intensity predicted increased smoking behavior, in a model with only pain as a predictor (F [1, 190]=6.5, p=.01). The association between pain and smoking remained significant (F [1, 188]=5.32, p=.02) even after controlling for overall smoking abstinence status. Conclusions: This study found that greater self-reported daily pain was associated with greater daily cigarette use among cancer patients enrolled in a smoking cessation program. This relation remained significant even when controlling for overall abstinence status. These findings add to a growing literature on pain and smoking by providing initial evidence that pain may inhibit quitting among cancer patients who smoke and have pain. Future research examining the effectiveness of integrated pain and smoking treatment in this population may be warranted.

This research was supported by a cancer prevention fellowship for C. Aigner, supported by the National Cancer Institute grant R25ST 257730, S. Chang-Pi, and by the National Institutes of Health MD Anderson Cancer Center Support Grant CA016672. This study was also funded by the R03CA139914-01 grant awarded by the National Cancer Institute, C. Lam-Pi.

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POS4-164
DEMOGRAPHICS OF SMOKERS SEEKING CESSATION VERSUS NON-CESSATION STUDIES

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INTRODUCTION: The Tobacco Research Programs at the University of Minnesota recruits subjects for multiple tobacco related studies. The goal of this study is to compare smokers interested in enrolling in a cessation vs. non-cessation trial. METHODS: Telephone screening data collected from two studies were examined; one study recruited subjects interested in using a very low nicotine content cigarette as an aide to cessation and the other study assessed the role of a chemoprevention agent in smokers continuing to smoke. Potential subjects called in response to advertisements and were asked questions to determine eligibility prior to study participation. Demographics, tobacco, alcohol and medication use, medical and psychiatric history, and motivation to quit were compared between smokers seeking cessation and non-cessation studies. RESULTS: Quitting Study (QS) callers (N=772) and Non-Cessation Study (NC) callers (N=589) were different on several variables. Smokers interested in quitting were older (mean age 43.7 +/- 13.1 vs 40.2 +/- 11.6, p<.001) and had smoked for a greater number of years (27.0 years +/- 13.0 vs 25.6 +/- 12.4, p= .05), respectively. In addition, the QS callers reported greater use of one or more medications than the NC group (p<.001). Lifetime use of psychiatric medications were reported by more of the QS than the NC group (p<.01). Males were more likely to participate in a NC study (p<.001). The two groups were not different on number of cigarettes smoked per day, overall health score (a scale of 0-10 with 10 being the "best your health has been") or frequency and quantity of alcohol use. Rate of menthol cigarette smokers was also similar (QS=37%; NC=38%). As expected, motivation to quit
POS4-165
FORENSIC ANALYSIS OF ONLINE MARKETING OF ELECTRONIC CIGARETTES
INTRODUCTION: Marketing of electronic cigarettes (e-cigs) by making therapeutic claims remains illegal in the US. We sought to describe complex networks of online e-cig marketing and to examine the connections between online advertisers of e-cig products (“affiliates”) and companies that sell the devices (“sellers”). METHODS: To identify online e-cig sellers, four keywords were entered into Google search and the first two pages of results were examined. Eligible webpages were archived and coded by two researchers. Coding included age verification, sale of nicotine liquid, therapeutic claims, health or toxicant exposure claims, and availability of an affiliate program. To examine the relationships between affiliates and sellers we manually identified three forms of marketing: SMS/text message, email-based, and banner advertisements. The forensic web proxy software Charles, was used to log an entire browsing session including identifiable objects (eg webpages, source files, servers) and their ties to each other via links, redirection or shared physical resources. The network analysis software ORA was used to graphically examine the relationship between affiliates and sellers. RESULTS: 20 unique e-cig sellers were identified. 6 used an age verification mechanism, all sold nicotine liquid, 4 made explicit therapeutic claims, 11 made health/toxicant exposure claims, and 12 offered an affiliate program. Forensic analysis of 4 ads revealed a multi-level relationship between consumers who received advertising and the seller, with logs demonstrating multiple layers of redirection. Textual analysis of advertising by these marketers, but not their linked sellers, included both misleading health and therapeutic claims. DISCUSSION: Misleading marketing claims are present on both affiliate advertisements and the websites of some e-cig sellers. Forensic analysis demonstrates that e-cig sellers also may be using a shadow network to distance potentially illegal marketing efforts from legal sales. These mechanisms, often used to market other unregulated health products, may attenuate efforts to regulate the health claims of nicotine based products. No funding.
