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Electronic Nicotine Delivery Systems (ENDS) or electronic-cigarettes (ECIGS), which deliver nicotine in vapor form are rapidly gaining popularity and are perceived as a safer alternative to cigarette use. In order to understand the public health impact of ECIGS it is imperative that we develop a better understanding of population-wide use patterns, perceptions regarding use, and the abuse liability of this nicotine delivery system. This symposium will provide an overview of existing and emerging, quantitative and qualitative evidence on ECIGS. Dr. Thomas Eisenberg will present data on the acute effects of ECIGS in adults, with a specific focus on individual variability in puff topography and nicotine delivery. Dr. Erin Sutfin will present evidence on trends in ECIGS use over time in a large young adult sample, with a specific focus on demographics of users and non-users, as well as reasons for use. Dr. Krishnan-Sarin will present data on use patterns in middle and high school students, and qualitative perceptions regarding use in middle and high school students and college-aged young adults. Dr. Chris Bullen will present an overview of the current evidence for the use of e-cigarettes to assist adult smokers with cessation, with a specific focus on surveys of users, population monitors, clinical studies of withdrawal and evidence from two recent randomized trials. The discussant, Dr. Dorothy Hatsuaki will provide a summary of the current state of knowledge regarding ECIGS and importantly lead a discussion on future directions for research.

JUSTIFICATION: This symposium will use multiple disciplines including experimental and clinical trial research in adults, and survey and focus group research in young adults and adolescents, to understand the current state of knowledge about electronic cigarettes.

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SYM1A
ACUTE EFFECTS OF ELECTRONIC CIGARETTES IN ADULTS: NICOTINE DELIVERY AND ABUSE LIABILITY

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"Electronic cigarettes" (ECIGs) heat a nicotine-containing solution to produce vapor for inhalation. However, little is known regarding the acute effects of the inhaled vapor, including its ability to deliver nicotine, suppress tobacco abstinence effects, and support continued use/abuse. This presentation provides a state-of-the-science overview of extant data on the acute effects of ECIG across a variety of populations and methods. Particular reference will be made to factors influencing between-subject and cross-study variability in nicotine delivery. For example, in Vansickel & Eisenberg (2013) experienced ECIG users evidenced substantial nicotine delivery, on average, during a laboratory session. However, inspection of the individual data show that some of these users experienced only negligible nicotine delivery. Similar variability is apparent when the individual data are inspected in related work (e.g., Dawkins & Corcoran, 2013). In addition, because previous reports indicate that the puff topography of experienced ECIG users differs significantly from that of cigarette smokers (e.g., double the puff duration; Farsalinos et al., 2013), and that puff duration influences vapor nicotine content (Shihadeh et al., 2013) preliminary results will be presented from the first study of experienced ECIG users that included detailed analysis of puff topography, including critical variables such as puff volume and flow rate during each puff. Data directly relevant to the abuse liability of ECIGs will also be discussed. The presentation will conclude with future directions for research as well as the public health implications of results as they stand today.

FUNDING: This work was supported by USPHS grant P50DA0386105

JUSTIFICATION: The rapid spread and growing prevalence of electronic cigarettes worldwide demands a science-based response, including details of nicotine delivery and abuse liability, that can inform practice and policy.

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SYM1B
ELECTRONIC CIGARETTE USE OVER TIME BY COLLEGE STUDENTS

Erin L. Sutfin, Ph.D.*, Beth A. Reboushdin, Ph.D.; Cynthia Suerken, M.S., Kimberly Wagoner, Dr.P.H., M.P.H., John Spangler, M.D., M.P.H., and Mark Wolfson, Ph.D. Wake Forest School of Medicine

Background: Electronic cigarettes, or e-cigarettes, deliver nicotine in vapor form, eliminating the combustion of conventional cigarettes. While extant evidence suggests electronic cigarettes pose fewer health risks than conventional cigarettes for the individual user, population-level effects must also be considered. Critical to an understanding of the public health impact is the extent to which e-cigarettes are used to quit smoking or to maintain nicotine addiction by using e-cigarettes in places where smoking is not allowed. The goal of this study was to assess trends in e-cigarette use over time, including use a quit aid and dual use with cigarettes, in a large sample of college students. Method: We recruited a cohort of 3,146 first-semester college students from 11 colleges in NC and VA (64% recruitment rate). Tobacco users and males were oversampled. Students completed online surveys on their tobacco use over 5 consecutive semesters (80% retention rate). Results: Slightly over half of the cohort are males, reflecting our oversampling. Most are White (85.6%) and non-Hispanic (94.3%). Among the full sample, the weighted prevalence of lifetime use increased at a rate of 2.6% in fall 2010 to 9.6% in fall 2012. Among current cigarette smokers (past 30 days), rates of e-cigarette use increased at every wave (14.5% at Wave 1). By the 5th wave, 43% of current cigarette smokers had tried an e-cigarette and 9.6% were dual users (past month use of e-cigarettes and conventional cigarettes). We also assessed e-cigarette use among former cigarette smokers, and found by wave 5, only 16.7% had tried an e-cigarette. Additionally, only 20% of current cigarette smokers reported using an e-cigarette as a quit aid. Conclusions: Rates of lifetime use of electronic cigarettes by the 5th wave of data collection were higher in this sample of college students than have been reported in other studies, including national studies. These results suggest that e-cigarette use is more common among current than former smokers, and e-cigarettes are not commonly used as a quit aid by this population.

FUNDING: Research reported in this abstract was supported by National Institutes of Health under Award Number R01CA141643.

JUSTIFICATION: This paper will provide much-needed data on young adults’ patterns of electronic cigarette use, including dual use and use as a quit aid, to help determine the public health impact of electronic cigarettes and inform policy and practice.

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SYM1C
ELECTRONIC CIGARETTE USE: PERCEPTIONS AND USE PATTERNS AMONG MIDDLE AND HIGH SCHOOL YOUTH AND YOUNG ADULTS

Suchitra Krishnan-Sarin, Ph.D.*; Grace Kong, Ph.D., Deepa Camenga, M.D., Dana Cavallo, Ph.D., and Meghan Morean, Ph.D. Yale University School of Medicine

Electronic-cigarettes (ECIGS), which deliver nicotine in vapor form are rapidly gaining popularity among younger smokers and there is concern that experimentation with these nicotine delivery devices will lead to nicotine addiction, continued use of ECIGS and other tobacco products. It is critical to develop a better understanding of perceptions regarding use, and use patterns among these high risk smokers. We examined perceptions regarding ECIG use among...
adolescents between the ages of 12 and 17 and young adults between the ages of 18 and 25. For this we completed 18 focus groups with 139 middle and high school-aged adolescents and college-aged young adults, grouped by smoking status and gender. Results suggest that all groups were familiar with ECIGS and reported social influences as the primary reason for initiation. Participants said that the appeal of ECIGS was related to flavors, ease of access, and lack of restrictions on use. Deterrents to use included cost, unknown health risks, similarity to a cigarette, and parental disapproval. Those who smoked cigarettes and had tried ECIGS reported that they were not as satisfying as cigarettes. With regards to prevalence rates, earlier evidence indicated that the prevalence of past 30 day ECIG use among high school smokers increased from 0.9% in February, 2010 to 2.3% in June, 2011 (Camenga et al., 2013). Surveys are evaluating current use patterns among middle and high schools and colleges. Recent evidence collected in May, 2013 from two CT high schools indicates a further increase in rates; specifically, of 1486 students (females: 48%, age: M=16.1, SD=1.2), 85.4% were aware of e-cigarettes, 13.4% have ever tried it, 6.7% have used it in the past 30 days. Of those who reported using e-cigarettes in the past 30 days, average days of use was 9.61 (SD = 11.01). Of those who have never tried an e-cigarette, 3.4% reported intention to use. E-cigarette use rates differed by smoking status and gender; non-smokers had the lowest and current smokers had the highest rates. This evidence indicates high awareness about ECIGS among youth and continued increases in rates of use.

FUNDING: Research reported in this abstract was supported by National Institutes of Health under Award Number P50DA009241.

JUSTIFICATION: Developing an understanding of perceptions regarding use, and use patterns, of e-cigarettes among youth and young adults is key to developing interventions and policies designed to prevent initiation of use among this young group of smokers.

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SYM1D
DO E-CIGARETTES ASSIST ADULT SMOKERS TO QUIT? AN OVERVIEW OF THE EVIDENCE

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Since e-cigarettes first became widely available in 2004, the question of their effectiveness at assisting people to quit smoking has been of considerable interest to smokers, healthcare providers, policymakers, and researchers alike. While there has been a large amount of supportive anecdotal evidence from smokers who have abstained from smoking since using e-cigarettes, relatively little objective research addressing the issue of cessation efficacy has been undertaken. Relevant studies have included e-cigarette user and smoker surveys, in-depth interviews with users, and trials of the effects of e-cigarettes on withdrawal and craving, and on nicotine delivery. These have pointed to potential for e-cigarettes as a means to assist in smoking cessation. To date, two randomized controlled trials on the use of e-cigarettes in cessation have been published. In one trial conducted among 300 smokers unwilling to quit, nicotine e-cigarettes were compared to placebo e-cigarettes over a 12 month period with cessation and smoking reduction endpoints; in the other cessation trial, 657 smokers wanting to quit were randomised to 13 weeks of nicotine e-cigarettes, placebo e-cigarettes, or nicotine patches and followed over 6 months from their quit date. Results from both studies showed modest quit rates, comparable with those of nicotine replacement therapy when used with minimal behavioural support. Both also found moderate reductions in cigarette consumption. In both trials nicotine delivery was low and devices were unreliable. In this paper we discuss the role of e-cigarettes in smoking cessation drawing on the findings from these studies. Study strengths, limitations, and implications will be considered, in particular in regard to study designs and conduct, including choice of study population, selection of interventional products (e.g., ability of the interventional device to deliver nicotine reliably and efficiently), the type and intensity of behavioral support provided, and other methodological challenges and considerations such as greater attrition in the control group, length of follow-up, and verification of abstinence.

FUNDING: This study was conducted while the first author was employed by The University of Auckland. Funding for the ASCEND trial, on which much of this paper draws, was through a project grant (HRC 10/243) from the Health Research Council of New Zealand.

JUSTIFICATION: The findings will be highly pertinent to current debates on policy and regulatory development and in clinical practice regarding e-cigarettes.

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SYM2
THE SCIENCE OF TOBACCO WITHDRAWAL: TRANSLATING ACROSS PRE-CLINICAL, HUMAN LABORATORY, CLINICAL, AND, EPIDEMIOLOGIC RESEARCH PERSPECTIVES

Chair: Adam M. Leventhal, Ph.D., University of Southern California
Presenters: Andre Der-Avakian, Ph.D., University of California San Diego; Peter S. Hendricks, Ph.D., University of Alabama at Birmingham; Andrea H. Weinberger, Ph.D., Yale University School of Medicine; and Adam M. Leventhal, Ph.D.
Discussant: David G. Gilbert, Ph.D., Southern Illinois University

Tobacco withdrawal—the constellation of symptoms and signs that occurs upon discontinuation of chronic tobacco use—is central to theories of tobacco addiction motivation and is a key target in smoking cessation treatment. New advances in the science of tobacco withdrawal are emerging within a diverse variety of disciplines. However, the failure to integrate across disparate scientific perspectives has limited the translation potential of tobacco withdrawal research, with regard to forward translation from basic knowledge to clinical and population-level applications as well as back translation from clinical and population science to basic knowledge. The focus of this symposium is to integrate and discuss new research on tobacco withdrawal by translating across several scientific perspectives: (a) pre-clinical animal models; (b) human laboratory studies; (c) clinical research; and (d) epidemiologic surveys. Collectively, this symposium will present novel research on withdrawal’s underlying mechanisms, phenotypic variations, impact on smoking behavior, and distribution in the population. The session will begin with the chair briefly reviewing the withdrawal concept and its significance for nicotine and tobacco research. Then, Dr. Der-Avakian will present data from a preclinical study demonstrating that diminished reward responsiveness reflects a valid phenotypic expression of nicotine withdrawal in rats that can be reversed via nicotine administration. Dr. Leventhal will present data from a human laboratory study of pharmacologic, cognitive-expectancy, and sensorimotor influences on expressions of tobacco withdrawal and smoking behavior during acute smoking abstinence. Dr. Hendricks will present data from a clinical study that carefully characterized tobacco withdrawal manifestations in the first 4-hr of abstinence and their prediction of cessation outcomes. Dr. Weinberger will present data on the distribution of withdrawal symptoms across demographic strata from a population-based epidemiologic study of U.S. adults. Finally, Dr. Gilbert will summarize and integrate the four presentations and lead a discussion with a view toward forward and back translation.

JUSTIFICATION: This interdisciplinary symposium will discuss tobacco withdrawal research, with regard to forward translation from basic knowledge to clinical and population-level applications as well as back translation from clinical and population science to basic knowledge

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SYM2A

DYSREGULATION OF REWARD RESPONSIVENESS DURING NICOTINE WITHDRAWAL AND RE-EXPOSURE IN RATS USING A TRANSLATIONAL TASK

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Abstinence from smoking is associated with depression-like symptoms, including deficits in reward processing, which are hypothesized to play an important role in relapse. Reward responsiveness (i.e., the ability to modulate behavior as a function of reinforcement history) is disrupted in major depressive disorder. We determined whether reward responsiveness was affected during nicotine withdrawal and subsequent nicotine re-exposure in male Wistar rats using a novel behavioral task that was recently developed to be analogous to an objective clinical assessment of reward responsiveness. Withdrawal from chronic nicotine (6.32 mg/kg/day, base; sc; 28 days; n=19), but not saline (n=20), administration diminished reward responsiveness. Two to eight weeks after termination of chronic nicotine, acute nicotine administration (0, 0.125, 0.25, 0.5 mg/kg, base; sc; ad lib) in each phase dose-dependently increased reward responsiveness. Conversely, acute nicotine administration in previously saline-treated rats dose-dependently decreased reward responsiveness. These results suggest that chronic nicotine exposure induces a long-lasting dysregulation of the processing of natural rewards. The disruption of reward responsiveness during immediate withdrawal may contribute to the depression-like state associated with withdrawal, while the nicotine-induced enhancement of reward responsiveness after withdrawal may contribute to relapse to tobacco smoking in order to re-constitute responsiveness to natural rewards. Thus, treatment of deficits in reward responsiveness in abstinent smokers may facilitate smoking cessation.


JUSTIFICATION: The use of the behavioral reward responsiveness task that is analogous between humans and rats adds strong translational value to the present preclinical studies that attempt to promote the development of affective clinical treatments for the negative emotional effects of nicotine withdrawal.

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SYM2B

PHARMACOLOGICAL, EXPECTANCY, AND SENSORIMOTOR INFLUENCES ON TOBACCO WITHDRAWAL

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BACKGROUND: Three key changes ensue upon smoking abstinence: (1) pharmacological—disruptions of biological homeostasis caused by nicotine removal; (2) expectancy—activation of beliefs about the effects of stopping smoking; and (3) sensorimotor—elimination of the smoking ritual. This single-day experiment used a novel design that is the first to simultaneously manipulate each of these factors in a single study, which allowed us to isolate the effects of each factor on withdrawal symptoms and signs while holding the other two factors constant. METHOD: After 12-hr of abstinence, 36 daily smokers (n=4 per cell) were subjected to 3 simultaneous manipulations in a 2×2×2 fully-crossed between-subjects design: (1) Pharmacological (Receive 21mg nicotine vs. placebo transdermal patch); (2) Expectancy (Told patch has nicotine vs. told placebo); and (3) Sensorimotor (Smoking a denicotinized cigarette every 60-min [subjects told cigarettes contained no nicotine] vs. no smoking). Subjects completed physiological assessments, subjective measures, and a behavioral task. In the task, subjects could earn money for each 5-min increment they delayed initiating smoking their preferred brand of cigarettes and then could purchase individual preferred brand cigarettes. RESULTS: Nicotine (vs. placebo) reduced negative affect, anhedonia, and urge to smoke, and increased positive affect, heart rate, and systolic blood pressure. Nicotine did not impact smoking task performance. Being told the patch had nicotine (vs. placebo) increased latency to smoking preferred cigarettes but did not affect other outcomes. Smoking denicotinized cigarettes (vs. no smoking) reduced urge, increased latency to smoking preferred brand cigarettes, and reduced number of preferred brand cigarettes purchased.

CONCLUSION: The pharmacological manipulation affected the widest array of withdrawal manifestations; yet, each factor impacted some component of withdrawal. Pharmacological, expectancy, and sensorimotor mechanisms may differentially affect expression of the withdrawal phenotype, which is critical for informing the precision and efficacy of pharmacological, cognitive, and behavioral cessation treatment approaches.

FUNDING: This research was supported by National Institute on Drug Abuse Grants R01-DA028831 and K08-DA025041

JUSTIFICATION: The identification of mechanisms underlying tobacco withdrawal can inform which treatment approaches may offset particular components of withdrawal that may interfere with cessation success.

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SYM2C

THE CLINICAL SIGNIFICANCE OF EARLY SMOKING WITHDRAWAL EFFECTS AND THEIR RELATIONSHIPS WITH THE RATE OF NICOTINE METABOLISM

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Introduction: Though the early time course of smoking withdrawal effects has been characterized, the clinical significance of early withdrawal symptoms (e.g., their relationships with quit attempt outcomes) and their predictors are unknown. The current pilot study examined the relationships of early smoking withdrawal effects with quit attempt outcomes as well as a leading candidate predictor, the rate of nicotine metabolism. Method: 11 treatment-seeking smokers abstained from smoking for 4 hours, preceding a quit attempt. Withdrawal measures included resting heart rate, sustained attention (the Rapid Visual Information Process Task), and self-report (the Wisconsin Smoking Withdrawal Scale). Following baseline assessment, withdrawal measures were administered every 30 minutes. At the end of the 4-hour session, participants were provided a brief smoking cessation treatment. Participants returned 1 week and 12 weeks post-treatment for outcome assessments that included biochemically confirmed smoking abstinence, cigarettes smoked in the past 24 hours, and self-reported withdrawal symptoms.

The rate of nicotine metabolism was estimated at intake using the nicotine metabolite ratio (trans-3'-hydroxycotinine/cotinine) measured in saliva. Results: Greater self-reported negative affect and craving during early withdrawal were strongly related with poorer quit attempt outcomes, including lower likelihoods of abstinence; poorer sustained attention during early withdrawal was associated with more favorable quit attempt outcomes, including increased odds of abstinence; and decreased heart rate during early withdrawal was a risk factor for some longer-term withdrawal symptoms, but a protective factor for others. Faster nicotine metabolism was related to greater anxiety during early withdrawal, but less craving and hunger. Conclusions: Early smoking withdrawal effects may hold clinical significance and the rate of nicotine metabolism may be a useful predictor of early withdrawal symptoms. Additional study is required to better understand complex relationships. The implications of these findings are discussed.

FUNDING: Funding for this study was provided by the National Institute on Drug Abuse (K05 DA016752, and P50 DA009253).

JUSTIFICATION: This study shows that very early manifestations of tobacco withdrawal should be targeted in cessation treatment or may be a marker for patients at high risk for relapse.

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14 Symposium

SYM2D
STUDYING WITHDRAWAL SYMPTOMS AND WITHDRAWAL-RELATED QUIT BEHAVIOR USING EPIDEMIOLOGICAL DATA

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Difficulty quitting smoking is associated with withdrawal which is a major target of both behavioral and pharmacological smoking treatments. The majority of research on smoking and withdrawal has come from laboratory and clinical treatment studies. While epidemiologic data collection can produce large samples that allow for subgroup analyses and greater generalizability, questions have been raised regarding the retrospective measurement of withdrawal symptoms. This talk will review past research on withdrawal symptoms using epidemiologic data and discuss advantages and challenges of using epidemiologic data to study the withdrawal syndrome. In addition, novel data from adult U.S. citizens who participated in the NIAAA’s National Epidemiologic Survey on Alcohol and Related Conditions (Wave 1, 2001-2002; Wave 2, 2004-2005) will be presented with a focus on differences in withdrawal and withdrawal-related smoking behavior of subgroups of smokers (e.g., gender, age, race, psychiatric disorders, substance use disorders). Among current smokers (n=1,847), women were more likely than men to report wanting to stop smoking (OR=1.42, 95% CI=1.29 -1.57) and having difficulty quitting (OR=1.17, 95% CI=1.08 - 1.27). Female current smokers were also more likely than men to report experiencing most specific withdrawal symptoms (p<0.001). While these patterns of gender differences remained significant for daily cigarette smokers, female non-daily smokers were more likely to report wanting to quit smoking (OR=1.27, 95% CI=1.03 -1.57) but not that they had more difficulty quitting smoking (p=0.82) than male non-daily smokers. In addition, female non-daily smokers were more likely to endorse just two specific withdrawal symptoms (weight gain, p<0.01; irritability, p<0.05). Significant differences in the report of withdrawal by race, age, and psychiatric diagnoses will also be presented. Epidemiologic datasets can identify subgroups of smokers who are disproportionately impacted by the withdrawal syndrome and who would benefit from targeted treatment and effort.

FUNDING: This work was supported by the National Institute of Drug Abuse at the National Institutes of Health grant P50-DA033945 [ORWH & NIDA; PI:McKee] and the State of Connecticut, Department of Mental Health and Addiction Services.

JUSTIFICATION: The use of epidemiologic data can help to direct research on subgroups of smokers who are more greatly impacted by withdrawal symptoms when attempting to quit smoking in order to develop treatments to improve smoking cessation outcomes.

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SYM3A
NEURAL SUBSTRATES OF AGE-DEPENDENT HIPPOCAMPAL SENSITIVITY TO THE EFFECTS OF NICOTINE ON HIPPOCAMPUS-DEPENDENT LEARNING

Erica D. Holliday and Thomas J. Gould, The Department of Psychology, College of Liberal Arts, Temple University

Adolescence is characterized by increases in impulsivity, risk-taking behaviors, and initiation of tobacco use. Limbic brain regions continue to mature well into adolescence and their perturbation during this developmental window may be associated with development of cognitive and addictive disorders. The hippocampal limbic brain region has distinct expression of nicotinic acetylcholine receptors (nAChRs), which influence contextual but not cued fear conditioning. Thus, our current study assessed the effects of nicotine dose and treatment during this developmental window may be associated with development of cognitive and addictive disorders. The hippocampal limbic brain region has distinct expression of nicotinic acetylcholine receptors (nAChRs), which influence contextual but not cued fear conditioning. Thus, our current study assessed the effects of nicotine dose and treatment duration on hippocampus-dependent learning at different ages. We tested peri-adolescent, adolescent, and adult mice after treatment with acute or chronic nicotine or during nicotine withdrawal. Mechanisms underlying our behavioral findings were assessed through the quantification of nAChR binding, cyclic AMP responsive element-binding protein (CREB) expression and nicotine metabolism across age and treatment groups. We also examined the effects of developmental stress on changes in learning and neural function. Our findings demonstrate that at younger ages, acute and chronic nicotine treatments have cognitive enhancing effects, while chronic low dose nicotine treated peri-adolescent mice exhibit reduced withdrawal deficits. These effects were selective to contextual and not cued fear conditioning, providing evidence for the role of hippocampal nAChRs in modulating the nicotine-facilitated age-dependent behavioral effects. Mechanisms underlying the age-dependent withdrawal effects reveal that limbic brain region CREB expression and the up-regulation of nAChR binding but not nicotine metabolism may be involved. Further, when chronic nicotine treated younger versus adult mice were tested for contextual fear conditioning later in adulthood, only the younger aged nicotine exposed animals exhibited deficits. Developmental stress may contribute to or worsen these deficits. Overall, the results suggest there may be a unique interaction between nicotine exposure and stress exposure during development that contributes to long-term deficits in hippocampal function.

FUNDING: DA017949 TG; DA024787 TG; CA143187 PI: Caryn Lerman PhD.

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SYM3B
NEONATAL NICOTINE EXPOSURE INCREASES EXCITATORY SYNAPTIC TRANSMISSION AND ATTENUATES NICOTINE-STIMULATED GABA RELEASE IN THE ADULT RAT HIPPOCAMPUS

Joanne C. Damborsky, William H. Griffith, and Ursula H. Winzer-Serhan, Department of Neuroscience & Experimental Therapeutics, Texas A&M University System Health Science Center

Developmental exposure to nicotine has been linked to long-lasting changes in synaptic transmission, which may contribute to behavioral abnormalities seen in offspring of women who smoke during pregnancy. Here, we examined the long-lasting effects of developmental nicotine exposure on glutamatergic and GABAergic neurotransmission, and on acute nicotine-induced glutamate and GABA release in the adult hippocampus, a structure important in cognitive and emotional behaviors. We utilized a chronic neonatal nicotine (CNN) treatment model to administer nicotine (6 mg/kg/day) to pups from postnatal day (P) 1-7, a period that corresponds developmentally to the third human trimester. Using whole-cell voltage clamp recordings from CA1 pyramidal neurons in hippocampal slices, we measured evoked and spontaneous excitatory and inhibitory postsynaptic currents in control- and CNN-treated young adult (P60-90) males. Neonatal nicotine exposure significantly increased AMPA receptor-mediated spontaneous and evoked excitatory signaling, with no change in glutamate release probability. Conversely, there was only minimal increase in spontaneous GABAergic neurotransmission in CNN-males. Furthermore, CNN treatment had no effect on nicotine-stimulated glutamate release, but nicotine-stimulated GABA release was significantly attenuated in adults. Thus, neonatal nicotine exposure results in a permanent net increase in excitation and a concurrent decrease in nicotine-facilitated GABA release. This imbalance between excitation and inhibition would be exacerbated following presynaptic nicotinic acetylcholine receptor (nAChR) activation. Our data underscore an important role for nAChRs in hippocampal excitatory synapse development, and suggest selective permanent changes in excitatory activity and at presynaptic nAChRs, which could explain some of the behavioral abnormalities associated with maternal smoking.

FUNDING: Texas A&M Health Science Center Bridge Funding Grant, UWS. NIH # 2-T32-MH085728, J.C.D., and the Texas Brain and Spine Institute Graduate Fellowship, J.C.D.

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SYM3D
DELETION OF ALPHA2* NICOTINIC ACETYLCHOLINE RECEPTORS ELIMINATES THE EFFECTS OF MATERNAL NICOTINE EXPOSURE ON NEURAL CIRCUIT ACTIVITY IN THE HIPPOCAMPAL CA1 REGION OF ADOLESCENT MICE

Sakura Nakauchi, Hailing Su, and Katumi Sumikawa, Neurobiology and Behavior, School of Biological Sciences

Growing evidence implicates the role of developmental cigarette exposure in deficits in the self-regulation of emotional processing, drug addiction, and cognitive impairment. Thus, it is important to identify the mechanisms underlying these psychopathologies. Our recent results demonstrate that deletion of the mouse α2 nicotinic acetylcholine receptor (nAChR) subunit gene (Chrnα2) results in the loss of nicotine-mediated facilitation and suppression of long-term potentiation (LTP) at two major excitatory inputs to hippocampal CA1 pyramidal cells. Furthermore, α2 null mutant mice show potentiated nicotine-modulated behaviors and sexually dimorphic deficits in nicotine-facilitated emotional memory processing. The α2 nAChR subunit is expressed within mouse limbic brain regions, including CA1 oriens/alveus GABAergic interneurons, known to influence the facilitation and suppression of LTP. Thus, we hypothesized that developmental exposure to nicotine through interaction with non-desensitizing α2* nAChRs on GABAergic interneurons modifies the maturation of limbic circuitry through aberrant GABA release. To test this hypothesis, we assessed neural circuit activity by recording optical signal using voltage sensitive dye in the hippocampal CA1 region of animals developmentally exposed to vehicle or nicotine (postnatal days 2-14). Our results demonstrate a significant effect of developmental nicotine exposure on nicotinic and muscarinic cholinergic systems, with differences observed in excitatory neural activity. While the consequences were observed in wild type mice, these effects were absent in α2 null mutant mice. The findings suggest that activation of α2* nAChRs is involved in the mechanisms influencing developmental nicotine-induced changes in excitatory neural activity within the CA1 region of the hippocampus. Because nicotine-induced GABA release onto CA1 pyramidal cells via α2* nAChRs was absent after maternal nicotine exposure, altered GABAergic inhibition is likely involved in the effect. Overall, our results provide a key role for CA1 oriens/alveus GABAergic interneurons expressing α2* nAChRs in the consequences of developmental nicotine exposure.

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SYM3C
PREDICTING BEHAVIOR BASED ON DIFFERENCES IN COORDINATED NEURONAL ACTIVITY IN ADOLESCENT RATS EXPOSED TO NICOTINE

Celina Y. Mojica, Jasmin M. Dao, Sandra E. Loughlin, and Frances M. Leslie, Department of Pharmacology, University of California, Irvine

Adolescence is a time of vulnerability to initiation of tobacco use. Teenage smokers are also more likely to use other types of abused drugs. The findings suggest that nicotine, the main psychoactive component of tobacco, may affect motivational systems to drive poly-drug use. There is evidence in rats that low-dose sub chronic nicotine pretreatment during adolescence affects neurochemistry in limbic regions important for motivated behavior. It is known that limbic regions form networks to control motivated behavior; therefore, the goal of the current study was to examine the effects of nicotine pretreatment on coordinated c-fos mRNA expression, a marker of recent neuronal activation, in the forebrain. Adolescent, postnatal day (P) 28, and adult, P85, rats were pretreated with nicotine (0 or 0.06 mg/kg) intravenously for 4 consecutive days. Subsequently, adolescent and adult rats were habituated to a novel open-field box for 30 min, and locomotion was recorded. Brains were immediately taken after the session and processed by in situ hybridization for the immediate early gene c-fos. Data for each treatment group was analyzed by adapting methodologies used by human brain imaging to create neuronal networks of coordinated changes in c-fos expression. Each treatment network was then statistically compared to determine significant effects of nicotine pretreatment on coordinated c-fos expression. This analysis revealed that nicotine pretreatment during adolescence affected networks involved in detecting metric changes in the environment. To test this hypothesis behaviorally, nicotine and saline pretreated adolescent and adult rats were assessed in a spatial discrimination task. Adolescents rats pretreated with nicotine were more sensitive to metric changes in their environment compared to both saline pretreated adolescents and their adult counter parts. To confirm this effect was not due to novelty, pretreated adolescent and adult rats were tested in a novel object discrimination task. No effects of age or pretreatment were seen, suggesting that maps of coordinated c-fos mRNA expression can predict changes in behavior as a result of nicotine pretreatment.

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The globalization of the tobacco epidemic and public health responses to this epidemic have been accompanied by the expansion of tobacco control research capacity in low- and middle-income countries. Research capacity in LMICs is critical to providing the locally-relevant evidence that is often needed to promote and improve tobacco control policies and programs. Furthermore, the future evolution of the World Health Organization’s Framework Convention on Tobacco Control will be strengthened if based on research from LMICs, including evaluation of policy and program innovations in LMICs. In spite of its clear importance, building tobacco research capacity is often difficult, time-consuming, and fraught with many challenges. To explore these issues, this symposium includes presentations from tobacco control researchers who have used a variety of methods for building tobacco research capacity in LMICs. Dr. Isabel Scarcini will describe efforts both to engage the general public and to facilitate the development of research proposals focused on key issues related to women and smoking in Brazil. Dr. Melissa Stigler’s capacity building research in India and Uruguay has involved collaborations around the development, implementation and evaluation of innovative school-based interventions to prevent youth tobacco use. In Argentina, Dr. Eliseo Perez-Stable engaged with Argentine researchers through post-doctoral training opportunities and development of variety of projects, ranging from tobacco industry document research to smoking cessation interventions for health professionals. The International Tobacco Control Policy Evaluation Project, led by Dr. Geoff Fong, has involved ongoing surveys of smoker cohorts in 23 countries, whose different sociocultural, political and economic contexts provide unique challenges and opportunities to advance tobacco control policy through locally relevant data. The discussant for this symposium, Dr. Michele Bloch, Acting Branch Chief, NCI Tobacco Control Research Branch, will further contextualize these presentations in light of results from a recent NCI workshop to identify research priorities for LMICs.

SYM4B TOBACCO CONTROL RESEARCH CAPACITY BUILDING IN ARGENTINA: POLICY AND SMOKING CESSION

Eliseo J. Pérez-Stable**, Raúl M. Mejía†, Celia P. Kaplan‡, and Ethel Alderete‡, †University of California, San Francisco, ‡Instituto Nacional del CancerArgentina, †Universidad de Ju羽y, Argentina

The UCSF Fogarty International Center Project to build tobacco control research capacity in Argentina was designed to host professionals and expose them to intensive post-doctoral training that would include epidemiological methods, seminars on tobacco control expertise, and mentored projects. Six scholars (attorney, 2 economists, and 3 physicians) were funded for up to 18-months and three returned to Argentina. Subsequently, 5 physicians with a track record of tobacco-related work were recruited for up to 12-week visits with a pre-specified writing project and goals to obtain specific skills. The focus of the capacity building was on tobacco control policy research, epidemiology of tobacco use, and smoking cessation strategies. There have been 15 papers published by these scholars directly related to this work to date. Policy research included training in use of the library of tobacco industry documents stored at UCSF to evaluate the history of tobacco litigation in Argentina, the use of psychographics in marketing tobacco to youth, and the history of failed legislative efforts at tobacco control. We supported training in use of the UCSF Coronary Heart Disease Policy Model and incorporation of Argentinean data to evaluate the benefit of implementing established smoking cessation strategies with and without increased taxation and how this affects cardiovascular outcomes. A mixed methods evaluation of the strategies implemented by the tobacco industry to prevent the ratification of the Framework Convention on Tobacco Control and an econometric analysis of the elasticity of price and demand of cigarettes using Argentinian data are additional examples of policy research. Developing strategies for promoting smoking cessation focused on training clinicians to assist their patients quit smoking by adapting the Rx for Change and promoting use of the Tomando Control website developed at UCSF. Scholars learned about adaptation of survey items, development of specific scales after qualitative research, and establishing rigorous study methods in effectiveness trials. Smoking cessation workshops and a tobacco prevention course to train health professionals were taught.

FUNDING: Tobacco Research Network Program, Fogarty International Center, National Institute on Drug Abuse, National Institutes of Health, USA. Grant number: TW05935.

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SYM4A IN-COUNTRY CAPACITY BUILDING ON TOBACCO CONTROL AMONG WOMEN IN BRAZIL

Isabel C. Scarini, Ph.D., M.P.H.**, University of Alabama at Birmingham

The need for gender-relevant tobacco control efforts has been highlighted as a priority in recent landmark guiding documents such as the Framework Convention for Tobacco Control. This is particularly relevant in low/middle-income countries where women have been major targets of the tobacco industry. We have established the Network for Tobacco Control among Women in Parana, Brazil to address tobacco control among women through three major and integrated efforts: research, advocacy, and capacity building. This presentation will focus on the “Career Development and Research Training Program” (CDRTTP) component of the Network that has the goal of training academicians and professionals in the development, implementation, and evaluation of theory-, culturally-relevant assessments, interventions, and policies changes addressing tobacco control, particularly among women. The CDRTTP has two major components: (1) Modules I and II that are open to the public (including students) and covers the broad spectrum of tobacco control with the goal of providing attendees with an overview of the major components of tobacco control efforts (e.g., production, prevention, cessation, environmental tobacco exposure, policy); and (2) Module III which consists of a one-year program with multi-mode sessions toward the development of a research plan (e.g., literature review, how to formulate hypotheses, bioethics, biostatistics, theories of behavior change). This Module only includes participants who have attended 80% of the sessions in Modules I and II and is limited to 8-12 scholars per year. It is implemented through co-learning among participants to facilitate cross-fertilization of knowledge, collaborations, and team science. Scholars are expected to develop a small-scale research project focusing on tobacco control among women, which are submitted to an external peer review committee. Research projects with scientific and public health merit will receive funding. To date, we have had over 100 participants in Modules I and II and 27 participants in Module III, with a completion rate of 81%. Specific examples and lessons learned will be discussed.

FUNDING: Funding received from NIH (R01TW009272, R01DA024875).

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SYM4C
CAPACITY BUILDING FOR YOUTH TOBACCO PREVENTION IN INDIA AND URUGUAY: LESSONS LEARNED
Melissa H. Stigler1, Cheryl L. Perry2, Monika Arora3, K. Srinath Reddy4, and Eduardo Bianco5. University of Texas Health Science Center, 1University of Texas Health Science Center, 2Public Health Foundation of India, 3Public Health Foundation of India, 4Center for Research on the Tobacco Epidemic, Uruguay

Fogarty's International Tobacco and Health Research and Capacity Building program (TOBAC) makes investments in low- and middle-income countries (LMICs) with those in high-income countries to build capacity and extend tobacco control research in LMICs. This presentation will provide an overview of strategies that have been employed in 3 TOBAC programs: (1) Project MYTRI (2002-2007); (2) Project ACTIVITY (2007-2012); and (3) ¡Activate Yal (2012-2017). The primary research goal of these projects was/is to design, implement, and evaluate a multiple-component approach to tobacco use prevention for youth in India (MYTRI, ACTIVITY) and Uruguay (¡Activate Yal). Capacity building strategies include short-course workshops, but the bulk of the learning obtained is done daily through “on-the-job doing.” Investigators and staff gain extensive experience in applying behavioral theory to intervention design, implementing large-scale behavioral interventions for youth; and conducting statistical analyses for group-randomized trials, among other topics. In India, these research studies have resulted in more than 30 publications and additional funded research projects. Our capacity building efforts also include children, families, and the community to build support for tobacco control in civil society. In India, we trained more than 30 NGO staff, 300 adult community leaders and teachers, and more than 2000 youth leaders and reached more than 20,000 youth and their families with our interventions. Contexts and related needs vary between India and Uruguay, and this presents unique challenges to capacity building. The scale of the projects in India was much larger than Uruguay such that the “chaos” inherent in all efforts was amplified there. Turnover among field staff was common, challenging our capacity building. In both contexts, investigators and staff had little to no formal training or experience prior to the study. Our partners in both countries were local NGOs, which offered both challenges and rewards. Important parallels and differences in capacity building between the studies and countries will be considered here.

FUNDING: Funding for all projects was provided by the Fogarty International Center at NIH. This includes Project MYTRI (R01-TW05962, 2002-2007; Cheryl Perry, PI); Project ACTIVITY (R01-TW007933; 2007-2012; K. Srinath Reddy, PI); and ¡Activate Yal (1 R01 DA035157-01; 2012-2017; Melissa H. Stigler, PI).

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SYM4D
BUILDING RESEARCH CAPACITY IN LOW- AND MIDDLE-INCOME COUNTRIES THROUGH DOING: EXAMPLES FROM THE INTERNATIONAL TOBACCO CONTROL POLICY EVALUATION PROJECT (ITC PROJECT)
Geoffrey T. Fong1, Mary E. Thompson, Anne C.K. Quah, and Lorraine V. Craig, University of Waterloo

Since 2002, the International Tobacco Control Policy Evaluation Project (the ITC Project), has conducted longitudinal cohort studies in 22 countries, including 11 low- and middle-income countries (LMICs), to assess the effectiveness of current tobacco control policies, to evaluate new policies as they are implemented, and to disseminate ITC findings to key stakeholders throughout the world. At each phase of an ITC country project, the ITC team centered at the University of Waterloo employs a close peer-to-peer collaborative model with in-country teams, starting with decisions on survey modality (face-to-face vs. telephone), sampling, survey development, and the fieldwork protocol. This collaborative model is applied through the data collection process and creates many opportunities for building research capacity within the country team. The most challenging phase of the ITC collaborative model is in building local capacity to develop research ideas, conduct specific analyses on ITC data, and to create research products (e.g., presentations at scientific meetings and manuscripts for submission to scientific journals). In this phase, the bidirectional collaborative model is likely to involve more formal skills training from the ITC Research Team to the in-country team. But in the final phase of an ITC survey cycle—the creation of dissemination products prepared for government, Civil Society, and other key stakeholders (e.g., ITC National Reports and Cross-Country Reports), the arrow swings in the opposite direction, with the in-country team providing critically important information to the ITC Project team about the social and political context of tobacco control policy within the country, and in identifying key contacts and opportunities for contact with such individuals and organizations to disseminate ITC findings. The landscape of existing research capacity in the LMICs in which the ITC Project has worked has been very heterogeneous, as has been the context for and impact of dissemination efforts, which has required flexible application of the ITC collaborative model. These challenges and successes will be described in this presentation.

FUNDING: US National Cancer Institute (R01 CA133839 and R01 CA100362) Canadian Institutes of Health Research (MOP-115016) Ontario Institute for Cancer Research (Senior Investigator Award) Canadian Cancer Society Research Institute (Prevention Scientist Award)

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SYM5
EVIDENCE FROM MOUSE AND MAN FOR OVERLAPPING ROLES OF NEUREGULIN IN NICOTINE DEPENDENCE AND SCHIZOPHRENIA.
Chair: Jill R. Turner, Ph.D., University of Pennsylvania, Philadelphia, PA, and University of South Carolina, Columbia, SC
Presenters: Jill R. Turner, Ph.D., Lin Mei, PhD, Medical College of Georgia, Georgia Regents University, David A. Talmage, Ph.D., Stony Brook University, Stony Brook, NY, and Jaakko Kaprio, M.D., Ph.D., Hjelt Institute, University of Helsinki Finland

Discussant: Julie A. Blendy, Ph.D., Perelman School of Medicine, University of Pennsylvania, Philadelphia, PA

Tobacco addiction affects an estimated 1.2 billion people, and though quitting significantly reduces the risk of smoking-related death and disease, about 80% of smokers attempting to quit fail. Twin studies have shown that ~50% of the individual differences that contribute to smoking relapse can be attributed to heritability. Of particular interest, a number of gene association studies have suggested that members of the Neuregulin family are linked to both nicotine dependence as well as schizophrenia susceptibility. For example, a gene for the neuregulin receptor, ErbB4, is located on 2q33, which overlaps both an established schizophrenia linkage locus and a linkage locus for an identified smoker phenotype. Speakers in this symposium will present data using functional, molecular, and genetic approaches from both mouse and human studies outlining the role of neuregulin and ErbB4 signaling as a potential common molecular pathway linking nicotine dependence and schizophrenia. First, Dr. Lin Mei will present data from Neuregulin 1 (NRG1) transgenic mice demonstrating the behavioral and functional deficits resulting from a gain-of-function NRG1 mutant. Second, Dr. David Talmage will report findings regarding the role of NRG1 in the regulation of nicotinic receptors and their concomitant brain circuitry. Third, Dr. Jill Turner will outline results from mouse and human studies investigating the role of neuregulin 3 and its receptor, ErbB4, in nicotine withdrawal and cessation outcomes. Finally, Dr. Jaakko Kaprio will provide some of the first evidence supporting the involvement of neuregulin signaling in nicotine addiction and describe a possible link between the high comorbidity of schizophrenia and nicotine dependence. The types of cross-species studies presented during this symposium may have the potential to accelerate target identification for smoking cessation therapies and increase understanding of co-morbid disorders, such as schizophrenia.

JUSTIFICATION: The types of cross-species studies presented during this symposium may have the potential to accelerate target identification for smoking cessation therapies and increase understanding of co-morbid disorders, such as schizophrenia.

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2014 Symposia
Schizophrenia is a disabling mental illness that affects 1% of the general population. It is believed to be a neural developmental disorder; however, mechanisms underlying synaptic dysfunction and abnormal behaviors remain poorly understood. Neuregulin 1 (NRG1), a trophic factor, and its receptor ErbB4 are schizophrenia susceptibility genes; and its levels and function are elevated in forebrain regions of some schizophrenic patients. To investigate pathogenic mechanisms of NRG1 gain-of-function, we generated transgenic mice, ctoNRG1, where the expression of exogenous NRG1 was specific in pyramidal neurons in the forebrain and could be turned off by doxycycline. ctoNRG1 mice showed schizophrenia-relevant behavioral deficits including hyperactivity, decreased prepulse inhibition, and impaired working memory. Both glutamatergic and GABAergic transmissions were impaired. Intriguingly, restoring NRG1 levels to normal in adult mice that had been symptomatic eliminates synaptic dysfunction and associated schizophrenia-related phenotypes, indicating the reversibility of the phenotypes. To test this hypothesis further, we characterized ctoNRG1 mice whose expression of exogenous NRG1 was not on until age of two months. We found that increased NRG1 levels in adulthood were sufficient to induce schizophrenia-relevant behavioral deficits. Further studies suggest a cell-autonomous pathologic mechanism of NRG1 gain-of-function in pyramidal neurons. Together, these observations demonstrate that continuous NRG1 abnormality is required and sufficient to cause schizophrenia-relevant deficits and that developmental impairment caused by NRG1 gain-of-function could be reversible. Our results also suggest that relevant schizophrenia may benefit from therapeutic intervention to restore abnormal NRG1 signaling.

FUNDING: NIMH, NARSAD

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Addiction to nicotine and ability to quit smoking are influenced by genetic factors. Recently, we have published data using functional genomic approaches (chromatin immunoprecipitation (ChIP) and whole genome sequencing) to identify novel CREB targets following chronic nicotine administration and withdrawal (Turner (2013) Mol Psychiatry). We found in rodents that chronic nicotine and withdrawal differentially modulate CREB binding to the gene for Neuregulin 3 (NRG3). Quantitative analysis of saline, nicotine, and nicotine withdrawal in two biological replicates corroborate this finding, with NRG3 increases in both mRNA and protein following withdrawal from chronic nicotine treatment. Further studies in humans indicated that single nucleotide polymorphisms (SNPs) across NRG3 were significantly associated with prospective smoking cessation among smokers of European ancestry treated with transdermal nicotine in two independent cohorts. NRG3 is a neural-enriched member of the EGF family, and a specific ligand for the receptor tyrosine kinase ErbB4, which is also up-regulated following nicotine administration and withdrawal. Our findings, in conjunction with a recent study identifying associations of ErbB4 in a different cohort of smokers (Loukola (2013) Mol Psychiatry), strongly implicate this pathway in the molecular mechanisms underlying nicotine dependence and smoking cessation. Interestingly, in addition to its relevance in smoking cessation, this pathway has also been described in the pathophysiology of schizophrenia, suggesting a common molecular link between these two highly co-morbid diseases. Ongoing experiments examining molecular changes downstream of NRG3/ErbB4 signaling indicate that alterations in NMDAR signaling may be influencing both smoking behavior as well as schizophrenia.

FUNDING: This research was funded by grants from the National Cancer Institute and National Institute on Drug Abuse, P50-CA143187, 1-F32-DA026236, K01-DA031747, 1-K99-DA032681, and U01-DA020830.

JUSTIFICATION: The types of cross-species studies presented during this symposium may have the potential to accelerate target identification for smoking cessation therapies and increase understanding of co-morbid disorders, such as schizophrenia.

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NRG1, ERBB4, and CHRNA7 have all been implicated as genes that contribute to the risk of developing schizophrenia. The Type III isoforms of NRG1 were initially identified as factors that regulated the expression of neuronal nicotinic acetylcholine receptors (nAChRs), including those containing the alpha 7 subunit (the product of the CHRNA7 gene). Reduction in Type III NRG1 in mice results in behavioral, anatomical, and synaptic phenotypes that resemble endophenotypes associated with schizophrenia. I will summarize the results of a series of studies that focused on the possibility that some of the phenotypes seen in Type III Nrg1 mutant mice result from decreased presynaptic targeting of alpha 7 nAChRs. Our key findings are (1) brief nicotine activation of presynaptic alpha 7 nAChRs results in sustained changes in glutamate release at both hippocampal – nucleus accumbens and cortico-amygdalar synapses; (2) brief nicotine exposure converts theta burst induced short term potentiation into long term potentiation at cortico-BLA synapses; (3) Type III Nrg1 regulates the levels of functional, presynaptic alpha7 nAChRs; (4) LTP and nicotine modulation of glutamate release are absent at cortico-BLA synapses in Type III Nrg1 heterozygous mice, and in alpha7 nAChR heterozygous mice; and (5) stimulation of Type III Nrg1 back-signaling restores nicotine modulation of glutamate release and LTP at a subset of cortico-BLA synapses. Based on these findings we propose that alterations that effect NRG1 signaling, in particular alterations that decrease axonal Type III Nrg1 signaling, contribute to schizophrenia related endophenotypes in part by decreasing presynaptic modulation by acetylcholine.
SYM5D
GENOME-WIDE ASSOCIATION STUDY ON DETAILED PROFILES OF SMOKING BEHAVIOR AND NICOTINE DEPENDENCE IN A TWIN SAMPLE.

Anu Loukola1, Beenish Qaiser1, Anti-Pekka Sarin2, Samuli Ripatti3, 4, Michele L. Pergadia5, Pamela A.F. Madden6, Jaakko Kaprio1, 2, 3, Department of Public Health, Hjelt Institute, University of Helsinki, Finland; 3, National Institute for Health and Welfare, Helsinki, Finland; 4, Institute for Molecular Medicine FIMM, University of Helsinki, Finland; 1, Washington University School of Medicine, Saint Louis, USA

Prior large-scale genome-wide association (GWA) studies have suffered from limited phenotypic definitions of relevance to smoking-related behavior. Furthermore, the potential shared genetic background of various neuropsychiatric disorders may have been neglected in the annotation of GWA data. We have recently published gene findings from a GWA study of 17 smoking-related phenotypes (Loukola (2013) Mol Psychiatry), comprehensively portraying the dimensions of smoking behavior including smoking initiation, amount smoked, and nicotine dependence (ND). In a sample of 1114 twins ascertained for ever smoking from the population-based Finnish Twin Cohort study, we utilized Illumina 670k array data imputed to HapMap2 reference, and detected intriguing association between DSM-IV ND and ERBB4, a neuregulin receptor. Three members of the neuregulin signalling pathway, NRG1, NRG3, and ERBB4, have previously been associated with schizophrenia liability. Further, ERBB4 is located on 2q33, overlapping an established schizophrenia linkage locus and a linkage locus for a smoker phenotype identified in this sample. The association between ERBB4 and DSM-IV ND diagnosis was replicated in an independent Australian sample. Interestingly, a significant increase in ErbB4 and Neuregulin (Nrg3) expression was reported following chronic nicotine exposure and withdrawal in mice and an association between NRG3 SNPs and smoking cessation success was detected in a clinical trial (Turner (2013) Mol Psychiatry). Our data suggest the involvement of the neuregulin signalling pathway in addictions and provides a plausible link between the high co-morbidity of schizophrenia and ND. We now follow up on the initial findings by including data from additional 956 non-twin siblings genotyped with the Illumina HumanCoreExome array. The total of 2070 subjects from 760 families have all been imputed to the 1000Genomes reference, providing a total of over 8.5M SNPs available for analysis, including rare exonic variants from the HumanCoreExome array. By utilizing both common and rare variants, we seek to confirm the results, and with increased power we expect novel signals to appear as well.

FUNDING: This work was supported for data collection by Academy of Finland grants 265240 and 263278 (JK) and a NIH Grant DA12854 (PAFM). Genome-wide genotyping in the Finnish sample was funded by Global Research Award for Nicotine Dependence/Pfizer Inc. (JK), and Wellcome Trust Sanger Institute, UK. Genome-wide genotyping in the Australian sample was funded by NIH Grants AA013320, AA013321, AA013326, AA011998 and AA017688. This work was further supported by the Sigrid Juselius Foundation (JK) and a NIH Grant DA019951 (MLP).

JUSTIFICATION: The types of cross-species studies presented during this symposium may have the potential to accelerate target identification for smoking cessation therapies and increase understanding of co-morbid disorders, such as schizophrenia.

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SYM6A
MINNESOTA SMOKERS’ PERCEIVED HELPFULNESS OF 2009 FEDERAL TOBACCO TAX INCREASE IN ASSISTING SMOKING CESSATION: A PROSPECTIVE COHORT STUDY

Kelvin Choi1 and Raymond G. Boyle2, 1, Division of Epidemiology and Community Health, University of Minnesota, “ClearWay Minnesota

Background: Cost of cigarettes has been cited as a motivating factor for smokers to quit smoking, and cigarette tax increases are effective ways to increase costs of cigarettes. Little is known about whether smokers actually find cigarette tax increase helpful, and whether this perception predicts subsequent smoking cessation behaviors. Method: Data were from the Minnesota Adult Tobacco Survey Cohort Study collected immediately and a year after the 2009 federal tobacco tax increase. In 2009, 727 smokers were asked whether they thought the federal tobacco tax increase helped them think about quitting, cutting down on cigarettes, and making a quit attempt. During the 2010 follow-up, 527 smokers were again asked about the federal tobacco tax increase and whether they thought it helped them think about quitting, cut down on cigarettes, and make a quit attempt. We also collected data on demographics, number of cigarette price minimizing strategies used, and cigarette consumption. In 2010, we assessed if these smokers had made a quit attempt, had cut down on their cigarette consumption, and had stopped smoking. Logistic regression models were used to assess the characteristics associated with perceiving the tax increase as helpful, and the association between this perception in 2009 and cessation behaviors in 2010. Results: Overall, 65% of the sample thought that the 2009 tax increase helped them think about quitting. 47% thought it helped them cut down on cigarettes, and 29% thought it helped them make a quit attempt. Lower education, lower income, lower cigarette consumption, and using more cigarette price minimizing strategies were associated with perceiving the tax increase as helpful (p<0.05). Smokers who perceived the tax increase as helpful were more likely than those who did not perceive the tax increase as helpful to report making a quit attempt in 2010 (p<0.05). Conclusions: A significant proportion of smokers in our sample found the 2009 federal tobacco tax increase helpful, particularly among smokers of lower socio-economic status. Health communication interventions to promote cigarette tax increases as opportunities and tools for smoking cessation may further assist smoking cessation.

FUNDING: ClearWay Minnesota

SYM6
ANATOMY OF A CIGARETTE TAX INCREASE: INSIGHT FROM SMOKERS, PUBLIC HEALTH, AND INDUSTRY

Chair: Raymond G. Boyle
Presenters: Kelvin Choi, Ph.D., M.P.H., Anne Betzner, Paula Keller, M.P.H., and Betsy Brock, M.P.H.
Discussant: Timothy McAfee, M.D., M.P.H.

It is well known that a cigarette tax increase reduces consumption and increases quitting. Less is known how this overall effect is influenced by the tobacco industry, public health and smokers themselves. For example, the tobacco industry could blunt a tax increase through pricing practices such as discounting. Public health could use media to reinforce available support with telephone and internet based treatment options. Smokers themselves can respond to a tax increase by quitting, reducing, changing products, or making no change at all. During the 2013 legislative session Minnesota lawmakers passed and the state implemented a $1.60 increase in the cigarette tax. This increase provided a significant opportunity for tobacco control researchers to explore reactions from multiple perspectives. This symposium will examine a unique compilation of data from multiple sources including smokers, cessation programs, and surveillance of the tobacco industry. kelvin Choi will report on his research involving a cohort of Minnesota smokers and the role a tobacco tax can play as a commitment device for cessation among smokers. The changes in strategies to minimize cigarette expenditure among individual smokers are then explored by Ann Betzner with qualitative data collected through in-depth interviews with Minnesota smokers conducted before and after the tax increase, supported by receipts for cigarette purchases collected at the two time points. Next Paula Keller will describe the change in call volumes, web traffic, and enrollments in the QUITPLAN® Helpline and quitplan.com. Data were compared to the previous year when there was no tax increase and minimal paid media. Betsy Brock will then examine the industry response through a detailed analysis of the results from a price surveillance study that tracked tobacco product prices and advertising in retail stores in Minnesota and neighboring states. Dr. Tim McAfee will serve as the symposium discussant and will synthesize the multiple perspectives presented and discuss how this work in Minnesota is applicable for other state tobacco control programs and for research in tobacco control.

JUSTIFICATION: This symposium was designed to describe a tax increase from multiple perspectives and has the potential to inform policy makers, quitline vendors, treatment providers, and the broader tobacco control community.

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Helpline and quitplan.com were analyzed. Data were compared to the previous year. Finally, we examined whether enrollees were motivated to quit by paid media campaign, on interest and enrollment in both telephone and web-based messaging in tobacco control.

Economic studies demonstrate that cigarette price increases reduce smoking consumption and prevalence at the population level. However, less is known about how individual smokers cope with cigarette tax increases and the mechanisms that drive their reactions. This abstract presents results from in-depth interviews immediately before and one month after a $1.60 cigarette tax increase. Respondents were asked about what, where, when, and how they smoke and buy cigarettes, and why, including the role of price. A total of 42 Minnesota cigarette smokers were recruited from a marketing research database and 37 completed both interviews. Participants were equally divided by education level and residence in or out of the metro area. Almost all respondents engaged in price minimizing behaviors before the tax increase and the increase made most think more about the price of cigarettes. Post-tax increase, many smokers maintained their tobacco buying patterns because of stress, enjoying smoking, and addiction. For other smokers, the tax was a catalyst to alter their cigarette purchasing and use. A pre- and post-tax comparison indicates that some respondents engaged in new price minimizing behaviors post-tax. Analysis of all price minimizing behaviors reported includes respondents who reported increasing price minimizing behavior, but respondents reporting reducing the number of cigarettes smoked per day solely to reduce cost. Other less studied price minimizing behaviors were also reported, such as sharing fewer cigarettes. Participants’ budget impacted their reaction to the tax, as did other individual traits and psychological and social factors, such as gamesmanship, brand loyalty, and addiction. A tax increase presents a brief, unique opportunity to support change among smokers. During the turbulent time immediately post-tax, tobacco control advocates may assist smokers by addressing their experiences and building on reductions in use that may be temporary as smokers adjust to price increases. Future studies may benefit from accounting for a fuller range of price minimizing behaviors.

FUNDING: ClearWay Minnesota Grant

JUSTIFICATION: Qualitative interviews about why and how price motivates smokers’ decision-making have the potential to inform treatment practice and messaging in tobacco control.

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HOW MINNESOTA SMOKERS RESPOND TO A TAX INCREASE AND WHY: A QUALITATIVE STUDY


TOBACCO INDUSTRY RESPONSE TO A TOBACCO TAX INCREASE: FINDINGS FROM MINNESOTA

Betsy Brock, M.P.H.*, | Molly Molanen, M.P.P.*, Samantha Carlson1, and Chris Farmer-Lies, B.A.1 | 1Association for Nonsmokers-Minnesota, St. Paul, MN, 2ClearWay Minnesota, Minneapolis, MN

In 2013, the Minnesota Legislature increased the tax on cigarettes by $1.60/ pack and the tax on other tobacco products went from 70% to 95% of wholesale price. It is commonly believed that the tobacco industry responds to tobacco tax increases by (1) increasing in-store price promotions to blunt the public health impact of tax increases and/or (2) slightly increasing tobacco prices as the tax goes into effect and blaming the entirety of the price increase on “the government.” The current study collected tobacco price and marketing data before and after the tax increase to measure tobacco industry response to the tobacco tax. Observational data were collected at convenience stores in Minnesota (n=48) and the border states of Wisconsin (n=9), North Dakota (n=2), and South Dakota (n=2). Data collectors visited the same stores twice before the tax increase and twice after the increase. At each visit, collectors purchased the same four tobacco products and collected data about in-store promotions. Matched data were analyzed with McNemar chi square. The average price of Marlboro cigarettes increased by 31% or $1.89 and Camel cigarettes by 31% or $1.65, both higher than the $1.60 tax increase. Smokeless tobacco prices also increased but by a smaller margin. Similar price increases were not observed in other states. In Minnesota, a wide variation of prices paid was observed in both cigarette prices ($2) and smokeless ($3). Some of this variation was likely due to in-store price promotions. Camel cigarette price promotions were commonly observed, and increased significantly post tax (p<0.05). Variation might also be due to store location or store type (chain vs. independent). After the tax increase there was also a significant increase (p<0.005) in the number of stores selling electronic cigarettes; this could be linked to higher cigarette taxes and/or growing consumer interest. In summary, a tobacco tax increase resulted in tobacco price increase greater than the tax and was associated with in-store price promotions, large price variations, and increasing availability of electronic cigarettes and other novel tobacco products.

FUNDING: ClearWay Minnesota

JUSTIFICATION: This abstract adds to policy research finding a tobacco tax increase resulted in tobacco price increase greater than the tax and was associated with in-store price promotions.

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SYM7
E-CIGARETTES AND THE END GAME: IS THIS THE ROAD FORWARD?

Session Chairs: Phillip Gardiner, Dr.P.H., Tobacco Related Disease Research Program, University of California Office of the President and Judith Prochaska, Ph.D., Department of Medicine, Stanford University
Presenters: Neal Benowitz, M.D., School of Medicine, University of California San Francisco, Natalie Walker, Ph.D., School of Population Health, University of Auckland, New Zealand, Rachel Granja, Ph.D., M.P.H., University of California San Francisco

Increasingly, e-cigarettes are dominating discussions in the tobacco control research arena. Even though there are no studies on the long term health effects of these products, still many in the field are hailing e-cigarettes as a healthier alternative to regular tobacco cigarettes. Moreover, many studies show that people using e-cigarettes as cessation devices continue to use regular tobacco products. Yet, many in the field are convinced that e-cigarettes are far superior and more acceptable than NRT and other pharmaceuticals for tobacco cessation. With the proliferation of "end-game" discussions, the question of e-cigarettes role in ending the supremacy of tobacco products has become a critical question; a burning issue, if you will. To address this matter, Dr. Neal Benowitz, will argue that substituting e-cigarettes for regular cigarettes AND tapering down the nicotine levels in regular cigarettes is the road forward for the smoking cessation movement. Dr. Benowitz will assert that this dual strategy, if adopted, would have tremendous public health benefits. Dr. Natalie Walker will review both her own research and the studies of others on smoking cessation efforts that have used e-cigarettes. Dr. Stan Glantz will discuss the problem of "dual use" of e-cigarettes and regular tobacco cigarettes, drawing on his own data and that of other published studies. All presenters will be asked to comment on the "vision" that Dr. Benowitz will lay out at the opening, including its practicality. This session will be moderated by Drs. Phillip Gardiner and Judith Prochaska, with Dr. Gardiner opening the session by painting a broad picture of a fundamentally altered tobacco / nicotine landscape and Dr. Prochaska introducing each speaker and moderating the Q and A that follows.

SYM8
ENGINEERING AND TRANSLATING TREATMENT FOR ALL SMOKERS IN PRIMARY CARE SETTINGS

Chair: Robin J. Meruelo, Ph.D., University of Illinois, Chicago
Presenters: Michael C. Fiore, M.D., M.P.H., M.B.A., Jessica W. Cook, Ph.D., Megan E. Piper, Ph.D., and Tanya R. Schlam, Ph.D., University of Wisconsin
Discussant: Thomas J. Glynn*, M.A., M.S., Ph.D., American Cancer Society

We remain far from reaching the 2020 National Health objective of reducing smoking prevalence among adults in the United States to 12%. The overarching goal for this research is to engineer highly effective smoking interventions and accelerate their dissemination. Tobacco dependence is a chronic disease, but there are no comprehensive chronic care treatments that (1) address all phases of smoking cessation, and (2) provide treatment for all smokers regardless of their treatment phase. Delivering such chronic care treatment to all smokers in primary care requires that there be an evidence-based treatment for every phase of cessation and requires that every smoker be engaged in treatment seamlessly and cost-effectively. Research presented at this symposium will focus on the use of cutting edge methodology (Multiphase Optimization Strategy [MOST], Phase-Based Model of Cessation) to engineer effective treatments for smokers who are, and are not, ready to quit at the time of their primary care visit. Further, we will discuss how the electronic health record (EHR) can be used to seamlessly implement such treatments in primary care. Thus, this research addresses how the marriage of cutting edge methodology and health information technology can guide the development and evaluation of effective phased-based treatments and permit their efficient delivery in healthcare. Dr. Meruelo (Chair) will introduce the symposium by providing background on the goals of the research, the chronic care treatment model, and how to translate these findings into real-world practice. Dr. Fiore will present research on the use of the EHR to facilitate treatment engagement in real-world clinics. Subsequent talks will focus on the experimental screening of multiple intervention components for (1) the Maintenance Phase, for smokers not yet ready to quit (Dr. Cook), (2) the Preparation and Cessation Phases, for smokers motivated to quit (Dr. Piper), and (3) the Maintenance Phase, with a focus on adherence interventions, for smokers trying to maintain abstinence (Dr. Schlam). Finally, Dr. Glynn will provide a synthesis and further discussion of these findings and the guiding theory and methods.

JUSTIFICATION: This research represents the use of a cutting edge methodology that facilitates the development of effective treatments for smokers that are designed to be provided and then implemented in real-world primary care clinics, thereby facilitating their translation into real-world use.

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SYM8A
RECRUITING AND ENGAGING SMOKERS IN TREATMENT IN A PRIMARY CARE SETTING: DEVELOPING A CHRONIC CARE MODEL IMPLEMENTED THROUGH A MODIFIED ELECTRONIC HEALTH RECORD

Michael C. Fiore*, M.D., M.P.H., M.B.A., David Fraser, M.S., Bruce A. Christiansen, Ph.D., Megan E. Piper, Ph.D. and Timothy B. Baker, Ph.D., University of Wisconsin, Madison

Almost 35 million U.S. smokers visit primary care clinics annually, creating a need and opportunity to identify such smokers and engage them in evidence-based smoking treatment. The goal of this research is to examine the feasibility and effectiveness of a chronic care model of treating tobacco dependence when it is integrated into primary care systems using electronic health records (EHRs). We worked with 11 primary care clinics to modify their EHRs so that identified smokers would be invited to receive smoking treatment. Specifically, the modified EHR promoted primary care clinic staff rooming patients to invite patients who smoke to participate in a tobacco treatment program whether they wanted to quit smoking or just wanted to cut down. Interested participants were electronically referred to the research office via the EHR, and participants were then screened over the phone, and eligible participants were invited to attend their first visit at their primary care clinic. Of the 113,243 patients who had a clinic visit during study recruitment, 17,078 (15%) were identified as smokers. More than 65% of the identified smokers were invited to participate, and 12.4% of all smokers enrolled in treatment—30% in smoking reduction and 70% in cessation treatment. Among smokers who visited these primary care clinics, we found that younger smokers were less likely to receive an invitation to participate and older smokers were more likely to decline the invitation. Smokers with Medicaid insurance had the highest rates of current smoking and the highest rates of not receiving the treatment invitation. These results suggest that the chronic care model developed for treating tobacco dependence, integrated into the primary care system through the EHR, has the potential to engage up to 4.3 million smokers in treatment a year. However, there are significant implementation barriers that need to be addressed so that all smokers are offered appropriate treatment at every clinic visit.

FUNDING: This research was supported by grant 9P50CA143188 from the National Cancer Institute to the University of Wisconsin-Center for Tobacco Research and Intervention; by grant 1K05CA139871 from NIH; and by the Wisconsin Partnership Program.

JUSTIFICATION: This research illustrates how smoking treatment can be efficiently translated to real-world use by modifying the electronic health record.

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SYM8B
IDENTIFYING OPTIMAL STRATEGIES FOR INCREASING SMOKERS’ MOTIVATION TO QUIT

Jessica W. Cook, Ph.D.1,2; Robin J. Mermelstein, Ph.D.2; Tanya R. Schlam, Ph.D.1,2; Megan E. Piper, Ph.D.1; Stevens S. Smith, Ph.D.1,2; Douglas E. Jorenby, Ph.D.1; Linda M. Collins, Ph.D.1,2; Michael C. Fiore, M.D., M.P.H., M.B.A.1,2; and Timothy B. Baker, Ph.D.1,2; University of Wisconsin, Madison, 2University of Illinois, Chicago, 3Pennsylvania State University

At any given point in time, most smokers are unwilling to make a serious quit attempt. The goal of this study was to examine intervention components aimed at identifying highly effective Motivation Phase treatments; i.e., those that increase quit attempts among smokers initially unwilling to quit and increase the success of their quit attempts. We recruited 517 smokers (63% women, 91% white) who were unwilling to quit from 11 primary care clinics in Wisconsin. This study utilized a full factorial design to assess the effects of 4 factors that focused on treatment opportunities available in the Motivation Phase: namely, (1) Nicotine Patch vs. No Nicotine Patch, (2) Nicotine Gum vs. No Nicotine Gum, (3) Behavioral Reduction (BR) Counseling vs. No BR Counseling, and (4) Motivational Interviewing (MI) Strategies vs. No MI Strategies. Primary outcomes, which were assessed throughout a 26-week period (6-week intervention + 20-week follow-up), included making a quit attempt and cessation success. Participants could elect to receive cessation treatment at any point during participation in the study. Results showed that smokers who were unwilling to quit had excellent treatment engagement: the average attendance rate was 76% across all 6 treatment contacts, with 34% of participants electing to receive additional treatment (either further Motivation Phase treatment or cessation treatment). At the 12-week follow-up, participants who received Behavioral Reduction Counseling (BR) were more likely to report 7-day point prevalence abstinence than those who did not receive BR (p<.05). We also found effects for Nicotine Gum: i.e., those using Gum were more likely to make a quit attempt at end of treatment than those not using Nicotine Gum (p<.05). In addition to demonstrating that smokers who are initially unwilling to quit will engage in Motivation Phase treatment, these results suggest the potential promise for the use of Behavioral Reduction Counseling and Nicotine Gum for facilitating quit attempts and cessation success in this population. These results will contribute to the development of an optimized chronic care treatment for smoking.

FUNDING: This research was supported by grant 9P50CA143188 from the National Cancer Institute to the University of Wisconsin-Center for Tobacco Research and Intervention; by grant 1K05CA139871 from NIH; and by the Wisconsin Partnership Program. This work was carried out in part while Dr. Schlam was a Primary Care Research Fellowship supported by a National Research Service Award (T32HP10010) from the Health Resources and Services Administration to the University of Wisconsin Department of Family Medicine.

JUSTIFICATION: This research evaluated the effects of intervention components designed to help smokers quit, thereby permitting the engineering of an optimized treatment package for smokers who want to quit.

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SYM8C
IDENTIFYING OPTIMAL SMOKING CESSATION INTERVENTION COMPONENTS FOR THE PRECESSION AND CESSATION PHASES OF QUITTING SMOKING

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Smoking cessation treatment research has advanced at an inconsistent pace. Using the Multiphase Optimization Strategy (MOST) we have attempted to identify effective smoking cessation intervention components that can be combined in an evidence-based manner to produce an optimized cessation treatment package that significantly improves cessation outcomes. We selected potential treatment components using the Phase-Based Model of Cessation, which identifies challenges and opportunities at each phase of cessation, from preparing to quit, to making the actual quit attempt, to maintaining abstinence. We recruited smokers willing to quit (N=637; 55% women, 87% white) from 11 primary care clinics in Wisconsin. This study utilized a fractional factorial design to assess the effects of 6 intervention components that focused on the treatment opportunities available in the Preparation and Cessation phases: (1) Pre-quit Patch vs. No Patch, (2) Pre-quit Gum vs. No Gum, (3) Pre-quit Counseling vs. None, (4) 8 vs. 16 Weeks of patch + gum, (5) Intensive In-person Counseling vs. Minimal, and (6) Intensive Phone Counseling vs. Minimal. Results showed that Intensive In-person Counseling produced significantly higher initial cessation rates (p<.05) and somewhat higher 8-week cessation rates (p=.07). There was also a significant interaction between In-person and Phone Counseling such that Intensive In-person Counseling alone produced higher 8-week abstinence rates than did the two intensive counseling components combined. Further, when Pre-quit Patch and Intensive In-person Counseling were combined, it produced significantly higher 26-week abstinence rates. We also examined the effects of the intervention components on self-efficacy and craving and the cost of each intervention component. Taken together, these results can be used to develop an optimized smoking cessation treatment package that includes only active treatment components that work well together.

FUNDING: This research was supported by grant 9P50CA143188 from the National Cancer Institute to the University of Wisconsin-Center for Tobacco Research and Intervention; by grant 1K05CA139871 from NIH; and by the Wisconsin Partnership Program. This work was carried out in part while Dr. Schlam was a Primary Care Research Fellow supported by a National Research Service Award (T32HP10010) from the Health Resources and Services Administration to the University of Wisconsin Department of Family Medicine.

JUSTIFICATION: This research evaluated the effects of intervention components designed to help smokers quit, thereby permitting the engineering of an optimized treatment package for smokers who want to quit.

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SYM8D
IDENTIFYING OPTIMAL SMOKING CESSATION INTERVENTION COMPONENTS TO INCREASE SMOKERS’ ADHERENCE TO CESSATION MEDICATIONS AND HELP THEM MAINTAIN ABSTINENCE

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Smokers who use cessation medications can double or triple their likelihood of quitting. However, this outcome may underestimate the benefit of medication because perhaps only half of smokers take their medication as prescribed. Thus, increasing adherence is a credible strategy to enhance cessation medications’ effectiveness. This experiment tested three adherence intervention components during the Cessation Phase (first 2 weeks postquit) and the Maintenance Phase (3-6 months postquit), plus two additional intervention components designed to boost long-term abstinence. Participants were smokers (N = 545; 59% women, 86% white) visiting 1 of 11 primary care clinics for a regular outpatient visit who, when asked, expressed willingness to participate in a cessation study. Case managers delivered treatments at participants’ primary care clinics and via phone. This experiment assessed the effects of five intervention components using a 2x2x2x2x2 full factorial design. The 3 adherence intervention components were (1) Cognitive Medication Adherence Counseling (C-MAC) vs. No C-MAC; (2) Electronic Medication Monitoring Device + Feedback vs. Medication Monitoring Device Only; and (3) Automated Adherence Promoting Calls vs. No Calls. The 2 nonadherence intervention components were (1) Maintenance Phase Phone Counseling (8 sessions) vs. No Maintenance Counseling, and (2) 26 vs. 8 Weeks of Combination Nicotine Replacement Therapy (NRT; nicotine patch plus gum). All participants received at least 8 weeks of combination NRT plus 50 minutes of counseling during the Cessation Phase. Maintenance Counseling increased 16-week point prevalence abstinence (p<.05), and Combination NRT for 26 weeks.
versus 8 weeks increased 26-week abstinence (p<.05). There were significant interactions among factors (e.g., Maintenance Counseling combined with C-MAC adherence counseling to produce the highest patch and gum adherence rates).

FUNDING: This research was supported by grant 9P50CA143188 from the National Cancer Institute to the University of Wisconsin-Center for Tobacco Research and Intervention; by grant 1K05CA139871 from NIH; and by the Wisconsin Partnership Program. This work was carried out in part while Dr. Schlam was a Primary Care Research Fellow supported by a National Research Service Award (T32HP10010) from the Health Resources and Services Administration to the University of Wisconsin Department of Family Medicine.

JUSTIFICATION: This research examined the effects of interventions designed to improve medication adherence and help smokers maintain abstinence, with the goal of using this information to develop an optimized treatment package for smokers willing to quit.

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SYM9
ESTABLISHING THE CAUSAL IMPACT OF TOBACCO USE ON HEALTH OUTCOMES USING MENDELIAN RANDOMISATION: THE CARTA CONSORTIUM

Chair: Marcus R. Munafò, MRC Integrative Epidemiology Unit, University of Bristol, UK Centre for Tobacco and Alcohol Research Studies, School of Experimental Psychology, University of Bristol, Bristol, UK

Presenters: Amy E. Taylor, MRC Integrative Epidemiology Unit, University of Bristol, UK, Jennifer J. Ware, MRC Integrative Epidemiology Unit, University of Bristol, Bristol, UK, and Richard Morris, UCL, London, UK, Marcus R. Munafò

Discussant: Jaakko Kaprio, Institute for Moleculare Medicine, University of Helsinki, Helsinki, Finland

Tobacco use is associated with a range of physical and mental health outcomes. Whilst the causal impact of tobacco use on a number of physical health outcomes has now been established (e.g., lung cancer), the direction of causality for a number of other outcomes associated with tobacco use remains uncertain. Conventional observational methodologies have well-known limitations due to confounding and reverse causality, and experimental studies are often impossible or unethical. Longitudinal studies provide a partial solution to these problems, but are often limited by poor temporal resolution, unmeasured confounding, and the possibility of reverse causality. One potential solution to these difficulties lies in the application of the principle of Mendelian randomisation, whereby genetic information can be used to test causal hypotheses regarding the effects of modifiable environmental exposures such as cigarette smoking. This requires specific genetic polymorphisms that have been shown to be robustly associated with measures of exposure (e.g., smoking quantity). Given the random assortment of genes from parents to offspring that occurs during gamete formation and conception, genotype should not be related to potential confounders. The consortium for Causal Analysis Research in Tobacco and Alcohol (CARTA) was established at the University of Bristol to determine the causal impact of tobacco and alcohol use on a variety of health-related and socioeconomic outcomes. To date, this consortium comprises 27 studies, with a total sample size in excess of 100,000. Using a Mendelian randomisation approach, whereby a genetic variant in the CHRNA5-CHRNA3-CHRNB4 nicotinic acetylcholine receptor gene cluster (rs1051730) is used as a proxy for level of tobacco exposure, we have been able to evaluate the causal impact of smoking on the following outcomes: (1) Depression and anxiety, (2) Blood pressure and pulse, (3) Income, (4) Regional adiposity, (5) Vitamin D. Each topic will be presented by respective study leads or study affiliates.

JUSTIFICATION: Knowledge of the causal effects of tobacco exposure will inform the development of relevant public health messages and campaigns, and also potentially aid the development of novel treatments for depression and anxiety. This is a work in progress and we anticipate that results will be available within a month.

FUNDING: Amy Taylor, Meg Flihuarty and Marcus Munafò are members of the UK Centre for Tobacco and Alcohol 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. This work was supported by the Medical Research Council (grant numbers MR/J01351X/1, G0800612, G0802736, MC_UU_12013/1-9).

SYM9A
ASSESSING CAUSAL LINKS BETWEEN SMOKING AND DEPRESSION AND ANXIETY USING A MENDELIAN RANDOMISATION APPROACH

Amy E. Taylor, Meg E. Flihuarty, and Marcus R. Munafò, MRC Integrative Epidemiology Unit (IEU) at the University of Bristol, UK Centre for Tobacco and Alcohol Research Studies, School of Experimental Psychology, University of Bristol, Bristol, UK

Smoking and depression and anxiety are highly comorbid, but it is unclear whether associations are causal. There are plausible biological mechanisms through which smoking may lead to changes in neurocircuity which could increase susceptibility to depression and anxiety. However, smokers report that smoking relieves symptoms of depression and anxiety, so it is possible that the association is due to reverse causality (the self medication hypothesis). The issue of confounding is also a problem as there may be lifestyle factors associated with both smoking and depression and anxiety which cannot be fully accounted for in observational studies. We performed a Mendelian randomisation analysis, using data on 118,739 individuals from the Consortium for Causal Analysis Research in Tobacco and Alcohol. We used logistic regression to look at the associations of a smoking-related variant (rs1051730/rs1696968) with binary measures of psychological distress, depression, and anxiety. Cases were defined in two ways: (1) according to diagnostic criteria or previously defined cut offs for continuous scales and (2) 90th percentile cut offs for continuous scales. In addition, we investigated associations with continuous scales (transformed to z-scores) using linear regression. All analyses were stratified by smoking status (never, former, current and ever (former + current)) at the time of outcome assessment. We also looked at observational associations between smoking status and smoking heaviness (cigarettes per day) and binary measures of psychological distress, anxiety, and depression. Results from individual studies were meta-analysed and evidence for interactions between genotype and smoking status was assessed using the Cochran Q statistic. We discuss the implications of these results for furthering understanding of the causal effect of smoking on depression and anxiety. This will inform the development of relevant public health messages and campaigns, and also potentially aid the development of novel treatments for depression and anxiety. This is a work in progress and we anticipate that results will be available within a month.

FUNDING: This research was supported by grant 9P50CA143188 from the National Cancer Institute to the University of Wisconsin-Center for Tobacco Research and Intervention; by grant 1K05CA139871 from NIH; and by the Wisconsin Partnership Program. This work was carried out in part while Dr. Schlam was a Primary Care Research Fellow supported by a National Research Service Award (T32HP10010) from the Health Resources and Services Administration to the University of Wisconsin Department of Family Medicine.

SYM9B
ASSESSING CAUSAL LINKS BETWEEN SMOKING AND BLOOD PRESSURE USING A MENDELIAN RANDOMISATION APPROACH

Allan Linneberg, Lise Lotte N. Husemoen, Ritke Kart Jacobsen, Marcus R. Munafò, and Marjo-Riitta Jarvelin, “Research Centre for Prevention and Health, Glostrup University Hospital, Denmark, MRC Integrative Epidemiology Unit (IEU) at the University of Bristol, UK Centre for Tobacco and Alcohol Research Studies, School of Experimental Psychology, University of Bristol, Bristol, UK, 1Department of Epidemiology and Public Health, Imperial College London, London, UK

Smoking is a major risk factor for cardiovascular disease (CVD) and has been associated with several CVD risk factors. Somewhat surprisingly smoking seems to be associated with lower blood pressure (BP). Whether this effect can be explained by confounding by obesity (with smokers generally having lower body mass index (BMI)) or other factors associated with both BP and smoking is not known. A recent...
Mendelian randomisation study examined the effects of a smoking related genetic variant on BP and found that the smoking increasing allele of rs1051730 tended to associate with lower systolic and diastolic BP (SBP, DBP) and lower BMI among smokers. Data on the association between smoking and resting pulse rate are sparse, but the available data from observational studies suggest that smoking may be associated with increased pulse rate at least in some subgroups. We performed a Mendelian randomisation analysis, using data on 141,916 individuals from the Consortium for Causal Analysis Research in Tobacco and Alcohol. We used linear regression to look at the associations of a smoking-related variant (rs1051730, rs16969968) with SBP, DBP, pulse, and pulse pressure (SBP-DBP), and logistic regression to look at associations of the variant with hypertension. Analyses were stratified by smoking status (never, former, current, and ever (current and former)) and were adjusted for age and sex. Further analyses were performed adjusted for BMI. We also conducted observational analyses looking at the associations of both smoking status and smoking heaviness in current smokers with BP measures. Analyses were conducted within individual studies and results were meta-analysed. Evidence for interactions between genotype and smoking status was assessed using the Cochran Q statistic. We discuss the implications of these results for further understanding of the causal effect of smoking on blood pressure. This will inform the development of relevant public health messages and campaigns, and also potentially aid the development of novel treatments for blood pressure. This is a work in progress and we anticipate that results will be available within a month.

FUNDING: Lise Lotte Husemoen is supported by grants from the Health Insurance Foundation (grant No. 2010 B 131), Marcus Munafö is a member of the UK Centre for Tobacco and Alcohol 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. This work was supported by the Medical Research Council (grant numbers MR/J01351X/1, G0800612, G0802736, MC_UU_12013/1-9).

JUSTIFICATION: Knowledge of the causal effects of smoking on blood pressure will inform the development of relevant public health messages and campaigns.

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SYM9C

ASSESSING CAUSAL LINKS BETWEEN SMOKING AND INCOME USING A MENDELIAN RANDOMISATION APPROACH

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Low socio-economic status is associated with higher levels of smoking prevalence, increased risk of initiation, increased risk of progression to regular use, increased heaviness of smoking and level of nicotine dependence, and decreased likelihood of smoking cessation. Whilst it is widely believed that smoking is a consequence of deprivation and low socio-economic status, it is possible that smoking directly contributes to poverty, through reduced earning capacity. Research has demonstrated that smokers earn less than non-smokers and that smoking is associated with increased sick leave. However, making causal inferences about the nature of this relationship from conventional epidemiological studies is difficult due to the problems of confounding and reverse causality. We performed a Mendelian randomisation analysis, using data on 53,866 individuals from the Consortium for Causal Analysis Research in Tobacco and Alcohol to investigate the causal nature of associations of smoking with income levels. Analyses of the association between a smoking-related variant (rs1051730, rs16969968) and income were assessed by linear regression, stratified by smoking status (categorised as never, former, current and ever) and sex and adjusted for age. Income (individual or household), assessed at the same time as smoking status, was standardized and treated as a continuous variable. Analyses were restricted to individuals aged 25 and 65 years. In addition we performed observational analyses of the associations between smoking status and smoking heaviness (within current smokers) and income using linear regression. Results from individual studies were meta-analysed. Interactions between smoking status and the variant were assessed by the Cochran Q Statistic. We discuss the implications of these results for further understanding of the causal effect of smoking on income. This will inform the development of relevant public health policy. This is a work in progress and we anticipate that results will be available within a month.

FUNDING: Jennifer Ware and Marcus Munafö are members of the UK Centre for Tobacco and Alcohol 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. This work was supported by the Medical Research Council (grant numbers MR/J01351X/1, G0800612, G0802736, MC_UU_12013/1-9). Jennifer Ware is supported by a Post-Doctoral Research Fellowship from the Oak Foundation.

JUSTIFICATION: Knowledge of the causal effect of smoking on income will inform public health policy.

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SYM9D

ASSESSING CAUSAL LINKS BETWEEN SMOKING AND REGIONAL ADIPOSY Using A MENDELIAN RANDOMISATION APPROACH

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There is evidence from Mendelian randomisation analysis that smoking causally lowers body mass index (BMI). However, it is not clear which aspects of weight distribution are affected, and observational evidence suggests waist circumferences and waist-hip ratio may be higher in smokers than non-smokers after adjusting for BMI. Moreover, among middle-aged Caucasians, heavy smokers exhibit greater central adiposity than light smokers, particularly among women. These studies suggest that smoking leads to a central fat accumulation at the expense of peripheral fat loss, particularly in women. In addition, there are also suggestions that smoking may lead to muscle mass loss as indicated by lower hip circumferences in smokers. We performed a Mendelian randomisation analysis, using data on 133,000 individuals from 21 studies in the Consortium for Causal Analysis Research in Tobacco and Alcohol to investigate the causal nature of associations of smoking with anthropometric and blood measures of regional adiposity. Associations of a smoking related variant (rs1051730, rs16969968) with waist circumference, hip circumference, waist-hip ratio, arm circumference, skinfold thicknesses, fat mass, fat free mass, and leptin and adiponectin (all log transformed) were assessed using linear regression, adjusted for age and stratified by sex and smoking status (never, former, current, ever). All analyses were additionally adjusted for BMI (or height for fat and fat free mass). In addition, we performed observational analyses of associations of smoking status with regional adiposity measures using linear regression. Results from studies were combined in meta-analyses. Interactions between smoking status and genotype, and sex and genotype, were assessed using the Cochran Q statistic. We discuss the implications of these results for further understanding of the causal effect of smoking on regional adiposity. This will inform the development of relevant public health messages and campaigns, and also potentially aid the development of novel treatments for disease outcomes. This is a work in progress and we anticipate that results will be available within a month.

FUNDING: Richard Morris is supported by the Higher Education Funding Council for England (HEFCE).

JUSTIFICATION: Knowledge of the causal effects of smoking on regional adiposity will inform the development of relevant public health messages and campaigns, and also potentially aid the development of novel treatments for disease outcomes.

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SYM9E
ASSESSING CAUSAL LINKS BETWEEN SMOKING AND VITAMIN D USING A MENDELIAN RANDOMISATION APPROACH

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There is a widening perception that many factors (lifestyle and others e.g., acute/chronic inflammation) may causally lower vitamin D levels. Observationally, smoking tends to be associated with lower vitamin D levels. Smokers also have increased fracture risk and decreased bone mass suggesting a potential causal effect of smoking on vitamin D. It has also been suggested that tobacco smoke chemicals may influence vitamin D metabolism and function. However, determining a causal link between smoking and lower vitamin D is problematic in conventional epidemiological studies due to confounding by other lifestyle factors. We performed a Mendelian randomisation analysis, using data on 32,823 individuals from the Consortium for Causal Analysis Research in Tobacco and Alcohol to investigate the causal nature of the associations of smoking with vitamin D levels. Associations between a smoking related variant (rs1051730/rs1696968) and serum vitamin D (25(OH)D) were assessed by linear regression stratified by smoking status (categorised as never, former, current, ever (former and current), and non (never and former)) and adjusted for age, sex, and geographic region, and additionally for body mass index (BMI). Observational associations between smoking status and vitamin D were assessed by linear regression, adjusted for age, sex, and month of data collection and additionally for geographic region, socio-economic status and BMI. Results from individual studies were meta-analysed. Interactions between smoking status and genotype were assessed using the Cochran Q statistic. We discuss the implications of these results for furthering understanding of the causal effect of smoking on vitamin D. This will inform the development of relevant public health messages and campaigns, and also potentially aid the development of novel treatments for disease outcomes. This is a work in progress and we anticipate that results will be available within a month.

FUNDING: This work was supported by grants from Diabetes UK and Chest Heart Stroke Scotland. Lise Lotte Husemoen is supported by grants from the Health Insurance Foundation (grant No. 2010 B 131). Amy Taylor is a member of the UK Centre for Tobacco and Alcohol 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. This work was supported by the National Institute for Health Research, under the auspices of the UK Clinical Research Collaboration, is gratefully acknowledged. Naveed Sattar is supported by a grant from the Wellcome Trust. Lise Lotte Husemoen is supported by grants from the Health Insurance Foundation (grant No. 2010 B 131). Amy Taylor is a member of the UK Centre for Tobacco and Alcohol 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. This work was supported by the National Institute for Health Research, under the auspices of the UK Clinical Research Collaboration, is gratefully acknowledged.