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POS4-166
COMMUNITY GUIDE SYSTEMATIC REVIEW ON THE EFFECTIVENESS OF SMOKE-FREE POLICIES IN REDUCING TOBACCO USE AND EXPOSURES TO SECONDHAND SMOKE: AN UPDATE
Background: Exposure to secondhand smoke (SHS) and tobacco use are linked to disease and premature death. The adoption of smoke-free policies, which prohibit smoking in indoor spaces and designated public areas, was previously recommended in 2005 by the Community Preventive Services Task Force. Our objective was to conduct an updated Community Guide (CG) systematic review on the effectiveness of smoke-free policies in reducing SHS exposure, tobacco use, and tobacco related morbidity and mortality. Methods: An existing systematic review (Callinan, 2010) with 50 studies, along with a supplemental updated literature search (search period January 2000-December 2011), was used to update the available evidence and examine additional outcomes. Systematic review methods developed for the CG were used to identify and abstract qualitative studies. Results: The updated CG search identified 82 studies and found a median relative reduction of -50% (Interquartile interval (IQI): -79% to -12%) in biomarkers indicating recent SHS exposure, including salivary and urinary cotinine. Indoor air pollution (primarily particulate matter) levels decreased by -88% (IQI: -95% to -81%). For tobacco use outcomes, a median absolute reduction of -2.7 pcts. (IQI: -4.7 to -1.5 pcts.) was found for population-level cigarette smoking prevalence (including worksites), while a decrease in cigarette consumption of -1.2 cigarettes/day (range: -3.6 to 0 cigs/day) was found among current smokers. Tobacco use cessation among current smokers increased by 3.8 pcts. (range: 2 to 17.4 pcts.), and a decrease in youth smoking prevalence was also observed (median OR: 0.85, IQI: 0.68 to 0.93). In addition, a -5.1% (IQI: -11.6% to -2.2%) median relative reduction in hospital admissions for cardiovascular events was observed. Smoke-free policies also showed promising results in venues such as multifunit housing and substance abuse facilities. Conclusions: Based on Community Guide criteria, there is strong evidence of effectiveness that smoke-free policies are effective in reducing exposure to SHS, reducing tobacco use among adults and youth, and improving health outcomes in various settings.
The Oak Ridge Institute for Science and Education funded the fellowship.
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POS4-167
CROSS-SECTIONAL STUDY IN THE EFFECT OF SMOKING ON THE PERIIMPLANT MICROBIAL ECOLOGY
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Objective: Smoking has been shown in many studies to be a factor associated with periodontal disease and periimplantitis. However, the data is unclear how smoking involves in the bacterial-induced inflammatory responses. In this study, 16S rRNA-based PCR assay has been used for detection of putative pathogens, including Porphyromonas gingivalis (Pg), Prevotella intermedia (Pi), Treponema denticola (Td), and Tannerella forsythia. Correlation with healthy periimplant sulci of smokers or nonsmokers. Methods: Patients of Faculty of Dentistry, Chulalongkorn University, or the Police Hospital, Thailand were randomly selected based on the criteria; having 1-3 implant-supported crowns for more than 1 year; exposure to more than 5 pack year or more smoking; no visible infection or inflammation; negative for uncontrolled systemic diseases, pregnancy, or using antibiotics within the past 3 months. Sterile paper points were used for subgingival samples collection and DNA was extracted using PowerBiofilm™ DNA Isolation Kit (MO BIO Laboratories, USA). and qPCR and quantitative PCR were performed to identify Pg, Pi, Td, Tf, and bacterial DNA. Results: The mean ages of smokers (n = 6), and nonsmokers (n = 7) were 49.8±38.21 and 55.7±11.61 years. The average years of implant installation in smokers and nonsmokers were 7.18±3.68 and 5.17±3.69, respectively. Implant sites appeared healthy and sulci were approximately 3 to 4 mm. Pi and Td were found in 75% and 100% in samples were shown by endpoint PCR. Some smokers, 50%, 66.7%, 33%, or 83.33%, and nonsmokers, 42.86%, 14.29%, 14.29%, or 83.33%, were detected with Pg, Pi, Td, or Tf, respectively. The prevalence of Td in smokers was significantly higher than that in non-smokers by Fisher’s exact test analysis (p<0.05). Consistently, quantitative PCR showed the ratio of Td to total bacteria were higher in smokers when compared to nonsmokers. Conclusion: The prevalence of periodontal pathogenic bacteria was higher in smokers than non-smokers with statistical significantly difference in Td. These results suggested smoking as a strong influence to the microbial ecology of the dental implant and its success. No funding.
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POS4-168
EXERCISE AS AN ADJUNCT TO STANDARD TREATMENT FOR SEDENTARY FEMALE SMOKERS: SHORT- AND LONG-TERM CESSATION OUTCOMES

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Background: When added to NRT and brief cessation counseling engagement in aerobic exercise 2-3 times a week can enhance both short- and long-term smoking cessation. However, adherence to exercise programs among smokers has been poor. The aims of this study were to: 1) Examine whether cognitive-behavioral exercise adherence counseling (CBC) added to a prescribed exercise program (EP); and 2) exercise supervision level, i.e. facility-based (FB) vs. home-based (HB) exercise, affects short-term (12 weeks post-cessation) and long-term (1 year post-cessation) outcomes. Methods: Three hundred sedentary female smokers were randomly assigned to one of four conditions: HB + CBC, FB + CBC, HB+EP, or FB+EP. All women were provided with 12-weeks of brief smoking cessation counseling and NRT (nicotine patch). The aerobic exercise program consisted of moderate-intensity exercise (walking/stationary bike) 3 times/week for 13 weeks (3 weeks prior to the quit day and 12 weeks after). Biochemically verified prolonged smoking abstinence was assessed at the end of treatment (EOT) and 12 months follow-up (EOF). Results: Participants were predominantly White (71.0%) and 25.3% were married. Majority (81.3%) had at least some college education. Mean age was 40.2 (10.1) and the mean daily cigarette consumption was 16.9 (7.3). One-third (32.3%) of the participants reported ‘time to first cigarette’ being less than 5 minutes. Consistent with previous research, the smoking relapse curve was steep with only 63.0% abstinent by the end of the first week. At the EOT the abstinence rate was 29.8. The FB + CBC group reported the highest physical activity and had the highest abstinence rate (38.2%). At the EOF the overall abstinence rate 9.0%. It was he highest in the FB + EP (13.1%) and lowest in the HB + EP (4.8%) group. Conclusions: Our results suggest that even with a multifaceted program created to enhance adherence to intervention and facilitate cessation, both the short- and long-term relapse rates are high. The challenge remains how to address smoking behavior and cessation among the high risk populations such as sedentary smoking women.

Funding: NIDA 12503 - Kinnunen.

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POS4-170
INTENSIVE GROUP INTERVENTION IN SMOokers WITH AND WITHOUT A HISTORY OF PSYCHIATRIC ILLNESS: EVALUATION OF 5 YEARS EXPERIENCE IN PRIMARY CARE

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Background. A high proportion of those seeking help to quit smoking suffers psychiatric disorders. The results of a descriptive longitudinal study with a one-year follow-up are presented and its effectiveness in those patients previously diagnosed with a psychiatric condition is evaluated. Methods. Twenty smoking cessation groups were conducted between 2006 and 2011 in a Primary Care Unit. A total of 267 smokers (57.3% female, 42.7% male) were treated. They participated in five 90 minutes-sessions, with a subsequent telephone follow-up at one year. Abstinence was verified by cooximetry at the end of sessions (6 weeks of abstinence) and self-declared afterwards. Ninety seven of them either had been previously diagnosed with a psychiatric disorder or had been prescribed an antidepressant or an anxiolytic drug for at least six months during the previous three years. Whereas 49.0% of women had history of psychiatric disorder (as defined), only 19.3% of men had (p=0.001). Results. The point prevalence abstinence rate at 12 months was 39.0%. Although it was higher in women than in men (43.8% vs. 28.6%), differences were not significant (OR:1.34, p.o.26). Smokers with no history of psychiatric illness showed higher abstinence rates (44.1% vs. 35.1%), but differences were not significant (OR:1.46, p.o.16). An analysis of when relapses happened shows that: a) smokers with a previous psychiatric history relapsed significantly more during the first six weeks (i.e., between the day they quit and the end of the treatment groups) (39.2% vs. 25.3, OR=1.90, LC95:1.08-3.36, p:0.019); b) its relapse rate between weeks 6-52 was similar to the one of patients without history of psychiatric disorder (42.4% vs. 40.9%, OR:1.06, p.o.87). Conclusions. Males and females from our sample differ in some of their characteristics. Although smokers with a previous psychiatric condition may find more difficult to achieve abstinence, they can nevertheless quit. Since they tend to relapse more during the first six weeks, they might benefit from a more intensive intervention during that period.