JUSTIFICATION: Knowledge of the causal effects of smoking on vitamin D will inform the development of relevant public health messages and campaigns, and also potentially aid the development of novel treatments for disease outcomes.

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SYM10
THIRDHAND CIGARETTE SMOKE: CHEMISTRY, EXPOSURE, TOXICITY, RISK ASSESSMENT AND POLICY IMPLICATIONS

Chair: Suzann F. Schick, Ph.D., University of California, San Francisco Presenters: Lara Gundel, Ph.D., Indoor Environment Group, Lawrence Berkeley National Laboratory; Manuela Martins-Green, Ph.D., University of California, Riverside, Cell Biology and Neurosciences Department; Jennifer Logue, Ph.D., Residential Building Systems Group, Lawrence Berkeley National Laboratory; and Jonathan P. Winickoff, M.D., Tobacco Research and Treatment Center, Massachusetts General Hospital

Discussant: Hugo Destaillats*, Ph.D., Indoor Environment Group, Lawrence Berkeley National Laboratory

Smoking releases thousands of chemicals into the environment. Many of these chemicals are semi-volatile organic compounds: oily, waxy, tar-like substances that stick to indoor surfaces and dust, are only partially removed by ventilation and persist long after the cigarettes are extinguished. These persistent chemicals are called thirdhand cigarette smoke (THS). THS accumulates in the environment, releases slowly back into the air and can react to form new chemicals. 60-90% of the nicotine released into the indoor environment during smoking will sorb to indoor surfaces. Sorbed THS can react with ambient gases to form carcinogenic compounds, including NNA: a nitrosamine that is not found in tobacco or secondhand smoke (SHS). Sorbed THS can also react to release new, respirable particles into the air. New data suggest that THS may have a different chemical structure than SHS. Low levels of THS chemicals evaporate back into the air and create a continuous, low-level exposure that may have a large cumulative effect on total VOC and particle exposure. THS can also be absorbed dermally, through contact with contaminated surfaces, and consumed by children as they mouth contaminated objects. Nonsmokers who move into homes previously occupied by smokers and nonsmokers who stay in hotel rooms that permit smoking have elevated levels of cotinine. Common cleaning methods do not appear to eliminate THS. THS in experimental biological systems can damage DNA, produce cytotoxic responses in cells, and cause steatosis, dislipidemia, lung inflammation, insulin resistance, metabolic syndrome, and hyperactive behavior in mice. Some of the toxic effects of THS appear to be caused by volatile organic compounds, others by less volatile oxidizing compounds, such as nitrosamines and polycyclic aromatic hydrocarbons. Knowing that THS is toxic and persistent can motivate parents to attempt to quit smoking and to enforce strict smokefree rules in their homes and cars. The available scientific knowledge on THS supports smokefree regulations in multiunit housing, disclosure laws for real estate and vehicle sales and a vigorous effort to protect the public from the potential health risks of THS exposure.

JUSTIFICATION: The available scientific knowledge on THS supports smokefree regulations in multiunit housing, disclosure laws for real estate and vehicle sales and a vigorous effort to protect the public from the potential health risks of THS exposure.

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SYM10A
CHEMICAL CHARACTERIZATION OF THIRDHAND SMOKE: INDOOR CHEMISTRY, ANALYTICAL METHODS FOR DIFFERENT INDOOR MEDIA, AND POLLUTION AND EXPOSURE IN REAL-WORLD SETTINGS

Lara A. Gundel, Ph.D.1, Hugo Destaillats, Ph.D.1, Mozamad Sleiman, Ph.D.1, Peyton Jacob III, Ph.D.1, and Georg E. Matt, Ph.D.2. 1Indoor Environment Group, Lawrence Berkeley National Laboratory; 2University of California, San Francisco, Department of Medicine, Division of Clinical Pharmacology. 3San Diego State University, Department of Psychology.

Thirdhand smoke consists of the pollutants that linger indoors after cigarette smoking, as well as their degradation byproducts. Exposure to this complex mixture can take place by several routes: inhalation, dermal contact, and dust ingestion, leading to potentially significant health, economic, and policy impacts. We developed analytical methods based on gas chromatography – mass spectrometry (GC-MS) and liquid chromatography – tandem mass spectrometry (LC-MS/MS) to measure concentrations of key tobacco toxicants in indoor air, fabrics, wallboard, culture media containing THS extracts, and house dust.
The gas-phase composition of THS evolves over time, and the percentage of nitrogenated compounds decreases, compared with fresh secondhand smoke. We have identified a set of potential THS gas-phase markers, including acetonitrile, isoprene, furans, and acetaldehyde. Cloth that has been exposed to SHS emits VOCs for days and months after exposure. Large amounts of nicotine and other smoke constituents adsorb strongly to indoor surfaces, and can react with indoor ambient nitrogen oxide to form carcinogenic tobacco-specific nitrosamines (TSNAs). Nicotine can also react with ozone (commonly present indoors through infiltration from outdoor air or generated by “air purifiers”), to form ultrafine particles containing a large number of partially oxidized byproducts that may be more severe asthmagens than the precursors. In field studies, THS compounds, including nicotine, 3-ethenyl pyridine, PAHs, and TSNAs, were found in private homes and cars, hotel rooms, and rental cars. As time passes, THS is more likely to be found on surfaces and in dust than in the air. Exposure to THS results in elevated levels of nicotine, cotinine, and NNAL in the urine, hair, and skin of non-smokers. This research demonstrates that smoking constitutes a dominant source of indoor pollution, and that smoke toxins remain in indoor environments long after smoking ceases.


JUSTIFICATION: The fact that thirdhand cigarette smoke persists in the environment and can react to form new toxins is strong support for smoke-free regulations.

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SYM10B
THIRDHAND SMOKE EXPOSURE INDUCES INSULIN RESISTANCE WITH A PHENOTYPE RESEMBLING NON-OBESE TYPE-2 DIABETES

Neema Adhami, Cristina Flores, and Manuela Martins-Green, Ph.D., University of California, Riverside, Department of Cell Biology and Neurosciences.

Thirdhand smoke (THS) consists of tobacco smoke toxins that linger on surfaces and in dust after tobacco has been smoked, including toxins that are re-emitted into the air, or react with other chemicals in the environment to yield new pollutants. We generated THS by exposing normal household fabrics and carpet to SHS and created THS exposure by housing wild-type C57BL/6 mice in the materials. Control mice were housed in normal bedding and both groups were fed a normal diet. Exposure occurs by ingestion, inhalation, and dermal absorption. THS-exposed mice have fasting blood glucose levels 25-50% higher than controls, cannot bring their glucose levels back to normal when fed glucose and, if given insulin, cannot use it to reduce circulating glucose levels. Because insulin is a key regulator of lipid metabolism, we tested total lipid, triglycerides, and LDL (bad cholesterol) and found their levels to be significantly increased and HDL (good cholesterol) levels to be decreased in THS-exposed mice. Although these animals were thin, their gut organs were covered with white fat, much like people with non-obese, stress-induced type 2 diabetes. Control animals had virtually no visceral fat. Insulin resistance and high lipid content indicate the presence of metabolic syndrome. Skeletal muscle is a major glucose-utilizing tissue and is highly affected by disorders in glucose and lipid metabolism. In THS-exposed mice, H2O2 levels are 75% above controls and the activity of catalase and glutathione peroxidase, two antioxidant enzymes, is much lower. This indicates elevated oxidative stress (OS) in skeletal muscle. FOXO1, a gene regulated by OS, is up-regulated in THS-exposed mice. FOXO1 induces apoptosis and down-regulates the insulin receptor, its substrates and the GLUT 4 transporter that brings glucose into the cell. Expression levels of these molecules are decreased in THS-exposed mice, suggesting that THS-induced OS contributes to insulin resistance. We conclude that THS is a stressor that can potentially lead to non-obese, stress-induced type 2 diabetes. This form of diabetes accounts for 15% of diabetes in the world and results in higher mortality than obesity-induced type 2 diabetes.

FUNDING: Supported By: The California Tobacco-Related Disease Research Program, grant # 273434.
SYM10D  
THIRDHAND SMOKE BELIEFS OF PARENTS AND CHILD PROTECTIVE BEHAVIORS

Jeremy E. Drehmer, M.P.H.,¹ Emara Nabi-Burza, M.B.B.S., M.S.,¹ Bethany Hippel, M.P.H.,¹ Nancy A. Rigotti, M.D.,¹ Yuchiao Chang, Ph.D.,¹ Heide Woo, M.D.,¹ and Jonathan P. Winickoff, M.D., M.P.H.,¹ ¹Center for Child and Adolescent Health Research and Policy and the Tobacco Research and Treatment Center, Massachusetts General Hospital; 2General Medicine Division, Massachusetts General Hospital, Harvard Medical School; 3Department of Pediatrics, University of California, Los Angeles; 4Center for Child and Adolescent Health Research and Policy and the Tobacco Research and Treatment Center, Massachusetts General Hospital and Richmond Center, American Academy of Pediatrics.

Little is known about how thirdhand smoke (THS) beliefs emerge, evolve, and influence parental smoking behaviors and attitudes. To determine if the belief that THS is harmful to the health of children is associated with smoking parents' attitudes, home or car smoking policies, and quitting behaviors, we collected data as part of a national RCT. Clinical Effect Against Secondhand Smoke Exposure. THS beliefs of 1947 smoking parents were assessed in an exit-interview following a pediatric office visit in 10 intervention and 10 control practices. Of the 1947 parents, 12-month telephone survey data were collected from 1355 parents about parental THS beliefs, behaviors, and attitudes. Multivariable logistic regression was used to determine if belief that THS harms the health of children is independently associated with parental behaviors and attitudes 12 months later. Odds ratios were adjusted for parent gender, age, education, race and ethnicity, number of cigarettes smoked per day, and study arm assignment. Additionally, a chi-square was calculated to determine if parents who disagreed at the exit-interview that THS is harmful were more likely to make a quit attempt if they later agreed that THS is harmful at the 12-month interview. Belief at the exit-interview that THS is harmful was independently associated with parents' perceptions at 12-month follow-up that being a smoker gets in the way of being a parent (aOR 2.27 (1.40 – 3.70)), using assistance to help quit smoking (aOR 1.70 (1.08 – 2.67)), and having a strictly enforced smoke-free home policy (aOR 2.05 (1.37 – 3.05)) and car policy (aOR 1.69 (1.04 – 2.74)). Among parents who initially disagreed at the exit-interview that THS is harmful, a significantly higher percentage (71% vs. 50%) made at least one quit attempt during the study period if they later agreed at the 12-month interview that THS is harmful, compared to parents who continued to disagree (p<.02). THS harm belief is associated with a strictly enforced smoke-free home, car, and attempts to quit smoking. Sensitizing parents to THS risk could facilitate beneficial tobacco control outcomes.

FUNDING: Supported 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 S-5-U46-10-001) and the AAP.

SYM10H  
THE IMPORTANCE OF TOBACCO PACKAGING AS A COMMUNICATIONS TOOL

Chair: Dr. Crawford Moodie, Centre for Tobacco Control Research, University of Stirling, Scotland

Presenters: Prof. David Hammond, School of Public Health and Health Systems, University of Waterloo, Canada, Prof. James Thrasher, Department of Health Promotion, Education, and Behaviour, University of South Carolina, US, and Prof. Karine Gallopel-Morvan, School of Public Health, Rennes, France

Discussant: Olivia Maynard, School of Experimental Psychology, University of Bristol, England

Packaging is a crucial and multi-functional marketing tool for tobacco companies. It can help capture consumer attention, heighten product appeal, influence product perceptions, aid purchase decisions and help drive the sale. As the only part of marketing communication that a consumer takes home post-purchase, packaging can also help build relationships through possession and usage. Packaging is, therefore, a unique marketing tool that plays a key role in how consumers are attracted to and experience a product. Tobacco packaging is not only an important communications tool for tobacco companies however, but also for governments. In the first talk, Hammond will discuss findings from a discrete-choice experiment on the importance of pack size and shape among young women, including the effect of “superslims” packaging. The study is among the first to test the impact of pack shape within the context of other packaging attributes such as branding and price. With the superslims segment growing faster than the overall cigarette market, this talk will highlight the value of packaging as a promotional tool. Packaging can also be used as a dissuasive tool however. Gallopel-Morvan will present findings from a naturalistic plain packaging study from France, where young adult smokers used plain roll-your-own packs for a period of ten days but otherwise smoked and socialised as normal. The study is the first to use only roll-your-own smokers. Thrasher will then discuss the role of packaging as an informational tool, specifically how on-pack warnings and pack inserts can be used to inform consumers of available help and the relationship between reading pack inserts and attempting to quit. Findings come from the first three waves of a longitudinal study of adult smokers from Australia, Canada and Mexico. Finally, Moodie will consider novel ways, beyond warnings, pack inserts and plain packaging, that the pack could be used to communicate risk and cessation messages and dissuade smokers. Findings come from a qualitative study in Scotland exploring young women smokers’ response to novel cigarette packaging, e.g., packs designed to play audio messages when the lid is opened.

SYM111A  
THE INFLUENCE OF PACK SHAPE AND “SLIM” CIGARETTES AMONG YOUNG WOMEN IN CANADA: EVIDENCE FROM A DISCRETE CHOICE EXPERIMENT.

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Background: In 2012, Australia became the first country in the world to ban “slim” cigarette packaging, with the European Commission proposing to do likewise. Slim and superslims pack sizes are primarily marketed towards females, and the presence of these brands is increasing. To date, few studies have tested the impact of different cigarette attributes simultaneously, including pack shape/size, branding and health warnings. This evidence is critical to ongoing legal challenges to packaging regulations. Method: A discrete choice experiment was conducted with smoking and non-smoking females, aged 16 to 24 (N=503). Respondents were shown 8 choice sets, each containing four packs containing different combinations of the attributes: pack structure (slim, lipstick, booklet, standard); brand ('Vogue', 'du Maurier'); branding (branded, plain); warning label size (50%, 75%); and price ($8.45, $10.45). For each choice set, respondents chose the brand that they: 1) would rather try, 2) would taste better, 3) would be less harmful, or “none”. The attributes’ impact on choices for each outcome was analyzed using a multinomial logit model. Results: Pack structure, branding, brand name, and warning size significantly increased interest in trying and taste related perceptions among young females. Specifically, packs with branding, “booklet” opening, significantly increased interest in trying and were perceived as better tasting. Perceptions of product harm were significantly driven by pack structure, branding, brand name, and price. Young females perceived slim and lipstick pack sizes, branded packs, ‘Vogue' brand, and more expensive packs as less harmful. Conclusions: The findings suggest that “plain” packaging and prohibiting variations in packs shaper/size may decrease interest in trying these packs and reduce false perceptions of reduced product harm among young females.

FUNDING: This research was funded by the National Institutes of Health (Grant number: 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
**SYM11B**  
THE IMPACT OF PLAIN ROLL-YOUR-OWN PACKAGING ON YOUNG ADULT SMOKERS IN FRANCE: A NATURALISTIC APPROACH

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Background: While there is a growing body of research on plain packaging, this has focused exclusively on plain cigarette packs. We explored the impact, if any, that plain roll-your-own (RYO) packaging has with young adult RYO smokers.

Method: Naturalistic research was employed, where 133 French young adult smokers (18-25 years) used plain RYO packs (75% pictorial warnings on pack front and reverse) for ten days in real-world settings. Participants were recruited in April 2013 in five cities in France (Paris, Marseille, Metz, Nantes, Toulouse). Participants completed questionnaires at the start and end of the study which allowed comparison between plain packs and their own packs. The questionnaires assessed pack perceptions (e.g., attractive, stylish); product perceptions (e.g., tastes light, tastes natural, good quality); brand attachment (e.g., brand appreciation, brand affection); feelings about smoking (satisfying, pleasurable); feelings while using the pack in front of others (e.g., embarrassment, hiding pack); response to warnings (credibility, awareness of risks) and smoking-related feelings (feel like smoking, feel like reducing consumption, feel like quitting). Results: After using plain RYO packs for ten days, participants were significantly more likely to miss out on cigarettes because they thought about the dangers of smoking, and significantly more likely to feel like reducing consumption and quitting. There were no significant differences, however, between the pack types in terms of number of smoked cigarettes, credibility of the health warnings or perception that the tobacco inside the pack was dangerous. Conclusions: While most (90%) of the sample were pre-controllers (i.e., they did not want to quit), using plain packs altered their perception of the pack and the product, weakened brand attachment, and increased motivation to reduce consumption and quit.

FUNDING: French Health Ministry (Direction Générale de la Santé)

**SYM11C**  
PROMOTINGcessation RESOURCES THROUGH CIGARETTE PACKAGE HEALTH WARNING LABELS AND INSERTS

James Thrasher**, Erika Nayeli Abad, Dave Hammond, Maansi Bansal-Travers, K. Michael Cummings, Hua Yong, Crawford Moodie, Ron Borland, and James Hardin,  
Department of Health Promotion, Education & Behavior, Arnold School of Public Health, University of South Carolina, Columbia, SC

Background: Cigarette health warning labels (HWLs) and pack inserts can provide smoking cessation information, but the impact of this information is not well understood. Method: Online consumer panels of adult smokers, aged 18 to 64, from Australia, Canada and Mexico, were surveyed in September, 2012, January, 2013 and May, 2013, and replenished to maintain sample sizes of 1000 participants in each country at each wave. Logistic generalized estimating equations (GEE) were used to assess correlates of citing HWLs as a source of information on quitlines and cessation websites. GEE models also regressed having called the quitline and having visited a cessation website on awareness of the resource because of HWLs. Having tried to quit by the subsequent wave was regressed on the frequency of reading pack inserts with cessation tips (only used in Canada). Both country-stratified and pooled models were estimated, controlling for sociodemographics and smoking-related variables. Results: Citing HWLs as a source of information about quitlines was more prevalent in Canada (33%) than in Australia (24%) or Mexico (20%), but the level in Australia increased after implementing new HWLs (from 19% to 27%, p<0.001). In pooled analyses, citing HWLs as a source of quitline information was significantly correlated with report of calling a quitline. Citing HWLs as the source of information about cessation websites was more prevalent in Canada (14%) than in Australia (6%) at the beginning of the study (Mexico was excluded from the analysis because HWLs do not contain this information), and again this increased (to 10%) and became comparable to Canada afterwards. Citing HWLs as a source of information on cessation websites had a statistically significant association with having visited a cessation website (AOR=8.44 in Australia; AOR=8.56 in Canada). In Canada, frequency of reading pack inserts with cessation tips (often/very often vs. not at all) predicted attempting to quit by the subsequent wave (AOR=2.14; p<0.01). Conclusions: HWLs and pack inserts are an important source of smoking cessation information which on governments should capitalize.

FUNDING: Funding for data collection and analyses was provided by a grant from the United States’ National Cancer Institute (R01 CA167067)

**SYM11D**  
NOVEL MEANS OF COMMUNICATING HEALTH RISK AND CESSATION MESSAGES VIA CIGARETTE PACKAGING: A QUALITATIVE STUDY

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Centre for Tobacco Control Research, Institute for Social Marketing, University of Stirling, Stirling, Shire, Scotland

Background: Although smoking prevalence is in long-term decline in the United Kingdom (UK), as it is in many developed markets, rates of smoking among young women remain particularly high. We consider novel ways that cigarette packaging could potentially be used to encourage young women smokers to think about their smoking behaviour. Method: Focus group research was conducted with 49 young adult women smokers, aged 16-24 years, from Greater Glasgow (Scotland) to explore their response to three innovative pack designs used to communicate the health risks of smoking and the benefits of cessation: (1) cigarette packs with Quick Response barcodes incorporated into the pack design which, when scanned with a smartphone, link to stop-smoking websites; (2) cigarette packs which play audio messages, when the lid is opened, explaining the health risks of smoking or benefits of quitting; and (3) the inclusion of a warning (Smoking kills) on the cigarette. Results: In general, all three measures were perceived to have value in communicating the health risks of smoking. Though quitting was a low priority for young women, the packs which played audio messages were perceived...
as very difficult to avoid and off-putting. There was support for the use of on-pack QR barcodes which link to stop-smoking websites, which were considered helpful, at least if thinking about quitting. There were mixed perceptions about 'Smoking Kills' on the cigarette itself, with most thinking that it would have little impact but some suggesting that it would make them stop, mainly due to embarrassment, and others considering it a constant reminder of the health risks. Conclusions: With some creative thinking both packaging and product design can be manipulated to more effectively communicate risk and cessation messages.

FUNDING: Cancer Research UK (Grant number: C14362)

JUSTIFICATION: This study shows that with some creative thinking both packaging and product design can be manipulated to communicate risk and cessation messages

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SYM12 EMERGING SCIENCE ON MENTHOL CIGARETTES: IMPLICATIONS FOR TREATMENT AND POLICY

Chair: Joanne D'Silva*, M.P.H., ClearWay Minnesota Presenters: Kolawole S. Okuyemi, M.D., M.P.H., University of Minnesota, Michael Kotlyar, Pharm.D., University of Minnesota, Arthur L. Brody, M.D., University of California at Los Angeles, and Michael Freiberg, J.D., Public Health Law Center Discussant: Dorothy K. Hatsuikami*, Ph.D., University of Minnesota

Since the passage of the Family Smoking Prevention and Tobacco Control Act, menthol cigarettes have been the focus of much discourse and debate within the tobacco control community. While some countries such as Brazil have taken steps to ban menthol cigarettes, the fate of menthol cigarettes in the U.S. will be determined by regulatory action from the Food and Drug Administration. Although independent reviews of the literature have found that smoking menthol cigarettes has been associated with increased smoking initiation, greater addiction and decreased quitting, there is a need for additional research to broaden our understanding of the impact of menthol cigarettes to inform regulatory actions worldwide, to assess the impact of potential regulatory actions and to help menthol smokers quit. This symposium will present new information on the impact of menthol cigarettes as it relates to user preferences, treatment implications and policy options. First, Kola Okuyemi will present new epidemiological data on socio-demographic factors that were associated with the use of menthol cigarettes in a multi-ethnic sample in South Africa. Second, Michael Kotlyar will report on an innovative study that simulated menthol smokers' response to a ban on menthol cigarettes. All participants switched to non-menthol cigarettes and reported that it was difficult to quit smoking. Next, Arthur Brody will present brain imaging data demonstrating that menthol smokers have greater up-regulation of nicotine receptors, which may impact their quitting behavior. Beyond federal action, options for product regulation also exist at the local and state levels. These policy options will be discussed by Mike Freiberg, who will present a review of the legal literature with emphasis on evidence-based policy approaches to address menthol cigarette use. Collectively, these studies will present new information on menthol cigarettes from epidemiological, clinical and policy perspectives that will add to the evidence base. The discussant, Dorothy Hatsuikami, will facilitate a dialogue between the audience and the panelists on the future of menthol research, treatment and advocacy.

FUNDING: NA

JUSTIFICATION: The research presented in this symposium has the potential to inform treatment and policy options to address menthol cigarette use.

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SYM12A CORRELATES OF MENTHOLATED CIGARETTE USE AMONG A MULTIETHNIC SAMPLE OF SMOKERS IN SOUTH AFRICA


Studies in the USA have shown differences in preference for mentholated cigarettes among Blacks and Whites with about 80% of Blacks smokers smoking menthol cigarettes compared to only 20% for Whites. However, limited research has been conducted on preferences for mentholated cigarettes among racial/ethnic groups outside of the USA. The purpose of the current study was to determine socio-demographic correlates of smoking mentholated cigarettes in a multi-ethnic population in South Africa including Blacks (59%), Coloureds (19%), Indians/or Asians (4%), and Whites (18%). Data was derived from the 2010 South African Social Attitudes Survey (SASAS), a representative sample of adults 16 years and older (n=620 smokers). Univariate and logistic regression analyses were conducted to determine correlates of mentholated cigarette use. Overall, 8.7% of the sample smoked menthol cigarettes (9.1% for Blacks, 8.3% for Coloureds, 4% for Indians/or Asians, and 12.3% for Whites). Univariate analysis showed that compared to smokers of non-mentholated cigarettes, mentholated cigarette smokers were more likely to be urban residents, use smokeless tobacco (snuff), report higher ratings of sensory perceptions in brand choice, report greater exposure to secondhand smoking at a bar, and report a better health status. Mentholated cigarette smokers were also less likely to buy single cigarettes, smoke low-tar cigarettes and less likely to use water-pipe. Logistic regression analysis showed that use of mentholated cigarettes was independently positively associated with female gender, smoking fewer cigarettes per day, contemplation stage of readiness to quit, not buying cigarette singles, and reporting higher ratings of sensory perceptions as an important consideration for selected cigarette brand. This study showed that only a small proportion of smokers in South Africa use mentholated cigarettes and there were no significant differences in use of mentholated cigarettes by racial/ethnic groups. Future studies should examine the potential treatment and policy implications of identified socio-demographic differences between menthol and non-menthol smokers.

FUNDING: No funding.

JUSTIFICATION: The findings can inform treatment and policy decisions for tobacco control.

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SYM12B SMOKER RESPONSE TO BANNING OF MENTHOL FLAVORED CIGARETTES

Michael Kotlyar, Pharm.D., Anne M Mills, M.P.H., Ryan Shanley, M.S., Kolawole S. Okuyemi, M.D., M.P.H., and Dorothy K. Hatsuikami, Ph.D., University of Minnesota

With the passage of the Family Smoking Prevention and Tobacco Control Act, the United States Food and Drug Administration (FDA) banned cigarettes flavored with fruit or candy in response to evidence that such flavoring encourages experimentation by young people and leads to regular use and ultimately addiction. Menthol was specifically excluded from this ban as the FDA examines the role of menthol in initiation, maintenance and health risks associated with use of such products. A piece of information that is needed regarding the consequences of banning menthol is to determine the effect such a ban would have on current smokers of menthol cigarettes. In this pilot project, 19 African American menthol cigarette smokers have completed a study in which they were asked to not smoke menthol cigarettes for 4 weeks. Subjects were seen at a screening visit, a baseline visit and at 1 week, 2 weeks and 4 weeks after stopping smoking menthol cigarettes. Subjects were given no specific instructions regarding how to cope with the inability to smoke menthol cigarettes. A total of 24 subjects were seen at the baseline visit. Of these, 21 completed the week 1 visit and 19 completed the week 4 visit. All smokers switched to non-menthol cigarettes. Two subjects made a smoking cessation attempt during the 4 week period. At the conclusion of the study, subjects were asked on a 10 point scale to rate how difficult it was to quit menthol cigarettes (1=easy; 10=hard) and the extent to which they were supportive of banning menthol cigarettes (1=not supportive; 10=very supportive).
Subjects indicated that quitting menthol cigarettes was difficult (average score = 7.7) and that they were generally supportive of banning menthol (average score = 6.5). Despite finding it difficult to abstain from menthol cigarettes, most subjects were generally supportive of a ban on menthol cigarettes.

FUNDING: This research is supported by grant # RC-2013-0001 from ClearWay Minnesota and by award # 8UL1TR000114-02 from the National Center for Advancing Translational Sciences of the National Institutes of Health.

JUSTIFICATION: Information is needed regarding how smokers of menthol cigarettes are likely to respond to banning flavored cigarettes in order to determine the potential consequences of such an action.

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SYM12C
UP-REGULATION OF NICOTINIC ACETYLCHOLINE RECEPTORS: EFFECTS OF MENTHOL AND NON-MENTHOL CIGARETTE SMOKING
Arthur L. Brody, M.D.1, Alexey G. Mukhin, M.D., Ph.D.1, Trinh Luu, M.A.2, Jennifer Tsieh, B.S.2, Lidaa Libig, B.S.2, Michael Mamoun, M.D.2, and Mark A. Mandelkern, M.D., Ph.D.4, 1Department of Psychiatry, University of California at Los Angeles, 2Department of Research, VA Greater Los Angeles Healthcare System, 3Department of Psychiatry, Duke University, 4Department of Physics, University of California at Irvine

Background: Up-regulation of alpha4beta2 nicotinic acetylcholine receptors (nAChRs) is one of the most well-established effects of chronic cigarette smoking. In addition to studies of human post-mortem brain tissue and laboratory animals who have had nicotine administered, this up-regulation has been demonstrated in previous brain imaging studies of human smokers, without regard to cigarette type. Roughly one-third of smokers use primarily menthol cigarettes, and usage of these cigarettes leads to more difficulty quitting in standard treatment programs. Recently, our group sought to determine if menthol cigarette use results in greater nAChR up-regulation than non-menthol cigarette usage. Method: 114 participants (22 menthol cigarette smokers, 41 non-menthol cigarette smokers, and 51 non-smokers) underwent positron emission tomography (PET) scanning using the o4b2* nAChR radioligand 2-[18F]fluoro-A-85380 (2-FA). Results: In comparing the entire group of smokers to non-smokers, an overall test revealed a significant between-group difference, resulting from smokers having higher o4b2* nAChR levels in all regions studied (36 to 42%) other than thalamus (3%). In comparing menthol to non-menthol cigarette smokers, an overall test of 2-FA total volume of distribution values revealed a significant between-group difference, resulting from menthol smokers having 9 to 28% higher o4b2* nAChR densities than non-menthol smokers across regions. Conclusions: Study results demonstrate that menthol smokers have greater up-regulation of nAChRs than non-menthol smokers, and replicate earlier work demonstrating up-regulation of nAChRs in smokers compared to non-smokers. The difference between menthol and non-menthol smokers may be due to higher nicotine exposure in menthol smokers, though other mechanisms for menthol influencing receptor density are possible. These results provide additional information about the severity of menthol cigarette use, and may help explain why these smokers have more trouble quitting in standard treatment programs.

FUNDING: This study was supported by the Tobacco-Related Disease Research Program (A.L.B. [19XT-0135]), the National Institute on Drug Abuse (A.L.B. [R01 DA20872]), and a Veterans Affairs Type I Merit Review Award (A.L.B. [19XT-0135]). Dr. Mukhin is a co-investigator on a grant from Phillip Morris, Inc., for research unrelated to this study. The sponsors had no role in the design and conduct of the study; collection, management, analysis, and interpretation of the data; or preparation, review, or approval of the manuscript. All other authors report no biomedical financial disclosures or potential conflicts of interest.

JUSTIFICATION: A better understanding of the effects of menthol and non-menthol cigarette uptake on nicotinic acetylcholine receptor density may affect clinical decisions regarding treatment of cigarette smokers, along with public policy regarding menthol additives to tobacco.

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SYM12D
REGULATING MENTHOL
Mike Freiberg, J.D.* and Kerry Cork, J.D., Tobacco Control Legal Consortium

Menthol cigarettes have been used for years to target vulnerable populations. Yet when Congress prohibited most cigarettes with flavorings as part of the 2009 Family Smoking Prevention and Tobacco Control Act, it exempted the most important flavoring of all: menthol. The Tobacco Control Legal Consortium, the nation’s legal tobacco control network – in partnership with nationally recognized experts on tobacco and menthol – is researching innovative policy solutions to address the crushing public health burden of mentholated tobacco products. The Consortium is exploring the limits of the legal authority to regulate the use of menthol in tobacco products and developing practical tools that tobacco control advocates can use to address this problem. Using standard legal research techniques, we identified and compiled relevant statutes, ordinances, decisions, pleadings, attorney general opinions, and proposals. This data was synthesized to identify promising policy options for menthol regulation. This session will start with a summary of federal regulatory action to date on menthol, including steps taken by the U.S. Food and Drug Administration – the federal agency charged by law with regulating tobacco products. Dr. Mukhin will discuss the scientific community’s potential role in the legal process by encouraging and facilitating community engagement around the issue of menthol. The presenter will then describe ways the scientific community can interact with the FDA and encourage it to address the problem of menthol. Given the agency’s recent announcement that it is seeking public comments on menthol, members of the scientific community should take this opportunity to become involved in the regulatory process and contribute their expertise and perspectives. Unfortunately, the tobacco industry has been adept at using the regulatory process to delay the regulation of menthol. As a result, public health has suffered. Finally, the presenter will discuss innovative policy approaches that advocates could consider and that state and local governments could implement to regulate mentholated tobacco products. These policy options will be evidence-based, such as advertising restrictions for tobacco products containing menthol, as well as pricing and related marketing strategies.

FUNDING: Funding was received from ClearWay Minnesota.

JUSTIFICATION: This study is intended to positively impact policy directly.

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SYM13
TARGETED MARKETING: CIGAR USE AMONG AFRICAN AMERICAN YOUTH AND YOUNG ADULTS AND TOBACCO INDUSTRY ADVERTISING
Chair: Jennifer Cantril, Dr.P.H., M.P.A., Department of Research and Evaluation, Legacy, Washington, DC
Presenters: Renée A. Arrazola, M.P.H., Office on Smoking and Health, Centers for Disease Control and Prevention, Atlanta, GA; Kentya H. Ford, Dr.P.H., M.S., University of Texas College of Pharmacy, Austin, TX; Ollie Ganz, M.S.P.H., Department of Research and Evaluation, Legacy, Washington, DC
Discussant: Aashir Nasim, Ph.D., Virginia Commonwealth University

Tobacco industry advertising and promotions make effective use of a variety of communication channels to reach specific audiences, including the retail point-of-sale, online advertising and social media. While data is limited, recent studies indicate that advertising of alternative tobacco products, such as cigars, little cigars, and cigarillos, may be disproportionately marketed to African American populations. Further, research suggests that cigar products are popular and may be increasing among African American youth and young adults. This symposium will bring together national and local data to inform understanding of cigar use and marketing among African American youth. Presenters will provide data on cigar use trends among this population as well as an overview of new research on pro-cigar media and advertising among African American communities. The discussant, Dr. Christine Delnevo, will provide a brief introduction to the cigar market, with data from the Alcohol and Tobacco Tax Bureau on consumption, the National Survey on Drug Use and Health on user characteristics, and Nielsen market scanner data on brand and product features. This broad overview will be followed by presentations from Mr. Arrazola, of the Centers for Disease Control, who will present national data from the National Youth Tobacco Survey from 2000-2012 on cigar use trends over time among African Americans, whites and Hispanics. Dr. Ford will share
qualitative findings on exposure to and perceptions of pro-cigar videos on YouTube among both non-student and college-student African American young adults. Ms. Ganz will share data on cigar advertising, including flavored cigars, at the point-of-sale in Harlem, New York – a predominantly African American community. Drs. Cantrell and Delnevo will briefly summarize the presentations and lead a discussion on the research and policy implications of this work in the context of federal and local policies related to cigar advertising and promotion. Finally, the discussion will consider how this research can be used to inform interventions to reduce cigar use among African American youth and young adults.

JUSTIFICATION: This symposium has the potential to inform local and federal tobacco control policy as well as interventions related to advertising of cigar, little cigar and cigarillo products.

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SYM13A
TRENDS IN CURRENT CIGAR USE AMONG NON-HISPANIC BLACK HIGH SCHOOL STUDENTS, NATIONAL YOUTH TOBACCO SURVEY 2000-2012.


Cigars are the second most frequently reported tobacco product used among youth. This presentation provides the epidemiology, overall as well as by sex and grade, of current cigar use using the National Youth Tobacco Survey (NYTS). The 2000 to 2012 NYTS data were used to generate estimates and calculate trends of current cigar use among non-Hispanic White, Hispanic and non-Hispanic black or African American (AA) high school students. We tested both linear and quadratic trends for statistical significance (p<0.05). Changes in the trends for current cigar use were observed among high school AA. For example, a quadratic trend was detected from 2000 to 2012 (p<0.05); current cigar use decreased from 2000 to 2009 (15.6% - 7.1%, p<0.05) but it increased from 2009 to 2012 (7.1% - 16.7%; p<0.05). Among non-Hispanic White (15.0% - 12.2%; p=0.72) and Hispanic (12.5% - 12.4%; p=0.98) high school students, no significant changes were observed for current cigar use from 2000 to 2012. Despite past progress and no increases for other groups, the spike in current cigar use among high school AA students since 2009 suggests a growing public health concern and an increasing health disparity. More research is needed to understand why there has been a spike in current cigar use among AA high school students, to determine if these products are being disproportionately marketed to this population, to assess if lower pricing of these products could be driving this increase, and to develop effective targeted prevention interventions.

FUNDING: There were no sources of funding, either direct or indirect, for this study. Acknowledgment: The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

JUSTIFICATION: This research can inform clinical providers and public health practitioners of cigar use among minority populations.

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SYM13B
EXPLORE LITTLE CIGAR/CIGARILLIO YOUTUBE VIDEOS: WHAT SPEAKS TO AFRICAN AMERICAN YOUNG ADULTS?

Kentya H. Ford, Dr.P.H., M.S.**1, Ming-Ching Liang, M.A.1, Motolani Ogunsanya, B.Pharm.1, Maegan Stephens, M.A.2, Benita Bamgbade, Pharm.D.1, Carolyn Brown, Ph.D.1, and Kymberle L. Sterling, Dr.P.H.1, *University of Texas at Austin, College of Pharmacy, 1University of Texas at Austin, College of Communication, 2Georgia State University, Department of Public Health

African American (AA) young adults are a rapidly growing segment of little cigar/cigarillo (LCC) users. Culturally tailored LCC promotion may contribute to this trend. The Internet is a largely unregulated venue for manufacturers to reach target audiences. 75% of AA Internet users reported using social networking sites, where pro-LCC messages are prevalent. We assessed young AA adults’ exposure to LCC messages, perceptions of YouTube videos, and explored how culturally-relevant cues in YouTube videos may promote LCC use among this group. Seven focus group sessions were held, with 26 non-student and 16 college student LCC users (aged 18-25). Participants shared their experience with LCC messages and evaluated LCC YouTube videos. Two of the three videos were shown in each session: a consumer product review of LCCs, a music video with LCC product placement, and an anti-LCC message. The product review showed a white man smoking and reviewing a LCC product; the music video showed a black rapper using LCC products with marijuana; and the anti-LCC message showed a speech addressed to AA adolescents. The majority of young adults reported little media exposure to LCC information. Some reported exposure to point-of-sale (POS) messages at local stores. Friends, siblings, and retail store staff were primary sources of LCC information. Not many watched LCC-related messages on YouTube. Most disliked the product review because the reviewer smoked LCCs as a tobacco product and participants believed LCC products to be used primarily as carriers for marijuana. Although cultural cues—black characters, AA styling, and rap music—appeared in the music video, participants did not think it specifically targeted AA population. Yet, some reported a desire to use LCCs after viewing. Most agreed with the anti-LCC clip and considered it ethnically targeted, but few considered quitting after viewing. YouTube videos may serve to promote LCCs and encourage use among current LCC users. POS advertising and interpersonal sources can be influential to AA young adults’ LCC consumption. Additional research is needed to understand how culturally-linked depictions of LCC in popular media may encourage use among AA young adults.

FUNDING: This project was funded by a research grant awarded by University of Texas, Office of the Vice President for Research to Dr. Kentya Ford, Principal Investigator. Also, this study was supported by the University of Texas, College of Pharmacy.

JUSTIFICATION: This research can help to inform public health interventions addressing cigar use among African Americans.

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SYM13C
THE AVAILABILITY AND PRICE OF LITTLE CIGARS AND CIGARILLIOS AT THE POINT-OF-SALE IN CENTRAL HARLEM, NEW YORK CITY

Ollie Ganz, M.S.P.H.**1, M. Jennifer Cantrell, Dr.P.H., M.P.A.1, Joyce Moon-Howard, Dr.P.H.1, Angela A. Aidala, Ph.D.1, Thomas R. Kirchner, Ph.D.1, and Donna M. Vallone, Ph.D., M.P.H.1, Department of Research and Evaluation, Legacy Foundation, 1Department of Sociomedical Sciences, Columbia University Mailman School of Public Health, 2Schoenher Institute, Legacy Foundation

Research has found that little cigars and cigarillos (LCCs) become cheaper and more available as the proportion of African Americans in a neighborhood increases and that having a higher proportion of African Americans and young adults is associated with more LCC exterior advertising. However, it is not clear whether the availability of flavored LCCs, which may be appealing to youth and young adults, varies by neighborhood demographics. A pilot study was conducted from February, 2013 to July, 2013 to examine tobacco point-of-sale advertising and promotion in Central Harlem, New York City, a predominantly African American neighborhood. An interactive voice response (IVR) system was used to collect survey data and
a smartphone application was used to collect photos of the interior and exterior of the retail environment for the 156 currently operating outlets licensed to sell tobacco in Central Harlem, New York City. Survey data was collected on the lowest pack price, promotion and placement of various tobacco products, including cigarettes, LCCs, smokeless tobacco and electronic cigarettes. Among the stores that were open at the time of the survey (n=152), 8.5% had LCC advertising on the exterior of the store and 71.7% sold LCCs inside the store. Of those stores that sold LCCs, the average price per pack was $1.38 (pack sizes range from 1 to 7 LCCs per pack). Slightly over half of the stores that sold LCCs, sold flavored LCCs (51.8%). Regression analyses demonstrated that block groups in areas with a greater proportion of young adults were nearly three times more likely to sell flavored LCC’s than block groups with fewer young adults. Results from this pilot study show that flavored LCCs are more available in neighborhoods with larger proportions of young adults. Since flavored products may play a role in tobacco use patterns among young adults, the higher availability of flavored LCCs in these neighborhoods could result in increased tobacco use, specifically among African Americans, who make up the majority of the population of Central Harlem.

FUNDING: This study was funded by the Legacy Foundation.

Justification: This research can help inform federal and local policies around cigar use marketing and promotion.

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SYM14 SMOKING CESSION INTERVENTIONS IN VULNERABLE POPULATIONS

Chair: Joan S. Tucker, RAND Corporation, Santa Monica CA
Presenters: Judith J. Prochaska, Stanford Prevention Research Center, Department of Medicine, Stanford University; William G. Shadel, RAND Corporation, Pittsburgh PA; Kolawole S. Okuyemi, University of Minnesota, Minneapolis MN; and Joan S. Tucker
Discussant: David B. Abrams*, Schroeder Institute for Tobacco Research and Policy Studies, Legacy

Compared to the general U.S. population, the prevalence of cigarette smoking is considerably higher among people with serious mental illness, who are living with HIV, or who are homeless or unstably housed. Clinical smoking cessation research with these vulnerable populations has yielded few conclusive results. This symposium will present findings from four research teams that are working with these populations to develop more effective approaches to smoking cessation. Dr. Prochaska will discuss the challenges of engaging and effectively treating adolescent and young adult smokers with mental illness. She will present results from a recent RCT that compared a combined treatment approach involving computer-assisted MI with brief counseling, communication to outpatient providers, and availability of nicotine patch to extended behavioral counseling support. In a randomized controlled trial (N=60), we examined treatment efficacy relative to brief advice and referral. Given the general lack of success with treating youth smoking in the literature, we examined efficacy in terms of traditional abstinence and with intermediary outcomes of reduced cigarettes/day and 24-hour quit attempts. The sample was 52% female with mean age of 19.5 years (SD=2.9, Range: 13 to 25); race/ethnicity was 40% Caucasian, 17% Hispanic, 22% multicultural, 8% African American, 7% Asian, and 6% other. At baseline, the sample averaged 8 (SD=6) cigarettes/day; 62% smoked daily; 38% smoked within 30 min of waking; only 12% intended to quit smoking in the next month; 47% had a parent who smoked and on average participants reported 3 of 5 of their closest friends used tobacco. For the sample as a whole, over the 12-mo study, 47% reported reductions in cigarettes/day; 80% made a 24-hr quit attempt; and 10%, 12% and 17% confirmed 7-day point prevalence abstinence at 3-, 6- and 12-months follow-up, respectively. None of the tobacco outcome measures, however, differed significantly by treatment condition, all p-values >.300. Tobacco abstinence at 12-mo follow-up was significantly more likely among lighter (39%) vs. heavier (11%) smokers (p=0.031) and among girls (29%) vs. boys (3%) (p=.015). No other variables predicted abstinence. Adolescent and young adult smokers with mental illness are a challenging group to engage and effectively treat for tobacco addiction, particularly heavier smokers and boys. Innovative approaches are needed.

FUNDING: NIDA K23DA018691 and P50DA09253

SYM14B IMPROVING NICOTINE PATCH ADHERENCE AMONG HIV-POSITIVE LATINO SMOKERS

William G. Shadel, Ph.D.*,†, Frank Galvan, Ph.D.*, and Joan S. Tucker, Ph.D.*, RAND Corporation, Biestean Human Services

The first generation of work with HIV-positive smokers mostly evaluated brief interventions with the provision of the nicotine patch (NP). While no single treatment was found to work especially well with HIV-positive smokers over the long term, a key finding was that individuals had worse smoking cessation outcomes if they were non-adherent with NP. While improving adherence is a problem for the general (non-HIV positive) population of adult smokers, adherence may be particularly challenging for HIV-positive smokers. People that are HIV-positive often find it challenging to maintain adequate adherence to their highly
ENGAGING HOMELESS SMOKERS IN SMOKING CESSATION

1University of Minnesota, Minneapolis MN, 2University of Michigan, Ann Arbor MI

Smoking prevalence in homeless populations is strikingly high (~70%), yet, smoking cessation clinical trials largely exclude homeless smokers. We conducted an NIH-funded clinical trial to assess the effects of motivational interviewing (MI) and nicotine patch (INRT) on smoking cessation among homeless smokers. We present the recruitment and main outcomes of the study. Working with local emergency shelters, a total of 847 adult smokers were screened for study eligibility of which 580 (68.5%) met eligibility criteria. Of those eligible, 430 (74.1%) were randomized to either the intervention arm (INRT+MI) or the control arm (INRT+Brief Advice). Primary outcome was 7-day abstinence from cigarette smoking at 26 weeks validated by exhaled carbon monoxide (CO) and salivary cotinine. Those who returned for randomization were older and more likely to have a phone contactable (58% vs. 43%). The most common reasons for exclusion included CO levels ≤5ppm, use of smoking cessation aid in the past 30 days, and not meeting the study definition of homelessness. Participants were predominantly Black, male, and had mean age of 44.4 years (SD = 9.9). Most reported adapting to smoking in emergency shelters and nearly half had been homeless for more than a year. Nearly all the participants were daily smokers with an average of 20 CPD. About 40% had PHQ-9 depression scores in the moderate/severe range, and more than 80% screened positive for lifetime history of drug abuse or dependence. Using intention-to-treat analysis, verified 7-day abstinence rate at week 26 for the intervention group was non-significantly higher than for the control group (9.3% versus 5.6%, P=0.15). Among participants who did not quit smoking, reduction in number of cigarettes from baseline to week 26 was equally high in both study groups (-13.7±11.9 for MI versus -13.5±16.2 for Control). This study demonstrates the feasibility of enrolling homeless smokers into a smoking cessation clinical trial. Adding MI to NRT did not increase quit rates significantly at 26-week follow-up for homeless smokers. The low quit rates underscore the need to develop interventions to enhance smoking cessation in homeless populations.

FUNDING: NIH R01HL081522

JUSTIFICATION: This talk present results from a smoking cessation RCT with homeless adult smokers.

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RESEARCH IN SMOKE TOXICITY: MINOR TOBACCO ALKALOIDS

Tobacco smoking is the leading cause of preventable disease and premature death in the world. Nicotine in tobacco smoke is the principle psychoactive chemical responsible for maintaining tobacco consumption. However, tobacco smoke also contains more than 4000 different constituents, and like nicotine, some of these constituents may exhibit pharmacological properties relevant to the maintenance of tobacco consumption. Surprisingly, little information is available on the pharmacological actions of these non-nicotine chemical constituents in humans. A few preclinical studies in rodents have shown that some minor tobacco alkaloids (e.g., normocitine, anabasine) exhibit nicotine-like pharmacological actions that may contribute to tobacco addiction. The aims of this symposium are to (1) discuss the role of minor tobacco alkaloids in tobacco addiction, (2) present new pharmacological and behavioral evidence from preclinical studies in rodents and non-human primates evaluating the abuse-related effects of minor tobacco alkaloids; and (3) consider future research directions on the role of minor tobacco alkaloids in tobacco addiction. Dr. Benowitz will provide an overview on minor tobacco alkaloids in humans and emphasize the lack of currently available information on the addiction-related effects of minor tobacco alkaloids in humans.
Dr. Sved will present new data from rodent self-administration studies showing that certain non-nicotine tobacco constituents can influence the reinforcing properties of nicotine. Dr. Clarke will report on behavioral effects of a tobacco-associated MAO inhibitor (norharman), and also present the effects of different MAO-inhibiting drugs on rodent nicotine self-administration. Dr. Desai will provide new evidence from studies in non-human primates showing that some minor tobacco alkaloids exhibit nicotine-like discriminative-stimulus effects, and also augment nicotine’s stimulus properties. Finally, the discussant, Dr. Donny, will integrate these novel findings from preclinical studies, and lead a discussion on the implications of the four presentations for future research on the role of minor tobacco alkaloids in tobacco addiction.

JUSTIFICATION: This is fundamental research. The translational potential is not yet obvious.

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SYM15A
SUBJECTIVE EFFECTS OF MINOR TOBACCO ALKALOIDS IN NON-HUMAN PRIMATES
Rajeev I. Desai, Ph.D.* and Jack Bergman, Ph.D., Department of Psychiatry, Preclinical Pharmacology Laboratory, Harvard Medical School/McLean Hospital, Belmont, MA

Smoking behavior and relapse to smoking are mediated in part by the interoceptive stimulus effects of nicotine—the primary psychoactive substance responsible for the maintenance of tobacco consumption. Preclinical studies in rats have suggested that other non-nicotine tobacco constituents may also exhibit pharmacological properties relevant to the maintenance of tobacco consumption. We will present data from drug discrimination studies in which the nicotine-like subjective (discriminative-stimulus) effects of minor tobacco alkaloids (nornicotine, anabasine, cotinine, myosmine, anabaseine, anatabine) was examined in non-human primates. The effectiveness with which such minor tobacco alkaloids engender nicotine-like discriminative-stimulus effects in monkeys, may serve as a preclinical indicator of their pharmacological actions in smoking behavior. These studies were conducted in stimulant (+)-epibatidine-trained squirrel monkeys that responded under a 10-response fixed-ratio schedule of stimulus termination (n=4/group). Results show that in stimulant-trained monkeys, the minor tobacco alkaloids anabasine and anatabine partially reproduced methamphetamine-like DS effects, and in (+)-epibatidine-trained monkeys, they engendered full (nornicotine, anabasine, myosmine, anatabine), or no (cotinine) substitution for (+)-epibatidine. In additional experiments, ED50 doses of nicotine that produced 0.001 mg/kg (+)-epibatidine discrimination were combined with ED50 doses of minor tobacco alkaloids. Results, to date, indicate that ED50 doses of nicotine in combination with nornicotine or myosmine engender full 0.001 mg/kg (+)-epibatidine-like discriminative-stimulus effects. In conjunction, these findings suggest that a) some minor tobacco alkaloids (nornicotine, anabasine, anabaseine, myosmine, anatabine) exhibit nicotine-like pharmacological properties that may contribute towards maintaining tobacco consumption; and b) minor tobacco alkaloids may augment the abuse-related behavioral effects of nicotine.

FUNDING: Funded by NIH/NIDA - DA-031231

JUSTIFICATION: This is fundamental research. The translational potential is not yet obvious.

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SYM15B
INFLUENCE OF MONOAmine OXIDASE inhibitorS, NICOTINE AND NORHARMANE ON INTRAVENOUS SELF-ADMINISTRATION BEHAVIOR IN ADULT RATS
Paul B. S. Clarke1*, Goleriz Bahamouni1, and Robert E. Sorge2, Department of Pharmacology and Therapeutics, McGill University, Canada, 1Department of Psychology, University of Alabama at Birmingham

Tobacco smoke contains several monoamine oxidase inhibitors (MAOIs), and MAO activity is moderately reduced in habitual smokers. In laboratory rats, MAOIs are reported to increase intravenous nicotine self-administration, sometimes dramatically, leading to suggestions that MAO inhibition may enhance primary reinforcing effects of nicotine. To date, animal studies have tended to employ high doses of MAOIs. In the present study, we compared the behavioral effects of several MAO drugs in relation to the degree of MAO-A and MAO-B inhibition produced, using a conventional nicotine self-administration procedure (0.03 mg/kg i.v. in 3 sec) in adult rats. We also assessed the tobacco-associated MAOI norharman for potential reinforcing and reinforcer-enhancing properties. Daily, high-dose treatment with the MAOI tranylcypromine (1.5 mg/kg IP) facilitated the acquisition of nicotine self-administration in rats; whereas both MAO-A and MAO-B showed near-total inhibition. Acute MAO inhibitor treatments were also tested: tranylcypromine (0.75-6.0 mg/kg IP), or phenelzine (12.5-100 mg/kg IP), or a combination of clorgyline (0.01-1.0 mg/kg SC) plus pargyline (0.05-4.0 mg/kg SC). Here, self-administration was enhanced/inhibited only at a high degree of MAO-A and MAO-B inhibition (~85% and 75%, respectively). Intravenous infusions of norharman appeared weakly reinforcing and there was no detectable synergy with nicotine; moreover, norharman did not exert a reinforcer-enhancing effect, although this occurred at low systemic doses of nicotine and d-amphetamine. In conclusion, degrees of MAO inhibition seen in smokers do not appear to acutely potentiate the reinforcing effects of nicotine in rats, and the tobacco constituent norharman appears only weakly reinforcing.

FUNDING: Funded by the Canadian Tobacco Control Research Initiative (CTCRI) and Canadian Institutes of Health Research (CIHR).

JUSTIFICATION: This is fundamental research. The translational potential is not yet obvious.

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SYM15C
THE IMPACT OF NON-NICOTINE CHEMICAL constituents OF CIGARETTE SMOKE ON NICOTINE SELF-ADMINISTRATION IN RATS
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Nicotine is the primary addictive component in cigarette smoke, but some of the thousands of other chemicals in cigarette smoke may interact with this action of nicotine. Among these chemicals, several minor alkaloids (nornicotine, myosmine, cotinine, anatabine, anabasine), beta-carbolines (harmane, norharman), acetaldehyde, and other chemicals that result in inhibition of monoamine oxidase (MAO) have been suggested to have behavioral effects in studies on experimental animals. We have been investigating the impact of a mixture of these other cigarette smoke constituents on nicotine self-administration in rats, with the goal of understanding the role that these other constituents may play in cigarette smoking. In these studies, we have indexed the dose of each of these other constituents relative to a dose of nicotine (30 ug/kg infusion) that readily supports nicotine self-administration in rats; because the chemicals in cigarette smoke that produce MAO inhibition observed in chronic cigarette smokers have not been identified, we have induced a background of MAO inhibition in some experimental groups by the chronic injection of the MAO inhibitor tranylcypromine. In a variety of studies conducted using adult male rats, when nicotine self-administration is coupled with these other constituents along with MAO inhibition, the threshold dose for nicotine self-administration is lowered and the responding for low doses of nicotine (<30 ug/kg/infusion) is markedly enhanced. However, this increase in nicotine self-administration appears to result from MAO inhibition, as the mixture of
other chemical constituents alone, even if the dose of each is increased 10-fold), does not alter nicotine-self administration in the paradigms tested. These studies support the notion that chemical constituents of cigarette smoke may increase the reinforcing properties of nicotine, but fail to provide evidence that the mixture of minor alkaloids, beta-carbolines, and acetaldehyde, at doses delivered in cigarette smoke, contribute to this effect.

FUNDING: Funded by NIH grant U54 DA-031659

JUSTIFICATION: This is fundamental research. The translational potential is not yet obvious.

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SYM15D
TOBACCO ADDICTION: EFFECTS OF MINOR TOBACCO ALKALOIDS IN HUMANS

Neal L. Benowitz, M.D., Department of Medicine, UCSF School of Medicine, San Francisco, CA

The consumption of tobacco and tobacco-related products is a major public health problem worldwide. There are approximately 1 billion regular tobacco users in the world. Globally, mortality associated with consumption of tobacco-containing products has been projected to increase to 6.4 million deaths per year by 2015 or 10% of all deaths worldwide. Nicotine in tobacco and tobacco-related products accounts for approximately 95% of the total tobacco alkaloid content, and is the principle alkaloid that underlies tobacco addiction. However, other non-nicotine constituents (e.g., cotinine, normocotine, anatabine, anabasine) are also found in tobacco smoke and these substances also may play an important role in maintaining tobacco consumption, i.e., addiction-related effects of their own or augmenting nicotine’s addictive properties. Indeed, emerging evidence from a few preclinical studies in rodents have suggested that some of these non-nicotine tobacco constituents exhibit nicotine-like abuse-related pharmacological properties that may be relevant for tobacco addiction. Remarkably, to date, the role of minor tobacco alkaloids in human tobacco consumption remains largely unexplored. The aim of my presentation is to provide an update on the clinical pharmacology of minor tobacco alkaloids in people.

FUNDING: Funded by NIDA/NIH grant DA-02277

JUSTIFICATION: This is fundamental research. The translational potential is not yet obvious.

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SYM16
MOBILE HEALTH FOR SMOKING CESSION: UBQUITOUS TECHNOLOGIES WITH PROMISING IMPACT

Chair: Jonathan B. Bricker, Ph.D., Fred Hutchinson Cancer Research Center & University of Washington
Presenters: Alexander V. Prokhorov, M.D., Ph.D.* and Damon J. Vidrine, Dr.P.H., University of Texas MD Anderson Cancer Center, Houston TX

Mobile phones are widely used and are increasingly integrated into individuals’ daily lives. Indeed, by 2011, there were six billion mobile phone subscribers worldwide, representing a global penetration of 87%. Over 40% of mobile phone subscribers in the US and Western Europe own smartphones, with rapid growth expected worldwide. Text messaging and smartphones are two mobile phone technologies holding great promise for smoking cessation. Advantages include their ease of use anytime and anywhere, cost-effectiveness, high interactivity, and high population-level reach. Text-messaging interventions consist of a series of short, and sometimes interactive set of text messages that guide a person through the process of quitting smoking. To date, promising trials have shown the effectiveness of text messaging interventions, but their effectiveness for high-risk groups is unknown. By contrast, smartphone interventions are computer programs, or applications (“apps”), residing on the phone that provide a broad range of possible interactive features, including tracking smoking, viewing progress, earning rewards, medication advice, and getting tailored tips for quitting. Despite the fact that there are over 400 apps for quitting smoking, no outcome studies have been reported on this rapidly growing intervention technology. To address these overall gaps, Dr. Prokhorov will first present results from a group-randomized text messaging intervention trial for low income smokers. Second, Dr. Heffner will show whether using specific features of a smartphone app prospectively predicts abstinence. Third, Dr. West will present results from a single-arm trial of the SF28 PRIME Theory-based smartphone app for quitting smoking. Finally, Dr. Bricker will present results from a randomized controlled trial of a smartphone app for quitting smoking which compared an Acceptance and Commitment Therapy app with the National Cancer Institute’s QuitGuide app. Dr. Abrams will synthesize the talks and their implications for the field.

FUNDING: NA

JUSTIFICATION: Results of this symposium will help stimulate more effective population-level utilization of smartphone apps for quitting smoking.

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SYM16A
AN INTERACTIVE MOBILE MESSAGING INTERVENTION FOR LOW-INCOME SMOKERS: PRELIMINARY FINDINGS FROM PROJECT ACTION

Alexander V. Prokhorov, M.D., Ph.D.* and Damon J. Vidrine, Dr.P.H., University of Texas MD Anderson Cancer Center, Houston TX

Less educated, economically disadvantaged individuals represent a high-risk group for cigarette smoking and tobacco-attributable morbidity and mortality. Traditional smoking cessation intervention services are typically not readily available to this high-risk group due to a variety of barriers (transportation, etc.). Project ACTION (Adult smoking Cessation Treatment through Innovative Outreach to Neighborhoods), was designed to utilize a mobile clinic model, a network of community sites (e.g., community centers and churches) and an interactive mobile messaging system to reach and deliver smoking cessation treatment to underserved, low-income communities. A group-randomized design with the community site as the sampling unit is utilized to compare the efficacy of 3 treatment approaches: (1) Standard Care (SC): brief advice to quit smoking, nicotine replacement therapy (NRT), and self-help materials; (2) Enhanced Care (EC): standard care components plus a cell phone-delivered text/graphical messaging component; and (3) Intensive Care (IC): enhanced care components plus a series of 11 cell phone-delivered proactive counseling sessions. The project aims to recruit 756 participants. At the time of randomization, participants complete a baseline assessment (smoking history, socio-demographic, and psychosocial variables). The final follow-up is performed at 12 months. Preliminary data indicate that the mHealth intervention is well-received by the target population, as indicated by high consent rates, intervention delivery success, and treatment satisfaction ratings. In addition, 3-month self-reported smoking abstinence is relatively high in all groups: SC (n=126): 70.6% at 24 hrs, 57.1% at 7 days, and 40.5% at 30 days; EC (n=72) 77.8% at 24 hrs, 63.9% at 7 days, and 51.4% at 30 days; and IC: 72.0% at 24 hrs, 55.3% at 7 days, and 38.8% at 30 days. Although the group differences are not significant, higher relapse rates are expected in the SC (vs. EC and IC) condition at 6 and 12 months. The proposed smoking cessation approach has shown considerable promise with respect to reducing smoking rates and related morbidity and mortality in low-income, underserved communities.

FUNDING: National Cancer Institute: 5R01CA141628

JUSTIFICATION: Results of this study can eventually translate into a mobile text messaging intervention to help low income smokers to quit.

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SYM16B
WHAT APP FEATURES MATTER FOR QUITTING?: FEATURE-LEVEL ANALYSIS OF A SMARTPHONE APPLICATION FOR SMOKING CESSATION

Jaimee L. Heffner, Ph.D.,*, Roger Vilardaga, Ph.D.,† Laina D. Mercer, M.S.,‡ Julie A. Kientz, Ph.D.,*, and Jonathan B. Bricker, Ph.D.,‡
Fred Hutchinson Cancer Research Center, University of Washington. Fred Hutchinson Cancer Research Center & University of Washington

Smartphone applications (apps) provide a novel platform for delivering smoking cessation interventions in a highly disseminable and cost-effective way. Over 400 smoking cessation apps are currently available, but all are of unknown efficacy. Importantly, no study has examined how often individuals use specific app features and whether use of these specific features predicts successful quitting. To address this major gap, the aims of this paper are: (1) describe features of a new smartphone app for smoking cessation, and, (2) examine app utilization data during a 9-week treatment period to determine how specific features were used and whether use of these features predicted abstinence. Eligibility criteria required that participants (n=98) smoked at least 5 cigarettes per day, wanted to quit within the next 30 days, and owned an iPhone. Results suggested that app features used by the greatest proportion of participants were creating a quit plan (76%), tracking smoking (66%), viewing progress in calendar (63%) or chart (62%) form, and tracking coping skills practice (60%). The total number of app openings trended toward predicting 30-day point prevalence abstinence at the 3-month outcome assessment (OR=4.08, p=.07). App features that demonstrated the strongest prospective prediction of smoking abstinence were: tracking frequency of practicing program tips (OR=18.00, p=.008); tracking frequency of letting urges pass (OR=9.93, p=.035), and viewing video of an exercise on letting urges pass (OR=6.63, p=.015). We conclude that tracking features and exercises to help smokers learn to cope with urges to smoke are desirable to users and predictive of smoking cessation. Continued efforts to understand individuals’ use of smartphone apps for smoking cessation and whether their engagement with the app predicts successful cessation are critical for the design of effective interventions on this new platform.

FUNDING: Fred Hutchinson Cancer Research Center, NIDA grant #K23DA026517 (JLH) and NIMH grant #T32MH082709 (RV).

JUSTIFICATION: Results of this study translate into identifying specific features of smartphone applications that are popular with users and predictive of quitting.

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SYM16C
PRELIMINARY EVALUATION OF SF28, A SMARTPHONE APPLICATION TO AID SMOKING CESSATION

Robert J. West, Ph.D., University College London

Smartphone applications have the potential to be an extremely cost-effective method of helping smokers to stop. There are over 200 available on iTunes, but an analysis of these indicates very few deliver ‘behaviour change techniques’ (BCTs) that are likely to be effective such as advice on optimum use of stop smoking medicines or specific advice on how to avoid or minimise cigarette cravings. SF28 has been designed on the basis of a comprehensive theory of motivation (PRIME Theory) as well as specific evidence on effectiveness of BCTs to promote complete abstinence for 28 days as a launchpad for lifetime cessation. It is available free on the iPhone from Apple Inc’s iTunes. Version 1 of the application has been evaluated in a uncontrolled trial of 2372 users whose data have been automatically captured by the application and uploaded to the server. Users have tended to be younger (Mean age=31.5 years), more affluent (Percent in non-manual occupations=43.4%) and heavier smokers (Mean daily cigarette consumption=15.5) than the average smoker in England who is trying to stop, as assessed by national surveys. Participants who set a quit date opened the app an average of 11.8 times. Of those who reached their quit date, counting all those who were lost to follow up as continuing smokers, 27.8% continued to use the app and reported complete abstinence for the full 28 days. This was higher than the expected rate for unaided cessation based on population surveys in England (15%). Validity of the automated outcome assessment was supported by outcome measured in this way being negatively associated with social grade and age and positively associated with use of smoking cessation medicines. These findings are sufficiently positive to warrant further development of the app and a move to a randomised trial to establish efficacy.

FUNDING: No Funding

JUSTIFICATION: Results of this pilot trial lay the groundwork for a definitive randomized clinical trial of an Acceptance & Commitment Therapy smartphone application for smoking cessation.

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SYM16D
FIRST RANDOMIZED CONTROLLED TRIAL OF SMARTPHONE APPLICATIONS FOR SMOKING CESSATION: PILOT COMPARISON OF ACCEPTANCE AND COMMITMENT THERAPY WITH NCI’S QUITGUIDE

Jonathan Bricker, Ph.D., Jaimee L. Heffner, Ph.D., Roger Vilardaga, Ph.D., Laina D. Mercer, M.S., and Julie A. Kientz, Ph.D., Fred Hutchinson Cancer Research Center and University of Washington

Introduction: Over 40% of mobile phone subscribers in the US and Western Europe own smartphones. Despite the fact that there are over 400 smartphone applications ("apps") for quitting smoking, no outcome studies have been reported on this rapidly growing intervention technology. To address this urgent need, this pilot trial compared an app based on a promising behavior change approach called Acceptance & Commitment Therapy (ACT) with NCI's QuitGuide app which is based on established clinical guidelines. Method: We nationally recruited 196 adult smokers (at least 5 cigarettes/day) who wanted to quit within the next 30 days and had iPhone access. Participants were randomized to either the ACT or QuitGuide app. Results: The follow-up data retention rate at 3 months was 84% and did not differ by group (p > .05). Regarding usage, ACT participants opened their app an average of 37 times (vs. 15 for QuitGuide; p = .0001). Regarding receptivity, 86% of ACT participants reported their app was organized (vs. 67% for QuitGuide; p =.003) and 54% reported it was useful for quitting (vs. 38% for QuitGuide; p =.070). Consistent with ACT’s theoretical model, ACT participants, but not QuitGuide participants, increased their acceptance of cravings from baseline to follow-up (p =.039 for ACT vs. p = .154 for QuitGuide). The overall 30-day point prevalence quit rates at 3-months were 13% in ACT vs. 6% in Quit Guide (OR=2.65, 95% CI=0.82-10.29). Among participants smoking one pack-per-day or more at baseline, the quit rates were 12% in ACT vs. 6% in QuitGuide (OR=1.88, 95% CI=0.11-58.90). Among participants scoring low on acceptance of cravings at baseline, the quit rates were 15% in ACT vs. 8% in QuitGuide (OR=3.12, 95% CI=0.67-22.36). Conclusion: This first RCT comparing two smartphone apps showed that, compared to the NCI QuitGuide app, the ACT app was more utilized, better received, showed potentially higher quit rates, and operated consistent with its underlying theory. A fully-powered comparative effectiveness trial is the natural next step in the testing of this promising new smartphone app.

FUNDING: Fred Hutchinson Cancer Research Center’s Hartwell Innovation Award

JUSTIFICATION: Results of this pilot trial lay the groundwork for a definitive randomized clinical trial of an Acceptance & Commitment Therapy smartphone application for smoking cessation.

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SYM17A
ANIMAL MODELS FOR ASSESSING THE RELATIVE ABUSE LIABILITY OF TOBACCO PRODUCTS

Mark G. LeSage, Ph.D., and Andrew C. Harris, Ph.D., Minneapolis Medical Research Foundation and University of Minnesota Medical School

Current animal models that only examine nicotine or other isolated tobacco constituents may not accurately assess the abuse liability of tobacco products per se because (a) as yet unidentified compounds may contribute (positively or negatively) to tobacco abuse and (b) it is the summation or interaction of these compounds in tobacco or smoke that determines the actual abuse liability of a product. This presentation will describe our progress in addressing this issue by using well-established animal models to study the abuse liability of aqueous tobacco extracts prepared from smokeless tobacco products. These extracts provide an extensive range of tobacco constituents in addition to nicotine to more closely model actual product use/exposure in humans. In one assay, we are comparing acquisition of i.v. self-administration and elasticity of demand in adolescent rats with access to smokeless tobacco extracts (Kodiak or Camel Snus) or equivalent doses of nicotine alone. Preliminary data show no marked differences in these measures between formulations. In another assay, we are comparing effects of acute injection of tobacco extracts (Kodiak or Camel Snus) and equivalent doses of nicotine alone on the minimal (threshold) stimulation intensity that maintains intracranial self-stimulation (ICSS). This measures the ability of nicotine to enhance the function of brain reinforcement pathways (i.e., ICSS threshold-lowering effects) at low to moderate doses and attenuate reinforcement pathway function (ICSS threshold-elevating effects) at high doses. These effects on ICSS may be related to nicotine’s “reinforcement-enhancing” and aversive effects, respectively. To date, tobacco extracts and nicotine alone have produced similar ICSS threshold lowering and elevating effects. Our findings thus far suggest the relative nicotine content in tobacco products is the best predictor of the relative abuse liability of these products, and that current levels of non-nicotine constituents in these products may represent the maximum allowable levels. These studies provide fundamental scientific information that the FDA needs to assess the prospects of nicotine regulation policy.

FUNDING: Funded by U.S. National Cancer Institute U191U19CA157345.

SYM17B
BEHAVIORAL ECONOMICS OF TOBACCO ABUSE LIABILITY TESTING: DEMAND CURVE ANALYSIS OF CIGARETTES, NICOTINE GUM AND SNUS

Warren K. Bickel, Ph.D., A. George Winston, Ph.D., Chris T. Franck, Ph.D., and Mikhail N. Koffarnus, Ph.D.

The proliferation of new tobacco products suggests the importance for accurate abuse liability assessments of these new products. Assessment of abuse liability (i.e., a product’s likelihood of being abused and the potential consequences of that abuse) is important to prevent or reduce potential harm due to excessive use of a product (e.g., addiction) and/or the associated toxicity of a product (relative to conventional cigarettes) prior to marketing. This project uses behavioral-economic methods to assess the abuse liability of potential modified-risk tobacco products (MRTP). Specifically, three behavioral-economic procedures are being used to compare methods of abuse liability. Behavioral-economic assessments are important because price is a critical factor in determining the use of tobacco products. We compare demand functions for conventional cigarettes with the potential MRTP Snus and medicinal nicotine gum with three different behavioral economic procedures; namely, (1) laboratory-based, (2) questionnaire-based (purchase task), and (3) an outpatient-based purchase procedure. With 30 cigarette smokers enrolled and 11 actively participating in the study, the overall findings, while early, suggest that cigarettes have the highest levels of consumption across the prices, followed by Snus, with gum showing the lowest levels of consumption. Data from the outpatient procedure suggest that the highest price examined ($1 per unit) produces comparable reduction in consumption for all three products. These findings also suggest that the abuse liability of Snus lies intermediate between cigarettes and nicotine gum. Future studies will examine the preference and substitutability across these products.

FUNDING: Funded by U.S. National Cancer Institute U191U19CA157345.

SYM17C
EFFECT OF CLAIM PRESENTATION ON INTEREST IN TRYING SNUS

Sarah E. Adkison, M.A. and Richard J. O’Connor, Ph.D., Roswell Park Cancer Institute

The advent of tobacco product regulation creates the possibility of modified risk claims for certain products, such as low-nitrosamine smokeless tobacco (SLT), that may present less health harms. However, little data exist on how such claims would be received by consumers. The current research has 3 primary goals: (1) evaluate cognitive and normative beliefs about SLT, (2) evaluate how these beliefs are associated with consumer perceptions of modified risk advertising claims, and (3) evaluate whether or not claim presentation style is associated with potential to try SLT. Respondents aged 14-65 drawn from a commercial web
SYM18 UNDERSTANDING AND ADDRESSING THE ALCOHOL-SMOKING CONNECTION: FROM LAB TO CLINIC TO POLICY

Chair: Christopher W. Kahler, Ph.D., Center for Alcohol and Addiction Studies, Brown University School of Public Health.
Presenters: Lisa M. Fucito, Ph.D., Yale School of Medicine; Benjamin A. Toll, Ph.D., Yale University School of Medicine, Yale Cancer Center, and the Smilow Cancer Hospital at Yale-New Haven; Kelly Young-Wolff, Ph.D., Stanford University, School of Medicine
Discussant: Andrea King, Ph.D., Department of Psychiatry & Behavioral Neuroscience, University of Chicago

Smokers drink more heavily than non-smokers and are more likely to have alcohol use disorders (AUDs). This is a particular concern because combined smoking and heavy drinking has synergistic negative health effects (e.g., increased risk of head and neck cancers). In addition, smokers who drink heavily have low rates of successful smoking cessation, and alcohol use is often implicated in smoking relapse. This symposium draws on data from laboratory, clinical, and policy-oriented studies to provide new insights on how alcohol impacts efforts to quit smoking, how interventions to reduce drinking may improve smoking outcomes, and how smoking policies may affect drinking on a population level. Dr. Kahler will present data from a lab study in which smokers consumed alcohol and then were monetarily reinforced for resisting smoking. Results indicate a dose-response relationship between higher doses of alcohol and reduced ability to resist smoking. This work was mediated in part by increases in urge to smoke. Dr. Fucito will present data on negative affect and situational triggers assessed using daily diaries prior to a quit smoking attempt. Results suggest that high levels of negative affect leading up to a quit attempt may account for part of the association between heavy drinking and poor smoking outcomes. Dr. Toll will present data from a randomized clinical trial in which brief alcohol counseling was integrated into standard quitline counseling. Although the addition of brief alcohol counseling led to reduced drinking and superior smoking outcomes relative to standard quitline tobacco only treatment, reductions in drinking did not mediate the effects of the intervention on smoking. Dr. Young-Wolff will present an analysis of the impact of tobacco-related policies on alcohol use in the general population. Results indicate that smoking bans were associated with reduced occurrence of new alcohol use disorders and increased remission of these disorders, while increases in cigarette taxes were associated with reductions in alcohol use among male smokers. Dr. King will provide a discussion of the symposium highlighting how this research can inform both treatment and policy.

JUSTIFICATION: This symposium provides new information (a) to clinicians on how alcohol use and alcohol interventions can affect smoking cessation attempts and quit rates and (b) to policy makers on how tobacco control policies may have beneficial effects on drinking and alcohol use disorders.

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SYM17D CLINICAL TRIAL: SNUS VS. NICOTINE GUM

Dorothy K. Hatsuksami, Ph.D.D., Joni A. Jensen, M.P.H., Rachel L. Vogel, M.S., and Herb H. Severson, Ph.D.D., University of Minnesota, Minnesota, Psychiatry, 717 Delaware St. SE, Minneapolis, MN 55414, United States; Phone: 612 626-2121, Email: hatsu001@umn.edu

An essential component of evaluating modified risk tobacco products is to determine how consumers use the product and resulting effects on biomarkers of toxicant exposure and effect. This study randomized cigarette smokers (n=390) recruited in Minnesota and Oregon) to either Camel Snus or 4 mg nicotine gum for 12 weeks; 4 weeks were dropped from the study due to participation in multiple competing studies. Participants were instructed to completely switch from cigarettes to these products, use at least 6-8 study products per day for 6 weeks and then taper off the product over the last 6 weeks to be tobacco/nicotine free after Week 12. Participants received supportive behavioral/product compliance counseling at each in-clinic or phone visit. Urine samples are collected to analyze for tobacco toxicant (NNAL, NNN) and nicotine levels. Of the 386 participants randomized and included, 52.9% were male, the mean ± standard deviation (SD) age was 43.8±12.5 years, baseline number of cigarettes per day was 18.1 ± 6.6 and FTND used was 37.5 ± 26.6. Dual use of cigarettes and these products were observed in 45.1% of participants assigned to Camel Snus users and 52.2% of those assigned to nicotine gum at week 6 and 53.3% and 57%, respectively at week 12. The end of treatment biochemically verified (CO ≤ 6 ppm) 7-day abstinence from usual brand cigarettes was 22.7% in the Camel Snus group and 26.0% in the nicotine gum group. Results on level of carcinogen exposure are forthcoming; based on our prior study, we hypothesize less toxicant exposure in the nicotine gum group compared to snus and less toxicant exposure of both the products compared to usual brand cigarettes. These results suggest that snus performs as well as nicotine gum in cigarette smokers who are interested in completely switching to these products, but are likely to be exposed to greater levels of toxicants than nicotine gum.

FUNDING: Funded by U.S. National Cancer Institute U19CA157345.

JUSTIFICATION: Clinical trials are an important component of determining how smokers might use a modified risk tobacco product and resulting toxicant exposure, and have relevance to tobacco regulatory science.

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SYM18A ACUTE EFFECTS OF LOW AND HIGH DOSE ALCOHOL ON SMOKING LAPSE BEHAVIOR IN A LABORATORY ANALOGUE TASK

Christopher W. Kahler, Ph.D., Jane Metrik, Ph.D., Nichea S. Spillane, Ph.D., Anne Day, Ph.D., Jennifer W. Tidey, Ph.D., Damaris J. Roshenow, Ph.D., Adam M. Leventhal, Ph.D., Sherry A. McKee, Ph.D., John E. McGeary, Ph.D., and Valerie S. Knopik, Ph.D.,* Center for Alcohol and Addiction Studies, Brown University School of Public Health; Keck School of Medicine, University of Southern California; Department of Psychiatry, Yale University School of Medicine; Rhode Island Hospital, Alpert Medical School of Brown University

Rationale: Smoking lapses (i.e., returns to smoking after quitting) often occur following consumption of alcohol with observational data suggesting that greater quantities of alcohol lead to greater risk. However, a causal dose-dependent relationship between alcohol consumption and the ability to resist smoking has not been established, and the mechanisms that might account for such a relationship have not been tested. Objectives: In a 3-session within-subjects design, we examined the effects of low (0.4 g/kg) and high (0.8 g/kg) dose alcohol, relative to placebo, on smokers’ ability to resist initiating smoking. We also tested
mechanisms that might account for these expected alcohol effects. Method: Participants were 100 heavy alcohol drinkers, smoking 10-30 cigarettes per day. Across three separate days, participants consumed either a placebo, low, or high dose of alcohol following 3 hours of smoking abstinence, and 35 minutes later were offered the opportunity to smoke while delaying smoking was monetarily reinforced at $1 for every 5 minutes of not smoking over a 50-minute period. Results: Results suggested a dose-response association between alcohol and latency to smoke where participants smoked 3.35 minutes earlier (95% CI [-7.09 - 0.40], p=0.04) following low dose alcohol and 6.36 min earlier (95% CI [-9.99, -2.73], p=0.0006) following high dose alcohol compared to drinking a placebo beverage; participants smoked 3.01 minutes earlier (95% CI [-6.66 - 0.63], p=0.11) earlier following high dose vs. low dose alcohol. The effects of alcohol dose on smoking behavior were mediated in part by increased urge to smoke with some evidence suggesting a mediating role for dose-dependent alcohol effects on subjective intoxication but not subjective stimulation. Conclusions: Alcohol can reduce the ability to resist smoking in a dose-dependent fashion, which is in part due to its effect on increasing the intensity of smoking urges.

FUNDING: Supported by NIAAA grant R01 AA016978 and a Senior Research Career Scientist award from the Department of Veterans Affairs to Dr. Rothenen.

JUSTIFICATION: Results can inform clinical practice, allowing tobacco treatment specialists to state more conclusively that drinking increasing amounts of alcohol reduces the ability to resist smoking and that this happens in part because alcohol increases cravings for cigarettes.

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SYM18B
CAN TOBACCO-RELATED POLICIES REDUCE ALCOHOL USE?
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Smoke-free policies and cigarette taxes are two of the most effective means of reducing tobacco consumption. Given the high comorbidity between alcohol and tobacco use, it is possible that the public health benefits of tobacco-related policies extend beyond smoking-related outcomes to influence drinking behaviors. However, there has been relatively little work examining the spillover effects of smoking bans and cigarette taxes on alcohol consumption. To address these gaps, our research group conducted two longitudinal investigations to examine the associations of tobacco-related policies with alcohol use disorders (AUD) and alcohol consumption, using data from a large, nationally representative U.S. sample. Findings indicated that smoking bans in drinking venues were associated with decreases in the occurrence of new onsets of AUD (OR = .75, 95%CI = 0.57 - 0.99, p = 0.04) and increases in AUD remission (OR = 1.88, 95%CI = 1.16 - 3.04, p = 0.01) among smokers. Furthermore, results demonstrated that increases in cigarette taxes were associated with modest to moderate reductions in typical quantity of alcohol consumption (b = -0.34, SE = 0.12, p = 0.005) and frequency of binge drinking (b = -0.13, SE = 0.07, p = 0.048) among male smokers. The effect was strongest among hazardous drinkers, such that when cigarette taxes increased, male smokers who were hazardous drinkers consumed approximately 8% less alcohol per drinking episode (a 10% reduction). Taken together, our results are promising and provide evidence that tobacco policies may represent an innovative policy approach to decrease morbidity and mortality associated with alcohol consumption among disproportionately impacted subgroups.

FUNDING: Supported by NIH (R21 AA018273; P50DA033945 (ORWH & NIDA); T32 HL07034; R25 DA020515)

JUSTIFICATION: Results from this study provide evidence that tobacco policies may represent a new and innovative policy approach to decrease morbidity and mortality associated with alcohol consumption among disproportionately impacted subgroups.

FUNDING: Supported by NIH (R21 AA018273; P50DA033945 (ORWH & NIDA); T32 HL07034; R25 DA020515)

SYM18C
EFFECTS OF AN ALCOHOL COUNSELING INTERVENTION ON ALCOHOL USE AMONG HAZARDOUS DRINKING SMOKERS CALLING A TOBACCO QUITLINE
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Daily smokers are more likely to report a pattern of hazardous drinking and alcohol abuse and dependence, which is also associated with lower rates of smoking cessation. In light of the evidence that brief alcohol interventions can significantly reduce alcohol consumption, we conducted a clinical trial in which participants (N=1948) recruited from the NY State Smokers’ Quitline were screened for their alcohol use and among those reporting a high risk drinking pattern were randomized to receive either brief counseling to limit or abstain from alcohol plus an alcohol reduction booklet added to standard care (Alcohol+Tobacco Counseling) or only smoking cessation counseling plus a smoking cessation booklet added to standard care (Tobacco Only Counseling). Analysis of the 7-month follow-up smoking cessation outcome revealed a significant difference favoring the Alcohol+Tobacco Counseling group [Alcohol+Tobacco Counseling: 26.2% vs Tobacco Only Counseling: 20.4%; OR=1.39; 95% CI, 1.03-1.87, p=.03] on quit rates. This report examines how the treatment modified drinking and whether treatment-related reductions in drinking mediate smoking outcomes. The number of heavy drinking days in the week prior to the 7-month follow-up favored the Alcohol+Tobacco Counseling group (74.6% no heavy drinking days) as compared to Tobacco Only Counseling group (70.3% no heavy drinking days) [IRR=1.20; 95% CI, 1.02-1.39, p=.03]. However, changes in drinking did not mediate smoking cessation. Possible explanations for lack of mediation are that the intervention directly targets reductions in drinking and smoking, but these reductions are not interrelated. It might also be that discussing a behavior intimately related to smoking such as one’s drinking patterns may have allowed for a fuller discussion of smoking cues and cue related coping skills. In order to change their drinking, it is possible that the public health benefits of tobacco-related policies extend beyond smoking-related outcomes to influence drinking behaviors. However, there has been relatively little work examining the spillover effects of smoking policies on alcohol consumption. To address these gaps, our research group conducted two longitudinal investigations to examine the associations of tobacco-related policies with alcohol use disorders (AUD) and alcohol consumption, using data from a large, nationally representative U.S. sample. Findings indicated that smoking bans in drinking venues were associated with decreases in the occurrence of new onsets of AUD (OR = .75, 95%CI = 0.57 - 0.99, p = 0.04) and increases in AUD remission (OR = 1.88, 95%CI = 1.16 - 3.04, p = 0.01) among smokers. Furthermore, results demonstrated that increases in cigarette taxes were associated with modest to moderate reductions in typical quantity of alcohol consumption (b = -0.34, SE = 0.12, p = 0.005) and frequency of binge drinking (b = -0.13, SE = 0.07, p = 0.048) among male smokers. The effect was strongest among hazardous drinkers, such that when cigarette taxes increased, male smokers who were hazardous drinkers consumed approximately 8% less alcohol per drinking episode (a 10% reduction). Taken together, our results are promising and provide evidence that tobacco policies may represent an innovative policy approach to decrease morbidity and mortality associated with alcohol consumption among disproportionately impacted subgroups.

FUNDING: This research was supported in part by National Cancer Institute Grant R01-CA140256 and the NYS Department of Health.

JUSTIFICATION: The study findings can be directly translated into the practice of smoking cessation telephone quitlines, in that they suggest that adding an alcohol intervention for hazardous drinking smokers would reduce heavy drinking and improve rates of smoking cessation.

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NEGATIVE AFFECT MEDIATES THE RELATION BETWEEN ALCOHOL CONSUMPTION STATUS AND SMOKING CESSATION SUCCESS

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The relation between alcohol use and smoking cessation success theoretically represents an inverted U-shaped curve; moderate drinkers have better smoking outcomes than heavy or non/infrequent drinkers. In a smoking cessation trial (N=1504), compared with moderate drinkers (≤3 drinks/occasion: women; ≤4 drinks: men), heavy drinkers (≥4 drinks/occasion: women; ≥5 drinks: men) and non/infrequent drinkers (no drinking or < once per month in past year) were less likely to initiate cessation and among those who were able to quit, heavy drinkers were more likely to lapse. This research explored whether the risk for smoking cessation failure that is conferred by alcohol consumption status, is related to symptomatic experiences, smoking expectancies, or contextual influences that exist prior to the quit attempt. Using daily diary data completed 1-week pre-quit revealed 4 distinct potential mechanisms, summarized with Bartlett’s factor scores: positive affect, negative affect, smoking beliefs, and smoking triggers. We tested whether any of the 4 constructs mediated the effect of baseline alcohol consumption status on smoking 2 cessation milestones (cessation initiation, lapsing). The magnitude and significance of the indirect effect of alcohol consumption status (moderate, non/infrequent, heavy) was tested on smoking outcomes through these 4 factors using probit regression with maximum likelihood estimation. There were significant indirect effects of alcohol consumption status on never initiating quitting (B =1.22, SE=.07, p=.002) and lapsing (B=1.20, SE =.06, p<.001) through negative affect. Heavy drinkers had the highest negative affect factor scores (M=.16±.08) followed by non/infrequent drinkers (M=.06±.05) and moderate drinkers (M= -.14±.05), respectively. These results suggest that greater negative affect leading up to a quit attempt may be a mechanism leading to poorer smoking cessation outcomes amongst heavy drinkers. Thus, heavy drinkers may benefit from smoking interventions that target negative affect prior to quitting smoking. Other analyses reveal additional paths via which drinking history and smoking outcomes are linked with pre-quit symptom trajectories.

FUNDING: This research was supported in part by National Institutes of Health grants P50DA019706 (to TBB), M01RR03186 from the General Clinical Research Centers Program of the National Center for Research Resources, K05AA014715 (to SOM), K23AA020000 (to LMF).

JUSTIFICATION: The results of this research further elucidate the potential mechanisms that contribute to poor smoking cessation outcomes amongst heavy-drinkers and suggest that smoking interventions that target negative affect may be important for this population.

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TOBACCO SURVEILLANCE AND RESEARCH INNOVATIONS IN NATIVE COMMUNITIES

PA1-1
URBAN INDIAN/ALASKA NATIVE ADULT TOBACCO SURVEY

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Introduction: American Indians and Alaska Natives are disproportionately affected by problems related to tobacco use. In an effort to assess the scope of commercial tobacco smoking, and identify potential opportunities to reduce this problem among urban American Indians and Alaska Natives (AI/ANs), the Urban Indian Health Institute (UIHI), a division of the Seattle Indian Health Board (SIHB), conducted a pilot study to determine the prevalence and patterns of tobacco use and desire to quit among urban AI/AN adults. Methods: This pilot project was conducted in 2004 at two urban Indian health organizations, the Seattle Indian Health Board (SIHB) located in King County, Washington, and the Native American Rehabilitation Association of the Northwest, Inc. (NARA), located in Multnomah County, Oregon. The UIHI collected baseline data on tobacco use, prevalence, knowledge, attitudes, and beliefs among AI/AN clients of the two urban Indian health organizations using the American Indian Tobacco Survey. 224 telephone and in-person interviews were conducted. Results: The survey cooperation rate was 73%. Among those who smoked (43%), smoking began at a mean age of 13.2 years. Among the strongest predictors of current smoking were having a household member who smoked and having less than a high school education. A majority (86%) of smokers wanted to quit and over half (53%) had made an attempt to quit within the past year. Predictors of intention to quit included provider advice to quit smoking and having a smoke-free home. Additionally, a belief that quitting smoking has a health benefit and having non-smoking friends were predictors of making an attempt to quit. Conclusions: These results indicate that for adult AI/ANs living in these two urban areas, there was a high prevalence of tobacco use and a strong desire among current smokers to quit. These findings highlight the need to provide treatment for tobacco dependence to urban AI/ANs. Updating these findings with more recent data would be of value in evaluating effectiveness of past efforts and directing current program planning and intervention strategies for urban AI/ANs.

FUNDING: Office of Minority Health

JUSTIFICATION: This study sheds light on the characteristics of tobacco use in the urban American Indian/Alaska Native populations and desire to quit, which may inform the development of interventions.

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PA1-2
THE NATIVE COMIC BOOK PROJECT

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Introduction: Comic books have long been used as an educational tool to improve and protect public health in the U.S. In 2010, the Native Comic Book Project was launched as a youth-focused community education pilot project of Native People for Cancer Control, a National Cancer Institute funded Community Network Program Center. The purpose of the Native Comic Book Project is to offer cancer risk-reduction education and healthy decision making skills to Native youth. Methods: Participants, all American Indian/Alaska Native (AI/AN) youth aged 8-17, receive education on traditional foods and wellness, non-ceremonial tobacco use, human papillomavirus (HPV), obesity prevention, and basic art skills. Modeled after Dr. Michael Bitz’s The Comic Book Project, The Native Comic Book Project has been adapted for both urban and reservation-based AI/AN youth, and incorporates Native storytelling and traditional values. We are currently evaluating the Native Comic Book Project to measure knowledge, habits, and decision-making regarding tobacco use, healthy eating, exercise habits, and human papilloma virus (HPV) among youth participants. Results: To date, the Native Comic Book Project has been implemented at 10 tribal sites with 172 youth. The results indicate that Native youth have substantial knowledge about the risks of non-ceremonial tobacco use; our pre-workshop surveys showed a high level of tobacco risk knowledge and, thus, our post-workshop surveys had only a slight increase of knowledge. We also saw a 10% increase in the awareness of the importance of good decision making regarding the use of non-ceremonial tobacco use and other health-related decisions. 78% of participants indicated that discussing decision making was helpful to them. Conclusions: Interactive, culturally-tailored cancer education workshops are an innovative way to increase Native youth’s cancer risk-reduction awareness and decision making skills. While Native youth show a high level of knowledge around the dangers of tobacco use, smoking rates remain high, indicating the importance of developing and testing additional kinds of interventions to decrease tobacco use.

FUNDING: U54CA153498 (NCI funded Community Network Program Center)

JUSTIFICATION: Lessons learned from the Native Comic Book Project suggest how traditional values and practices can be incorporated into a tobacco use intervention to address Native tobacco use.

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PA1-3
TOBACCO CESSATION TREATMENT FOR ALASKA NATIVE ADOLESCENTS: GROUP RANDOMIZED PILOT TRIAL

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Tobacco cessation treatments have not been evaluated among Alaska Native (AN) adolescents. This pilot study evaluated the feasibility and potential efficacy of a targeted cessation intervention for AN youth using a group randomized design. Eight villages in Western Alaska were randomly assigned to receive the intervention (n=4 villages) or to a delayed treatment control condition (written materials only; n=4 villages). Ten adolescents ages 12-17 were targeted from each village with a planned enrollment of 80. The intervention was held over a weekend and youth traveled from their villages to quit tobacco use with other teens. The intervention comprised 8 hours of group-based counseling. Talking circles, personal stories from elders, and recreational activities were included to enhance cultural acceptability and participation. Newsletters were mailed weekly for 5-weeks post-program. Assessments were conducted at baseline, week 6 (end-of-treatment) and 6-months. Self-reported tobacco abstinence was confirmed with salivary cotinine. Recruitment targets were met in the intervention (41 enrolled) but not control villages (27 enrolled). All intervention participants attended the weekend program. Retention was high with 98% of intervention and 86% of control participants completing the 6-month follow-up. Seven-day point-prevalence self-reported tobacco abstinence rates for intervention and control participants were 10% (4/41) and 0% (0/27) at both week 6 and 6-months (p=0.16). Only one adolescent in the intervention condition was biochemically confirmed abstinent at week 6 and none at 6-months. In conclusion, the intensive, individual-focused intervention used in this study was feasible but not effective for tobacco cessation among AN youth. Alternative approaches are warranted.

FUNDING: National Institute on Drug Abuse, R01 DA25156

JUSTIFICATION: Applications to minority adolescent treatment research

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PA1-4
PERCEPTIONS AND OPINIONS ABOUT SMOKE-FREE POLICIES IN NAVAJO NATION

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American Indian tribes are sovereign nations, and therefore not required to implement state smoke-free laws. Many enclosed environments on tribal lands continue to allow smoking even though both patrons and employees are being exposed to tobacco smoke. The Diné (Navajo) of Navajo Nation have a long tradition of respect for traditional ceremonial use of “sacred tobacco” while disagreement exists about the proper role, if any, for commercial tobacco use on Navajo Nation for either ceremonial or recreational purposes. This concern over commercial tobacco use and exposure to secondhand smoke has resulted in efforts to pass legislation to eliminate commercial tobacco smoke in indoor and public spaces. No such law has been passed. The Networks Among Tribal Organizations for Clean Air Policies project is a community based participatory research project that aims to identify smoke-free policy efforts on the Navajo Nation.

In order to identify message strategies about smoke-free policy that resonate with Navajo people, we aimed to develop and test evidence-based messages on the economics and health effects of smoke-free policy. Methods: Bicultural researcher teams of indigenous and non-indigenous, tested nine messages through a series of focus groups among Navajo citizens living in the distinct geographic regions of the Nation. Results: Through a process of collaborative analysis, qualitative data were categorized according to the fundamental law of Sa’ah Naahal Bi’ik’eh Hozhoo (SNBH) which is the Diné’ traditional system that places human life in harmony with the natural world and provides principles for protection from the imperfections of life and for the development of wellbeing. Perceptions and opinions about smoke-free policies and reactions to associated messages clustered into themes related to family, economics, environment, and ethics, and the inherent imbalance experienced by Diné people when smoke free policy is applied (or not) differentially across sectors. Conclusions: Traditional Navajo K’e (relationships) and the desire to bring smoke free policy into balance through SNBH were found to be vital in protecting and preserving the health of the Din’.

FUNDING: National Institutes of Health, National Cancer Institute U01 A154300

JUSTIFICATION: Indigenous centered and community engaged scholarship contributes to the cultural salience of smoke-free tobacco policy messages.

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PA1-5
EXCISE TAX AND PRICING DIFFERENTIALS AT TRIBAL SMOKE SHOPS IN OKLAHOMA: OPPORTUNITIES FOR HARMONIZATION

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With a patchwork of tribal versus nontribal land ownership and no formal reservations, the nature and geography of tribal smoke-shop sales in Oklahoma is different than elsewhere in the United States. Furthermore, the excise tax charged by the state for cigarette sales varies from tribe to tribe and takes 5 distinct levels, ranging from 5.75 cents to $1.03 per pack. There has recently been significant flux in the tax treatment of Oklahoma cigarettes, with active renegotiation of tribe-state tax treaties among Oklahoma’s 38 federally recognized tribes. We conducted two waves of site visits to nearly all smoke shops in the northeastern quarter of the state, an area containing the city of Tulsa and 75 percent of all tribal outlets. We recorded representative prices, looked for the sale of illegal (tax-free) cigarettes, and verified the tax rate paid (via tax stamp) for each shop. For each tribal outlet visited, we also collected price data from a nearby nontribal outlet (when practical). One wave of price data for shops in the rest of the state was obtained via phone survey. We supplemented these field data with archival information on tax revenue collections and state-tribal tax treaties. As has been found previously, with regard to increases in state-level tax rates, we found that lower-taxed cigarettes tend to be priced at discounts that are even greater than the differential in tax rates. For example, the average pack of Marlboros sold with a 5.75 cent tax stamp sold for 63 cents less than the same pack sold from a shop with a 25.75 cent tax stamp, 72 cents less than from a 51.5-cent shop, and $1.05 less than from a 77.25-cent shop. In contrast, we found that prices at nontribal outlets were relatively invariant to the tax rates of nearby tribal outlets. Resistance to excise rate increases is thought to come mainly from tribes that may lose current price advantages. We show how cross-subsidization schemes, linked to tax stamp registries, can be used to address these objections.

FUNDING: This study was financed by Oklahoma Tobacco Research Center seed grant number: OUHSC 20091891-09.

JUSTIFICATION: This research could support State and tribal governments in Oklahoma during their ongoing negotiations for changes to tribal excise tax levels for cigarettes and state-tribal revenue sharing for cigarette taxes.

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WRAP IT UP: PLAIN PACKAGING AND WARNING LABELS

PA2-1
SMOKING SATISFACTION, HEALTH MESSAGE ACCEPTANCE AND MOTIVATION TO QUIT AFTER PLAIN PACKAGING

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In December 2012, Australia became the first country in the world to legislate the manufacturing, packaging, labelling, and supply of plain packaged cigarettes; prohibiting the use of logos and brand imagery and mandating that all cigarettes be sold in olive green, standardised packaging. This move was made in part based on lab-based and simulated-naturalistic studies suggesting that the removal of branding would diminish the positive experience of smoking and increase the impact of health warnings. Whether these effects would carryover in real-world conditions, and impact on behaviour, was unknown. Here we present results from a study that utilised electronic momentary assessment methods to monitor smokers’ experiences with plain packet cigarettes. Smokers (n=73) used smartphones to monitor their smoking, interest in quitting, and reactions to health warnings for up to 4 weeks (1,765 subject days). On days when participants had packs with gain-focused warnings (e.g., quitting can improve health) they reported being more worried about their health and that the message made them more fearful (compared to loss-focused warnings, e.g., smoking causes blindness); such messages were also judged as being more truthful. We also observed a significant warning-type X gender interaction with motivation to quit (gain-focused: men>women; loss-focused: women>men). We did not see significant changes in satisfaction with smoking or smoking rate as smokers transitioned from branded to plain packaging, but quitting self-efficacy did increase. Changes in reactions to the warnings (e.g., increases in personal health fears) following the transition were not maintained past the first week. Implications for the further development of plain packaging and the delivery of health messages will be discussed.

FUNDING: This work was supported by an internal grant from the University of Tasmania. Additional funding support was provided by Cancer Council Tasmania.

JUSTIFICATION: It is important to understand the real-world effects of plain packaging

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PA2-2
PLAIN PACKS AND SLIPPERY SLOPES: AN ANALYSIS OF TOBACCO INDUSTRY MEDIA TACTICS IN NEW ZEALAND

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In 2012, British American Tobacco New Zealand (BATNZ) launched the “Agree/Disagree” campaign to coincide with Government consultation over plain packaging legislation. As the first campaign the tobacco industry has publicly fronted in New Zealand since it opposed the removal of mass media advertising 20 years ago, it provides a unique opportunity to analyse industry tactics. We used a logical fallacies framework to analyse the campaign themes, framing, and reasoning. Published media rate card information was used to estimate overall expenditure, advertising placements, and audience viewership. The media schedule shows the campaign aimed to sway public opinion to oppose plain packaging legislation. The non-discounted television, print, and radio expenditure was estimated at US$2.9 million. Television advertisements reached approximately 93% of the 25-54 year old population with an average of 26 advertisement exposures over the campaign period. The five campaign advertisements employed rational, though highly contorted, arguments. BATNZ tried to position itself as a legitimate business and a voice of reason that advocated on behalf of fair-minded New Zealanders to prevent ‘unreasonable’ regulation. Campaign messages used logical fallacies to generate concern about plain packaging. Specific tactics included ‘slippery slope’ claims (plain packaging of tobacco products would inevitably lead to regulation of other products), ‘compromise’ (acknowledging that tobacco is harmful to add credibility), and ‘straw man’ propositions (misrepresenting how plain packaging would affect the tobacco industry’s intellectual property). Overall, BATNZ tried to relocate attention away from the core issues of smoking’s harms and evidence plain packaging will reduce smoking prevalence. The Agree/Disagree campaign highlights the tobacco industry’s concern about plain packaging and exposes its attempts to shape public opposition. These messages will likely be used in other jurisdictions considering plain packaging and illustrate the need for pro-active responses that debunk industry myths and highlight research documenting plain packaging’s likely benefits.

FUNDING: The research was funded by an internal University of Otago research grant.

JUSTIFICATION: Findings from the research will help counter tobacco industry tactics to obstruct plain packaging legislation.

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PA2-3
LONGER TERM IMPACT OF CIGARETTE PACKAGE WARNINGS: FINDINGS FROM AUSTRALIA, CANADA, AND THE UNITED KINGDOM

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This study aimed to examine the longer term impact (including the wear-out effects) of (1) the 2006 graphic pack warnings in Australia; (2) the 2003 larger text warnings implemented in the UK; and (3) the 2000 graphic pack warnings in Canada. The data came from the International Tobacco Control Four Country Survey (2002-2012), a prospective multi-country cohort survey of adult smokers. The total unique cases of current smokers included in the analysis for the three countries studied are as follows: Australia (n=5195), Canada (n=5376), United Kingdom (n=5150). Key measures included reported salience of pack warnings, cognitive responses to warnings, forgoing cigarettes as a result of the warnings, and avoiding warnings. Generalized Estimating Equations models were employed. In a longer term (up to five years of implementation) graphic pack warnings implemented in Canada and Australia stimulated higher levels of cognitive responses and avoiding behaviours than did text-based warnings implemented in the UK; and prominent Canadian picture warnings also had advantages in eliciting greater forgoing of cigarettes. Pack warnings in all three countries showed 'wear-out' trends over time, but the declines in warning salience among the Canadian smokers were the smallest; and cognitive responses remained high after 3-5 years’ of warning implementation in Australia and Canada, and significant decline in cognitive responses in the latter period was only evident for the UK text warnings. The findings clearly suggest that pictorial warnings sustain their effects for longer. This study provides new evidence on the potency and effectiveness of graphic warnings.

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JUSTIFICATION: The findings from this study support arguments for governments to require that all tobacco packages include prominent and effective warnings (especially graphic warnings) to show the sickness and suffering caused by tobacco use.

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PA2-4
A PROTOCOL FOR TESTING WARNING MESSAGES ON SMOKERS’ CIGARETTE PACKAGES

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OBJECTIVE: Lab experiments testing cigarette warnings do not replicate what smokers experience in the real world. This study sought to develop a new protocol for testing cigarette warnings that better reflects real-world exposure by presenting them on cigarette smokers’ own packs. METHOD: We pilot tested three minor variations of a cigarette pack labeling protocol with 49 US smokers ages 18-54. In protocol variation 1, smokers applied our warning labels to their cigarette packs on their own for two weeks. In protocol variation 2, we gave a cash incentive to smokers, we accompanied them to a nearby store where they purchased two weeks of cigarettes, and we applied warnings to these packs. In protocol variation 3, smokers bought a week’s worth of cigarettes with their own funds and brought them to study appointments, and we applied warnings to these packs. RESULTS: Smokers reported high fidelity to all three labeling protocols and generally found the burden to be acceptable. Most (76%) protocol variation 1 smokers reported applying labels. Most (87%) protocol variation 2 smokers reported that at least 75% of the packs they smoked in the prior two weeks had our warnings. Protocol variation 2 smokers reported higher quit intentions (p<0.04) and worry about the harms of smoking (p=0.01) after using cigarette packs with the study warning labels for two weeks. Protocol variation 3 was feasible even for low-income smokers. CONCLUSIONS: We recommend a feasible and practical new protocol for studying the effects of cigarette pack warnings in which smokers provide their own cigarette packs to which investigators apply warnings. When used in experiments in real-world settings with real-world message exposure over time, the protocol can help us to better understand the true impact of warnings and thus to better inform tobacco product labeling policy.

FUNDING: This work was supported by 4CNC: Moving Evidence into Action, a collaborating site in the Cancer Prevention and Control Research Network (Grant U48/DP001944) from the Centers for Disease Control and Prevention and the National Cancer Institute. This research was also partially funded by the National Institutes of Health/National Cancer Institute (U01 CA154281).

JUSTIFICATION: Our new protocol can help researchers and policy-makers better understand the true impact of cigarette pack warnings on smoking behavior.

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Backgroud: Tobacco packaging is an important form of promotion. Standardising the appearance and shape of cigarette packs ('plain' packaging) represents a novel tobacco control policy. This study examined perceptions of branded and standardised cigarette packs, including slim cigarettes, among UK youth.

Method: 712 youth aged 11-17 completed an online survey. Participants viewed pairs of packs including a branded and a standardised pack altered using a 3 x 2 factorial design: health warning type (40% text, 40% pictorial, 80% pictorial) x standardised pack colour (white vs. brown). A discrete-choice task was used in which participants selected packs based on attractiveness, taste, tar, health risk, impact of health warning, and enticement to start smoking. Participants also compared regular Silk Cut and 'Superslims' Silk Cut packs. Participants completed a final selection task from two standardised and two branded packs. Results: Compared to the branded packs, the standardised pack was significantly less likely to be perceived as being more attractive, less likely to encourage smoking uptake, and more likely to have a higher impact health warning (p<0.001 for all). Warning type was significantly associated with all six outcomes: packs with larger pictorial warnings were more likely to be perceived as less attractive, less smooth, greater health risk, higher tar delivery, more effective health warnings, and less likely to encourage initiation (p<0.05). The same pattern was found for brown vs. white standardised packs, with the exception of attractiveness and initiation. Compared to the regular Silk Cut pack, the ‘Superslims’ Silk Cut pack was perceived as significantly more favourable on all outcomes (p<0.001), except tar delivery. Finally, among respondents who selected a pack in the pack selection task, 95.1% selected a branded pack versus 4.9% who selected a standardised pack.

Conclusions: Increasing the size of pictorial health warnings and standardising the appearance of packs may reduce the appeal of smoking among young people. Prohibiting slim packs and standardising the shape of packs may also enhance the efficacy of health warnings and reduce appeal.

FUNDING: Financial support for this project was provided by Action on Smoking and Health (ASH) London; 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.

JUSTIFICATION: These findings are particularly relevant to policy-makers in the UK, where standardised packaging of tobacco products is being considered by government, but are also relevant at EU level, where the prohibition of ‘Superslims’ cigarette packs has been proposed, and in all jurisdictions where greater controls on tobacco packaging are being considered.

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MULTI-MEDIA MANIA

PA3-2 A DESCRIPTIVE ANALYSIS OF FACEBOOK APPLICATIONS RELATED TO SMOKING CESSATION

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An increasing proportion of the population is using the Internet to search for health-related information such as smoking cessation. As Facebook.com (FB) is the dominant social networking site in the United States (US), individuals may also use FB to access health information. Few studies have documented the utility of FB for health behavior change. The purpose of this study was to determine what types of smoking cessation applications are available within FB and to rate their quality. In August, 2013, we searched FB and three top Internet search engines using smoking cessation keywords. Twenty-two unique FB applications/games were screened for eligibility (smoking cessation-related, English language, and functioning). Eligible applications (N=12) were installed and coded using the native FB platform (N=9) or the iPhone platform for mobile only applications (N=3) by two independent coders. Coding included use metrics, cost, developer source, content features (interactive, informational, and social), as well as adherence to an established index derived from the US Public Health Service’s Clinical Practice Guidelines for Treating Tobacco Use and Dependence (“PHS Guideline”). Most applications were free (N=12). Four applications were sponsored/funded by a government-based group, three by a pharmaceutical company, and the remaining (N=5) were unclear. Applications fell into three broad categories: public pledge to quit (N=3), calculator and/or tracker (N=6), or a comprehensive quit smoking program (N=3). All except two calculator and/or tracker applications incorporated interactive, informational, and social features. Adherence index scores varied from 7 to 28 (Mean=16, SD=8; Range=0-40). The two comprehensive smoking program applications scored the highest on the index and were both funded by government-based groups. Findings suggest that there are few cessation applications available via FB and even fewer that adhere strongly to the PHS Guideline. Future research should consider the FB platform as it enables users to harness existing social support/social networks for quitting and may reach individuals who do not engage with stand-alone web-based interventions.

FUNDING: R01 CA155369-01A1

MULTI-MEDIA MANIA

PA2-5 HEALTH WARNINGS, BRANDING, AND SUPERSLIMS: PERCEPTIONS OF CIGARETTE PACKAGING AMONG UK YOUTH

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Background: Tobacco packaging is an important form of promotion. Standardising the appearance and shape of cigarette packs (‘plain’ packaging) represents a novel tobacco control policy. This study examined perceptions of branded and standardised cigarette packs, including slim cigarettes, among UK youth.

Method: 712 youth aged 11-17 completed an online survey. Participants viewed pairs of packs including a branded and a standardised pack altered using a 3 x 2 factorial design: health warning type (40% text, 40% pictorial, 80% pictorial) x standardised pack colour (white vs. brown). A discrete-choice task was used in which participants selected packs based on attractiveness, taste, tar, health risk, impact of health warning, and enticement to start smoking. Participants also compared regular Silk Cut and ‘Superslims’ Silk Cut packs. Participants completed a final selection task from two standardised and two branded packs. Results: Compared to the branded packs, the standardised pack was significantly less likely to be perceived as being more attractive, less likely to encourage smoking uptake, and more likely to have a higher impact health warning (p<0.001 for all). Warning type was significantly associated with all six outcomes: packs with larger pictorial warnings were more likely to be perceived as less attractive, less smooth, greater health risk, higher tar delivery, more effective health warnings, and less likely to encourage initiation (p<0.05). The same pattern was found for brown vs. white standardised packs, with the exception of attractiveness and initiation. Compared to the regular Silk Cut pack, the ‘Superslims’ Silk Cut pack was perceived as significantly more favourable on all outcomes (p<0.001), except tar delivery. Finally, among respondents who selected a pack in the pack selection task, 95.1% selected a branded pack versus 4.9% who selected a standardised pack.

Conclusions: Increasing the size of pictorial health warnings and standardising the appearance of packs may reduce the appeal of smoking among young people. Prohibiting slim packs and standardising the shape of packs may also enhance the efficacy of health warnings and reduce appeal.

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JUSTIFICATION: These findings are particularly relevant to policy-makers in the UK, where standardised packaging of tobacco products is being considered by government, but are also relevant at EU level, where the prohibition of ‘Superslims’ cigarette packs has been proposed, and in all jurisdictions where greater controls on tobacco packaging are being considered.

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MULTI-MEDIA MANIA

PA3-1 NATURE OF TELEVISION VIEWING MODERATES RELATIONSHIP BETWEEN EXPOSURE TO SMOKING IMAGERY AND SMOKING BEHAVIOR

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Introduction: Exposure to smoking imagery in movies and TV has been linked to youth smoking. With youth watching more TV shows online, it becomes important to determine whether this relationship is changed based on whether TV shows are watched online or via traditional TV. For instance, attentiveness or the personal connection youth feel with characters may vary by platform type, impacting internalization of smoking imagery and thus the effect of such imagery on smoking.

Method: The June, 2013 national cross-sectional Legacy Media Tracking Online questionnaire surveyed 2,036 13-24 year olds. Multivariate models examined whether the relationship between exposure to smoking imagery and smoking was moderated by the type of platforms on which one watched TV shows. Smoking was defined as ever or past 30 day use of cigarettes, cigars, cigarillos, pipe, hookah, or e-cigarettes. Results: 17% watched TV shows solely on traditional TV platforms (e.g., cable, satellite, network TV), 17% watched only on online platforms (e.g., YouTube, Netflix, Hulu), 64% mentioned both platforms, and 3% reported not watching TV shows. Multivariate analyses revealed the relationship between exposure to smoking imagery and smoking was moderated by viewing platform. Exposure to smoking imagery approximately doubled the likelihood of having smoked in the past 30 days (OR: 2.0, p=0.025) or ever (OR: 1.8, p=0.041) for those who watched TV shows only on TV, but there was no such relationship for those who watched TV shows solely online. Among viewers of both TV and online platforms, exposure to smoking imagery increased the likelihood of smoking in the past 30 days (OR 1.4, p=0.032) and ever (OR 1.4, p=0.016) by 40%. Conclusions: Findings suggest the relationship between exposure to smoking imagery and smoking exists when watching TV shows on TV but not online. Further research is necessary to explain this. Understanding how changing TV viewing patterns impact the relationship between exposure to tobacco imagery and tobacco use will be critical in informing tobacco prevention policy related to video content in an increasingly diversified media landscape with vast amounts of such content.

FUNDING: This study was funded by Legacy.

JUSTIFICATION: Understanding how changing TV viewing patterns impact the relationship between exposure to tobacco imagery and tobacco use will be critical in informing tobacco prevention policy related to video content in an increasingly diversified media landscape with vast amounts of such content.

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JUSTIFICATION: This study may inform the development of future web-based smoking cessation interventions.

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PA3-3
INTERMEDIATE CESSATION OUTCOMES AMONG QUITLINE CALLERS DURING A U.S. NATIONAL TOBACCO EDUCATION CAMPAIGN

Katrina Vickersen, Ph.D.1, Lei Zhang, Ph.D.2, Ann Malaracher, Ph.D.2, Paul Mowery, M.A.3, and Kelly Carpenter, Ph.D.1 1Alere Wellbeing, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, Biostatistics, Inc.

Introduction: To educate the public on the health damage caused by cigarette smoking and to encourage smokers to quit, the Centers for Disease Control and Prevention launched the first federally-funded National Tobacco Education Campaign - Tips From Former Smokers (Tips) – from March to June, 2012. This study examined the campaign’s impact on quitline callers’ quit attempts and cessation. Methods: Using quitline data from 22 states and the District of Columbia, we compared the number of quitline callers and callers who received services during the 12-week 2012 Tips campaign to similar weeks in 2011. We used multivariate logistic regression to examine the relationship between Tips exposure, measured as gross rating points or GRPs (i.e., advertisement reach times frequency of exposure) and intermediate cessation outcomes (i.e., 24-hour quit attempts and 7+ day cessation) reported during counseling. We also assessed whether the Tips campaign’s impact differed by state tobacco control funding. Results: Compared to similar weeks in 2011, the number of quitline callers increased 88.6% (48,738 in 2011 vs. 91,911 in 2012) and the number provided counseling and/or medication increased 70.8% (40,546 in 2011 vs. 69,254 in 2012) during the Tips campaign. Greater numbers of callers reported positive intermediate cessation outcome during the campaign. In states with higher tobacco control funding, Tips campaign GRPs were positively associated with 24-hour quit attempts and 7+ day cessation. In states with lower tobacco control funding, the highest GRP group (2000+ GRPs) had lower levels of cessation than the middle GRP group (1200-1999 GRPs). Conclusions: An evidence-based national tobacco education campaign with adequate reach and frequency can lead to substantial increases in quitline use and 24-hour quit attempts and 7+ day cessation. Other studies are now examining long-term cessation outcomes of Tips callers in selected states.

FUNDING: Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health.

JUSTIFICATION: Evaluates the impact of the first federally funded national tobacco education media campaign on state quitlines and intermediate quit outcomes of those callers.

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PA3-4
PERSISTENCE OF PRO-SMOKING MEDIA EFFECT ON YOUNG ADULTS SMOKING RISKS: A STUDY USING ECOLOGICAL MOMENTARY ASSESSMENT

Claude Setodji, Ph.D.1, Steven Martino, Ph.D.2, Deborah Scharf, Ph.D., and William G. Shadel, Ph.D., RAND Corporation

Pro-smoking media messages (i.e., movie smoking, cigarette advertising) and their cumulative influences are commonly assumed to have enduring effect on people’s smoking attitudes and beliefs upon exposure. More research is needed to test this assumption directly and examine how long the effect of exposure to pro-smoking media persists. Understanding the persistence of these effects has implications for ongoing public policy discussions about how tobacco advertising should be regulated. In our study, a sample of 134 college students (ages 18-24) were enrolled in an ecological momentary assessment study in which they carried palm pilots for three weeks and reported their exposures to pro-smoking media as they occurred in the real world. 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 future smoking risk (i.e., smoking intentions, smoking refusal self-efficacy); the exact dates and times of assessments were also recorded. On average, 11.5 random assessments occurred between pro-smoking exposures and the length of between instances of pro-smoking media exposure ranged from 1 minute to 19 days (Mean=3.7 days). Persistence was defined as the length of time that pro-smoking exposure effects could be detected in the random assessments taken between one exposure to pro-smoking media and the next. Results from a non-parametric regression analysis indicated that after exposure, future smoking risk increased significantly (p < 0.001) before stabilizing (i.e., were no longer affected by the exposures, p = 0.83). This study is the first to examine the persistence of pro-smoking media and suggests that exposure to pro-smoking media is likely to have an impact on behavior even if opportunities to act (i.e., smoke) on one’s increased smoking risk happen relatively infrequently.

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

JUSTIFICATION: Pro-smoking media exposure increases college students’ smoking risks and these effects persist for seven days after initial exposure before leveling off and as such, pro-smoking media exposure is likely to have an impact on behavior even if opportunities to act on one’s increased intentions or weakened self-efficacy happen several days later.

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PA3-5
AN EFFECTIVENESS STUDY OF TARGET MESSAGES DELIVERED ONLINE TO INCREASE YOUNG ADULT SMOKERS’ USE OF EVIDENCE-BASED TREATMENT

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1University of Illinois at Chicago, 2University of Iowa, 3American Legacy Foundation

Young adulthood, when smoking often becomes entrenched, is an important time to help smokers stop smoking. Young adult smokers are interested in quitting, but have low use of evidence-based treatment. The primary goal of this study was to develop and evaluate tailored, web-based ads that would “drive” young adult smokers to an evidence-based treatment web site (BecomeAnEx.org). Through qualitative work, we developed a set of banner ads targeted to young adults. These ads conveyed one of 2 themes that resonated with this population: “someone like you” or “create your own plan.” We validated these ads in an efficacy trial (N=900), and then launched the effectiveness trial, which included publishing the 6 efficacious ads on the internet (3 per theme). This paper reports the results of the effectiveness trial. The design of the trial was an interrupted time series design with 4 “ads off” periods interspersed with 3 “ads-on” periods; each period was 4 weeks in length. This design was feasible because purchasing ads space can easily be turned on and off, and it allowed for rigorous testing of ads in real-world Internet settings that did not require independence among Internet sites. In collaboration with an Internet media broker, advertising space was purchased through 3 Internet network publishers, and the 6 efficacious ads were bundled for rotating presentation. A variety of strategies was used to ensure the ads were exposed to young adults, e.g., Custom Channel behavioral targeting, and we used optimization techniques to improve the reach to the targeted group. The primary outcome was the number of young adults (18 to 30 years old), who signed up at the BecomeAnEx site. Compared with times when the ads were “off,” there was a significant increase in the number of young adults signed up at the treatment site during the ads “on” periods: Compared to baseline, the first ads on period showed more than a 6-fold increase in sign-ups (394 vs 2505); a 5.6 fold increase for the next comparison period (462 vs 2571), and a 2.5 fold increase for the last ads on time (287 vs 705). Responses to the ads and treatment use behaviors are also discussed.

FUNDING: This work was supported by grant #5R01CA134861 from the National Cancer Institute with additional support by American Legacy Foundation.
PA4-1
PROTECTING INDIGENOUS INFANTS FROM SECOND-HAND SMOKE: A RANDOMISED CONTROLLED TRIAL IN AUSTRALIA AND NEW ZEALAND

David Thomas\textsuperscript{1,2}, Natalie Walker\textsuperscript{3}, Vanessa Johnston\textsuperscript{4}, Marewa Glover\textsuperscript{2}, Chris Bullen\textsuperscript{2}, Adrian Trenholme\textsuperscript{5}, Anne Chang\textsuperscript{3}, Peter Morris\textsuperscript{1}, Catherine Segan\textsuperscript{1}, and Ngiare Brown\textsuperscript{6,7}. Menzies School of Health Research, Charles Darwin University; Darwin, Australia; \textsuperscript{2}School of Population Health, University of Auckland, Auckland, New Zealand; \textsuperscript{3}Kidz First and Women's Health Division, Counties Manukau District Health Board; Auckland, New Zealand; \textsuperscript{4}Centre for Health Policy, Programs and Economics, University of Melbourne; Victoria, Australia; \textsuperscript{5}University of Wollongong; Wollongong, Australia

Background: Second-hand smoke (SHS) is a significant cause of acute respiratory illness (ARI), the most common preventable cause of death in infants and five times more common in Indigenous people, than their non-Indigenous counterparts in Australia and New Zealand. A single-blind, randomised trial was undertaken to determine the efficacy of a culturally appropriate, family-centred tobacco control program about SHS to improve the respiratory health of Indigenous infants in Australia and New Zealand. Method: Indigenous women and their newborn infants from each country were randomized to an intervention group who received a tobacco control program over three home visits in the first three months of the infant’s life; or a control group who received usual care. Outcomes included the rate of health provider presentations for new episodes of ARI in the first year of life, infant’s exposure to SHS, smoking restrictions in the home and car, and smoking cessation in the mother. Results: 293 mother/infant dyads were randomised, with a loss to follow-up at one year of 14%. There was limited self-reported exposure of infants to ETs (at baseline 95% of homes and 96% of cars were smokefree). Despite this, urinary cotinine levels were high in infants (some partners did not live with them). Using intent-to-treat analyses, we found no differences in either biochemically validated 7-day point abstinence at 12 months postpartum (Control: 36% vs. Intervention: 35%) or continuous abstinence (Control: 22% vs. Intervention: 20%). Results were similar using survival analysis. Women were more likely to remain continually abstinent if they reported that they intended to return to smoking (p=0.004) and if they were from the army medical center (p=0.02). Conclusion: Our intervention did prevent return to smoking among pregnant spontaneous quitters. However, our biochemically validated cessation rates were higher than those reported in most other studies. Given that no intervention for maintaining smoking cessation after delivery has been shown to be effective, new strategies are needed to help women who quit smoking during pregnancy maintain their abstinence after delivery.

FUNDING: R01NR009429

JUSTIFICATION: A different approach is needed to help pregnant spontaneous quitters remain abstinent postpartum.

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PA4-2
EFFICACY OF A NURSE-DELIVERED INTERVENTION TO PREVENT AND DELAY POSTPARTUM RETURN TO SMOKING: THE QUIT FOR TWO TRIAL

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Objective: Although many pregnant women quit smoking, most return to smoking postpartum. We designed a two-arm trial, Quit for Two, to compare the efficacy of a nurse-delivered postpartum intervention to standard of care in preventing postpartum smoking among pregnant women who quit smoking. Method: We recruited adult, English-speaking women with a history of smoking at least 100 cigarettes in their lifetimes and at least 5 cigarettes a day prior to becoming pregnant from 14 prenatal clinics, including one exclusively serving military personnel and spouses. Women were randomized to either one-on-one counseling by trained nurses (one face-to-face during pregnancy and up to 11 telephone sessions spanning 9 months postpartum) or receiving newsletters only. We assessed 7-day point prevalence and continuous abstinence at 12 months postpartum. We used logistic regression to assess arm differences in cessation, and survival analysis to estimate arm differences in time to return to smoking. Results: We recruited 386 women: 42% were African American, 49% had more than a HS education, 50% were married or living with a partner. 62% were not employed for pay, 29% were nulliparous, and 63% had a partner who smoked (some partners did not live with them). Using intent-to-treat analyses, we found no differences in either biochemically validated 7-day point abstinence at 12 months postpartum (Control: 36% vs. Intervention: 35%) or continuous abstinence (Control: 22% vs. Intervention: 20%). Results were similar using survival analysis. Women were more likely to remain continually abstinent if they reported that they intended to return to smoking (p=0.004) and if they were from the army medical center (p=0.02). Conclusion: Our intervention did prevent return to smoking among pregnant spontaneous quitters. However, our biochemically validated cessation rates were higher than those reported in most other studies. Given that no intervention for maintaining smoking cessation after delivery has been shown to be effective, new strategies are needed to help women who quit smoking during pregnancy maintain their abstinence after delivery.

FUNDING: R01NR009429

JUSTIFICATION: A different approach is needed to help pregnant spontaneous quitters remain abstinent postpartum.

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PA4-3
WHO RECOMMENDATIONS FOR THE PREVENTION AND MANAGEMENT OF TOBACCO USE AND SECOND-HAND SMOKE EXPOSURE IN PREGNANCY

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Maternal tobacco use and exposure to secondhand smoke (SHS) negatively affects all stages of human reproduction. There are an estimated 137 million births globally, and about 80% of pregnant women receive antenatal care provided by skilled health personnel at least once during pregnancy. This predictable interaction with the health-care system provides an opportunity time to identify and address tobacco use and exposure to SHS with millions of pregnant women, their partners, and other household members. However, many countries, especially low- and middle-income countries, do not have evidence-based guidelines for addressing maternal tobacco use, and many existing guidelines do not include all forms of tobacco use or measures to limit maternal SHS exposure. To fill this gap, the World Health Organization (WHO) developed the “WHO Recommendations for the Prevention and Management of Tobacco use and Second-hand Smoke Exposure in Pregnancy,” which was published in Fall, 2013. The process included input from a group of technical experts from all WHO regions to evaluate the quality

FUNDING: R01NR009429

JUSTIFICATION: A different approach is needed to help pregnant spontaneous quitters remain abstinent postpartum.

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MOTHERS AND BABIES

2014 Paper Sessions

JUSTIFICATION: Results of this study help to inform efforts to increase the reach of evidence-based cessation treatments.

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of existing evidence and to make recommendations based on the GRADE system. It provides evidence-based recommendations to health-care providers and other related service providers on (1) identification, management, and prevention of tobacco use and SHS exposure in pregnant women and, (2) where relevant, advice for other members of their household on how to reduce SHS exposure of pregnant women. This presentation will briefly describe the guideline development process and the WHO’s recommendations on the following topics: the necessary elements for effective screening of pregnant women for smoking and smokeless tobacco use, safety and effectiveness of psychosocial interventions and pharmacological treatment in pregnancy, and effective interventions for preventing SHS exposure of pregnant women at home, health-care facilities, workplaces, and public places. The presentation will also discuss identified research gaps and dissemination strategies.

FUNDING: Centers for Disease Control and Prevention, National Cancer Institute

JUSTIFICATION: This presentation will provide evidence-based recommendations for clinicians, public health practitioners and policy makers to screen and intervene with pregnant women, their partners, and others in the household on tobacco use and SHS exposure.

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PA4-4

COTININE SCREENING OF NEWBORN DRIED BLOOD SPOT SPECIMENS INCREASES IDENTIFICATION OF PREGNATAL TOBACCO EXPOSURE

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Objective: Tobacco smoking by pregnant women is a major public health hazard with both short- and long-term effects on offspring. Newborn dried blood spots (DBS) present an untapped opportunity for both surveillance of prenatal TSE and interventions to reduce postnatal tobacco exposure. The objective of this study was to describe the presence and level of cotinine in newborn DBS in comparison to reported maternal smoking on the Certificate of Live Birth. Methods: This observational, cross-sectional study used data from four state newborn screening programs. We analyzed DBS from 1414 anonymous newborn infants screened by California, Michigan, New York, and Washington states. We measured cotinine using liquid chromatography tandem mass spectrometry. DBS were linked to each state’s birth registry to produce a limited dataset; the variables obtained were sex, race, birth weight, gestational age, month and year of DBS collection, age at DBS collection, and all available smoking data. The main outcome was level of cotinine detected. Results: Reported smoking during pregnancy was relatively infrequent at 10.5% (147/1396); however, cotinine >0.3 ng/g was detected in 35% of newborn DBS, including DBS of 29% of newborns whose mothers did not report smoking any cigarettes during pregnancy (some of whom were presumably exposed to environmental tobacco smoke). Twelve percent of the newborn DBS had cotinine levels that were >9.0 ng/g (equivalent to 6 ng/ml plasma, a level which indicates active smoking of the mother), although 41% of the mothers of these infants did not report smoking, and mothers of some newborns with levels <9.0 ng/g were also likely to have been active smokers. The percent of DBS with detectable cotinine and median cotinine levels differed significantly by state, race, season of collection, and day of collection, although the absolute differences in cotinine levels were relatively small. Conclusions: These data confirm that self-reported smoking during pregnancy under-estimates prenatal tobacco smoke exposure. Demonstrating the presence of cotinine in newborns’ blood may form the basis of intervention to promote cessation or reduction of indoor smoking.

FUNDING: This work was supported by NHLBI 1RC2HL10140.

JUSTIFICATION: Detection of cotinine in newborns’ blood with routine screening may identify a cohort of parents for whom interventions for smoking cessation or implementation of smoke-free home policies are indicated.

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PA4-5

SMOKING DURING PREGNANCY AND IMPLEMENTATION OF THE 5 AS DURING PERNATAL CARE IN ARGENTINA AND URUGUAY

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Background: The 5As strategy, a best practice approach for smoking cessation during pregnancy, has been widely implemented in high-income countries; however, no studies have evaluated its implementation in middle-income countries. The aim of this study was to evaluate the smoking patterns and the prevalence of receipt of the 5As among pregnant women attending antenatal care in Argentina and Uruguay. Methods: As part of a two-arm, parallel cluster randomized-controlled trial of implementation of a smoking cessation intervention, baseline data were collected from women who attended one of 21 prenatal clinics and delivered at selected publicly-funded hospitals in Buenos Aires and Montevideo from October, 2011-May, 2012. The validated questionnaire included basic demographic data: tobacco use and cessation behaviors and receipt of the 5As. Self-reported quitting during pregnancy was verified with saliva cotinine cut-point of >10 ng/ml. Analyses were conducted using SURVEYFREQ and SURVEYREG procedure in SAS version 9.3 to account for the clustered design of the study. Results: Of 3283 postpartum women, 69.8% were never smokers, 8.5% quit upon learning of their pregnancy, 3.7% quit during pregnancy and 18.1% continued to smoke. Among all women, 78.3% reported that a healthcare provider asked them about their smoking status. Among continued smokers, 69.7% reported that a healthcare provider asked them about their smoking status; 52.0% reported being told that quitting was the best thing for them and the baby, 17.9% reported they were asked if they wanted to quit, 14.0% reported the provider helped them to quit (e.g., gave printed materials, counseling, etc.), and 3.0% reported they were asked to return to talk about their smoking. Conclusion: Approximately, one in five women continued to smoke during pregnancy in Buenos Aires and Montevideo; however, less than 70% of smokers reported that a health care provider asked them about their smoking status and only half of those received the message that quitting was the best thing to do. Health care providers are missing opportunities to help pregnant smokers quit during prenatal care visits in Argentina and Uruguay.

FUNDING: The study was supported through CDC cooperative agreement 5U48DP001948-04 (SIP09-18) to Tulane University

JUSTIFICATION: This study informs us on how the 5As are being implemented in a middle income country

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PA4-6

SMOKING SIMPLIFIED ASSOCIATION TEST AND THE PREDICTION OF SMOKING CESSION ABSTINENCE IN POST-PARTUM WOMEN

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Social-cognitive models of smoking relapse prevention (Marlatt & Donovan, 2005) have generally relied on explicit measures of motivation and cognition (e.g., self-efficacy, motivation, etc.) to predict outcomes. Explicit measures assume that cognitive and affective processes can be assessed via conscious introspection by smokers. Borrowing from social-cognitive psychology which suggests that
many determinants of human behavior are not readily accessible via conscious introspection, the current research tests whether implicit cognitive measures, that tap into more automatic processes, improve prediction of abstinence/relapse. Pregnant women who had quit smoking due to their pregnancy enrolled in a randomized clinical trial testing interventions to enhance motivation and problem-solving skills to prevent postpartum relapse. Participants completed baseline measures at week 33 of pregnancy and measures of biochemically-verified abstinence at 8 and 26 weeks post-partum. At baseline, participants completed a smoking Valence (Good/Bad) Implicit Association Test (Waters, Carter et al., 2007) as an implicit measure of smoking’s association with positivity or negativity. Participants also completed motivational, social-cognitive, smoking measures, and demographics. For the smoking IAT, higher numbers indicate more positive associations with smoking. Therefore, higher IAT scores were hypothesized to be negatively related to abstinence. Two logistic regressions used the smoking IAT to predict Week 8 and 26 abstinence, controlling for motivation to maintain abstinence, positive and negative affect, smoking expectancies, self-efficacy, time to first cigarette, dependence, age, education, partner status, and treatment condition. For both Week 8 and Week 26, the smoking IAT was significantly negatively associated with maintaining abstinence (Week 8: Odds Ratio = .47, CI = .24-.92 p =.03; Week 26: Odds Ratio = .35, CI = .15-.84, p = .02). Stronger associations of smoking with positive constructs in memory improve the prediction of abstinence at 8 and 26 weeks postpartum over and above explicit motivational, social-cognitive, and smoking measures.

FUNDING: This manuscript was supported by grants from the National Cancer Institute (R01CA93350 and R25CA57730) and the CDC (K01DP001120 and K01DP000086).

JUSTIFICATION: Future research might explore not only improvement in prediction of clinical outcomes, but how mapping into nonconscious, automatic processes might be harnessed to improve intervention approaches.

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PA5-1
SMOKING AUTOMATICITY MODERATES BRAIN ACTIVATION DURING EXPLORE-EXPLOIT BEHAVIOR

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The adaptive trade-off between exploration and exploitation is a key component of theories of reinforcement learning, which have been applied to the study of reward-seeking behavior over the past decade. Drugs of addiction induce reward-seeking behavior and modify the natural neurophysiological processes involved. These neural changes may underlie a behavioral shift from a flexible, exploratory mode to a more focused, exploitative mode, which in turn precedes the development of inflexible, habitual drug use. As a result, chronic exposure to drugs of abuse might alter the normal balance of exploratory and exploitative behavior and their underlying neural processes. Previously, we found that smokers made significantly fewer exploratory choices (and thus more exploitative choices) during initial learning in the first 300 trials of a 6-armed bandit task (6ABT). The goal of this study was to extend this work by investigating the neural correlates of explore/exploit behavior in cigarette smokers. Participants (n = 22) with varying IAT scores were used to complete a self-reported measure of smoking dependence motives and played the 6ABT during functional magnetic resonance imaging (fMRI). As expected, across subjects there was greater activation in exploratory trials than exploitative trials in the bilateral superior parietal cortices (including the intraparietal sulci and precuneus) and bilateral frontal cortices (including the superior, middle, and precentral frontal gyri). After controlling for nicotine tolerance (defined as smoking increasing amounts to experience the desired effects), smoking automatically positively correlated with bilateral parietal activation in regions that were preferentially activated by exploratory choices. These results suggest that more cognitive effort is exerted to make target-selection decisions and to track the value of targets during exploratory decision making among smokers for whom smoking is automatic or habitual.

FUNDING: This research was supported by R01 DA28649 from the National Institutes on Drug Abuse.

JUSTIFICATION: Future research might explore not only improvement in prediction of clinical outcomes, but how mapping into nonconscious, automatic processes might be harnessed to improve intervention approaches.

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PA5-2
EFFECTS OF TOLCAPONE ON WORKING MEMORY AND BRAIN ACTIVITY IN ABSTINENT SMOKERS: A PROOF-OF-CONCEPT STUDY

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Background: Dopamine levels in the prefrontal cortex (PFC) are thought to play an important role in cognitive function and nicotine dependence. The catechol-O-methyltransferase (COMT) inhibitor tolcapone, an FDA-approved treatment for Parkinson’s disease, increases prefrontal dopamine levels, with cognitive benefits that may vary by COMT genotype. We tested whether tolcapone alters working memory-related brain activity and performance in abstinent smokers. Methods: In this double-blind crossover study, 20 smokers completed 8 days of treatment with tolcapone and placebo. In both medication periods, smokers completed blood oxygen level-dependent (BOLD) fMRI scans while performing a working memory N-back task after 24-hours of abstinence. Smokers were genotyped prospectively for the COMT val158met polymorphism for exploratory analysis. Results: Compared to placebo, tolcapone modestly improved accuracy (p=0.017) and enhanced suppression of activity in the ventromedial prefrontal cortex (vmPFC) (p=0.002). There were no effects of medication in other a priori regions of interest (dorsolateral PFC, dorsal cingulate/medial prefrontal cortex, or posterior cingulate cortex). Exploratory analyses suggested that tolcapone led to a decrease in BOLD signal in several regions among smokers with val/val genotypes, but increased or remained unchanged among met allele carriers. Tolcapone did not attenuate craving, mood, or withdrawal symptoms compared to placebo. Conclusions: Data from this proof-of-concept study do not provide strong support for further evaluation of COMT inhibitors as smoking cessation aids.

FUNDING: This research was supported by NIH grant R01 DA28649 from the National Institutes on Drug Abuse.

JUSTIFICATION: Data from this proof-of-concept study do not provide strong support for further evaluation of COMT inhibitors as smoking cessation aids.

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PA5-3
BRAIN MECHANISMS ASSOCIATED WITH REGULAR SMOKING AND WITH RISK FOR REGULAR SMOKING: A COTWIN-CONTROL STUDY IN MONOZYGOTIC TWIN PAIRS

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This study used a cotwin-control design in monozygotic twin pairs to investigate the effect of regular smoking (≥100 cigarettes lifetime) and genetic risk for regular smoking on working memory processing in response to a monetary reward guessing task using functional magnetic resonance imaging. Adult (24-36 years) twin pairs were recruited from a population-based epidemiologic study of female twins. Twin pairs were either concordant or discordant for smoking and all twins had tried cigarettes. Within-pair comparisons examined the effect of regular smoking on brain activation in response to winning or losing money, where differences were expected in discordant twin pairs but not in concordant twin pairs. Between-pair
comparisons of discordant and concordant pair smokers examined the effect of genetic risk for smoking; discordant pair smokers are at low risk because their identical twin sister is a non-smoker and concordant pair smokers are at high risk because their identical twin sister is also a smoker. Whole-brain analysis of variance (adjusted for multiple comparisons) resulted in three main findings: (1) differential activation to winning or losing money was consistently found in medial prefrontal and frontal cortex, middle and inferior frontal cortex, inferior parietal cortex, anterior and posterior cingulate cortex, dorsal and ventral striatum, anterior insula, precentral, and visual cortex; (2) there were no differences in activation to winning or losing money between smokers and non-smokers or between low and high-risk smokers; and (3) there was enhanced activation in frontal and parietal cognitive control regions in discordant pair smokers compared to both their non-smoker co-twins and to exposure-matched concordant pair smokers. These results suggest that (1) reward engages many brain regions and systems; (2) reward processing is not affected by lifetime regular smoking or differential risk for smoking among regular smokers; and (3) engagement of cognitive control systems may be an indicator of low genetic risk for smoking or light smoking in regular smokers.

FUNDING: Barnes-Jewish Hospital Foundation in Saint Louis, Missouri; McDonnell Center for Systems Neuroscience at Washington University; Alvin J. Siteman Cancer Center (supported in part by an NCI Cancer Center Support Grant #P30 CA91842) at Washington University School of Medicine and Barnes-Jewish Hospital in St. Louis, Missouri, for use of the Prevention and Control Research Program; and NIH grant DA027046

JUSTIFICATION: This study uses a genetically informed design to ask questions about neurobiological mechanisms associated with smoking behavior.

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PA5-4

IMAGING THE EFFECTS OF NICOTINE AND SMOKING ON ALCOHOL WITHDRAWAL-INDUCED CHANGES IN BRAIN GABAA RECEPTORS IN MONKEYS AND HUMANS

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It is well known that tobacco smoking and alcohol dependence are highly comorbid. GABA receptors are the primary mechanism for modulating inhibitory synaptic transmission in the brain, play a central role in modulating the effects of alcohol, and alterations in GABA-ergic neurotransmission are associated with symptoms of alcohol tolerance, dependence, and withdrawal. We conducted a translational study to investigate the role of smoking and nicotine on alcohol induced changes in GABA-benzodiazepine receptors (BZRs) during acute and prolonged alcohol withdrawal. We measured GABA-BZRs with PET and SPECT brain imaging during acute (first week) and prolonged (4-12 weeks) withdrawal in male rhesus monkeys (n=13) that consumed alcohol daily for 24 weeks (up to 6 g/kg/d) and in alcohol dependent humans (n=27) who entered an inpatient controlled to controls (n=25). We found in both the monkeys and humans increases in GABA receptors during early alcohol withdrawal that recover by one month of abstinence. Preliminary data indicate that continued consumption of nicotine in the animals and tobacco smoking in humans during the alcohol withdrawal period prevented normalization of GABA receptor levels. These findings suggest that continuing to smoke during alcohol treatment may prevent critical adaptations in GABA receptors.

FUNDING: Supported by the Center for Translational Neuroscience of Alcoholism, VA Alcohol Center, NIDA (K01DA0200651, K02DA031750), and NIAAA (R01AA17464, R01AA11321)

JUSTIFICATION: This study describes a translational finding in monkey and man and informs the treatment of alcohol dependence such that individuals should consider quitting smoking and drinking at the same time.

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PA5-5

LARGE SCALE BRAIN NETWORK COUPLING PREDICTS ACUTE NICOTINE ABSTINENCE EFFECTS ON CRAVING AND COGNITIVE FUNCTION

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Interactions of large-scale brain networks may underlie cognitive dysfunctions in psychiatric and addictive disorders. This study tested the hypothesis that the strength of coupling between three large scale brain networks - salience, executive control, and default mode - will: (a) reflect the state of nicotine withdrawal (vs. smoking satiety), and (b) predict abstinence-induced craving and cognitive deficits. Also, we developed a composite metric (Resource Allocation Index, RAI) that reflects the combined strength of interactions between the three large-scale networks. This within-subject functional magnetic resonance imaging study compared resting state functional connectivity coherence strength after 24 hours of abstinence vs. smoking satiety and examined the relationship of abstinence-induced changes in the RAI with alterations in subjective, behavioral, and neural function. Participants were 37 healthy smoking volunteers, ages 19-61. The RAI was significantly lower in the abstinent compared to smoking satiety condition, suggesting weaker inhibition of the default mode network by the salience network. Weaker inter-network connectivity (reduced RAI) predicted abstinence-induced cravings to smoke and less suppression of default mode activity during performance of a subsequent working memory task. These findings suggest that alterations in salience network-default mode network coupling, and inability to disengage from the default mode network, may be critical in cognitive/affective alterations that underlie nicotine dependence.

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PA5-6

VERY LOW NICOTINE CONTENT CIGARETTES WITH NICOTINE PATCH REDUCE POST QUIT BRAIN REACTIVITY TO SMOKING CUES

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Smoking very low nicotine content cigarettes (VLNCs; typically < .1 mg nicotine yield) while wearing a transdermal nicotine patch (NRT) in the weeks leading up to the target quit date has been shown to reduce smoking behavior and nicotine dependence; and result in better cessation outcomes. By making nicotine administration non-contingent with smoking behavior, new associations between behavior and drug effects are created (instrumental extinction). In a small, uncontrolled pilot study (McClernon et al., 2007) we found evidence that VLNCs+NRT decrease brain activation to conditioned smoking cues. The objective of the present controlled study was to investigate the effects of VLNCs+NRT on brain reactivity to smoking cues with the hypothesis that smoking VLNCs+NRT (EXT group) would reduce brain reactivity to these cues relative to smoking one’s usual brand (UB group). Eighty-nine (n=89) adult, treatment-seeking regular smokers were randomly assigned to EXT (n=46) in which they smoked VLNCs while wearing a 21 mg/d nicotine patch for one month prior to their quit date or UB (n=43) in which they smoked their usual brand of cigarettes up to the quit date. Following the quit date, both groups received standard nicotine replacement therapy. Brain cue-reactivity was measured using fMRI prior to randomization, following pretreatment but prior to the quit date, and within 12-24 hrs after quitting smoking. 83% (n=38) and 86% (n=37) of subjects assigned to EXT and UB, respectively, completed all three scans. Consistent with prior research, compared to UB, EXT resulted in significantly reduced breath CO levels, F=7.73, p<.001, and FTND scores, F=16.6, p<.001, in the 4 weeks prior to quitting smoking. Preliminary analysis of the post-quit scan data in FSL indicate attenuated brain cue-reactivity in reward valuation regions (medial prefrontal cortex; caudate) in EXT as compared to UB. The results of this study are consistent with the notion of interactions of large-scale brain networks may underlie cognitive dysfunctions in psychiatric and addictive disorders. This study tested the...
that VLNcs plus NRT devalue smoking, which may in turn mediate their combined effects on nicotine dependence and cessation outcomes. Implications for further refining VLNcs-based interventions will be discussed.

FUNDING: This research was supported by R01 DA025876 (FJM).

JUSTIFICATION: This study provides information regarding the mechanisms that underlie VLNcs+NRT treatments for smoking cessation.

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YOUNG ADULT

PA6-1
EXPLORING AN OXYMORON: DO YOUNG ADULTS MAKE AN “INFORMED CHOICE” ABOUT SMOKING?

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In New Zealand, smoking rates among children have decreased in recent years, but remain unchanged among young adults. This suggests that the transition to becoming a regular smoker increasingly occurs among people aged 18-25 years. Tobacco companies argue that these people make an “informed adult choice” to smoke. To investigate these assertions, we conducted in-depth interviews with 40 18-25 year olds who had started smoking since turning 18. Using a framework describing the main facets of informed choice, we explored participants’ general and specific knowledge of smoking’s harms and addictiveness, and their understanding and personal acceptance of risk. We used a constructivist thematic analysis to examine patterns in the transcripts. Although most participants had a general awareness that smoking has adverse health effects and knew some specific conditions caused by smoking, many lacked a comprehensive understanding of those risks and had over-estimated their ability to avoid becoming addicted. Most saw smoking as part of a temporary life phase that they would discontinue in the future, so tended to discount longer-term, more severe risks. Many participants’ initial experimentation with smoking was highly impulsive, involving little if any rational decision-making. Smoking sometimes seemed a way of taking control of their new, adult, identity, and lifestyle. Discovering they had become addicted may consider themselves informed, our findings suggest that they underestimate the risks they face because they do not associate their current smoking with a long term behaviour. Furthermore, they often act impulsively, further undermining the notion of an informed choice. A fully informed choice should recognise that each cigarette smoked increases the risk of addiction. As participants’ smoking progresses they become more informed through experience. Ironically, however, their growing addiction undermines their increased knowledge and ability to make a free or informed choice.

FUNDING: Oklahoma Tobacco Research Center

JUSTIFICATION: Youth programs that develop or maintain developmental assets can protect against tobacco use in young adulthood. Interventions focusing on developing or maintaining positive relationships with parents and other adults may be especially beneficial to young adults.

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PA6-2
THE PROSPECTIVE ASSOCIATION BETWEEN YOUTH ASSETS AND TOBACCO USE IN YOUNG ADULTS

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Developmental assets protect adolescents from tobacco use, but their influence during the transition to young adulthood is unknown. Prospective analyses were conducted using five waves of annual data collected from 487 randomly-selected ethnically-diverse youth (baseline age = 15 to 17) participating in the Youth Asset Study. Logistic regression, controlling for age, family structure, parent education, and ethnicity, was conducted to prospectively examine associations between ten assets assessed at wave 1 with tobacco use in the last 30 days at wave 5. Assets were categorized into interpersonal (Family Communication, Relationship with Mother, Relationship with Father, Parental Monitoring, Non-Parental Adult Relationship, and Positive Peer Role Model) and individual (General Self-Confidence, Future Educational Aspirations, General Future Aspirations, and Responsible Choices). Six wave 1 assets were significantly associated with tobacco use in the last 30 days at wave 5. Youth without the Relationship with Father (OR 2.25), Positive Peer Role Model (OR 2.46), General Aspirations for the Future (OR 2.48), and Responsible Choices (OR 1.91) assets at wave 1 were twice as likely to report tobacco use at wave 5 than those without the asset. There was a significant interaction between family structure and two assets. Youth in 2-parent households without the Non-Parental Adult Relationship asset (OR 2.94) were 3 times as likely to report tobacco use at wave 5 than those with the asset. There was a significant interaction between family structure and two assets. Youth in 2-parent families without the Non-Parental Adult Relationship asset (OR 2.94) were 3 times as likely to report tobacco use at wave 5 than those with the asset. Youth in 2-parent families without the Future Educational Aspirations asset (OR 2.69) were more than twice as likely to report wave 5 tobacco use than those who had the asset. There was not a significant association for those in 1-parent households. Developmental assets were significantly associated with tobacco use up to 4 years later. These results suggest that interventions focusing on developmental assets in older adolescents still benefit youth as they transition to young adulthood and can protect against tobacco use in young adulthood. Interventions focusing on developing or maintaining positive relationships with parents and other adults may be especially beneficial to young adults.

FUNDING: This study provides information regarding the mechanisms that underlie VLNcs+NRT treatments for smoking cessation.

JUSTIFICATION: The study examines the relevance of tobacco industry rhetoric to young adults’ actual experiences of smoking initiation, while informing potential interventions to reduce initiation.

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PA6-3
NUNCERACY AND SMOKING RISK PERCEPTIONS IN A NATIONALLY REPRESENTATIVE SAMPLE OF U.S. YOUNG ADULTS

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Health information is often expressed in terms of the quantifiable risk of disease or death, particularly with respect to tobacco-related health consequences. For those with low levels of numeracy, the ability of an individual to understand numerical concepts, quantitative information may not influence risk perceptions about health hazards. This study used the third wave of the Legacy Young Adult Cohort Study (ages 18-34) to examine the associations between numeracy and risk perceptions related to tobacco use. All respondents completed a validated general numeracy scale (3 items, alpha = 0.49) and an expanded numeracy scale (6 items, alpha = 0.63); probability of a correct response ranged from 63% to 87.5% across all 9 items. In the full sample (n=4,239), there was a positive relationship between higher educational attainment and probability of a correct response to the numeracy items (p < 0.001). In a multivariable analysis among
ever smokers, lower numeracy scores were associated with agreement on two of the smoking risk perception items ("The medical evidence that smoking is harmful is exaggerated" and "You've got to die of something, so why not enjoy yourself and smoke?"). Other significant predictors of endorsing the medical evidence item were current cigarette use, being Black, male, and having less education. In addition, younger adults, males, Whites, and current cigarette smokers were significantly more likely to endorse the "You've got to die..." item. Endorsement of the "People I care about believe I shouldn't smoke" item was significantly lower among those with higher scores on the expanded, but not general, numeracy scale in a multivariable model. There were no significant relationships between numeracy and the "Smoking is no more risky than lots of other things that people do" item. These findings highlight associations between numeracy and smoking risk perceptions and the need for further research to examine the role of numeracy in understanding health risks associated with tobacco use in this and other age groups. Future research is also needed to examine how to effectively disseminate complex risk information to those with low numeracy skills.

FUNDING: Funded internally by Legacy.

JUSTIFICATION: These findings highlight the need for further research to examine the role of numeracy in understanding health risks associated with tobacco use in this and other age groups.

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PA6-4
PATTERNS OF TRANSITIONS IN MENTHOL USE AMONG U.S. YOUNG ADULT SMOKERS OVER TIME: ASSOCIATIONS BETWEEN MENTHOL USE AND CESSATION RELATED INTENTIONS AND BEHAVIORS

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Background: To date, menthol is the only characterizing flavor in cigarettes that has not been banned. However, few longitudinal studies have explored the role of menthol in smoking initiation and progression. Purpose: The purpose of the study was twofold: (1) to describe patterns in menthol initiation and switching between menthol and non-menthol cigarettes in young adults, and (2) to examine correlations between these patterns and cessation-related intentions and behaviors. Method: Using three time points from a longitudinal national sample of young adults aged 18-34 years (N=212 smokers), patterns of menthol use over one year were defined among smokers as (1) remained menthol smoker, (2) remained non-menthol smoker, (3) switched from menthol to non-menthol, and (4) switched from non-menthol to menthol. Characteristics of the groups were assessed as well as the association between current menthol cigarette use and cessation intentions and behaviors. Proportions of participants remaining in the menthol/non-menthol groups were assessed over time. Results: Significant predictors of current menthol cigarette use at one year included initiation with menthol (OR=8.26), Black race (OR=23.60), and higher scores on the Allen menthol taste subscale (OR=1.53). Menthol smokers are more likely to report intention to quit, but no differences existed between menthol and non-menthol users in ever making a quit attempt. Conclusions: Young adults who initiate with a menthol cigarette are likely to remain menthol smokers and switching is more common from non-menthol to menthol cigarettes than vice versa.

FUNDING: This project has been funded in part by the National Institutes of Health, National Cancer Institute (CA077026; PI Sargent) and National Institute on Drug Abuse, and by the Food and Drug Administration, Department of Health and Human Services, Contract No. HHSN271201100027C.

JUSTIFICATION: Direct-to-consumer tobacco marketing reaches adolescents and young adults.

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PA6-5
DIRECT-TO-CONSUMER TOBACCO MARKETING AND ITS ASSOCIATION WITH TOBACCO USE AMONG ADOLESCENTS AND YOUNG ADULTS

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Objective: We assess exposure to direct-to-consumer tobacco marketing and its association with ever having tried smoking, smoking within past 30 days (‘current’), and smoking ≥100 cigarettes in lifetime (‘established’) among adolescents and young adults. Method: We conducted a telephone survey among 3,342 15-23 year olds in the U.S. to assess exposure to direct-to-consumer tobacco marketing (receiving direct mail from tobacco companies and viewing tobacco company websites) and potential associations of exposure to ever having tried smoking, current smoking, and established smoking. Results: Overall, 12 percent of 15-17 year olds and 26 percent of 18-23 year olds had been exposed to direct-to-consumer tobacco marketing. Racial/ethnic minority non-smoking respondents were more likely to have viewed tobacco websites than non-smoking Whites. Respondents exposed to either form of direct-to-consumer tobacco marketing were more likely to have ever tried smoking (adjusted odds ratio [AOR]: 1.7; 95% CI 1.3-2.2), while those exposed to both forms of marketing experienced even higher odds of ever-smoking (AOR: 8.2; 95% CI 2.5-26.7). We observed similar relationships for current and established smoking. Conclusions: Direct-to-consumer tobacco marketing reaches adolescent and young adult non-smokers and is associated with smoking behavior.

FUNDING: This project has been funded in part by the National Institutes of Health, National Cancer Institute (CA077026; PI Sargent) and National Institute on Drug Abuse, and by the Food and Drug Administration, Department of Health and Human Services, Contract No. HHSN271201100027C.

JUSTIFICATION: Direct-to-consumer tobacco marketing reaches adolescents and young adults.

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RECENT ADVANCES IN PRECLINICAL ANIMAL RESEARCH
PA7-1
DEXTROMETHORPHAN SIGNIFICANTLY REDUCES NICOTINE SELF-ADMINISTRATION IN FEMALE RATS

Corinne Wells, Susan Slade, Jed E. Rose, Ph.D., and Edward D. Levin, Ph.D.*, Department of Psychiatry and Behavioral Sciences, Duke University Medical Center

Dextromethorphan (DXM) is a widely used antitussive agent used in a variety of over the counter cold and flu remedies. It has actions on a variety of neurotransmitter receptors, including antagonist effects at NMDA glutamate receptors and agonist effects at opioid receptors. DXM also acts as an antagonist at alpha3beta4 nicotinic receptors. DXM has previously been found to have promise for reducing nicotine discrimination and self-administration. The current project was conducted to determine the acute dose-effect function of DXM in reducing nicotine self-administration in a rat model, its specificity for nicotine vs. food-motivated responding, and effects on locomotor activity. Young adult female Sprague-Dawley rats (N=15) were trained to self-administer nicotine IV in 60-minute sessions (FR1, 0.03 mg/kg/infusion) for five sessions. They were then

FUNDING: This project was conducted to determine the acute dose-effect function of DXM in reducing nicotine self-administration in a rat model, its specificity for nicotine vs. food-motivated responding, and effects on locomotor activity. Young adult female Sprague-Dawley rats (N=15) were trained to self-administer nicotine IV in 60-minute sessions (FR1, 0.03 mg/kg/infusion) for five sessions. They were then

JUSTIFICATION: This study provides evidence relevant to the FDA’s consideration of promulgating a tobacco product standard banning menthol, in particular, whether the standard would increase or decrease the likelihood that existing users of tobacco products will stop using such products.

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tested for the effects of acute DXM (0, 1, 3, 10, and 30 mg/kg, SC) on nicotine self-administration in a repeated measures counterbalanced design. Compared with vehicle control the 3 (p<0.025), 10 (p<0.005) and 30 mg/kg (p<0.0005) DXM doses significantly reduced nicotine self-administration by 22%, 31%, and 60% relative to control respectively. None of these doses significantly reduced food motivated responding. The 30 mg/kg dose caused a nearly significant (p<0.08) decrease but the lower doses, which significantly lowered nicotine self-administration had no hint of an impact on food motivated responding. Locomotor activity in the figure-8 apparatus over the course of a one-hour session was significantly decreased by 30 (p<0.001) and 10 mg/kg (p<0.025) of DXM but no hint of a sedative effect was seen at 1 or 3 mg/kg. These studies show that DXM significantly decreases nicotine self-administration at a dose level lower than those that decrease food motivated responding or locomotor activity. DXM is an inexpenisive, widely available medication that would be interesting to investigate as an aid to smoking cessation.

FUNDING: This research was supported by P50 grant DA DA027840 from NIDA.

JUSTIFICATION: This preclinical research supports the promise of dextromethorphan as a potential useful aid to smoking cessation.

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PA7-2
A MENTHOL INCENTIVE PROMOTES LOW-DOSE NICOTINE SELF-ADMINISTRATION IN RATS
Matthew I. Palmatier*, Ethan M. Odineal, Dakota A. Myers, and A. Brianna Sheppard, Department of Psychology, East Tennessee State University

Converging evidence suggests that NIC amplifies incentive motivation and learning about incentive stimuli. However, the effects of NIC on incentives that are part of the tobacco use context have not been thoroughly investigated. For example, many individuals experience menthol as an incentive (candy) before experimenting with menthol-flavored tobacco products. Therefore, feed-restricted rats learned to associate either menthol (0.0005% w/v, M+ group, n=8) or Grape Kool-Aid® (0.05% w/v, G+ group, n=8) with a sweet taste (20% sucrose) during 14 taste-conditioning tests. For both groups, a second bottle with the alternate taste (unsweetened) was available during each test; bottle-positions were alternated daily. After conditioning, all rats were shaped to respond for 20% sucrose delivered in a liquid dipper. Rats were subsequently instrumented for NIC self-administration. During self-administration tests all rats received intravenous NIC infusions (30 ug/kg/infusion) delivered in conjunction with unsweetened menthol solution (0.0005%) in the liquid dipper for meeting the schedule of reinforcement. There was a trend for increased self-administration of NIC by the M+ group during acquisition tests, but this trend only reached statistical significance under a fixed ratio (FR) 2 reinforcement schedule. After acquisition, a dose-response curve was generated by testing several unit NIC doses (0-60 ug/kg/infusion); each dose was tested for at least 2 days before progressing to the next dose. Relative to the G+ group, the dose-response curve was shifted far to the left for the M+ group. Peak self-administration was observed at a dose 5 times lower for M+ (3.25 ug/ kg/infusion) relative to G+ rats (15 ug/kg/infusion). The findings suggest that self-administration of NIC in conjunction with taste incentives can potentially alter the relationship between behavior and NIC dose, with flavor incentives making rats more responsive to the effects of lower NIC doses. This study provides convincing evidence that flavor additives that are familiar incentives may increase the abuse liability of tobacco products.

FUNDING: This research was funded by an internal award from East Tennessee State University

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PA7-3
THE NICOTINIC α4β2 DESENSITIZING AGENT YL-2-203 SIGNIFICANTLY REDUCES NICOTINE SELF-ADMINISTRATION IN RATS
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Nicotinic α4β2 desensitizing agents have shown promise as a novel line of treatment to aid smoking cessation. Two different classes, Sazetidine-A and VMY-12-95, have been shown in our earlier studies to significantly reduce IV nicotine self-administration in rats. The current study tested in a dose-response study whether a representative of a third class of α4β2 desensitizing agents YL-2-203 would also reduce nicotine self-administration. Young adult female Sprague-Dawley rats (N=15) were trained to self-administer nicotine IV in 45-minute sessions (FR1, 0.03 mg/kg/infusion) for ten sessions. Then they were tested for the effects of acute doses of YL-2-203 (0.3, 1, and 3 mg/kg) on IV nicotine self-administration in a repeated measures counterbalanced design with each dose and the vehicle control tested twice. There was a significant (p<0.05) main effect of YL-2-203 on nicotine self-administration with the 3 mg/kg dose significantly (p<0.05) decreasing nicotine self-administration relative to the control condition with a 17% decrease after acute dosing. The effect of YL-2-203 decreasing nicotine self-administration did not seem to be secondary to any sedative effects; in fact, all three YL-2-203 doses caused significant (p<0.005) increases in locomotor activity. None of the YL-2-203 doses significantly affected food motivated operant responding. A chronic study showed that YL-2-203 significantly (p<0.005) reduced relapse to nicotine self-administration after a one week period of enforced abstinence with a 46% decrease in nicotine self-administration relative to control. These studies provide evidence for a third line of α4β2 nicotinic receptor desensitizing agents for decreasing nicotine self-administration. Nicotinic α4β2 desensitizing agents can potentially be targeted for new effective treatments for smoking cessation.

FUNDING: This project was supported by Grant DA DA027990 from NIH/NIDA.

JUSTIFICATION: This is support in an animal model for the promise of alpha4beta2 nicotinic desensitizing agents for developments as smoking cessation treatments.

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PA7-4
BEHAVIORAL ECONOMIC ANALYSIS OF NICOTINE’S REINFORCEMENT ENHANCING EFFECT
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Nicotine appears to enhance the value of reinforcing stimuli in the environment, and this effect may contribute to nicotine’s widespread abuse. We attempted to better quantify this effect using a demand curve analysis. Six Long- Evans rats were exposed to an observing response procedure. In this procedure, two levers were concurrently available. Presses to one lever resulted either in food according to a variable-interval 15 second schedule (45 mg pellets, VI 15 s) or extinction, which alternated according to variable interval 60s schedule (VI 60s component duration). Presses to a second, observing lever illuminated stimuli correlated with the schedule in effect on the food/extinction lever. The schedule-correlated stimuli served as conditioned reinforcers which maintained observing responding, and observing responses did not alter the probability of food reinforcement and observing presses were not required to earn food. The number of responses required on the observing lever increased across sessions (fixed-ratio (FR) schedule values: 1, 2, 3, 5, 7, 10). The number of presentations of conditioned reinforcers was plotted as function of FR value to generate a demand curve. Nicotine was administered via subcutaneous injection at a dose of 0.3 mg/kg. The exponential demand equation, which estimates the essential value of the stimuli, was then fit to the data. Compared to vehicle, nicotine increased the value of
the conditioned reinforcers as measured by this equation. The current analysis has demonstrated that under certain conditions nicotine increases the value of non-drug conditioned reinforcers.

FUNDING: NIDA 2 T32 DA016184; UF Department of Psychology

JUSTIFICATION: Nicotine’s reinforcement enhancing effect may help explain nicotine’s widespread abuse and better quantification of this effect may help better evaluate potential treatments.

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PA7-5
MOLECULAR ATTRIBUTES OF CONJUGATE ANTIGEN AND CHOICE OF ADJUVANT IN NIC7 ANTI-NICOTINE VACCINE INFLUENCE PHARMACOKINETICS (PK) AND TISSUE DISTRIBUTION OF NICOTINE FOLLOWING IV CHALLENGE IN NON-HUMAN PRIMATES

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Background: Anti-nicotinic antibodies (Ab) reduce nicotine entering the brain which is expected to reduce the sense of reward associated with smoking tobacco. We previously showed that Ab function in mice induced by nicotine conjugate vaccines was influenced by antigen (Ag) characteristics such as epitope density and % high molecular mass species (HMMS). Herein, we evaluate the effect of these Ag attributes as well as adjuvant on PK and distribution of nicotine following IV challenge with nicotine in non-human primates immunized with NIC7 (nicotine-like hapten conjugated to CRM197). Method: 4 lots of NIC7 conjugate were generated under different reaction conditions, resulting in variations in hapten load (~5-16 hapten/CRM), and molecular size (monomer ~30–100%; HMMS 0-60%). Cynomolgus monkeys were immunized 4 to 6 times with NIC7 (100 or 150 µg), alone or with aluminium hydroxide (500 µg Al3+) +/- CpG (500 or 1000 µg). After the last dose, animals received nicotine (IV), nicotine levels in plasma were measured, PK analysis conducted and compared to non-immunized control animals. Thereafter, animals received 3h-nicotine (IV) and nicotine levels in brain and plasma were determined. Plasma was tested for Ab titer (ELISA) and function (nicotine-binding capacity in equilibrium dialysis assay followed by LC/MS/MS). Result: All NIC7 conjugates resulted in equivalently high titers of anti-nicotine Ab, but varied greatly in their ability to retain nicotine in the plasma and prevent its uptake into brain. Highest nicotine levels in plasma (as measured by Cmax and AUC) and slowest clearance (as measured by t½, MRT, Cl) was achieved with a NIC7 conjugate having low HMMS content and an epitope density of ~16. The combination of aluminium hydroxide/CpG as adjuvant resulted in higher levels of nicotine in plasma for a longer period of time than aluminium hydroxide alone. The combination of aluminium hydroxide/CpG as adjuvant resulted in higher levels of nicotine in the brain. The capacity of antibodies to retain nicotine in the plasma at higher levels and for longer periods of time correlated with an increased nicotine binding capacity and reduction of nicotine in the brain.

FUNDING: All studies were funded by Pfizer.

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PA8-1
THE ROLE OF MAJOR DEPRESSION, GENERALIZED ANXIETY DISORDER, AND PANIC ATTACKS IN THE RELAPSE OF SMOKING AMONG ADULTS IN THE UNITED STATES: 1994-2005

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The current study investigated the relation between smoking relapse and depression and specific anxiety disorders (generalized anxiety disorder [GAD] and panic attacks) among smokers in the U.S. over a 10-year period. Data were drawn from the Midlife Development in the United States (MIDUS) Survey Waves I & II. Logistic regression analyses were used to empirically explore the associations between history of major depression and anxiety disorders and risk of smoking relapse ten years later, compared with that among those without depression/anxiety disorders. Approximately 40% of those who relapsed had depression, GAD, or panic attacks compared to only 22% who remained abstinent. Major depression and panic attacks in 1994 predicted increased likelihood of smoking relapse by 2005 compared to those without these disorders in 1994 (OR=1.7 (CI: 1.2-2.4) and OR=2.5 (CI: 1.6-4.0, respectively). These associations largely remained statistically significant after adjusting for demographics, alcohol/ substance use disorders, amount of smoking, duration of daily smoking, and duration of cessation period. Major depression and panic attacks appear to be significant barriers to successful smoking cessation over the long term in the general population. These data suggest that smoking intervention efforts could usefully address clinically significant depression and anxiety in order to enhance cessation outcome and prolonged abstinence.

FUNDING: No Funding.

JUSTIFICATION: Overall, the present findings uniquely extend previous work and suggest that depression and certain anxiety disorders are prospectively associated with increased risk of smoking relapse over extended periods of time and thereby add to a growing empirical literature suggesting greater clinical attention be focused on these psychiatric conditions in smoking cessation.

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PA8-2
DO MENTALLY ILL SMOKERS IN PRIMARY CARE RESPOND TO NICOTINE REPLACEMENT THERAPY? RESULTS FROM THE STOP STUDY

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Background: Smokers with mental illness are more heavily dependent but may respond to NRT. The aim of this project was to examine the association between the duration of NRT use, history of mental illness, and quit success. Method: Study participants (n=1,025) came from primary care offices in Ontario. All participants received smoking cessation counselling and were eligible for 26 weeks of free NRT including combination and high dose at the discretion of the treating team. Subjects were followed up at 6 months. Bivariate analyses were performed to examine the differences between those with and without a lifetime diagnosis of mental illness on key variables including amount of NRT prescribed, age, sex, and Heaviness of Smoking Index (HSI). Multivariate analyses were performed to examine the association between total NRT dispensed and quit success, and the effect of a
A DATE WITH DENSITY: RETAIL AVAILABILITY OF VERY LOW NICOTINE CIGARETTES ACROSS A 5-HR PERIOD IN HEAVY SMOKERS WITH AND WITHOUT SCHIZOPHRENIA

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Aims: Acute use of very low nicotine content (VLNC) cigarettes produces compensatory increases in puff intensity, which is a concern as the FDA is considering reducing cigarette nicotine content as a regulatory approach to reducing smoking rates. Furthermore, the higher smoking rate among smokers with schizophrenia (SS) suggests that they may be more prone to compensatory smoking. Topography patterns in SS and non-psychiatric smokers (NS) across 5-hr periods were compared to determine whether compensatory smoking (a) abates over time and (b) is more severe among SS. Method: We collected topography patterns of VLNC (0.05 mg nicotine) and usual brand (UB) cigarettes in SS (n = 23) and NS (n = 20) who were cued to smoke at their typical rate for 5 hrs. We used GEE models to examine the effects of Group (SS, NS), Cigarette condition (UB, VLNC), and Cigarette number (Cignum) on puff volume, duration, inter-puff interval, and puffs per cigarette. Results: SS smoked more puffs per cigarette and had shorter inter-puff intervals than NS (ps < .01). A 3-way interaction on puff duration (p < .05) indicated that, in SS, VLNC puff durations were longer than UB durations and stable across the session; in NS, VLNC puff durations remained elevated but UB puff durations tended to decrease over time. VLNC puff volumes exceeded UB puff volumes across the session (p < .05); in NS, VLNC puff volumes were highly variable and no effects were significant. A Condition x Cignum trend on inter-puff interval (p = .09), indicated that, in both groups, puffs per UB cigarette was stable, whereas puffs per VLNC cigarette started lower but tended to increase over time. Conclusions: Compensatory smoking of VLNC cigarettes did not abate across a 5-hr period. As compensatory smoking may be an unintended negative consequence of nicotine regulatory policy, effects of extended VLNC use on topography should be examined. There was little indication of greater compensatory VLNC smoking in SS.

FUNDING: Supported by U54DA031659, R01DA14002, K23DA033302 and T32DA016184.

JUSTIFICATION: These results suggest that compensatory smoking could be an unintended negative consequence of an FDA-mandated reduction in the nicotine content of cigarettes and indicate that effects of extended VLNC use on topography should be examined.

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TOBACCO AND ASSOCIATIONS WITH USE

**PA9-1**
TOBACCO RETAIL OUTLET ADVERTISING PRACTICES AND PROXIMITY TO SCHOOLS, PARKS AND PUBLIC HOUSING AFFECT SYNAR UNDERAGE SALES VIOLATIONS IN WASHINGTON, DC

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To examine the cross-sectional association between illicit sales of tobacco to minors, Washington DC (DC) tobacco outlet advertising practices, retail store type, the demographic make-up of the area surrounding each outlet, and the proximity of each outlet to DC schools, recreational parks, and public housing. Seven hundred fifty tobacco outlets in the DC area, n=947 of which were randomly selected for inspection by the DC Synar Inspection Program in 2009-2010. Illicit sales to minors were more common near gas stations (OR=3.01; 95% CI:1.5-6.3), outlets that displayed exterior tobacco advertisements closer to parks (OR=3.36; 95% CI:1.38-8.21), and outlets located closer to DC high schools in majority African-American block-groups (OR= 1.29; 95% CI:1.07-1.58). The presence of tobacco advertisements on the exterior of gas stations was much greater than on other retail store types (OR=6.68; 95% CI:4.05-11.01), as was the absence of any advertisements at bars or restaurants that sold tobacco (OR=0.33; 95% CI:0.22-0.52). External tobacco advertisements were also more likely in predominantly African-American areas of the city (OR=3.11; 95% CI:2.8-4.25), and particularly likely on storefronts located closer to parks (OR=1.87; 95% CI:1.06-3.28). Findings demonstrate that illicit tobacco sales to minors in DC, while occurring at acceptably low rates by Synar standards, vary considerably by tobacco-outlet type, advertising approach, and proximity to public schools, parks, and African-American residential areas. Future work may help inform regulatory efforts to reduce youth access at the neighborhood, city, state, and national-levels.

FUNDING: 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 the American Legacy Foundation. The project was also funded by the Centers for Disease Control and Prevention CPPW Contract from the DC Department of Health (PI: Kirchner).

JUSTIFICATION: Results of this paper indicate that underage sales violations represent a valuable metric that may help inform regulatory actions at the point-of-sale that can be “narrowly tailored” to reduce youth access.

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**PA9-2**
TOBACCO OUTLET DENSITY AND SMOKING SEVERITY AMONG SMOKERS WITH SERIOUS MENTAL ILLNESS

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With high smoking prevalence and challenges quitting, individuals with serious mental illness (SMI) are a priority population for tobacco control. Large unexamined, however, are environmental influences on smoking severity and resistance to quitting in this vulnerable group. In a diverse sample of 1060 adult smokers with SMI in the SF Bay Area (47% male; 53% white; aged 18-75), we (1) characterized geographical access to tobacco outlets, and (2) tested whether outlet access is associated with smoking severity, readiness to quit, and mental health functioning. Participant addresses were geocoded and linked with retailer licensing data to determine the distance between a participant’s residence and the nearest outlet and the density of outlets near one’s residence. Relative to the average Bay Area resident, our sample of Bay Area smokers with SMI lived in census tracts with 1.6 times greater tobacco outlet density per acre. The median distance to the nearest outlet was 247 meters (IQR: 115, 528), with a median density of 7.5 and 12 outlets within 500 and 1000 sq meters of their residences, respectively. Multilevel regressions, adjusting for individual demographics and neighborhood poverty, indicated that tobacco outlet density (outlets/acre within 500 sq meters) was positively associated with nicotine dependence (FTND total scores) (B=3.31, p<.001), # of cig/day (B=2.37, p<.02), and psychosocial symptoms (B=3.15, p=0.04), and negatively associated with planning to quit smoking in the next 30 days (B=-2.55, p=.01), expected success with quitting (B=7.66, p<.0001), and mental health (B=-2.32, p=.02). Results were similar for 1000 sq meter tobacco outlet density. Associations were stronger for women than men. Distance to the nearest tobacco retailer was not associated with smoking or mental health measures. Controlling for poverty level and participant demographics, density of tobacco outlets, rather than closest proximity, was significantly associated with tobacco use severity (dependence and quantity of use), lowered self-efficacy with quitting, and poorer mental health. Restricting tobacco outlets may support cessation efforts in this vulnerable group.

FUNDING: Research supported by NIH R01 MH083694 and NIH T32 HL007034.

JUSTIFICATION: Individuals with serious mental illness are a priority population for tobacco control and the results of our study suggest that restricting tobacco outlets may support cessation efforts in this vulnerable group.

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**PA9-3**
RETAIL ACCESS TO CIGARETTES: ASSOCIATIONS WITH YOUTH CIGARETTE SMOKING AND ACCESS BELIEFS

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This longitudinal study examines (1) associations between city demographics and retail access to cigarettes including tobacco outlet density, retailer noncompliance with underage tobacco sales laws, and local enforcement of these laws, and (2) effects of these retail access measures on youth cigarette smoking and access beliefs over time. City demographics were obtained from 2010 GeoLytics data. We conducted linear and multilevel linear regression analyses. We found that all measures of retail access to cigarettes were associated with some city demographics. Focusing on the associations with youth smoking and beliefs, outlet density was positively associated with youth smoking behaviors. Also, cross-level interaction effects between outlet density and time indicated that smoking frequency of youth who lived in cities with greater density of tobacco outlets was higher at Wave 1 than smoking frequency of youth in cities with lower density. At Wave 3, smoking frequency of youth in cities with greater tobacco outlet density was similar to this of youth in cities with lower outlet density. These results suggest that higher tobacco outlet density may be associated with early initiation of smoking by youth. Greater density was also positively associated with perceived cigarette availability and negatively associated with youth perceptions of enforcement of access policies in their community. No main effects of retailer noncompliance with underage tobacco sales laws and local enforcement of these laws on youth smoking behaviors were found. However, we found that these retail access measures affected youth access beliefs cross-sectionally and over time.

FUNDING: Tobacco-Related Disease Research Program [19CA-016, Sharon Lipperman-Kreda PI] and National Cancer Institute [CA138956, Joel Grube PI]
JUSTIFICATION: Results will help to inform policymakers regarding how to craft policies which regulate youth access to cigarettes.