No funding.

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POS4-169
ANALYZING COMPLIANCE OF CIGARETTE PACKAGING WITH THE FCTC AND NATIONAL LEGISLATION IN EIGHT FORMER SOVIET UNION COUNTRIES

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Introduction: Rates of smoking in countries of the former Soviet Union (FSU) are among the highest in the world. Tobacco control measures were virtually nonexistent in the Soviet era and after the collapse of the Soviet Union, transnational tobacco companies actively obstructed progress in tobacco control. There has been some progress in the past decade; however implementation of tobacco control policies remains a major challenge. The aim of this study is to analyse compliance of labelling on cigarette packets with the FCTC and national legislation in eight former Soviet Union countries. Methods: As a part of the Health in Times of Transition (HITT) study, nationally representative household surveys in Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Moldova, Russia and Ukraine were performed with samples of between 1800 and 3000 respondents in each country. Smokers were asked to report which brands they consumed and the 10 most commonly consumed brands were collected from these eight countries. A total of 80 packets were collected and analyzed using a structured data collection tool; duplicate packets were excluded (one in Armenia). Results: Health warnings were on all packets from all countries and met the FCTC minimum recommendations on size and position except Azerbaijan and Georgia. All countries used a variety of warnings except Azerbaijan. No country had pictorial health warnings, despite them being mandatory in Georgia and Moldova. Deceptive labels were present in 57% of packets analyzed with an average of 2.4 labels per pack. All of the countries had deceptive labels despite being banned in all countries except Russia and Azerbaijan where still no such legislation exists. Conclusion: All of the countries were close to meeting the FCTC minimum recommendations and national legislation on health warning labelling, with the exception of Azerbaijan. However, gaps remain with respect to compliance of legislation and pack assessment, which should include pictorial warnings that have rotating messages in the main language of the country. Deceptive labelling remains an even greater challenge and should be a policy priority.

European Union’s 7th Framework Program; project HEALTH-F2-2009-223344.

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POS4-171
CIgARETTE BRAND AND SUB-BRAND PREFERENCES AMONG U.S. YOUNG ADULTS, 2011

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Background: Tobacco companies spend billions to cultivate brand allegiance and obtain market share. While 2009 data showed market shares of 39.9% for Marlboro, 9.9% Newport and 6.4% Camel, many sub-brands are marketed to younger smokers (e.g. Camel has 19 sub-brands). Details of brand/sub-brand preference among young adult smokers have not been recently described.
Objective: To determine cigarette brand preferences among young adult cigarette users in the US. Methods: A representative sample of 1834 U.S. 18-23 year olds was recruited via RDD from landline and cell phone frames in winter 2010/11. Ever-smokers were asked about usual brand smoked, with sub-brand detail for the 3 above brands. Frequency and quantity of smoking was also asked. Results: Of 1834 subjects, 54.5% had ever tried smoking. Of ever-smokers, 47.6% (n=475) were current smokers (past 30 days), and of current smokers 52% smoked daily (n=247). Marlboro, Camel and Newport brands predominated as ‘most often smoked’ among both non-daily and daily smokers, with 46% of non-daily smokers choosing Marlboro brands, 23.1% Camel and 13.2% Newport. Some 7.9% of non-daily smokers reported no usual brand, and an additional 4% ‘did not know’ their usual brand. For daily smokers, 47% smoked Marlboro brands, 15% Camels, and 21.4% Newport. No daily smokers reported not having a usual brand. Some 40% of current Marlboro smokers usually smoked a menthol sub-brand, as did 53.5% of Camel smokers. Among current smokers of any brand, 48% smoked menthol and 30% non-menthol (22% not specified). In separate multivariate regression analyses, usual brand of cigarette was not associated with daily smoking (versus non-daily smoking), nor intensity of smoking. Conclusions: A vast majority of young adult smokers continue to smoke the 3 most heavily advertised cigarette brands, and many smoke Marlboro and Camel menthol sub-brands. Brand choice does not appear related to smoking intensity. Given that marketing of cigarette brands is now under FDA oversight, it will be prudent to monitor changes in brand preferences in response to any restrictions imposed under the Family Smoking Prevention and Tobacco Control Act.

Funding from grant support, NCI: R01-CA077026.

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