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PA9-4
THE IMPACT OF THE TOBACCO RETAIL OUTLET ENVIRONMENT ON ADULT CESSION ATTITUDES AND BEHAVIORS AND DIFFERENCES BY NEIGHBORHOOD SOCIOECONOMIC STATUS

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The ready availability of cigarettes in the retail environment may be a serious deterrent to reducing smoking prevalence. Nearly one-third of smokers report they would either quit or cut down if cigarettes were not available within walking distance of their residence or usual activities. We examined the impact of tobacco retail outlet concentration on cessation cognitions and behaviors over time across multiple U.S. regions and assessed differences in effects by neighborhood socioeconomic status. The sample consisted of 2,388 baseline smokers from the Legacy Longitudinal Cohort Survey, a nationally representative cohort followed over three waves from 2008 to 2010. Generalized estimating equations were used to examine cessation cognitions and behavior (30-day abstinence) over time in relation to the proximity, count, and density of tobacco retail outlets across 8 broad metropolitan areas of the U.S. Tract-level outlet density and the number of outlets within 1 kilometer from home residence were associated with reduced cessation activity among all smokers. Smokers in higher poverty neighborhoods who lived further from a retail outlet were over 2 times more likely to be abstinent than those living closer to an outlet. A greater number of outlets within 500 meters from home residence reduced abstinence by 30% among smokers in poorer areas. This is the first study to examine outlet density and proximity across multiple and diverse geographic regions in the U.S. Findings suggest that cessation activity may be undermined by the widespread availability of tobacco outlets near smokers’ residence and smokers in low SES areas may be most influenced by the proximity and number of outlets closest to their homes. Cessation activity among smokers may be undermined by the current landscape of tobacco retailing in the U.S., which helps ensure that cigarettes are easier to access than products and services that help smokers quit.

FUNDING: 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 the American Legacy Foundation. The views and opinions expressed in this presentation are those of the authors only and do not necessarily represent the views, official policy or position of the US Department of Health and Human Services or any of its affiliated institutions or agencies.

JUSTIFICATION: This study can inform tobacco outlet licensing and zoning policies, particularly in low SES communities.

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PA9-5
THE AVAILABILITY OF ELECTRONIC CIGARETTES IN US RETAIL OUTLETS, 2012: RESULTS OF TWO NATIONAL STUDIES

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Since their introduction to the US market in 2007, electronic cigarette (‘e-cigarette’) awareness and use has grown rapidly. Little is known about the variation in availability of e-cigarettes across areas with different levels of tobacco taxes and smokefree air policies. This paper looks at US retail availability of e-cigarettes and the factors at the store, neighborhood, and policy levels associated with it. In-person store audit data come from two national samples of stores in the contiguous US that sell tobacco products (‘tobacco retailers’) collected in 2012. Study 1 collected data from a nationally representative sample of tobacco retailers (n=2165). Study 2 collected data from tobacco retailers located in school enrollment zones for a nationally representative samples of 8th, 10th, and 12th grade public school students as part of the Bridging the Gap Community Obesity Measures Project (n=2,415). Studies collected data on e-cigarette availability and predictors of availability at the store, neighborhood/school catchment, and policy levels. Nationally, in 2012, e-cigarette retail availability was 34% in study 1 and 31% in study 2. In study 1 and 2, tobacco stores and pharmacy/drug stores were more likely to sell e-cigarettes than beer, wine, and liquor stores. Price of traditional (‘analogue’) cigarettes was inversely related to e-cigarette availability (Study 1). Retail availability of e-cigarettes was more likely in stores neighborhoods with higher median household income (Study 1). Stores in states with an ALA Smokefree Air grade of F vs Grade A states had increased likelihood of having e-cigarettes. Currently, the availability of e-cigarettes appears to be more likely in areas with weak tax and smokefree air policies. Given the substantial availability of e-cigarettes at tobacco retailers nationwide and the largely unsubstantiated health profile and marketing claims, states and localities should regulate the sales and marketing of e-cigarettes at point of sale (POS).

FUNDING: Study 1: Maximizing State & Local Policies to Restrict Tobacco Marketing at Point of Sale (Grant Number: U01 CA154281) Study 2: Monitoring and Assessing the Impact of Tax and Price Policies in the U.S. (Grant number: U01 CA154248)

JUSTIFICATION: JUSTIFICATION: States and localities should regulate the sales and marketing of e-cigarettes at POS and continue to monitor the effects of tax and smokefree air policies on availability of this rapidly emerging product.

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PA10-1
USE OF E-CIGARETTES AND ALTERNATIVE TOBACCO PRODUCTS BY INDIVIDUALS WITH MENTAL HEALTH CONDITIONS

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Tobacco-related morbidity and mortality are disproportionately high among individuals with Mental Health Conditions (MHC) due to high smoking prevalence rates. Little is known about this population’s use of electronic cigarettes (e-cigarettes) or other tobacco products such as snus or hookah. As high consumers of cigarettes, smokers with MHC may consider using alternative forms of nicotine delivery. Increasingly popular, e-cigarettes are designed to resemble standard cigarettes but provide nicotine without combustion. Of particular interest, they have even been marketed on websites as a way to manage depression and anxiety. Examination of the use of e-cigarettes and other tobacco products by individuals with MHC will provide essential information for the regulation of these
products. This study used a population survey with a national probability sample (N=10,041). Respondents self-reported diagnoses of anxiety disorder, depression, or other mental health condition. They were asked if they had ever used or were current users of various tobacco products (cigarettes, snus, hookah, etc.) with special emphasis on e-cigarettes, where they had heard about them, whether they had used them and why, and their likelihood of using them in the future. Individuals with MHC were more likely to have tried e-cigarettes (14.8%) and be current users of them (3.1%) than those without MHC (6.6% and 1.1%, respectively). MHC were more susceptible to future use of e-cigarettes (21.4% vs. 10.1%), although the difference was only significant among current smokers (60.5% vs. 45.3% for smokers with and without MHC, respectively). Smokers with and without MHC used e-cigarettes for the same reasons: they believe them to be effective quitting aids and safer than regular cigarettes. Individuals with MHC were more likely to smoke cigarettes (39.9%), cigars (8.3%), and cigarettes (7.5%), and to use snus (2.1%) than those without MHC (16.7%, 4.8%, 3.2%, and 0.5%, respectively) but no more likely to use hookah or chewing tobacco. This presentation will discuss the implications of the findings for smoking-related health disparities.

FUNDING: Supported by a grant from the National Cancer Institute (U01CA154280).

JUSTIFICATION: The appeal of e-cigarettes and alternate tobacco products to individuals with mental health conditions can be used to inform regulation of these products and their potential to increase or decrease health disparities.

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PA10-2 REDUCED EXPOSURE TO HARMFUL AND POTENTIALLY HARMFUL SMOKE CONSTITUENTS AFTER FIVE DAYS OF USE OF A CANDIDATE MODIFIED RISK TOBACCO PRODUCT: THE TOBACCO HEATING SYSTEM 2.1

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OBJECTIVE: To evaluate the reduction in exposure to selected harmful and potentially harmful constituents (HPHCs) after 5 days of ad libitum use of Tobacco Heating System 2.1 (THS 2.1) compared to smoking conventional cigarettes (CC). The following biomarkers of exposure (BoExp) were measured as primary objectives: Carboxyhemoglobin (carbon monoxide), S phenylmercapturic acid (phenylmercaptan), 3-hydroxypropylmercapturic acid (acrolein), and mono- and dihydroxybutenyl mercapturic acid (1,3-butadiene). Additional BoExp were measured and safety was monitored. METHODS: An open-label, randomized, controlled, parallel group design was used in this confinement study in 40 healthy smokers aged between 21 and 65 years. After admission, smokers smoked CC for 2 days (baseline) and were subsequently randomized to continue smoking CC, or switched to THS 2.1 for 5 consecutive days. Smokers were allowed to smoke ad libitum. BoExp and cytochrome P450 1A2 (CYP1A2) activities were measured using validated methods. Twenty-four hour urine was collected to evaluate the levels of urinary BoExp. This study was conducted according to GCP and is registered in ClinicalTrials.gov, number NCT01780714. RESULTS: At the end of the 5-day exposure, the reduction in the levels of primary BoExp (urinary cotinine expressed as concentration adjusted for creatinine) in the THS 2.1 arm as compared to CC, ranged from 72.1% to 93.0%. Differences between the 2 arms were statistically significant and were observed within 24 hours of starting use of THS 2.1. Nicotine equivalent excretion at baseline and at the end of exposure were similar for THS 2.1 (12.1 and 12.3 mg/mg creatinine, respectively) and were slightly increased for CC (12.4 and 14.2 mg/mg creatinine, respectively). Average daily consumption increased by 27.1% from Day 1 to Day 5 for the THS 2.1 arm, and by 12.9% for the CC arm. No serious or severe adverse events were reported. CONCLUSIONS: Exposure to HPHCs was significantly reduced in subjects switching from CC to THS 2.1, as compared to subjects who continued smoking CC for 5 days.

FUNDING: PMI

JUSTIFICATION: EVALUATION IN THE REDUCTION IN EXPOSURE TO SELECTED HARMFUL AND POTENTIALLY HARMFUL CONSTITUENTS AFTER USE OF TOBACCO HEATING SYSTEM 2.1 (THS 2.1)

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PA10-3 ELECTRONIC CIGARETTE USE AND WILLINGNESS TO USE APPROVED NICOTINE REPLACEMENT FOR CESSATION

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In the absence of sufficient data and FDA regulation, electronic cigarettes are controversial with regard to cessation of cigarette smoking. We examined cessation activity among current cigarette smokers and the use of electronic cigarettes. Data for this study are from the 2012 Social Climate Survey of Tobacco Control, which applied a mixed-mode phone and web-based survey to obtain a representative sample of US adults. Current smokers (n=490) who had made at least one quit attempt in the past year were more likely to have tried an electronic cigarette (45.4%) than smokers who had not made a quit attempt (36.4%), p<.001. Current smokers who have tried the electronic cigarette were more willing to use an approved nicotine replacement medication (70.1%) compared to those who have not tried the electronic cigarette (53.8%), p<.001. In multivariable analysis, a quit attempt in the past year (OR=1.8, 95% CI = 1.2 - 2.6) and use of the electronic cigarette (OR=1.9, 95%CI 1.3-2.9) remained significant predictors of willingness to use approved nicotine replacement medication, controlling for education, age, race, region, and age. Our results indicate that cigarette smokers who want to quit are more willing to try multiple approaches, perhaps in the hope that at least one approach will be effective. Electronic cigarette use is an important predictor for wanting FDA-approved nicotine replacement medications. Clinicians may struggle with messaging around electronic cigarette use; however, they may consider, while counseling about cessation, that patients who have used these products may be more willing to use FDA-approved nicotine replacement medications for cessation.

FUNDING: 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.

JUSTIFICATION: Clinicians may struggle with messaging around electronic cigarette use, however they may consider, while counseling about cessation, that patients who have used these products may be more willing to use FDA-approved nicotine replacement medications for cessation.

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PA10-4 CURRENT RATES OF ELECTRONIC NICOTINE DELIVERY SYSTEMS (ENDS) AMONG YOUTH

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Use of e-cigarettes, also known as electronic nicotine delivery systems (ENDS), has recently increased significantly among adults. Prevalence among youth is less reported on a national level. The purpose of the study was to provide an up-to-date look at the magnitude of the increase by examining changing trends in ENDS use among youth ages 13-18 from 2011 through 2013 using two surveys: (1) the 2011 National Youth Tobacco Survey (NYTS; N=19,001) and (2) the 2013 Legacy Media Tracking Online survey (LMTO; N=1,006). The prevalence of ENDS use and dual use of ENDS and cigarettes were compared. Correlates of ENDS use
were identified in each sample. The two samples were similar in overall prevalence of current youth cigarette smoking rates and demographic characteristics (age, race, and ethnicity). Ever and current (past 30-day) ENDS use more than doubled from the 2011 NYTS sample (ever = 3.6%; current = 1.2%) to the 2013 LMTO sample (ever = 9.4%; current = 4.8%). The rate of dual use of ENDS and cigarettes also increased across surveys. Among past 30-day cigarette smokers in the NYTS, 16.2% reported ever use of ENDS and 5.7% reported current ENDS use. In the LMTO study, ENDS ever use among past 30-day smokers increased to 39.3% and 24% of current cigarette smokers also reported current ENDS use. Among current ENDS users, ever smoking was 90.6% in 2011 and 84.3% in 2013. In a multivariable analysis, correlates of current ENDS use in both samples included age, current smoking status, and the number of close friends who smoke cigarettes. The NYTS 2012 rates of ENDS use among 6th-12th graders reported by the Centers for Disease Control fall between the NYTS 2011 and LMTO 2013 rates presented in this study, corroborating the pattern of increasing ever and current use of ENDS among adolescents. For example, the rate for ever ENDS use in the NYTS 2011 was 3.6%, 6.8% in the NYTS 2012 and 9.4% in the 2013 LMTO. ENDS sales are estimated to approach $2 billion by the end of 2013 and more than $10 billion by 2017. Given the rapid increase in ENDS use among youth, rapid surveillance is needed to monitor uptake of ENDS and poly use of ENDS and other tobacco products.

FUNDING: This study was funded internally by Legacy.

JUSTIFICATION: Given the rapid increase in ENDS use among youth, rapid surveillance is needed to monitor uptake of ENDS and poly use of ENDS and other tobacco products.

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PA10-6 EFFECTS OF SOLVENT AND BATTERY OUTPUT VOLTAGE ON NICOTINE LEVELS RELEASED FROM ELECTRONIC CIGARETTES

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Significance: There are hundreds of e-cigarette brands on the market currently and it is difficult to generalize about e-cigarettes as a single device. The engineering of e-cigarettes varies with respect to types of nicotine solutions, the capacity of the cartridges containing the solution, the nature of the heating element and battery, the resistance of the heater, the battery output voltage, and the types of additives and flavorings. The aim of this study was to examine how the battery output voltage and the nicotine solvent affect amount of nicotine released from e-cigarette to the vapor. Materials and Methods: In the laboratory settings, we measured how much nicotine was released to the vapor with 15 puffs from e-cigarette. Vapors were generated from the most popular e-cigarette in Poland (eGo3 Twist model, Volish brand) using an automatic smoking machine with following puffing conditions: puff duration 2 sec., intervals between puffs 17 sec., and puff volume 50 mL. E-cigarette contained 18 mg/mL nicotine dissolved in three different solvents: vegetable glycerin (VG), propylene glycol (PG), or a mixture of VG and PG (50:50). The e-cigarette battery output voltage was also changed during the experiments (from 3.2 to 4.8 volts). Nicotine was absorbed in a set of washing bottles with methanol and analyzed with gas chromatography. Results: When low battery output voltage was used (3.2 volts), the amounts of nicotine released with 15 puffs from VG, VG/PG and PG were 0.46, 0.59, and 1.21 mg, respectively. However, when the battery output voltage was increased to 4.8 volts, the same amounts of nicotine were released from all solvents (0.72-0.82 mg/15 puffs). Conclusions: We found that nicotine solvent and battery output voltage affect nicotine amounts released in the vapor from e-cigarette. The nicotine content in e-cigarette is thus only one of the factors contributing to nicotine levels delivered to users. Different e-cigarette models provide different nicotine delivery to vapor which is not directly related to nicotine content in a product.

FUNDING: This work was supported by the Institute of Occupational Medicine and Environmental Health, Sosnowiec, Poland

JUSTIFICATION: The findings of this study will be used by: 1) regulatory agencies to implement standards for accurate labeling of nicotine content in e-cigarettes, 2) users of the products, and 3) researchers when designing clinical trials with e-cigarettes.

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PA11-2

“TOBACCO FREE TAR HEELS”: OUTCOMES AND LESSONS LEARNED FROM EMPLOYEE CESSATION PROGRAMS AT UNC HEALTH CARE SYSTEM AND THE TOWN OF CHAPEL HILL

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As health care costs continue to rise, employers seek ways to support healthy lifestyles of employees, reduce risks of chronic disease, and increase productivity. Work site based tobacco cessation programs that include counseling and access to cessation medications offer a win-win opportunity to employees who use tobacco and their employers. Since 2011, the University of North Carolina (UNC) Nicotine Dependence Program (NDP) has offered comprehensive tobacco use treatment to employees of the UNC Health Care System (HCS) and the Town of Chapel Hill (ToCH). The program models differ in several aspects. For example, one offers all FDA medications at no cost, the other only nicotine patches, gum, and/or lozenges. One offers a small incentive for referring other employees, as well as cash gift cards for taking follow-up surveys, the other offers a generous cash gift card after six and twelve months of continuous abstinence. Surveys demonstrate high satisfaction from employee participants. Both programs have been well received, and numerous employee participants have enthusiastically shared their stories in newsletter interviews. To date, we have served 140 UNC HCS employees and 65 ToCH employees, with seven day point prevalence quit rates of 21%-22% at 12 months. We will present 3, 6, and 12 month cessation outcomes for each program and discuss the impact of free medications and incentives on enrollment, participation, quit attempts, and abstinence rates. Conference participants will gain knowledge and models for implementing effective employee tobacco use treatment in similar work site settings. Key facilitators include ease of enrollment and convenience of meeting place and time. Key barriers include scheduling challenges and outreach to a large population. Discussion of these and other lessons learned will inform efforts and provide guidance on providing effective employee tobacco use treatment in similar work site settings.

FUNDING: The UNC Health Care System provides funding for its employee “Tobacco Free Tar Heels” program. The Town of Chapel Hill contracts with the UNC Department of Family Medicine’s Wellness@Work program, which includes employee tobacco use treatment.

JUSTIFICATION: Findings have the potential to improve work site cessation programs.

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PA11-3

RESISTING THE URGE TO SMOKE: EFFECTS OF INHIBITORY CONTROL TRAINING IN CIGARETTE SMOKERS

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Smokers have difficulty in resisting smoking urges. This study assessed the effects of inhibitory control training (ICT) on inhibition and cigarette use in smokers. We hypothesised that ICT would improve response inhibition, and reduce cigarette use. Current smokers (n = 55) abstained from smoking for 12 hours prior to the test day. On the test day, participants recorded cigarette use for the past 7 days and completed pre-training measures of global and cue-specific (i.e., smoking-related) response inhibition, using a go/no-go task. Participants were randomised to an ICT group (active, control). The active training group was required to repeatedly inhibit a response towards smoking cues (100%), while the control group was required to inhibit a response towards smoking and neutral cues with equal frequency (50%). Post-training, performed post-ICT training and measures of response inhibition was assessed using logistic regression, while cigarette use was examined by ANOVA of number of cigarettes per week, with a within-subjects factor of time (pre-posttrain) and a between-subjects factor of training group (active/control). The cue-specific version included an additional factor of cue (smoking/neutral). Our secondary outcome of smoking resistance was assessed using logistic regression, while cigarette use was examined by ANOVA of number of cigarettes per week, with a within-subjects factor of time and a between-subjects factor of training group. Error data did not indicate the hypothesised time × group or time × group × cue interactions. Smoking resistance data indicated that, as hypothesised, smokers in the active group were more likely to be able to resist smoking for a period of 20 minutes than those in the control group (OR = 3.33, 95% CI 1.03 - 10.80, p = 0.045). Cigarette use data did not indicate the hypothesised time × group interaction. Our data suggest that ICT enhances the ability to resist smoking, indicating that training may be a promising adjunct to smoking pharmacotherapy. Further research is required to improve the duration of training effects and to understand the mechanism underlying training.

FUNDING: University of Bristol, School of Experimental Psychology Pilot Grant

JUSTIFICATION: Our data are the first to suggest that inhibitory control training may enhance the ability to resist smoking, indicating that training may be a promising adjunctive treatment to smoking pharmacotherapy.

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PA11-4

DOES LUNG AGE FEEDBACK IMPROVE SHORT TERM QUIT RATES IN SMOKERS SEEKING INTENSIVE TREATMENT

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The purpose of this study was to investigate the effect of spirometry-based feedback of lung age at baseline on treatment compliance and quit rate at one month follow-up. A Randomized Controlled Trial Setting was employed. Participants were solicited from outpatient medical practices in Hershey Pennsylvania area. Methods: Participants were 225 smokers of at least 5 cigarettes per day, aged over 21 years and willing to make a quit attempt in the next 30 days. At the initial assessment all participants had FEV1, exhaled CO, and various other measures recorded. 120 were randomly allocated to receiving motivational feedback on their “Lung Age” as estimated by their FEV1 (Intervention group) or not (Control group, n=105). Participants were then offered 6 group smoking cessation sessions and recorded cigarette use for the next 7 days. The primary outcome measure was 7-day point prevalence tobacco abstinence, biochemically-confirmed by CO<10ppm. Other indices of motivation and treatment compliance were also measured. Results: Regression analysis found no difference between the groups for abstinence at 4 weeks after the target quit date (Intervention 50% v Control 52% quit), after controlling for other significant predictors of abstinence (dependence, confidence, weight concern, baseline phone; 11-quitline; 15- ROPC). Estimates of cost per QALY saved ranged from $161 to $7,975 (median $1,963), with the mobile phone intervention as the most cost-effective option based on 1 study. Cost-benefit studies were only available for ROPC: eight of ten found that benefits exceeded costs. All 3 smoking cessation interventions provide an efficient use of public health resources to help smokers quit. The economic evidence indicates that quitlines and the reduction of out-of-pocket costs are cost-effective interventions for smokers, with cost-effectiveness ratios well below the $50,000 threshold. In addition, the implementation of the ROPC intervention may provide net savings to the implementer. Though mobile phone-based interventions show evidence of cost-effectiveness, the limited body of evidence warrants more research. When taking into consideration the best option for implementation, it is important to consider the size and scope of the target population of the smokers.

FUNDING: No Funding

JUSTIFICATION: This review helps inform public health practitioners and policy makers with determining the best way to allocate resources and appropriate intervention options for reducing tobacco use.

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stress, menthol use, and substance use treatment). Among those attending the 28-day follow-up (n=164, 73%), a greater proportion of the intervention group had an improved FEV1 (63% vs. 37%, p=0.04). Conclusion: Lung age feedback did not improve quit rates or compliance at 4 weeks but was associated with improved FEV1.

FUNDING: Penn State Cancer Institute

JUSTIFICATION: Lung age feedback did not improve quit rates or compliance at 4 weeks in smokers highly motivated to quit.

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PA11-6

PROACTIVE OUTREACH TO OFFER TOBACCO CESSATION TREATMENT TO DISADVANTAGED SMOKERS AFTER A PRIMARY CARE VISIT: A RANDOMIZED CONTROLLED TRIAL

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BACKGROUND: Low socioeconomic status (SES) and minority smokers have less access to tobacco treatment. Proactive outreach to these smokers after a primary care (PC) visit, using interactive voice response (IVR) technology, telephone counseling, and free nicotine replacement (NRT), might promote treatment access and smoking cessation. In a RCT, we compared an IVR-mediated tobacco treatment program for low SES and minority smokers to usual care. METHODS: African-American, Hispanic, or white adults with a recent PC visit to a large health care delivery system were eligible if they were documented as smokers in the electronic health record and lived in a low-moderate income census tract. The IVR system made up to 15 proactive calls per person to confirm smoking status and offer study participation. Enrollees were randomized to usual care or IVR-mediated intervention (up to 4 calls with a bilingual tobacco treatment specialist). 13 weeks of free NRT, and referral to community resources to reduce life stressors). The primary outcome was self-reported past 7-day smoking status 9 months after randomization, with patients not reached counted as smokers. Multivariate regression was used to test whether the intervention was more effective in any subgroup. RESULTS: The IVR system attempted to contact 8547 patients, of whom 116 (1%) were ineligible because they reported not smoking, 5553 (65%) were not reached by IVR, 2170 (25%) declined participation, and 708 (8%) consented and were randomized. To date, 542 have completed outcome assessment (70% response rate). Participants had a median age of 50 yrs. (range 19–82); 23% were African American, and 17% were Hispanic; 34% had no more than a high school education. At 8-month follow-up, self-reported quit rate was 8.6% in the control group and 14.9% in the intervention group (p=0.02). Hispanics were more likely to quit than whites (p=0.008). CONCLUSION: An integrated program using IVR outreach and offering centralized telephone smoking cessation counseling, free NRT, and linkage to community resources may be an effective treatment strategy for engaging disadvantaged populations of smokers, particularly Hispanic smokers.

FUNDING: Supported by NIH grant 1P50CA148596-01.

JUSTIFICATION: An integrated program using automated telephone outreach and offering centralized telephone smoking cessation counseling, free nicotine therapy patches, and linkage to community resources may be an effective treatment strategy for engaging disadvantaged populations of smokers, particularly Hispanic smokers.

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INTERNATIONAL HEALTH DISPARITIES

PA12-1

EXPLORING THE RELATIONSHIP BETWEEN CIGARETTE PRICES AND SMOKING AMONG ADULTS: A CROSS-COUNTRY STUDY OF LOW- AND MIDDLE-INCOME NATIONS

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Introduction: Evidence on the effect of cigarette prices on adult smoking in low- and middle-income countries (LMICs) is relatively limited. This study offers new evidence on this relationship using individual-level data from a set of 13 LMICs. Methods: We use Global Adult Tobacco Survey (GATS) data from approximately 200,000 participants aged 15 and older. Estimates of the association between
Objective: This study sought to determine correlates of support for complete ban in advertisement (ad) of all tobacco products. Methods: This study involved all school personnel that participated in the Global School Personnel Survey (GSPS) conducted during 2007-2011 in 14 countries in the WHO AFRO region with available data (n=7,659). The GSPS used a nationally representative sample of school personnel. Information obtained included socio-demographic data, knowledge of health risk, perception of influence of school teachers’ tobacco use on youth tobacco use, availability of tobacco products for purchase inside or within 100m of school, existence of school policy against tobacco use, and support for complete ad ban and pricing measures. Data analysis included multiple logistic regression. Results: Of the participants, 41.4% (n=3328) were female and 32.2% (n=1755) were <30-years-old. Smoking prevalence ranged between 2.7% (Ghana) and 17.4% (Senegal) and snuff used ranged between 0.3% (Niger) to 18.8% (Congo). Only 43.6% reported having any anti-tobacco school policy and 32.1% thought industry should be allowed to sponsor school events. Nevertheless, 79.1% supported a complete ad ban [lowest in Malawi (65.3%) and highest in Mauritania (94.4%)]. Similarly, 80.2% supported price increase measures [lowest in Seychelles (64.7%) and highest in Mauritania (93.4%)]. Support for ad ban was positively correlated among those who thought industry encourages youth smoking (OR=5.50; 95%CI: 3.35-9.05) and believing that teacher smoking influences students own smoking (OR=2.00; 1.05-3.82). However, support for ad ban was less likely among those who thought industry should be allowed to sponsor school events (OR=0.26; 0.13-0.52). Conclusions: This study’s findings highlight the need to educate school personnel on industry strategies to promote youth smoking as part of any program aimed at gaining their support for policy change in Sub-Saharan Africa.

FUNDING: Bloomberg Philanthropies.

JUSTIFICATION: This study’s findings can inform advocacy program that would promote greater adoption of complete ban of tobacco product advertisement (WHO-FCTC Article 13) in the WHO Afro region.

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PA12-2
THE IMPACT OF CIGARETTE EXCISE TAXES ON SMOKING CESSATION RATES FROM 1994 TO 2010 IN POLAND, RUSSIA, AND UKRAINE

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Introduction: We studied the impact of cigarette excise taxes on the rates of smoking cessation using data from three neighboring Eastern European countries (Russia, Poland, and Ukraine) during the post-transitional period of the 1990s and 2000s. Methods: Using Global Adult Tobacco Survey data from 11,106 former and current smokers, we estimated the impact of cigarette taxes on the smokers’ likelihood of quitting over time. To do so, we first transformed the survey’s cross-sectional data into a pseudo-longitudinal format in which the average observation period for individual subjects was 12 years and then employed duration analysis. Results: We estimated that a 10% increase in cigarette taxes during the observation period increased the probability of smoking cessation among smokers in these countries by 1.6% to 2.3%. Conclusions: Cigarette tax increases have played a significant role in driving smoking cessation in Poland, Russia, and Ukraine. Further increases in cigarette excise taxes are likely to encourage further cessation and thus impact the prevalence of smoking in the region.

FUNDING: This work was supported by the European Commission (EC FP7) under the project Pricing Policies and Control of Tobacco in Europe (PPTCE) (HEALTH-F2-2009-223323). Funding for the Global Adult Tobacco Survey (GATS) is provided by the Bloomberg Initiative to Reduce Tobacco Use, a program of Bloomberg Philanthropies.

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PA12-3
SCHOOL PERSONNEL SUPPORT FOR COMPLETE AD BANS IN SUB-SAHARAN AFRICA: FINDINGS FROM 14 WHO AFRO COUNTRIES’ GLOBAL SCHOOL PERSONNEL SURVEY 2007 - 2011

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Background: School personnel, who are significant members of the community, may exert significant influence on policy adoption. Yet, little is known of the extent of and factors associated with their support for tobacco use prevention policy.

FUNDING: Funded by Intramural Research Program of the NIH (Pickworth), NIDA DA020436 (Waters), NCI and NIDA TTURC (P5084718)
PA12-5 SUFFERING IN SILENCE: IMPACT OF TOBACCO USE ON COMMUNICATION DYNAMICS WITHIN VIETNAMESE AND CHINESE IMMIGRANT FAMILIES

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BACKGROUND: While the overall smoking prevalence rate among adults in the United States has declined over the past decade, the prevalence rate of current smoking remains higher in some Asian-American subgroups, such as foreign-born Chinese and Vietnamese American. The goal of this project was to conduct a qualitative exploration of family communication dynamics and their implications for smoking cessation. METHODS: In-depth dyadic and individual qualitative interviews were conducted with 13 immigrant smoker-family member pairs of Vietnamese (n=18) and Chinese (n=8) descent, including 7 current and 6 former smokers and 13 family members who were recruited by 3 partnering community-based organizations. Participants had lived in United States between 3 to 38 years and ranged in age from 19 to 60 years. All interviews were conducted in the language preferred by participants and digital recordings were transcribed and translated into English. All 13 dyadic and 26 individual interviews (n=39) were analyzed using a collaborative “crystallization” process (Kiefer 2006), as well as grounded theory methods (Charmaz, 2006). RESULTS: Participants described three interrelated pathways by which tobacco use in immigrant Vietnamese and Chinese families impacts family processes and communication dynamics. First, smoking represents a direct source of conflict. Participant interviews describe the nature, quality, tone, and results of these conflicts, and analysis provides important insights into the daily-lived experiences of smoking-related communications and negotiations. Second, smoking related behaviors interfere directly and indirectly with emotional and physical engagement including sexual intimacy. And lastly, both of these pathways can lead to disruptions in the family’s perceived level of harmony. CONCLUSIONS: These findings illuminate the nature of dilemmas that tobacco use and accompanying smoking related behaviors create for Asian immigrant smokers and their family members. Important for intervention development is the recognition that maintenance of family harmony may take precedence over the need to address health behavior changes such as smoking cessation.

FUNDING: Research was supported by grants from the Tobacco-Related Disease Research Program (19KT-0083H), the National Institute on Drug Abuse (R21DA030569, P50DA009253) and the National Cancer Institute (K07CA126999).

JUSTIFICATION: Assessing attentional bias in African American smokers may be used to identify individuals that are at risk of relapse

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PA12-6 POLYTABOCO USE AMONG A RACIALLY AND ETHNICALLY DIVERSE SAMPLE OF NONDAILY SMOKERS

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Nondaily smokers account for 22% of current US smokers. 44% of nondaily smokers are polytobacco users (PTU) – i.e., they use cigarettes in combination with other tobacco products (e.g., cigarillos, little cigars, pipes). PTU may lead to increased exposure to nicotine and higher rates of tobacco-related disease and death, yet PTU among nondaily smokers has been almost completely overlooked in the literature. This study examined factors associated with PTU among nondaily smokers participating in a larger cross-sectional survey of smoking behaviors among nondaily and daily smokers. METHODS: 1,201 nondaily smokers were recruited using an online panel survey company. Equal samples of Blacks (n=401), Latinos (n=400), and Whites (n=400) were recruited. Nondaily smoking was defined as smoking at least one cigarette on 4 to 24 days in the past 30. Nondaily smokers reporting use of cigars, cigarillos, little cigars, pipes, snuff/smokeless tobacco, hand-rolled cigarettes, and/or hookahs/water pipes in the past month were classified as PTU. Nondaily smokers reporting no use of these products in the past month were classified as cigarette only smokers. RESULTS: 56% of nondaily smokers were PTU. Cigars (61%), cigarillos (43%), hand-rolled cigarettes (31%), and little cigars (29%) were the most common products used in combination with cigarettes. A backward stepwise regression was used to build a multiple regression model to evaluate which factors were most strongly related to PTU. Nondaily smokers who were PTU were younger (OR=0.98), male (OR=2.6), Hispanic (OR=2.0) or Black (OR=1.5), had higher nicotine dependence (OR=1.7), were more likely to borrow versus buy their cigarettes (OR=1.6) and to be classified as problem drinkers (OR=1.7) than nondaily smokers who used cigarettes only (p<0.05). CONCLUSIONS: Rates of PTU among nondaily smokers are strikingly high. Younger, male, racial/ethnic minority, and price-sensitive non-daily smokers may be at increased risk for PTU. Findings substantiate the need for more work in this area, especially in efforts to effectively identify and treat all forms of tobacco use among nondaily smokers in research and clinical settings.

FUNDING: Findings substantiate the need for efforts to effectively identify and treat all forms of tobacco use among nondaily smokers in research and clinical settings.

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ALTERNATIVE PRODUCTS AND THE CONTINUUM OF RISK

PA13-1 AN EVALUATION OF A SOCIAL MARKETING CAMPAIGN TO DETER HOOKAH SMOKING ON A COLLEGE CAMPUS

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Background: Hookah smoking is a popular form of tobacco smoking in and around college campuses. The ill effects of hookah smoking involve the respiratory, cardiovascular, and central nervous systems. College students, as well as other youth and adults often are unaware of the negative health consequences. This study is the first evaluation of a social marketing campaign to deter hookah smoking among college students. Methods: Formative research included an online survey, interpretive interviews of both hookah smokers and nonsmokers, focus group interviews, and observations of behavior at hookah bars. Interviews were also conducted among key stakeholders on campus. A strategic marketing plan was developed by social marketing experts. Three concepts were developed into 4 testable messages. The adopted message was tailored and disseminated in multiple campus venues. An online evaluation was conducted to assess current behavior, information dissemination, key message attainment, readiness to...
change and intention to smoke. Results: A total of 820 students completed the online survey. Of these, 75% reported having seen messages on campus to deter hookah smoking. When assessed on their readiness to change, 38% of students who reported having smoked hookah reported having no temptation to smoke, 7% reported thoughts of quitting hookah smoking, 4% reported getting ready to be a hookah nonsmoker, 11% reported being in a smoking setting and not smoking, 3% reported being a regular hookah smoker and having stopped in the past year, and 38% planned on continuing to smoke. Bivariate correlations indicated a statistically significant association between campaign awareness and harmfulness beliefs, readiness to change, and hookah smoking behavior. Discussion: College students are exposed to hookah smoking in and around their campuses. There is a dearth of available valid resources on the Internet to inform students of the negative health effects of hookah smoking. Formative research is important to inform approaches to social marketing campaigns. Social marketing campaigns are needed to deter hookah smoking and alter negative health behaviors.

FUNDING: The USF Area Health Education Center funded the research.

JUSTIFICATION: Social marketing is an effective strategy to change behaviors related to tobacco smoking on college campuses.

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PA13-2
NOT JUST CIGARETTES: DISPARITIES IN CIGAR AND MARIJUANA USE AMONG AFRICAN AMERICAN AND WHITE YOUTH AND YOUNG ADULTS MASK COMBUSTIBLE USE TRENDS

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Background: Trends in cigar and marijuana use among youth and young adults are not well documented. This study explores whether focusing on cigarette trends alone, without consideration of cigar and marijuana trends, masks disparities in any combustible use among youth and young adults. Methods: We used data from the National Survey on Drug Use and Health to compare estimates from 2002-03 and 2010-11; statistical significance (p<0.05) was determined by use of two-sided t-tests. We examined past 30-day cigarette, cigar, and marijuana use separately and combined as any combustible use, among African American (AA) and White youth (aged 12-17) and young adults (aged 18-25). Results: From 2002-03 to 2010-11, any combustible use prevalence remained relatively unchanged among AA youth (11.5% to 10.6%), despite significant declines in prevalence of cigarette (8.7% to 4.8%) and cigar use (5.2% to 3.5%). However, marijuana prevalence significantly increased (6.6% to 8.0%). Among White youth, any combustible use prevalence declined significantly (19.2% to 13.9%) as cigarette, cigar, and marijuana prevalence all significantly declined (15.4% to 9.7%; 5.1% to 3.9%; and 8.9% to 7.9%), respectively. Among AA young adults, any combustible use prevalence was relatively unchanged (38.0% to 36.7%), despite a significant decline in cigarette prevalence (28.4% to 25.8%). Cigar prevalence was unchanged (13.2% to 12.3%) but marijuana prevalence significantly increased (16.3% to 18.9%). Among White young adults, any combustible use prevalence declined significantly (53.0% to 48.2%) as cigarette prevalence significantly declined (46.3% to 38.2%). However, cigar (12.2% to 12.5%) and marijuana (19.7% to 20.6%) prevalence were relatively unchanged. Conclusions: Any combustible use prevalence was relatively unchanged among AA youth and young adults. Whereas, any combustible use significantly declined among White youth and young adults. Considering cigarettes alone would mask the trend found in any combustible use among AA and White youth and young adults. Cigar and marijuana use need to be considered, in addition to cigarettes, to more accurately inform smoking prevention interventions.

FUNDING: This research was supported by a grant from the National Institute of Drug Abuse, DA10767.

JUSTIFICATION: This information can be used by the FDA to regulate novel tobacco products and for each product, their favorability of social images, perceptions of harm, and perceptions of addictive potential. The social images of hookah users were more favorable than that of other novel product users. Cigarettes were perceived as most harmful, followed closely by little cigars and hookah. The smokeless products were, as expected, perceived as less harmful. Interesting, although all contain nicotine, traditional products (cigarettes, chewing tobacco), and little cigars and snus were perceived as most addictive; whereas e-cigarettes, followed by hookah and dissolvables were perceived as least addictive. The associations between lifetime and annual use and perceived harm, perceived favorability, and risk of addiction suggest that perceptions are related to use. Understanding the prevalence of use of the novel products and the correlates of this use is essential to guide prevention efforts. However, prospective studies are needed to further explore the direction of effects.

FUNDING: This research was supported by a grant from the National Institute of Drug Abuse, DA10767.

JUSTIFICATION: This information can be used by the FDA to regulate novel tobacco products and to provide information of the effect of advertising and other forms of media on novel product use.

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PA13-4
SNUS EXPERIMENTATION AS A GATEWAY TO SMOKING AMONG YOUNG ADULTS

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Background: Snus may be a gateway to cigarette smoking. We assessed whether experimentation with snus is associated with subsequent current smoking among young adults, and the potential mechanisms that explain this association.

Methods: Data were from the Minnesota Adolescent Community Cohort Study collected when the participants were aged 20-28. At baseline (2011), we assessed whether the non-smoking participants (n=1696) had ever used snus. Covariates including demographics, experimentation with smoking, and chewing tobacco use were also assessed. Information on potential mediators (i.e., perceptions of smoking, receipt of cigarette coupons) was collected. At follow-up (2012), we assessed whether participants became current smokers. Logistic regression
models were used to assess the association between trying snus at baseline and becoming current smokers at follow-up, adjusting for covariates. Path analysis was conducted to examine whether perceptions of smoking or receipt of cigarette coupons explained the association. Results: Overall, 9% of the sample had tried snus at baseline, and 6% became current smokers at follow-up. Non-smokers who had tried snus at baseline were more likely than those who had not tried snus to become current smokers at follow-up, adjusting for covariates (OR=2.25, 95% CI=1.17 - 4.32). In the mediation analysis, having tried snus was associated with more positive perceptions of smoking (e.g., smoking is enjoyable) and receipt of cigarette coupons at baseline (p<0.05). Positive perceptions of smoking at baseline, but not receipt of cigarette coupons, was also associated with becoming current smokers at follow-up (p<0.05). About 16% of the overall association between trying snus at baseline and becoming current smokers at follow-up was explained by these two mediators combined. Conclusions: This is the first study to suggest that snus can be a gateway to cigarette smoking among non-smoking young adults, who are still developing their smoking behaviors. Discussion about whether snus can be a harm reduction product should include the risk of introducing young adults to cigarette smoking.

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

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PA13-5 IMPACT OF SNUS USE AMONG U.S. SMOKERS: PRELIMINARY RESULTS FROM A NATIONWIDE RANDOMIZED, NATURALISTIC CLINICAL TRIAL

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Some observational surveys suggest that use of low nitrosamine smokeless tobacco (i.e., snus) among smokers is associated with cessation. However, the absence of controlled trials prohibits firm conclusions, and thus the debate on snus endures. As part of a nationwide, prospective (1yr) telephone-based naturalistic clinical trial (N=1236), we randomize smokers unmotivated to quit to (1) receive a 6-week supply of Camel Snus to use ad libitum (including not at all) vs. (2) not. We report interim data on the first 831 participants (67% female; M/SD age = 48.7(12.9) to reach 6mth follow-up: we anticipate 92% of the full sample will reach 6mth follow-up for conference presentation. To date, receipt of snus is associated with a decreased incidence of attempts to quit smoking, both self defined (11% vs. 22%; gender-adjusted odds ratio [AOR]=0.46; 95% CI =31-67) and those lasting >24hr (9% vs. 19%; AOR=4.1; 95% CI =27-83), and decreased rates of ever having achieved 7+ days of abstinence from smoking (5% vs. 9%; AOR=62; 95% CI =36-108), but comparable rates of point prevalent abstinence at 6mths (5% vs. 7%; AOR=71; 95% CI =39-1.3). For those who made a quit attempt, longest duration of cigarette abstinence (M/SD) was 12.0(17.5) days among snus vs. 13.6(20.9) days among control participants (p=6). Smoking level (avg cigs/day) decreased 15% vs. 3% in snus vs. control participants (p=0.001) during the sampling period, and 21% vs. 18% (p=2) throughout 6mth follow-up. During the sampling period, 78% of snus participants used snus at least once (vs. 2% in control), and 24% were using snus daily at the end of the sampling period (vs. 0% in control). During follow-up, 18% of snus vs. 0% of control participants independently purchased snus at least once. In contrast to non-randomized studies, data from our ongoing randomized trial suggest that brief provision of snus to smokers not ready to quit: (1) results in nominal product conversion, (2) modestly decreases smoking level, (3) decreases quit attempts, but (4) is unrelated to 6mno abstinence. Upon confirmation at end of study, these data argue against the viability of snus as a harm reduction strategy for smokers.

FUNDING: Funding through NCI R01CA154992 (PI: Carpenter).

JUSTIFICATION: The results of this nationwide randomized trial provides strong relevance to the ongoing clinical and public policy debate about use of smokeless tobacco among smokers and its association with quitting.

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PA13-6 MONITORING TOBACCO-SPECIFIC N-NITROSAMINES AND NICOTINE IN NOVEL SMOKELESS TOBACCO PRODUCTS: FINDINGS FROM NEW PRODUCT WATCH, 2010-2013

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In recent years, tobacco manufacturers have introduced a range of novel products which are being marketed to smokers as an occasional or complete substitute for cigarettes. Information on the characteristics of these products is scarce. The aim of our project was to carry out a systematic data collection on the levels of nicotine and tobacco-specific N-nitrosamines (TSNA) in this category of tobacco products, while maintaining standard sampling, handling, and analytical protocols. Samples of novel products were obtained through a nationwide monitoring network, New Product Watch. Three rounds of sample purchases were carried out between 2010 and 2013 in six U.S. regions. A total of 472 samples were obtained, including different flavors of Camel, Marlboro, and Skoal Snus, as well as dissolvable products of the same brands. We compared constituent levels across brands and product formulations, and examined potential differences across regions and potential changes over time. Our analyses demonstrated that levels of nicotine and TSNA differ across various brands and product types. We also found that constituent levels varied regionally and over time within the same product. For example, we observed an increase in TSNA levels over time in most products. The levels of unprotonated nicotine in different products continued to vary across regions, suggesting that manufacturers may tailor the levels of this constituent consistently to different U.S. regions. This information is particularly important given its relevance to the FDA regulation of tobacco products. Although tobacco companies are now required to disclose the levels of these constituents in tobacco products, approaches to product sampling may not capture the potential variability of constituent levels and may not reflect the actual state of the product when purchased by consumers in different U.S. regions. Our results indicate that standardization of sampling of tobacco products for constituent reporting should be carried out at the point of sale, so that potential variations due to manufacturing, temporal, or regional factors are properly represented.

FUNDING: Supported by NCI Contracts HHSN261201100513P, HHSN261201000544P, and HHSN261201200392P, by grants NIH R01-CA141631 and R01-CA135884, and by the startup funds from the Masonic Cancer Center, University of Minnesota to Irina Stepanov.

JUSTIFICATION: Annual surveillance of novel smokeless tobacco products over 3 consecutive years generated important data on the brand, regional, and temporal variation of key constituent levels in these products, providing important insights for the tobacco regulation.

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FINDINGS FROM NEW PRODUCT WATCH, 2010-2013

NICOTINE IN NOVEL SMOKELESS TOBACCO PRODUCTS: FINDINGS FROM NEW PRODUCT WATCH, 2010-2013

Irina Stepanov, Ph.D. 1, Lois Biener, Ph.D. 2, Mark Parascandola, Ph.D. 3, M.P.H. 2, and Dorothy Hatuskami, Ph.D. 1. 1University of Minnesota, 2University of Massachusetts Boston, 3Tobacco Control Research Branch, NCI.
INNOVATIONS IN PHARMACOTHERAPY

PA14-1

VARENICLINE RE-TREATMENT FOR SMOKING CESSATION IN SMOKERS WHO HAVE PREVIOUSLY TAKEN VARENICLINE: A RANDOMIZED, PLACEBO-CONTROLLED TRIAL

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Few studies have investigated the efficacy of re-treating smokers with a smoking cessation medication that they had used previously in an attempt to quit smoking. This is the first study to assess the efficacy and safety of re-treating smokers with varenicline. The objective of this study was to evaluate the efficacy and safety of re-treatment with varenicline in smokers who had taken varenicline in a previous smoking cessation attempt. Methods: A randomized, double-blind, placebo-controlled, multicenter trial was conducted at 36 centers in Australia, Belgium, Canada, Czech Republic, France, Germany, UK, and US. Subjects were generally healthy smokers, ≥18 years of age, smoking ≥10 cigs/day (with exhaled carbon monoxide (CO) >10 ppm), motivated to quit, with no quit attempts in the previous 3 months, and recruited via various methods. All should have made ≥1 prior quit attempts using varenicline for ≥2 weeks (≥3 months ago). Subjects were randomly assigned at a 1:1 ratio to receive brief counseling (≤10 minutes) and varenicline (N=249) or placebo (N=245) titrated to 1 mg twice daily for 12 weeks and ≥40 weeks no-drug follow-up. Potential suicide risk was assessed at screening and all other clinic visits with the Columbia Suicide Severity Rating Scale. The primary endpoint was the CO-confirmed (<10 ppm) continuous abstinence rate (CAR) for weeks 9-12 (last 4 weeks of treatment). Secondary endpoints included CARs for weeks 9-24 and 9-52. Results: The primary endpoint CARs for varenicline vs. placebo for weeks 9-12 were 45.0% vs 11.8% (OR=7.08, 95% CI: 4.34 -11.55; P<0.0001). CARs for weeks 9-24 and 9-52 were 28.9% vs 7.8% (OR=5.83; 95% CI: 3.25 -10.44; P<0.0001) and 20.1% vs 3.3% (OR=9.90; 95% CI: 3.97-20.41; P<0.0001), respectively. The most commonly reported treatment emergent adverse events for varenicline vs. placebo were nausea (26.5% vs 9.0%), abnormal dreams (14.5% vs 3.3%), and headaches (10.4% vs 9.8%). There were no reports of suicidal behavior in either treatment group. Conclusion: Varenicline is effective and well tolerated in smokers who have previously taken varenicline to quit smoking. Abstinence rates are comparable to those of prior trials of varenicline naive smokers.

FUNDING: This study was supported by Pfizer Inc.

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PA14-2

IS CYTISINE AT LEAST AS EFFECTIVE AS NICOTINE REPLACEMENT THERAPY FOR SMOKING CESSATION? FINDINGS FROM A NON-INFERIORITY TRIAL

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Background: Cytisine is an alkaloid, found in plants such as Golden Rain and New Zealand Kowhai that partially blocks the effects of nicotine on the brain. Cytisine has been used for smoking cessation in several European countries since the 1960s, is inexpensive, and has few known side effects. Placebo controlled trials suggest cytisine almost doubles the chances of quitting smoking at six months or longer. No trials have yet compared its safety and efficacy to nicotine replacement therapy (NRT). The aim of this study was to determine whether cytisine is at least as effective as NRT in assisting smokers to remain abstinent for at least one month. Method: A parallel group, single blind, randomised controlled non-inferiority trial was undertaken in New Zealand. Participants were identified through a telephone-based Quitline cessation service, and randomised to receive a 25-day course of cytisine tablets (Tabex®) or usual Quitline care which consisted of eight weeks supply of NRT patches and/or gum or lozenges. Both groups received Quitline behavioural support. A non-inferiority margin of 5% was pre-defined. The primary outcome was the proportion of participants who had been continuously abstinent for one month. Secondary outcomes (measured at one week, and one, two and six months) included seven-day point prevalence abstinence, continuous abstinence, withdrawal, self-efficacy, compliance, alcohol use, and adverse events. Results: 1,310 smokers were randomised (655 in each arm). Non-inferiority was proven, as was superiority at all time points (one month continuous abstinence 40% cytisine vs 31% NRT; Relative risk = 1.30, 95% CI 1.12-1.51, p<0.004; Absolute risk difference = 9.3, 95% CI 4.2-14.5). Self-reported adverse events were more common in the intervention group (Incidence rate ratio=1.67, 95% CI 1.38-2.01, p<0.001), but were generally non-serious and self-limiting. Conclusion: Cytisine combined with behavioural support is an effective cessation product, which has been shown to be superior to NRT plus behavioural support for smoking cessation, although adverse events are more common.

FUNDING: This trial was supported by funding from the Health Research Council of New Zealand. This trial is registered with the Australasian Clinical Trials Network: Number ACTRN1261000590068.

JUSTIFICATION: The low price and proven efficacy of cytisine makes it an attractive treatment option for smokers, particularly in low and middle income countries

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PA14-3

COMBINATION VARENICLINE AND BUPROPION SR FOR TOBACCO DEPENDENCE TREATMENT IN CIGARETTE SMOKERS: A RANDOMIZED TRIAL

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Cigarette smoking is associated with a decade of lost life, and stopping smoking can reduce the risk of death by 90%. Combining pharmacotherapies for the treatment of tobacco dependence may further increase smoking abstinence rates. The aim of this study was to determine the efficacy and safety of combination therapy with varenicline and sustained-release bupropion compared to varenicline monotherapy for treating smokers. A randomized, blinded, placebo-controlled multicenter clinical trial with a 12-week treatment period and follow-up through 52 weeks was conducted. Adult smokers from 3 midwestern clinical research sites were randomized to 12 weeks of (1) varenicline and bupropion SR (combination therapy) or (2) varenicline and placebo (varenicline monotherapy). Of 635 potentially eligible smokers, 506 (80%) were randomized and 315 (62%) completed the study. At 12 weeks, 53% of the combination therapy group achieved prolonged smoking abstinence compared to 43.2% of the varenicline monotherapy group (odds ratio [OR] 1.49; 95% confidence interval [CI], 1.05-2.12; P = .028). At 26 weeks, 36.6% of the combination therapy group achieved prolonged smoking abstinence compared to 27.6% for varenicline monotherapy (OR 1.52; 95% CI, 1.04-2.22; P=.031). Among heavier smokers (≥ 20 cigarettes per day), combination therapy was associated with significantly higher prolonged smoking abstinence rates at weeks 12, 26, and 52. Among participants who achieved prolonged smoking abstinence, combination therapy was associated with less weight gain at 12 weeks compared to varenicline monotherapy (1.1 ± 3.4 kg vs. 2.5 ± 2.7 kg; P < .001). Anxiety and depressive symptoms were more frequently reported with combination therapy. Combination therapy with varenicline and bupropion SR increased smoking abstinence rates compared to varenicline monotherapy.
VARENICLINE VERSUS PLACEBO FOR ALCOHOL DEPENDENCE: A RANDOMIZED TRIAL OF SMOKING CESSATION IN PATIENTS BEING TREATED FOR ALCOHOL DEPENDENCE

JUSTIFICATION: Combination therapy can increase smoking abstinence among heavy smokers.

FUNDING: Supported by NIH Grant P50 CA143187.

CORRESPONDING AUTHOR: Kenneth Perkins*, Joshua L. Karelitz†, and Caryn Lerman‡, Department of Psychiatry, University of Pennsylvania, Philadelphia PA

PA14-4 EFFICIENT EARLY PHASE 2 SCREENING FOR SMOKING CESSATION MEDICATIONS

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Early Phase 2 studies to screen novel drugs for potential efficacy should be efficient in identifying which drugs may, or may not, warrant spending the resources needed to conduct extensive clinical testing for FDA approval. We have developed a brief crossover procedure to evaluate initial efficacy of novel medications versus placebo for smoking cessation in an innovative within-subjects design. Most such screening is problematic because it usually involves either (1) small (but still expensive) clinical trials with treatment-seekers that are often valid but impractical as initial tests of a drug’s potential efficacy or (2) brief lab-based studies of acute responses to drug in non-treatment seekers that are practical but often invalid as predictors of the drug’s therapeutic efficacy. We reasoned that early Phase 2 screening may be more efficient if it combines the validity of clinical trials with the practical advantages of acute lab studies. Thus, our procedure uses abstinence as the main index of efficacy and tests smokers with high quit motivation (i.e., already preparing to quit soon), typical of clinical trials but not of brief lab studies. Yet, it also uses a cross-over design and a continuous outcome measure of number of days quit (i.e., rather than dichotomous quit/not quit at one follow-up point) to maximize statistical power, more typical of within-subject lab studies but not of clinical trials. The daily outcome measure is CO<5 ppm to detect even brief lapses. This presentation will outline our research on the development, evaluation, and validation of this procedure for sensitivity in detecting medication efficacy for smoking cessation, using NRT patch, varenicline, and bupropion as model drugs in separate placebo-controlled studies. The procedure’s specificity in identifying drugs with no efficacy vs. placebo, using modafinil, will be noted. We will also address factors that may limit the utility of this procedure. This brief crossover procedure may accelerate medication development by efficiently evaluating whether a novel medication has efficacy to aid cessation so as to inform preparation of subsequent Phase 2 randomized clinical trials.

FUNDING: Supported by NIH Grant P50 CA143187.

JUSTIFICATION: Initial tests of efficacy in novel medications for smoking cessation can be assessed with sensitivity and specificity in an efficient manner.

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PA14-5 SMOKING CESSION IN PATIENTS BEING TREATED FOR ALCOHOL DEPENDENCE: A RANDOMIZED TRIAL OF VARENCLINE VERSUS PLACEBO

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Background: Smoking prevalence among those with alcohol dependence is as high as 90%. Despite this, cessation treatment in those with concurrent alcohol dependence is seldom undertaken. We conducted a randomized, placebo-controlled, double-blind trial whereby patients currently in an alcohol treatment program at the Centre for Addiction and Mental Health were assigned to placebo or varenicline treatment for 12 weeks. We hypothesized that varenicline would be a safe and efficacious treatment for tobacco dependence in this specific population. Methods: Daily dependent smokers in treatment for alcohol dependence and interested in participating in the study were first screened over the phone, and then assessed in-person. Exclusion criteria included current regular drug use, and current Axis I Disorder assessed by SCID interview. They attended weekly appointments for smoking cessation counseling and completed daily diaries for the full 12 weeks of treatment. Results: To date, 25 subjects have been randomized to either varenicline (n=12) or placebo treatment (n=13). Participants are predominantly male (71%) with a mean age of 42.4 (age range 23 to 59). Preliminary analyses indicate a significant decline in cigarettes per day (CPD) by end of treatment in the varenicline group (21±7 CPD at baseline to 1.4±2; p<0.001) compared to the placebo group (16±5 CPD at baseline to 6±7). Only 1 subject in the placebo group had quit by end of treatment, compared to 5 in the varenicline group (Chi-square 3.95, p<0.05). Those treated with varenicline also had significantly greater decreases in ratings of cigarette and alcohol craving compared to those in the placebo group. Conclusions: This is the first placebo-controlled clinical trial to assess the efficacy of varenicline for smoking cessation in individuals with concurrent alcohol dependence. These preliminary analyses indicate that varenicline is a safe and effective treatment for tobacco dependence in this population. In addition, the risk of alcohol relapse may also be attenuated by varenicline’s effect on subjective alcohol craving.

FUNDING: This study was funded by a Grant-in-Aid from the Ontario Lung Association.

JUSTIFICATION: Clinical practice by expanding the evidence-base for effective smoking cessation treatments in those with co-morbid alcohol dependence.

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SUPERCALIFRAGILISTICEXPIALIGROSSNESS: LIVING WITH SECOND-HAND SMOKE

PA15-1 PREFERENCES AND PRACTICES REGARDING SECONDHAND SMOKE EXPOSURE AND SMOKE-FREE POLICIES IN MULTI-UNIT HOUSING: A BASELINE SURVEY OF MULTI-UNIT HOUSING RESIDENTS LIVING IN 6 COMMUNITIES ACROSS THE UNITED STATES

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Background: Considerable evidence shows that secondhand smoke (SHS) can transfer between units in multi-unit housing (MUH) buildings. The voluntary adoption of smoke-free building policies is increasing, but may result in disparities in smoke-free policy coverage among vulnerable populations. Here, we describe baseline data from a study aiming to speed the diffusion of smoke-free policies in MUH. Methods: A community-based intervention trial was initiated in 3 community pairs (control & intervention) across the US: Columbia (CO) and Charleston (CH), SC; Grand Forks (GF) and Bismarck (BM), ND; and Pueblo (PB) and Fort Collins (FC), CO. Population-level sampling of MUH residents resulted in 1,565 completed interviews at baseline (Aug-Dec, 2012). Data were weighted to demographic characteristics of US MUH residents. Univariate analyses were stratified by community. Results: The frequency of voluntary smoke-free home rules ranged from 64% (PB) to 92% (FC, GF). Among those with smoke-free home rules, 35% (CH) to 62% (FC) reported experiencing a SHS incursion into their living space. In multivariate analyses, incursions were more likely among smokers, those with higher education and higher knowledge of SHS, and younger respondents. Between 7% (CO) and 40% (BM) of MUH residents reported living in a smoke-free building. Among residents of market-rate housing, higher knowledge of SHS was associated with higher likelihood of living in a smoke-free building.
PA15-2

UTILIZING BIOMARKER FEEDBACK DOCUMENTING CHILD EXPOSURE TO TOBACCO TOXINS IN SECOND-HAND SMOKE TO PROMOTE SMOKE-FREE HOMES

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Background: Exposure to second-hand smoke (SHS) early in life increases the risk of SIDS, asthma, and respiratory illnesses. Ironically, child primary exposure to SHS is in the home. Although exposure to SHS is a quickly reversible cause of excess morbidity, few low-income homes restrict child exposure to tobacco smoke. A novel approach to encourage the adoption of home smoking restrictions (HSR) is to provide parents with objective, biomarker feedback documenting child exposure to tobacco toxins. Methods: From 2010-2013 we recruited low-income, female smokers with children < age 10 residing in their homes into a two-arm RCT. Exposures were measured both in the home and car using a double antibody assay.RESULTS: Weekly mean cotinine concentrations ranged between 5-15 ng/mL and 15-20 ng/mL in the winter and summer, respectively. Mean nicotine levels were between 30 and 1800 ng/mL and were much higher in the winter compared to summer (623-680 ng/mL). Mean nicotine levels were significantly higher in the winter when compared to summer (623-680 ng/mL) and were more extreme in the winter compared to summer (623-680 ng/mL) and were much higher in the winter compared to summer (623-680 ng/mL). The average PM2.5 concentrations and average nicotine concentrations measured in the winter were significantly correlated (r = 0.9). Mean nicotine levels were highest in elderly/disabled buildings (1227.0 ng/m³), followed by family smoking-allowed (288.9 ng/m³), and family smoke-free buildings (25.3 ng/m³). Our results show that smoking-related exposures are higher in winter when compared to summer (10.3 vs. 8.0 ng/m³). Mean nicotine levels were between 30 and 1800 ng/mL and were much higher in the winter compared to summer (623-680 ng/mL). Mean nicotine levels were significantly higher in the winter when compared to summer (623-680 ng/mL). The average PM2.5 concentrations and average nicotine concentrations measured in the winter were significantly correlated (r = 0.9). Mean nicotine levels were highest in elderly/disabled buildings (1227.0 ng/m³), followed by family smoking-allowed (288.9 ng/m³), and family smoke-free buildings (25.3 ng/m³). Our results show that smoking-related exposures are higher in winter when compared to summer (10.3 vs. 8.0 ng/m³). Mean nicotine levels were between 30 and 1800 ng/mL and were much higher in the winter compared to summer (623-680 ng/mL). Mean nicotine levels were significantly higher in the winter when compared to summer (623-680 ng/mL). The average PM2.5 concentrations and average nicotine concentrations measured in the winter were significantly correlated (r = 0.9). Mean nicotine levels were highest in elderly/disabled buildings (1227.0 ng/m³), followed by family smoking-allowed (288.9 ng/m³), and family smoke-free buildings (25.3 ng/m³). Our results show that smoking-related exposures are higher in winter when compared to summer (10.3 vs. 8.0 ng/m³).
PA15-4
EFFECT OF BRIEF PHONE COUNSELING WITH NONSMOKERS ON ESTABLISHING A HOME BAN ON SMOKING - AN RCT EMBEDDED IN CITY HEALTH INFORMATION SERVICE IN BEIJING

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Restrictions on smoking in the home protect nonsmokers and increase the chance of smokers’ quitting in the long run. Many nonsmokers, however, are still exposed to second-hand smoke in the home, especially in countries with limited tobacco control programs. This study tested the effect of a brief telephone counseling program on establishing home bans among callers to the 12320 health information line in Beijing, China. This city-wide program provides free services to residents on health-related questions by telephone. 12320 services in China receive large numbers of calls; the line in Beijing where this study was conducted receives an average of 20,000 calls each month. This study embedded a procedure to screen for smoking into Beijing’s 12320 service and focused on working with nonsmoking women (as most women in China do not smoke). Women calling the hot line were assessed for study eligibility (i.e., nonsmoking adult married to a smoker and living in a home without a complete smoking home ban) and invited to participate in the study, if eligible. Following consent, participants were randomized to a control or an intervention group. Control subjects received a book on the harm of smoking. Subjects in the intervention group were mailed specially designed reading material about home bans on smoking and received two brief telephone counseling sessions. Participants were evaluated two months after randomization. A total of 399 (200 in control and 199 in intervention groups) participated in the study. At two-months, 377 subjects (186 in intervention, 191 in control) were reached and evaluated (response rate = 94.5%). In an intent-to-treat analysis, the complete home ban rates were 17.0% and 32.7%, for the control and intervention groups, respectively (P<0.001). These results indicated that brief telephone counseling with nonsmokers (plus sending self-help materials) can significantly increase the probability of establishing a complete home ban in smoking households. These results have implications for protection of nonsmokers as well as helping smokers quit smoking, especially in places like China where smoking cessation services are still limited.

FUNDING: Supported by a grant from the National Institute of Health (U01 CA154280)

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PA15-5
IMPLEMENTATION OF A ROUTINE ASSESSMENT OF SMOKE FREE HOMES AMONG HOSPITALIZED PATIENTS

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BACKGROUND: Second hand smoke (SHS) exposure accounts for 48,000 deaths per year in non-smokers. Hospitals may offer cessation services to smokers, but rarely identify or assist non-smokers at risk for SHS exposure. On 9/11/12, a large Boston, MA hospital added a field to record home smoking policy (yes, smoking is allowed; no, not allowed; or unknown) in the electronic nursing order set for new admissions. We assessed the field’s implementation and hypothesized that socioeconomic status and reason for admission would be associated with allowing smoking at home. METHODS: Using hospital records, we assessed completion of the field (% unknown) and predictors of home smoking bans over the first 6 months of implementation. We used multivariable logistic regression to identify risk factors for allowing smoking at home, stratified by age (<18 yrs vs ≥18), with clustering of admissions within patients, and including demographic variables, marital status, insurance, nursing unit, and discharge diagnosis. RESULTS From 9/1/12 – 2/28/13, there were 11603 non-smokers admitted with finalized discharge diagnoses. Nurses recorded a home smoking policy for 10000 (86%) of them. Few (3%, n=263/10000) allowed smoking at home. Among 9526 adult (≥18 yrs) non-smoker admissions, being on a psychiatric unit (vs general medical, adjusted odds ratio [AOR] 3.0 [1.4-6.1]) and a discharge diagnosis of COPD (AOR 2.5 [1.0-5.9]) were positively associated with allowing smoking at home, while being married (AOR 0.7 [0.6-1.0]), on an obstetric (AOR 0.3 [0.1-0.7]) or oncology unit (AOR 0.2 [0.1-0.7]) were negatively associated. Of 474 pediatric (<18 yrs) admissions, discharge diagnosis of asthma (AOR 6.1 [2.0-18.6]) was positively associated with allowing smoking at home. CONCLUSIONS: Nurses successfully documented home smoking policies in hospital patients after a field was added to the nursing admission order set. While only 3% of hospitalized non-smokers allowed smoking at home, it was associated with admission for COPD, asthma, and psychiatric diagnoses. Interventions to promote smoke-free homes are especially needed for patients hospitalized with chronic lung disease and on psychiatric units.

FUNDING: This project is funded by the Flight Attendant Medical Research Institute Grant # 2008A057502

JUSTIFICATION: This study demonstrates a model for routine identification of potential secondhand smoke exposure among hospitalized patients so that this risk factor can be addressed during a hospital stay.

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PA16-1
IS THE NON-RISK VARIANT OF THE D397N (RS16969968) SNP IN THE MOUSE PROTECTIVE AGAINST ADOLESCENT NICOTINE INTAKE FOLLOWING DEVELOPMENTAL NICOTINE EXPOSURE?

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The human CHRNAS D398N polymorphism (rs16969968) results in an aspartic acid to asparagine change in residue 398 in the cytosolic loop between the third and fourth transmembrane domains of the nicotinic acetylcholine receptor (nAChR) alpha 5 subunit. The N398 variant has been linked to early onset smoking behavior in some studies as well as increased risk for nicotine dependence. Although we know the N398 variant is associated with increased risk for nicotine dependence and early onset smoking behavior, whether developmental exposure to nicotine might impact this risk has not been investigated. Recently, we developed a knockin mouse with this SNP (D397N in the mouse) to facilitate mechanistic investigation. To that end, we exposed female mice to nicotine (100ug/ml) in 0.2% saccharin water or 0.2% saccharin water alone as their sole source of fluid for 4 weeks prior to breeding. These treatments were maintained throughout pregnancy. Following parturition, mice were maintained on nicotine/saccharin until weaning at 25 days. Initial testing utilized a two bottle choice paradigm (ascending choice, 100-400 ug/ml nicotine, 4 days each concentration beginning at 30 days of age). Results indicated that these mice do indeed mirror the human condition- following developmental exposure to vehicle, D397 (non-risk variant) mice drink less nicotine than N397 (risk variant) mice. Developmental exposure to nicotine had little impact on nicotine intake in N397 mice relative to controls except at the highest nicotine concentration tested. Control N397 mice reduced their intake at the high 400 ug/ml concentration while the N397 mice exposed to nicotine during development did not. Interestingly, D397 mice developmentally exposed to nicotine drank significantly less nicotine in the two bottle choice study than all other groups, suggesting that the D397 variant may be protective against nicotine intake when developmental exposure to nicotine occurs. Studies are ongoing investigating the impact of developmental nicotine exposure on measures of anxiety and underlying presynaptic function in conjunction with the D397N polymorphism.

FUNDING: Supported by R01DA019375, R01DA03194, and P01DA015663 to Michelle J. Marks.
JUSTIFICATION: The mouse model utilized in these studies has a humanized variant of the rs16969968 polymorphism that has been linked to increased nicotine intake as well as early onset smoking behavior.

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PA16-2 RESULTS FROM THE EXOME META-ANALYSIS OF DRINKING AND SMOKING (EMADS) CONSORTIUM

Scott Vrieze*, on behalf of the Exome Meta-Analysis of Drinking and Smoking (EMADS) Consortium, Department of Biostatistics, University of Michigan

Genome-wide Association Studies have identified common genetic variants associated with both smoking and drinking phenotypes. More recently, exome sequencing has enabled the design of the “exome chip,” an array-based technology to genotype rare nonsynonymous variants exome-wide. A nonsynonymous variant is one predicted to modify the amino acid sequence of a protein, possibly resulting in a different protein or even disabling the entire gene. Such variants are therefore rare, and until very recently have not been studied on a large and genome-wide scale. We have assembled a consortium of 13 studies with a total sample size over 100,000. The project is ongoing, and participating studies continue to submit data, with an expected final data freeze in December, 2013. Currently, preliminary meta-analytic results are available for five phenotypes in 8 studies totaling ~80,000 samples. In this preliminary data set, phenotypes include cigarettes smoked per day (N=23,948; 8 studies), pack years (N=21,658; 7 studies), age of initiation of smoking (N=16,148; 8 studies); whether an individual has ever had a regular smoker (N=37,018; 6 studies), and drinks per week (N=33,868; 8 studies). In these data, we replicated well-known single-variant associations (inc. rs16969968, p=1e-26) between CHRNA5 and cigarettes per day. Of the >16,000 genes tested, we found that eight rare nonsynonymous variants (minor allele frequencies ranging from .00005 to .01) within CHRNA5 were significantly associated with cigarettes per day, as determined from a rare variant count-based burden test (p=2.5e-6). However, this association became nonsignificant after controlling for rs16969968 (p=.41 after conditional analysis). In general, the results indicate the need for very large samples to detect rare variant associations and we look forward to presenting results based on our full meta-sample. The EMADS effort will inform our understanding of how rare variants influence these complex addiction-related behaviors, and provide insight into the performance of rare variant burden tests to evaluate the aggregate effects of rare variants within genes.

FUNDING: NIH grant DA024417

JUSTIFICATION: Rare functional variants, which this study is powered to detect, provide naturally occurring examples of “human knockouts” which are of high priority in identifying potential drug targets for somatic treatment of nicotine and alcohol addiction.

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PA16-3 ASSOCIATION BETWEEN GLIAL CELL LINE-DERIVED NEUROTROPIC FACTOR (GDNF) POLYMORPHISMS AND SMOKING BEHAVIOR

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Introduction: Glial cell line-derived neurotrophic factor (GDNF) promote the development and differentiation of dopaminergic neurons, thus it is a candidate gene for several dopamine-related neuropsychiatric diseases. For example, it has promising therapeutic implications in Parkinson disease. Previously we have found an association between genetic variants of GDNF and mood characteristics (anxiety and depression). There is a high comorbidity between depressive disorders and smoking, which could be explained by overlapping neurological mechanisms.

A previous study (Yoshimura et al., 2011) found an association between methamphetamine use and a GDNF polymorphism. Thus, we hypothesized that GDNF polymorphisms may be in association with smoking as well. Methods: Psychometric association analyses were carried out using a sample of 849 Hungarian young adults (age range was between 18 and 35; 44% male, 56% female). We collected noninvasive DNA samples and self-report data about their smoking behavior (never smoked, quitter, occasional, or regular smoker). Eight GDNF single nucleotide polymorphisms were genotyped (rs1981844, rs3812047, rs3096140, rs2973041, rs2910702, rs1549250, rs2073050, rs11111). Associations were tested with Khi-square analyses in an allele-wise model. Results: From the analyzed eight GDNF SNPs one showed a significant association with smoking behavior. This result survived the Bonferroni correction for multiple testing (Khi2=13.326, p=0.0039). The rs3096140 C allele was more frequent in all three groups who smoked as compared to those who never smoked. Conclusions: According to our best knowledge this is the first association study on GDNF and smoking behavior. Our results suggest that among the smoker groups the GDNF rs3096140 C allele is a protective factor against smoking and nicotine addiction. These results are in line with the findings of Yoshimura who showed that GDNF rs2910704 is associated with the severity of methamphetamine use. In conclusion, these results suggest that GDNF polymorphisms may play an important role not only in the molecular background of mood characteristics, methamphetamine use disorder, but smoking behavior as well.

FUNDING: This work was supported by the Hungarian Scientific Research Funds (OTKA K81466 and K100845) and we thank support of the Active Psychology Foundation.

JUSTIFICATION: To develop more efficient prevention and interventions for smoking it is essential to understand the biological background, and the genetic risk and protective factors of smoking. The presented study is highly relevant to the understanding of the molecular basis of smoking and additions. Furthermore, the GDNF protein coded by the GDNF gene may be a potential molecular target not only in Parkinson disease but in the battle against smoking behavior as well.

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PA16-4 NORTHERN PLAINS AMERICAN INDIAN SMOKERS POSSESS FASTER AND MORE VARIABLE RATES OF NICOTINE METABOLISM AND UNIQUE CYP2A6 GENETIC VARIATION

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Background: CYP2A6 variability, resulting in altered rates of nicotine metabolism, is associated with variation in smoking behaviors. American Indians (AIs) exhibit unique patterns of smoking behaviors and disease prevalence, but genetic contributors to variation in nicotine metabolism are unknown. We investigated CYP2A6 genetic variability and nicotine metabolism in Northern Plains AIs. Methods: Northern Plains AIs (N=298) were genotyped for CYP2A6 variants 1B, 2, 4, 7, 9, 12, 17, and 35 representative of prevalent loss of function alleles from different ethnicities. Allele frequencies were compared to those in other ethnic groups. Using 3'-hydroxycotinine to cotinine ratio (3HC/COT) as a biomarker of nicotine metabolism, association between CYP2A6 genotype and rate of nicotine metabolism was determined. Results: A unique allelic pattern of CYP2A6 genetic variation was observed, for example with a 4 frequency of 2% and 14.5% in AIs and Alaska Natives, respectively, and a 12 frequency of 0.2% and 2% in AIs and Caucasians, respectively. Overall, the frequency of reduced metabolizers, those with loss of function alleles, among AIs was similar to Caucasians. There was an association between CYP2A6 genotype and rate of nicotine metabolism (3HC/COT) among AI current smokers (N=91, P<0.001), confirming that CYP2A6 genotype predicts rate of nicotine metabolism for this population. The rate of nicotine metabolism was higher in AIs than seen in Caucasians, African Americans, and Alaskan Native peoples (P<0.05), and higher among just those with wild-type genotypes, indicating that this is not a result of a lower frequency of reduce-of-function variants compared to other ethnic groups. Conclusions: These results indicate that Northern Plains AIs are genetically distinct from other ethnicities at the CYP2A6 locus, with faster rates of nicotine metabolism than other ethnic groups. Faster metabolism in other populations has
been associated with higher levels of smoking and tobacco dependence, more difficulty quitting, and reduced response to some cessation pharmacotherapies, suggesting tailored prevention and cessation may be beneficial.

FUNDING: We acknowledge the support of an Endowed Chair in Addictions (RFT), CIHR grant MOP97751, NIH grant DA020630, CAMH, the Canada Foundation for Innovation (#80289 and #18014), the CAMH Foundation and the Ontario Ministry of Research and Innovation. This research was performed under the auspices of the Collaborative to Improve Native Cancer Outcomes, a P50 project program sponsored by the National Cancer Institute (grant no. 1P50CA148110; PIs Buchwald and Henderson). The Collaborative to Improve Native Cancer Outcomes includes: Buchwald D, Plum DR, Garroutte EM, Gonzales AA, Henderson JA, Nez Henderson P, Patrick DL, Tu SP, Winer RL. Dr. Tyndale has acted as a consultant to several pharmaceutical companies, primarily concerning smoking cessation medications.

JUSTIFICATION: Knowledge of the rates of nicotine metabolism and CYP2A6 genotype among American Indians provides potential for tailored smoking prevention and cessation approaches.

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UNSOLVED MYSTERIES IN SMOKING CESSATION

PA17-1
WHEN PLACEBO PATCHES WORK BETTER THAN ACTIVE PATCHES: AN RCT TESTING THE QUIT ATTEMPT THEORY FOR SMOKING CESSATION

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Efforts to help smokers quit smoking generally emphasize relapse prevention, because most smokers relapse soon after making a quit attempt. This study tests a theory that places the primary emphasis on motivating smokers to make a quit attempt. It was hypothesized that sending smokers placebo patches by express mail would lead more to quit smoking than asking smokers to obtain active patches from a pharmacy, because timely access to a placebo would induce a larger proportion of them to make a quit attempt. A total of 4,200 smokers who called the California Smokers’ Helpline were randomly assigned to 3 groups: Group 1 were to obtain nicotine patches by themselves, Group 3 were sent active patches directly from the Helpline by express mail, and Group 2 were sent placebo patches from the Helpline by express mail. We hypothesized that the quit rates would be ordered as follows: Group 3 > Group 2 > Group 1. Assignment to Groups 2 and 3 was double blind, while assignment to no patches sent (Group 1) vs. patches sent (Groups 2 and 3) was not blind. Participants were followed for 7 months. The primary outcome was 6-month prolonged abstinence at 7 months. By 7 months, 73.0% in Group 3 and 71.3% in Group 2 had used the patches sent from the Helpline, while only 30.1% of Group 1 used patches which they obtained themselves. Quit attempt rates were not different between Groups 3 and 2, and both were higher than for Group 1. The survival rate of those quit attempts over the 6-month period was not different between Groups 2 and 1, and both were lower than Group 3. The total 6-month prolonged abstinence rates were ordered as hypothesized: 3 > 2 > 1; the rates were 10.6%, 8.4%, and 5.8% for Group 3, 2, and 1, respectively, in an intent-to-treat analysis. All a priori hypothesized paired comparisons (3 vs. 1, 2 vs. 1) were statistically significant. This is the first study to show a large effect for placebo NRT. This effect was achieved mainly by stimulating quit attempts, and this effect was so powerful that it outperformed the usual-care practice of sending smokers to obtain active NRT from a pharmacy for themselves. Implications for population cessation will be discussed.

FUNDING: Supported by the California Department of Public Health under a contract # CDPH 05-45834 and a supplement from the National Cancer Institute 5 P30 CA 23100-2254.

PA17-2
CHARACTERIZING "QUIT": DISCLOSURE OF CHIPS, SLIPS, AND RELAPSES IN A TWITTER QUIT SMOKING GROUP

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Social media provides an unprecedented, non-invasive, opportunity to observe how smokers describe smoking status and define being “smoke-free”. The National Heart Lung and Blood Institute defines smoking relapse as 7+ days of successful abstinence followed by 6 days or less of regular smoking; researchers often define abstinence more stringently, i.e. “not even a puff.” We examined tweets from 40 adult daily smokers participating in one of two Twitter-based private quit smoking groups. Participants received nicotine patches, were encouraged to set a quit date and reminded to tweet daily. Participants’ tweets were analyzed for consistency of smoke-free claims (e.g., “Its been more than 24 hours since I have smoked”) during the 3 month Twitter group. The sample had a mean age of 36 years (SD=9.5, range 20-57), was 60% female, and smoked an average of 20 cigarettes/day (SD=9.3) for 18 years (SD=9.6, range 4-40). During the 3-month group, 19 of the 40 participants announced being tobacco abstinent. We observed tweets consistent with complete abstinence, such as “At work and on day 6 still no puffs!!!!!.” However, 9 of the 19 participants also tweeted that they chipped, slipped, or relapsed during a period of reported abstinence. Smoking behavior included a few puffs, e.g., “I tried to smoke.. it was gross and made it hard for me to breathe. Think I’ve got this beat, almost.” slippage or abstinence periods, e.g., “Well I slipped and found an old nasty cigarette.. smoked two puffs;” and relapses, e.g., “It has been very stressful, I had a relapse, the engine blowing in the car was just too much!” followed by chronic low-level smoking. In addition, a number of participants described smoking as a cessation test, e.g., “I tried to smoke.. it was gross and made it hard for me to breathe. Think I’ve got this beat, almost!” Current assessments in clinical practice and research may not adequately capture the fluctuating daily experience of individuals trying to quit smoking. In a non-invasive way, social media allows tracking of daily shifts in smoking behavior – including chips, slips, and relapses - and may prove useful in better understanding the quitting process.

FUNDING: This research was supported by an R34 Innovation Grant from the National Institute of Drug Abuse of the National Institutes of Health to Cornelia Pechmann, PhD under Award Number DA030538.

JUSTIFICATION: Understanding what smokers means by cessation may help us 1) interpret patient and research responses more appropriately and 2) design more effective interventions.

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PA17-3
HOW SMOKERS FEEL VS. WHAT SMOKERS KNOW: A COMPARISON OF AFFECTIVE AND COGNITIVE ATTITUDE TOWARD SMOKING AS A PREDICTOR OF SMOKING CESSATION OUTCOMES IN A LONGITUDINAL, POPULATION-BASED STUDY

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Most cigarette smokers intend to quit, but as quit rates are low and relapse rates are high, a search for predictors of quit attempts and abstinence is vital to treatment development. This study of affective and cognitive attitudes toward smoking is part of a nationwide RCT of cessation induction for US smokers not yet ready to quit (N = 831; 67% female, M, SD age in years = 48.7, 12.9). Affective and cognitive attitudes were measured at wks 0 and 6 with follow-up through wk 26. Semantic differential items tapped affective and cognitive attitudes: Participants reported their “feelings” (e.g., tense-calm, sad-delight) and “opinions”
JUSTIFICATION: Understanding how many quit attempts it takes a smoker to quit successfully is important to providing clinical advice, and developing programs and messages for public health.

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PA17-5
QUIT EPISODES AND TIMING OF RELAPSE IN A COHORT OF YOUNG AND MIDDLE-AGED ADULTS

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RATIONALITY: Multiple attempts are often required to achieve long-term abstinence among cigarette smokers. OBJECTIVES: It was the aim of this study to determine whether and which point in time the likelihood of relapse among people who have quit smoking begins to decrease (i.e., tipping point) and smoking relapse risk is reduced to 10%. Covariate adjustment was for years since smoking initiation, level of education, and number of previous quit episodes. METHODS: We used information on smoking status from baseline and exam years 2, 5, 7, 10, 15, 20, and 25 in the Coronary Artery Risk Development in Young Adults (CARDIA), a longitudinal community-based study, initiated in 1985 at 4 US centers. Parametric survival analysis was used on interval censored data to examine the duration until relapse (or right censoring in those who did not relapse) and factors that might relate to a relapse near the time of the latest quit episode. We fit a life curve model because it suits the assumption that relapse hazard function occurs at a higher rate early on and then slows. The log-log goodness of fit test for the Weibull distribution was consistent with a straight line, which indicated that the Weibull model was reasonable. RESULTS: We estimated that for 10 years since smoking initiation, 12 years of education, and 1 previous quit attempt, the tipping point was achieved at 1 month (27 days; 95% CI: 17.8-40.5) while 10% relapse risk was observed at 2 months (61 days; 95% CI: 51.5-73.2). Abstinence time required to meet the 10% relapse risk point was longer the lower the education level. Years since smoking initiation was not associated with relapse risk (p<0.30). CONCLUSIONS: The shape of the relapse curve flattens out over time, meaning that as time since the quit episode passes, the likelihood of relapse diminishes slowly. The first quitting milestone for quitters approximated 1 month. Maintenance of 6 months of abstinence is a conservative estimate that may be a milestone that could result in a higher likelihood of sustained abstinence among smokers.

FUNDING: No Funding

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PA17-4
HOW MANY QUIT ATTEMPTS DOES IT TAKE TO QUIT SMOKING SUCCESSFULLY? A LIFE TABLE ANALYSIS OF A LONGITUDINAL COHORT

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Introduction: The number of quit attempts that a takes a smoker to quit successfully is a commonly reported figure; however, current estimates are based on highly biased data from cross-sectional surveys, thus the actual number is not known. Methods: Included were 1277 participants of the Ontario Tobacco Survey, a longitudinal survey of smokers followed every 6 months for up to 3 years, who reported at least one quit attempt in the first eighteen months of follow-up. The number of quit attempts needed to quit successfully for at least one year was calculated using different methods of estimation: (1) reported quit attempts among successful quitters, and (2) using a life table approach to estimate the expected number of attempts needed to quit. Results: Among survey participants, the average number of lifetime quit attempts reported by successful quitters was 6.1, with an average of 2 quit attempts during the three year period of observation and exceeding 4 previous attempts prior to observation in the study. However, using a life table approach to account for the decreasing probability of success on additional quit attempts, the average number of quit attempts expected to be needed to quit successfully among the study population was 29.6. Conclusions: We may be dramatically understating the number of quit attempts needed to quit successfully by most smokers. During three years of study observation, smokers who successfully quit for one year or longer did so, on average, on their 2nd attempt. However, many smokers try and fail repeatedly suggesting qualitative differences between quit attempts or smokers in the probability of success and number of attempts required for success. Future research is needed into the best ways to motivate and support attempts to quit both among those who have not tried as well as those with multiple failed attempts.

FUNDING: Funding was received from the Ontario Ministry of Health and Long Term Care and the Canadian Cancer Society (award #702160)

JUSTIFICATION: This study shows smokers' feelings about their smoking are a stronger determinant of future behavior than smokers' beliefs about their smoking and (2) affective attitude toward smoking is a powerful, long-term effect on smoking cessation outcomes even if one controls for proven predictors. Clearly affective attitude toward smoking is a viable treatment target.

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PA17-5
QUIT EPISODES AND TIMING OF RELAPSE IN A COHORT OF YOUNG AND MIDDLE-AGED ADULTS

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RATIONALITY: Multiple attempts are often required to achieve long-term abstinence among cigarette smokers. OBJECTIVES: It was the aim of this study to determine whether and which point in time the likelihood of relapse among people who have quit smoking begins to decrease (i.e., tipping point) and smoking relapse risk is reduced to 10%. Covariate adjustment was for years since smoking initiation, level of education, and number of previous quit episodes. METHODS: We used information on smoking status from baseline and exam years 2, 5, 7, 10, 15, 20, and 25 in the Coronary Artery Risk Development in Young Adults (CARDIA), a longitudinal community-based study, initiated in 1985 at 4 US centers. Parametric survival analysis was used on interval censored data to examine the duration until relapse (or right censoring in those who did not relapse) and factors that might relate to a relapse near the time of the latest quit episode. We fit a life curve model because it suits the assumption that relapse hazard function occurs at a higher rate early on and then slows. The log-log goodness of fit test for the Weibull distribution was consistent with a straight line, which indicated that the Weibull model was reasonable. RESULTS: We estimated that for 10 years since smoking initiation, 12 years of education, and 1 previous quit attempt, the tipping point was achieved at 1 month (27 days; 95% CI: 17.8-40.5) while 10% relapse risk was observed at 2 months (61 days; 95% CI: 51.5-73.2). Abstinence time required to meet the 10% relapse risk point was longer the lower the education level. Years since smoking initiation was not associated with relapse risk (p<0.30). CONCLUSIONS: The shape of the relapse curve flattens out over time, meaning that as time since the quit episode passes, the likelihood of relapse diminishes slowly. The first quitting milestone for quitters approximated 1 month. Maintenance of 6 months of abstinence is a conservative estimate that may be a milestone that could result in a higher likelihood of sustained abstinence among smokers.

FUNDING: No Funding

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PA17-4
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M. Chaiton1,2, L.M. Diemert3, S.J. Bondy1,2, J.E. Cohen1,2, J. Garcia4, K.S. Brown1,2, R. Ferrence2,3, P. Selby2,3, and R. Schwartz1,2, 1Ontario Tobacco Research Unit, University of Toronto, 2Johns Hopkins Bloomberg School of Public Health, 3University of Waterloo, 4Centre for Addiction and Mental Health

Introduction: The number of quit attempts that a takes a smoker to quit successfully is a commonly reported figure; however, current estimates are based on highly biased data from cross-sectional surveys, thus the actual number is not known. Methods: Included were 1277 participants of the Ontario Tobacco Survey, a longitudinal survey of smokers followed every 6 months for up to 3 years, who reported at least one quit attempt in the first eighteen months of follow-up. The number of quit attempts needed to quit successfully for at least one year was calculated using different methods of estimation: (1) reported quit attempts among successful quitters, and (2) using a life table approach to estimate the expected number of attempts needed to quit. Results: Among survey participants, the average number of lifetime quit attempts reported by successful quitters was 6.1, with an average of 2 quit attempts during the three year period of observation and exceeding 4 previous attempts prior to observation in the study. However, using a life table approach to account for the decreasing probability of success on additional quit attempts, the average number of quit attempts expected to be needed to quit successfully among the study population was 29.6. Conclusions: We may be dramatically understating the number of quit attempts needed to quit successfully by most smokers. During three years of study observation, smokers who successfully quit for one year or longer did so, on average, on their 2nd attempt. However, many smokers try and fail repeatedly suggesting qualitative differences between quit attempts or smokers in the probability of success and number of attempts required for success. Future research is needed into the best ways to motivate and support attempts to quit both among those who have not tried as well as those with multiple failed attempts.

FUNDING: Funding was received from the Ontario Ministry of Health and Long Term Care and the Canadian Cancer Society (award #702160)
NIPA-1

THE GENETIC BASIS OF COTININE LEVELS IN DAILY SMOKERS: RESULTS FROM A GENOME-WIDE META-ANALYSIS

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Genome-wide association studies (GWAS) have facilitated the search for genetic factors that contribute to specific phenotypes. However, GWAS tend to employ relatively crude phenotypes (e.g., self-report measures) given the need to collect data on very large samples in order to have adequate power to detect the small effects of common variants on complex phenotypes. This can be problematic when these measures need to be harmonised across studies. We conducted a GWAS of cotinine, the primary metabolite of nicotine, in a consortium of eleven samples (the Cotinine Consortium), comprising 4,622 daily smokers of European ancestry. Genotype imputation was performed using 1,000 Genomes (March 2012 release) as a reference panel, resulting in a common set of approximately nine million common SNPs (MAF >1%). All results were adjusted for sex and age. Results were combined in a meta-analysis. We observed association between multiple variants within the 15q25 region and cotinine level, all located within the CHRN5-A3-B4 gene cluster or adjacent genes (minimum p = 5.74 x 10^-11 for rs12910984 in CHRNA3). Examination of the linkage disequilibrium (LD) structure between our top hits suggested two independent signals in CHRNA3, one marked by rs12910984 (A: ? = 0.161, S.E. = 0.025, p = 5.74 x 10^-11) and one by rs8040868 (T: ? = 0.130, S.E. = 0.021, p = 3.85 x 10^-10). This latter variant is in strong LD with rs16969993 (R2 = 0.84). These results correspond well with findings in previous much larger GWAS using self-report measures of smoking quantity. Our approach illustrates the benefit of using precise, objective phenotypes in genetic association studies, as also highlighted in other recent GWAS employing metabolite measures (e.g., Kettunen et al., 2012). We plan to conduct further analyses conditioning on rs12910984 and rs8040868 to determine if these variants fully account for the much larger GWAS using smoking status was not associated with longitudinal changes in CESD caseness (B(?)=0.01(0.02); 95%CI -0.03,0.03). Smoking status was not associated with longitudinal changes in CESD caseness (B(?)=0.01(0.02); 95%CI -0.03,0.03). Smoking status was not associated with longitudinal changes in CESD caseness (B(?)=0.01(0.02); 95%CI -0.03,0.03). Findings were confirmed in sensitivity analysis and in a subsample of participants with a history of mental health problems. Conclusions and relevance: In older smokers, depression may act as a barrier to quitting but smokers can be assured that quitting will not increase depressive symptoms long-term. Older smokers should be supported to quit, especially those with depression, as they are likely to experience better health outcomes in the longer term.

FUNDING: National Institute on Aging; UK Government; University of Greenwich; Cancer Research UK

CORRESPONDING AUTHOR: Lion Shahab*, UCL; Gail Gilchrist, KCL; Gareth Hagger-Johnson, UCL; Aparna Shankar, UCL; Elizabeth West, University of Greenwich; and Robert West, UCL

NIPA-2

THE RECIPIROCAL ASSOCIATION OF SMOKING CESSION AND DEPRESSION IN OLDER SMOKERS: FINDINGS FROM THE ENGLISH LONGITUDINAL STUDY OF AGEING (ELSA)

Lion Shahab*, UCL; Gail Gilchrist, KCL; Gareth Hagger-Johnson, UCL; Aparna Shankar, UCL; Elizabeth West, University of Greenwich; and Robert West, UCL

Importance: Tobacco use and depressive disorders are major contributors to premature mortality and it is well documented that onset of either is a risk factor for the other. What remains unclear and controversial, however, is the impact of smoking cessation on mental health and vice versa. Objective: To examine the reciprocal, longitudinal relationship between smoking cessation and depression among long-term smokers. Design, Setting and Participants: Core members of the English Longitudinal Study of Ageing, an on going panel study of the general population aged 50 and older. Only participants who were smokers at baseline were included in the analysis (N=2,170). Main outcomes and measures: Smoking status and depressive symptoms measured using the 8 item Centre for Epidemiologic Studies Depression Scale (CESD) over a period of 6 years (2002-2008). Results: CESD caseness (Wald(?)=31.00, p<0.001) and current smoking (Wald(?)=25.30, p<0.001) were positively associated with each other across subsequent waves in a dose dependent manner when analysed independently. When changes across waves were modelled concurrently using parallel latent growth curve models, CESD caseness was associated with change in smoking status but not vice versa, adjusting for a range of covariates. Participants considered to be depressed cases were less likely to stop smoking (or more likely to re-start smoking) across waves (B(?)=0.21 (0.27); 95%CI 0.08,0.35) whereas smoking status was not associated with longitudinal changes in CESD caseness (B(?)=0.01(0.02); 95%CI -0.03,0.03). Conclusions and relevance: In older smokers, depression may act as a barrier to quitting but smokers can be assured that quitting will not increase depressive symptoms long-term. Older smokers should be supported to quit, especially those with depression, as they are likely to experience better health outcomes in the longer term.

FUNDING: National Institute on Aging; UK Government; University of Greenwich; Cancer Research UK

CORRESPONDING AUTHOR: Lion Shahab*, UCL; Gail Gilchrist, KCL; Gareth Hagger-Johnson, UCL; Aparna Shankar, UCL; Elizabeth West, University of Greenwich; and Robert West, UCL

NIPA-3

USE OF ENDS FOR CESSATION: ASSOCIATION WITH NRT AND CESSATION

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Introduction: It unclear whether electronic nicotine delivery system (ENDS, or e-cigarette) use is associated with smoking cessation. We address this question by examining the prevalence and correlates of ENDS use and association with cessation among smokers enrolled in a web-based randomized trial for smoking cessation. Method: Adult smokers who were new registrants on the cessation website BecomeAnEx.org were recruited following site registration. Participants
completed baseline, 3-, and 9-month surveys. We report the correlates of ENDS use in the past year at baseline and the 3-month follow up. Logistic regression examined the association between ENDS use and attitudes towards NRT, as well as the relationship between past 3-month ENDS use and 7-day abstinence at 3 months. Results: Between March 2012 and August 2013, N=3,392 participants enrolled in the parent study. Mean age was 41.7 years, and the majority of registrants was female (68%), non-Hispanic White (84.9%), had completed at least some college (72.2%), and smoked within 30 minutes of waking (79.2%). At baseline, 26.2% (n=987) of smokers used ENDS as a cessation device in the past year, 30.1% used NRT, and 11.2% used a prescription medication. In multivariable analyses, attitudes concerning NRT at baseline did not predict ENDS use at 3 months; however, the odds of reporting ENDS use in the past month were 78% higher among those who had also used NRT in the past month (OR=1.78, 95% CI 1.35,2.33, p<0.001). In multivariable regression controlling for demographics, study condition, nicotine dependence, CPD, past use of NRT or cessation medication, confidence to quit, and motivation to quit, past 3-month ENDS use decreased the odds of 7-day abstinence by 31% (OR=0.69, 95% CI .53, .88, p=0.003). Conclusions: ENDS are as popular as NRT among smokers registering for Internet cessation treatment and enrolled in a randomized trial. Smokers who reported past ENDS use have lower odds of cessation than those who did not use ENDS as cessation devices.

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POS1-1
RECRUITMENT AND RETENTION OF AMERICAN INDIAN SMOKERS INTO A CULTURALLY-TAILORED SMOKING CESSATION STUDY
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American Indians have the highest smoking rates of the major racial/ethnic groups in the United States. Furthermore, this underserved population has very low smoking cessation and abstinence rates. To date, few studies have focused on methods to encourage smoking cessation among American Indian smokers. The current study is an ongoing group randomized controlled trial to examine the efficacy of a culturally-tailored smoking cessation program. *All Nations Breath of Life.* We randomized 28 groups per site (8 smokers per group) to tailored or non-tailored intervention for a total sample size of 448 American Indian smokers at two centers. We present the recruitment rate and the barriers for recruitment and retention in this population. The quarterly recruitment target for the Mary's was 45 participants and of the 9 quarters of potential recruitment, we reached the target in 5 of the quarters. Initial delay in the recruitment of participants across both centers (University of Kansas Medical Center and the University of Oklahoma Health Science Center) was related to the time required to obtain tribal approvals. In addition, we encountered challenges related to training of facilitators and resistance of a few tribes to adopt a randomized trial design. Finally, the delay from initial screening to randomization of participants caused some smokers to lose interest in the program, which also impacted recruitment. The major reasons for lack of retention included phone numbers being disconnected, change of home addresses and/or phone numbers, child/parent responsibilities, transportation, intensity of the program (especially first 3 months), and coordination of the meeting day/time for each group member. Although we will reach our enrollment target of 448 total American Indian smokers, delays in the initial recruitment and maintenance of our target recruitment rate have presented challenges in conducting this study. Lessons learned from these challenges will inform future studies with this priority population.

FUNDING: Funding for this research was provided by the National Cancer Institute (R01 CA141618). Additional funding was provided by the National Institute of Minority Health and Health Disparities, P20MD004805 (Daley). Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the sponsoring organizations.

JUSTIFICATION: Effective culturally-tailored smoking cessation programs are needed to address the high prevalence of smoking among American Indians.

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POS1-2
HEALTH-RELATED EFFECTS REPORTED BY ELECTRONIC NICOTINE DELIVERY SYSTEMS (ENDS) USERS IN CHINESE SOCIAL MEDIA
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Background: China, with a smoking population of over 350 million, is the largest smoking market for electronic nicotine delivery systems (ENDS). Despite the importance of understanding the health effects caused by ENDS use in China, related scientific research and surveillance efforts are sparse. The question on how ENDS use may affect the public health in China needs urgent investigation. This study aims to document the health effects of ENDS use in China by performing an analysis of messages in Chinese social media. Methods: The data source of our study is one of the most popular Chinese microblogging sites called Sina Weibo. With a customized crawler, we collected all messages which contained the Chinese keyword “???” (English: electronic cigarettes) and ranged from 2-26 - 2012 to 7-31 - 2013. The raw dataset included 5283 records. After eliminating duplicated messages and irrelevant messages (the messages that do not contain explicit feedback of ENDS consumers), a sample of 240 messages were analyzed in terms of type and frequency of health effects. Results: A total of 82 different symptoms due to ENDS use were found in our sample. In these symptoms, 30 were positive, 42 were negative, and 10 were neutral. The symptom mentioned by most messages was “ENDS addiction” with 13 messages, followed by “nausea” with 9 messages, “itch” with 5 messages, “sweet taste” with 5 messages, and “dizziness” with 5 messages. Conclusions: To the best of our knowledge, this is the first attempt to analyze the Chinese social media to document the health effects reported by ENDS consumers. The results of our study showed that social media provides a useful resource for assessing how ENDS use affects public health in China, which would help the public health authorities better educate the ENDS consumers and make appropriate regulatory decisions to ensure the product safety of ENDS in China.

FUNDING: This work was supported by the following grants: The National Natural Science Foundation of China, Grant No. 71103180, 91124001 and 91204300, and The Ministry of Health, Grant No. 2011ZX10004001 and 2013ZX10004218.

JUSTIFICATION: This study could help public health authorities gain a better understanding of ENDS use and inform regulatory decision making.

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POS1-3
THE IMPACT OF VARIATION OF HOOKAH COMPONENTS ON CHEMICAL AND PHYSICAL EMISSIONS
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To investigate the effects of hookah components on the chemical and physical properties of hookah smoke, we used machine smoking and a human puffing regimen obtained from subjects smoking a standard research grade hookah configuration. Topographies from ten subjects smoking the standard hookah in three separate laboratory sessions showed that hookah puffing varied throughout a session, with more frequent and larger puffs in the first ten minutes. Each subject’s topography was separated into tertiles and all puffing parameters were averaged by tertile: 32 puffs (0.72 L, volume, 4.6 s duration) for the first 11.2 min, 42 puffs (0.46 L, 3.6 s) for the remaining 22.6 min, for a total puffing volume of 42.4 L. The hookah was machine smoked in a controlled chamber similar in size and ventilation to a small residential bathroom (246 m3, 1.5 h–1). Mainstream and sidestream smoke (MS and SS) was continuously monitored for each of four different hookah configurations (standard and 3 variations) to examine the impact of heat source (charcoal vs. electric coal), hose length (150 vs. 225 cm), and screen (foil with small holes vs. sheet metal with large holes) on particulate, semi-volatile, and volatile organic compound (SVOC and VOC) emissions. SS VOCs (acetonitrile, acrylonitrile, benzene, 1,3-butadiene, 2,5-dimethylfuran and isoprene) were quantified using a proton transfer reaction-mass spectrometer, and carbon monoxide (CO) was quantified using an environmental CO monitor. MS particle size distribution was measured and particulate was collected using an electrical low pressure impactor. Fine and ultrafine particulate were chemically extracted and MS SVOCs, including the tobacco-specific nitrosamines, benzo[a]pyrene, pyrene, nicotine, and quinoline were quantified. For the standard hookah configuration, SS benzene and acetaldehyde reached peak levels of ~0.2 ppm, and CO peak levels were more than 1,000 times greater (~500 ppm), well above the acute exposure threshold for these compounds. The major reasons for lack of retention included phone numbers being disconnected, change of home addresses and/or phone numbers, child/parent responsibilities, transportation, intensity of the program (especially first 3 months), and coordination of the meeting day/time for each group member. Although we will reach our enrollment target of 448 total American Indian smokers, delays in the initial recruitment and maintenance of our target recruitment rate have presented challenges in conducting this study. Lessons learned from these challenges will inform future studies with this priority population.

FUNDING: Funding for this research 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.

JUSTIFICATION: This work has public health implications in that (1) hookah smoking involves two different chemistries (the burning of charcoal and heating of
tobacco) possibly contributing uniquely to human pathology; (2) so little is known about human exposure to, and the health consequences of, hookah smoking even though it is overtly advertised as a reduced risk method of tobacco use; and, (3) the study has established methods and materials for the broader community of scientists to use in tests of hookah smoking.

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**POS1-4**

**THE IMPACT OF CIGARETTE USE ON INADEQUATE COLON CANCER SCREENINGS**

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Colonoscopy is a test used to identify (and remove) adenomas (precancerous polyps), thus preventing colorectal cancer. A thorough cleansing or bowel preparation (BP) of the colon is necessary for the test to be effective. Inadequate BP often results in lesions being overlooked, lengthy procedure times, and cancellation of the colonoscopy due to low visualization. All have impact on health care costs, resource utilization and patient risk. With the presence of over 7000 chemicals in tobacco, cigarettes have been proven to have negative effects on the functioning of most bodily systems. Such systems include the respiratory, circulatory, and digestive systems. The latter includes both colon cancer development and bowel motility. Limited research exists regarding the association between tobacco use and poor BP. Prior studies found that cigarette smokers are more likely to have poor bowel preparation for the procedure than non-smokers, but smoking as a predictor of bowel prep was not the primary focus of these studies. For this study, we assessed for the first time that cigarettes smoking played in poor BP. We recruited over 1200 patients from two colonoscopy clinics to complete a pre-colonoscopy survey. With complete data for 949 patients to date, nearly 1 in 5 (18.9%) demonstrated a poor preparation. Those who reported current cigarette use were more likely to demonstrate poor preparation (27.3%) compared to non-smokers (19.2%) or former smokers (14.6%; chi-square = 9.8, p<.008). This finding is especially concerning given that those who smoke cigarettes are 2.0–2.7 times more likely to have adenomas. This study demonstrates the effect of cigarette smoking on poor BP and ultimately the successful identification of key indicators for cancer. Cigarette smokers are at significantly elevated risk, given the dual hazard of higher adenoma incidence and the increased risk of missing them due to poor colonoscopy screenings. Additionally, the results of this study demonstrated the need to further characterize the association between smoking and poor bowel prep to reduce the potential for unnecessary health care expenditures and for improvement in patient outcomes.

FUNDING: Bankhead-Coley Cancer Research Program

JUSTIFICATION: This study can inform both clinical practice and research regarding the effects of tobacco use on cancer screening.

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**POS1-5**

**ASSOCIATIONS BETWEEN ANHEDONIA AND RISK FACTORS FOR SMOKING INITIATION AMONG ADOLESCENT NEVER SMOKERS**

Matthew D. Stone, B.A.* and Adam M. Leventhal, Ph.D., University of Southern California

**BACKGROUND:** Anhedonia—diminished capacity to experience pleasure—is recently been linked to cigarette smoking initiation. Yet, it is unclear whether anhedonia relates to important risk factors directly proximal to smoking initiation that could be targeted in prevention. It is also unknown if such associations are independent of depression, which is related to anhedonia and implicated in smoking. This study of adolescent never smokers examined cross-sectional relations between anhedonia and several factors known to robustly increase risk of smoking initiation, including smoking outcome expectancies, curiosity about smoking, and willingness and future intention to initiate smoking.

**METHOD:** Southern California high school students (N = 585; mean age = 14.5 years; SD = .54) were administered in-classroom surveys of smoking and other characteristics, of whom 506 (86.5%) reported never smoking a whole cigarette and were included in analyses. **RESULTS:** In linear regression models controlling for demographics, anhedonia was associated with greater reward expectancies (Beta = .14, p < .01), lower negative expectancies (Beta = -.15, p < .001), greater curiosity about smoking (Beta = .11, p < .05), and greater future willingness to smoke (Beta = .10, p < .05). Except for the relation to willingness to smoke, each relation of anhedonia to the smoking risk factors remained significant after controlling for depressive symptom level, which was independently associated with reward expectancies (Beta = .13, p < .05) and willingness (Beta = .15, p < .01). **CONCLUSION:** These findings indicate that, in comparison to teens who experience higher pleasure, anhedonic teens who have never smoked: (a) expect that smoking will produce greater rewarding effects and less negative consequences; and (b) are more curious about trying smoking for the first time. Further, anhedonia and depressive symptoms may have independent roles in the development of certain key risk factors proximal to smoking initiation. Preventive interventions that modify or buffer against the beliefs and curiosity about smoking may reduce the risk of smoking initiation in anhedonic adolescents.

FUNDING: This work was supported by NIH grant R01-DA033296.

JUSTIFICATION: This study’s findings on anhedonia and depressive symptoms in youth will contribute to smoking prevention.

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**POS1-6**

**ASSESSMENT OF THIRDHAND EXPOSURE TO NICOTINE FROM ELECTRONIC CIGARETTES**

Lily Lee, Mark J. Travers, Ph.D., and Maciej L. Gomienicz, Ph.D.*, Roswell Park Cancer Institute, Buffalo, USA

Purpose: Electronic cigarettes (e-cigarettes) are new battery-powered devices that resemble tobacco cigarettes and convert nicotine solutions into inhalable vapors. The e-cigarette vapor contains primarily nicotine dissolved in a propylene glycol or glycerin. Thirdhand exposure occurs when smoke constituents such as nicotine remain on surfaces, are re-emitted into the gas phase, or react with oxidants and other compounds in the environment to form secondary pollutants, such as carcinogenic nitrosamines. Exposure can continue long after smoking has ceased and is a major health concern. We assessed the possibility of the deposition of nicotine on various surfaces as a marker of thirdhand exposure from e cigarettes. Materials and Methods: Three brands of e-cigarettes were refilled with varying nicotine concentrations and then smoked (~“vaped”) with a syringe in an exposure chamber in four experiments. Surface wipe samples were taken from several indoor 100 sq. cm surfaces (window, walls, floor, wood and metal). Nicotine was extracted with methanol from the wipes and analyzed using gas chromatography with a selective nitrogen-phosphorus detector (GC-NPD). Blank samples were collected from each surface before the experiments to estimate background exposure.

Results: Three out of four experiments showed significant increases in the amount of nicotine on all five surfaces. Some surfaces were easier for nicotine to adsorb to. The floor and glass windows had the greatest increases in nicotine, on average by a factor of 28 and 4, respectively. The average amount of nicotine deposited on a floor during each experiment was 24 ng per sq. cm, and varied from 0.5 to 55 ng per sq. cm.

Conclusions: Our work indicates that nonsmokers can be exposed to nicotine released from e-cigarettes and deposited on surfaces. Thirdhand exposure levels differ depending on the surface and e-cigarette brand, creating the potential danger of e-cigarettes exposing people to carcinogens. Future research should explore the risks of thirdhand exposure to carcinogens from e-cigarettes.

FUNDING: This work was supported by Roswell Park Cancer Institute, National Cancer Institute (NCI) grant #P30 CA016056, and NCI CURE Supplement (LL).
JUSTIFICATION: The findings of this study might inform regulators whether e-cigarettes should be included under smoke-free policies to protect nonusers from inhaling the toxicants.

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POS1-7 HOOKAH SMOKERS: WHAT ELSE ARE THEY USING?


Hookah use presents several risks, including the opportunity for multiple tobacco use among adolescents and young adults. As part of a larger study to explore reasons for hookah use, six focus groups were conducted with college and non-college young adults (18-24 years). At the conclusion of each group, participants completed a survey to assess their tobacco use history. In all, 40 hookah users (average age 19.2 (SD = 1.4)), 55 females and 73% white, completed the survey. Every participant reported using at least one additional tobacco product, both in their lifetime and in the past year. Past year use of other products included: cigarettes (47.5%), cigars (40%), pipe (25%), and smokeless (22.5%). The majority (85%) of hookah users also reported using an additional form of tobacco in the past 30 days: cigarettes (32.5%) and cigars (27.5%). While males were more likely to report current cigarette use (61.1% vs 9.1%; chi-square = 12.2, p<.05), no statistically significant sex differences were found for cigar use; hookah using females reported high levels (18.2%) of cigar use. When asked which tobacco products they tried first, more than half (52.5%) indicated hookah. Additionally, for those who tried tobacco products prior to age 18, it was often an alternative tobacco: cigars (91%), hookah (76%), and cigarettes (38%); chi-square (22.5%). The majority (85%) of hookah users also reported using an additional form of tobacco in the past 30 days: cigarettes (32.5%) and cigars (27.5%). While males were more likely to report current cigarette use (61.1% vs 9.1%; chi-square = 12.2, p<.05), no statistically significant sex differences were found for cigar use; hookah using females reported high levels (18.2%) of cigar use. When asked which tobacco products they tried first, more than half (52.5%) indicated hookah. Additionally, for those who tried tobacco products prior to age 18, it was often an alternative tobacco: cigars (91%), hookah (76%), and cigarettes (38%); chi-square (22.5%). Notably, nearly one-fourth of hookah users did not first try tobacco until after the age of 18. Prior to the growth of hookah and other alternative products, reaching age 18 before using tobacco was considered a protective factor against future use. However, a newer pattern may be that for those who do try tobacco at a younger age, their products of choice tends to not be cigarettes. Also, a novel finding is that hookah using females reported high levels of cigar use. Multifaceted interventions are needed that can both protect the young adult as well as the adolescent or young adult who engages in multiple tobacco product use and appears attracted to alternative products. Ultimately, the use of alternative tobacco products at an early age may lead to an increase in addiction rates by young adulthood.


JUSTIFICATION: Openness to alternative tobacco products is leading to greater tobacco exposure for young adults.

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POS1-8 RELIABILITY OF CONSUMER PERCEPTION AND TOBACCO DEPENDENCE MEASURES IN A WEB BASED SAMPLE

Sarah E. Adkison, M.A.* and Richard J. O’Connor, Ph.D., Roswell Park Cancer Institute

Background: A number of modified risk tobacco products (MRTPs) have recently entered the market; however, it remains unclear how consumers perceive these products as there are no validated measures to assess this. To date, no standardized approach has been defined for measuring consumer perceptions of tobacco products, specifically low-nitrosamine smokeless tobacco (SLT) like snus. This research establishes psychometric properties and test-retest reliability of consumer perception measures regarding SLT products. Methods: We employed a test-retest design with youth (14-17) and adults (18-65) in the US drawn from a web panel. Respondents completed a survey about their smoking behaviors, nicotine dependence, SLT attitudes, product expectancies, health risks associated with tobacco use, and tobacco harm reduction. Respondents were re-contacted to complete a second administration three months later. We assessed psychometric properties for each instrument using Cronbach’s alpha, paired t-tests, and intraclass correlation coefficients. In addition we constructed positive and negative expectancies for low-nitrosamine SLT using EFA. Results: Of the 3000 respondents originally surveyed, 42% (N=1259) completed the survey re-administration. Older adults (25-65), smokers and susceptible smokers, and males were more likely to complete the second administration. The Fagerstrom nicotine dependence scale (W1=72, W2=72; ICC: .880) and the WISDM scales (ICC range: .782-.901) had high internal consistency and ICCs from time 1 to time 2. Perceived prevalence of SLT use and prevalence of use among the elite had a high internal consistency across survey administrations and a good ICC (.835 and .728). Test-retest reliability of measures regarding health risks associated with both smoked and SLT products was also established (ICC: .778). EFA produced consistent positive (ICC=.774) and negative (ICC=.741) expectancies for SLT across administrations Conclusion: Test-retest reliability of cognitive, affective, and normative measures about SLT products was established. Such metrics can be useful in evaluating consumer response to MRTPs in the premarket and postmarket context.

FUNDING: Funded by U.S. National Cancer Institute U19CA157345-01A1

JUSTIFICATION: These metrics can be useful in evaluating consumer response to MRTPs in the premarket and postmarket context.

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POS1-9 QUITLINE SERVICE UTILIZATION AMONG ADULTS ENROLLED IN A TOBACCO DEPENDENCE TREATMENT TRIAL IN APPALACHIAN OHIO: THE ROLE OF LIMITED PHONE ACCESS

Amy M. Wermert, M.P.H.,** Julianna M. Nemeth, M.A.,† Nancy E. Hoo, Ph.D.,‡ Sarah E. Krygowski, M.P.H.* and Mary Ellen Wewers, Ph.D.* The Ohio State University, College of Public Health, ‘Community Properties of Ohio Appalachian has a high prevalence of tobacco use and are at increased risk for tobacco-related diseases. A cessation quitline offers a resource for quitting. The purpose of this study was to compare the utilization of Ohio Tobacco Quitline (QL) phone counseling among participants enrolled in a cessation trial in Ohio Appalachia, according to phone access. The trial included up to 5 free phone counseling sessions with the QL and up to 8 weeks of free nicotine replacement therapy (NRT) (i.e., 21 mg patch). Eligibility criteria included resident of a participating Appalachian county, 18 years and older, self-reported daily cigarette use, willing to quit in the next 30 days, no medical contraindication to NRT patch use, and if female, not pregnant. Data collection started in November, 2010. Participants were categorized as having limited phone access if they reported only having a cell phone and if, in the last six months, experienced at least one of the following to save minutes: asking others not to call, not answering their phone or turning off their phone. Regression modeling was performed in SAS v9.2. This abstract reports on the first 276 participants, with 25 categorized as having limited phone access and 251 with unlimited access. Data were collected at baseline and 3 months post-intervention. The sociodemographic characteristics of both groups were similar, with the exception of poverty. For those with limited phone access, the average length of each QL phone session was significantly shorter (p=0.0374) compared to those with unlimited phone access. Calls were 3.68 minutes shorter on average. The total time spent on sessions trended towards being shorter (p=0.0556) for those with limited phone access. Overall, counseling time was 16.43 minutes shorter. The mean number of calls to the QL did not differ between the two groups. Abstinence outcomes at 12 months for both groups will also be compared. This study emphasized the importance of continued research into the barriers associated with utilizing QL phone counseling services. Limitations of this study included a small sample size and a homogenous study population (i.e., living in Appalachia, Ohio).

FUNDING: This study was conducted while the first author was at The Ohio State University. Supported by NIH grant # R01 CA129771 and a National Center for Advancing Translational Sciences NIH grant # UL1TR000090.
ROSE 10.00 A.M. – 4:00 P.M.

POSTER 10-10

EUDAIMONIA\(^{\text{A}}\) ENHANCE THE SMOKE EFFICACY OF SMOKING CESSATION INTERVENTIONS?

Christopher B. Thorne, M.A.*, Kathryn J. Van Marter-Sanders, B.A., and Peter S. Hendricks, Ph.D. University of Alabama - Birmingham

INTRODUCTION: Decades of research demonstrate a robust link between negative emotional states (e.g., anxiety, depression, anxiety) and cigarette use. Only a few recent studies, however, have examined the relationships between positive emotions, or “eudaimonia” (e.g., optimism, purpose in life, positive affect), and smoking. This omission is consequential because negative and positive emotions are categorically different, not endpoints on a continuum. Examining the relationships between eudaimonia and cigarette use would inform potential new targets for smoking cessation interventions, which have thus far demonstrated limited efficacy. METHODS: Smokers (n= 239) and non-smokers (n= 1577) from the National Survey of Midlife Development in the United States II, a study of the behavioral and psychosocial determinants of age-related differences in physical and mental health, were compared on three domains of psychological well-being: (1) optimism (Life Orientation Test – Revised); (2) purpose in life ( Ryff Measures of Psychological Well-being); and (3) positive affect (the Midlife Development Inventory Affect Scales [MDIAS] and the Positive and Negative Affect Schedule [PANAS]). A logistic regression model controlling for age, race, gender, education, and income evaluated the associations of these eudaimonic constructs with smoking status. RESULTS: Smokers were less optimistic ( Adjusted OR = .95, [.91, .99]), reported reduced purpose in life (Adjusted OR = .96, [.93, .99]) and reported less positive affect (MDIAS Adjusted OR = .77, [.66, .89]; PANAS Adjusted OR = .84 [.73, .96]) than non-smokers. DISCUSSION: These data suggest that smokers experience reduced positive emotions relative to non-smokers. Leading theoretical models suggest that eudaimonic deficiencies drive smoking behavior. Thus, tobacco interventions may benefit from components designed to augment positive emotions (e.g., Positive Psychology interventions).

FUNDING: No funding.

JUSTIFICATION: Incorporating interventions targeting positive emotions may increase the efficacy of smoking cessation treatments.

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POSTER 10-11

FACTORS THAT PREVENT ELECTRONIC CIGARETTE INITIATION IN ADOLESCENT AND YOUNG ADULT SMOKERS AND NON-SMOKERS

Deepa R. Camenga*, M.D., M.H.S., Dana Cavallo, Ph.D., Grace Kong, Ph.D., Amanda Palmer, B.A., Meghan Morean, Ph.D., and Suchitra Krishnan-Sarin, Ph.D., Yale School of Medicine, New Haven, CT

There is growing concern that electronic (e-) cigarette use is increasing in adolescents and young adults. The objective of this study is to examine the factors that prevent e-cigarette initiation among adolescents and young adult smokers and non-smokers. Eighteen focus groups were conducted in 2012-2013 in 2 colleges (n=59 students), 2 high schools (n=52) and 2 middle schools (n=16) in New Haven County, CT. College and high school groups were stratified by gender and cigarette smoking status and middle school groups by gender only. A standard focus group guide was used to ask participants about their knowledge of electronic cigarette reasons for use and non-use. Group discussions were recorded, transcribed, and examined using thematic analysis. College and high school smokers were deterred by the high cost of e-cigarettes. They preferred the known satisfaction of a traditional cigarette to the “unknown feeling” of an e-cigarette. College smokers were hesitant to try e-cigarettes due to unknown health risks, and lack of scientific evidence supporting the products’ safety. College and high school non-smokers equated e-cigarettes to traditional cigarettes, and anti-tobacco sentiments shape their desire not to use e-cigarettes. They described the potential of adverse health effects/addiction as factors that prevent initiation, and believed that e-cigarettes are for “smokers only.” Both high school and middle school students described parental disapproval as a factor that prevents initiation, and high school students also described friend disapproval. All groups described lack of “coolness” as a factor that prevents initiation. Cost and unknown health risks prevent the initiation of e-cigarettes among college and high school smokers. Negative perceptions about traditional cigarettes shape non-smokers beliefs about e-cigarettes. High school and middle school students additionally describe parental disapproval as a reason not to initiate electronic cigarettes. Thematic analysis is ongoing. These formative qualitative data suggest that smokers and non-smokers identify distinct factors that prevent initiation of electronic cigarettes.

FUNDING: This work was supported by the National Institute on Drug Abuse grant P50DA009241.

JUSTIFICATION: This study identifies factors that may prevent electronic cigarette initiation in adolescents and young adults and may inform public health programs aimed at preventing increasing rates of use.

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POSTER 10-12

CHANGE IN CIGARETTE DESIGN CHARACTERISTICS AND METAL CONCENTRATIONS OF RESERVATION-MADE CIGARETTE IN WESTERN NEW YORK

Rosalie Caruso*, Danielle Dickson, and Richard O’Connor, Roswell Park Cancer Institute

New York state taxes on cigarettes are among the highest in the United States, and reservation-made cigarettes are increasingly the most prominent brands used in Western New York, as they are inexpensive and easily accessible. In 2009, the Federal Food and Drug Administration (FDA) acquired regulatory authority over tobacco products and their marketing, requiring the removal of ‘light/mild’ product descriptors in 2010. In order to see if reservation-made cigarettes complied with these changes and to determine whether other product changes had occurred, varieties of Smokin Joes, Exact, and Seneca purchased in 2007, 2008, and 2013 were tested, with Marlboro Regular/Red, Gold/Light, and Silver/ Ultra Light products from the same years used for comparison purposes. Packs were conditioned for a minimum of 48 hours at 22±2°C and 60±2% relative humidity and then tested for cigarette design characteristics, including tobacco length/weight, filter length/weight, tobacco moisture, and ventilation. Over the years, there was an increase in mean tobacco length (p<0.01) and a decrease in rod density (p=0.013). An increase in ventilation was also observed which nearly achieved statistical significance (p=0.058). Comparing ventilation, rod density, and tipping paper length of reservation cigarettes to Marlboro across the years showed no significant differences (p>0.323). Reservation cigarettes complied with FDA-mandated changes in pack descriptors and added banding to cigarette papers in 2013. Further work is being done to test tobacco alkaloid and metal content of reservation cigarettes to compare with popular cigarettes such as Marlboro.

FUNDING: This work was supported by Roswell Park Cancer Institute via National Cancer Institute (NCI) grant P30 CA016056.

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POS1-13
PHYSICAL AND DESIGN CHARACTERISTICS OF SMALL CIGARS AND CIGARILLINES
Rosalie V. Caruso1, Terrence Troutman2, Richard J. O’Connor3, Mark Travers4, and Cristine Delnevo5, Roswell Park Cancer Institute, “Rutgers University

Cigar use has increased in America as cigarette use has steadily decreased, and small cigars and cigarillos have increased in popularity within teen, minority, and low income groups. Little published data exists on the design characteristics of cigars and cigarillos, therefore a variety of both was purchased online for testing, based on brands that had both flavored and unflavored varieties as well as brands with different manufacturers. After cataloging, packs were conditioned for a minimum of 48 hours at 22°C, 2% and 60%±2% relative humidity in an environmental chamber prior to testing. Packs were then measured for characteristics including tobacco weight, column length, and ventilation of filtered cigars. Differences in means of tobacco weight of filtered cigars (1.0g) vs. cigarillos (2.5g) were found to be statistically significant (t=11.38, p<0.001), as well as the differences in column length (cigars = 72.0mm vs. cigarillos = 110.6 mm; t=22.58, p<0.001), and rod density (cigars = 317.3 g/cm3 vs. cigarillos = 273.2 g/cm3; t=3.08, p=0.0025). Both filtered cigars and cigarillos still feature flavored tobacco, unlike cigarettes; however, there were no statistical differences in design characteristics between flavored and non-flavored versions of products. The differences in mean ventilation (overall mean = 19.6%, min = 0.84%, max = 57.6%) across filtered little cigar brands were found to be statistically significant (p=0.031), with much variation among brands such as Remington (22.3-33.8%), Swisher Sweets (0.8-63.0%), Cheyenne (1.4-43.0%), and Phillips (2.1-25.5%). This can be compared to the ventilation of a U.S. pack of Marlboro Lights at 25.0% ventilation. Differences of pressure drop among filtered cigars were also found to be statistically significant (p=0.022, mean = 180.9mmWg, min = 89.1, max = 289.8). With cigar use rising, and filtered cigars displaying substantial similarities to filtered cigarettes, more research on product characteristics is warranted. Future plans include testing tobacco alkaloid and metal content.

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POS1-14
CHANGES IN TAR YIELDS AND CIGARETTE DESIGN IN SAMPLES OF CHINESE CIGARETTES, 2009-2012
Liane Schneller, Benjamin Zwierzchowski, Rosalie Caruso, and Richard O’Connor, Roswell Park Cancer Institute

The burden of cigarette smoking continues to increase in China, and even as awareness of health risks increases, tobacco manufacturers have introduced so-called lower tar products. Epidemiological evidence suggests that cigarettes marketed as “low tar/light” are equally harmful to health, yet marketing leads consumers to believe otherwise. This study examined multiple cigarette brands available in China in 2009 and 2012 to determine if the reported tar, nicotine, and carbon monoxide yields declined overtime, and what design features were associated with any such changes. Physical characteristics and design, including tobacco moisture, weight, paper porosity, filter ventilation, and pressure drop were analyzed using published methods, while tar, nicotine, and carbon monoxide (CO) emissions information was obtained from product packages. Cigarettes were also tested for metal content (As, Cd, Cr, Ni, Pb) as well as tobacco nicotine content and several minor alkaloids. Findings show that the mean tar emissions decreased from 2009 to 2012 by 8%, while mean emissions of nicotine and carbon monoxide decreased by 4% and 6%, respectively. This can be directly associated with mean filter ventilation, which showed a 32% increase over time (2009 = 8.28%, 2012 = 10.91%). Both filter ventilation and cigarette tobacco weight are predictors of tar emissions (B = -0.008, S.E. = 0.0013, p < 0.001; B = 0.444, S.E. = 2.1232, p = 0.037, respectively). These were also found to be predictors of nicotine (B = -0.006, S.E. = 0.0012, p < 0.001; B = 0.405, S.E. = 0.1603, p = 0.012, respectively) and carbon monoxide (B = 0.10, S.E. = 0.0011, p < 0.001; B = 0.577, S.E. = 0.1935, p = 0.002, respectively). There was a less significant change in cigarette tobacco weight (1.3% decrease) and tobacco moisture (3% increase) from 2009 to 2012. Results presented here indicated a slight within-brand reduction in tar, nicotine, and CO yields over time. Furthermore, filter ventilation remained the most influential predictor of yields and was the primary design parameter that significantly changed from 2009 to 2012.

FUNDING: This work was supported by grants from the National Cancer Institute (R01CA125116, P01CA136839).

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POS1-15
IDENTIFICATION OF CYTOTOXIC CHEMICALS IN THIRDHAND SMOKE
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Little information is available on the health effects of thirdhand smoke (THS). Our work evaluates the adverse effects of THS on mouse neural stem cells, an in vitro model for the neonatal brain. Cytotoxicity was studied using the MTT assay which evaluates conversion of a tetrazolium salt to a colored formazan by mitochondrial reductases. Terry cloth exposed to cigarette smoke for 110 hours over 1 year was stored at room temperature to allow aging of THS, and extracts were prepared after different times of aging. THS aged for 11 months on terry cloth was cytotoxic to mNSC, causing complete cell death in the MTT assay at the highest dose; however, cytotoxicity was lost when the terry cloth was aged for an additional 5 months. Another sample of terry cloth was exposed to cigarette smoke for 19.5 hours over 1 month. The THS extract obtained immediately after the smoking period was cytotoxic to mNSC in the MTT assay causing 50% cell death at the highest dose, but lost its activity when allowed to age for an additional 45 days. These results indicate that as little as 1 month of accumulation of THS is sufficient to produce cytotoxicity and that this toxicity is lost with aging. The decrease in cytotoxicity could be due to loss of volatile organic chemicals (VOC) that are present in cigarette smoke or degradation of chemicals. Authentic standards of VOC present in THS were tested individually and in combination to determine which could contribute to cytotoxicity. Out of the chemicals tested to date, 2,5-dimethylfururan (DMF) and acrolein were cytotoxic in the MTT assay. Combining up to 5 chemicals together did not affect the dose response curves. Because of their high volatility, an additional trial was performed with each chemical being replaced at 4 hour intervals for 48 hours. Dose response results were not affected except for DMF which had increased potency in this experiment. These results are consistent with the conclusion that DMF and acrolein contributed to the cytotoxicity observed in the terry cloth extracts.

FUNDING: Tobacco-Related Disease Research Program of California

JUSTIFICATION: Identification of two cytotoxic chemicals in thirdhand smoke could affect public health policies and remediation of environments containing thirdhand smoke.

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POS1-16
CHANGE IN HEAVINESS OF SMOKING INDEX (HSI) AS AN INDICATOR OF TREATMENT SUCCESS: A SMOKING CESSATION INTERVENTION PROGRAM IN ADDICTION AND MENTAL HEALTH AGENCIES
Erin Cameron, M.P.H.*, Dolly Baluianas, Ph.D., Laurie Zawertailo, Ph.D., and Peter Selby, M.B.B.S., Nicotine Dependence Clinic, Centre for Addiction and Mental Health, and University of Toronto, ON, Canada

To better integrate tobacco treatment in addiction and mental health agencies, a province-wide smoking cessation initiative has been implemented in Ontario, Canada. The intervention program offers no-cost Nicotine Replacement Therapy...
and to the initiation, of tobacco use. JUSTIFICATION: To the extent that a
public health implications with respect to dynamics fundamental to the cessation,
large number of never-users acknowledged having initiated tobacco use following
rate among Airmen who used tobacco products prior to enlistment. However, a
BMT (a period of 8.5 weeks forced tobacco abstinence) resulted in a 28.8% quit
of use within the 1-year follow-up window. Conclusions: It appears that USAF
who used tobacco prior to BMT, 28.8% remained abstinent for 1 year. Conversely,
to BMT, while 76.2% denied any tobacco use preceding enlistment. Among those
reached for follow-up. Results: Of 1,318 Airmen, 23.8% reported tobacco use prior
to BMT, 8.5 weeks of forced tobacco abstinence on rates of abstinence at 1-year follow-up.

Background: Of the over 50 million tobacco users in the United States, 70%
spouse a desire to discontinue using tobacco, and more than half will make
least 1 quit attempt in any given year. Unfortunately, data suggest that only 6% of
quit attempts ultimately are successful. Across branches of the United States
army, all personnel are required to abstain from tobacco use for the duration of
Basic Military Training (BMT). In the United States Air Force (USAF), this initial
training spans 8.5 weeks. The present study sought to evaluate the effect of 8.5
weeks of forced tobacco abstinence on rates of abstinence at 1-year follow-up.
Method: Approximately 85.2% of all Airmen attending USAF BMT between
January 2011-Feb 2012 agreed to complete a 17-item questionnaire concerning
pre-enlistment tobacco use, and to participate in a 1-year follow-up assessing
tobacco abstinence. Among those who consented at baseline, 86.4% were
reached for follow-up. Results: Of 1,318 Airmen, 23.8% reported tobacco use prior
to BMT, while 76.2% denied any tobacco use preceding enlistment. Among those
who used tobacco prior to BMT, 28.8% remained abstinent for 1 year. Conversely,
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large number of never-users acknowledged having initiated tobacco use following
completion of their training. Taken together, these data carry potentially significant
public health implications with respect to dynamics fundamental to the cessation,
and to the initiation, of tobacco use. JUSTIFICATION: To the extent that a
protracted interval of forced abstinence enhances the viability of cessation efforts,
relevant stakeholders (e.g., capitlated health systems; employers) might consider
leveraging incentives to increase the relative ‘total cost’ of tobacco use beyond its
known demand elasticity.

FUNDING: Funded by the Ontario Ministry of Health and Long-Term Care, Health
Promotion Division.

JUSTIFICATION: This study addresses the conspicuous absence of tobacco
treatment in addiction and mental health settings, challenging some assumptions
about an at-risk client population in order to help inform public health intervention
programs, and integrate evidence-based treatment into practice.

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POS1-17
PROTRACTED FORCED TOBACCO ABSTINENCE AND ASSOCIATED IMPLICATIONS FOR STAYING QUIT

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spouse a desire to discontinue using tobacco, and more than half will make
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POS1-18
EXAMINING THE CO-OCCURRENCE OF SMOKING AND OBESITY IN WOMEN OF CHILDBEARING AGE

Drina Vurbic1, Valerie S. Harder, and Stephen T. Higgins, University of Vermont

Smoking and obesity are independent risk factors for chronic disease and premature deaths worldwide. In women, both conditions are also associated with
gynecological dysfunction, infertility, and pregnancy complications. Additionally, infants born to smoking or obese mothers have poorer immediate and longer-term
health outcomes. Despite these serious health risks, little research has been reported that examines their combined effects in women. Moreover, though
socioeconomic disparities in smoking and obesity in women are well established, little is known about the demographic patterns that characterize their co-
ocurrence. The present study used data from the National Health and Nutrition Examination Survey (2007-2010) to examine smoking and obesity in women between the ages of 25 and 49. Here we characterize the influence of educational attainment, on the prevalence of obese smokers and examine the combined
effects of smoking and obesity on depression, cardiovascular risk factors, and
gynecological problems and procedures. The combination of smoking and obesity was strongly associated with educational attainment. Prevalence was greatest
among women with the lowest educational attainment (i.e., less than a high school diploma), and decreased linearly as education level increased. Examination of the
health outcomes suggested that the independent effects of smoking and obesity were additive. Compared to women who were smokers only or obese only, obese smokers had higher depression scores, higher low-density lipoprotein (LDL or “bad”) cholesterol and triglycerides, lower high-density lipoprotein (HDL or “good”) cholesterol, and greater likelihood of menstrual irregularity, hysterecctomy, and ovary removal. Although the current study only begins to characterize the co-
ocurrence of smoking and obesity, the data clearly underscore the need for greater understanding of the potential impact on women’s health, especially among socioeconomically disadvantaged women where it has the potential to further worsen the unsettling problem of health disparities.

FUNDING: Funding support provided by NIDA grant T32DA007242

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POS1-19
PHYSICIAN INITIATED CESSION TREATMENT FOR SMOKERS WITH DEPRESSION IN PRIMARY CARE CLINICS

David R. Strong, Ph.D., William Sieber, Ph.D., Sharon Cummings, Ph.D., Madison
Bolbe, B.A., Alita Newsome, B.A., and Gene Kallenberg, M.D.

Despite persistent tobacco control efforts, the prevalence of smoking among those reporting symptoms of depression has not declined in step with non-
depressed smokers. Smokers with depression are 2.5 times more likely to be current heavy smokers and are 50% less likely to quit successfully than non-
depressed smokers. Public health efforts to decrease smoking in this difficult to
reach population may be enhanced through promotion of improved depression screening within healthcare settings where cessation services can be delivered.
Challenges in universal screening for depression and tobacco use dictate selection of brief and valid instruments that are feasible to administer to the high volume of
smokers screened by primary care. The current study examined sociodemographic and economic characteristics of patients screening positive for tobacco use and
depression in a diverse practice of Hispanic, African American, Asian, and White
smokers in primary care. We hypothesized that smokers screening positive for depression would be more likely to engage physician-initiated cessation treatment and
to be less likely to quit successfully than non-depressed smokers. Electronic

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POS1-19
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medication of 30,391 patients from UCSD Family Medicine clinics in 2011 were evaluated. Patients screening positive for depression using the PHQ-9 (7%) had odds of current smoking (16% vs 8%) that were 2.58 times higher (p<0.001) than non-depressed smokers. Smokers screening positive for depression had similar rates of quit attempts (24%), and were more likely to receive nicotine replacement therapy (OR=1.7; 95%CI=1.7-2.5) than non-depressed smokers. Despite higher rates of pharmacotherapy, smokers screening positive for depression had quit rates (55% vs 70%) that were significantly lower (p<0.001) than non-depressed smokers. These data suggest promoting more effective smoking cessation for difficult to reach populations of smokers with mental health problems.

FUNDING: Grant### R03DA027950-02, National Institute on Drug Abuse

JUSTIFICATION: The findings should alert the Center for Tobacco Products about the impact of marketing on youth initiation of smokeless tobacco.

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POS1-22

THE ROLE PHARMACIES PLAY IN ASSISTING SMOKERS TO STOP TOBACCO USE IN CHINA

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Objective: To investigate the extent to which pharmacies in China are involved in assisting Chinese smokers to quit. Methods: A total of 281 pharmacies were randomly selected in Changsha, Hunan, China (65% from urban, 35% from rural). In-person pharmacy visits were conducted using a standardized checklist to collect data. The items on the checklist included: (1) cessation medications; (2) smokeless tobacco; (3) cigarettes; (4) cessation treatment programs; (5) advertisements for cessation medications or programs; (6) cessation self-help materials; and (7) smoke-free environment. The percentage of pharmacies that sold first-line smoking cessation medications was defined as any medication marketed as a drug to help smokers quit. Results: Among 217 pharmacies visited, the prevalence of selling smoking cessation medications was low (4.5%). No pharmacy sold first-line smoking cessation medication; however, two pharmacies did in the past. The products sold were mainly traditional medicine products and cessation e-cigarettes, the majority of which had not been tested for effectiveness and safety. Availability of cessation medications varied among urban (5.4%) and rural areas (2.9%), with little difference between urban (4.9%) and non-urban pharmacies (4.2%). The percentage of pharmacies that sold the medications in the past was higher than those that currently sold the medications (14.8% vs. 4.6%). The availability of smokeless tobacco products (4.7%) was similar to that of smoking cessation medications, and 2% of pharmacies sold cigarettes. No pharmacy offered a cessation program or self-help materials. One pharmacy had a cessation medication advertisement posted on the front door. We also found that 32.5% of the pharmacies had a visible ‘smoke-free’ sign. Interestingly, only 5.4% of the rural pharmacies had a visible smoke-free notice in the store, while 42.9% of the urban pharmacies had one.

FUNDING: This work was funded by the Welcome Trust as part of a PhD programme awarded to Michelle Taylor

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POS1-21

IMPACT OF MARKETING ON YOUTH INITIATION OF SMOKELess TOBACCO

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Background: Initiation of smokeless tobacco (SLT) has been studied extensively with regards to the demographics and risk-taking behaviors of adolescents. Though, no study to the author’s knowledge has examined the impact of marketing on youth initiation longitudinally. Methods: Adolescents were recruited and followed from 1993 to 1999 in the Teen Longitudinal California Tobacco Survey. Limiting the sample to non-initiators at the baseline survey (n=2,214), independent variables predicting any use of smokeless tobacco in regression models were identification of the most advertised SLT brand, receipt of a tobacco-sponsored promotional item, demographic measures, self-perceived likelihood of using SLT, exposure to SLT users (family/friends), and risk-taking behaviors. Results: Adolescents who identified the most advertised brand of smokeless tobacco at the baseline survey had more than four times the odds of initiating use by the 1999 survey (OR=4.18 (2.57, 6.81)). Adjusting for baseline covariates in a regression model, the statistically significant association was still observed (OR=2.62 (1.52, 4.52)). An interaction on youth initiation, however, was not observed between the variables for marketing and self-perceived likelihood of using smokeless tobacco. Conclusions: The finding that marketing may contribute to the uptake of smokeless tobacco among adolescents is particularly disconcerting because of the increase in SLT advertising expenditures, as previously demonstrated. Furthermore, unlike cigarettes, the 2009 Tobacco Control Act does not restrict the flavoring of smokeless tobacco products, which is likely to appeal to youth.

FUNDING: This work was funded by the Welcome Trust as part of a PhD programme awarded to Michelle Taylor

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POS1-20

USE OF MENDELIAN RANDOMIZATION TO ASSESS WHETHER SMOKING IS CAUSALLY ASSOCIATED WITH ALCOHOL CONSUMPTION

Michelle Taylor1,2, Matthew Hickman1, Glyn Lewis1, and Marcus Munafò1,2
1University of Bristol, 2Tobacco and Alcohol Research Group, 3University College London

Mendelian randomization (MR) utilizes the properties of genetic variants in order to assess causality within an observational model and uses SNPs as instrumental variables to remove confounding, reverse causality and biases that are found in traditional epidemiological studies. Genetic studies have provided evidence that SNP rs1051730 is causally related to heaviness of smoking and smoking cessation. Here, we assessed whether tobacco use is causally associated with alcohol consumption in women before and during pregnancy. We used SNP rs1051730 in MR analyses between cigarettes per day (CPD) before pregnancy or continued smoking during pregnancy. Third, MR analysis was performed using rs1051730 as an instrumental variable, with genotype regressed on alcohol consumption before and during pregnancy. Observational analyses indicated an association between CPD and alcohol consumption before pregnancy (OR=1.73; 95% CI 1.21 to 2.50, p=0.002), but this was also not seen in our MR analysis (OR=0.92, 95% CI 0.92 to 1.3, p=0.68). Our results do not support the involvement of smoking being causally associated with alcohol consumption; however, we cannot fully exclude this possibility given the limited strength of rs1051730 as an instrumental variable. Nevertheless, our results indicate that many observed associations between tobacco and alcohol use might be heavily influenced by confounding or reverse causality. Mendelian randomisation is one method which can be used to address these problems.

FUNDING: This work was funded by the Welcome Trust as part of a PhD programme awarded to Michelle Taylor

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Poster Session 1 • Thursday, February 6, 2014 • 11:30 a.m.–1:00 p.m.

**POS1-23**
**CONTENT AND YOUTH ACCESS OF ELECTRONIC CIGARETTE VIDEOS ON YOUTUBE**

Chuan Luo1, Xiaolong Zheng1,2, Daniel D. Zeng1,2, and Scott J. Leischow1,2,3
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Background: As the most popular video sharing website in the world, YouTube has the potential to reach and influence a huge audience, especially the youth. This study aims to gain a better understanding of what e-cigarette messages people are being exposed to and assess the youth access to these e-cigarette videos on YouTube. Methods: Researchers identified the top 20 search results on YouTube by relevance and view count for the following search terms: "electronic cigarettes", "e-cigarettes", "ecigarettes", "ecigs", "smoking electronic cigarettes", "smoking ecigarettes", "smoking ecigarettes", "smoking ecigs". A sample of 196 unique videos was coded for overall portrayal and genre. Main topics covered in e-cigarette videos were recorded and video statistics and viewer demographic information were documented. The youth access to e-cigarette YouTube videos was determined by assessing whether YouTube permits youth viewing of these videos. Results: Among the 196 unique videos, 94% (n=185) were "pro" to e-cigarettes and 4% (n=8) were neutral, while there were only 2% (n=3) that were "anti" to e-cigarettes. The top 3 most prevalent genres of videos were advertisement, user sharing, and product review. 84.3% of "pro" videos contained Web links for e-cigarette purchase. 71.4% of "pro" videos claimed that e-cigarettes were healthier than conventional cigarettes. Audience was primarily from the United States, the United Kingdom, and Canada and "pro" e-cigarette videos were watched more frequently and rated much more favorably than "anti" ones. Mainly females aged 13-17 years were among the main audience of two "pro" e-cigarette videos. None of the e-cigarette videos in the sample had blocked youth viewing. Conclusions: The vast majority of information on YouTube about e-cigarettes promoted their use and depicted the use of e-cigarettes as socially acceptable. YouTube does not restrict youth from viewing e-cigarette videos. It is critical to develop appropriate health campaigns to inform e-cigarette consumers of potential harms associated with e-cigarette use and take action to ensure that YouTube does not become a vehicle for e-cigarette promotion to youth.

**FUNDING:** This work was supported by the following grants: The National Natural Science Foundation of China, Grant No. 71120180, 91124001 and 91024030, and The Ministry of Health, Grant No. 2012ZX100040801 and 2013ZX10004218.

**JUSTIFICATION:** This study could help public health authorities gain a better understanding of e-cigarette information on YouTube and inform regulatory decision making.

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**POS1-24**
**GENDER-BASED VIOLENCE AND ITS ASSOCIATION WITH SMOKING AMONG WOMEN IN OHIO APPALACHIA**

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Background: Intimate partner and sexual violence, herein called gender-based violence, are associated with smoking. Gender-based violence and smoking are risk factors for cervical cancer. Women in Ohio Appalachia experience cervical cancer and smoke at higher rates than women elsewhere in Ohio. However, little is known about (1) women's life course exposure to gender-based violence, or (2) the association between gender-based violence exposure and smoking among women in Ohio Appalachia. The purpose of this study is to describe life course prevalence of intimate and sexual violence in Ohio Appalachia, and to examine the association between exposure and smoking. Methods: We aim to recruit 400 adult women, residing in 3 Ohio Appalachian counties, by random selection utilizing a postal household sampling frame. Interviewers administer a cross-sectional survey. Results: 347 have completed interviews (51 yrs. mean age; 87.8% health insured; 24.4% with B.A. or higher education; 20.5% current & 23.0% former smokers). 54.8% of women have experienced intimate partner and/or sexual violence at some point in their lives (49.9% emotional abuse, 20.2% physical abuse, 32.3% sexual abuse). Among the total sample, 5.2% of women were exposed to gender-based violence at age 12 or younger, 14.2% between the ages of 13 and 17, 17.4% since turning age 18, and 4.9% in the past year. There is a significant association between exposure to any form of intimate or sexual violence throughout life and current smoking (OR: 3.0, p<0.001); 74.6% of current smokers reported gender-based violence exposure. Ever smoking is significantly associated with gender-based violence exposure at age 12 or younger (OR: 2.7, p=0.04), at ages 13 to 17 (OR: 2.1, p=0.02), and since turning 18 (OR: 3.4, p<0.001). Discussion: Over 1 in 2 women in the three Ohio Appalachian counties studied have experienced intimate partner and/or sexual violence at some point during their lives. Among current smokers, 3 of 4 report lifetime gender-based violence exposure—their unique needs as survivors of intimate and/or sexual violence should be considered when developing population-specific smoking cessation interventions.

**FUNDING:** Julliana Nemeth has received pre-doctoral fellowship funding through the Behavioral Cooperative Oncology Group Center for Symptom Management and the Walther Cancer Foundation. This analysis is an extension of a Center for Population Health & Health Disparities NIH P50 Grant # S50CA105632-06 to conduct research on cervical cancer disparity in Appalachia. In addition, this analysis is supported by a National Center for Advancing Translational Sciences NIH Grant #UL1TR000090.

**JUSTIFICATION:** Unique needs of survivors of intimate and/or sexual violence should be considered when developing population-specific smoking cessation interventions.

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**POS1-25**
**DATA QUALITY MANAGEMENT TOOL: AN EFFICIENT TOOL FOR GRANT EVALUATION AND MANAGEMENT**


Introduction: Arkansas Department of Health-Tobacco Prevention and Cessation Program (TPCP) provides funding to 54 entities which include community and schools groups with limited experience in data collection and reporting. In the past, grantees developed SMART objectives and reported outcomes in narrative format. This style of reporting produced lengthy non-substantive reports. Evaluating and interpreting data from these types of reports was labor intensive and resulted in subjective and misleading conclusions. The lack of objective evidence put the programs at risk with stakeholders. TPCP re-tooled the data collection system to focus on objective outcomes, minimize errors, and capture work effort. Objectives: To capture relevant data, enhance qualitative analysis, and report outcomes to stakeholders. Methods: In collaboration with Mosaic-Network Inc., TPCP revised the Grant Evaluation Management System linking grantee activities that are specific,
measurable and relevant. Examples of various reporting templates include those that track community actions/changes, quitline referrals, and changes in local ordinances, etc. It has the capacity for real time, periodic reporting and the ability to monitor progress. This project assists TPCP in assessing the impact of program efforts and to drive decision making. Result: This project changed the reporting landscape focusing on outcomes, 94% of the grantees reported significant satisfaction with the new system. Grantees reported the benefits of increased accountability which includes documenting implementation and the effectiveness of their programs. The new system will decrease time-consuming reporting and accelerate data interpretation. Moreover, the TPCP office is able to analyze data effectively and evaluate cost-effectiveness to justify continued or additional funding. Conclusion: The project to collect relevant and measurable data was eagerly embraced by managers and grantees. Documentation of effectiveness for activity is pending. Organizations apart from the tobacco community may benefit from this system. It is user friendly, portable, and able to capture and analyze a variety of text or numerical data.

FUNDING: Centers for Disease Control and Prevention (CDC) Tobacco Master Settlement Agreement (MSA)

JUSTIFICATION: An electronic reporting system that appears to offer managers a superior process for grant management and improved reporting of outcome measures and increased program impact strategies.

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POS1-26

MOTIVATION AND METHODS ASSOCIATED WITH SUCCESS VS. FAILURE IN QUITTING SMOKING: A FOCUS GROUP PILOT STUDY OF FORMER SMOKERS

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Building on research that has identified the motivational factors people use to quit smoking, the purpose of our study was to (1) determine whether motivational factors associated with the final, successful quit attempt differed from those associated with previous, failed attempts to quit; and (2) explore methods that smokers used to overcome challenges during the quit attempt and to prevent a relapse after quitting successfully. We conducted four focus groups with former smokers to gather information about their motivations and methods to quit smoking. Results showed that motivational factors and methods associated with successful quits did differ from those associated with failed attempts to quit. Motivations and methods associated with the successful quit included (1) personalizing risk perceptions; (2) increasing self-efficacy; (3) obtaining social support; and (4) developing a concrete quitting plan. Motivations and methods associated with failed quit attempts were less individualized. We use our findings to suggest avenues for further research into how smoking cessation interventions can incorporate motivations and methods that are associated with successful quitting. The findings are a benefit to public health and clinical practice by continuing to improve interventions for smokers who want to quit is significant, and our study contributes to this ongoing effort.

FUNDING: Support for this research was through the University of Hawaii Department of Public Health graduate research grant.

JUSTIFICATION: Findings from this study can benefit both clinical practice and overall public health by improving interventions to help smokers successfully quit and remain abstinent.

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POS1-27

EMOTIONAL PATHOLOGY IN ADOLESCENTS WITH A HISTORY OF ALCOHOL OR DRUG USE: DOES COMORBID TOBACCO USE MATTER?

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BACKGROUND: Drug and alcohol use has been linked to several forms of emotional psychopathology among adolescents. Although tobacco may serve as a gateway to other substances, it is not clear if emotional psychopathology among substance-using teens differs as a function of comorbid tobacco use. Also, little is known about the relation between substance use and underlying emotional vulnerability traits among adolescents. This cross-sectional study compared emotional disorder symptoms and vulnerabilities among adolescents with (1) no history of any substance use (n=294); (2) a lifetime history of drug/ alcohol use without lifetime tobacco use (n=166); and (3) a lifetime history of drug/ alcohol use with concomitant tobacco use (n=115).

METHOD: Surveys measuring substance use and emotional disorder symptoms (i.e., major depression, generalized anxiety disorder, panic disorder, social phobia) and vulnerability traits (i.e., positive and negative affect, distress intolerance, anxiety sensitivity, anhedonia) were administered in classrooms to students attending high schools in the Los Angeles area (Mean age = 14.5 years). ANCOVA was used to test for group differences in each emotional characteristic with and without adjusting for demographics. RESULTS: The three groups significantly differed in major depression, panic disorder, and generalized anxiety disorder symptoms as well as negative affect, anxiety sensitivity, and anhedonia; most differences remained significant in adjusted analyses. Pairwise comparisons generally showed that the two substance-using groups reported greater distress on each emotion measure than never substance users but did not significantly differ from each other. DISCUSSION: Adolescents with a history of drug or alcohol use reported greater symptomatology and trait vulnerabilities for several mood and anxiety disorders, regardless of comorbid tobacco use. The extent to which tobacco serves as a gateway to other substances in adolescents may have little bearing on emotional health. The connection between various types of substance use and emotional pathology should be considered in substance use and mental illness prevention.

FUNDING: This work was supported by NIH grant R01-DA033296

JUSTIFICATION: This study’s findings on tobacco use and mental health in youth will contribute towards substance use and mental illness prevention.

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POS1-28

VAPING THE ENVIRONMENT: ENVIRONMENTAL HEALTH HAZARDS OF E-CIGARETTES

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Electronic Cigarettes are rising in popularity but there are no uniform safe disposal or recycling guidelines for the various components of these e-cigarettes. These unregulated devices are composed of many parts all of which need to be separately disposed of and that, if improperly disposed of, can have a negative impact on the environment and public health. The full effect of this negative impact is not yet known because e-cigarettes are unregulated and the concentrations of chemicals and flavorings is unknown. Streamlined safe disposal guidelines for e-cigarettes that the average consumer can follow are either absent or not based on standardized guidelines. In this presentation we discuss findings from a qualitative analysis of disposal and recycling information available to the public by manufacturers, present the known and suspected health risks of the various e-cigarette toxic/oxidizing components, compare findings to known environmental health hazards from traditional cigarettes, and recommend strategies to include these health risks in the global discussion of regulations regarding these products.

FUNDING: Funded in part by NIH National Cancer Institute grant # R01CA152093 (McIntosh, PI).
JUSTIFICATION: Increased awareness of these understudied health consequences will inform public health policy development by broadening the scope of discussion of the public health impact of e-cigarettes.

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POS1-29 COMPARISON OF NATIVE AND CONVERTED LIGHT DAILY SMOKERS
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Approximately 22% of daily smokers can be categorized as light smokers who smoke 10 or fewer cigarettes per day (CPD); for Latino and African American smokers the prevalence is closer to 50%. Light smoking, like heavier smoking, is associated with increased risk of cardiovascular disease, lung cancer, and all causes of mortality. Thus, all light smokers would benefit from quitting. Light smokers are not a homogeneous group. Some light smokers never proceed to higher levels (native) and others are former heavy smokers who reduced their CPD due to cost, interest in quitting, or efforts to reduce harm (converted). Thus, intervening with these two groups might require different approaches. The purpose of this work is to explore differences between native and converted light smokers regarding tobacco-related and psychosocial variables. Data for this study comes from a multietnic online survey with equal numbers of African American, Latino, and White smokers (n=604). Eligibility criteria were smoking 25 to 30 days in the past 30 days and currently smoking <10 CPD. We coded light smokers as native if they reported smoking the same or fewer CPD and as converted if they reported smoking more than 10 CPD smoked during the time in their life when they smoked the most. Multivariable logistic regression identified several factors that differed between native and converted light smokers. Compared to converted light smokers, native light smokers were more likely to be African American (OR=2.2, CI=1.3-3.6; p=0.003), smoke fewer CPD (OR=0.7; CI=0.5-0.9; p=0.0001), report smoking the same amount or more than in the previous year (OR=0.4; CI=0.2-0.6; p=0.0002), and report higher perceived risk of heart disease (OR=1.6; CI=1.1-2.5; p=0.01). This study demonstrates that smokers who have never been heavy smokers differ from those who started as heavier smokers in potentially important ways, including the stability of their smoking pattern and of their perceived risk. While there are many similarities between native and converted light smokers, given these differences, interventions might need to be tailored for native and converted light smoking to be most effective.

FUNDING: Pfizer’s Global Research Awards for Nicotine Dependence

JUSTIFICATION: Difference between native and converted light smokers suggest that interventions might need to be tailored for native and converted light smoking to be most effective.

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POS1-30 EFFECTS OF CIGARETTE EXCISE TAXES ON STATE PER CAPITA ALCOHOL CONSUMPTION
Melissa J. Krauss, M.P.H., Patricia A. Cavazos-Rehg, Ph.D., Laura Jean Bierut, M.D., and Richard A. Grucza, Ph.D.,1 Washington University School of Medicine

It is well established that increasing state cigarette excise taxes and strengthening clean indoor laws reduce the prevalence of smoking and per capita cigarette consumption. Less is known about the effects of these tobacco policies on alcohol use, which is often a complementary behavior to smoking. We sought to determine whether state changes in cigarette excise taxes and clean indoor air policies over time were associated with changes in alcohol consumption as measured by sales, tax, and industry shipment data. Using a differences-in-differences approach and ordinary least squares models, state per capita alcohol consumption from 1980-2009 was modeled as a function of state excise tax per pack of cigarettes (adjusted for inflation) and clean indoor air policy scores (6 point scale based on bar, restaurant, and worksite policies). Total alcohol (beer, wine, and spirits) and beer consumption per capita were modeled separately. In addition to state and year fixed effects, we controlled for state beer excise tax per barrel, per capita income, unemployment rate, and racial, age, and religious compositions of the state. Results from multivariable models suggest that a one dollar increase in cigarette tax was associated with a 1.6% reduction in per capita alcohol consumption, but this did not reach statistical significance (95% CI = -0.1% to 3.2%, p = .065). However, a one dollar increase in cigarette tax was significantly associated with a 2.5% reduction in per capita beer consumption (95% CI = 0.9% to 4.2%, p=.003). Clean indoor air policy scores were not significantly associated with either total alcohol or beer consumption. Our findings extend those of a recent report showing that cigarette excise tax increases are associated with reduction in self-reported alcohol consumption by suggesting that such effects are primarily driven by reductions in beer consumption. The public health benefits of increasing cigarette taxes appear to go beyond the reduction of smoking and extend to alcohol consumption. Future studies should examine whether strengthening tobacco policies is associated with reductions in alcohol-related morbidity and mortality.

FUNDING: This study was conducted while the first author was at Washington University School of Medicine. Supported by NIH R01 DA031288 (RAG), NIH K01 DA025733 (PCR), NIH R01 DA032843 (PCR), and American Federation for Suicide Prevention SRG-00214-1210 (RAG).

JUSTIFICATION: The public health benefits of increasing taxes extend beyond smoking to reductions in alcohol consumption, which could potentially lead to reductions in alcohol-related morbidity or mortality.

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POS1-31 EXPLORING REACTIONS TO NICOTINE DEPENDENCE GENETIC SUSCEPTIBILITY FEEDBACK AMONG COLLEGE SMOKERS
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Purpose: Many young smokers downplay their chance of becoming addicted to cigarettes. Educating them about and providing genetic susceptibility feedback to nicotine dependence may overcome optimistic thinking about addiction and potentially curb smoking. We explored how providing science education along with susceptibility feedback among light college smokers influenced perceived risk and desire to quit, about becoming addicted, desire to quit and 30 day point prevalence self-reported quit rates. Methods: Colleges students who smoked less than five cigarettes a day during the last week completed a baseline phone survey (N=168), then came to an in-person session (n=142) to learn mechanisms of nicotine addiction, including the role of genetics, and offered genetic testing. Among those who agreed to testing, 1/3rd (n=52) and 2/3rds (n=90) were randomized to a no testing and testing arm, respectively. Tested participants were informed in person that they were above (n=42) or not above average risk (n=48) for nicotine dependence based on the rs1696968 SNP in the CHRNA5 gene. Participants completed a one-month follow-up phone survey (N=128). Main outcomes were perceived risk (1=no chance to 7=certain to happen) and worry (1=not at all to 7=extremely) about becoming addicted to cigarettes if they continued to smoke, desire to quit (1=not at strong to 7=extremely strong) and 30 day quit rate. Results: Perceived risk was highest among participants at above average versus not at above risk or not tested (M=5.1 vs. M=4.2 and M=4.3, respectively, p=.05). The same, but not statistically significant trends, occurred for worry (p=.20) and desire to quit (p=.06). Among the 20% (n=26) who reported not smoking during the last 30 days, quit rate was highest among participants at above average risk (47.6%), followed by those at not above average risk (33.3%) and those not tested (19.0%) = p<.12. Quitting was highest among those tested vs. not tested (p<.04). Conclusion: These data are the first to show that among light college smokers, science educational materials along with genetic susceptibility feedback for nicotine dependence can motivate and result in higher quit rates.

FUNDING: Pilot funds from the Duke Institute for Genome Sciences and Policy, Duke University.
BACKGROUND: Use of Electronic Nicotine Delivery Systems [ENDS] is increasing in the U.S., and advertising for ENDS is prevalent in print, TV, radio, and online. The degree to which advertisements (ads) influence attitudes, beliefs, and intentions to use ENDS, particularly among young adults, is unknown. METHODS: Respondents of a national, representative survey of young adults, ages 18-34, were randomized to one of two conditions: half (n=2,079) were exposed to four different ENDS ads (blu, Fin, NJOY, White Cloud), and the remaining (n=2,159) served as a control (unexposed). Weighted analyses assessed ad receptivity for each ad in the experimental condition and ENDS-related attitudes, beliefs, and intentions across participants. RESULTS: Among those exposed to ENDS ads, ad receptivity was higher among current ENDS users as compared to cigarette users. Compared to the control, exposed participants were more likely to state curiosity about trying ENDS (22.6% vs. 17.5%) and were more likely to report using an ENDS (31.7% vs 27.1%, p<0.05). There were also significant differences in attitudes/beliefs about ENDS between the experiment and control groups, in particular that using ENDS can help people quit smoking (69.9% exposed vs. 64.1% control, p<0.01), come in appealing flavors (68.6% vs. 63.9%, p<0.05) and are cheaper than regular cigarettes (48.6% vs. 43.0%, p<0.05). Gender, age, and prior tobacco ad exposure were significantly associated with some ENDS-related attitudes, beliefs, and intentions. Income and education, in particular, were strong predictors for, for example, a significantly higher percentage of respondents of low income households (household incomes to federal poverty line ratio less than one) reported that they would try an ENDS soon. DISCUSSION: The results of this large, randomized experiment indicate that exposure to ENDS advertising is correlated with positive perceptions of ENDS in young adults. As the tobacco industry continues to invest in the widespread marketing of ENDS, it is critical to monitor how advertising influences young adults’ perceptions and use of ENDS and other tobacco products.

FUNDING: This research was funded internally by Legacy

JUSTIFICATION: Understanding how advertising of ENDS impacts attitudes, beliefs and intentions regarding ENDS use in young adults is important when considering how this new emerging product will influence nicotine product and tobacco use in young adults.

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POS1-34 GOING WHERE CIGARETTES CAN’T GO: ENDS TELEVISION AND RADIO ADVERTISING

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INTRODUCTION: For the first time in over 30 years, a tobacco product is currently advertised on TV and radio. We describe ENDS media spend, volume, and content of TV and radio advertising by month, with special attention to ad volume and content around the “quitting season” in December and January. METHODS: Using data from the commercial advertising firm Competitrack, we collected ENDS TV and radio ads aired between June 2012 and February 2013 from national and local markets. Quantitative data were collected from Competitrack metadata. Two independent coders evaluated TV and radio ads (agreement = 91.5%), with disagreements resolved by a third coder. We characterized the volume of airings by month, ENDS company, and advertising theme. RESULTS: From June 2012 to February 2013, we identified 11 TV and 22 radio ads from 11 ENDS companies aired 10,618 times. Major advertisers included NJOY and V2Cigs (radio) and Blu and NJOY (TV). NJOY’s radio ads were concentrated in 42 high population markets, expanding the brand’s national footprint. Similarly, NJOY’s TV media spend targeted a broad, gender-neutral audience through media buys during the Oscars and Superbowl. All but one of the V2Cigs radio ads were delivered by DJs and all were unique, though they shared V2Cigs taglines and themes. Capitalizing on preexisting smoking associations, Blu’s TV ad buys centered around programming that embodies masculinity and autonomy. Four major ENDS advertising points emerged from qualitative analysis: harm reduction, cessation, “smoke anywhere,” and stigma reduction. The majority (30/33) of ads contained harm reduction themes and 14/33 contained cessation themes. Cessation themes were significantly more common in radio ads and increased from 7% of ads in October 2012 to 66% of ads in January 2013. CONCLUSIONS: Some ENDS TV and radio ads promote ENDS as harm reduction and smoking cessation products, claims that are not currently supported by scientific evidence.

FUNDING: This research was support by internal Legacy funding.
POS1-35 NEIGHBORHOOD DEPRIVATION AND SMOKING BEHAVIOR IN MEXICO: FINDINGS FROM THE ITC MEXICO SURVEY

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Background: In high-income countries (HICs), higher neighborhood socioeconomic deprivation is associated with higher levels of smoking. Few studies in low- and middle-income countries (LMICs) investigate the role of the neighborhood environment on smoking behavior. Objective: To determine whether neighborhood socioeconomic deprivation affects smoking intensity, quit attempts, quit success, and smoking relapse among a cohort of smokers in Mexico from 2010-2012, a period shortly after and during which a range of strong World Health Organization Framework Convention on Tobacco Control (WHO-FCTC) policies were implemented. Methods: Data were analyzed from adult smokers and recent ex-smokers who participated in waves 4 (2010), 5 (2011), and 6 (2012) of the Mexican Administration of the International Tobacco Control Policy Evaluation Project. Data were linked to the Mexican government’s composite index of neighborhood socioeconomic deprivation, which is based on 2010 Mexican Census data, including census-tract markers of education, housing infrastructure (e.g., piped water, toilets, dirt floors, refrigerator), crowding, access to health services, and child mortality. We used generalized estimating equations to determine associations between neighborhood socioeconomic deprivation and smoking behaviors at the individual level, adjusting for age, sex, and individual-level socioeconomic status, as well as quit intention and smoking intensity for the quit attempts, and quit success models. Findings: Contrary to research from high-income countries, lower neighborhood socioeconomic deprivation was associated with higher levels of smoking, lower levels of quit attempts, and lower levels of successful quitting. Conclusions: Neighborhood socioeconomic environments in Mexico appear to operate in a manner that is contrary to what has been found for HICs. Further research should investigate whether rapid implementation of strong WHO-FCTC policies in LMICs avoids the concentration of tobacco-related disparities among socioeconomically disadvantaged groups.

FUNDING: Funding for data collection from waves 4 and 5 came from the Mexican Consejo Nacional de Ciencia y Tecnología (Salud-2007-C01-70032), and wave 6 data were collected with funding from a grant to the Canadian Institutes of Health Research (115016). Analysis was partially supported by a grant from the National Cancer Institute at the National Institutes of Health (P01 CA138389).

JUSTIFICATION: The positive association between neighborhood deprivation and cessation-related behaviors in Mexico in the context of WHO-FCTC policy implementation suggests that these policies may not yet have concentrated smoking in the most deprived areas in at least one LMIC.

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POS1-36 DENTAL PROVIDER EXPERIENCES USING A WEB-BASED CLINICAL DECISION SUPPORT SYSTEM FOR TOBACCO USE TREATMENT

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Background: Dental providers have an important role in treating tobacco use, yet their adherence to guideline recommended care is poor. We tested the feasibility of integrating a clinical decision support tool (CDSS), based on the Public Health Services Guideline on Treating Tobacco Use and Dependence. The CDSS offers dentists a simple algorithm for assessing smokers’ readiness to quit, referring patients to the state quitline, and prescribing cessation medication. Methods: The CDSS was tailored to dental providers through a development process of definition, usability and clinical testing. After implementing CDSS in six clinics in the NYU College of Dentistry, we conducted 23 semi-structured interviews with dental students and dentists to assess their experience in using the CDSS. Venkatesh’s Technology Acceptance Model (TAM2) provided a framework for the interview guide and coding process. Interviews were audiotaped and transcribed. We used standard methods for qualitative analysis. Results: We identified two main domains that appear to influence the user’s intention to use CDSS: perceived usefulness of CDSS and perception of CDSS’s ease-of-use. Factors that contributed to perception of usefulness included (a) social influences, (b) job relevance, (c) output quality, and (d) perceived “mandatoriness” of use. Perceived ease of use was related to beliefs about how long it took to use the system and “convenience”. Providers described the tool as “very user friendly… the questions are very simple, straight forward. Putting the response in is easy and then it…directs you where you need to go, step by step.” Other themes, outside of the TAM2 model, included how incentives (financial or educational) may influence dentist’s practices and the patients’ reactions to the CDSS tool. Conclusion: The CDSS has potential to enhance the quality and consistency of tobacco use treatment in dental health care settings. Qualitative interviews suggest that providers believe the CDSS is an easy-to-use system that saves time and improves their confidence in addressing tobacco use. Next steps include testing strategies to adapt the CDSS for use more broadly in the dental community.

FUNDING: Agency for Healthcare Research & Quality: Grant Number 1R21HS02002-01

JUSTIFICATION: Large-scale improvements in the rate and effectiveness of dentists’ interventions toward smoking cessation in dental public health centers is an essential step toward achieving national health objectives and reducing tobacco-related health disparities, health information technology tools offer one method of achieving this goal if they are designed and developed within the clinical environment and with the users for which they are intended.

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POS1-37 MORTALITY ATTRIBUTABLE TO TOBACCO AMONG MEN IN SWEDEN AND OTHER EUROPEAN COUNTRIES: AN ANALYSIS OF DATA IN A WHO REPORT

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The ‘WHO Global Report: Mortality Attributable to Tobacco’ has provided estimates of death rates specifically attributable to tobacco. These estimates do directly represent the size of each country’s health burden of tobacco, overall and with respect to the different diseases. The current study has extracted data for all European Union Member States and made inter-country comparisons for different age groups and diseases. In these comparisons men in Sweden stand out by exhibiting lower death rates attributable to tobacco than men in any other EU country. One example: For ‘All cardiovascular diseases’ in the age group 60-69, the death rate attributable to tobacco is 72 per 100,000 for men in Sweden, the
next lowest rate is 107 per 100,000 and the highest 618 per 100,000. To examine possible determinants of these differences we analysed the assessment of, mainly legislative, tobacco control activities in 30 European countries published by Association of European Cancer Leagues. Here Sweden did not score high at all, ranking as number 9 with 51 points, while the top ranking country got 77 points. This suggests that the low death rates for Swedish men reflect a contributory impact by some Sweden-specific factor that was not included in the above assessment. One such factor could be the wide-spread use of the Swedish kind of low-nitrosamine oral smokeless tobacco, snus. During the last 50 years the initially high smoking rates in men have been dramatically reduced, and snus use has become the dominating kind of tobacco use. The observation that men in Sweden have lower death rates attributable to tobacco than men in any other EU country is found in each of those age groups and for all those diseases that are reported. Further, the differences between Sweden and the rest of EU are larger in younger than in older age groups. This is consistent with data from Statistics Sweden showing that the shift from smoking to snus use has been more pronounced in younger than in older groups. The above data from the new WHO report appear to support the conclusion from other studies that the use of snus among Swedish men has yielded public health benefits in Sweden.

**FUNDING:** No funding

**JUSTIFICATION:** The patterns that in this study have been derived from the basic epidemiological research data in the WHO report indicate the potential effectiveness of broadening the scope of tobacco control policies to include novel kinds of alternative nicotine delivery products.

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### POS1-38

**RELAPSE-PREVENTION BOOKLETS AS AN ADJUNCT TO A TOBACCO QUITLINE**

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Relapse prevention remains a major challenge to smoking cessation. Previous research found that a set of self-help relapse prevention booklets, entitled Forever Free, significantly reduced relapse. This study tested the real-world effectiveness of adding the relapse prevention booklets to the New York State Tobacco Quitline services. Participants (N = 3458) were enrolled into the clinical trial and randomized to one of three conditions: (1) Usual Care (UC), namely, the standard intervention provided by the tobacco quitline, including brief counseling and nicotine replacement therapy; (2) Repeated Mailings (RM), i.e., Forever Free relapse prevention materials sent to participants over 12 months; and (3) Massed Mailings (MM), i.e., all Forever Free relapse prevention materials sent to participants at one time. Follow-ups were conducted at six-month intervals, through 24 months. Multiple imputation analyses were used to address missing data. Overall, 7-day-point prevalence abstinence was 61% at baseline, and 41.9%, 42.7%, 44%, and 45.9% at the 6-, 12-, 18-, and 24-month follow-ups, respectively. Although RM tended to produce higher abstinence rates, the differences did not reach significance for the full sample. Post-hoc analyses of at-risk subgroups revealed that among participants with high nicotine dependence (FTND > 5; N=1593), the addition of RM materials increased the abstinence rate at the 12 month (42.2% versus 35.2%; OR=1.38; CI=1.03 -1.85; p=.031) and 24 month (42.7%, 44%, and 45.9% at the 6-, 12-, 18-, and 24-month follow-ups, respectively. These results highlight the potential for enhancing telephone quitline-based treatment outcomes by targeting specific “at-risk” groups with the addition of a minimal intervention.

**FUNDING:** NCI R01CA137357

**JUSTIFICATION:** The study highlights the potential for enhancing telephone quitline-based treatment outcomes by targeting specific “at-risk” groups with the addition of a minimal intervention.

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### POS1-39

**ACCULTURATION AND PERCEIVED DISCRIMINATION: PREDICTORS OF TOBACCO USE TRAJECTORIES FROM ADOLESCENCE TO EMERGING ADULTHOOD AMONG HISPANICS**

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Previous studies have documented associations between cultural factors and smoking among Hispanic adolescents. Negative cultural experiences such as discrimination have been associated with an increased risk of smoking, whereas positive cultural resources, such as maintenance of Hispanic cultural orientations, have shown protective effects. However, few studies have examined the continuing influence of cultural factors smoking from adolescence to emerging adulthood. We surveyed a cohort of Hispanic adolescents in Southern California in 9th, 10th, and 11th grades, and 3-4 years after high school. Growth curve analyses were conducted to examine the effects of U.S. acculturation, Hispanic acculturation, ethnic identity, and perceived discrimination on change in tobacco use over time. Past-month smoking increased from 7% in 9th grade to 25% in emerging adulthood. Higher initial level of Hispanic acculturation was significantly associated with a lower slope of tobacco use. Cultural phenomena such as acculturation and perceived discrimination can continue to affect smoking through the transition to emerging adulthood. Health education interventions are needed to help Hispanics navigate this developmental transition without engaging in tobacco use.

**FUNDING:** This research was supported by the National Institute on Drug Abuse (grants DA016310 and DA025694).

**JUSTIFICATION:** This study suggests that interventions to help Hispanic adolescents cope with discrimination and retain or learn about their cultures of origin may be useful strategies to prevent smoking across the transition from adolescence to emerging adulthood.

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### POS1-40

**INTERPRETATIONS OF SMOKE-FREE MESSAGES TO PROMPT CESSION DURING PREGNANCY**

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Although numerous studies have documented the health risks of smoking during pregnancy, many women continue to smoke during and after pregnancy. These women often come from communities where smoking is commonplace and where their own observations of other women smoking while pregnant may challenge messages that smoking is harmful and reduce motivation to quit. Further, women may see quitting as segregating them from their social network at a time when they require greater support. Smoke-free messages must recognize the role of cultural factors smoking from adolescence to emerging adulthood. Higher initial level of Hispanic acculturation was significantly associated with a lower slope of tobacco use. Cultural phenomena such as acculturation and perceived discrimination can continue to affect smoking through the transition to emerging adulthood. Health education interventions are needed to help Hispanics navigate this developmental transition without engaging in tobacco use.

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small diameter cigarettes (circumference 17-23mm) demonstrate lower machine yields of certain toxicants than regular format cigarettes (circumference about 25mm) of equivalent ISO tar. It is proposed that smokers of slim cigarettes modify their smoking behaviour and are exposed to greater levels of toxicants. However, because smokers do not smoke like machines, we have evaluated whether the superslim (SS) cigarette format had any influence on smokers’ mouth level exposure per cigarette (MLE) to tar and nicotine compared with the regular King Size (KS) format. A filter analysis study to estimate MLE to tar and nicotine was conducted in Russia. To assess the effect of format on MLE, a commercial KS (83-84mm long) SS cigarette at 1, 4 and 7mg ISO tar levels, was compared with a regular KS product at each ISO tar level. Sixty healthy smokers of each product were recruited (approximately equal numbers of males and females aged between 21 and 50). All subjects reported consumption of at least 10 cigarettes per day and gave written informed consent. Smokers’ daily cigarette consumption was collected for 7 days using diaries. Mainstream smoke chemistry yields were measured under ISO and intense machine smoking regimes. MLE to tar was not significantly different between smokers of 1mg ISO tar yield regular KS and SS products. However, smokers of the 4mg and 7mg SS products obtained significantly lower MLE to tar compared with smokers of the respective regular KS format products. For MLE to nicotine, no significant differences were found between the smokers of the 1mg and 7mg regular KS products and the smokers of the respective SS format products. Smokers of the 4mg SS product obtained significantly lower MLE to nicotine compared with smokers of the regular KS product. Daily cigarette consumption was not significantly different between any smoker group. Machine-smoked yields of the nine toxicants recommended by WHO ToToReg for reporting tended to be lower for the SS products compared with the respective regular KS product. In conclusion, smokers of SS products did not have increased MLE to tar and nicotine compared with smokers of regular KS format products.

**FUNDING:** This work was funded by British American Tobacco Group Research and Development.

**JUSTIFICATION:** This may help inform any decisions on potential regulation of slim format cigarettes.

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**POS1-42**

**CULTURALLY TAILED SMOKING CESSATION FOR ARAB AMERICAN MALE SMOKERS IN A COMMUNITY SETTING**

Linda Haddad, R.N., Ph.D., FAAN, and Roula Ghadban*, R.N., Ms.N., Virginia Commonwealth University

Tobacco use has been found to be around 20–30% more prevalent in Arab American adult men than in the general US adult male population, and Arab Americans have a lower quitting ratio when compared to national data. As a result, the health risks for these men, and those resulting from their families’ exposure to second-hand smoke, are significant. Many Arab Americans come from countries where tobacco use among men is a means to show hospitality and maturity, and more generally is an important part of the culture. The main goal of this study was to develop a culturally-tailored and linguistically-sensitive Arabic-language smoking cessation program. A secondary goal was to evaluate the feasibility of recruiting Arab Americans through a faith-based community organization, which serves as a neighborhood social center for the city of Richmond’s Arab Americans. Method: Eight first-generation Arab American men aged 20 years and above completed the three-month program. The program consists of four parts (or stages) based on the transtheoretical model framework: stage 1—preparation, stage 2—contemplation, stage 3—action, and stage 4—maintenance. All stages were designed on the bases of Islamic and Arabic cultural values and assumptions, such as deep religious orientation, reliance on the extended family, defined gender roles and taboos, use of the Arabic language, adherence to traditional beliefs and practices, and, finally, social and family concerns, rather than a focus on the individual. Results: There was general agreement for the following: (1) each stage of the five-stage cessation program could be improved; (2) several glaring errors could be easily corrected; and (3) minor variation among the various countries-of-origin of participants could lead to a few changes in the program with respect to the use of some colloquial terms. The results suggest that it is possible to reach smokers from Arab American communities with a tailored Arabic language smoking cessation program. Conclusion: The findings of this report will be used as the basis for a large-scale intervention study of a culturally and linguistically sensitive cessation program for Arab American ethnic groups.

**FUNDING:** Virginia Commonwealth University

**JUSTIFICATION:** This smoking cessation program can be used in clinical/community setting as a ready package of Arabic language smoking cessation.

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**POS1-43**

**ADOPTION OF AND ADHERENCE TO INDOOR SMOKING BANS AMONG HEALTH DISPARITY COMMUNITIES: THE BREATHE FREE FOR KIDS PROJECT**

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**BACKGROUND:** While the numbers of reported smoke-free homes in the United States has increased in recent years, home smoking bans are less frequently observed among certain populations, including low income and African American families. However, self-reported smoking bans may not fully reflect actual smoking behavior. Current home smoking behaviors and attitudes, and secondhand smoke (SHS) levels, were assessed among parents of young children in low income, racial/ethnic minority communities in eastern Massachusetts. METHODS: Using a cross-sectional design, home smoking rule (complete, partial, or no ban); smoking status; cigarettes smoked in the home; and perceived barriers and benefits to attaining a smoke-free home were assessed among 138 primary caregivers (mean age 30.0 years; 92% female) of children aged 0-6 years. Indoor SHS was assessed using a nicotine dosimeter. RESULTS: Households with no ban reported a higher weekly mean number of cigarettes smoked in the home (114 cigarettes/week) than homes with partial (71 cigarettes/week) or complete (30 cigarettes/week) bans (p<0.01). Smoking was more likely to occur outside than inside homes with partial or complete bans. Air nicotine levels were positively associated with no household smoking ban, current smoking by the primary caregiver, and smoking indoors. CONCLUSIONS: Strategies to reduce home SHS should focus on adherence to a “complete” home smoking ban and smoking cessation by the primary caregiver.
POS1-44
EXPOSURE TO SMOKING ON A PATIO AND RISK OF SMOKING RELAPSE DURING A QUIT ATTEMPT
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Worldwide, jurisdictions are implementing laws and regulations creating smoke-free spaces in indoor places. Some jurisdictions are further limiting smoking on outdoor patios. One justification for smoke free laws on patios is that they directly reduce harm to the smoker by reducing the number of cigarettes smoked and, by affecting the ability to make or succeed in a quit attempt. However, little is known about the impact of exposure to smoking on a patio on smoking behaviour. This study includes smokers from the Ontario Tobacco Survey, a longitudinal population representative cohort survey of smokers (2005-2011). There were 3410 current smokers at baseline who had completed at least one follow up and were asked whether they had been exposed to smoking on a patio in the month prior to the survey. Generalized estimating equations (GEE) and survival analysis were used to examine the association of exposure with smoking behaviour outcomes (intention to quit and time to relapse among those engaging in a quit attempt), controlling for potential confounders. There was no association between intention to quit smoking and having been exposed to smoking on a patio (IRR: 0.94, 95% CI: 0.88, 1.01; p=0.110). However, those who were exposed to smoking on a patio were more likely to relapse (HR: 1.56; 95% CI: 1.04, 2.68; p=0.03) after making a quit attempt. Those who were exposed to smoking on a patio were also more likely to relapse than people who had been to a patio without being exposed to smoke (p=0.04). Being exposed to smoking on a patio of a bar or restaurant is associated with lower likelihood of success in a quit attempt. Instituting smoke-free patio regulations will reduce harm to smokers by helping them quit smoking.

FUNDING: Funding was received from the Ontario Ministry of Health and Long Term Care, and the Canadian Cancer Society (award #702160).

JUSTIFICATION: Many jurisdictions are beginning to regulate smoking on patios, but there is little behavioural research examining this issue.

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POS1-45
HOW DO BRAND VARIANT NAMES AFFECT PERCEPTIONS OF RISK AND QUITTING EASE?
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Plain packaging plays a pivotal role in denormalizing smoking by stripping tobacco products of their aspirational attributes and exposing their pernicious effects on smokers’ health. However, Australian plain packaging law allows both brand and variant names to appear on tobacco packaging and tobacco companies have already begun extending variant names and incorporating non-flavour descriptors, such as “ultimate” and “supreme”, into these. Expanded variant names may enable tobacco companies to promote traits formerly communicated through brand imagery, thus undermining the intent of plain packaging. To examine the potential likelihood of extended variant names on smokers’ brand choice behaviour, we undertook an online study of 254 young adults, sourced from an internet panel. First, a Best-Worst choice experiment manipulated variant descriptors representing quality, taste, colour, and non-taste attributes, while keeping all other pack elements constant. Participants then used an eleven-point scale to assess the perceived harm and effect on ease of quitting of one of two brands. The first brand had the descriptor “Red” while the second was labelled “Premium Rich Midnite Red” (PRMR). Analysis of choice patterns found that brands labelled “Smooth” and “Classic” were significantly more attractive than brands not featuring these descriptors. Perceptions regarding the harm and effect on ease of quitting of the two packs showed no significant demographic effects. However, social smokers thought the PRMR cigarettes would be less harmful than did daily smokers, (though not significantly), but their assessments of quitting ease did not differ. Respondents who intended to quit saw the PRMR pack as significantly less harmful than the Red pack (p = .032), but perceptions of quitting ease did not differ by quit intention. Although preliminary, these findings suggest extended variant descriptors of tobacco brands may support misleading perceptions of the harm associated with different cigarettes. Countries planning to introduce plain packaging should ensure their regulations do not allow proliferation of such descriptor names.

FUNDING: No Funding

JUSTIFICATION: Only Australia has introduced plain packaging of tobacco products and potential loopholes in its regulations are now being discovered; this paper examines how variant descriptors, which may create positive connotations, reduce the perceived harm of smoking and undermine plain packaging.

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POS1-46
EVIDENCE FOR PHYSIOLOGIC RESPONSE TO VARIATION IN SMOKE PH
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Modern cigarettes are specifically designed for rapid delivery of nicotine to the brain. This rapidity results in immediate reinforcement of smoking behavior that allows the smoker to exert fine control over nicotine intake, from one puff to the next. Historically, the tobacco industry has recognized that the level of free base nicotine contributes to the sensory and hedonistic qualities of cigarettes, including immediate perceptions of impact and satisfaction that contribute to their abuse liability. We conducted a study to determine if variation in smoke pH resulted in a physiologic impact – specifically changes in the electroencephalogram (EEG). Fifty subjects completed a single blind, random order, cross-over trial of commercial cigarettes. “Light” cigarette smokers smoked a pair of ultra-light cigarettes, one of which was high in smoke pH and the other low in pH, while both were similar in machine-smoked nicotine and “tar” yields. Subjects who preferred full flavor cigarettes smoked a full flavor pair, also with the same machine-smoked nicotine and “tar” levels but varying greatly in smoke pH. Each subject smoked a single cigarette per smoking session, at least 24 hours apart, while EEGs were recorded. Low-alpha band power (8-10 Hz) was compared for high pH and low pH cigarettes, as a function of hemispheric (left and right) and regional (frontal, central, parietal, occipital, temporal) recording locations. Spectral estimates were calculated by averaging one-second bins across the 5-minute period immediately following the first puff. The results reveal lower cortical arousal in the high pH group relative to low pH group which attained statistical significance at the left temporal recording site. This region is associated with analytical and associative processes. This study reinforced the viability of EEG to detect changes in cortical activity as a function of different tobacco products, even in a laboratory setting and with multiple blood draws. It is the first study to demonstrate a physiologic reaction to differences in smoke pH, and implies a difference in abuse liability associated with variation in pH.

FUNDING: For this project was provided by an award from NIH-National Institute on Drug Abuse (5R01DA019691, Clark)

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POS1-47
ENHANCING AND EXTENDING “QUIT AND WIN” CONTESTS TARGETING COLLEGE SMOKERS: IMPACT ON SIX-MONTH ABSTINENCE OUTCOMES

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Background: Quit & Win contests are simple to implement and may be well-suited for college smokers. In the current 2X2 factorial randomized controlled trial (RCT), we examined the efficacy of single vs. multi-Quit & Win contests, with and without telephone counseling, on abstinence rates. Methods: During three academic years, 2010-2013, an RCT was implemented at 2- and 4-year colleges in 3 waves (15 schools; N=1,217). Participants were required to abstain from tobacco for 1- or 4-months for the chance to win prizes. Participants were randomized into one of four study arms evaluating single vs. multiple-contests and Motivation and Problem-Solving Counseling (MAPS) vs. no counseling: TX1, 1-month contest only (n=306); TX2, 1-month contest plus 6 counseling sessions (n=296); TX3, 3 successive contests (n=309); and TX4, 3 successive contests plus 6 counseling sessions (n=306). An online survey was completed at 1, 4, and 6 months post-enrollment. Urine cotinine was analyzed at baseline and at each follow-up to confirm self-reported tobacco use. Primary outcome was 30-day point prevalence abstinence (PP) at 6-months post-randomization. Results: At baseline, participants smoked 11.5±3.1 cigarettes per day on 28.5±3.8 days/month; mean age was 26.3±7.7; 54.9% were female and 85.1% Caucasian. A main effect of multiple contests emerged at 4-months post-randomization whereby participants in the multi-contest arms (TX3/TX4), had higher abstinence rates (19.3%) than the single contest conditions (10.3%, p<0.001). Continuous abstinence at 6-months (i.e., urine-verified quits at every follow-up) was also higher in the multi-contest conditions (7.8% vs. 3.8%, p<0.01). Although a main effect of counseling was not found, logistic regression analyses indicated that each counseling session completed increased the odds of 30-day PP abstinence at 6-months by 21% (OR=1.21, p<0.0001). Conclusion: Results suggest that the opportunity to win financial rewards for two additional contests may increase the likelihood of sustained abstinence. Because of the dose effect observed in the counseling conditions, further research into incentivizing counseling is warranted.

FUNDING: All funding for this trial was supported by an investigator initiated award from the National Institute for Heart Lung and Blood (R01HL094183-05, Thomas, PI).

JUSTIFICATION: Results of this NIH funded RCT have policy, public health and research implication for the use of contingency management or financial incentives for health behavior change among young adult college students.

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POS1-48
CHEMICAL CHARACTERIZATION OF NEW ORAL TOBACCO PRODUCTS

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Although the decline in cigarette smoking prevalence in the U.S. has recently stalled, oral tobacco product (OTP) use is increasing. Often perceived as a safer alternative to smoking, case-control studies report greater risk for acute coronary events in traditional smokeless tobacco users, with dual users (of cigarettes and smokeless products) having the greatest risk. Since 2005, every major U.S. cigarette manufacturer has entered the smokeless market and introduced a range of OTPs, including many that do not look like tobacco and feature candy-like flavors that may appeal to youth. These new products may exacerbate the already rising prevalence of OTP use by increasing tobacco use initiation, or they may be safer alternatives to smoking or even a bridge to quitting. For the first of three trials in an on-going study examining harmful and potentially harmful compound (HPHC) exposures and abuse liability potential of new OTPs, we characterized five OTPs: polymer disc (Verve), dissolvable tablet (Arvia), moist snuff sachet (Skool), Snus (Camel), and medicinal nicotine (Nicorette). Although the moist snuff had the highest total nicotine (10.3 mg/g wet), levels of the more addictive free-base form were similar for moist snuff and Snus. They also had the highest tobacco-specific nitrosamine levels (2.1 – 3.2 µg/g wet), whereas the dissolvable tablet’s levels were ten times lower, and the polymer disc and medicinal nicotine levels were not detected (<0.0017 mg/g wet). A semi-quantitative analysis of the 20 most highly concentrated volatile organic compounds (VOCs) in the headspace above each product showed ethanol and a wide variety of flavor compounds in all products, including citrus, minty and buttery flavorings. The polymer disc headspace showed many more compounds and a much higher total VOC concentration than the other OTPs, including low levels (1-3 ppb) of the HPHCs 1,3-butadiene and toluene, and very high levels of propylene glycol (66 ppm), a common solvent for electronic cigarette nicotine solutions. Acetaldehyde and propylene glycol were detected in the Snus headspace (100-150 ppb). Nicotine was found in the headspace of all products but medicinal nicotine.

FUNDING: Funding for this project was provided by an award from NIH-National Institute on Drug Abuse (R01DA031142, Clark) and a sub-award from University of Maryland School of Public Health to Battelle.  

JUSTIFICATION: This work is significant in that its focus is the development of new methods for acutely assessing oral tobacco product (OTP) use, addiction potential and exposure, creating a new testing paradigm that will lead to mechanisms for rapid, high throughput, acute human testing of OTP products as they are introduced.

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POS1-49
THROUGH THE EYES OF THE CONSUMER: ATTENTION PAID AND RECALL OF THE TOBACCO POWER WALL DISPLAY IN A STORE THROUGH MOBILE EYE-TRACKING

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Background: As tobacco advertising restrictions increase, the space behind the counter (i.e., the “power wall”) has become increasingly invaluable for marketing tobacco products. Methods: 25 Smokers (S) and Susceptible or non-Daily Smokers (SS) aged 18-30 were recruited from the Buffalo area for a mobile eye-tracking study. They completed a pre-session survey (e.g., demographics, smoking behaviors, intention to use) and were fitted and calibrated to mobile eye-tracking equipment, which records the orientation (fixation) and duration (dwell-time) of visual attention. Participants were randomized to one of three purchase tasks at a convenience store; Candy bar Only (CO:N=10), Candy bar + Specific cigarette Brand (CSB:N=6), and Candy bar + cigarette Brand of Choice (CBC:N=9). After the purchase, respondents completed a post-session survey evaluating recall of store ads and displays, perceptions of tobacco marketing, and cigarette cravings. We analyzed dwell time and fixations on the power wall cigarette displays, analyzing data from participants whose fixation duration surpassed the threshold necessary for cognition (i.e., 100ms). Eye-tracking data were analyzed from the selection of the candy bar to checkout; real-time video was recorded of each session. Results: Half of participants were daily smokers and half were susceptible or non-daily smokers. Overall, nearly three-quarters (72%) of respondents fixated on the power wall at some point during their purchase (S:77%, SS:67%; CO:44%, CSB:71%, CBC:100%). Participants spent an average of 62 seconds in the retail environment; 28% of fixations during that time included the power wall (S:26%, SS:29%; CO:8%, CSB:26%, CBC:38%). Fixations were particularly likely on tobacco ads (10%; S:13%, SS:3%) and cigarette displays (18%; S:15%, SS:22%); differences were not observed by smoking status. Conclusions: The tobacco power wall is prominent in retail environments to all consumers, regardless of smoking status.
status and intention to use. As successfully implemented in Canada, Australia, and many other countries, the FDA should consider regulations that limit exposure to point-of-sale tobacco marketing among consumers, especially youth.

FUNDING: This study was funded by the Erie Niagara Tobacco Free Coalition.

JUSTIFICATION: This study demonstrates the visibility and impact of the tobacco power wall in a real-life retail setting through mobile eye-tracking.

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POS1-50
DEPRESSIVE SYMPTOMS AND RESPONSES TO HEALTH WARNING LABELS ON CIGARETTE PACKS: RESULTS FROM THE INTERNATIONAL TOBACCO CONTROL (ITC) SURVEY IN MEXICO

Amira Osmann, James F. Thrasher, Ebru Cayir, Rosaura Perez-Hernandez, and Brett Froeliger. University of South Carolina; National Institute of Public Health, Mexico; Dept. of Neuroscience, Hollings Cancer Center, Medical University of South Carolina

Background: Depression is associated with smoking and with deficits in emotional and cognitive information processing; however, little is known about the effects of depression on smokers’ responses to pictorial health warning labels (HWLs) on cigarette packages. Methods: Data were analyzed from smokers who participated in the International Tobacco Control Policy Evaluation Project (ITC) in Mexico, using wave 4 (2010; n=1853) and wave 5 (2011; n=1763), which coincides with the period before and after implementation of pictorial HWLs. A modified CES-D scale was used to classify participants to depressed or non-depressed persons. Generalized Estimating Equation (GEE) models estimated the main and interactive effects of depression and time on HWL responses (i.e, attention to HWLs; cognitive impact of HWLs; behavioral responses to HWLs; awareness of quitting number on HWLs; and knowledge of tobacco constituents on HWLs). Logistic regression models were estimated to investigate whether baseline depression status predicted quit attempts, quit success, and change in cigarette consumption at followup. Results: Stronger cognitive and behavioral responses to HWLs and increases in knowledge of tobacco constituents and quitting number were observed over time. Depressed persons had stronger responses to HWLs and had higher knowledge of tobacco constituents and of quitting number. Statistically significant interactions between depression status and time were found for models predicting cognitive impact of HWLs, knowledge of tobacco constituents, awareness of quitting number, and for stubbing out a cigarette because of HWLs. Despite stronger responses to HWLs, at baseline, among depressed persons, increases in responses over time were greater for non-depressed persons. At followup, HWL related knowledge was higher among non-depressed smokers; however, quit-related cognitions and behaviors remained higher among depressed smokers. Depression status did not predict cessation behaviors or change in consumption. Discussion: Our results suggest that depressed smokers were less impacted by the implementation of pictorial HWL policy in Mexico than non-depressed smokers.

FUNDING: Funding for data collection came from a grant from the Mexican National Council on Science and Technology (Salud-2007-C01-70032), and partial funding for data analyses came from two grants from the US National Cancer Institute (R01 CA167067; P01 CA138389).

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POS1-51
STORES THAT SELL TOBACCO TO MINORS - THE MORE YOU LOOK, THE MORE YOU FIND

J.L. Patnaik* and A.H. Levinson, University of Colorado, Denver

Purpose: U.S. regulations require retail tobacco businesses to be tested each year, using a single undercover purchase attempt, in order to estimate rates of unlawful tobacco sales to underage adolescents. In a previous study, we conducted two visits per store and found a 50% increase in the proportion of businesses that violate the law. The current study tested each business up to six times and estimated the proportion of businesses that violated the cigarette sales law on one or more occasions. Method: Supervised minors attempted to purchase cigarettes at retail tobacco businesses in a Colorado suburban county. Each store was retested for a total of up to six visits within a six month time period. Violation rates were calculated for all visits and for each business. Results: Between October 2012 and September 2013, 17 minors aged 15-16 attempted to purchase cigarettes 1,083 times from 208 retail businesses. Overall, 19.2% of visits resulted in a violation. Violation rates were higher at the first visit (27.9%) compared to follow-up visits (17.1%). At the individual business level, a total of 110 (52.9%) of businesses violated the law one or more times. Of the 110 business that sold cigarettes to a minor, 52.7% sold one time, 26.4% sold two times, and 20.9% sold three or more times. Conclusion: Retesting retail tobacco businesses with six visits identified a violation rate that was 2-3 times higher than would have been detected with a single visit. These findings indicate that observed low violation rates may be due to the low frequency of compliance checks.

FUNDING: The work was supported by contract #11H1HM17890 from the Colorado Division of Behavioral Health.

JUSTIFICATION: Although only a pilot study is reported, we think the results have important implications for U.S. federal agencies (FDA and SAMHSA) as well as policy makers in other countries that use compliance checks to enforce no-sales-to-minors provisions.

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POS1-52
SECONDHAND SMOKE EXPOSURE AMONG WOMEN OF CHILDBEARING AGE IN ECONOMICALLY DISADVANTAGED DOMINICAN REPUBLIC COMMUNITIES

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Women of childbearing age are a particularly vulnerable population for secondhand smoke exposure because of the potential dual risk to mother and unborn child should the woman become pregnant. Globally, most exposure occurs at home, though data have been lacking for the Dominican Republic. This study reports on secondhand smoke exposure at home for women of childbearing age in 7 economically disadvantaged Dominican Republic communities. A total of 909 nonsmoking women ages 15-49 were identified from surveillance of randomly selected households (approximately 175 households/community) regarding demographics, health conditions, tobacco use, and smokefree home policy. Exposure to secondhand smoke was defined as reported presence of one or more smokers (cigarettes, self-rolled, pipes, cigars) in the home. Overall, 27.94% of women were exposed. Controlling for presence of a smokefree home policy, logistic regression analysis indicated that women living in tobacco growing communities (vs. not) were over twice as likely to be exposed (OR 2.46; 95% CI 1.77 - 3.41; OR 2.48; 95% CI 1.68 - 3.67, respectively), and women who could not read or write (vs. those who could) were nearly twice as likely to be exposed (OR 1.94; 95% CI 1.06 - 3.53). Women who were not employed (vs. those who were) and those who were not married or in a civil union (vs. those who were) were over 1-1/2 times more likely to be exposed (OR 1.65; 95% CI 1.07 - 2.54; OR 1.60; 95% CI 1.12 - 2.28, respectively). No differences were found in exposure for women by age or presence of children in the home. These findings indicate that over one-quarter of nonsmoking women exposed to secondhand smoke at home, with exposure greater in women who appeared relatively more disadvantaged (illiterate, unemployed, unmarried) and had greater overall tobacco exposure by virtue of living in a tobacco growing community. Combined with the observation that presence of respiratory disease or children in home were not protective against exposure, results indicate a need for targeted interventions, particularly for the most vulnerable groups.

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the responsibility of the authors and does not necessarily represent the official views of the National Cancer Institute or the National Institutes of Health.

JUSTIFICATION: Understanding prevalence of and factors associated with secondhand smoke exposure in women of childbearing age in a low and middle income country can help target interventions to impact public health outcomes.

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POS1-53
#HOOKAHLIFE AND #VAPELIFE: AN EXPLORATION OF ONLINE COMMUNICATION AND NICOTINE-TOBACCO-RELATED CONTENT ON SOCIAL MEDIA PROFILES OF HOOKAH AND ELECTRONIC NICOTINE DELIVERY SYSTEM USERS


Background: Alternative tobacco products such as hookah and electronic nicotine delivery systems (ENDS) are rapidly gaining popularity. The purpose of this study was to explore how hookah and ENDS users obtain, perceive, discuss, and portray nicotine- and tobacco-related content online and via social media. Methods: We conducted semi-structured interviews with 19 hookah smokers and 20 ENDS users >18 years old who used the internet >1 hr/day, and reported recent use of social media (e.g., Facebook, Instagram, Twitter). Participants were recruited via online and print flyers. Participants were asked to describe their nicotine/toobacco use, internet and social media use, specific use of the internet related to nicotine products, and perceptions of hookah, ENDS, and cigarettes. We then coded participants' social media accounts for nicotine- and tobacco-related content. Results: The mean age among hookah smokers was 26 years old and 73% were male. 95% of participants used the internet to look up information about hookah, mainly to find hookah lounges and places to purchase hookah products. 63% had references to hookah on their social media profiles and 89% had seen hookah-related content posted by friends in their social media network. Among the ENDS users, the mean age was 34 years old and 76% were male. 95% of participants reported using the internet to look up information about ENDS and 65% purchased ENDS over the internet. 45% had references to ENDS on their social media pages and 65% had both seen postings about ENDS on social media and talked with others about ENDS online. Participants in both groups reported searching for safety of hookah/ENDS online, producing limited and often conflicting results; for some this validated continued use. Among both groups, those who did not have hookah/ENDS-content on their profiles cited that they did not want certain people to know about their hookah/ENDS use. Conclusion: Hookah and ENDS users actively use the internet and social media to share and obtain information about hookah and ENDS. The internet is a valuable potential resource for communicating with this group about risks and harm reduction related to emerging tobacco/nicotine products.

FUNDING: No Funding

JUSTIFICATION: The internet is valuable potential resource for communicating with hookah and electronic nicotine delivery system users about risks and harm reduction related to emerging tobacco/nicotine products.

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POS1-54
NICOTINE AND CARCINOGEN EXPOSURE AFTER WATER PIPE SMOKING IN HOOKAH BARS

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Background: Water pipe tobacco smoking is spreading globally and is increasingly becoming popular in the United States, particularly among young people. While many perceive water pipe smoking to be relatively safe, clinical experimental studies indicate significant exposures to tobacco smoke carcinogens following water pipe use. We investigated biomarkers of nicotine intake and carcinogen exposure from water pipe smoking in the naturalistic setting of hookah bars. Methods: Fifty-five experienced water pipe users were studied before and after smoking water pipe in their customary way in a hookah bar. Urine samples were analyzed for nicotine, cotinine, the tobacco-specific nitrosamine 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol (NNAL), and mercapturic acid metabolites of volatile organic compounds (VOCs). Results: We found an average 73-fold increase in nicotine, 4-fold increase in cotinine, 2-fold increase in NNAL, and 14-91% increase in VOC mercapturic acid metabolites immediately following water pipe smoking. We saw moderate to high correlations between changes in tobacco-specific biomarkers (nicotine, cotinine, and NNAL) and several mercapturic acid metabolites of VOC. Conclusion: Water pipe smoking in a hookah bar is associated with significant nicotine intake and carcinogen exposure. FUNDING: The study was supported by U.S. Public Health Service grants R25 CA113710 and DA012393 from the National Institutes of Health and the California Tobacco-Related Disease Research Program (15RT-0181).

JUSTIFICATION: Water pipe smoking leads to significant increases in carcinogen exposure and poses a public health risk.

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POS1-55
MONITORING THE ILLICIT CIGARETTE TRADE: TRENDS IN TAX EVASION AND PRICE AMONG INTERNET CIGARETTE VENDORS

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BACKGROUND: Higher cigarette prices have been shown to reduce cigarette consumption. However, Internet cigarette vendors (ICVs) often sell untaxed cigarettes to US customers illegally, depriving governments of revenue and undermining the public health benefit of tax hikes. METHODS: We conducted a content analysis of ICVs from 2004 to 2011 (n = 199 to 759) to document evidence of tax evasion and the price per carton of Marlboro cigarettes (shipping included). We compared internet prices to Nielsen estimates of the average Marlboro carton retail price at grocery stores in the New York Designated Market Area (DMA), an area with high cigarette excise taxes. We classified ICV location into three categories: international (ICVs located outside of the US), US (ICVs with no international affiliation), and mixed (ICVs with Native American affiliation or with US and international components). To measure tax evasion, we created an index representing the number of instances of tax evasion on each website (range: 0-7). We dichotomized tax evasion, coding ICVs as tax evading if they scored a 1 or higher on the index. RESULTS: In 2011, the average price per carton when buying on the Internet was $39.86 less than the average retail price in the New York DMA, which translates to annual savings of $1434.81 for a pack-a-day smoker. Across all years, about 60% of ICVs showed some evidence of tax evasion. Five percent of websites reported that they do not pay US federal excise taxes, and 8% reported that they do not pay state excise taxes. About one-third (31%) of websites advertised that they sell from a duty-free zone. Mixed and international ICVs were more likely to evade cigarette taxes than US ICVs (OR=5.06, p<.001; OR=12.06, p<.001, respectively). CONCLUSIONS: Our findings suggest that cigarettes sold
online are substantially cheaper than those sold in grocery stores in high-tax areas. Mixed and international online vendors were more likely to evade taxes than US vendors. Future policies should focus on reducing tax evasion among ICVs selling from international and Native American locations.

FUNDING: The work was supported by grant number 5R01CA169189-02 from NCI, and grant number 64747 from the Robert Wood Johnson Foundation Substance Abuse Policy Research Program.

JUSTIFICATION: This study highlights the need for stronger regulation of tax evasion among Internet cigarette vendors in the US.

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POS1-56 IMPLEMENTING ACA: A REPORTING ON SUSTAINABILITY ACTIVITIES AMONG STATE QUITLINES


Background: As the Affordable Care Act (ACA) is implemented in the U.S., cessation services should become more available and their cost should be borne by health care insurers. Given the recent economic climate and enactment of ACA, states have reconsidered their role in supporting quitlines. Many states are developing innovative cost-sharing partnerships with Medicaid and other insurers to support the growing demand for quitline services and to align payment for services with the appropriate insurers. Methods: Data from the FY2012 North American Quitline Consortium Annual Survey of Quitlines were analyzed. 52 of 53 state quitlines completed the survey. The survey contained new questions on quitline sustainability activities. Results: Of the 52 state quitlines responding to the survey, 21 (40%) indicated they intended to claim (or already claimed) the newly allowed 50% Federal financial participation (FFP match) for quitline administrative expenditures for Medicaid enrollees. Four states (8%) reported actively invoicing Medicaid and receiving FFP funds, with an additional three (6%) having executed a Memorandum of Understanding with their Medicaid agency. Barriers are described. Quitlines are also pursuing other cost-sharing strategies. 24 U.S. quitlines (46%) reported that a cost-sharing arrangement currently existed (or is being pursued) with an entity other than Medicaid. Five quitlines (10%) reported receiving reimbursement from either an employer/employer group (n=3), or from an insurance company/health plan (n=2). Seven quitlines (13%) report transferring callers directly to health plan/employer services they are eligible for, and more than one-quarter (n=14, 27%) report restricting quitline services for callers who are eligible to access cessation coverage through an insurer or employer. Given that 60% of quitline users reported having some type of insurance, quitlines have increasing rationale for pursuing cost-sharing strategies. Conclusion: As demand for quitline services continues to rise, strategies for cost-sharing with appropriate insurers will be critical.

FUNDING: Centers for Disease Control and Prevention, American Legacy Foundation, NAQC Member Dues

JUSTIFICATION: This study provides data that can be acted upon by quitlines, health plans, Federal and State Medicaid offices, and other potential funders of quitlines to make and measure progress on providing sustainable funding for a critical and cost effective network of programs in the United States.

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POS1-57 ELECTRONIC CIGARETTE USE AND DUAL USE WITH OTHER TOBACCO PRODUCTS AMONG ADULTS IN NEW YORK CITY.

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Background: Electronic nicotine delivery devices (ENDS) are battery-powered devices that deliver vaporized nicotine when inhaled. Given the dramatic rise in ENDS use there is an urgent need to fill gaps in our knowledge about patterns of use and dual use (use with other tobacco products) and reasons for initiation and discontinuation among ENDS users. Methods: We conducted an intercept survey among 307 consecutive eligible participants leaving an ENDS store in lower Manhattan. Eligibility included ever use of e-cigs. Survey questions assessed ENDS use, use of tobacco products, and reasons for initiation and discontinuing use of ENDS. Frequencies, means, and Fischer’s exact test were conducted using SAS version 9.2. Results: Participants’ mean age was 28.6, range 18-69. 88% of participants were current smokers (smoked at least one cigarette in past 7 days) and smoked a mean of 10.9 cigarettes per day. 12% were former smokers (no cigarettes smoked in the last 12 months). 45% had tried ENDS, 26% were currently using cigarettes and ENDS, and 12% only used ENDS. Among exclusive ENDS users, 89% were former smokers. The most common reasons for starting ENDS was to quit smoking (32.5%), curiosity (26.3%), and to use where/when smoking is prohibited (16.2%). The primary reason for discontinuing ENDS was that it wasn’t satisfying (41%). ENDS were also used concomitantly with other products (15%). 7% reported using cigarettes, ENDS, and cigars and 12% ENDS, cigarettes, and hookah. Conclusion: Smokers are turning to ENDS for several reasons including cessation and to satisfy their need for nicotine in smoke free environments. Most were short term users who were simply interested in trying this new product. Notably, a large percent discontinued using ENDS because they did not like the experience. With the tobacco industry developing new versions of ENDS, nicotine delivery may become more reliable and thus the products may become more appealing. Ongoing surveillance is needed to track trends in use. Given the interest in this product as a cessation strategy, research is also needed to obtain an understanding of how these products might be used to help smokers quit.

FUNDING: No funding

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POS1-58 TOBACCO DIRECT MAIL MARKETING: FREQUENCY, CONTENT, AND PROSPECTIVE EFFECT ON SMOKING BEHAVIORS OF YOUNG ADULTS

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Background: Tobacco companies use direct mail to promote their products. Little is known about what young adults received from tobacco companies in the mail, and the impact of receiving cigarette coupons in the mail on their smoking behaviors. Methods: Data were from the Minnesota Adolescent Community Cohort Study collected when the participants were aged 20-28 (n=2622). At baseline (2011), we assessed whether the participants had received gifts or advertisements in the mail from the tobacco companies in the past six months, the associated brands, and the content of the mail. Demographics, peer smoking, tobacco use behaviors (cigarette, snus, and chewing tobacco) were assessed at baseline. At follow-up (2012), we assessed their smoking and cessation behaviors. Logistic regression models were used to examine characteristics associated with receiving tobacco coupons in the mail at baseline, and the associations between receiving coupons in the mail at baseline and smoking and cessation behaviors at follow-up. Results: Overall, 13% of the participants received tobacco direct mail in the past six months. Of these participants, 78% received cigarette coupons, 85% received cigarette advertisements, 61% received advertisements for smokeless tobacco, and 56% received smokeless tobacco coupons. Camel and Marlboro were the most commonly reported brands (60% and 37%, respectively). Being older, less educated, having friends who smoke, and being heavier smokers were associated with receiving cigarette and smokeless tobacco coupons (p<0.05). Ex-smokers (vs. non-smokers) and current snus users (vs. never trying snus) were more likely to have received coupons for both cigarettes and smokeless tobacco (p<0.05).
Baseline non-smokers who received cigarette coupons were more likely than those who did not to be current smokers at follow-up (OR=2.29). Baseline current smokers who received cigarette coupons were less likely than those who did not to have attempted to quit smoking (OR=0.53) and to have quit smoking (OR=0.51). Conclusions: Tobacco companies seem to use direct mail to promote and sustain smoking behaviors, and promote dual use of cigarettes and smokeless tobacco.

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**POS1-59**

**BARRIERS TO TRANSIT WORKER PARTICIPATION IN HMO SMOKING CESSATION TREATMENT: FOCUS GROUP RESULTS**

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Urban transit workers are a blue-collar occupational group who maintain elevated smoking rates despite having access to free or low-cost smoking cessation treatment through their HMO as an employee benefit. Little is known about the factors that hinder blue-collar workers from participating in these cessation services. The goals of this mixed-method study are (1) to identify the extent that aspects of the workplace social environment (e.g., job strain) and structural factors (e.g., non-standard work shifts) serve as barriers to transit worker participation in HMO cessation activities, and (2) to determine how these barriers may be overcome. We conducted 11 focus group discussions with 71 bus operators and maintenance workers (45% female; 83% African American) who are current smokers, lapsed quitters, and successful quitters to elicit reactions to and awareness of the covered employee options for cessation, including NRT support and support groups, attitudes towards smoking, job strain, and other topics. Qualitative analyses of the digitally recorded transcripts identified key themes. In terms of the workplace social environment, job strain emerged as a barrier to quitting since smoking is perceived as a readily accessible and effective response to daily stressors encountered on the job. Successful quitters described strategies for overcoming job strain and disclosed critical incidents that led to their decision to quit smoking. Some smokers who had tried varenicline reported adverse side effects (e.g., depression); others said they refused to try the medication after hearing about side effects. Many bus operators identified their work schedules (e.g., being on duty for the morning and afternoon/evening rush hours, with an hours-long mid-day break in between) as a structural barrier to participating in HMO cessation activities. Others saw the mid-day split-shift break as an opportunity to participate in cessation activities if they were held at the bus garages. Results suggest that offering onsite stress-reduction and cessation services tailored to workers' schedules may help overcome barriers to participation.

FUNDING: Funding for this study was provided by the Tobacco-Related Disease Research Program, Office of the President, University of California, Grant No. 21RT-0113.

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**POS1-60**

**IMPROVING FIDELITY TO TREATMENT MANUALS IN SMOKING CESSATION USING BEHAVIOR CHANGE TECHNIQUE (BCT) ANALYSIS, FEEDBACK, AND GOAL-SETTING**

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Background: Implementation of behavioral support for smoking cessation is a challenge in many areas of healthcare. Although the evidence is limited, it suggests that fidelity to treatment manuals, where these exist, is moderate. Comparing treatment manuals and behavioral support as delivered in practice in terms of Behavior Change Techniques (BCTs) could provide a basis for training practitioners to improve fidelity. The Australian ‘Call it Quits’ trial, evaluating a smoking cessation intervention for socioeconomically disadvantaged smokers provided an opportunity to do this. Objectives: This study aims to examine whether using a BCT analysis of what was supposed to be delivered according to smoking cessation treatment manuals and what was actually delivered could form a practical basis for improving fidelity. Methods: A pre and post-test study design was used with percentage agreement between BCTs in the treatment manual and delivered during sessions at 6 weeks follow-up as the primary outcome. Fidelity of seven practitioners was measured by coding the treatment manual in terms of BCTs and comparing this with the BCTs delivered in the intervention session. Twenty-three pre-test smoking cessation sessions and 24 post-test sessions were recorded and the transcripts coded. The intervention consisted of: anonymous group feedback which summarised the groups’ performance delivering BCTs contained in the manual, a discussion identifying strategies to improve practitioner performance and individualised written feedback of performance along with a goal for improvement. Results: Percentage agreement between two independent coders was 79% indicating high inter-rater reliability. The pre-test results indicated wide variation across practitioners in the use of BCTs, length of counselling sessions (in minutes), and fidelity to the treatment manual. The post-test outcomes of the study will be reported during the presentation. Conclusion: While further research is required, this novel technique shows promise as a strategy for improving smoking cessation practitioner fidelity to treatment manual and, consequently, the standard of quit support provided to smokers.

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**POS1-61**

**SELF-REPORTED UTILIZATION OF SMOKING CESSATION ASSISTANCE IN 12 LOW AND MIDDLE INCOME COUNTRIES**

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Background: It has been projected that by 2030, about 80% of tobacco-related deaths will occur among people living in low and middle income countries. Little is known about the utilization of smoking cessation assistance in these countries. Thus, the goal of this study was to estimate the use of various forms of assistance, and to describe the variability in low and middle income countries. Methods: Data were from the Global Adult Tobacco Survey in 2008-2011. This nationally representative household survey collected data on assistance that smokers used to quit, such as provider advice, pharmacotherapy, traditional medicine, and quit lines. A descriptive data analysis was performed. Results: Percent of smokers reported being asked about smoking status by provider in the past 12 months varied greatly across countries (9% to 71%); those who reported receiving advice to quit ranged from 4% to 33%. Use of any assistance in the past 12 months varied greatly in low income countries (6% to 60%), with less variation in middle income countries (16% to 35%). Use of only one type of assistance ranged from 5% to 49% in low income countries and from 13% to 32% in middle income countries. Little variation was found in using 2 or more types of assistance across all countries, and the prevalence was low (1% to 25%). Quit lines were rarely used (0.1% to 1.5%). Smokers using any assistance in the past 12 months were more likely to be males, in their 40s, with less than high school education, and residents of rural areas in 9 out of the 12 countries. In the remaining countries (Ukraine, Brazil, and Mexico), there was little difference in assistance use by gender, and the users tended to reside in urban areas and have higher education levels. Conclusions: Cessation assistance was fairly underused in these low and middle income countries. Efforts are needed to facilitate the use of effective cessation assistance in these countries to promote quit rates.

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POS1-62
HARDENING TARGET OR MOVING TARGET?
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BACKGROUND: As smoking rates in the United States decline, particularly in states with substantial tobacco-control programs, there has been speculation of ‘harden ing’ in the smoking population, whereby those who continue to smoke despite significant pressure to stop may be more severely nicotine dependent and less able or willing to attempt smoking cessation. METHODS: Treatment-seeking smokers (N=1,356) enrolled in five consecutive randomized clinical trials conducted in the mid-peninsula region of the San Francisco Bay Area from 1998-2013 were included in analyses. We compared baseline characteristics across the trials to understand how changes in demographics may be associated with changes in smoking-related behavior and attitudes over time. One-way analysis of variance or Chi-Square was used to compare baseline variables across the studies. RESULTS: Across the trials, the number of cigarettes smoked per day decreased steadily (F(4,1348)=30.3, p<.001), and changes in levels of nicotine dependence (F4,1343)=21.2, p<.001) and depressive symptoms (F(4,1345)=7.2, p<.001) were observed with decreases in nicotine dependence and increases in reported depressive symptoms, respectively, in the most recent trials. Compared to participants in the earlier trials, participants from the most recent trials were more likely to be younger (p=0.01), male (p=0.01), unmarried (p=0.001), and from a minority ethnic/racial group (p<.001). When adjusting for these covariates, cigarettes smoked per day (F(4,1343)=27.7, p<.001), nicotine dependence (F(4,1339)=21.8, p<.001), and depressive symptoms (F(4,1340)=6.2, p<.001) remained statistically significant. CONCLUSIONS: These results suggest that smokers enrolled in clinical trials in our region are not necessarily ‘hardened’ in the conventional sense but rather that the population of continuing smokers may be shifting to reflect changing demographics and perhaps lighter smokers with more depressive symptomatology. If trends observed in our region are reflected in other populations, public health partnerships with primary care and mental health should be considered to increase reach to a changing target of smokers.

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JUSTIFICATION: If changes in the smoking population observed in our region are reflected in other populations, public health partnerships with primary care and mental health should be considered to increase reach to a changing target of smokers.

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POS1-63
REDUCTION IN MICHIGAN ASTHMA HOSPITALIZATIONS FOLLOWING THE DR. RON DAVIS SMOKE FREE AIR LAW
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Exposure to secondhand smoke is associated with adverse health outcomes and is a known asthma trigger. With the goal to improve health by reducing the public’s exposure to secondhand smoke, the state of Michigan passed the Dr. Ron Davis Smoke Free Air (SFA) law. The law, effective May 1, 2010, banned smoking in all public areas, including but not limited to workplaces, restaurants, and bars. A study conducted in Michigan in 2011 demonstrated significantly improved respiratory health (assessed by self-report) in bar employees following the SFA law. To extend these findings to the general public, we examined monthly asthma hospitalizations in 25-65 year olds from January 2002 through June 2012. Asthma hospitalizations were identified by primary ICD9 diagnosis of 493.xx in the Michigan Inpatient Hospital Database (MIDB). The MIDB is compiled by the Michigan Health and Hospital Association (MHA) and contains short-stay hospital discharge research TV, radio and print media disseminate harms of tobacco, Poisson regression and interrupted time series analyses to model the occurrence and rate of change of asthma hospitalizations before and after the ban. In the month immediately following the smoking ban, our model shows 89 fewer asthma hospitalizations, a decrease from 14.1 to 12.4 hospitalizations per 100,000 Michigan residents aged 25-65 years (P<0.0001). Over the past 12 years, the rate of asthma hospitalizations in Michigan has been steadily increasing; however, our model shows a reduction in this rate following implementation of the SFA law. Before the SFA law, the rate of asthma hospitalizations was increasing by 2.7% annually. After the SFA law, the rate of asthma hospitalizations slowed to a 1.2% annual increase (P<0.0001). This study is the first to demonstrate a reduction in the occurrence and rate of change of asthma hospitalizations following implementation of the SFA law. These results support continued implementation of the SFA law.

FUNDING: This study was supported in part by an appointment to the Applied Epidemiology Fellowship Program administered by the Council of State and Territorial Epidemiologists (CSTE) and funded by the Centers for Disease Control and Prevention (CDC) Cooperative Agreement Number 5U38HM000414.

JUSTIFICATION: This study describes an association between a smoking ban and the reduction in asthma hospitalizations in the state of Michigan.

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POS1-64
A SYSTEMATIC REVIEW ON THE EFFECTIVENESS OF MASS-REACH HEALTH COMMUNICATION INTERVENTIONS IN REDUCING TOBACCO USE: AN UPDATE
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Background: Anti-smoking, mass-reach health communication interventions use TV, radio, and print media to disseminate harms of tobacco use and change behaviors affecting tobacco use. This intervention has been part of tobacco control efforts for many years and was previously recommended in 2001 by the Community Preventive Services Task Force (CPSTF). We updated the Community Guide (CG) systematic review on the effectiveness of mass-reach health communication interventions in tobacco use and initiation, tobacco use cessation, and use of cessation services. Methods: A systematic search was conducted (search period Jan 2000–July 2012) to identify and abstract qualifying studies using standard CG systematic review methods. Effect estimates were calculated for each outcome and results narratively summarized when effect estimates could not be calculated. Results: The updated CG search identified 84 eligible studies. There was a median reduction of 3.4 percentage points (pct. pts.) (Intertquartile interval (IQI): -4.7 to -1.6 pct. pts.) in tobacco use prevalence among young people (11 studies), and a reduction of 5.0 pct. pts. (range: -5.2 to 1.9 pct. pts.) among adults (4 studies). Studies that provided narrative results also reported reduction in tobacco use
prevalence among young people (2 studies) and adults (4 studies). Seven studies reported interventions to be effective in reducing or delaying tobacco use initiation among young people. Interventions were also effective in increasing tobacco use cessation among current smokers (Median: 3.5 pts.; IQI: 2.0 to 5.0 pts.; 12 studies), and increasing use of cessation services (132%; IQI: +39% to +378%; 11 studies). Increased intervention exposure was associated with increased successful cessation (5 studies) and use of cessation services such as quitlines (17 studies). Conclusions: Consistent with the previous CPSTF recommendation, there is strong evidence on the effectiveness of mass-reach health communication interventions in decreasing tobacco use prevalence, increasing cessation and use of cession services and decreasing initiation of tobacco use among young people.

FUNDING: No funding

JUSTIFICATION: Mass-reach health communication interventions are effective in decreasing tobacco use prevalence, increasing use of cessation services and decreasing initiation of tobacco use among young people.

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POS1-65 TEXT MESSAGING IN THE CONTEXT OF QUITLINES: WHO IS USING AND TO WHAT EFFECT?

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Background: An estimated 20% of quitlines offer text messaging in addition to phone counseling services. Text2Quit is an automated, personalized and interactive mobile health program that has been integrated into quitline services offered by Alere Wellbeing Inc. (AWI). Objective: This study examined the characteristics of quitter callers who enrolled in phone counseling and Text2Quit and their smoking cessation outcomes. Methods: Adult callers to the AWI commercial quitline between April 1, 2012 and December 31, 2012 who enrolled in phone counseling and expressed interest in text messaging were included in this analysis (n=9152). Callers were followed up at 7 months to assess smoking status. Electronic records of participant use of quitline services including phone counseling and the program website were analyzed. Results: Of those who expressed interest in text messaging, 73.1% (n=6887) completed their enrollment offer via SMS and enrolled in Text2Quit. Text2Quit enrollees had a mean age of 40.5 years (SD=10.9) and were equally split between male and female. The majority lived or worked with smokers (77.9%) and about one third (30.9%) smoked within 5 minutes of waking. Enrollees were similar to non-enrollees (n=2465) in their age, confidence in their ability to quit, in the presence of smokers in their homes or work, but significantly different that enrollees were more likely to be female, smoke more than 5 minutes after waking, and have a greater number of prior quit attempts. Using an analysis whereby missing participants were assumed to be smoking, 62.1% of enrollees reported not smoking in the past 7 days, a significantly larger proportion compared to non-enrollees (50.6%). Among those who enrolled in Text2Quit, quitting was predicted by older age, being male, lower nicotine dependence, and greater number of phone counseling calls completed. Conclusion: Those who completed their enrollment in Text2Quit were found to be more likely to quit smoking than non-enrollees who did not complete their enrollment. Future research should explore the efficacy of text messaging for quitter users in a randomized trial.

FUNDING: This study was supported by the National Heart, Lung, and Blood Institute of the National Institutes of Health under Award Number R01HL112212, and by the Flight Attendants Medical Research Institute. The content is solely the responsibility of the authors and does not necessarily represent the official views of the funders.

JUSTIFICATION: This study enhances understanding of the problem of secondhand smoke in multiunit public housing, as well as methods for studying it.

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POS1-66 AIRBORNE NICOTINE IN NON-SMOKERS' HOMES IN PUBLIC HOUSING

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BACKGROUND: Non-smoking residents of public multiunit housing are at high risk of exposure to tobacco smoke pollution (TSP). We tested TSP in apartments from two Massachusetts housing authorities. We hypothesized that airborne nicotine would be correlated with resident self-reported exposure and health. METHODS: The FreshAir study used Hammond filters to measure airborne nicotine in the homes of subjects living in family public housing in Boston (n=189) and Cambridge (n=955), Massachusetts. Subjects were a convenience sample of residents living in homes where no one smoked. Nicotine monitors were placed in subjects’ living rooms for approximately 7 days. Subjects were surveyed about whether they smelled tobacco smoke in their apartments, household behaviors that might affect airflow (open windows, AC use), and self-reported health (fair/ poor health, regular cough/wheeze, children’s asthma diagnoses). Analyses excluded homes where visitors smoked during monitor deployment. Nicotine levels were evaluated using tobit regressions of log(nicotine) to account for censoring at the lower limit of detection (20ng/m3) and a skewed nicotine distribution.

RESULTS: In homes where no smoking took place during monitor deployment (n=249, 91%), 54% had detectable nicotine levels. Among those with detectable levels, the geometric mean nicotine was 59ng/m3 (range 7ng/m3 – 1330ng/m3). In homes where no smoking took place, there was no association between residents’ self-reports of smelling smoke and objectively measured nicotine levels, controlling for open windows, AC use, and housing authority. Nicotine levels were not associated with subjects’ concurrently assessed self-reported fair/poor health or respiratory symptoms (cough, wheeze), nor with reports of asthma diagnoses among household children. CONCLUSIONS: In participants’ homes where no one smoked, over half had detectable levels of nicotine. Self-reports of smelling tobacco smoke were not associated with objectively-measured nicotine levels and may not be a useful measure of TSP in non-smoking homes. There is no relationship between objectively-measured ETS and indicators of health in these cross-sectional analyses.

FUNDING: No funding

JUSTIFICATION: There is strong evidence on the effectiveness of mass-reach health communication interventions in decreasing tobacco use prevalence, increasing cessation and use of cessation services such as quitlines that are effective in increasing tobacco use cessation among current smokers. Conclusions: Consistent with the previous CPSTF recommendation, there is strong evidence on the effectiveness of text messaging in decreasing tobacco use prevalence, increasing cessation and use of cessation services and decreasing initiation of tobacco use among young people.
an additional 74 participants will be recruited by October 2013. A single cigarette advertisement was modified to include one of 9 FDA approved graphic warning labels. Participants were assigned at random to one of three study conditions: two intervention conditions with the FDA graphic warning label at 20% or 33% of the ad area, or a control condition with the equivalent warning message as text only. A post-experiment survey captured recall of ad and health warning elements. Results: On average, participants spent 12.2 seconds viewing the tobacco ad. Participants spent 0.28 seconds viewing the graphic warning, compared to 0.12 seconds on the text-only warning. Among those who viewed the graphic warning label, the most time was spent on the text (57%) and graphic image (36.7%), with 6.3% of the time spent viewing the Quiltline number. During an unaided recall for the “most memorable aspects” of the tobacco ad, 63 participants (28.9%) mentioned any content related to the health warning label; the majority of those with unaided recall (79.4%, n=50) had viewed the graphic warning label. Conclusions: These preliminary results suggest that graphic imagery attracted somewhat more attention and unprompted recall of health messages when viewed within cigarette ads. Complete results for the entire study sample within intervention condition by warning label size will be discussed.

FUNDING: Support for this project was provided by the National Cancer Institute (NCI R01 CA129771) and National Center for Advancing Translational Sciences (UL1TR000006).

JUSTIFICATION: These results will support the empirical basis for the optimal characteristics of health warning label attributes.

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POS1-68 PROVIDING TOBACCO CESSATION SUPPORT FOR CANCER PATIENTS: A SURVEY OF PHYSICIANS AT NATIONAL CANCER INSTITUTE DESIGNATED CANCER CENTERS

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Background: Though tobacco use by cancer patients is associated with adverse cancer treatment outcomes and tobacco cessation can improve outcomes, many oncologists do not routinely provide tobacco cessation support for cancer patients. Methods: Reported is an interim analysis of an ongoing email survey of physicians at NCI Designated Cancer Centers (NDCC) asking about tobacco assessment and cessation practices and about potential mechanisms to increase tobacco cessation support for cancer patients. Results: The first 717 respondents from a potential pool of 6844 emails (10.5%) are reported. Most respondents ask about tobacco use (90%) and most advise to quit (84%), but few discuss medication options (36%) or actively provide tobacco cessation support (35%). In contrast to prior studies, respondents at NDCC report lack of time (70%), lack of available resources (57%), and training (49%) as larger barriers to cessation support; however, few reported concerns about tobacco cessation medications as a barrier (11%). Most (71%) prefer to start tobacco cessation assistance at the time of initial consultation and 46% would support cessation assistance to all cancer patients including metastatic cancer patients. However, most do not address tobacco use in family members of cancer patients. While 58% would prefer to use dedicated tobacco cessation resources inside their institution, 38% would use dedicated cessation support either inside or outside their institution. Importantly, 54% would prefer to have tobacco cessation training for someone else in their clinic and 97% of respondents prefer for some other clinician (primary care physician, mid-level practitioner, another physician, or clinical support staff) to provide cessation support. Conclusions: These are the first data to assess physician preference about providing tobacco cessation support for cancer patients at NDCC and results suggest that although most providers ask about tobacco use and advise smokers to quit, the majority would prefer to have another professional address tobacco cessation in the cancer treatment setting.

FUNDING: American Cancer Society

JUSTIFICATION: This study demonstrates the need for dedicated tobacco cessation support for cancer patients and has direct implications on efforts to increase tobacco cessation efforts in cancer programs nationwide

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POS1-69 PHYSICIAN USE OF E-CIGARETTES AS CESSATION DEVICES, NORTH CAROLINA, 2013


The University of North Carolina Tobacco Prevention and Evaluation Program (TPEP) conducted a survey of North Carolina (NC) physicians to assess physician awareness, knowledge, and behavior related to tobacco use cessation treatment, including the North Carolina Quitline. As part of the survey, physicians involved in direct patient care were asked about their knowledge regarding Food and Drug Administration (FDA) approval of electronic cigarettes (e-cigarettes), how often their patients who use tobacco inquire about e-cigarettes, their perception of e-cigarettes as a cessation product or harm reduction, and whether they recommended e-cigarettes to their patients. A direct marking company with access to the American Medical Association (AMA) mailing list distributed the survey through e-mail to a random sample of 787 NC Family Medicine, Internal Medicine, General Surgery, OB Gyn, and Psychiatry physicians. From this e-mail, 14 addresses were invalid or returned, 413 were opened, and 128 responded. Respondents reported being asked (48.4% responded frequently or sometimes being asked about e-cigarettes by patients that used tobacco, and 67.2% believed e-cigarettes were helpful in treating tobacco dependence. Almost two-thirds (64.8%) reported they believed that e-cigarettes lowered the risk of cancer compared to regular cigarettes. Over one third (35.2%) of respondents reported recommending the use of e-cigarettes to patients trying to quit. Thirteen percent of participants believed (incorrectly) that e-cigarettes were approved by the FDA as a tobacco cessation treatment. Analyses differentiated physicians and specialties who believed e-cigarettes were helpful compared to those that did not, as well as those that recommended them to patients for cessation. E-cigarettes appear to play a substantial role in clinical tobacco dependence treatment even though they are not approved or recommended by the FDA. This increasing utilization of e-cigarettes by the patient community has profound implications for tobacco use treatment and potential FDA regulation. We will discuss recommendations and potential guidelines for physician-patient counseling about e-cigarettes.

FUNDING: North Carolina Department of Health and Human Services

JUSTIFICATION: We will provide and understanding of FDA regulations for tobacco and how they can inform clinical practice.

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POS1-70 SMOKING BEHAVIOR TRENDS AMONG AFRICAN-AMERICANS AND NON-HISPANIC WHITES IN CALIFORNIA

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California has the longest running comprehensive tobacco control program in the U.S. However, Californian African-Americans (AA) continue to have the highest adult smoking prevalence in the state, with 2010 rates similar to those of Non-Hispanic Whites (NHW) from 1999. This study examines trends in smoking behaviors among these groups, data that are critical in understanding and addressing tobacco-related health disparities. Methods: The California Tobacco Surveys (CTS) are population-based surveys designed to monitor changes
Poster Session 1 • Thursday, February 6, 2014 • 11:30 a.m.–1:00 p.m.

POS1-72
USE OF FLAVORED CIGARS, CIGARILLOS, AND LITTLE FILTERED CIGARS AND HARM PERCEPTIONS: FINDINGS FROM THE 2012-2013 NATIONAL ADULT TOBACCO SURVEY

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Cigar use is a growing public health problem in the U.S. Cigars contain the same harmful compounds found in cigarettes and regular cigar smoking has been found to increase the risk of dying from oral and lung cancer, cardiovascular disease, and chronic obstructive pulmonary disease (Shanks & Burns, 1998; Iribarren et al., 1999). From 2000 to 2011, cigar sales more than doubled, while cigarette sales declined (CDC, MMWR). Factors that may be contributing to the rise in cigar use include the availability of a wide range of characterizing flavors, lower costs, and perceptions of less harm and less addictiveness compared with cigarettes (Delineo, 2006, 2013; Jolly, 2008). A recent study of U.S. adults found that more than two fifths of adult cigar smokers used flavored cigars (CDC, 2012). We will present our research on measuring cigar use by product type (cigars, cigarillos, and little filtered cigars), flavored cigar use, and perceptions of harm and addictiveness of cigar smoking using the 2012-13 National Adult Tobacco Survey (NATS). NATS is a national landline (75%) and cell phone (25%) survey of 60,064 adults, with an overall response rate of 44.9%. The 2012-13 NATS includes detailed data on the size of the cigar, presence of filters, usual brand smoked, and use of any flavored cigars in the past 30 days. To characterize current cigar smoking, we estimated the prevalence of cigar type and flavored product use, as well as name brands usually smoked among current cigar smokers, and also assessed the demographic characteristics of cigar users. We used multivariate logistic regression to examine factors independently associated with flavored cigar use, as well as the association between cigar type and perceptions of harm and addictiveness of cigar smoking. Understanding type of cigar product used and role of characterizing flavors in cigars will help inform future research and regulatory action by the FDA, as well as inform CDC’s National Comprehensive Tobacco Control Programs.

FUNDING: Funding for data collection and analysis was provided by the U.S. Food and Drug Administration (FDA) Center for Tobacco Products (CTP).

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POS1-74
THE ASSOCIATION BETWEEN ALCOHOL, SUBSTANCE USE AND NEW AND EMERGING TOBACCO PRODUCTS IN A YOUNG ADULT POPULATION

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BACKGROUND: Young adults have the highest rates of alcohol and substance use relative to any other age group. The use of cigarettes and other tobacco products is also extremely common in this age group and frequently co-occurs with alcohol and drug use. However, few studies have examined the co-occurrence of...
alcohol and substance use with new and emerging tobacco products (little cigars/cigarillos, hookah, e-cigarettes) in this vulnerable population. To address this gap, this study examined the association of alcohol and substance use with use of cigarettes and emerging tobacco products in a nationally representative sample of young adults. Self-reported co-use of alcohol and tobacco at the same time was also assessed. METHODS: Data were drawn from the sub-group of 18-24 year olds in Wave 4 (n = 1609) of the Legacy Young Adult Cohort, a nationally- representative sample of men and women aged 18 to 34. Groups were created for current (every day or some days) alcohol users and substance users (marijuana and/or other drugs). Nineteen participants were missing data on alcohol or substance use. RESULTS: Using weighted estimates, results showed that, a greater number of alcohol users, compared to non-users, used tobacco products (including cigarettes) “often” or “always” while drinking alcohol. Substance users were less likely than non-users to report drinking alcohol “often” or “always” when using tobacco products. Compared to non-users, alcohol users were more than twice as likely to ever use cigarettes and e-cigarettes; and nearly three times as likely to have ever used little cigars/cigarillos and hookah. Substance users were twice as likely as non-users to have used cigarettes, little cigars/cigarillos, and hookah; and three times as likely to have used e-cigarettes. Both alcohol and substance users tried a greater number of tobacco products than non-users. DISCUSSION: Health-behavior comorbidities, such as drug and alcohol use, may portend greater risk for tobacco product use, especially emerging products. Efforts should be made to identify mechanisms linking alcohol and drug use to emerging tobacco product use in young adults.

FUNDING: No Funding

JUSTIFICATION: Findings suggest that prevention programs aimed at smoking cessation and reducing the risk of tobacco product use in young adults should address drug and alcohol use as potential contributing factors.

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POS1-75
SMOKING CESSATION INTERVENTIONS IN LIGHT AND INTERMITTENT SMOKERS: A SYSTEMATIC REVIEW

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Introduction: Light/intermittent smokers are becoming more prevalent. They have similar health risks as heavier smokers. Little is known regarding effective interventions because they are often excluded from cessation trials. Methods: Searches were conducted in PubMed, Psychinfo, Scielo, and Pepsic. Search terms included [light smoker, non-daily smoker, intermittent smoker; social smoking, occasional smoking, low-level smoking] AND [Intervention studies, clinical trial and evaluation studies] AND [tobacco use cessation, tobacco use disorder]. Selection criteria included studies that (1) focused on light smokers, (2) included a cessation intervention, and (3) included quantitative data on abstinence rates. Among 515 studies identified, 9 met criteria for review. Results: Definitions of light/intermittent smoking varied. Five studies used a cutoff of <10 cigarettes per day (cpd) and two used a cutoff of <15 cpd. One classified light smoking as using between 6-15 cpd, and another as using between 3-9 cpd. One study focused on non-daily smokers. Four studies focused on ethnic (2; Hispanic/Latino) and racial (2; African Americans) minority groups. Two studies did not find significant differences between study groups; these included brief intervention (1) and bupropion (1). Successful interventions included varenicline + brief intervention (1); medication + intensive counseling (1); counseling about the dangers of exposing others to environmental tobacco smoke (1); nicotine lozenge (1); and health education (1). Three studies examined and found no differences in abstinence between light and heavy smokers given the same intervention. Discussion: Counseling, NRT, and varenicline are promising interventions for light smokers. Light smokers have similar difficulty quitting as heavy smokers. Intervention content was, in general, adapted from treatments for heavier smokers and not targeted to light smokers. Future studies could identify measures of dependence that are sensitive to light smokers, identity whether there are cessation challenges specific to light smokers, and explore physiological reasons for light smokers’ difficulties in quitting.

FUNDING: Funding for this project has been provided by Brazilian Government – CNPq, while the first author was at the University of Kansas Medical Center.

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POS1-77
SIX-STATE QUITLINE OUTCOMES FOR SMOKERS WITH PSYCHIATRIC CONDITIONS AND LIMITATIONS
Amy V. Lukowski, Psy.D. 1, David Tinkelman, M.D. 1, Chad Morris, Ph.D. 1, and Susan Young, Ph.D. 2, National Jewish Health, 1 University of Colorado

Research has established that tobacco cessation quitlines offer an effective intervention. Recent data show a slowing of cessation rates for the overall population, particularly for those with psychiatric disorders (PD), including substance dependence. Recent studies have found that up to half of quitline callers have PD, and that quitlines may be equally effective for these callers. However, there is also evidence that the callers who expect their PD to interfere with quit attempts (“Interference”), beyond the PD itself, have less success with quitting. The current study characterizes quitline callers with PD from a multi-State tobacco user population. National Jewish Health collected data from 6 state quitlines (n=26,964) between January 1 and December 31, 2012. Participants received up to 5 coaching sessions and up to 8 weeks of NRT, with one state offering prescription tobacco cessation medications. Data sources include caller intake information, program utilization, and individual outcome data. There was no significant difference between the 7 and 12-month cessation rates of those with PD and those without. Individuals with PD who reported interference were significantly less likely to quit than those with PD who did not report interference (7 month follow-up: 23.6% v. 30.8%, p<0.01; 12 month follow-up: 20.1% v. 33.7%, p<0.01). Among demographic characteristics, both age and gender were associated with differences in the likelihood of reporting PD: women report PD significantly more often than men (p<0.01 for all 3 questions), and the likelihood of reporting current PD symptoms or impairment was higher for younger respondents (p<0.001). These findings highlight the importance of evaluating mental health status in all individuals seeking support for smoking cessation, as they may need more tailored intervention to ensure healthy outcomes. Limitations include the lack of specific DSM-IV diagnoses and information on individual use of medications for behavioral health conditions. We are developing an expanded behavioral health assessment to better understand this population and validate our findings across quitlines.

FUNDING: The program services were funded by each individual state quitline that was included in this project.

JUSTIFICATION: This study will help expand behavioral health assessment to better understand this population and allow the opportunity to validate our findings across quitlines.

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POS1-79
CIGARETTE SMOKING AMONG CRACK AND HEROIN USERS IN SOUTH AFRICA
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In the United States, cigarette smoking is ubiquitous among cocaine and heroin users. Associations with cigarette smoking and heroin/cocaine use have been noted in the US (e.g., in Baltimore, MD; Harrell et al., 2011, 2012). However, cigarette use patterns and associated cultural factors often differ by country. To address this, we examined data from the international NEURO-HIV study of cocaine/heroin users in South Africa (SA). This study was designed to examine neuropsychological and other risk factors of HIV and other infectious diseases among drug users. SA has the world’s largest population of people living with HIV/AIDS (PLWHA). Data collection occurred in Pretoria, a government center of SA in Gauteng among 232 Black Africans. Participants who reported drug use in the past 6 months were eligible. Participants were recruited primarily via street outreach. Injection drug use (IDU) occurred in less than 2% of the sample. IDU was excluded from this sample, as well as participants with no lifetime usage of heroin or crack. Participants completed the HIV-risk behavior interview, which included items on tobacco/drug use. Drug use reports were similar to urinalysis results. Almost all (95%) reported smoking cigarettes in the past day. Similar to the US, reports of cigarettes per day (CPD) clustered around 5-digit increments with ‘20’ as the mode. However, fewer participants in this sample reported 20 CPD or more than Baltimore, (35% vs. 45%) and 37% smoked less than 10 CPD. Thus, we defined heavy smoking as smoking 10+ CPD. Heavy smokers were more likely to be women (Odds Ratio:1.70, 95% Confidence Interval: 1.0-2.9), about two times more likely to smoke crack (OR:2.11, 95%CI: 1.2-3.6) and have engaged in prostitution (OR:2.32, 95% CI: 1.4-4.0), and were slightly older (M=24.6, SD=4.9 vs. M=23.4, SD=4.4, p =.06). Over 2/5 (42%) of heavy smokers were HIV-positive. This is of particular concern given increased risk of opportunistic infections and cancers associated with cigarette smoking in PLWHA. Cigarette smoking in cocaine and heroin users presents slightly differently in SA than US and may be of even greater concern due to high prevalence of HIV/AIDS.

FUNDING: Funded by NCI training grant R25CA091934.1 and a grant awarded to William Latimer from NIDA’s Southern Africa initiative as a supplement to the parent study conducted in the United States (R01DA014498).

POS1-78
COMMITMENT AND CAPACITY FOR PROVIDING EVIDENCE-BASED TOBACCO TREATMENT IN U.S. DRUG TREATMENT FACILITIES
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Background: Although people with mental illness, including substance use disorders, consume 44% of cigarettes in the U.S., few drug treatment facilities treat tobacco dependence. This study identifies drivers of tobacco treatment. Methods: We administered surveys to a stratified sample of 405 clinic directors selected from an inventory of 3,800 U.S. facilities provided by SAMHSA. The main outcome was the 7-item Index of Tobacco Treatment Quality (ITTQ), a validated measure that yields a composite score for each facility. Predictors included (1) the Tobacco Treatment Commitment Scale (TTCs), a validated measure that yields a composite score of staff support for tobacco treatment, and (2) 15 items that assess facility capacity and resources for treating tobacco. Results: We used stepwise model selection to determine the relationship between capacity/resources and treatment quality. The final model retained 8 items and had a good fit (adj. R2=0.43). Four capacities significantly predicted treatment quality. We used SEM to test the impact of staff commitment on treatment quality; the model had good fit and the relationship was significant, with every 1 standard deviation increase in the TTCs yielding a half-score (.449) increase in the ITTQ (z=8.0, p<0.001). Adding the 8 capacity/resources to the SEM improved model fit (X2=143.971, p<0.001). The relationship between commitment and treatment quality was attenuated to 0.184 (z=4.147, p<0.001). Three capacity items remained strongly related to treatment quality, including (1) having a policy that requires staff to offer treatment (.559; z=5.021, p<0.001), (2) having dedicated staff time to treat tobacco (.397 z=5.559, p<0.001), and (3) having staff with skills in tobacco treatment (.367 z=3.839, p<0.001). Conclusions: In drug treatment, the quality of tobacco treatment is largely related to facility resources and capacity. Staff attitudes have a significant but lesser impact on treatment provision. As has been demonstrated in New York, mandating treatment provision is likely to be effective in improving adoption, and should be accompanied by skills development and efforts to create time for dedicated service provision.

FUNDING: This study was funded by the National Institutes on Drug Abuse (R21DA020489).

JUSTIFICATION: This is the first study to use validated measures of treatment quality and staff attitudes to examine drivers of tobacco treatment in drug treatment; policy makers and public health professionals can use results to advocate for policy changes to enhance widespread adoption of services.

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IS SMOKING CESSATION ASSOCIATED WITH THE SAME METABOLIC RISK IN MEN AND WOMEN?

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BACKGROUND: Smoking cessation has been shown to increase the short-term risk of type 2 diabetes (DM), with differences between men and women. The aim of the study was to assess the association between smoking cessation and the incidence of DM and impaired fasting glucose (IFG) in a European population and to test if there was an interaction for sex in this association. METHOD: Data from 4,974 participants from the CoLaus study in Lausanne, Switzerland, aged 35-75 at baseline and followed for 5 years were used. Participants were classified as smokers, recent quitters (quit for ≤5 years), long-term quitters (quit for >5 years), and non-smokers at baseline, based on self-reported. Altered glycemia at follow up was defined as either IFG (fasting serum glucose (FSG) 5.6-6.99 mmol/l) and/or DM (FSG ≥7.0 mmol/l) and/or treatment. We assessed the association between smoking status and incidence of altered glycemia using logistic regression with adjustment for age, education, physical activity, alcohol intake, hypercholesterolemia, hypertension, body-mass index, and waist circumference at baseline. RESULTS: There were 3,166 participants (63% women) with normal baseline FSG with 846 (26.7%) smokers, 207 (6.5%) recent quitters, 743 (23.5%) long-term quitters, and 1,370 (43.3%) non-smokers. During follow-up 1,358 participants (42.6%) developed an altered glycemia: 1311 (41.1%) IFG and 47 (1.5%) DM. In women, former and non-smokers tended to have increased odds of altered glycemia compared with smokers with ORs of 1.30 [95% confidence interval 0.83-2.04] for recent quitters, 1.03 [0.77-1.37] for long-term quitters, 1.10 [0.86-1.42] for never smokers. In men we observed an inverse association between smoking status and incidence of DM and impaired fasting glucose with ORs of 0.91 [0.57-1.45], 0.78 [0.56-1.10] and 0.92 [0.68-1.24]. There was a significant interaction for sex (p=0.003). CONCLUSION: We found no significant association between smoking cessation and the incidence of IFG or DM in our population. However, there was an interaction for sex; the risk of developing altered glycemia after smoking cessation tended to increase in women and to decrease in men.

FUNDING: The CoLaus study was and is supported by research grants from GlaxoSmithKline, the Faculty of Biology and Medicine of Lausanne, Switzerland and three grants of the Swiss National Science Foundation (grants #3200BO–105993, #3200BO–118308, #33C5CO122681). Joana Le Boudec is employed as a medical research resident by the Department of Ambulatory Care and Community Medicine at the University Hospital of Lausanne from December 1, 2012 to October 31, 2013. Carole Clair is partially supported by a grant “Medicine and gender” from the Faculty of Biology and Medicine of Lausanne.

JUSTIFICATION: This study improves knowledge about recently raised concerns on metabolic risk after smoking cessation, a relevant topic since weight gain and risk of diabetes in men and women are major public health issues.

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THE EFFECT OF A PRICE DIFFERENTIAL BASED ON NICOTINE CONTENT ON CIGARETTE CONSUMPTION: RESULTS FROM A TRIAL IN SMOKERS UNMOTIVATED TO QUIT

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Background: A nicotine reduction strategy is one approach that may help reduce the level of nicotine dependence in smokers, resulting in a greater chance of quitting. Aim: We undertook a randomised feasibility trial to determine if, in smokers unmotivated to quit, a price differential linked to nicotine content reduced cigarette consumption. Method: Thirty-three smokers, who were unmotivated to quit, from the Otago/Southland region of New Zealand were randomised to a control group where participants were free to purchase their usual brand cigarettes; or an intervention group in which two weeks before a 1st January 2013 10% tobacco excise tax increase, participants received 12 weeks free very low nicotine content (VLNC) cigarettes (<0.05mg nicotine yield per cigarette). Outcomes included change from baseline to 12 weeks in the daily mean number of regular cigarettes smoked per day (cpd) over the past week and the daily mean number of VLNC cpd over the past week (data collected by daily text message), salivary cotinine, and change in measures of addiction and quitting behaviour. Results: Intervention group smokers reduced the number of cpd smoked by approximately half, but replaced them with VLNC cigarettes. The net result was that a similar number of cpd were smoked by intervention participants, exposing them to a similar level of toxicants as the control group. No change in the number of cpd smoked was noticed after the tax increase. Reduction in all measures of addiction and increased quitting was observed in the intervention group compared to the control. Conclusion: In order to save money, smokers willingly halved their usual brand consumption, which led to reduced addiction scores and increased quitting behaviour. However the economic incentive of free VLNC cigarettes is unrealistic as a future government policy. A second study is planned whereby VLNCs are sold at a realistic price assuming an excise rate based on their toxicity, but reduced somewhat to reflect their reduced addictive potential.

FUNDING: This research was one project being undertaken as part of the New Zealand Tobacco Control Research T?ranga: A programme of innovative research to halve the smoking prevalence in Aotearoa/New Zealand within a decade. The T?ranga is supported through funding from the Reducing Tobacco-related Harm Research Partnership, co-funded by the Health Research Council of New Zealand and the Ministry of Health of New Zealand (HRC grant 11/818). This trial is registered with the Australasian Clinical Trials Network: ACTRN12612000914864

JUSTIFICATION: Making very low nicotine content cigarettes available at a considerably reduced price to regular cigarettes has the potential to reduce levels of addiction and reduce the prevalence of smoking.

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PATTERN RECOGNITION APPROACH TO CULTURALLY- TAILORED BEHAVIORAL INTERVENTIONS FOR SMOKING CESSATION: DOSE AND TIMING

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Introduction: Methods are underdeveloped for characterizing smokers’ complex behaviors during longitudinal multiple-component behavioral interventions. Culturally-tailored behavioral interventions target specific populations, but we need to learn how racial/ethnic groups respond to such interventions, when and how much cultural tailoring is useful. This NIH/NIDA funded methodological project presents a new robust pattern recognition approach to clarify the efficacy of such interventions. Method: We expand our pattern-recognition approach, developed in two NIH funded observational studies for pregnancy smoking, to longitudinal random controlled trials. We demonstrate this approach on a NIDA-funded
cognitive, culturally tailored, community-based RCT intervention for Korean-American smokers. Data (N = 109) are collected at baseline and at four follow-ups: at 1, 3, 6, and 12 months from the quit date, with missing rate less than 25%. This intervention has three components: cognitive behavioral therapy, cultural tailoring, and nicotine replacement therapy. Each component has four repeated measures, total 12 attributes. We characterize Korean smokers' cognitive responses using all attributes, and identify their distinct cognitive response patterns over the intervention period. We compare our method with 8 other traditional models. In addition to relating identified behavioral patterns to 6-month and 1-year abstinence status, patterns are associated with smoking-related mental conditions (e.g., depression) and symptoms of nicotine withdrawal. Conclusion: The timing and received intervention "dose" represented by patterns are identified. Intervention components are evaluated for different smokers. Our pattern-recognition approach uncovers important relationships missed by traditional approaches and provides new evidence on high-risk behavioral patterns that may be clinically important for early targeted intervention.

FUNDING: This study is conducted while the first author is at the University of Massachusetts Medical School. Supported by both the Pilot Project Award from NCCR 5UL1RR031962-04 and NIH/NIDA R01 1 R01 DA033323-01A1 to Dr. Fang and partially by NIDA 5K23DA021243-02 to Dr. Kim.

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POS1-83 SINGLE, DUAL, AND MULTIPLE TOBACCO PRODUCT USE AMONG US ADOLESCENTS AND YOUNG ADULTS

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Objective: To assess single, dual, and multiple tobacco product use among a national U.S sample of adolescents and young adults. Methods: We conducted a telephone survey that covered 1,596 16-26 year olds from all 50 states in the U.S. to assess their use of 10 different classes of tobacco products. We ascertained recent (within the past 30 days) tobacco product use among the 927 respondents that had ever used tobacco. Tobacco products included cigarettes and cigars (little filtered, cigarillos, and premium) and non-combustible tobacco products (chew, dip, dissolvables, e-cigarettes, hookah, snuff, and snus). We fit a multinomial logistic regression model to assess the demographic and behavioral characteristics of single, dual, and multiple (3+) use. Results: Among the 48% of tobacco user-s that recently used tobacco, 54% were single, 25% dual, and 21% multiple product users. Most single users smoked cigarettes. Most dual and multiple product users smoked cigarettes along with little filtered cigars, hookah, and e-cigarettes. We observed differences between sex within racial/ethnic groups for having ever used and current use of multiple tobacco products. White males were 1.6 times (95% CI, 1.4-1.9) more likely than white females to have ever used multiple tobacco products and 1.8 times (95% CI, 1.2-2.6) more likely than white females to have recently used multiple tobacco products. Black males were 2.0 times (95% CI, 1.6-2.5) more likely than black females to have ever used multiple tobacco products and 2.3 times (95% CI, 1.3-3.7) more likely than black females to have recently used multiple tobacco products. We also observed differences among racial groups within sex for having ever used multiple tobacco products. While white males were 1.4 times (95% CI, 1.0-2.8) more likely than black males and white females were 1.8 times (95% CI, 1.1-2.9) more likely than black females to have ever used multiple tobacco products. The likelihoods of having ever used and recent use of multiple tobacco products did not differ across age groups. Conclusions: Dual and multiple tobacco product use is common among adolescents and young adult tobacco users.

FUNDING: This project has been funded in part by the National Cancer Institute (CA077026; PI Sargent).

JUSTIFICATION: Dual and multiple tobacco product use common among adolescents and young adults.

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POS1-84 EFFECTIVENESS OF A COMMUNITY-BASED MOTIVATIONAL INTERVENTION TO REDUCE CHILD SECONDHAND SMOKE EXPOSURE IN LOW INCOME COMMUNITIES

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BACKGROUND: Motivational interviewing (MI) is an efficacious intervention for reducing secondhand smoke (SHS) exposure among children which promotes change in home smoking behaviors. However, there is little research on the feasibility and effectiveness of delivering such an intervention in a community setting. The Breathe Free For Kids (BFFK) project sought to implement and evaluate an MI intervention to reduce SHS exposure in the homes of children in three low-income, racially and ethnically diverse communities, delivered by community health workers (CHWs), using a community-based participatory research approach. METHODS: A two-arm randomized controlled design was used to compare MI with brief information and advice (usual best practice; UB). Both interventions were delivered by CHWs to primary caregivers of children under age 12 in their homes. Main outcomes assessed included SHS exposure of children in the home (past week), average nicotine levels in living room and child's bedroom, and child's salivary cotinine. RESULTS: Data were obtained from 138 parents/caregivers. Participants (91% female) were from ethnically and racially diverse backgrounds (32% Hispanic; 43% non-Hispanic/non-White). One third (36%) of participants were unemployed and 57% had a high school education or less. While air nicotine levels for both the MI & UB groups were relatively low compared with previous studies (means 1.85 & 2.08 μg/m3), self-reported home smoking (85.1 & 87.9 cigs/week) and child cotinine levels were relatively high (means 3.1 & 4.0 ng/ml). However, no significant differences were observed between the MI and UB groups at 6 month follow-up. CONCLUSIONS: Despite the lack of a significant MI effect, CHW delivery of the home based MI interventions was well received within communities. Factors such as historically low prevalence of in-home smoking, low baseline home SHS levels and use of mitigation strategies by participants may have influenced the observable outcomes. Further evaluation will investigate issues of competing priorities in this population, the quality of CHW MI training and support, and the sufficiency of the intervention dose.

FUNDING: Supported by NIH grant R24-MD-002772 from the National Institute on Minority Health and Health Disparities

JUSTIFICATION: This study demonstrates the effectiveness of implementing a brief motivational intervention into a home-delivered, community based setting

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POS1-85 EXPOSURE TO TOBACCO PROMOTION AMONG YOUTH IN THE NETHERLANDS

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Background: Exposure to tobacco promotion contributes to smoking onset in adolescents. While in many countries tobacco advertising is largely banned, adolescents still are exposed to ‘below-the-line’ marketing, as was shown in a recent survey among Australian youth (Perez et al., BMC Public Health 2012, 12:429). This paper presents a Dutch replication of the Australian study. Methods: In a telephone survey among a representative sample of 801 youngsters aged 12 to 24 years, self-reported exposure to tobacco advertising (sometimes/often) in the last month was measured in three areas: (1) at venues (events or festivals, pubs, clubs, nightclubs or bars, or retailers), (2) media portrayal (internet, movies, TV, video games, smartphone); (3) displays of cigarette packs at points-of-sale (supermarkets, grocery stores, convenience stores, petrol stations). Correlates of exposure, notably smoking status, education, age, gender, income, and number of smokers in household or among friends, were assessed with logistic regression analyses. Results: Dutch youths in general are frequently exposed to tobacco promotion at points of sale, on the internet, in entertainment media, and at various venues. This occurs primarily through media (76% movies), but also at venues
such as festivals, nightclubs, and bars (21-35%), at retailers (24-33%) and on the internet (32%). Exposure in smartphone applications, email, and regular mail is low (1-3%). Compared to Australia, cigarette pack displays in supermarkets in the Netherlands are an important source of exposure (35% vs. 65%). Smoking status and other characteristics (e.g., education, friends smoking) are correlated to exposure. Conclusions: Despite a comprehensive ban on tobacco marketing, Dutch youths are still frequently exposed to advertising through various channels. Overall, the level of exposure in the Netherlands appears to be somewhat higher than in Australia. The most striking contrast points to a difference in legislation: a cigarette pack display ban was introduced in Australia for large supermarkets, which was associated with much smaller exposure levels compared to the Netherlands that has no such legislation.

FUNDING: This research was funded by the Dutch Cancer Society and the Dutch Foundation on Smoking and Health (STIVORO)

JUSTIFICATION: Youth is still extensively exposed to tobacco marketing, but implementing further restrictions, in particular on point-of-sale cigarette pack displays, may be effective in reducing exposure.

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POS1-86
CHALLENGES IN ASSESSING EXPOSURE TO SECONDHAND SMOKE AMONG SMOKERS AND NON-SMOKERS USING SELF-REPORT MEASURES


Introduction: The health effects of secondhand smoke (SHS) are well-documented, and assessment of exposure to SHS, particularly for non-smokers, is a frequent component of statewide and national surveillance, in the US and internationally. However, as part of a larger study to explore the nature of SHS exposure in Minnesotans we found evidence of measurement error in some commonly used SHS surveillance items. In this study we examined the functioning of survey items designed to assess Minnesotans’ exposure to SHS in the workplace, at home, in vehicles, and in other locations. Methods: Cognitive interviews were conducted with 10 smokers and 10 non-smokers in order to identify possible measurement error with SHS surveillance items. Interviewees were stratified by gender, education, and geography (within the 7-county Twin Cities metropolitan area). Eight items designed to assess SHS exposure were tested; five items had been used in the past on the Minnesota Adult Tobacco Survey and three new items were tested. Both think-aloud and follow-up probes were utilized throughout each of the interviews. Results: Half of non-smokers reported to have been exposed to SHS in any location, although the nature of this exposure was found to be typically minimal and rarely did it occur indoors. Due to the wording of some existing items, some respondents included indoor and outdoor exposure to SHS in the workplace, indicating that exposure to SHS in the workplace is likely over-reported. A related finding is that the wording of some existing items allowed for the respondent to include exposure to third hand smoke as well as to SHS. Conclusions: These results lead to the overall conclusion that some items currently utilized in SHS surveillance may be answered by respondents in ways that result in poor measurement of the intended construct. Specifically, some of these items, as currently worded, may measure smoking rules or behaviors, rather than exposure to SHS. Particular attention to the purpose of the item and the intended use of the survey results should be carefully considered.

FUNDING: Funding for this research was provided by ClearWay Minnesota.

JUSTIFICATION: The findings from this study could be used to directly inform decisions about items to include on state and national tobacco surveillance instruments that use some of the tested items; data from these surveys is used to inform policy, programming, and to set priorities.

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POS1-87
THE OTHER COMBUSTIBLE PRODUCTS: PREVALENCE AND CORRELATES OF LITTLE CIGAR/CIGARILLO USE AMONG CIGARETTE SMOKERS

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BACKGROUND: The use of little cigars and cigarillos (LCCs) in the U.S. is increasing. Given the exemption of cigars from federal regulation of tobacco, this pattern may continue. Despite this, little is known about the prevalence, harm perceptions, and correlates of LCC use, particularly in smokers who may use LCCs in place of more tightly regulated cigarettes. METHODS: This study analyzed data from 1,487 current and former smokers who completed the 4th wave of the Legacy Longitudinal Smoke Cohort (LLSC). Unweighted frequencies of LCC awareness, use and purchase were calculated, as were harm perceptions, and use of other tobacco products. Weighted logistic regression models were used to determine correlates of use. RESULTS: The majority of the sample (87%) was aware of LCCs, 46% had ever tried and 21% had ever purchased LCCs. As opposed to those who never used LCCs, LCC-users were significantly more likely to be male (64.6% vs. 33.9%, p<0.001), and significantly less likely to report owning a home (51.2% vs. 62.9%, p<0.001) or having a retirement fund outside of social security (44.2% vs. 51.1%, p<0.001). LCC-users were more likely than non-users to perceive LCCs as less harmful than cigarettes (14.0% vs. 8.1%, p<0.001) and more likely to have used other tobacco products, including e-cigarettes (21.2% for users vs. 11.4% for non-users, p<0.001), snus (24.3% vs. 4.6%, p<0.001), chew/dip/snuff (38.6% vs. 8.1%, p<0.001), and dissolvables (7.4% vs. 1.26%, p<0.001). There were no significant differences between LCC-users and non-users in cigarette smoking status (current or former smoker) or nicotine dependence. CONCLUSIONS: A high percentage of current and former smokers have at least tried using LCCs, and this population may be more likely than non-LCC-users to have experimented with other tobacco products as well. Findings suggest that efforts to educate the public about the harms associated with combustible LCCs are necessary, as is policy to curb LCC use and reduce the consequences of tobacco-related illness in the U.S.

FUNDING: Research was funded internally by Legacy

JUSTIFICATION: This data helps clarify the degree to which smokers are co-using other harmful combustible products (little cigars/cigarillos), which can inform prevention and treatment efforts

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POS1-88
TRIAL RESULTS OF A NOVEL ONLINE CESSATION PROGRAM INTEGRATING A COMMERCIALIZATION ELEMENT TO PROMOTE ENGAGEMENT IN COLLEGE STUDENT SMOKERS

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Maintaining engagement in online health promotion programs is a challenge. Thus, we tested the feasibility, acceptability, and potential efficacy of an interactive online cessation intervention for college smokers that provided deals for healthy services/goods from vendors near campuses to incent participation. In Spring 2013, 10,000 randomly selected students at two Southeastern colleges were recruited to complete an online screening survey (response=20.0%, n=2,002). We randomly selected 200 respondents who smoked in the past 30 days, enrolling 122 (61.1%) of the respondents assigned. The control condition involved 12 online modules delivered bi-weekly over 6 weeks with content from the American Cancer Society’s Guide to Quitting Smoking. The intervention involved 12 modules related to young adult smoking (e.g., progressing addiction, concurrent drinking) delivered over 6 weeks. Intervention participants also completed a timeline follow-back of the number of minutes exercised, drinks consumed, and cigarettes smoked each day; received a graph of their behaviors over time; and received deals (e.g., athletic club passes, massage therapy) from vendors close to their campus. We conducted assessments at baseline, end-of-treatment (EOT), and 12-week follow-up (FU). Participants smoked 14.3 (SD=11.7) days of the past 30 at baseline. Both groups
were satisfied with the programs; 90% said they would recommend it to friends. The intervention vs. control condition demonstrated greater adherence over the 6-week period (73% vs 34%, respectively), with twice the visits and pageviews (p<.001). Overall, 55.6% learned about a new business through this program; 37.0% told someone about one of the businesses. Regarding smoking, the groups were not different at EOT or FU except control vs. intervention participants more frequently made a quit attempt at EOT (63.3% vs 41.8%, respectively, p=0.02). However, intervention participants smoked marginally fewer cpd at EOT (p=0.06). Both groups showed significant cessation rates at EOT (control 16.3%; intervention 20.0%). The intervention showed promise for increasing engagement, addressing smoking, and being a commercially supported tool.

FUNDING: This research was supported by the National Center for Advancing Translational Sciences (1R43TR000358-01; PI: Sokol) and the Georgia Cancer Coalition (PI: Berg).

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**POS1-89**

**DESIGN CHARACTERISTICS AND METAL CONCENTRATIONS OF CIGARETTES FROM THE INTERNATIONAL TOBACCO CONTROL (ITC) SURVEY PARTICIPANTS IN THE U.S., U.K., MEXICO, THAILAND, AND MAURITIUS FROM 2010-2011**

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In order to compare physical cigarette design features and tobacco metal content of cigarettes packs between countries, participants in the U.S., U.K., Mexico, Thailand, and Mauritius International Tobacco Control (ITC) surveyed from 2010-11 sent a pack of their current brand of cigarettes. Eligible participants in each country willing to send in a pack of their regular brand of cigarettes did so (N=1,317 packs), and 50 packs were selected at random from each country for testing. Basic cigarette design characteristics such as cigarette/filter length and weight, ventilation, and tobacco moisture were assessed. Fifty packs from each country were also selected at random for testing, using polarized energy dispersive x-ray fluorescence (XRF), of arsenic (As), cadmium (Cd), chromium (Cr), nickel (Ni), and lead (Pb) concentrations. When analyzing the cigarette design characteristics by country, cigarette length (p<0.01), tipping paper (p<0.01), tobacco length (p<0.01), filter length (p<0.01), filter weight (p<0.01), pressure drop (p=0.006), ventilation (p<0.01), per-cigarette weight (p<0.01), filter density (p<0.01), and rod density (p<0.01) were all statistically significant. When analyzing design features by manufacturer, ventilation, filter density, tipping paper length, and percentage of tobacco moisture were all found to be statistically different (p<0.01). When mean metal concentrations were assessed by country, Cr (p<0.01), Ni (p<0.01), As (p<0.01), Cd (p<0.01), and Pb (p<0.01) showed significant differences. The countries with the highest average metal concentrations were as follows: US for Cr (1.99ug/g), Thailand for Ni (2.23ug/g), Mexico for As (0.29ug/g), Thailand for Cd (1.64ug/g) and the UK for Pb (0.43 ug/g). Cigarette design characteristics and metal concentrations vary considerably by country. Future work involves examining association between design and metal concentrations with participant demographics, smoking behaviors, and beliefs about cigarettes.

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**POS1-90**

**SECONDHAND SMOKE EXPOSURE AND MITIGATION STRATEGIES AMONG A NATIONAL SAMPLE OF HOME VISITATION WORKERS**

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BACKGROUND: Currently, all 50 US states have partial or full bans on indoor smoking in the workplace. Although these bans have been effective in protecting workers, and children from secondhand smoke (SHS), certain workers, such as those whose work requires in-home visits, are not fully protected by these laws from occupational SHS exposure (SHSe). A cross sectional survey was used to document SHSe and mitigation strategies among in-home workers from 48 US states. METHODS: Eligible participants were individuals whose work currently required in-home visits with families who attended the 2011 Annual Early Head National Conference meeting. Outcome measures included self-reported SHSe and incidence of discussion with clients to reduce home SHS in the past month. Multivariable logistic regression was conducted to predict SHS discussion, with demographic and work variables chosen using backward stepwise regression. The final regression included number of in-home visits per month, number of visits during which the participant smoked, smoking confidence discussing SHS risks, concern about clients’ and their families’ SHSe, and age. RESULTS: The likelihood of discussing ways to reduce SHS at home with clients increased significantly with the number of in-home visits made per month (OR=1.05, p=0.0001); smoking smoke during 1-5 visits (OR=3.46, p=0.039); and participant age (OR=1.07, p=0.017). Likelihood decreased among those who reported little confidence in discussing SHS risks with clients (OR=0.22 p=0.007), or none (OR=0.15, p=0.041). Compared to participants who were very concerned about clients and their families’ SHSe, participants who were somewhat concerned were significantly less likely (OR=0.35, p=0.029) to discuss SHSe with their clients. CONCLUSIONS: Self-reported SHSe occurs regularly among early childhood workers in the course of their home visiting duties. Exposure was greater among workers with lower confidence in engaging clients in discussion of SHS and younger age. Agencies should consider implementing programs that address worker self-efficacy and issues of social risk, while providing resources to reduce SHSe during in-home visits.

FUNDING: Supported by NIH grant R24-MD-002772, from the National Institute on Minority Health and Health Disparities (NIMHD).

JUSTIFICATION: The data have the potential to shape future policy in home-visiting agencies, such as Early Head Start, to protect workers from secondhand smoke exposure

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**POS1-91**

**EVALUATION OF THE DETERMINANTS OF SMOKING CESSION AMONG CURRENT AND FORMER SMOKERS IN SOUTH KOREA: THE KOREA NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY FROM 2008 TO 2009**

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Introduction: Assessments of the determinants of smoking cessation as well as tobacco use prevalence and secondhand smoke exposure are critical for evaluating the progress of tobacco control programs. We conducted this study to identify these determinants among adult smokers using the data from the Korea National Health and Nutrition Examination Survey from 2008 to 2009. Methods: Our analysis was conducted with a cross-sectional study design. We obtained distributions of self-reported motives for smoking cessation including “because of current deterioration of health,” “to maintain good health in the future, although currently no health problem has been found,” “to protect family members’ health,” “because of increasing cigarette prices,” or “because of tobacco control mass media campaigns.” Respondents who reported smoking at least 100 cigarettes in their lifetimes and who, at the time of survey, either did or did not smoke currently were defined as former (n = 2,430) and current (n = 1,823) smokers,
respectively. A pooled survey weight for the 2008 and 2009 data sets was applied to take the complex sampling design into account. Results: Among both current and former smokers, the two main motives for smoking cessation were (1) to maintain good health in the future, although currently no health problem has been found (47.5% and 37.2%, respectively), and (2) because of current deterioration of health (20.2% and 27.6%, respectively). Approximately 11 to 12% of current or former smokers reported that they had quit or tried to quit smoking to protect their family members' health. However, less than 2% of current or former smokers reported that their cessation was influenced by increasing cigarette prices or mass media campaigns. Conclusions: We provided quantitative evidence supporting the necessity of strong health concern-oriented smoking cessation strategies in South Korea. This baseline information may be useful for future evaluations of the progress of the national tobacco control programs recently implemented in South Korea.

FUNDING: No funding

JUSTIFICATION: This baseline information may be useful for future evaluation of the progress of national tobacco control programs recently implemented in South Korea.

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POS1-93
ENVIRONMENTAL TOBACCO SMOKE AND NEUROMOTOR PERFORMANCE IN APPALACHIAN CHILDREN

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Secondhand smoke (SHS) exposure remains an important public health concern, especially in children and Appalachian communities, despite widespread smoke-free laws and tobacco control policies. Previous studies on neurotoxic effects of SHS primarily focused on health neurobehavioral outcomes, despite the fact that neuromotor functions play an important role in child’s normal developmental course, cognition, and social interactions. The objective of the study was to estimate the prevalence of SHS exposure in 7-9 year old Appalachian children and associated neuromotor deficits using standardized neuromotor tests. Exposure to SHS was determined by self-reported and serum cotinine measurements. A comprehensive neuromotor assessment using Halstead-Reitan Finger Tapping Test, Purdue Grooved Pegboard Test, and brief version of Bruininks-Oseretsky Test of Motor Proficiency – 2 was administered to 7-9 year old children residing in Washington and Guernsey Counties, Ohio. Approximately 50% of Appalachian children were exposed to SHS based on serum cotinine measures. Parental education and parental IQ were significantly and inversely associated with serum cotinine levels in children. After adjustment for parental education, parental IQ, blood lead, blood and hair manganese, there was a significant inverse association between serum cotinine and child’s performance on visuo-motor coordination, fine motor precision, fine motor integration, balance, upper-limb coordination, and strength. Exposure to SHS is associated with deficits in fine and gross motor skills and visuo-motor coordination in Appalachian children. Our findings support the efforts to encourage smoke-free households, where children are primarily exposed to SHS. Future research should confirm the causality of these findings, and whether these neuromotor deficits in childhood continue to persist into adolescence affecting their postural stability or risk for falls and injuries.

FUNDING: This study was supported by National Institute of Environmental Health Science 1R01 ESO16531-01; ST32ES10957, RO1ES016531, R03 HD059615-01 and Center for Environmental Genetics-New Investigator Scholar NIEHS P30-ES006666.

JUSTIFICATION: This study can encourage health educators in examining and exploring how risk communication messages and effective strategies geared towards smoking cessation in Appalachian communities can be employed.

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POS1-94
HEALTH CARE PROVIDER ADVICE FOR ADOLESCENT TOBACCO USE: FINDINGS FROM THE 2011 NATIONAL YOUTH TOBACCO SURVEY

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Background: Health care providers play an important role in promoting tobacco use abstinence among adolescents. The purpose of this study was to provide nationally representative data on the prevalence of health care provider tobacco use screening and advice delivered to adolescents. Cessation behaviors and correlates of past year quit attempts among current smokers are also explored. Methods: Data came from the 2011 National Youth Tobacco Survey, a nationally representative, anonymous, self-administered, school-based survey of adolescents in grades 6 through 12 (n=18,385). Health professional screening and advice were assessed by smoking status and demographic characteristics. Multiple logistic regression models were constructed to assess the association between advice and past year quit attempts. Results: The overall prevalence of current cigarette smoking was 10.8% (95% CI 10.1%, 11.5%). Established smokers who smoked 20 or more of the past 30 days, and 7.2% were non-established smokers who smoked between 1 and 19 of the past 30 days). 9.0% were former smokers quit <1 year and 8.4% were former smokers quit ≥1 year. Among all respondents, the prevalence of being asked about tobacco use by a health care provider was 32.2%; the prevalence of being advised to quit or avoid tobacco was 31.4%. Established smokers were more likely than other groups to report health care provider assessment of tobacco use and advice. Among current smokers, receipt of provider advice was associated with a higher adjusted odds of having made a past year quit attempt (OR=1.46, 95% CI:1.18, 1.80). Conclusion: Less than one-third of adolescents report being asked about tobacco use or being advised not to use tobacco. Increased tobacco use intervention by health care providers is needed to prevent initiation and increase cessation.

FUNDING: There were no sources of funding, either direct or indirect, for the report research.

JUSTIFICATION: These data suggest that additional interventions and/or educational efforts may be needed to increase health care provider screening and advice to all adolescents - both those who currently smoke and those who do not.

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ARE E-CIGARETTE COMPANIES TARGETING YOUTH? AN EMPIRICAL STUDY BASED ON SOCIAL MEDIA

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Background: As the e-cigarette industry increases their promotional efforts through traditional and online marketing channels, there has been a major concern about whether youth has been targeted by such efforts. There is a critical need for empirical findings on the impact of e-cigarette promotional messages on youth. This study investigates how social media platforms have been used by e-cigarette companies to reach youth. Methods: We selected two representative social media sites as our study targets, namely YouTube and Sina Weibo (the most popular Chinese microblogging website). A set of e-cigarette related keywords was submitted to the official search engines of the two sites. For each search, the top 20 results returned by YouTube and the top 1000 results returned by Sina Weibo were collected. A final sample of 196 videos and 999 messages was analyzed. The youth access to such e-cigarette information was also determined by assessing whether YouTube and Sina Weibo have any age restriction to view these videos and messages. Results: For our dataset, 94% (n=185) of the 196 YouTube videos and 68% (n=677) of the 999 Sina Weibo messages were promoting e-cigarette use. There are four categories of induction information from these promotional messages. The first category exaggerates the benefits of e-cigarette use. The second category aims to ease the public concerns of e-cigarette use. The third category tries to promote the ‘cool’ factor of e-cigarette use through images of fashion or positive association. The last category contains offers to lower the barriers to e-cigarette purchases. None of the sampled e-cigarette videos in YouTube and messages in Sina Weibo blocks youth viewing. Notably, males and females of 13-17 years were found among the main audience of two promotional videos in YouTube. Conclusion: E-cigarette companies are targeting youth through social media applications. Given the prevalence of social media use among youth, research is critically needed to gain a better understanding of such youth-targeting strategy and practice, with public policy implications.

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JUSTIFICATION: This study could help public health authorities gain a better understanding of e-cigarette information in social media and inform regulatory decision making.

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AN INVESTIGATION OF EVERYDAY ENCOUNTERS WITH ANTI-SMOKING WARNINGS

Alexandra Hunn, Stuart G. Ferguson, Ph.D.*, Jenn L. Scott, Ph.D., and Natalie Schüz, Ph.D.

Information about the health risks associated with smoking is encountered in a variety of forms in everyday life. The use of graphic health warnings on tobacco products is mandated by law in numerous jurisdictions around the world. Lab-based studies indicate that such warnings are perceived as important and effective, are successful in increasing knowledge of smoking-related disease, and induce fear and cessation-related thoughts. While these findings are promising, the impact of smoking health warnings in day-to-day life has not been assessed in detail. The current study employed ecological momentary assessment (EMA) to assess the everyday encounters with anti-smoking warnings of 30 smokers and 24 never-smokers. Participants were required to carry modified smartphones for up to three weeks (912 subject days of monitoring in total) and to report encounters with smoking warnings along with responding to randomly scheduled prompts; current smokers were also required to report cigarettes smoked. Assessments focused on attitudes and reactions to the health warnings, perceived risk, and motivation to quit. Our results suggest that, compared to non-smokers, current smokers encounter significantly more health warnings during their day-to-day activities (2.02 vs 0.54 warnings per day), although the absolute number was surprisingly low given that package warnings are designed to be encountered each time a cigarette is smoked. While some under-reporting is possible, the findings suggest that warnings may be ignored, avoided, or covered. Feelings of vulnerability to smoking-related disease were not significantly higher in smokers than never-smokers, suggesting a strong optimistic bias of the smokers in this sample. Feelings of vulnerability were found to predict smokers’ intention to quit. Furthermore, both smokers and never-smokers reported higher feelings of vulnerability when health warnings were present. The results of this study suggest that while smoking-related health warnings may not be consciously encountered as frequently expected, they do appear to be related to intentions to quit.

FUNDING: This study was funded by the University of Tasmania’s Research Enhancement Grant Scheme (NS)

JUSTIFICATION: Important to understand the extent of tobacco warnings

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A SMOKE-FREE COMMUNITY HOUSING POLICY: CHANGES IN REPORTED SMOKING BEHAVIOUR – FINDINGS FROM WATERLOO REGION, CANADA

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BACKGROUND: In October, 2009, Region of Waterloo Council (Canada) approved a smoke-free housing policy for all regionally owned and operated affordable rental housing units (2722 households). This policy came into effect on April 1, 2010 and made all new leases signed with Waterloo Region Housing 100% smoke-free (including balcony or patio areas). Existing lease holders were ‘grandfathered’ – meaning they could still smoke in their units. Tenants have been surveyed over time to understand support for the policy, reported exposure to secondhand smoke, and impacts on smoking behavior. METHODS: An envelope containing a cover letter that described the smoke-free housing policy, the survey questionnaire, and a letter that provided instructions on how to access language translation support for completing the survey was delivered by a private courier to every household in the portfolio in the winter of 2010 (pre-policy), and the winter of 2011 and 2013 (post-policy). RESULTS: The survey was completed by 26% of households (n=717) in 2010, 25% of households (n=685) in 2011, and 23% (n=618) in 2013. At the time of the post-policy survey, the proportion of households that had a smoke-free lease was approximately 12% (2011) and 31% (2013). Reported support for the policy was 72% pre-enactment (2010), and increased to 79% in 2013 (p=0.003). In 2010, the majority of respondents reported they are exposed to secondhand smoke (SHS) in their home at least sometimes (58%); in 2011 and 2013, 50% reported they are exposed to SHS in their home. Of respondents who identified as smokers, 41% reported they had tried to quit in the last year (2010 and 2011) and 45% in 2013. Since the policy, 45% (2013) of smokers reported they go outside to smoke more often than before the smoke-free housing policy.

CONCLUSIONS: After 3 years, approximately one third of households have a smoke-free clause in their lease. The housing policy is associated with positive changes in smoking behavior and exposure including increased quitting attempts, an increase in reported outdoor smoking, and reduced reported exposure to SHS. Support for the policy increased modestly after it was implemented.

FUNDING: This study was funded by the Region of Waterloo and the Propel Centre for Population Health Impact (CCSRI – Canadian Cancer Society Research Initiative).
Poster Session 1 • Thursday, February 6, 2014 • 11:30 a.m.–1:00 p.m.

**POS1-98**

#CALLTOACTION: TWITTER AS AN E-CIGARETTE ADVOCACY PLATFORM

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Introduction: Twitter, a microblogging website, has the potential to be used as a dynamic platform to influence public opinion on a range of issues related to electronic cigarettes (ecigs). Tracking and analyzing tweets may provide insights into attitudes towards ecigs and potential regulation of these products. Methods: Tweets were captured for 30 consecutive days (May 5–June 6) at the same time each day. We identified tweets by entering four keywords (ecig, ecigs, electronic cigarette, vaping) in the Twitter search Application Programming Interface https://twitter.com/search-home. Two data analysts independently coded each tweet into one or more of the 17 mutually exclusive categories. Each tweet was reviewed and discrepancies were discussed. Qualtrics, a data collection and analysis software program, was used to assist with data analysis. Results: 1467 tweets were captured. Fifteen percent of tweets were coded as “advocacy” (4th most common category with 217 tweets). Eighty-eight percent (n=189 tweets) of the advocacy tweets were related to potential regulatory bans. Of the 189 ban tweets, 140(74%) were against a prospective ban, 7(4%) were in favor of a ban(e.g. tweet: “they definitely need to make a law against smoking a ecig in restaurants”), and 42(22%) were neutral. Fifty-seven percent (n=108) of the ban tweets contained the hashtag, #EUEcigban; indicating a trending topic, and referring to the potential ban within the European Union (e.g., tweet: “cigs have the potential as long-term alternatives to tobacco to make the virtual elimination of tobacco a realistic target #EUEcigban”). Conclusion: Twitter is a free social media tool that has the potential to reach a vast number of people with timely public health information. This analysis indicates that Twitter is being used to disseminate information about ecig regulations. These tweets are also predominately from ecig users who are arguing against current proposals to regulate ecigs. There is a need for public health professionals to participate in the conversation to ensure the dissemination of accurate information that is consistent with promoting public health goals, and to counter misinformation.

**FUNDING:** No Funding.

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**POS1-99**

"QUIT TO WIN CONTEST" TO PROMOTE SMOKING CESSATION: A RANDOMIZED CONTROL TRIAL ON THE EFFECTIVENESS OF BRIEF AND BEHAVIORAL INTERVENTIONS

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Background and aim: The “Quit and Win” program has been organized all over the world to use monetary incentives to motivate smokers to quit. Few previous programmes had tested the effectiveness of additional interventions in helping the participants. Methods: A 3-arm cluster randomized controlled trial was conducted to evaluate the effectiveness of face-to-face brief counselling (Intervention group: n=265) and Short Message Service (SMS group: n=419), compared with no counselling and SMS (Control group: n=432), to motivate participants of the Hong Kong Quit-to-Win Contest to quit. The “Counselling group” had a brief on-site and two telephone counselling sessions, while the “SMS group” received 16 motivational messages in 4 weeks after joining the Contest. All participants received a self-help smoking cessation booklet and were followed up at 3 and 6 months. Results: The self-reported 7-day point prevalence quit rates at 6 months for the three RCT groups were 10.6%, 6.7%, and 11.3%, respectively. The rates of smoking reduction by 50% or more were 29.8%, 23.6%, and 26.6%, respectively. There were no significant differences in the two outcomes between any of the groups. No significant changes in the perceived importance, difficulty, and confidence of quitting were detected in the three groups. Conclusions: We found no evidence to support that brief behavioral interventions could boost up the quit rates or improve the perceptions of quitting among participants who joined the Quit and Win programme. Future studies on additional interventions for the Quit and Win programme should consider other non-behavioral or more intensive interventions to increase quitting.

**FUNDING:** The project was funded by the Hong Kong Council on Smoking and Health.

**JUSTIFICATION:** We found no evidence to support that brief behavioral interventions could boost up the quit rates or improve the perceptions of quitting among participants who joined the Quit and Win programme.

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POS1-101
UTILIZING FACEBOOK ADVERTISEMENTS TO RECRUIT UNDERREPRESENTED SMOKERS INTO A SMOKING CESSATION STUDY
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Background: An estimated 149 million Americans use Facebook (FB) every month. While 86% of FB users are young adults, 62% are male, and 68%-72% of racial/ethnic minorities are regular users of social media (i.e., FB, Twitter, Instagram, Pinterest, Tumblr), FB has not yet been examined as a means of recruiting these underrepresented groups into research studies. This study explored FB as a vehicle to recruit males, adults under 40 years of age, and non-Hispanic Blacks into an ongoing NIH-funded smoking cessation study stratified by race (White, Black), gender, and age (18-40, >40). The study also compared recruitment costs for Facebook and radio advertising. Methods: Two identical FB advertisements were composed targeting males and females under 40 years of age residing in the greater Kansas City area. Radio ads were similar in content to the FB ads and were targeted by selecting stations based on listener demographic. Specifically, the majority of radio ads were featured on stations with a high volume of listeners who were young adults and racial/ethnic minorities. Results: 194 smokers have been enrolled to date. Over a 4-week period, $280 was spent on FB. During this time frame, FB ads reached 17,000 users and resulted in 484 likes, 35 private messages, 20 individuals screened, and 10 eligible participants (50% eligibility rate) for a cost of $28 per eligible participant ($280/10 eligible). 100% (10/10) of those eligible through FB were within the targeted demographic (7 male, 10 under 40, 1 non-Hispanic Black). Within the same 4-week period, $2,860 was spent on radio ads. Radio ads resulted in 204 calls to the study line, 98 individuals screened, and 32 eligible participants (33% eligibility rate) for a cost of $89 per eligible participant ($2,860/32 eligible). 78% (25/32) of radio ad responders were within the targeted demographic (14 male, 25 under 40, 14 non-Hispanic Black). Conclusion: Facebook ads are a cost-effective method of recruiting underrepresented cohorts of smokers, particularly males and adults under 40 into smoking cessation studies.

FUNDING: Conducted at the University of Kansas School of Medicine and Swope Health Services with support from the National Institute on Drug Abuse R01DA031815.

JUSTIFICATION: Facebook advertisements are a cost-effective method of recruiting males and adults under 40 into smoking cessation studies.

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POS1-102
IS EVERY SMOKER INTERESTED IN PRICE DISCOUNTS? AN EVALUATION OF PRICE-RELATED DISCOUNTS BY CIGARETTE BRANDS
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Background: Raising unit price is one of the most effective ways of reducing cigarette use. However, price-sensitive smokers used a variety of strategies to mitigate the effect of rising price of cigarettes on their smoking habits. In particular, these smokers may switch to cheaper brands or use discount coupons. Studies have shown that 23%-34% of adult smokers in the U.S. use cheaper brands of cigarettes in response to higher cigarette prices, and 18%-49% use coupons or promotions. Little is known about how patterns of discount use vary by types of brands. Objectives: To evaluate the impacts and the determinants of price-related discount use by cigarette brands. Methods: The price-related discount includes coupons, rebates, buy 1 get 1 free, 2 for 1, or any other special promotions. Using data based on 15,563 current smokers from the 2009-2010 National Adult Tobacco Survey (NATS), a stratified nationally representative landline and cell phone survey, multivariate analyses were performed by type of cigarette brands. The premium brands include Camel, Kool, Marlboro, Newport, Pall Mall, Parliament, Salem, Virginia Slims, and Winston. The brand names of Basic, Doral, GPC, Misty, Sonoma, and USA Gold are considered as generic. Results: Discount use was most common among premium brand users (22.06%), followed by generic and other brand users (13.30% and 10.79%). Among smokers of premium brands, females, younger smokers, greater daily smokers and dual users of cigarettes and other tobacco products were more likely to use discounts, whereas African Americans, those with college education and above, and those with higher household income were less likely to do so. Among smokers of generic brands, those who had no quit intentions, and those who were more nicotine dependent were more likely to use discounts. Conclusions: Discount users’ socio-demographic and tobacco use characteristics are different between smokers of premium and generic brands. Strategies such as setting a high floor price for cigarettes together with limiting the use of coupons and promotions need to be considered to help uphold the effect of taxes to reduce the prevalence of smoking.

FUNDING: No Funding

JUSTIFICATION: Strategies such as setting a high floor price for cigarettes together with limiting the use of coupons and promotions need to be considered to help uphold the effect of taxes to reduce the prevalence of smoking.

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POS1-103
MODERN USES FOR AN ANCIENT PRACTICE: YOUNG ADULTS’ KNOWLEDGE, BELIEFS, AND USE OF HOOKAHS
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OBJECTIVES: Relatively little is known about the perceptions, beliefs, and use behaviors of hookah smokers, such as how and why they use, and what influences maintenance of use. This qualitative project sought to assess reactions to this emerging product and the methods that are used in advertising hookah smoking venues. METHOD: Focus groups were conducted to encourage a natural dialogue between participants (two groups, N=15; mean age = 22.5 range 18-26 years). The participants viewed a hookah and related materials. Participants were selected based on ever hookah use. A trained moderator led a semi-structured discussion; groups were audio recorded and transcribed, and open coding was used to extract themes. RESULTS: In their last hookah smoking session, all participants (100%) reported sharing a hookah with others, 86% shared a hose and mouthpiece, and 93% smoked flavored tobacco. Participants attributed: increased use as being related to increased health risk, less harm to those who don’t inhale, and health risks were less than regular cigarette smoking. Users also commonly deviated from the traditional shisha-charcoal-water trio with 29% reporting mixing or replacing the water in the bowl with other liquids such as alcohol, flavored beverages, milk, and/or ice. Novel activities, such as blowing smoke bubbles and smoke rings, were cited as an important aspect in hookah use. Many (36%) reported smoking at a commercial hookah café and cited both location and word of mouth as the most important forms of advertising for these establishments. CONCLUSIONS: These focus groups found that young adults are engaging in hookah use in both traditional and innovative ways, including variations in the product they are smoking and the liquid they are using in the bowl. Experimenting with different ways to smoke hookah was attractive to this group and raises the need for future research, especially as it relates to the use of alcohol in the hookah. With rapidly increasing appeal and use rates of hookah among young adults, it is imperative that additional regulations be implemented to limit the manufacture, distribution, and marketing of hookahs and their associated products.

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POS1-104
UNASSISTED SMOKING CESSATION IN ARGENTINA

Background: Currently, pharmacotherapy to help smokers quit is one of the most cost-effective medical interventions available. The increasing promotion of this intervention, mainly by the pharmaceutical industry, has made the fight of tobacco control a medicalized practice, even though the majority of former smokers quit unaided. In Argentina although 90% quit smoking without assistance 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, Argentina. 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 Buenos Aires. Analysis was based on grounded theory. Results: Participants were 50% women with a mean age of 36 years old; most participants had completed high school or more years of formal education. “Cold turkey” turns out to be one of the strategies used although in some cases the strategy of postponing the cigarette linked to certain daily practices and declared “no smoking” produced less anxiety and proved to be effective and will power and being convinced they wanted to stop. The most significant reasons for quitting were the desire of improving health, feeling free of tobacco dependence, pregnancy and their children, who sometimes were the ones who asked their parents to quit smoking. The interviewees were thinking about the benefits brought by quitting smoking, the creation of smoke-free places, having family and friends support and recognize of and quitting at the same time with some friends or family members. The main obstacles in the process were being in smoke-permitted places, withdrawal symptoms, difficult to imagine without the “company of a cigarette” and the fear of not being able to quit. 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.

FUNDING: This study was funded by grant International Development Research Center de Canada - IDRC.

JUSTIFICATION: Unassisted cessation is the most successful method used by ex-smokers, this point should be accepted and reported as one of the most important messages from health professionals and public health authorities.

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POS1-105
SALES OF ELECTRONIC CIGARETTES VS. TRADITIONAL CIGARETTES AT GAS STATIONS: OPPORTUNITY FOR CESSSION INTERVENTION

In light of anti-tobacco campaigns across the U.S., electronic cigarettes (e-cigarettes) have surfaced as a potential alternative to smoking. Though not approved by the FDA as smoking cessation devices, the popularity of e-cigarettes appears to be on the rise with sales doubling in the last year for adolescents (CDC, 2013). To examine sales of this emerging product, we visited 40 gas station convenience stores and recorded if traditional cigarettes, e-cigarettes, or nicotine replacement therapy (NRT) products were sold. In addition, we asked the sales staff within the stores if they believed sales of each of the products were decreasing, staying the same, or increasing at their store. Finally, we asked the sales staff to explain why they thought sales of the different products were changing or staying the same. All 40 of the gas stations sold traditional cigarettes, all but one sold e-cigarettes (n=39), and none sold NRT products. Of the gas station attendants who commented on sales in their stores, 20.6% believed e-cigarette sales were increasing a little and 58.8% believed sales were increasing a lot. The majority (70.6%) of gas station attendants perceived traditional cigarette sales were staying the same. Additionally, at gas stations where e-cigarettes were sold, 35.9% of the attendants reported e-cigarette sales were increasing because people are trying to quit smoking traditional cigarettes. This pilot study demonstrates the increasing trend of e-cigarette use among patrons who frequent gas stations. Furthermore, some individuals are perceiving e-cigarettes as smoking cessation devices. There are many tobacco users looking for products to help with tobacco cessation, however, e-cigarettes may be the only non-tobacco nicotine replacement available at gas stations. While NRT sale restrictions vary from state to state, the convenience and availability of gas stations for many tobacco users may make gas stations ideal locations for placement of NRT products. Health professionals should consider using gas stations as an intervention location to aid in smoking cessation using FDA approved NRT products.

FUNDING: No Funding

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POS1-106
PERCEIVED HARM, ADDICTIVENESS, AND SOCIAL ACCEPTABILITY OF TOBACCO PRODUCTS AND MARIJUANA AMONG YOUNG ADULTS
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Recently, light cigars, cigarettes, snus, hookah, and e-cigarettes have grown in popularity. Concurrent use of tobacco and marijuana is also high. We examined the perceived harm to health, addictiveness, and social acceptability of tobacco products (cigarettes, cigar products, smokeless tobacco, hookah, electronic cigarettes) and marijuana use among young adult college students. In 2013, 10,000 students at 2 universities in Southeastern US were recruited to complete an online survey (N=2,002; response rate 20.0%). Participants were asked to indicate on a 7 point scale how harmful, addictive, and socially acceptable each product was; these data were then recoded in order to yield an overall positive perception score for each product. The products perceived to be least harmful were marijuana (4.14±2.14), e-cigarettes (4.26±1.95), and hookah (4.56±1.78); those perceived to be the most were cigarettes (6.47±1.00), cigar products (6.19±1.19), and smokeless tobacco (6.07±1.30). The products perceived to be least addictive were hookah (3.66±2.12), e-cigarettes (4.29±2.06), and marijuana (4.02±2.24); those perceived to be the most were cigarettes (6.42±1.27), smokeless tobacco (5.63±1.72), and cigars (5.63±1.72). Those perceived to be most acceptable were hookah (5.39±2.18), marijuana (5.13±2.06), and cigarettes (5.12±2.02); those perceived to be the least were smokeless (3.60±2.05), e-cigarettes (4.12±2.03), and hookah (3.66±2.12), e-cigarettes (4.29±2.08), and marijuana (4.60±2.24); those perceived to be most were cigarettes (6.42±1.27), smokeless tobacco (5.63±1.72), and hookah (5.53±1.72). Those perceived to be most acceptable were hookah (5.39±2.18), marijuana (5.13±2.06), and cigarettes (5.12±2.02); those perceived to be the least were smokeless (3.60±2.05), e-cigarettes (4.12±2.03), and hookah (3.66±2.12), e-cigarettes (4.29±2.08), and marijuana (4.60±2.24); those perceived to be most were cigarettes (6.42±1.27), smokeless tobacco (5.63±1.72), and hookah (4.56±1.72); the least positively perceived were cigarettes (7.62±2.79), smokeless tobacco (7.70±3.21), and cigars (6.62±3.27). Across all products, males had more favorable perceptions than females (p's<.01), with the exception of hookah (p=ns). Also, Blacks had the least positive perceptions of all tobacco products compared to Whites and other minorities (p's<.05) except hookah (p=ns), but more positive perceptions of marijuana (p's<.001). Research is needed to understand the origins of differing perceptions of harm and social norms of these products to facilitate efforts to reduce tobacco and marijuana use in young adults.

FUNDING: No Funding

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BACKGROUND: Smoking is a leading cause of numerous eye diseases including age-related macular degeneration. Optometrists are well positioned to address tobacco use with their patients; however, few supports, such as posters, factsheets, and continuing education (CE) courses, have been developed to help educate patients about the link between smoking and eye disease. This national study sought to identify what optometrists believe will help their discussions with patients about tobacco.

METHODS: An on-line survey was developed and sent to all 4,528 optometrists registered in Canada. Optometrists were presented with sample images and text for materials that might be used in patient education and CE relevant to supporting tobacco prevention and cessation among their patients. Researchers surveyed 450 respondents (19% response rate). Comparing image content for posters, preferences were higher for an image that communicated lifestyle impact from vision loss (person using a white cane) than for a fearful image (eye surgery) (43% vs. 27%, p<0.0001). A poster with text “We ask because…” was slightly preferred over a poster that encouraged patients to “Feel free to ask!” about smoking’s impact on eye health (44% vs. 39%, p=0.06). A loss-framed message (lose vision 10 years sooner) was preferred to a gain-framed message (gain vision 10 years sooner) (43% vs. 27%, p<0.0001). A poster with text “We ask because…” was slightly preferred over a poster that encouraged patients to “Feel free to ask!” about smoking’s impact on eye health (44% vs. 39%, p=0.06). A loss-framed message (lose vision 10 years sooner) was preferred to a gain-framed message (gain vision 10 years sooner) (43% vs. 27%, p<0.0001).

CONCLUSIONS: Canadian optometrists want tools to better address tobacco use with their patients including in-office eye-related educational materials, CE, and cessation referral systems. In general, images that are less fearful with loss-framed messages were preferred. It is important to understand practitioner preferences because they decide what is displayed in their offices.

FUNDING: Health Canada Federal Tobacco Control Strategy, and support from the Propel Centre for Population Health Impact (CCSR – Canadian Cancer Society Research Initiative). Jeffrey T. Fong was supported by an Ontario Institute for Cancer Research Senior Investigator Award and a Canadian Cancer Society Research Institute Prevention Scientist Award.

JUSTIFICATION: This study’s methods and findings could be translated to a variety of other primary care practitioner settings.

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POS1-108

ELECTRONIC CIGARETTE STORE CUSTOMERS: ‘VAPING’ BEHAVIORS AND BELIEFS

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University of Oklahoma Health Sciences Center, 2Oklahoma Tobacco Research Center (OTRC), Oklahoma State University

Over the last several years, the number of e-cigarette (EC) stores (i.e., vapor stores) has been increasing across the country. These stores typically only sell ‘tank’ system style ECs and also mix their own EC liquid (i.e., e-juice), creating ‘gourmet’ flavors. The current EC literature has primarily focused on online surveys of online vapor forums to profile the EC community, while no research has been conducted investigating the vaping behaviors and beliefs of vapor store customers.
Poster Session 1 • Thursday, February 6, 2014 • 11:30 a.m.–1:00 p.m.

POS1-111
EXPLORING THE ROLE OF SMOKELESS TOBACCO USE INDICES AS BRIEF MEASURES OF DEPENDENCE

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Background: There is a considerable interest in using brief measures of dependence for evaluation and treatment of tobacco dependence. Heaviness of smoking index (HSI) is a validated measure of dependence among cigarette smokers. However, a similar index has not been studied among ST users. Aim of this study is to develop similar ST use indices and evaluate their utility as concise dependence measures. Time to first chew/dip of the day (TTFD), number of cans of ST used per week (CPW), and dips/chews per day (DPD) were used to create ST use indices: heaviness of ST use index (HSTI) and ST dependence index (STDI). Methods: Study was based on data collected from a community based sample of exclusive ST users living in Oklahoma. Method of scoring for TTFD and CPD was similar to the scoring scheme employed for HSI items. DPD was transformed by a series of statistical tests into three category scoring variable. Concurrent validity and reliability of ST use indices were evaluated and overall accuracy of ST use indices and FTND-ST was assessed. Level of agreement between ST use indices and FTND-ST was calculated to find the extent these indices were equivalent to FTND-ST in measuring dependence. Results: ST use indices were significantly correlated with FTND-ST. ST users who had higher HSTI or STDI scores were more likely to have dependence diagnosis (OR: 1.50, 95%CI: 1.12, 2.02 and OR: 1.53, 95%CI: 1.16, 2.02, respectively). Study findings showed that all tobacco use indices were predictors of cotinine concentration. The internal consistency assessed by cronbach’s alpha indicated that STDI had acceptable reliability. At the optimal cutoff scores, both HSTI and STDI had good level of agreement with FTND-ST (k =0.81, p <0.0001 and k = 0.71, p = <0.0001, respectively). Conclusion: Significant association of HSTI and STDI with other tobacco dependence measures and FTND-ST suggests that these indices are valuable brief measures of dependence among ST users and can be used as a substitute for FTND-ST as proposed for HSI in smoking dependence studies. A concise dependence measure like HSTI or STDI has reduced response burden and is an effective tool in clinical and research setting.

FUNDING: Oklahoma Tobacco Research Center

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POS1-112
THIRDHAND CIGARETTE SMOKE ON WALLBOARD: EFFECTS OF WASHING AND LATEX PAINT ON RESIDUAL NICOTINE

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Thirdhand smoke (THS) is the complex mixture of cigarette smoke chemicals that linger in the environment after cigarettes are smoked. Cigarette smoke contains large quantities of nicotine. 60-90% of the nicotine released in tobacco smoke will sorb to indoor surfaces, where it can persist, re-emit, and react to form new compounds. Nonsmokers who move into homes previously occupied by smokers and nonsmokers who stay in hotel rooms that permit smoking have elevated levels of cotinine, a metabolite of nicotine. Normal cleaning methods do not appear to remove nicotine from indoor environments. Wallboard, a gypsum panel compressed between two sheets of paper, is common interior wall surface.

We painted a wallboard sample with water-based primer and applied 2 coats of eggshell-texture, latex paint. After the paint dried, we exposed the painted sample and an unpainted control to SHS at 20 mg particles per m3 for 4 hours and let the wallboard rest overnight in the smoke-filled chamber with no ventilation. The back and sides of the wallboard samples were sealed with aluminum tape and the samples did not contact the interior surface of the chamber. The surface of the painted board sample was wiped vigorously 3 times with a Cambridge filter saturated with 50% methanol: 1% HCI. Then the wipes, the paint/paper layers and the gypsum layers were extracted and analyzed for nicotine and other tobacco specific alkaloids by both GCMS and LCMSMS. Scrubbing the painted surface of the wallboard 3 times with methanol:HCl, a stronger solvent than most household cleaning solutions, removed 9% of the total nicotine. 79% of the nicotine remained in the paint/paper layer and 2.5% was found in the gypsum layer. In the unpainted control, we found 57% of the nicotine in the paper layer and 43% in the gypsum layer. This suggests that nicotine cannot be removed from painted walls by non-destructive solvents and that latex paint resists permeation by nicotine during short exposures to high concentrations of cigarette smoke.

FUNDING: Supported By: The California Tobacco-Related Disease Research Program, Grants # 20PT-0184 and 215T-0111, National Institute on Drug Abuse #P30 DA012933, the National Center for Research Resources #S10 RR026437 and the Northern California Center for Occupational and Environmental Health

JUSTIFICATION: Because nicotine cannot be removed from painted walls by non-destructive solvents, disclosure of smoking should be required in real estate transactions.

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POS1-113
INDOOR CHEMISTRY AND THIRDHAND SMOKE: FORMATION OF CARCINOGENS AND ASTHMAGENS AFTER SMOKING TOOK PLACE

Hugo Destaillats, Ph.D., Mohamad Sleiman, Ph.D., and Lara A. Gundel, Ph.D., Indoor Environment Group, Lawrence Berkeley National Laboratory, Berkeley, CA

Residual nicotine from tobacco smoke sorbs to indoor surfaces in large amounts, and is susceptible to react with ambient nitrous acid (HONO, from combustion sources, e.g., gas stove) to form carcinogenic tobacco-specific nitrosamines (TSNAs). In laboratory experiments using cellulose as a model indoor material, we observed a > 10-fold increase of surface-bound TSNAs concentrations after exposure of sorbed secondhand smoke to HONO (60 ppb) over a 3-h period. We identified 1-(N-methyl-N-nitrosamino)-1-(3-pyridinyl)-4-butanal (NNA), a TSNA absent in freshly emitted tobacco smoke, as the major reaction byproduct. Other potent carcinogens were also observed: 4-(methylNitrosatino)-1-(3-pyridinyl)-1-butanone (NNK) and N-nitroso nomicotine (NNN). Overall nicotine conversion to TSNAs was 0.4%. TSNAs can be degraded by reaction with HONO, ozone and other reactive species present in indoor air, but those reactions can be slowed significantly by competition with large amounts of co-adsorbed nicotine typically present in environments impacted by tobacco smoke. We also investigated the chemistry of nicotine with ozone, commonly present indoors through infiltration from outdoor air or generated by “air purifiers”. In experiments carried out with full smoke and nicotine vapor in the presence of ozone, the oxidation of nicotine led to the formation of ultrafine particles containing a large number of partially oxidized byproducts. The asthma hazard index was calculated for these oxygenated multifunctional compounds, showing that in most cases the byproducts are more severe asthmagens than their precursor. The discovery of toxic products from reactions of nicotine with common indoor pollutants uncovered the potential hazards of exposure to residual tobacco smoke (thirdhand smoke, THS) through inhalation, dermal contact, and dust ingestion, thus laying important groundwork for studying the health effects of THS and related economic and policy impacts.

FUNDING: Funded by TRDRP’s California Consortium on Thirdhand Smoke (Grant #20KT-0051), and by a TRDRP New Investigator Award to M. Sleiman (Grant #20KT-0051).
JUSTIFICATION: Thirdhand smoke (THS) has been only recently described, and it’s not yet fully characterized. Our research lays the groundwork for studying health effects and related economic and policy impacts of THS.

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POS1-114

CHANGING IMPLICIT ATTITUDES TOWARD SMOKING: RESULTS FROM A WEB-BASED APPROACH-AVOIDANCE PRACTICE INTERVENTION

Jonathan T. Macy, Ph.D., M.P.H.1,*, Laurie Chassin, Ph.D.2,*, Clark C. Presson, Ph.D.1,3, and Jeffrey W. Sherman, Ph.D.1,3, *Indiana University, 1Arizona State University, 2University of California, Davis

BACKGROUND: Dual process models and supporting data have shown that both conscious, controlled, reflective processes (such as explicit attitudes) and automatic associations that may be beyond conscious awareness (such as implicit attitudes) are important predictors of addictive behaviors like cigarette smoking. An important public health goal is the development of interventions to change implicit attitudes toward smoking. The objective of this study was to assess the effects of a web-based intervention involving an approach-avoidance practice task and anti-smoking PSA on changing implicit attitudes toward smoking and increasing receptivity to information about smoking. METHODS: Participants (n = 1,097) were recruited to a two-session web-based study. During the first session, baseline data were collected. The second session, completed on average three months later, contained the intervention, which consisted of random assignment to either the experimental or control version of an approach-avoidance practice task and random assignment to an anti-smoking PSA and post-intervention implicit attitudes measures. RESULTS: In an ANCOVA model with pre-intervention implicit attitude as the covariate and post-intervention implicit attitude as the outcome, there was a significant interaction of education level, smoking status, and task (p = .014). For smokers with lower educational attainment and non-smokers with higher educational attainment, their implicit attitudes were more negative toward smoking if they completed the approach-avoidance task. There was no effect of the PSA on implicit attitudes toward smoking, and there were no effects of the intervention on receptivity to smoking-related information or on plans to quit among smokers. CONCLUSIONS: An online intervention involving an approach-avoidance task is a potentially feasible and useful public health strategy for changing implicit attitudes toward smoking, but additional interventions may be required to influence other outcomes such as receptivity to smoking-related information.

FUNDING: This study was supported by Grant DA013555 from the National Institute on Drug Abuse.

JUSTIFICATION: Results suggest that it is feasible to utilize this intervention strategy to reach large target audiences, an important public health objective for reducing smoking.

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POS1-115

INVESTIGATING CHARACTERISTICS ASSOCIATED WITH SMOKING IN HOMELESS POPULATION: FINDINGS FROM AN AUSTRALIAN NATIONAL SURVEY

Jeong Kyu Lee* and Christopher Magee, University of Wollongong, NSW, Australia

While the overall smoking prevalence has decreased over the past several decades in Australia, the rate in homeless population is strikingly high and little is known about characteristics associated with smoking in this population. In this study, we compared two subgroups of smokers (“light” smokers [fewer than 10 cigarettes per day] and “heavy” smokers [10 or more cigarettes per day]) with non-smokers in terms of demographics, general health, mental health, alcohol, and other drug use. We used data from the first wave of Journeys Home, a new national survey of individuals exposed to high levels of housing difficulties. To account for the complex sampling design of the Journeys Home survey, we incorporated population weights that are the multiplication of design weights and response weights. Bivariate and multivariate analyses identified significant characteristics associated with smoking in homeless individuals. We found that in homeless individuals, approximately 75% had smoked in last 6 months and of those who had smoked, 71% reported they smoked 10 or more cigarettes per day. Heavy smokers (10 or more CPD) were more likely to be male (69.6%), older (25-44: 52.8%) and Australian born (89.6%) than light smokers and non-smokers. In comparison with non-smokers and light smokers, greater proportions of heavy smokers reported they had ever been diagnosed with schizophrenia, depression, and anxiety disorder. In addition, greater portions of both light and heavy smokers used alcohol, marijuana, and illegal drugs in last 6 months than non-smokers. Consistent with the bivariate comparisons, the multivariate analysis revealed that main demographics, general/mental health and alcohol and other drug use were significant correlates of smoking in homeless population. Overall, these findings indicate that a large majority of homeless adults were current smokers and more than half were heavy smokers. These smokers had various health problems/illnesses and high rates of comorbidities. In homeless smokers, these health issues may make quitting smoking more challenging. Hence future interventions targeting homeless smokers should consider addressing these barriers identified by this research.

FUNDING: No Funding

JUSTIFICATION: Future interventions targeting homeless smokers should consider addressing these barriers identified by this research.

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POS1-116

SMOKING PREVALENCE AND SOCIAL INFLUENCE AMONG YOUTH IN TBILISI, GEORGIA

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Low- and middle-income countries are high-risk for tobacco use and related morbidity and mortality. Georgia, a former Soviet Union country, has high rates of smoking; however, little is known about the prevalence and correlates of youth smoking. The current study was a secondary data analysis of the 2010 Behavioral Surveillance Survey of the USAID-funded Georgia HIV Prevention Project in Tbilisi, a program aimed at improving HIV prevention. The parent study was conducted among 15-16 year old secondary school students and 18-24 year old post-secondary school students in Tbilisi (N=1,879). The survey assessed sociodemographics, leisure activities, tobacco use, alcohol use, knowledge and awareness of HIV/AIDS, drug use, and sexual behavior. For the current study, we examined sociodemographics, tobacco, alcohol, and marijuana use, and leisure activities (e.g. going to bars/parties, going to cafes, sports, reading, internet use). We analyzed predictors of lifetime cigarette use and past 30-day use among secondary school students and post-secondary school students, respectively. Overall, 46.1% had ever smoked; 22.6% reported past 30-day smoking. Among secondary school students, predictors of lifetime use included being male (p<.001), consuming alcohol (p<.001), lifetime marijuana use (p<.001), and lower perceived risk (p=0.01). Predictors of past 30-day cigarette use among lifetime users included being male (p=0.03), consuming alcohol (p=.05), lifetime marijuana use (p=0.003), lower perceived risk (p<.001), less frequently engaging in sports (p=0.009), and more often going out (p=0.06). Among post-secondary school students, predictors of lifetime use included being male (p=0.01), consuming alcohol (p<.001), lifetime marijuana use (p<.001), lower perceived risk (p<.001), going out in the evening (p=0.003), and using the internet for recreation (p=0.02). Predictors of past 30-day use among lifetime users included being male (p=0.04),...
Poster Session 1 • Thursday, February 6, 2014 • 11:30 a.m.–1:00 p.m.

POS1-117 CHARACTERISTICS OF WATERPIPE USERS INTERESTED IN QUITTING: POPULATION-BASED FINDINGS FROM SYRIA
Kenneth D. Ward, Ph.D.,1,2, Gisela Guerrero2, Nancy Wilson, Ph.D.,3, Mark W. Vander Weg, Ph.D.,4, Taghrir Asfar, M.D.,4,4, and Wasmz Maziak, M.D., Ph.D.,5,6,1
1University of Memphis, 2Syrian Center for Tobacco Studies, 3Brown University, 4University of Miami, 5University of Iowa, 6University of Miami, 7Florida International University

Waterpipe (WP) use is increasing dramatically in the Middle East and around the world. Many users exhibit signs of dependence and have difficulty quitting. Little is known, however, about the prevalence or characteristics of those interested in quitting this information. This will help guide intervention development. We conducted a cross-sectional, population-based household survey of 2038 adults (18-65 years of age; 45% men, mean age 35 yrs; response rate 86%) in Aleppo, Syria, using two-stage (neighborhood, household), stratified (“formal” vs “informal” areas), cluster sampling. We examined prevalence of WP use, interest in quitting, perceived difficulty of, and challenges to quitting, and compared WP users who were interested vs. not interested in quitting on sociodemographic, tobacco- and health-related characteristics. Twelve percent of adults currently smoked waterpipe (n=248), and of these, 56% were interested in quitting, 25% had made a quit attempt in the past year, and 89% perceived quitting to be “not difficult.” Friends/socializing (69%) and boredom/free time (16%) were the most reported obstacles to quitting. In multivariable logistic regression analysis, those interested in quitting were more likely to live in economically deprived “informal zones” (OR= 2.07; 95% CI=1.10-3.90), and eat less fruit (OR = 0.65; CI= 0.49-0.86). WP users who also smoked cigarettes but did not want to quit cigarettes were less likely to want to quit WP compared to non-cigarette smokers (OR= 0.24; CI= 0.10-0.58). In contrast, those who wanted to quit cigarettes were more likely to want to quit WP (OR= 2.03; CI= 1.10-3.76). Interest in quitting WP was not associated with frequency of use, exposure to others’ WP use, health behaviors such as vegetable and fast food intake, general health status, or being diagnosed with respiratory or cardiac problems. Substantial numbers of WP users wanted to quit and perceived the loss of WP’s positive social features to be an obstacle. Cessation efforts may benefit from addressing social support and time use, and targeting users who are economically disadvantaged and want to quit all use of tobacco

FUNDING: Funded by U.S. Public Health Service grants R21TW006545, R01TW005962, and R01DA035160

JUSTIFICATION: Findings will help target interventions to individuals most likely to participate and benefit in such efforts.

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POS1-118 #E-CIGARETTES: WHAT’S BEING TALKED ABOUT ON TWITTER
Allison M. Pastel, M.P.H.*, Deanna P. Jannat-Khah, M.S.P.H., and Donna R. Shelley, M.D., M.P.H., New York University School of Medicine

Background: Twitter, a real time social media microblogging website, with over 500 million users, is a communication mechanism for individuals, manufacturers, and distributors to disseminate information and share news and experiences related to e-cigarettes. A descriptive content analysis was performed on Twitter to explore the nature and extent of communication about this product. Methods:

Tweets were captured for 30 consecutive days (May 5–June 6) at the same time each day. We identified tweets by entering four keywords (ecig, ecigs, electronic cigarette, vaping) in the Twitter search Application Programming Interface https://twitter.com/search-home. Two data analysts independently coded each tweet into one or more of the 17 mutually exclusive categories. Each tweet was reviewed and discrepancies were discussed. Qualtrics, a data collection and analysis software program, was used to assist with data analysis. Results: A total of 1467 tweets were captured. Fifty-three percent (n=603 tweets) included hashtags, indicating a trending topic. The most prevalent categories were personal comments/stories (26%, e.g., “I don’t understand why you want an e cig if you’ve never even smoked a cigarette”), 22% of tweets were categorized as product promotions (sales/offers/coupons, free gifts, e.g., “Super 808 Mini Electronic Cigarette 10% Discount Now”), 19% were categorized as information dissemination (research, news articles, and blogs), and 15% advocacy (opinions about e-cig regulations). Product promotions were the tweets most often retweeted and favored. Both are Twitter basics used for disseminating, and saving, new content. Conclusions: This analysis demonstrated the significant presence of e-cigarette discussions on Twitter, and the feasibility of using Twitter as a real time surveillance tool to identify and track emerging trends such as adolescent e-cigarette use, user experiences with the product including side effects, and overall attitudes and beliefs towards this and other emerging products. In addition, Twitter presents a tremendous opportunity for public health professionals to disseminate information and counter misinformation in a timely manner.

FUNDING: No Funding.

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POS1-119 VULNERABILITY TO SMOKELESS TOBACCO USE AMONG THOSE WITH MENTAL ILLNESS
Ryan Redner, Ph.D.*, Thomas J. White, Ph.D., Valerie S. Harder, M.H.S., Ph.D., and Stephen T. Higgins, Ph.D., University of Vermont

Introduction: Smoking prevalence is unevenly distributed in the U.S. population, with those with psychiatric disorders being especially at high risk. Less research has been conducted regarding whether these same groups are vulnerable to smokeless tobacco (ST) use. The goal of this study is to examine vulnerability to ST use among individuals with mental health disorders. Methods: Using the most recent (2011) National Survey on Drug Use and Health (NSDUH), we determined odds ratios for current cigarette smoking and ST use among adults meeting criteria within the past year for severe psychological distress, serious mental illness, and major depressive disorder, after adjusting for relevant sociodemographic characteristics. Vulnerability to cigarette smoking was assessed to confirm these mental health disorders were indeed associated with increased smoking in this data set, as shown in prior studies. Results: Odds for current cigarette smoking were increased for each mental health classification (p < .0005): severe psychological distress (OR with 99% CI = 1.74 [1.54, 1.97]), serious mental illness (OR = 2.05 [1.68, 2.49]), and major depressive disorder (OR = 1.70 [1.40, 2.07]). Odds for current ST use were not increased for any of the mental health classifications. Conclusions: Mental health risk factors for cigarette smoking diverged considerably from those for ST use. Additional research is needed to identify risk factors for ST use.

FUNDING: This research was supported by Institutional Training Grant T32DA07242 from the National Institute on Drug Abuse and by Fogarty International Center / National Institutes of Health Grant K01TW008410.

JUSTIFICATION: Identifying groups that are vulnerable to smokeless tobacco use has potential application in the development of tailored treatments to vulnerable populations.

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Poster Session 1 • Thursday, February 6, 2014 • 11:30 a.m.–1:00 p.m.

POS1-120
ACCESS TO TECHNOLOGY AND ATTITUDES TOWARDS WEB-BASED TOBACCO CESSION TRAINING


Introduction: Web-based learning is increasingly being used to train healthcare professionals in providing effective tobacco cessation counseling. Online educational programs have been shown to be effective with the dissemination of evidence-based clinical practice guidelines. This study aimed to evaluate whether attitudes and readiness towards information technology (IT) had an impact on the uptake of tobacco cessation knowledge and self-efficacy among dental students using an interactive web-based training program. Methods: Second-year dental students at the Columbia University College of Dental Medicine completed a web-delivered, theory-informed training program based on the U.S. Public Health Service 5 A’s (Ask, Advise, Assess, Assist, and Arrange). Didactic content was presented as text and video, skills training included immediate response quizzes, interactive treatment activities and simulated virtual patient encounters. Pre- and post-test surveys were used to assess students’ tobacco-related knowledge, attitudes, and behaviors. Surveys also included items related to IT readiness and attitudes towards using IT for education. Results: Fifty-five students completed both pre and post-intervention surveys. Overall, attitudes towards technology and IT access were high. 98.2% of students reported regular educational use of a laptop computer, 14.5% used a desktop computer, 14.5% used a tablet, and 63.6% used a smartphone. The majority preferred electronic (78.2%) to print formats (20.0%). After viewing the tobacco cessation course, there was a statistically significant increase in students’ tobacco-related knowledge and self-efficacy scores (p<0.05). Students’ who placed a higher value on the use of technology for educational purposes were more likely to have spent a greater number of hours on the site (p<0.05); however, beliefs about technology were not associated with greater tobacco cessation knowledge scores. Conclusions: A web-delivered, interactive tobacco cessation education program is a viable training method for pre-doctoral dental trainees.

FUNDING: No funding

JUSTIFICATION: Web-based tobacco training can be an effective method for disseminating evidence based tobacco cessation guidelines to dental students.

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POS1-121
A MIXED METHODS EVALUATION OF SMOKING AND QUITTING TRAJECTORIES OF SELF-IDENTIFIED FORMER SMOKERS: IMPLICATIONS FOR CLINICAL TRIALS

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Background: Cessation treatment trials use stringent measures to assess abstinence outcomes (e.g., not even a puff in past 7 days). In contrast, eligibility screening often assesses smoking status with more blunt, categorical items (e.g., “every day,” “some days,” “not at all”), excluding “not at all” respondents. This mixed methods study examined smoking behavior and quitting trajectories of self-identified former smokers to characterize this understudied group of treatment seekers. Methods: Participants were N=202 new members of a web-based cessation intervention who indicated at registration “I used to smoke cigarettes.” A baseline survey assessed demographics, tobacco use, quitting trajectory, and participants’ definition of a former smoker (qualitative item). Self-reported abstinence (continuous, 7-day) was assessed at 1 month (follow-up 54.5%, N=110). Quantitative and qualitative data were triangulated to examine users’ definitions of a former smoker and the correspondence with smoking behavior.

Results: The sample was primarily female (78.7%), White (87.6%), and Non-Hispanic (96.5%), with a mean age of 43.8 years (SD=12.2). Almost half were very recent quitters, with 46% abstinent for less than 7 days. Participants reported relatively high craving scores (M=4.1, SD=0.8, scale 1-5) and motivation to quit (M=9.7, SD=1.2, scale 1-10), and 30.2% (N=61) reported current use of other tobacco products. Participants’ definitions of “former smoker” were wide ranging, largely corresponding to their personal experience. Qualitative analyses revealed that 8.9% (N=18) of participants did not consider themselves former smokers but registered as such to affirm their commitment to quit. At 1 month, 27.3%-32.7% of participants had relapsed. Conclusions: Former smoking status is subject to interpretation, leading some to identify as former smokers when they more closely resemble current smokers. Excluding this group of participants from treatment trials may miss an important subgroup of treatment seeking smokers. Future research should consider the methodological implications of applying the stringent criteria used for abstinence outcomes to eligibility screening.

FUNDING: FUNDING: This project was supported by R01 CA155489 and internal support from the American Legacy Foundation.

JUSTIFICATION: Future research should consider the methodological implications of applying the stringent criteria used for abstinence outcomes to eligibility screening.

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POS1-122
PROMPTING MASS QUITTING USING A NATIONAL GROUP STOP SMOKING COMPETITION

Marewa Glover, Ph.D.d,*, Anette Kira, Ph.D., and Warren Moetara, Dudley Gentles, School of Population Health, University of Auckland Moetara - Healthy Lifestyles Tea, Northland District Health Board

Background: The New Zealand (NZ) Government has set an aspirational goal to reduce smoking to 5% or less by 2025. Current smoking prevalence is 18% but smoking prevalence is higher for Mṭori (the indigenous people) and Pacific Island people (41% & 26%). With the current cessation rate in NZ of 3% per year, innovative ways to prompt mass quitting are needed. A team-based quit smoking contest pilot with 15 teams of 10 smokers achieved a verified 36% cessation rate at 3 months; dropping to a self-reported still quit of 28% at 6 months. The contest was subsequently tried as an inter-regional contest, preceding the roll-out of a national competition aiming to prompt mass quit attempts. Intervention: There were two stages to the study: one initial inter-regional competition between two regions (Northland and Hawkes Bay) in NZ, followed by a competition open to teams from across NZ. Incentives included a first prize of $5000, a second place prize of $2000, and a web participation prize of $500 awarded to the winning team’s charity of choice. Spot prizes for individuals incentivised effort throughout the competition. Cessation support was usual care provided by existing providers plus access to a suite of internet based resources: the competition website and iPhone/iPad app and game. Method: Contestants were recruited over a 6 week period by existing health providers, newspaper advertising, and some regionally based competition coordinators. The main outcome was number of people participating. Smoking status was biochemically verified at baseline and at competition end (3 months) with weekly self-reports of smoking status updated to the website’s team page. Results: Overall, nearly 1000 mainly Maori smokers participated. In the inter-regional contest, 220 smokers competed, and in the first national competition 740 smokers competed. Participants ranged in age from 15 to over 70 years. Participation by region varied depending on local comprehension of the concept, and subsequent promotion and co-ordination efforts. Implications: Team-based competitions are an effective method for triggering mass quitting, especially among high priority, high smoking prevalence groups.

FUNDING: Funding acknowledgement: Hawkes Bay District Health Board, Northland District Health Board, Ministry of Health

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1,2 Northland District Health Board, Ministry of Health

POS1-122
PROMPTING MASS QUITTING USING A NATIONAL GROUP STOP SMOKING COMPETITION

Marewa Glover, Ph.D.d,*, Anette Kira, Ph.D., and Warren Moetara, Dudley Gentles, School of Population Health, University of Auckland Moetara - Healthy Lifestyles Tea, Northland District Health Board

Background: The New Zealand (NZ) Government has set an aspirational goal to reduce smoking to 5% or less by 2025. Current smoking prevalence is 18% but smoking prevalence is higher for Mṭori (the indigenous people) and Pacific Island people (41% & 26%). With the current cessation rate in NZ of 3% per year, innovative ways to prompt mass quitting are needed. A team-based quit smoking contest pilot with 15 teams of 10 smokers achieved a verified 36% cessation rate at 3 months; dropping to a self-reported still quit of 28% at 6 months. The contest was subsequently tried as an inter-regional contest, preceding the roll-out of a national competition aiming to prompt mass quit attempts. Intervention: There were two stages to the study: one initial inter-regional competition between two regions (Northland and Hawkes Bay) in NZ, followed by a competition open to teams from across NZ. Incentives included a first prize of $5000, a second place prize of $2000, and a web participation prize of $500 awarded to the winning team’s charity of choice. Spot prizes for individuals incentivised effort throughout the competition. Cessation support was usual care provided by existing providers plus access to a suite of internet based resources: the competition website and iPhone/iPad app and game. Method: Contestants were recruited over a 6 week period by existing health providers, newspaper advertising, and some regionally based competition coordinators. The main outcome was number of people participating. Smoking status was biochemically verified at baseline and at competition end (3 months) with weekly self-reports of smoking status updated to the website’s team page. Results: Overall, nearly 1000 mainly Maori smokers participated. In the inter-regional contest, 220 smokers competed, and in the first national competition 740 smokers competed. Participants ranged in age from 15 to over 70 years. Participation by region varied depending on local comprehension of the concept, and subsequent promotion and co-ordination efforts. Implications: Team-based competitions are an effective method for triggering mass quitting, especially among high priority, high smoking prevalence groups.

FUNDING: Funding acknowledgement: Hawkes Bay District Health Board, Northland District Health Board, Ministry of Health

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POS1-123
DOES EVERY SMOKER BEAR THE SAME CIGARETTE TAX? THE IMPACT OF PRICE MINIMIZATION STRATEGIES ON EXCISE TAX PASS-THROUGH RATES

Xin Xu, Ph.D.*, 1, Ann Malarcher, Ph.D.1, Alissa O’Hailoran, M.S.P.H.1, Northrop Grumman2, and Judy Kruger, Ph.D.*, 1, Office on Smoking and Health Centers for Disease Control and Prevention, Atlanta, GA, 2Contractor Support for NCCDPHP/NGIS Centers for Disease Control and Prevention, Atlanta, GA

Objectives: To evaluate the excise tax pass-through rates with respect to selected price minimization strategies. Methods: Data were obtained from the 2009-2010 National Adult Tobacco Survey (NATS), a stratified, national, dual-frame telephone survey of non-institutionalized adults ages ≥18 years. Unadjusted and adjusted per pack prices with and without coupon were estimated for pack purchase vs. carton purchase, the use of generic brands vs. premium brands, and purchases from Indian reservations vs. non-Indian reservations. Multivariate regression analyses controlling for individual demographic characteristics, seasonal effects, and multiple state factors associated with cigarette smoking were used to evaluate how smokers and manufacturers split the excess burden of taxation. Results: The average per pack price paid differed substantially by smokers’ price minimization strategies. Smokers who used any type of price minimization strategies paid substantially less than those who did not use these strategies. Carton purchasers, generic brand users, and those who were likely to purchase cigarettes at Indian reservations paid between 39 to 84 cents per pack for every $1 tax increase. In contrast, users of cigarette premium brands who purchased by pack (not by carton) outside an Indian reservation paid between $1.07 and $1.18 for every $1 tax increase. Conclusions: Price minimization strategies likely mitigate the benefit that state excise tax increases could have on reducing the demand for cigarettes by lowering pass-through rates. Tobacco control efforts need to incorporate price minimization strategies into the assessment of tax impacts. Policies that can reduce such cost-reduction opportunities, such as setting a high floor price for cigarettes, prohibiting discounts or promotions, or expanding state-level negotiations with tribes to collect taxes from non-member purchases need to be considered to maintain prevention impact.

FUNDING: No funding

JUSTIFICATION: Policies that can reduce such cost-reduction opportunities, such as setting a high floor price for cigarettes, prohibiting discounts or promotions, or expanding state-level negotiations with tribes to collect taxes from non-member purchases need to be considered to maintain prevention impact.

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POS1-124
GEOGRAPHIC DISTRIBUTION OF POISON EVENTS ASSOCIATED WITH DISSOLVABLE TOBACCO PRODUCTS, UNITED STATES, 2009–2011

Baoquang Wang*, Ii-Lun Chen, and Brian Rostron, United States Food and Drug Administration Center for Tobacco Products

Background: In 2001, a new type of tobacco product, dissolvable tobacco products (dissolvables), was introduced to the U.S. market. The first two dissolvables were sold nationwide until December, 2012. Several new dissolvables were test-marketed in Indiana, Ohio, Oregon, Colorado, North Carolina, Kansas, and Virginia since 2009. Some dissolvables have candy-like appearances and flavors, prompting concerns that these products may be attractive to young children and increase the risk of accidental ingestion. Recent national data indicate that 3.4% of ingesting dissolvables is 0.6% among adults and 2.0% among middle and high school students in the U.S. This study describes the frequency and geographic distribution of poison events associated with dissolvables (poison events) in the U.S. during 2009-2011, and identifies an association between test market locations and frequency of these events. Methods: Data were from the National Poison Data System (NPDS). The frequency of poison events during 2009-2011 was tabulated overall and by geographic location, demographics, and other factors. Results: Twenty-seven cases of poison events were recorded in NPDS during 2009-2011. Of these, 20 (74.1%) were children < 6 years old and 7 (25.9%) were adults. Twelve (44.4%) cases were reported in states where dissolvables were being test marketed and 10 cases (37.0%) were from neighboring states. Of the five cases (18.5%) from other states, three were associated with Stonewall (discontinued). Seven cases (25.9%) were referred and/or taken to health care facilities. Conclusions: Most poison events were concentrated in test market states or neighboring states, suggesting a correlation between test market locations and poison events. The relatively small number of poison events nationwide largely reflects low prevalence of dissolvable use and low general public awareness of poison control centers. However, this could change if the use of dissolvables increases. While continued monitoring is needed to better understand the extent and nature of poison events, the states where dissolvables are marketed should remain particularly vigilant.

FUNDING: No funding.

JUSTIFICATION: This study provides information on poison events associated with dissolvable tobacco products, which may be helpful for developing strategies to prevent these events.

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POS1-125
REDUCING SMOKING IN PREGNANCY USING INCENTIVES: WHY WOULDN’T WOMEN WANT TO DO IT?

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Objectives: Smoking during pregnancy places the unborn child at extreme risk of complications. Indigenous New Zealanders, M?ori, women are two times more likely to smoke than non-M?ori women. Although women quit smoking when pregnant, 40% of M?ori women are still smoking when they register with a midwife. Financial incentives to stop smoking when pregnant have been shown to be four times more effective than other stop smoking interventions. We conducted a trial to investigate using incentives to encourage M?ori women to quit smoking while pregnant. However, recruitment proved to be difficult. The aim of this study was to investigate why women didn’t want to participate in this research. Method: Data on recruitment from the incentives trial was collected as well as a short survey with pregnant smokers about their willingness to participate in cessation research. Pregnant smokers were intercepted in public places for the short survey. Results: Recruitment initially involved contacting health professionals (HPs) such as midwives, general practitioners, and service providers. Although many of the HPs supported the trial, few referrals resulted. Over 7 months 74 women were referred, of which 50 declined to be part of the study and 24 consented, giving a recruitment rate of 27%. Twenty women declined to be part of the study because they weren’t interested and 24 did not respond to contact attempts. For one month, recruitment strategies extended to using media ads (radio, social media, and newspaper). Direct marketing led to 11 women contacting the study team with 6 going through to randomisation, giving a recruitment rate of 64%. The mail-intercept survey found that 85% of participating pregnant women would be willing to participate in cessation research. Discussion: Recruiting via HPs was time consuming and ineffective. It appeared that women were not interested. However, approached directly by a research assistant in a non-health setting pregnant women expressed a high level of willingness to participate. We concluded that alternative means of recruiting women into an incentive to not smoke scheme need to be tested, such as using lay community health workers.

FUNDING: The T?ranga is supported through funding from the Reducing Tobacco-related Harm Research Partnership co-funded by the Health Research Council of New Zealand and the Ministry of Health of New Zealand (HRC grant 11/818) and the Ministry of Health’s “Innovative stop smoking interventions for Pregnant women: Reaching the ‘Hard to Reach’”

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**POS1-126**

**VOLATILE ORGANIC COMPOUNDS IN SECONDHAND AND THIRDHAND TOBACCO SMOKE**

Mohamad Sleiman, Ph.D.†,°; Hugo Destaillats, Ph.D.‡; Lara A. Gundel, Ph.D.†; James F. Pankow, Ph.D.∥; and Suzaynn F. Schick, Ph.D.∥, 1Indoor Environment Group, Lawrence Berkeley National Laboratory; 2Department of Chemistry, Portland State University; 3Department of Medicine, University of California San Francisco

We present results from measurements of volatile organic compounds (VOCs) in a 25 cubic meter chamber and in a smoker’s home for different smoking ages periods ranging from a few minutes to 18 hours. More than 40 VOCs were identified in thirdhand smoke (THS) with concentrations ranging between 0.2 and 32 microgram per cubic meter. Typical secondhand smoke (SHS) tracers such as 3-ethenylpyridine and nicotine disappeared quickly after smoking ended, likely due to sorption to indoor surfaces, whereas nitriles, aromatics, and carbonyls persisted in indoor air for 18 hours. A set of potential gas-phase markers for THS was identified, including acetonitrile, isoprene, 2-methyl furan, and acetaldehyde. Re-emissions of VOCs from surfaces of common furnishing materials (cotton, polyester) to air fresheners were also investigated. The results indicate that exposed materials can be long-term indoor sources of VOCs, particularly carbonyls (e.g., formaldehyde, acetaldehyde, and acrolein) and acetonitrile. Re-emission factors of these VOC were determined in the range of 1-40 microgram per cigarette per square meter, which comprise a significant fraction of the initial emissions. This study represents an important step towards better characterizing THS and assessing long-term exposures of non-smokers via inhalation.

**FUNDING:** Supported by the TRDRP California Consortium on Thirdhand Smoke (Grant # 20PTF-0184), and by the TRDRP New Investigator Award to M. Sleiman (Grant #20K7-0051)

**JUSTIFICATION:** Thirdhand smoke is a relatively recent concept that needs to be better defined and characterized. This study contributes to understanding similarities and differences between SHS and THS, and potential risks associated to long-term inhalatory exposure.

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**POS1-129**

**TOBACCO USE, SECONDHAND SMOKE EXPOSURE, AND RESPIRATORY HEALTH ISSUES AMONG CALIFORNIA MIGRANT FARM WORKERS**

Kim Pulvers†, Devan R. Romero‡, Azucena Vazquez Santiago§, Konane Martinez∥, Arcelia Nuñez-Alvarez¶, and Thomas E. Novotny†, †California State University San Marcos, Department of Psychology, ‡Anthropology, §‘National Latino Research Center, San Marcos, CA, ¶San Diego State University, Graduate School of Public Health

Farmworkers experience disproportionately high rates of infectious respiratory disease and are often exposed to respiratory irritants which can be further exacerbated by tobacco use or second hand smoke (SHS) exposure. However, many farmworkers are under-counted in the U.S. Census, with a resultant deficiency of data on tobacco use and respiratory health among them. This study assessed tobacco use, SHS exposure, and respiratory illness among a sample of California (CA) migrant farmworkers through a cross-sectional survey administered by Spanish-speaking interviewers (N=150, 54% female, Mage=33.6, 82% < high school education, 96% Hispanic). Current smoking (past 30 days) was reported by 39% of the sample, including cigarettes (35%) and cigars (22%), with cigarettes often used daily (20%) vs. nondaily (15%). Smokers were more likely to be male (p < 0.001), to have consumed alcohol in the past 30 days (p < 0.001), and to report the presence of cough and phlegm on most days (p < 0.05). The majority of participants reported some level of SHS exposure at work, in public places, and where living. The strongest correlates of SHS exposure at work were current tobacco use (p < 0.01) and home smoking exposure (p = 0.01). SHS exposure at work was also associated with having a persistent cough (p < .01) and providing self-reported health problems (p < .05). SHS exposure at home was associated with having a persistent cough (p < 0.01), persistent phlegm (p < 0.01), and having been prescribed medication for TB (p < 0.01). Current alcohol use was associated with both TB and asthma (p < 0.05). Inverse relationships were observed between the strength of smoking restrictions in one’s home and vehicle and some respiratory issues (p < 0.05). This study adds to the limited literature on tobacco exposure and health among migrant farmworkers. Our findings suggest needs for smoking cessation services, and interventions to reduce SHS exposure and respiratory co-morbidities in this population. This study is an important step in understanding the tobacco-related health issues of CA farmworkers and may inform community health interventions directed to them.

**FUNDING:** This research was funded by a Grant Proposal Seed Money award from California State University, San Marcos

**JUSTIFICATION:** Findings in the present study translate to public health by providing possible targets of attention for smoking prevention and treatment efforts in an under-served population.

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**POS1-127**

**PROMPTING MASS QUITTING USING A NATIONAL GROUP STOP SMOKING COMPETITION**

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Background: The New Zealand (NZ) Government has set an aspirational goal to reduce smoking to 5% or less by 2025. Current smoking prevalence is 18% but smoking prevalence is higher for M?ori (the indigenous people) and Pacific Island people (41% & 28%). With the current cessation rate in NZ of 3% per year (New Zealand Institute of Economic Research, 2012) innovative ways to prompt mass quitting are needed. A team-based quit smoking contest pilot with 15 teams (Northland and Hawkes Bay) in NZ, followed by a competition open to teams from across NZ. Incentives included a first prize of $5000, a second place prize of $2000 and a web participation prize of $500 awarded to the winning team’s charity of choice. Spot prizes for individuals incentivised effort throughout the competition. Cessation support was usual care provided by existing providers plus access to a suite of internet based resources: the competition website and iPhone/iPad app and game. Method: Contestants were recruited over a 6 week period by existing health providers, newspaper advertising, and some regionally based competition coordinators. The main outcome was number of people participating. Smoking status was biochemically verified at baseline and at competition end (3 months) with weekly self-reports of smoking status updated to the website’s team page. Results: Overall nearly 1000 mainly Maori smokers participated. In the inter-regional contest, 220 smokers competed, and in the first national competition 740 smokers competed. Participants ranged in age from 15 to over 70 years. Participation by region varied depending on local comprehension of the concept, and subsequent promotion and co-ordination efforts.

**FUNDING:** Hawke’s Bay District Health Board Northland District Health Board The T?ranga is supported through funding from the Reducing Tobacco-related Harm Research Partnership co-funded by the Health Research Council of New Zealand and the Ministry of Health of New Zealand (HRC grant 11/818)

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POS1-130
DIFFERENCES IN NICOTINE METABOLITE RATIO ACROSS 5 COUNTRIES: RESULTS FROM THE INTERNATIONAL TOBACCO CONTROL (ITC) STUDY

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Previous research has suggested that nicotine metabolism rates, as measured by the ratio of trans 3’-hydroxycotinine to cotinine, are correlated with smoking behavior. Studies have also shown ethnic differences in the 3-HC: cotinine ratio, also known as nicotine metabolite ratio (NMR), a noninvasive biomarker of the rate of nicotine metabolism. This study uses data from the International Tobacco Control (ITC) Surveys to compare differences in NMR across 5 countries. Saliva samples were collected from 1317 adult smokers in the US, UK, Mexico, Thailand, and Mauritius during ITC surveys conducted in 2010-2011. The saliva was assayed for levels of 3-HC and cotinine using liquid chromatography tandem mass spectroscopy. The NMR was calculated and statistical analyses were performed using SPSS 21.0. The mean NMR among smokers from the US, UK, Mexico, Thailand, and Mauritius was 0.528 (SD=0.393), 0.438 (SD=0.249), 0.418 (SD=0.230), 0.342 (SD=0.270), and 0.360 (SD=0.255), respectively. A Pearson Chi-Square revealed distribution of NMR quartiles varied significantly across the 5 countries (X2=34.224, df= 9, p<0.000). NMR quartiles were significantly associated with cigarettes smoked per day (1-10, 11-20, 21-30, 31+); p = 0.146, p<0.001. Stratification by country showed that this effect was strongest in the US (b2=-13, p<0.023), with Mauritius showing a nonsignificant trend (b2=0.095, p=0.091). No associations were found between NMR and time to first cigarette, measures of intention to quit, or perceived addiction. The results of this study confirm previous studies that indicate that differences in NMR are correlated to the activity of CYP2A6, which is highly polymorphic across different ethnicities, and that NMR is related to heaviness of smoking.

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POS1-131
CAN YOU REFUSE THESE DISCOUNTS? AN ANALYSIS OF PRICE-RELATED PROMOTIONS BY U.S. CIGARETTE COMPANIES

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Objective: Increasing the unit price of cigarettes is among the most effective public health interventions to reduce cigarette consumption. However, cigarette companies may be directly influencing the prices of their products by using discounts. Little is known about price-related discounts offered by cigarette manufacturing companies and the impacts of these discounts on average per pack prices paid in the United States. In this study, we assessed the use of price-related discounts, including coupons, rebates, buy-1-get-1-free, 2-for-1, or any other special promotions by cigarette manufacturing company and by major cigarette brand. Methods: Using the 2009–2010 U.S. National Adult Tobacco Survey (NATS), we determined the prevalence and independent price reduction associated with price-related discounts used by current smokers in their lastpurchase of cigarettes. Results: About 1 of 4 smokers of Phillip Morris brands used price discount offers compared with 1 in 5 of those who smoked R.J. Reynolds brands, 1 of 8 of those who smoked Lorillard products, and 1 in 10 of those who smoked brands from other cigarette companies. Among the top 10 leading cigarette brands, the prevalence of using price-related discounts varied from 9.1% (Salem) to 33.0% (Camel). The percent of price discount for a pack of cigarettes ranged from 0.48% (Pall Mall) to 10.57% (Salem). The adjusted average (national) price of a pack of cigarettes ranged from $4.15 to $6.11; however, the average price-related discount of PM brands was 42 cents compared with 28 cents (RJR), 51 cents (Lorillard, Newport), and 24 cents from other companies. Conclusion: The leading U.S. cigarette manufacturing companies continue to offer remarkable price discounts to smokers of their brands, although these promotions appear to be concentrated among their top-selling cigarette brands. Because other studies have shown that smokers who use price-related discounts are less likely to make quit attempts or to successfully quit in the future, implementing policies that decrease price-minimization strategies will benefit public health.

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POS1-132
DSM-5 TOBACCO USE DISORDER CRITERIA IN A REPRESENTATIVE SAMPLE OF THE LARGEST METROPOLITAN AREA IN SOUTH AMERICA

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Aims: Given the recent launch of a new diagnostic classification(DSM-5) for tobacco use disorder(TUD), we aimed to identify continuous and categorical fenotipes among individuals who had at least 1 cigarette per week during lifetime. Most of the conceptual framework for TUD come only from alcohol use disorder(AUD) studies. Data are from the São Paulo Megacity Mental Health Survey (SPMHS) and were collected in 2005-2007, as part of the World Mental Health Survey Initiative. Methods: Exploratory factorial analysis(EFA) and latent class analysis(LCA) of the DSM-5 TUD criteria - SPMHS did not include the 3 DSM-IV nicotine abuse questions - were performed using Mplus software taking into account complex survey design features. Then, via weighted logistic regression models, we examined socio-demographic correlates of the DSM-5 TUD latent classes. Results: As in DSM-5-AUD studies, a one-factor model reached the best fit in EFA, including very high loadings (>60%) of all eight symptoms tested. The best LCA model was a four-class model: (1) a “non-symptomatic class” (31.1%), (2) a “lost control class” (27.3%) - defined by high probabilities of “use in larger amounts” and unable to cut down criteria - (3) a “craving-tolerance class”(7.9%), and (4) a “high-symptomatic class” (33.6%). Those in the “lost-control class” and “craving tolerance class” were more than 2 times more likely to be 18-34 years-old than those in the non-symptomatic class. Being in the three symptomatic classes was associated with unemployment/other as compared being in the non-symptomatic class. Conclusion: Prevention and specific treatment protocol can be designed based on this data. Varenicline or bupropion, as anti-craving medications, seem to be an interesting treatment option for those in the “craving-tolerance class”. Cognitive-behavioral therapy (plus pharmacological treatment) are adequate for those in “loss-control class”. Unemployed and young adults could be the target of prevention interventions for TUD in São Paulo.

FUNDING: The São Paulo Megacity Mental Health Survey was funded by the State of São Paulo Research Foundation, Brazil (FAPESP Grant 03/00204-3). Instrument development was supported by the Foundation for Science and Technology of Vitória, Espírito Santo, Brazil (Fundo de Apoio à Ciência e Tecnologia do Município de Vitória - FACITEC 002/2003). Dr. Martins is currently supported by NIH-NICHD R01HD060072.

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**POS1-133**

DOES ASKING SMOKERS ABOUT INTEREST IN FREE NICOTINE PATCHES IMPACT ON INTENT TO QUIT?

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**INTRODUCTION:** While there are numerous factors that contribute to smokers’ motivation to quit, the availability of free nicotine replacement therapy (NRT) on intentions to quit smoking has not been thoroughly explored. This study therefore examined whether simply asking about interest in free nicotine patches impacts intent to quit smoking. **METHODS:** A random digit dialing telephone survey was conducted of 983 daily Canadian smokers aged 18 years or older who had smoked at least 10 cigarettes per day for the past 3 months. As part of a large survey, two question sets assessed (a) intent to quit smoking within the next 6 months and 1 month, and (b) interest in receiving nicotine patches if offered for free. The order in which the two sets of questions were asked was randomly assigned. **RESULTS:** Intent to quit smoking was significantly affected by the order in which interest in free nicotine patches was asked, in that 66.7% of individuals who were asked about interest in free nicotine patches first (condition 1; n = 475) were intent on quitting smoking within the next 6 months, compared to 54.1% of individuals who were asked about their interest to receive free nicotine patches second (condition 2; n = 508) (chi square = 16.3, 1 df, p<0.001). Similarly, significantly more interested were found between the two conditions in smokers’ intent to quit in the next 1 month (50.0% vs. 33.3%; chi square = 16.7, 1 df, p<0.001). **CONCLUSIONS:** These findings provide important evidence that the mere measurement of interest in receiving free nicotine patches positively affects motivation in quitting smoking. They further underscore that programs that promote the availability of free NRT are a strong determinant in motivating and driving smokers to quit and are thus a viable public health initiative to reduce the prevalence of smoking.

**FUNDING:** Canadian Institutes of Health Research (CFP 230448)

**JUSTIFICATION:** As this research suggests that merely discussing the potential provision of free smoking cessation aides motivates smokers to think about quitting smoking, the availability of free nicotine replacement therapy through public health initiatives or primary care settings can drive change and reduce the prevalence of smoking.

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**POS1-134**

INCREASING SMOKERS’ “APP” TITUDE: A REVIEW OF SMART PHONE APPLICATIONS TO AID IN SMOKING CESSATION

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**Background:** Mobile Health (mHealth) is advancing the way many people access health-care related information and resources to treat or prevent negative health behaviors. Mobile health provides affordable to no-cost primary, secondary, and tertiary self-empowered approaches to assist in an individual’s health-related needs. In the United States alone, cigarette smoking accounts for approximately one of every five deaths. Traditional smoking cessation programs incorporate counseling and nicotine replacement therapies. Smoking cessation counselors should be aware of the growing prevalence of smart phone applications (apps) as an adjunct for traditional smoking cessation. Method: This study investigated 52 smart phone apps and summarized what resources were provided for each app. Beginning with the first app and increasing with each subsequent app, a matrix was developed to provide information to cessation counselors or interested quitters on the cost and resources available. Results: Of the 52 smart phone apps reviewed, 62.5% of the apps are free of cost, 22.9% of the apps cost $0.99, and the remaining 14.6% cost $1.99 or more. Features included games to keep his or her hands busy and mind occupied, information about nicotine replacement therapy, positive reinforcement, social media sharing of achievements, slip or relapse help, and the health benefits of quitting smoking. A calculation of the amount of money saved from quitting appeared in 43.8% of the apps. Other app features included links to other apps, links to external websites, and a helpline for smoking cessation. Some of the apps required the participant to make an account, be 17 years of age or older, and a consent to send push notifications to the participant.

**Discussion:** With the emergence of mHealth an individual going through cessation may desire to have additional support from smart phone apps. A tobacco cessation counselor can utilize the summary matrix developed through this research to help a client select an app to supplement traditional smoking cessation programs.

**FUNDING:** No funding

**JUSTIFICATION:** The use of this matrix may serve to inform clinical practice.

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**POS1-135**

ESTIMATING THE HEALTH EFFECTS OF ALTERNATIVE TOBACCO PRODUCTS: AVOIDING THE WRONG MISTAKE

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**Objectives:** Rarely observed covariate combinations, or “sparsity”, is a phenomenon associated with research concerning the health risks of alternative-use (non-combusted) tobacco products (AUPs). Of particular concern is the effect of the choice of regression model and sparsity relating to AUP users who do not currently or formerly use other tobacco products on statistical inference. **Methods:** We constructed examples from a case-control and cohort study based on existing and future real-world studies of AUPs combined with hypothetical data. Multivariable regression models were used to estimate associations between AUP use and outcomes under different modeling assumptions. Results: Parameter estimates in these scenarios can vary widely depending on the regression model used. Violation of scale or interaction assumptions can cause parameter estimates to be severely biased, and the biases can result in either overestimation or underestimation of parameters of interest such that the estimated effect is in the opposite direction compared to the true effect. **Conclusions:** The presence of sparsity must be considered when designing and analyzing AUP studies. Modifications both to the usual design and analysis of studies may be required to make appropriate inferences.

**FUNDING:** No funding was received for this work.

**JUSTIFICATION:** The results of this study might prevent that typical but potentially severely biased analysis results lead to incorrect policy decisions regarding alternative-use tobacco products.

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**POS1-136**

OPTIMISATION OF ADVISOR-SMOKER INTERACTIONS IN COMMUNITY PHARMACY SMOKING CESSATION SERVICE DELIVERY

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Community pharmacists are an important, easily accessible, front line service for primary care, as recognised by UK National Health Service policy. Community pharmacy smoking cessation services account for 38,000 quit attempts in London annually, but only 48% translate into a quit at 4 weeks. There has been no attempt to optimise interactional service delivery to increase quit rates. We are synthesising findings from a systematic review and qualitative study to develop a training intervention for community pharmacists. This will build on pharmacists’ consultation skills and knowledge, improving interactions between pharmacy staff and smokers, and delivery of the service, hence, increasing numbers of smokers enrolling and staying in the pharmacy smoking cessation programme and successfully quitting. The intervention will be piloted and formally trialled in...
an RCT. Here we report on the qualitative component of our five-year research programme. Three consecutive ‘real life’ community pharmacy smoking cessation consultations are being audio recorded for up to 350 smokers in approximately 21 community pharmacies evenly spread across three East London Public Health departments. Saliva samples are taken at the first consultation (baseline) and at 6 month follow up to obtain DNA and 3-OH cotinine measures, to determine smoker metabolic status (genetically fast or slow metaboliser), and 6-month quit status. Interviews with some advisors and smokers provide their perspectives of the consultations. Qualitative analysis of the interviews and consultations is being mapped onto metabolism and quit status data, with both thematic content analysis and micro-level systematic conversation analysis to determine successful and unsuccessful interactional strategies and underlying context. Consultations are compared for 20 demographically matched pairs (n=40) of 6-month quitters and non-quitters. We will report preliminary findings, especially considering problems where English is not the smoker’s first language.

FUNDING: National Institute for Health Research (UK) Programme Grant

JUSTIFICATION: If successful, the training intervention developed from this study will be made available to all community pharmacies, with some UK Public Health departments already expressing an interest in this.

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POS1-137

EFFECTS OF DURATION OF ELECTRONIC CIGARETTE USE

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E-cigarettes, which deliver nicotine through inhaled vapor, have been viewed as both a threat and a potential benefit to public health. Despite great strides made in researching these products over the last several years, many questions remain unanswered, including questions regarding the effects of e-cigarette use over time. Aims: To examine the effects of duration of e-cigarette use on several factors including current tobacco cigarette use, dependence to e-cigarettes, frequency of e-cigarette use, and the strength of nicotine solution used in e-cigarettes. Design and setting: Individuals were recruited at e-cigarette retail locations in a large metropolitan city in the Midwestern U.S. in July, 2013. One-hundred and fifty-nine participants with a mean age of 35.8, 84.8% Caucasian, 53.7% male completed a survey. Results: Duration of use was associated with decreased current cigarette use. Additionally, past heavy smokers (i.e., > 10 cigarettes per day) and past light smokers demonstrated significantly different patterns of dependence with duration of use. Overall, e-cigarette users decreased the strength of nicotine in their e-cigarette products; however, duration of use was not associated with changes in strength of nicotine, as some decreased nicotine strength very quickly while others took much longer. Frequency of e-cigarette use increased with increasing duration of use; however, this finding was not significant when traditional cigarette use was added as a covariate. Conclusions: Duration of e-cigarette use appears to be associated with decreased cigarette use and differing patterns of dependence contingent on past smoking history. Likely a function of individuals transitioning from traditional cigarettes to e-cigarettes over time, reported frequency of e-cigarette use increased with increased duration of use.

FUNDING: Oklahoma Tobacco Research Center Advanced Development Grant

JUSTIFICATION: The information gathered during this study should be considered when shaping future policies and regulations regarding electronic cigarettes.

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POS1-138

A SYSTEMATIC REVIEW OF RESEARCH ON TOBACCO USE AND PUBLIC, STRUCTURAL, AND SELF-STIGMA

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Introduction: Although denormalization of tobacco use may yield public health benefits, it may also lead to increased stigma—stereotyping, prejudice, and discrimination—and stigma-related social, economic, and psychological harms.

Methods: Studies were identified via PubMed, PsychINFO, SciELO, and PsyCIS. Key search terms included [social stigma, experienced stigma, self stigma, prejudice, social discrimination, denormalization, stereotype] and [tobacco, smoking, tobacco use disorder, tobacco products]. Articles within each domain were pooled, and the two domains were merged to identify all candidate studies. Reference lists and queries to listserves yielded additional articles. Selection criteria for the review included (1) having stigma and tobacco as main topics of the article, and (2) having original data. Initially 142 studies were identified; 23 articles met inclusion criteria for review. Results: Study designs included qualitative (1) and quantitative (21) data collection; 1 included both. Definitions of stigma varied widely across studies. Most (16) studies focused on stigma held by the public toward tobacco users (public stigma). Of these, 7 studies found that the public stigmatized smokers. Two articles found that tobacco control campaigns may exacerbate stigmatization. Five studies examined structural stigma—institutional discrimination that intentionally restricts opportunities for tobacco users. Two studies found that policies to increase the social unacceptability of smoking in effective in reducing consumption. One study found that tobacco control legislation increased public stigma and another reported important negative consequences arising from the stigmatization. No studies examined self-stigma—the prejudice that smokers might turn against themselves. Discussion: Our comprehensive search found few studies on tobacco and stigma. U.S. drug policies have traditionally relied on “harm maximization” approaches that concentrate penalties on drug users in order to drive down prevalence. To ensure that control efforts minimize harms to tobacco users, more research on stigma, especially self stigma, is needed.

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POS1-139

OPPORTUNITIES AND BARRIERS FOR INTEGRATING TOBACCO CONTROL IN HEALTH PROGRAMS: FINDINGS OF A STAKEHOLDER ANALYSIS IN INDIA

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In India a National Tobacco Control program was piloted in 2008 to strengthen the implementation and enforcement of tobacco control law and policy. One such activity aimed at strengthening health systems is to build tobacco control activities into clinical practices of the current health workforce. The primary objective of our study was aimed at understanding current practices, missed opportunities and operational barriers for mainstreaming tobacco control in existing health programs at a district level. A semi structured discussion guide with prior themes was developed to provide for a systematic process in the interviews. We adopted a Case Analysis approach in this study where we analyzed the data in 2 stages: we used Case analysis technique for analyzing the data, cases were based on their positive, negative, or no/ neutral responses for each interview and grouped accordingly. Patterns of similarities and dissimilarities were searched across the cases. The transcripts were reviewed as multiple comparative cases. The codes that were inducted from the data were used to label chunks of data by using Atlas Ti software for data analysis. Additional review of the coded data and reflection on the initial conceptualization led to refinement of the concepts. Findings revealed that many cases (about 70%) were not familiar with the policy for smoke-free places, Tobacco control continued to be a low priority issue by most stakeholders. Financial constraints in form of inadequate allocation of budget/ funds was the most common barrier cited. Lack of inter- departmental coordination, irregular
monitoring, and lack of motivation amongst health care providers were also noted. Issues like low awareness amongst health care providers, lack of training and counseling skills were also noted as significant barriers for mainstreaming tobacco control in health programs. None of the cases were aware or confident of evidence-based measures available to treat addiction. Stakeholders’ alignment and support are one of the most important components of good stewardship. Some of the potential solution levers as suggested by many respondents are aligned very much with system sciences approach

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JUSTIFICATION: stakeholders perceptions on exiting barriers and suggested solutions for overcoming these barriers will help address gaps in enforcements of tobacco control policies at the implementation level in India

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POS1-140 HOUSEHOLD SMOKING AND DEPRESSIVE SYMPTOMS IN CHINESE AMERICANS

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Background: Secondhand smoke (SHS) exposure increases depressive symptoms among non-smokers. However, studies have not considered the influence from social proximity to smokers who may have an elevated level of depressive symptoms. This study explored the associations between household smoking and depression. Method: Baseline data were collected from 613 smoker-supporter dyads of Chinese descent who enrolled in a smoking cessation intervention study. All 613 smokers (11% female, mean age was 42, 44% smoked within 30 minutes after waking; mean cigarettes per day was 9.9) reported smoking at least 5 cigarettes in the past 7 days. Supporters were a selected family member or a friend of a participating smoker. The 613 supporters included 77% females with mean age of 38, 78% never smokers, 35% spoke limited English, 72% lived in the same household of the smoker participant, and 50% were spouses of the smokers. Multivariate regression was used to identify individual and social correlates of depressive symptoms (CES-D score) among the supporters. Results: Multivariate analyses revealed that living in the same household with the smoker participant (B=0.85), smoker’s elevated depressive symptoms (B=0.19), poor satisfaction in communication quality with the smoker (B=0.19), poor satisfaction in communication quality with the smoker (B=-0.67), lower commitment to assist smoker to quit (B=-1.19) were independent social correlates for supporters’ depressive symptoms with the supporter’s age, gender, marital status, smoking status, income, and perceived health adjusted in the model. Conclusion: Potentially higher SHS exposure via living with a smoker, and exposure to a smoker’s elevated depressive symptoms may both increase a supporter’s depressive symptoms. Interestingly, supporters’ depression was associated with less satisfied communication with their smokers and being less committed to assisting them to quit smoking. Findings revealed new reciprocal associations among household smoking, depression levels of both smokers and their supporters, and the amount of support smokers may receive during quitting, which would be important to address in smoking cessation treatment.

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JUSTIFICATION: stakeholders perceptions on exiting barriers and suggested solutions for overcoming these barriers will help address gaps in enforcements of tobacco control policies at the implementation level in India

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POS1-141 THE RELATIONSHIP BETWEEN JOB TYPE AND SMOKING-RELATED CHARACTERISTICS OF WORKERS IN SMALL MANUFACTURING COMPANIES


Although smoking has declined in most occupational groups, it remains high among the blue-collar workforce. There has been little research on tobacco use in small manufacturing companies, an important site for blue-collar workers. This study describes the smoking patterns, quit behaviors and smoking context of smokers employed in small manufacturing companies (i.e., those employing 20 to 150 workers). Smokers (n=714 of 2,599 surveyed) employed at 47 small manufacturing companies in the Twin Cities, MN, completed surveys on their tobacco use; quit efforts; smoking prevalence and support for quitting from family, friends, supervisors, and coworkers; and a variety of other variables, such as stress levels and health care visits, that could be related to smoking and quitting. We examined these variables by job type (i.e., managers (M); employees who were both managers and production (M/P) workers; and production-only (P) workers), controlling for age, sex, and company. We also used latent class analysis (LCA) to group workers with similar smoking-related characteristics. Production workers had significantly lower rates of characteristics favorable to cessation than did M or M/P workers. For instance, they had the highest rate of daily smoking (87% vs 68% (M) and 85% (M/P)) and smoking within < 30 minutes of waking (60% vs 28% (M) and 51% (M/P), lowest past use of any cessation aids (43% vs 56% (M) and 57% (M/P)), and lowest level of support to quit from friends, coworkers, and company management. They were the most likely to perceive worksite norms regarding smoking as more permissive and they had the highest levels of general stress and job strain. The LCA identified 3 clusters of smokers. The 1st cluster included workers with the healthiest characteristics; the 2nd and 3rd clusters had progressively less healthy characteristics. These clusters were significantly associated with job type: the majority of managers were in the 1st cluster (52%), while most production workers were in the 2nd (38%) and 3rd (37%) clusters. These results can be utilized to develop smoking profiles of each of these occupations that can aid in developing targeted interventions.

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Justification: These results can inform targeted interventions by occupational group through developing profiles of smokers based on the clusters identified through the latent class analysis.

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POS1-142 THE FEASIBILITY OF RECRUITING YOUNG ADULT DAILY SMOKERS FROM DIVERSE ETHNIC GROUPS INTO A STUDY THAT EXAMINES DIFFERENCES IN NICOTINE DEPENDENCE AMONG MENTHOL AND NON-MENTHOL CIGARETTE SMOKERS


Native Hawaiians, Filipinos, and Whites have the highest lung cancer incidence and death rates in Hawaii. Reducing smoking prior to age 35 can significantly reduce most tobacco-specific morbidity and mortality. Little is known about how to recruit young adults from diverse ethnic groups into studies on cigarette smoking. This study examines the feasibility of using Craigslist.org and newspaper ads to recruit Native Hawaiian, Filipino, and White daily smokers aged 18-35 into a study that investigates differences in nicotine dependence among menthol versus non-menthol smokers. Recruitment ads were posted in 4 major Hawaii newspapers and weekly on Craigslist.org. Ads directed participants to call or email the University of Hawaii for study information. Participants were screened by phone for eligibility. Eligible smokers completed an online survey in the health communication lab at the
University of Hawaii Cancer Center and provided a saliva sample, a picture of their cigarette pack, carbon monoxide level readings, and anthropometric measures. Over an 11-week period, we received 525 inquiries. Fifty-four percent (n=284) were received by phone, 43.4% (n=228) by email, and 2.9% (n=13) other. Sixty-seven percent (n=353) of inquirers completed the phone screener and 32.8% (n=172) were called but could not be reached. Overall, 83.8% of participants learned about the study through Craigslist, 12.5% through newspaper, 3.1% through family/friend, and 0.6% other. Of the completed phone screeners, 50.7% (n=179) were eligible for the study. Of eligible participants, 96.6% (n=173) expressed interest in the study and 3.4% (n=6) declined to participate. Of smokers who agreed to participate, 60% (n=84) completed the one-hour study. Of study completers, 29% were Native Hawaiian, 37% Filipino, and 34% White. Twenty-three percent were of Hispanic origin, 37% were female, 36% had a high school diploma/GED or less, 81% were employed, 24% had incomes <$10K, and 66% reported menthol cigarette smoking. Results suggest that Craigslist.org is a useful strategy to recruit young adult daily smokers from diverse ethnic groups into a study on smoking.

FUNDING: American Legacy Foundation and University of Hawaii Cancer Center

JUSTIFICATION: Racial/ethnic groups are often under-represented in research and media channels successfully used in this study can be applied to other studies conducted in community and clinical settings.

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POS1-143
SMOKESCREEN: A TARGETED GENOTYPING ARRAY AND SOFTWARE APPLICATION FOR NICOTINE RESEARCH

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Tobacco dependence is associated with increased risk of disease and premature death. While public health and pharmacological interventions have made good progress in reducing the overall rate of smoking, challenges remain in optimizing their effectiveness based on patient characteristics including genetic variation. In order to maximize collaborative efforts to advance tobacco research, we have developed a solution called Smokescreen consisting of two major components - a targeted genotyping array and a centralized software application. We present the design of our array, which includes multi-population coverage of 1,015 genomic regions associated with addiction, as well as biological pathways related to the metabolism of nicotine and the brain’s reward system. The Smokescreen genotyping array includes a genome-wide core (296,038 SNPs); loss of function and exonic SNPs in the selected genomic regions (44,274); pharmacogenomics SNPs (2,031); eQTLs (5,870); ancestry informative markers (5,419); replicated genome-wide association studies findings (5,669); fine mapping of chr15q25, CYP2A6, and CYP2B6 (8,150); tagging of the selected 1,015 regions (205,579); and high priority SNPs identified in the literature related to smoking phenotypes and co-morbidities. We also present the centralized software application specifically designed to complement the array. The software features automated quality control, data analysis pipelines, and the ability for researchers from different institutions to combine their data for powerful analyses. The software integrates databases, cloud computing, algorithms for analysis, and a web-based user interface. We conclude by describing analytic extensions to the platform for multivariable modeling of nicotine metabolism pathways.

FUNDING: This project has been funded in whole or in part with Federal funds from the National Institute on Drug Abuse, National Institutes of Health, Department of Health and Human Services, under Contract No. HHSN271201300004C.

JUSTIFICATION: The data gathered can be used in the development of biomarkers for smoking cessation.

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POS1-144
STRENGTHENING TOBACCO CONTROL IN PRIMARY HEALTH SERVICES: FINDINGS FROM AN RCT IN INDIA

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The WHO has called for cessation to be integrated into primary health care globally. India’s GATS data indicate a failure to advise on tobacco cessation during clinical visits. We present the end line findings of a project aimed at strengthening tobacco cessation in primary care in India. Objectives of this study were to evaluate a brief intervention package on tobacco cessation in primary health care providers which was conducted in 12 districts in India. Two cross-sectional surveys were conducted which compared differences in indicators at the start of the project (June 2011) and at the project closure (August 2013). An intervention package comprised of training, monitoring and supportive supervision and the effective use of communication materials for cessation was applied in randomised health facilities. Bi-variate analysis was used to measure associations between variables such as knowledge and counseling practices in tobacco cessation, with statistical significance based on the χ2 test. Medical officers in intervention facilities of AP reported 10% and 4% higher improvement in the knowledge level on health effects of tobacco pertaining to adverse reproductive health outcomes and lung cancer respectively in comparison to corresponding change in control health facilities (p value <0.05). Knowledge level of AM/Nurses on NRT and counseling increased significantly in intervention facilities from 38% and 82% to 62% and 95% respectively in Gujarat (p value<0.05). An increase of 16% was self-reported in counselling practices of medical officers in tobacco cessation in intervention health facilities over and above the increase in counseling practices in control facilities in both the states. Around 22% and 6% incremental change was noted in the attitude of HSPs towards the statement that “Patient’s chances of reducing tobacco use increases if a health professional advises to reduce consumption” in intervention facilities in AP and Gujarat respectively over and above the change noted in control health facilities (p value <0.05). The intervention package for HSPs can help increase opportunistic advice in routine clinical practices of HSPs.

FUNDING: BILL AND MELINDA GATES FOUNDATION

JUSTIFICATION: Evaluation study demonstrates an increase in knowledge attitude and practices of primary care health providers by allow cost integration model.

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POS1-145
SOCIAL WORK STUDENT INTERNS IN TOBACCO TREATMENT – A TRAINING PARADIGM SHIFT

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Integrating tobacco use treatment (TUT) knowledge and skills into professional training programs across a variety of disciplines is a promising strategy for growing the TUT workforce and reducing smoking prevalence. Professional social workers make up over 50% of the mental health workforce and are well positioned to address tobacco use with clients from vulnerable populations with persistent disparities in tobacco use and related health outcomes. Growth of the case management model puts social workers at the crux of patient care in healthcare settings where TUT can be addressed. However, TUT has not been a focus in social work training and practice, and barriers to treating tobacco use in mental health and substance abuse settings are well documented. In 2010, The University of North Carolina (UNC) Nicotine Dependence Program (NDP) became a practicum setting for UNC School of Social Work graduate students. Through training, shadowing, and supervised practice, students become proficient in Tobacco Treatment Specialist core competencies. Students assist with treatment groups and independently complete patient consults, facilitate treatment plan development, provide follow-up, and advocate for patients within the healthcare system. We report findings from a post-placement survey, including changes in student knowledge and skills, perceptions about the fit of TUT and social work, attitudes related to integrating TUT with mental health and substance abuse
treatment, and experiences disseminating TUT knowledge and skills in classes or other work settings. Qualitative data from School of Social Work faculty describe knowledge and attitudes about TUT and its place in social work training and practice. These data provide direction for improved engagement with the academic and internship curriculum. Lessons learned from three years of training Social Work students will inform efforts to broaden and strengthen the tobacco use treatment workforce through integration into diverse fields. Such efforts have the potential to increase the inclusion of TUT in mental health and substance abuse settings, and across the health care system.

FUNDING: The UNC NDP programs are funded by UNC Health Care, the UNC Department of Family Medicine, the North Carolina Cancer Hospital, and the Lineberger Comprehensive Cancer Center.

JUSTIFICATION: Integrating tobacco use treatment knowledge and skills in Social Work education and field training has the potential to significantly expand the reach of tobacco use treatment in mental health, substance abuse, and general healthcare settings.

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POS1-146
NORTH CAROLINA PHYSICIANS’ KNOWLEDGE AND UTILIZATION OF A STATE QUITLINE SERVICES

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Research shows that quitlines are an effective and evidence-based approach to tobacco cessation. We report results from an online survey of North Carolina (NC) physicians who assessed awareness, knowledge, and behavior related to the NC quitline (QuitlineNC) and its services. A direct marking company with access to the American Medical Association (AMA) mailing list distributed the Provider Survey through e-mail to a random sample of 787 NC Family Medicine, Internal Medicine, General Surgery, OB Gyn, and Psychiatry physicians. From this e-mail, 14 addresses were invalid or returned, 413 were opened, and 128 responded. The majority (86%) of respondents were men (60%), in an academic, group or hospital-based practice, use an electronic health record (77.7%) and, were very clinically active. The majority (81.6%) of respondents said they had not previously heard about QuitlineNC. Among those that had heard of QuitlineNC, only one-third reported knowing the quitline telephone number. Most of those who knew about the quitline knew about the free telephone coaching services available, but substantially less knew about the web coach online cessation support or quitline fax referral service. Among those providers aware of the quitline, almost a third reported rarely or never informing patients of QuitlineNC telephone coaching services and the majority reported rarely or never informing patients about the QuitlineNC fax referral service (79.9%), or of the free cessation medications available (67.8%). Finally, the great majority of physicians reported that they felt that QuitlineNC services are very successful or successful in helping their patients quit using tobacco (84.8%) and that the offer of free cessation medications would dramatically (89.8%) increase their likelihood of recommending QuitlineNC to their patients. Results show that substantial numbers of NC physicians still do not have knowledge about QuitlineNC, and among those who have heard of it, utilization is quite low. Dedicated efforts should occur around educating providers about Quitline services. Most providers believe the services are effective, but innovative ways to reach busy providers are needed.

FUNDING: North Carolina Department of Health and Human Services

JUSTIFICATION: Physicians will learn about all Quitline services which will help their patients that use tobacco products.

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POS1-147
WATERPIPE SMOKING AMONG A SAMPLE OF JORDANIAN ADOLESCENTS: PATTERNS AND PREDICTORS

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Numerous researchers have indicated the alarming increase in a different method of tobacco use; waterpipe, especially among young people. Still, the patterns and predictors of this method are not well known. The current study was conducted to assess the patterns and predictors of waterpipe tobacco smoking among sixth grade or higher school students in one of Jordan’s Central Governorates. Method: A cross-sectional survey was conducted in the spring of 2012 to investigate the patterns and predictors of tobacco use among adolescents (grades 6, 8, 10, and 12) of Zarqa Governorate, central Jordan. Participants were randomly selected using multistage random sampling with a total of 1,050 participants. Questionnaires were distributed in 11 public schools. Data were collected using the Arabic Youth Tobacco Use Composite Measure. Results: Participants’ ages ranged from 11 to 17 years, (M = 14.7, SD= ± 1.9 years). Waterpipe smoking was more prevalent among girls (51.8%) compared to boys (48.2%), and among those who had heard of QuitlineNC, only one-third reported more likely to smoke a waterpipe when they perceived it as not harmful to their health. Our findings illustrate the need for public health campaigns to educate and reach adolescents, teachers, and families regarding the health harms of waterpipe smoking. School education systems should be engaged in educating students against the health risks of all tobacco use, including waterpipe smoking.

FUNDING: Hashemite University, Deanship of Research, Jordan

JUSTIFICATION: young boys and girls smoking waterpipe as early as 12 years old.

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POS1-148
PREGNANT WOMEN’S SECONDHAND SMOKE EXPOSURE AND RECEIPT OF SCREENING AND BRIEF ADVICE BY PRENATAL CARE PROVIDERS IN ARGENTINA AND URUGUAY

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Background: Preventing secondhand smoke (SHS) exposure among pregnant women could avert poor pregnancy, infant and longer term health outcomes. This study estimates the prevalence of women who reported exposure to SHS during pregnancy, received screening and brief advice to avoid SHS during prenatal care, and avoided SHS during pregnancy for their baby's health in Buenos Aires, Argentina and Montevideo, Uruguay. Methods: Women who attended prenatal care at one of 21 clusters of publicly-funded prenatal care clinics were interviewed at their delivery hospitalization from October 2011 to May 2012. We calculated SHS exposure prevalence by source and presence of home or workplace smoking bans during pregnancy. Women’s receipt of prenatal care provider screening and advice to avoid SHS exposure and report of always avoiding SHS were also described. Analyses were conducted using SURVEYFREQ procedure in SAS version 9.3 to account for the clustered study design. Results: Of 3,143 pregnant women, 43.6% had a partner who smoked, 52.6% lived with household members who smoked, and 34.4% had or a partial smoking ban at home during their pregnancy. Of 556 pregnant women who worked outside of the home, 21.6% reported past month SHS exposure at work, and 38.1% reported no or a partial smoking ban at work.
Overall, 36.2% of pregnant women were exposed to SHS during pregnancy at home or at work. In at least one prenatal care visit, 67.7% of women were screened for SHS exposure by their prenatal care provider, and 56.6% reported receiving advice to avoid SHS. Percentage of women who reported always avoiding SHS for their unborn baby’s health was 52.9%. Conclusion: In Buenos Aires and Montevideo, a third of pregnant women attending publicly-funded prenatal clinics were exposed to SHS, predominantly at home, and only half of pregnant women always avoided SHS for their unborn baby’s health. Provider screening and advice rates can be improved in these prenatal care settings, as all pregnant women should be screened and advised of the harms of SHS and to avoid it.

FUNDING: The study was supported through CDC cooperative agreement 5U48DP001948-04 (SIP09-18) to Tulane University.

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POS1-149
EFFECTIVENESS OF ASSIST LINKED BRIEF INTERVENTION ON PREVALENCE OF TOBACCO USE IN NIGERIA: A RURAL-URBAN COMPARISON

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Objective: To score a sample of Nigerian community members for the risk of hazardous and harmful consequences of tobacco use using the Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST), followed by the ASSIST Linked Brief Intervention at entry and 3 months. Design: A cross sectional intervention study was carried out in an urban and a rural local government area of Oyo state, Nigeria. Methods: Participants were from a Yoruba speaking State in Nigeria; 1203 subjects 14 years and older were selected. Intervention: Lower risk participants scored 0-3 (general health advice), moderate risk scored 4-26 (brief intervention and take home booklet and information), and high risk scored 27+ (brief intervention, take home booklet and information and referral to specialist hospital assessment and treatment). Outcome measure was prevalence of tobacco use at 3 and at 6 months after intervention. Results: Prevalence of current use of any tobacco product at baseline was 248 (20.6%). Of these current users, 79 (31.9%) scored 0-3 (low health risk), 130 (52.4%) scored 4-26 (moderate risk), and 39 (15.7%) scored 27+ (high risk) on the ASSIST. At 3 months, prevalence of current use was 199/1199 (16.5%) and at 6 months 169/1195 (14.1%). Multivariate analysis revealed at 6 months, the significant factors that remained associated with current use was females, OR =0.12, 95% CI (0.03-0.29), p < 0.01, and 33.3% of individuals who first tried tobacco use were females, OR =0.12, 95% CI (0.03-0.29), p < 0.01, and being a rural dweller, OR = 1.96, 95% CI (1.03-3.23), p = 0.04. Conclusion: Drug screening and brief intervention should be integrated into primary care services in Nigeria.

FUNDING: New World Specialists Hospitals Ltd.

JUSTIFICATION: This study will inform policy makers on the need to invest on tobacco control in the community.

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POS1-150
NEIGHBORHOOD ACCESS TO SINGLE CIGARETTES AND SMOKING RELAPSE IN MEXICO: FINDINGS FROM THE ITC MEXICO SURVEY

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The World Health Organization Framework Convention on Tobacco Control (FCTC) calls for the prohibition of single cigarettes sales. Single cigarettes have been banned in Mexico since 1999, but are frequently sold. Existing evidence is inconclusive on whether the availability of single cigarettes promotes or inhibits quit behavior among adults. We used data from adult smokers (n=1272) who participated in the 2011 and 2012 Mexican administrations of the International Tobacco Control Policy Evaluation Survey to examine the association between neighborhood-level access to single cigarettes and both quit attempts and relapse. The survey included participants living in 150 census tracts (average number of participants per census tract=15; range: 4-22). Neighborhood access to single cigarettes was measured as the proportion of residents in each census tract that reported seeing singles sold in their neighborhood every day. Covariates included gender, quit intentions, smoking intensity, singles purchasing behavior, and neighborhood-level socioeconomic status. We conducted statistical modeling using generalized estimating equations to account for the within-neighborhood non-independence of observations. The average proportion of residents who reported seeing singles sold in their neighborhood every day was 0.60 (range: 0-1). About one-third of smokers made a quit attempt in the past year. Of smokers who made a quit attempt, 26% successfully quit and 74% relapsed. In adjusted analyses, higher neighborhood access to single cigarettes was associated with a lower probability of making a quit attempt (prevalence ratio (PR)=0.79; 95% confidence interval (CI): 0.48 - 1.32) and was statistically significant. Similarly, people living in neighborhoods with higher access to singles were more likely to relapse (PR=1.31; CI: 0.94 - 1.84), but the relationship was not statistically significant. Higher levels of neighborhood access to singles may be associated with a lower probability of making a quit attempt and a higher probability of relapse. More research is needed to determine whether this pattern holds in larger samples and in different populations.

FUNDING: Funding for data collection from waves 4 and 5 came from the Mexican Consejo Nacional de Ciencia y Tecnología (Salud-2007-C01-70032), and wave 6 data were collected with funding from a grant from the Canadian Institutes of Health Research (115016). Analysis was partially supported by a grant from the National Cancer Institute at the National Institutes of Health (P01 CA138389), as well as the 2012 Latin America/Latino Health Summer Fellowship at the University of North Carolina.

JUSTIFICATION: The results of this study indicate that neighborhood access to single cigarettes may be associated with higher rates of smoking relapse, suggesting a need for stronger enforcement of the ban on single cigarettes in Mexico.

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POS1-151
WHICH TOBACCO PRODUCTS ARE GATEWAYS TO REGULAR USE: AN EXAMINATION OF FIRST USED TOBACCO PRODUCTS AND CURRENT USE IN COLLEGE STUDENTS

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Concerns have been raised regarding emerging tobacco products (ETPs; e-cigarettes, snus, dissolvables) and hookah/waterpipe tobacco use and their potential as a gateway product to further tobacco use for youth. It is important to understand how trying certain products affect the risk of future use. To determine the prevalence of use of various tobacco products among youth on a college campus and whether the first product tried predicts later single, dual, or poly tobacco use, 1,304 undergraduate students (Mage=19.57) at a mid-western university completed questionnaires regarding current and past tobacco use. Tobacco use questions included first product tried, and ever, non-daily, or daily use. Cigarette, smokeless tobacco (SLT), dissolvables, snus, hookah, and e-cigarettes use were assessed. Multinomial Logistic Regressions were used to examine whether first product used predicted current daily/non-daily single-, or poly-tobacco use. Dissolvables, snus, and e-cigarettes were categorized as ETPs. The sample consisted of 1037 nonusers (79.5%), 180 single- (13.8%), 58 dual- (4.4%), and 19 poly-users (1.5%). Approximately 24.5% of individuals who first tried cigarettes were current smokers and 39.0% were tobacco users (n=127); 40.2% of individuals who first tried SLT are current SLT users and 52.5% are tobacco users (n=51); 3.4% of individuals who first tried ETPs were current ETP users and 28.8% were tobacco users (n=17); 33.3% of individuals who first tried Hookah were current Hookah users and 34.6% were tobacco users (n=54).
First product tried did not discriminate between current tobacco use vs. non-use, but individuals who first tried SLT or cigarettes were more likely to be poly users of tobacco compared to those who first tried either hookah or ETPs. Lastly, those who first tried ETPs or hookah and were current tobacco users were largely using Hookah (82% and 93%, respectively); those who first tried a cigarette or SLT and were current tobacco users were largely single/dual users of cigarettes and/or SLT (cig-first: current = 63% cig and 20% SLT; SLT-first: current = 35% cig and 75% SLT). Percentages sum to greater than 100% due to dual users.

FUNDING: No external funding

JUSTIFICATION: The information presented will be useful for public health officials to better understand the potential role of emerging tobacco products to be gateways of further cigarette and smokeless tobacco use.

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POS1-152

EFFECTS OF PSYCHIATRIC COMORBIDITY ON QUITTING BEHAVIORS WITHIN THE LOMA LINDA VETERANS AFFAIRS MEDICAL CENTER TOBACCO-DEPENDENCE TREATMENT PROGRAM: 2000-2011

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Thirty-six percent of American adults with psychiatric illnesses smoke, and psychiatric illness is an established risk factor for poor abstinence outcomes. The Loma Linda Veterans Affairs Medical Center (LLVAMC) Tobacco-Dependence Treatment (TDT) program developed a clinical database amenable to study smokers with psychiatric comorbidities; it is the only continuously gathered 10-year database for veterans’ tobacco treatment. Our study sought to determine the prevalence of psychiatric disorders in veterans who smoke and their effects on various abstinence outcomes in the LLVAMC TDT program. Veterans seen by a physician and diagnosed with any medical or psychiatric condition from February 2000 to June 2011 were included (n = 4,589 met inclusion criteria). The prevalence of any psychiatric diagnosis, which included the following categories, was 47.2%; depressive disorder, 25.3%; chemical dependency, 19.7%; post-traumatic stress disorder, 12.8%; anxiety disorder, 7.3%; bipolar disorder, 4.9%; psychotic disorder, 4%; and other psychiatric diagnoses, 3.5%. There was no meaningful difference in the average number of cigarettes smoked per day at the first visit for any of the psychiatric diagnoses. The proportion of patients with more than 7 encounters, including office visits, was significantly higher for all psychiatric diagnoses (Chi-square test; relative risk 2.5 for patients with any psychiatric diagnosis; p < 0.001). Veterans with chemical dependency or psychotic disorder were less likely to stop by their final visit, while those with anxiety disorder were more likely to stop (Chi-square test; relative risk 0.85, 0.73, and 1.15; p = 0.001, 0.005, and 0.05, respectively). The number of encounters among veterans who successfully stopped by their final visit was significantly higher for patients with any of the psychiatric diagnoses than for those with no psychiatric diagnosis (t-test for means; p < 0.001). We conclude important differences exist in utilization and effectiveness of the LLVAMC TDT services based on psychiatric diagnoses. These differences must be further explored and taken into account when developing TDT policies for veterans.

FUNDING: Development of LLVAMC TDT Database funded under National Institute on Drug Abuse (NIDA) training grant, 1995-97, to Loma Linda University Preventive Medicine Residency Program.

JUSTIFICATION: Given the immense burden that mental illness (over 1.5 million veterans) and smoking-related morbidity (8-24% of the Department of Veterans Affairs' total healthcare costs) have on the Veterans Health Administration (VHA) system, more attention should be placed on identifying and monitoring smokers with psychiatric comorbidities in tobacco-dependence treatment programs to address their specific barriers to abstinence and ultimately, reduce VHA health expenditures.

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POS1-153

LITERACY AMONG HIV-INFECTED PERSONS REFERRED TO A WEB-BASED TOBACCO TREATMENT TRIAL

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Introduction: Web-based interventions are assuming an increasingly important role in public health. Most online tobacco treatment programs are heavily text-based, and literacy is a requirement to effectively utilize them. HIV-infected smokers are a high-priority group, but little is known about their literacy rates. We examined the prevalence of, and factors associated with, low literacy/literacy literacy in Persons Living With HIV (PLWH) who were referred to a web-based smoking cessation trial. Methods: In 2011, we initiated a randomized controlled trial of online tobacco treatment for PLWH. HIV-infected smokers with internet access were referred by providers to the study. Screening included the Short Assessment of Health Literacy- Spanish and English (SAHL-S&E) - a validated test of word recognition and reading ability. Participants are asked to accurately pronounce and identify topical connections within three word sets. In a prior validation study, scores <15 out of a possible 18 indicated low literacy. We used this cutpoint in our screening, and those with low literacy were excluded from the trial. We present summary statistics of the patient sample and prevalence and correlates of low literacy. Results: 178 patients were screened: mean age 46; 44% female, 55% male, 1% transgender; 73% African American, 20% White, 48% Latino. 9% scored <15. Factors associated with low literacy on SAHL-S&E were educational attainment.

FUNDING: This study was conducted while the principal investigator, Dr. Jonathan Shuter, was at Albert Einstein College of Medicine. Supported by NIH/NCI.

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POS1-154

DESIGNING A NOVEL SMOKING CESSATION INTERVENTION IN COMMUNITY PHARMACIES USING THEORY-BASED ANALYSIS OF SUCCESSFUL HEALTH PROMOTION PROGRAMMES: A SYSTEMATIC LITERATURE REVIEW

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BACKGROUND: Community pharmacies are an easily accessible platform for promoting lifestyle change, and smoking cessation is one of the most important behaviour change tasks. However, quit rates are low in this setting suggesting that interventions could be optimised further. This review aims to identify all rigorous studies of health behaviour change in pharmacies to understand the range of theories and techniques underpinning successful programmes. This information will inform development of a new smoking cessation intervention to be tested in a randomised controlled trial (RCT) in East London. METHODS: Systematic searches were conducted using multiple databases to identify all eligible studies. RCTs, cluster RCTs, controlled before-after studies and interrupted time series studies were included. Studies were coded using the Behaviour Change Taxonomy and Theoretical Domain Framework and assessed for quality using the...
POSI-155 EXPANDING THE ROLE OF COMMUNITY HEALTH WORKERS IN A LOW-MIDDLE INCOME COUNTRY TO INCLUDE SMOKING CESSATION ASSISTANCE

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Background: Despite high rates of tobacco use in low-middle income countries (LMICs), smoking cessation services are not readily available. Vietnam, like other LMICs, employs a large workforce of community health workers (CHWs) to deliver a wide range of preventive services. The purpose of this study was to assess attitudes among CHWs in Vietnam towards leveraging the CHW infrastructure to increase access to evidence-based smoking cessation interventions. Methods: We conducted 4 focus groups in Vietnamese with 29 CHWs recruited from 4 different district community health centers (CHCs) in Hanoi. Results: Key themes included the belief by most CHWs that expanding their role to include smoking cessation assistance “fit well with their current roles and responsibilities” and that they had the “relevant experience” counseling patients on a range of prevention issues including informally advising smokers to quit. They also endorsed the concept of serving as a referral resource for providers in local CHCs expressing the belief that CHWs were the most appropriate health care provider to offer cessation assistance. “It is more suitable and effective if we, rather than people working in other departments, give counseling to quit.” They were confident that with training, they could provide effective cessation assistance. CHWs were supportive of Vietnam’s current tobacco control policies and programs but noted a gap in programs to help smokers quit. CHWs described the primary barrier to smoking cessation as the lack of direction and support from government. “We have not been assigned to help smokers to quit and only do programs directed by senior departments. We do not decide by ourselves what to do.” Conclusion: These results suggest that CHWs’ current roles and responsibilities are consistent with delivering smoking cessation interventions. With training and support from public health authorities, CHWs believe that they could promote and provide cessation services. The findings have important implications for policy and intervention design to facilitate implementation and dissemination of effective treatment for tobacco dependence in LMICs.

FUNDING: No funding

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POSI-156 POLY-TOBACCO USE AND CESSATION: DO SMOKERS TURN TO ENDS AND/OR OTPS AS PART OF THEIR QUITTING STRATEGY?

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Background: Awareness and use of electronic cigarettes and other novel tobacco products has increased significantly in recent years. These products currently occupy a regulatory limbo with regard to the FDA, during which the tobacco and e-cigarette companies are aggressively marketing to smokers and non-smokers alike. Many of the media messages, however, appear to either directly claim or to imply that e-cigs or OTPs can reduce nicotine cravings and potentially help smokers to quit. Methods: In February, 2013, GfK fielded an online survey of 17,522 US adults, using their nationally representative Knowledge Panel, supplemented by a convenience sample from SSI, a large market research firm with access to millions of US adults. Data were appropriately weighted. Separate logistic regression models were constructed for awareness and use of electronic cigarettes, dissolvable tobacco products, and evidence-based NRTs. Control variables included average daily cigarette consumption, intentions to quit smoking, amount of tobacco use, gender, age, race/ethnicity, LGBT status, education, income, Internet and social media use, and media market of residence. Results: Current smokers were significantly more likely than never or former smokers to report awareness or use of e-cigarettes or OTPs. Among smokers, respondents were more likely to report awareness and use of e-cigarettes than OTPs. Young adults and LGBT respondents were more likely than other respondents to report awareness and use of e-cigarettes and OTPs. Electronic cigarette use was higher among smokers who reported intentions to quit. Discussion: Our findings suggest that smokers may be using e-cigs as part of a cessation strategy. Further, our results suggest the possibility of differential exposure to, searching for, and sharing information about electronic cigarettes and OTPs, as well as the possibility that ads and other messaging about the products may contain both implicit and explicit messages about their utility in quitting smoking. More research is necessary to investigate the relationship between media messages about these products, risk perceptions and use.

FUNDING: National Cancer Institute

JUSTIFICATION: These data provide valuable information to inform clinicians and public health officials on use of e-cigarettes and other tobacco products smokers use to make a quit attempt.

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POSI-157 THE USE AND POLY USE OF CIGARETTES AND OTHER TOBACCO PRODUCTS AMONG U.S. HIGH SCHOOL STUDENTS

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A growing number of tobacco products (such as snus, hookah, and e-cigarettes) have been introduced into the U.S. market in recent years. Experimenting with these new products may lead adolescents to smoke cigarettes. On the other hand, because these products represent alternatives to cigarettes, this increase in the number of products may reduce the probability that adolescents will start smoking cigarettes. The present study examines the use of tobacco products among high school students from the 1999-2011 National Youth Tobacco Survey (NYTS). Poly use was defined as using any tobacco products other than and in addition to smoking cigarettes. The results show that although the prevalence of smoking among high school students decreased over the years (from 28.5% in 1999 to 15.8% in 2011), the poly use of cigarettes and other tobacco products has been constant since 2002 (approximately 10%). The prevalence of poly use surpassed that of exclusive cigarette smoking (9.4% vs. 6.4%, p < 0.05) for the first time in 2011. Among those using more than one tobacco product in 2011, the majority (75.9%) were cigarette smokers. Furthermore, for those who have ever tried both cigarettes and chewing tobacco, the 2011 data show that those who tried cigarettes first were more likely to be current smokers than to be current chewing tobacco users (64.5% vs. 52.0%, p < 0.05). Similarly, those who tried chewing tobacco first had a higher rate of being current chewing tobacco users than being current smokers (56.3% vs. 45.3%, p < 0.05). These results indicate that poly use of cigarettes and other tobacco products is becoming the norm.
among high school students. There is no clear indication that the increase in the number of non-cigarette tobacco products introduced has led to an increase in the use of cigarettes. Adolescents appear to be more likely to stay with the first product they experimented with than they are to switch to another product, whether it is cigarettes or smokeless tobacco. Future studies should examine whether this primacy effect is consistent across all tobacco products.

FUNDING: National Cancer Institute

JUSTIFICATION: As efforts to reduce youth tobacco use are implemented, it is important to know that more students are using more than one type of tobacco.

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POS1-158

USING SMART PHONES TO IDENTIFY PREDICTORS OF DISSOLUTION IN HOMELESS SMOKERS DURING A QUIT ATTEMPT

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Smoking cessation rates in homeless populations are low, despite similar desire to quit and comparable numbers of quit attempts relative to more socioeconomically advantaged smokers. Research is needed to identify barriers to smoking cessation among homeless smokers. Ecological momentary assessment (EMA), in which handheld devices (e.g., smart phones) are used to capture moment to moment experience, measures phenomena in real time in natural settings, reducing recall bias and error, and improving ecological validity. The objectives of this study were to demonstrate the feasibility of using smart phones to collect EMA data and to identify factors associated with non-abstinence among homeless individuals seeking smoking cessation treatment. A total of 68 homeless individuals were loaned smart phones to collect EMA data over a 2 week period (1 week prequit through 1 week post quit). Eight participants lost their phones and 1 participant deleted the application from the phone. Thus, we have EMA data on 59 participants (86.8%). On average, participants completed over 70 EMAs. Participants completed 62.3% of all pushed assessments (i.e., Daily Diary and Random assessments) and self-initiated 1.3 assessments (e.g., Urge, Lapse assessments) each day. Prequit random EMAs were used to identify predictors of quitting on the quit date. After controlling for relevant covariates, the slopes of EMA measures including restlessness (p=.057), stress (p=.022), hostility (p=.077), negative affect (p=.103), expectancies (p=.035), and motivation for quitting (p=.034) predicted successful quitting on the quit date. In addition, aggregated data collected on the day prior to the quit date indicated that lower restlessness (p=.048), lower negative affect (p=.007), greater coping expectancies (p=.053), and greater motivation to quit (p=.047) each predicted quitting on the quit date. Results demonstrated that smart phones can be used to provide real-time information about the factors associated with quitting in homeless smokers. EMA may yield an understanding of the proximal determinants of quitting in homeless people and lead to improved future cessation interventions for this population.

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POS1-160

SHELTER PROXIMITY AND REAL-TIME AFFECT AMONG HOMELESS SMOKERS MAKING A QUIT ATTEMPT

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The prevalence of cigarette smoking among the homeless is high, estimated between 70-80%. Unfortunately, lifetime quit rates among the homeless are low (around 9%). More research is needed to understand the barriers to cessation among the sheltered homeless. Unfortunately, characteristics of the shelter environment itself may present a challenge to smoking cessation, given the high rates of smoking on shelter grounds, the availability of cigarettes from peers, and other smoking cues that can vex quitting smokers. Consequently, smokers' proximity to a shelter during a quit attempt might be associated with a myriad of emotions, including negative affect, which is a robust predictor of relapse. Understanding more about these associations may inform interventions that address smoking among this vulnerable population. This pilot study explored how proximity to the shelter was associated with real-time affect as measured by Ecological Momentary Assessment (EMA) in the weeks immediately before and after an aided quit attempt among 22 sheltered homeless smokers (64% male, 50% Black). Shelter proximity was based on geo-location data gathered during EMAs. Adjusted linear mixed model regressions, controlling for demographics, socioeconomic status, tobacco dependence, and daily smoking status, were used to examine associations between shelter proximity and EMA affect ratings. During the pre-quit week, closer shelter proximity was significantly associated with greater irritability, frustration/anger, restlessness, stress, and overall negative affect (ps <.05) and marginally associated with greater worry and less calmness (ps <.08). An additional analysis indicated proximity was unrelated to real-time smoking urge, perhaps due to ceiling effects. We conclude that, among homeless smokers trying to quit, the shelter may be associated with negative affect/stress, which may hamper quit attempts. Clinicians and administrators might consider how to attenuate this link, which might include disallowing smoking within and around the shelter perimeter.

FUNDING: This work was supported by University of Texas School of Public Health in the form of a PILOT grant (to M.S. Businelle) and start-up funds (to M.S. Businelle and D.E. Kendzor). Additional support for this study was provided by the American Cancer Society (MRSSTG-10-104-01-CPHPS to D.E. Kendzor and MRSSTG-12-114-01-CPPB to M.S. Businelle) and the National Institutes of Health (The MD Anderson Cancer Center Support Grant #CA106872), as well as by faculty incentive funds (to L.R. Reitzel) as provided by The University of Texas MD Anderson Cancer Center.

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POS1-162

RELATIONSHIP BETWEEN SYMPTOMS OF ALCOHOL DEPENDENCE AND SMOKING INITIATION AND PERSISTENCE: ANALYSIS OF LONGITUDINAL DATA FROM THE U.S. ADULT POPULATION

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A large number of adults report symptoms of, but do not meet full diagnostic criteria for, an alcohol use disorder; however, little is known about the relationship between symptoms of alcohol use disorders and smoking behavior. The current study examined the relationship between 22 shelter homeless symptoms of alcohol dependence (without abuse) and smoking initiation, smoking persistence, and nicotine dependence over a three-year period among adults in the United States. The findings indicate that higher levels of alcohol symptoms were associated with lower odds of smoking initiation and with lower smoking persistence. The findings highlight the importance of screening for alcohol symptoms among homeless adults in order to identify those at risk for smoking initiation and persistence.
Poster Session 1 • Thursday, February 6, 2014 • 11:30 a.m.–1:00 p.m.

POS1-163
HOW DO U.S. ADULTS FIND OUT ABOUT ELECTRONIC CIGARETTES? IMPLICATIONS FOR PUBLIC HEALTH MESSAGES

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Background: Electronic cigarettes (e-cigarettes) are battery-powered nicotine delivery systems that have become increasingly popular in the U.S. since their introduction to the market in 2007. We sought to understand how U.S. adults hear about e-cigarettes. Methods: A U.S. national sample of 17,522 adults completed an online survey in March, 2013. Results: Most respondents (86%) had heard about e-cigarettes. Of those who were aware, 17% had ever tried them. The most common sources of information were: friends or family (25%), television (34%), and seeing e-cigarettes being sold (29%), although the relative frequency of these sources differed for current, former, and never smokers. Former and current smokers were more likely to have heard about e-cigarettes from an e-cigarette user than were never smokers (78% and 83%, respectively, vs. 72%, both p<.01). Adults age 30 and younger were more likely than adults over age 30 to have heard about e-cigarettes online (23% vs. 14%, p<.001). Conclusions: Nearly all U.S. adults have heard of e-cigarettes. Both interpersonal communication and mass media were common sources of information. As public interest in and scientific research on e-cigarettes continue to grow, the public health community can issue targeted messages about e-cigarettes by focusing on those with a wide range of alcohol use in order to have the greatest impact on reducing the harms associated with smoking.

FUNDING: This work was supported by the State of Connecticut, Department of Mental Health and Addiction Services.

JUSTIFICATION: While most research and clinical efforts focus on smokers with alcohol use disorders, our data suggests that problematic alcohol use at the subclinical level must also be addressed in order to improve efforts to reduce the costly consequences of smoking.

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POS1-164
USE OF NOVEL TOBACCO PRODUCTS AMONG CURRENT, FORMER AND NEVER-SMOKING ADULTS

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While cigarette smoking prevalence among U.S. adults is at a historic low, consumers have an expanded choice of novel tobacco products to choose from, including e-cigarettes and waterpipes. In 2009, the Family Smoking Prevention and Tobacco Control Act banned characterizing flavors other than menthol in cigarettes. However, many novel tobacco products are manufactured with characterizing flavors. Adding flavoring to tobacco can improve the palatability and sensory experience of tobacco use and may contribute to the overall appeal of novel tobacco products. In utilizing a population health standard in the context of novel tobacco products, FDA must consider the potential for increased harm among current tobacco users- including reduced or delayed cessation; the potential for increased initiation among never users, and the potential that former users might relapse back to tobacco use. In this study we will examine the use of novel tobacco products among 60,664 adult respondents from the 2012-2013 National Adult Tobacco Survey (NATS). NATS is a national landline (76%) and cell phone (25%) survey of adults aged ≥ 18 years old residing in the 50 U.S. states and the District of Columbia. The overall response rate for the survey was 44.9%. We will assess the percentage of current, former, and never cigarette smokers that report ever and current use of e-cigarettes, waterpipes, snus, and dissolvable tobacco products. Among former smokers who report quitting smoking within the past year, we will assess and report the proportion that switched to e-cigarette use. Furthermore, we will assess the proportion of novel tobacco product users reporting past-month use of flavored products and conduct multivariate regression analyses to identify respondent characteristics independently associated with flavored product use. Understanding the patterns of novel tobacco product use will help inform FDA regulatory actions and the CDC’s National Tobacco Control Program.

FUNDING: Funding for data collection and analysis was provided by the U.S. Food and Drug Administration (FDA) Center for Tobacco Products (CTP).

JUSTIFICATION: Understanding the patterns of novel tobacco product use will help inform FDA regulatory actions and the CDC’s National Tobacco Control Program.

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POS1-165
COMPARING THE EFFECTIVENESS OF GRAPHIC WARNING LABELS AMONG THE GENERAL POPULATION AND FOUR PRIORITY SUB-GROUPS OF SMOKERS

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Background: Population-level communication interventions such as graphic warning labels (GWLs) on cigarette packs may exacerbate tobacco-related health disparities if they are ineffective in certain sub-groups of smokers. Pre-testing can identify unintended effects prior to implementation. We assessed the potential effectiveness of the 9 original GWLs proposed by the FDA, and examined differences in effectiveness among smokers in the general population and in each of 4 priority sub-groups. Methods: Data were collected online from current smokers randomly assigned to see 3 GWLs or 1 of the current text-only warnings. Participants were stratified by age in each of 5 groups: general population (n=1246), African-Americans (n=1200), Hispanics (n=1200), women of childbearing age (n=1488), and low education (n=1790). Outcome measures included emotional responses and quitting-related intentions. Results: GWLs (all combined) out-performed the text-only labels on 4 of 8 outcomes for at least half of the 10 sub-groups that we considered, and they were equally effective for the
POS1-166

CIGARETTE AND SMOKELESS TOBACCO USE TRANSITIONS: ANALYSIS OF THE NATIONAL LONGITUDINAL STUDY OF ADOLESCENT HEALTH 1996-2005

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Tobacco use among adolescents and young adults (AYA) remains a significant public health concern given that nearly 90% of adult smokers begin smoking by age 18. However, little is known about the within person changes in use of cigarettes and smokeless tobacco (ST) among AYA over time. The purpose of the current study is to evaluate and describe cigarette and ST use transitions prospectively from adolescence into young adulthood. The current study utilizes four waves of the National Longitudinal Study of Adolescent Health (Add Health) to examine patterns of cigarette and ST use beginning in 7th-12th grade (1994–1995) into young adulthood (2007–2008) as well as to identify factors associated with use of these tobacco products. At each wave participants were asked, “During the past 30 days, on how many days did you smoke cigarettes?” Responses were dichotomized (yes/no) to indicate use at each wave. Among the total sample (N=20,774), 39.5% reported using cigarettes only, 3.6% reported using ST only, and 9.2% reported using cigarettes and ST in at least one wave (not necessarily in the same wave). Transition probabilities were estimated using Markov Modeling. Sex, race, and age differences were evident. For example, females were less likely to make transitions between tobacco product use categories than males. Also, Native American ST only users were twice as likely as white ST only users to later report cigarette smoking (hazard ratio [HR] 2.11, 95% confidence interval [CI] 1.02-4.36). ST only users transitioned to dual use (reporting use of both cigarettes and ST in the same 30 day period) at 3.84 (95% CI=2.73-4.85) times the rate of cigarette only users. Findings suggest that those who use multiple tobacco products are likely to continue such use as they move into young adulthood. When addressing tobacco use among AYA, patterns of multiple forms of tobacco use should be considered.

FUNDING: No Funding

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POS1-167

PSYCHOSOCIAL CORRELATES OF CONCURRENT USE OF TOBACCO AND KHAT (CATHA EDULIS)

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Habitual substance use poses public health threat. This is a growing concern in countries where one or more substances are commonly used. In East African and Middle Eastern countries as well as in immigrant communities in Europe, khat (Catha edulis), an amphetamine-like stimulant, is widely used and is often accompanied by smoking. However, few systematic attempts have been made to examine psychosocial correlates such as gender and patterns of khat and tobacco use. This study used a cross-sectional survey method including 151 (74 women) concurrent users of tobacco and khat and 141 (76 women) khat-only users in Yemen. Mean age of the sample was 31 years (SD=9.8). A series of analysis of variance (ANOVA) and chi-square tests were conducted. The results indicated that reported frequency and intensity of tobacco and khat use were greater in men than in women (p<.05). Men and women khat users consumed different tobacco products while using khat: men tended to smoke cigarettes whereas women tended to smoke waterpipe (ps <.05). Khat use was more frequent among women than men (p<.05). The majority of concurrent users reported initiating khat use prior to tobacco use. These results provide support for gender differences in khat and tobacco use, and positive associations between tobacco and khat use. More research is needed to elucidate psychosocial determinants of tobacco and khat use to develop effective harm reduction and prevention strategies.

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POS1-168

QUITLINE UTILIZATION AND OUTCOMES AMONG TOBACCO USERS WITH MENTAL HEALTH AND SUBSTANCE ABUSE DISORDERS

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Persons with mental health and substance abuse disorders (MHSADs) have some of the highest smoking prevalence rates, at least double that of the general population. Prior studies have shown that smokers with MHSADs want to quit at comparable rates as smokers without MHSADs, but little is known about the extent to which they use state tobacco quitlines and the quitlines’ effectiveness in serving this population. In August, 2011, two questions were added to the Oklahoma Tobacco Helpline registration screen for behavioral health conditions. Using registration data through July, 2013, we examined demographic and tobacco use history among Helpline callers with and without MHSADs. Intensity of Helpline intervention received and quit outcomes at the 7-month follow-up were also examined. Nearly half of the tobacco users who registered during the two years of investigation reported one or more MHSAD (n=30,542, 46.5% of all registrants). Among those, nearly two-thirds reported depression and more than half reported generalized anxiety disorder. The prevalence of MHSADs was significantly higher among women as compared to men (51.4% vs. 39.3%, p<.0001). Persons with MHSADs smoked more cigarettes per day and reported younger age at initiation. Almost 80% of persons with MHSADs received 2 weeks or more of nicotine replacement therapy from the Helpline, as compared to 77% of persons without MHSADs. Similarly, 19.1% of persons with MHSADs received three or more intervention calls from the Helpline, as compared to 16.0% of persons without MHSADs. Despite receiving somewhat more intensive Helpline intervention,
30-day quit rates at the 7-month follow-up were significantly lower for persons with MHSADs (23.8%) compared to those without MHSADs (40.9%). These results confirm that tobacco users with MHSADs call state quitlines in substantial numbers, but quitline services may need to be tailored to the individual needs of those tobacco users with MHSADs. Developing bi-directional referral relationships between quitlines and community behavioral health providers or modifying existing quitline services may be needed to effectively serve this priority population.

FUNDING: This study was funded by the Oklahoma Tobacco Settlement Endowment Trust.

JUSTIFICATION: These results suggest that state quitline services may need to be tailored to the individual needs of those tobacco users with MHSADs.

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POS1-169

THE NATIONAL TIPS ANTI-SMOKING CAMPAIGN: PROMOTING AWARENESS OF SMOKING-RELATED RISKS, AWARENESS OF CESSATION RESOURCES, AND CESSATION BEHAVIORS

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Objective: Evaluate the impact of the second flight of the national TIPS campaign among adult smokers in the US. Methods: Two waves of data were analyzed from adult smokers, aged 18 to 64, from an online panel representative of US consumers (wave 1 in January 2013, n=1404; wave 2 in May 2013, n=1401; n=603 followed from wave 1). TIPS recall was assessed by showing stills from ads, which were aired starting in March,2013 and continued through the second survey period. Participants who reported seeing ads in the prior three months were considered exposed, and those who did not recall any ads were combined with all wave 1 participants. Generalized estimating equations (GEE) were used to assess the relationship between TIPS recall and knowledge about risks included in the TIPS ads (i.e., blindness and amputation), awareness and use of telephone and website resources for quitting, and attempting to quit in the prior four months. Models adjusted for sociodemographics and smoking-related variables. Results: Knowledge of TIPS-targeted risks increased over time (11% to 18% for blindness; 33% to 46% for amputation) and was significantly higher among those who recalled the specific TIPS ad with that content compared to participants who did not (AOR=2.24, p<0.001 for blindness; AOR=3.41, p<0.001 for amputation). Awareness of cessation resources also increased over time (32% to 36% for quitline; 22% to 26% for website) and was significantly higher among those who recalled any TIPS ad than those who did not (AOR=1.80, p<0.001 for quitline; AOR=1.92, p<0.001 for website). Recall of TIPS ads was independently associated with greater likelihood of visiting websites for quitting resources (AOR=1.68, p<0.05); however, TIPS recall was associated with calling the quitline only in the bivariate model (OR=2.23, p<0.001; AOR=1.28, ns). TIPS recall was associated with having attempted to quit only in the bivariate model (OR=1.23, p<0.01; AOR=1.12, ns). Conclusions: The 2013 TIPS campaign appears to have increased knowledge of smoking-related risks, as well as awareness and utilization of cessation resources.

FUNDING: Funding for data collection and analyses was provided by a grant from the United States’ National Cancer Institute (R01 CA167067).

JUSTIFICATION: Large-scale improvements in the rate and effectiveness of dentists’ interventions toward smoking cessation in dental public health centers is an essential step toward achieving national health objectives and reducing tobacco-related health disparities, health information technology tools offer one method of achieving this goal if they are designed and developed within the clinical environment and with the users for which they are intended.

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POS1-170

A WEB-BASED CLINICAL DECISION SUPPORT SYSTEM FOR IMPROVING TOBACCO USE TREATMENT

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Background: Dental providers have a central role in providing evidence-based tobacco cessation services. Yet provider adherence to Public Health Services Guidelines (PHS Guidelines) on Treating Tobacco Use and Dependence is poor. We tested the feasibility of integrating a clinical decision support system (CDSS) to improve tobacco use treatment in dental practice. Methods: We developed a web-based CDSS for assessing smokers’ readiness to quit and prescribing appropriate cessation medication in the NYU College of Dentistry general dental clinics. Based on the PHS Guidelines, the CDSS was tailored to dental providers based on a development process of definition, usability, and dissemination. Preliminary effectiveness, defined as offering cessation assistance (referral to quitline and/or pharmacotherapy), was assessed by conducting pre and post intervention patient exit interviews (PEIs) in 6 clinics. Feasibility was also evaluated by analyzing usage data that are collected and stored through the CDSS and qualitative interviews with providers post intervention. Results: Based on data collected from the CDSS, from October 17, 2012 to July 16, 2013, 48 dentists (59%) used the CDSS, 87.5% used it more than once for a mean of 6.8 visits and 238 patients were assessed for tobacco use through the CDSS. Among smokers, 56% received a prescription or medication from the pharmacy (31% Nicotine gum, 21% lozenge, 26% nicotine patch, and 22.2% Varenicline). 78% received the tailored patient education sheet. Based on PEIs, patients were significantly (p<0.05) more satisfied with their visit, more likely to report a quit attempt, receive a referral to the quitline and to report reading self-help material in the post intervention period compared to pre intervention. Contact with the quitline also increased (p<0.08).

FUNDING: Agency for Healthcare Research and Quality: Grant # R21HS020202-01

JUSTIFICATION: Large-scale improvements in the rate and effectiveness of dentists’ interventions toward smoking cessation in dental public health centers is an essential step toward achieving national health objectives and reducing tobacco-related health disparities, health information technology tools offer one method of achieving this goal if they are designed and developed within the clinical environment and with the users for which they are intended.

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POS1-171

CUTTING BACK TO QUIT: PREVALENCE, DEMOGRAPHIC CORRELATES, AND RELATIONSHIP TO PAST-YEAR CESSATION AMONG U.S. ADULT CIGARETTE SMOKERS

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Introduction: Cutting back on the number of cigarettes smoked is a common strategy for quitting smoking, but little is known about who uses this strategy and whether it is associated with population-level cessation. The purpose of this study was to assess the prevalence and demographic characteristics of U.S. adult smokers who tried to quit in the past year by cutting back and the relationship between cutting back and successful quitting. Methods: Data came from 11,535 adults in the 2010-2011 Tobacco Use Supplement to the Current Population Survey who tried to quit smoking in the past year. Frequencies and percentages were used to assess cutting back prevalence, and bivariate and multiple logistic regression models were used to assess correlates of cutting back and whether cutting back was associated with successful quitting in the past year (i.e., quit
for > 6 months). Analyses were conducted in SAS-callable SUDAAN. Results: Among adults who tried to quit smoking in the past year, 42.9% (n=5,017) did so by gradually cutting back. When compared to those who used other cessation strategies, persons who tried cutting back had a significantly lower prevalence of using either counseling or medication (41.3% vs. 56.0%), but used a higher average number of combined evidence-based and non-evidence-based strategies (2.3 vs. 1.5). In adjusted models, females (vs. males), blacks (vs. whites), those aged 45-64 years (vs. those aged 18-24), and polytobacco users (vs. those who were not) had greater odds of trying to quit by cutting back. Adjusting for demographic characteristics, smoking-related variables, and use of evidence-based treatments, the odds of gradually cutting back were negatively associated with successful past-year quitting (OR=0.59, 95% CI: 0.51-0.67). Conclusion: Gradually cutting back is a common cessation strategy and, in these analyses, was associated with lower cessation success rates. Persons who choose to quit through cutting back appear to use multiple cessation strategies, but may be less likely to use effective treatments. Educational efforts on effective cessation treatments may be needed for those who are interested in cutting back to quit.

FUNDING: There were no sources of funding, either direct or indirect, for the report research.

JUSTIFICATION: These data can inform future interventions and educational efforts to aid those who currently attempt to quit by cutting back on smoking.

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POS1-173 CONCURRENT USE OF TOBACCO, ILLICIT DRUGS, AND ASSOCIATED SMOKING PATTERNS

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Polydrug use is a common pattern of substance use among drug users. This study aimed to investigate the concurrent use of tobacco with illicit drugs. We examined data from the Swiss, longitudinal “Cohort Study on Substance Use Risk Factors” (N = 5,728). Past 12 months tobacco use (status, weekly smoking, and score of nicotine dependence) and exposure to 16 illicit drugs was assessed. Tests of proportions (2-tests) were used to explore the differences between smokers and non-smokers. Linear regression and ANCOVA with a bootstrap procedure were performed to compare patterns of tobacco use according to the use of illicit drugs (total number of illicit drugs used and each of the 16 drugs). The results showed that smoking status was associated with concurrent use of illicit drugs. For the 2,592 smokers (45.3% of the sample), the use of illicit drugs was more frequent than for non-smokers, (e.g., cannabis: 53.1% vs. 10.6%, p < .05; ecstasy: 7.1% vs. 0.7%, p < .05). Concerning patterns of tobacco use among smokers, a higher number of illicit drugs was associated with increased weekly smoking (beta = .145, p < .001) and a higher score of nicotine dependence (beta = .036, p = .029). Moreover, the use of 15 of the 16 illicit drugs (excepted research chemicals) was associated with a higher weekly smoking. The use of 5 illicit drugs (heroin, ketamine, GHB/GLB, crystal meth, spice) was associated with a higher score of nicotine dependence. This study found two main results. First, the use of tobacco was associated with increased concurrent use of illicit drugs. Second, and among smokers, the patterns of tobacco use were heavier for concurrent users of tobacco and illicit drugs compared with tobacco only users. The results were stronger for weekly smoking compared with score of nicotine dependence, which was only associated with the “hardest” illicit drugs such as heroin or crystal meth. To conclude, tobacco use seemed to be associated with a profile of heavier drug use.

FUNDING: Swiss National Science Foundation FN 33C530_139467

Justification: As polydrug use increased patterns of tobacco use, this kind of drug use should be taken into account in interventions designed to prevent tobacco use.

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POS1-174 GEOGRAPHY, MEDIA CONSUMPTION, AND HOW TO REACH AT-RISK YOUTH

Sidney C. Turner, M.P.P.* and Kara A. Marsh, Ph.D., Fors Marsh Group LLC

Background: Achieving cost-effective reductions in youth tobacco-use through anti-tobacco prevention campaigns requires the identification of those media that at-risk youth are most likely to consume. However, simply observing the types of media consumed by youth in general will lead to incorrect inferences if the consumption of certain types of media affects tobacco use. Methodology: Drawing on Monitoring the Future (MTF) survey data consolidated across years and grades, this study proposes a two-stage method for identifying the media-use by at-risk youth that mitigates the bias that may result from endogeneity of tobacco-use to media consumption. In the first stage, respondent risk of cigarette and smokeless tobacco-use is modeled as a function of plausibly exogenous variables (e.g., age, race/ethnicity, socio-economic status, and geographic location). In the second stage, the relationships between predicted risk and time spent consuming different media (television, internet, etc.) are analyzed using parametric and non-parametric methods. Results: Across both urban and rural youth, high risk of using cigarettes or smokeless tobacco was found to be positively associated with time spent using computers and the internet and negatively associated with time spent reading magazines. Time spent on sports and television was found to be negatively associated with risk of cigarette use, but positively associated with smokeless tobacco use. Cigarette and smokeless tobacco risk were both found to have a positive association with newspaper consumption and a negative association with radio consumption for urban youth; for rural youth, only smokeless tobacco risk was associated with newspaper and radio consumption. Discussion: There is evidence of heterogeneity in the relationship between risk and media consumption across types of tobacco risk, media, and geography. The results of this study provide insight on the most effective channels to reach at-risk youth and can be used to inform media allocation strategies for tobacco prevention campaigns.

FUNDING: No Funding

JUSTIFICATION: The results of this study can be used to inform anti-tobacco media strategies targeted at at-risk youth.

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POS1-175 LOWER HEALTH LITERACY PREDICTS SMOKING RELAPSE AMONG Racially/ETHNICALLY DIVERSE SMOKERS WITH LOW SOCIOECONOMIC STATUS

Diana W. Stewart, Ph.D.1, Miguel A. Cano, Ph.D.1, Virmarie Correa-Fernández, Ph.D.1, Claire E. Adams, Ph.D.2, Yasheng Li, Ph.D.1, Andrew J. Waters, Ph.D.4, David W. Wetter, Ph.D.1, and Jennifer Irvin Vidrine1,2,3,4 University of Texas MD Anderson Cancer Center, Department of Health Disparities Research, 1The Catholic University of America, Department of Psychology, University of Texas MD Anderson Cancer Center, Department of Biostatistics, 1Uniformed Services University of the Health Services, Department of Medical and Clinical Psychology.

Background: Achieving cost-effective reductions in youth tobacco-use through anti-tobacco prevention campaigns requires the identification of those media that at-risk youth are most likely to consume. However, simply observing the types of media consumed by youth in general will lead to incorrect inferences if the consumption of certain types of media affects tobacco use. Methodology: Drawing on Monitoring the Future (MTF) survey data consolidated across years and grades, this study proposes a two-stage method for identifying the media-use by at-risk youth that mitigates the bias that may result from endogeneity of tobacco-use to media consumption. In the first stage, respondent risk of cigarette and smokeless tobacco-use is modeled as a function of plausibly exogenous variables (e.g., age, race/ethnicity, socio-economic status, and geographic location). In the second stage, the relationships between predicted risk and time spent consuming different media (television, internet, etc.) are analyzed using parametric and non-parametric methods. Results: Across both urban and rural youth, high risk of using cigarettes or smokeless tobacco was found to be positively associated with time spent using computers and the internet and negatively associated with time spent reading magazines. Time spent on sports and television was found to be negatively associated with risk of cigarette use, but positively associated with smokeless tobacco use. Cigarette and smokeless tobacco risk were both found to have a positive association with newspaper consumption and a negative association with radio consumption for urban youth; for rural youth, only smokeless tobacco risk was associated with newspaper and radio consumption. Discussion: There is evidence of heterogeneity in the relationship between risk and media consumption across types of tobacco risk, media, and geography. The results of this study provide insight on the most effective channels to reach at-risk youth and can be used to inform media allocation strategies for tobacco prevention campaigns.

FUNDING: No Funding

JUSTIFICATION: The results of this study can be used to inform anti-tobacco media strategies targeted at at-risk youth.

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between health literacy and smoking cessation outcomes among 200 low-SES, racially/ethnically diverse smokers enrolled in cessation treatment (58% female, 45% Black, 68% high school diploma/GED, 48% unemployed, 58% <$30,000/year income). Logistic regression analyses adjusted for demographics, SES (i.e., age, gender, race/ethnicity, relationship status, education, income, employment), and nicotine dependence investigated associations between health literacy and smoking relapse at the end of treatment (3 weeks post quit). Results indicated that smokers with lower health literacy were significantly more likely to relapse by the end of treatment, even after controlling for demographics, SES, and dependence (OR=3.26; 95% CI=1.14-9.26). Results provide the first evidence that lower health literacy may be a unique risk factor for smoking relapse among low-SES, racially/ethnically diverse smokers — even over and above more established socioeconomic predictors of cessation (i.e., education, income, employment). Future research is needed to investigate longitudinal relations between health literacy and cessation outcomes and potential mechanisms underlying this relationship. Findings may be useful in informing and developing cessation interventions targeting smokers with lower health literacy, thereby reducing tobacco-related cancer disparities.

FUNDING: This research is supported in part by grants from the Centers for Disease Control (K01CD000193), the National Cancer Institute (R25 CA57730), and the University of Texas MD Anderson’s Cancer Center Support Grant P30 CA016672, and the Latino Cancer Control and Community Networks Program Center Grant U54CA153505. This work was also supported in part by a faculty fellowship from the University of Texas MD Anderson Cancer Center Duncan Family Institute for Cancer Prevention and Risk Assessment.

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POS1-176 SMOKING CESSATION AMONG PEOPLE SEEKING MENTAL HEALTH TREATMENT

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Background: People with mental illness are much more likely to smoke cigarettes and smoke heavily. Smoking among this population, however, has been historically accepted by health professionals and family members. Their cessation behaviors have been also largely overlooked. We examined the smoking cessation behaviors and cessation social norms among smokers seeking mental health treatment and described the temporal trend over time. Methods: We combined data on adult current smokers (n=18,939) from the 2000, 2005, and 2010 National Health Interview Survey. We used multivariate regression models and trend analysis to assess smoking cessation behaviors including quit attempt, use of cessation aids, and quit intention, and social norm measures including health professional's advice to quit, and smoke free home among smokers seeking mental health treatment. Results: Among the study sample of the current smokers, 9.30% had seen a health professional for mental health in the past year. Multivariate regressions suggested that these smokers had higher odds to have made quit attempts in the past year (OR=1.20), to have used nicotine replacement therapy (OR=1.25), counseling (OR=2.38), telephone quit line (OR=1.73) or support group (OR=1.60) to assist smoking cessation, to have been advised by health professionals to quit smoking (OR=1.60), but were significantly less likely to have a smoke-free home (OR=0.79). The use of prescription medication as a cessation aid was not significantly different between smokers who sought mental health treatment and smokers who did not. However, smokers seeking mental health treatment were increasingly more likely to make quit attempt, use smoking cessation aids, and have a smoke-free home. Conclusions: Smokers with mental illness are motivated to quit smoking, and their quit behaviors are more likely to be encouraged by health professionals and supported by smoking cessation aids. The findings highlight the need for tailored efforts to reduce the disparities in tobacco use in this vulnerable subpopulation.

FUNDING: No funding.

POS1-177 THE IMPACT OF NURSES’ SMOKING STATUS ON OUTCOMES OF AN EDUCATIONAL PROGRAM IN THE CZECH REPUBLIC

Linda Sarna, Ph.D., R.N.*; Stella A. Bialous, Dr.P.H., R.N.; Eva Králiková, M.D.; Alexandra Kmetova, M.D.; Marjorie Wells, Ph.D., R.N.*; and Jenny Brook, M.S.†, 1School of Nursing, University of California, Los Angeles, 2Tobacco Policy International, 3First Faculty of Medicine, Charles University in Prague, 4David Geffen School of Medicine, University of California, Los Angeles

Background: Efforts are underway to expand smoking cessation capacity in the Czech Republic (current smoking prevalence 36.9%) using guidelines based on the 5As. Czech nurses have had minimal education to provide cessation interventions and smoking among nurses may be a barrier to their involvement. Purpose: To determine the impact of an educational program on nurses’ interventions and attitudes towards cessation, and the role of nurses’ smoking status on program outcomes. Design: Prospective, single group design Methods: A convenience sample of 90 nurses (all female, mean age 43 years, 53% current smokers, 64% in medical/surgical/oncology settings) attended hospital-based one-hour educational programs on helping smokers quit delivered by nurses who participated in a train-the-trainer program. Participants completed surveys about the frequency (i.e., always, usually sometimes, rarely, never) of interventions based on the 5As, perceived abilities to provide quit support prior to and 3-months after the course, and their smoking status. Findings: At 3-months nurses reported significant increases in their interventions with smokers. Overall, there was improvement in the proportion of nurses who rated their ability to help smokers quit as good, very good, or excellent (35.0% vs 48.96%, p = .02). However, improvement varied by nurses’ smoking status. Comparing consistency of interventions (defined as always/usually intervening) between nurses who smoked and nurses who did not smoke, there were no differences at baseline, but significant differences at 3-months. Nurses who smoked were less likely to consistently ask about smoking status (43.5% vs 73.4%, p = .007), advise patients to quit (30.0% vs 60.0%, p = .008), assess interest in quitting (34.8% vs 57.8%, p = .05), arrange for follow up (0% vs 17.5%, p = .01), and recommend use of the quitline (12.5% vs 39.7%, p = .009). Conclusion: A brief educational program demonstrated promise in building capacity of Czech nurses to assist patients with smoking cessation and improve their attitudes towards cessation interventions. However, nurses who smoked were less likely to benefit from the program.

FUNDING: Bristol Meyers Squibb Foundation grant, to the International Society of Nurses in Cancer Care, and the UCLA School of Nursing Lulu Wolf Hassensplug Endowed Chair fund.

JUSTIFICATION: Smoking status of healthcare providers should be considered in the development and evaluation of educational programs about tobacco cessation.

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POS1-178 QUANTIFICATION OF SERUM COTININE IN SMOKERS AND NONSMokers VIA DEVELOPMENT AND VALIDATION OF A FULLY AUTOMATED METHOD

Ronald E. Hunter, Jr., Ph.D.*; Connie S. Sosnoff, M.S., Ernest E. McGahee, M.P.H., M.S.H.A.; Kirstin A. Dortch, M.S.; Kevin T. Caron, and Lanqing Wang, Ph.D., Centers for Disease Control and Prevention, Tobacco Exposure Biomarkers Laboratory

Exposure to tobacco smoke remains the primary preventable cause of premature morbidity and mortality in the United States. Cotinine, the primary proximate metabolite of nicotine, is the preferred biomarker to measure active smoking and to assess the exposure of non-smokers to secondhand smoke.
CDC laboratories have been measuring serum cotinine levels in the participants of the National Health and Nutrition Examination Survey (NHANES) for more than 20 years. To increase the laboratory sample throughput in anticipation of a doubling of our sample load with samples from the Food and Drug Administration’s Population Assessment of Tobacco and Health Study, we developed and validated a rugged, automated sample preparation method using PerkinElmer Staccato Systems robotics technology. The analysis of cotinine in serum is performed by isotope-dilution high-performance liquid chromatography/atmospheric pressure chemical ionization tandem mass spectrometry. To our knowledge, we are the first to use a fully automated method in the analysis of serum cotinine in smokers and non-smokers. Similar to the manual method, the new automated method includes addition of internal standard and base, on-column liquid-liquid extraction, and evaporation of extracts. The integrated sample preparation automation system can be used unattended 24/7 for high throughput. It has multi-layer platforms, which host multiple peripherals with flexibility to extend modularity and future modification. A powerful Mitsubishi RV-6SDL S15 6-axis robot integrates these peripherals for multi-task operations. This innovative automated method has the potential to quadruple sample throughput to 384 samples per day, reduce sample volume by 60% and solvent usage by more than 88%, and cut consumable costs dramatically with no change to our limit of detection. The method is rugged and sensitive with superior accuracy and precision. This method will provide the basis for future assessment of cotinine in other matrices, such as saliva and urine, as well as the assessment of other primary nicotine metabolites, such as trans-3,4-dihydroxyacetone.

FUNDING: This study was conducted at the Centers for Disease Control and Prevention in collaboration with the Food and Drug Administration’s PATH study.

JUSTIFICATION: This study has wide-spread applicability for clinical research in that it not only allows for a dramatic increase in throughput but also is translatable to a variety of biological matrices and nicotine metabolites.

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**POSTER SESSION 1 • Thursday, February 6, 2014 • 11:30 a.m.–1:00 p.m.**

**POS1-179**

**AROMATIC AMINES IN MAINSTREAM SMOKE FROM US CIGARETTE BRANDS**

Bryan Hearn1, Yanfeng Chen1, Yan Ding2, Clifford Watson3, and Ben Alverson2

1National Center for Environmental Health, Centers for Disease Control and Prevention
2Oak Ridge Institute for Science and Education

Aromatic Amines (AAs) are a class of compounds typically associated with occupational exposure (rubber, dye, textile industries) as well as diesel engine exhaust and smoking. Six aromatic amines are identified by FDA on the list of 93 harmful and potentially harmful constituents (HPHCs) of cigarette smoke to be reported under section 904(a)(3) of the Family Smoking Prevention and Tobacco Control Act, H.R. 1256. Three of these HPHC aromatic amines, 4-aminobiphenyl, 2-aminoanthanthrene, and 2,4-toluidine, are classified as International Agency for Research on Cancer (IARC) Group 1 carcinogens. Although several studies have reported some values of AAs in mainstream smoke from reference and commercial cigarettes, very few report values for more than two or three AAs, particularly for commercial brands. We survey mainstream smoke from selected US market cigarette brands for 11 aromatic amines, including the six on the HPHC list, four additional structural isomers, and benzidine, an IARC Group I carcinogen. Reference ranges of these 11 AAs from various US brands are presented. Mainstream deliveries for US market brands for o-toluidine, 2-aminoanthanthrene, and 4-aminobiphenyl ranged from 4 to 169, 1.1 to 18, and 0.9 to 7.6 ng/cig, respectively. This survey gives ranges of these aromatic amines found in different commercial cigarettes. It provides the opportunity of estimating the potential exposure risks of these compounds from cigarettes in the US market.

FUNDING: No external funding. CDC program funds used.

JUSTIFICATION: This study provides the opportunity of estimating the potential exposure risks of these aromatic amines from cigarettes in the US market.

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**POS1-180**

**TOBACCO PRODUCT JUDGMENTS AND REGULATION BELIEFS IN THE UNITED STATES: RESULTS FROM THE HEALTH INFORMATION NATIONAL TRENDS SURVEY (2012-2013)**

Annette Kaufman1, Lila Rutter2, Mark Parascandola3, Kelly Blake4, and Erik Augustson5, Division of Cancer Control and Population Sciences, National Cancer Institute, Division of Epidemiology, Population Health Science Program, Center for the Science of Health Care Delivery, Health Communication and Informatics Research Branch, Behavioral Research Program, Division of Cancer Control and Population Sciences, National Cancer Institute

The Family Smoking Prevention and Tobacco Control Act grants the Food and Drug Administration (FDA) regulatory authority over the manufacture, marketing, and distribution of tobacco products in order to protect public health. Little is known about people’s harm judgments associated with different types of tobacco products and even less is known about beliefs about FDA in regulation. We analyzed national survey data to assess how judgments about the relative harms of tobacco products may be related to beliefs about FDA tobacco product regulation. The Health Information National Trends Survey 4, Cycle 2 is a national survey of the U.S. adult population that assesses knowledge, attitudes, and behaviors relevant to health communication. Data were collected October, 2012 through January, 2013 (n = 3,630) by mailed questionnaire. Measures include demographics, cigarette smoking status, three items on relative harm judgments of tobacco products (e.g. In your opinion, do you think that some types of cigarettes are less harmful to a person’s health than other types?), and one item on FDA regulation (Do you believe that the United States Food and Drug Administration (FDA) regulates tobacco products in the U.S.? yes/no/don’t know). Descriptive analyses revealed that 41% believe the FDA regulates tobacco, 23.6% believe the FDA does not regulate tobacco, and 35.3% report they do not know. Chi-square analyses show that FDA regulation beliefs are significantly associated with relative product harm judgments. A multinomial logistic regression predicting FDA regulation beliefs further reveals that not knowing about FDA tobacco regulation is generally associated with “don’t know” responding on judgments about tobacco product harm: A majority of respondents either believe (incorrectly) that the FDA does not regulate tobacco products or report that they do not know, suggesting that many are not well informed about tobacco product regulation. Additionally, beliefs about tobacco product regulation are associated with judgments about the relative harms of tobacco product, suggesting the need for public education.

FUNDING: No Funding

JUSTIFICATION: Public perceptions about the relative risks of tobacco products and beliefs of FDA tobacco product regulation may influence related tobacco risk behaviors.

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**POS1-181**

**CHANGES IN THE PREVALENCE OF DEPRESSION AND ANXIETY DISORDERS AMONG SMOKERS IN THE UNITED STATES: 1990 TO 2001**

Renee D Goodwin, Ph.D., M.P.H.*, Sandra Galea, M.D., Ph.D., Farah Taaha, M.A., Michael J. Zvolensky, Ph.D., Melanie Wall, Ph.D., and Deborah S. Hasin, Ph.D., City University of New York.

Purpose: The present study investigated whether the prevalence of depression and anxiety disorders has increased over time among daily smokers, as well as whether these trends differ by gender and among non-smokers. Methods: Data were drawn from the National Comorbidity Survey (NCS: 1990) and the National Comorbidity Survey-Replication (NCS-R: 2001), representative samples of the U.S. adult population. Logistic regression analyses were used to determine differences between depression and anxiety disorders among daily smokers in 1990 and 2001 stratified by gender and among those who were never daily smokers. Results: Depression and anxiety disorders were significantly more common among daily smokers in 2001 compared with 1990. Increases in anxiety disorders were more prominent among females whereas the increase in depression was only statistically significant among males. The same trends were not observed among those who...
were not daily smokers. Conclusions: The prevalence of depression and anxiety disorders among daily smokers appears to have increased from 1990 to 2001. Future studies are needed to determine whether these trends have continued. If so, interventions aimed at moving the prevalence lower may have limited success if depression, anxiety disorders, and other mental health conditions are not considered in the development and dissemination of tobacco control programs.

FUNDING: No Funding.

JUSTIFICATION: Our results, which suggest the prevalence of depression and anxiety disorders among U.S. smokers has increased, compared with previous decades, is critical to informing and revising strategies for the public health/ tobacco control community, e.g., Healthy People 2020, which has a large influence on the allocation of resources for tobacco control/smoking cessation.

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POS1-182
OPTIMAL CUT POINT OF URINARY 4-(METHYLNITROSAMINO)-1-(3-PYRIDYL)-1-BUTANOL FOR DISTINGUISHING CIGARETTE SMOKERS FROM NONSMOKERS AMONG DIFFERENT DEMOGRAPHIC GROUPS IN THE UNITED STATES BETWEEN 2007 AND 2010

Yang Xia, Ph.D.*, B. Rey de Castro, Ph.D., Lee-Yang Wong, M.S., and John T. Bernert, Ph.D., Division of Laboratory Sciences, National Center for Environmental Health, Centers for Disease Control and Prevention

Tobacco specific nitrosamines (TSNAs) are a group of carcinogens inherent to tobacco and tobacco products. There is strong evidence for TSNAs’ important role in inducing tobacco-related diseases. Of all TSNAs, 4-(methylnitrosamino)-1-(3-pyridyl)-1-butane (NNK) is the most carcinogenic. 4-(Methylnitrosamino)-1-(3-pyridyl)-1-butanol (NNAL), the primary metabolite of NNK, is a cancer risk biomarker in addition to its well-established role as an exposure biomarker in epidemiologic studies. The aim of the study was to determine optimal cut points (OCP) of NNAL to discriminate active smokers from nonsmokers in different demographic groups by using National Health and Nutrition Examination Survey data. Total urinary NNAL was measured in both smokers and nonsmokers from 2007-2010 in NHANES. Optimal urinary NNAL concentration for discriminating smokers from nonsmokers was determined using bootstrapping and receiver operator characteristic curve analysis. The NHANES OCP for the entire NHANES population was 19.9 ng/g creatinine (sensitivity 96.2%, specificity 94.9%). For female and male, OCPs [bootstrap 95% CI] were 20.9 [15.0 - 34.7] and 19.2 [15.5 - 22.7] ng/g creatinine (sensitivity 96.8%, specificity 95.8%; sensitivity 96.0%, specificity 94.5%), respectively. For adults and adolescents, OCPs were 20.0 and 14.2 ng/g creatinine (sensitivity 97.2%, specificity 96.9%; sensitivity 93.2%, specificity 92%), respectively. The OCPs differed by race/ethnicity: they were 35.7 (sensitivity 96.2%, specificity 96.7%), 20.0 (sensitivity 96.8%, specificity 94.1%) and 11.4 (sensitivity 96.7%, specificity 95.4%) ng/g creatinine for non-Hispanic White, non-Hispanic Black, and Mexican Americans, respectively. Total urinary NNAL is sensitive and specific biomarker for discriminating the source of tobacco smoke exposure. Because of NNAL’s long half-life, NNAL would be particularly useful to indicate exposure levels when exposure is less frequent or when sampling is delayed. More importantly, because total NNAL is also a biomarker of smoke exposure. Because of NNAL’s long half-life, NNAL would be particularly useful to indicate exposure levels when exposure is less frequent or when sampling is delayed. More importantly, because total NNAL is also a biomarker of

FUNDING: This research is funded by the Canadian Cancer Society Research Institute (grant number: 2011-70099).

JUSTIFICATION: Public health decision-makers need to consider the role of evidence-based social media and digital interventions in reaching important subpopulations as a part of an integrated tobacco cessation system.

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POS1-183
BREAK-IT-OFF: EVALUATION OF A DIGITAL AND SOCIAL MEDIA SMOKING CESSATION CAMPAIGN FOR YOUNG ADULT SMOKERS

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Background: The Propel Centre for Population Health Impact partnered with the Canadian Cancer Society to co-create the evaluation strategy for the Break-it-off (BIO) social media campaign that ran in Canada from January 12 – March 31, 2012. The purpose of the study was to determine the effectiveness of the campaign by looking at reach, engagement, interactivity, insights and quitting success. It was hypothesized that a successful campaign would increase reach to young adult smokers, engage these smokers in quit attempts and use of quitline services, and result in a greater number of successful quitters. Methods: The study employed a mixed-methods approach to collecting data using web-analytic data, focus groups after the campaign, and close-ended follow-up surveys. Focus group transcripts were analyzed according to a thematic coding scheme. Quitting success was measured using 7-day and 30-day point prevalence abstinence (quit rates) and comparing a sample of young adult smokers who used BIO(n=101) to those who used just a quitline(n=137). Logistic regression was run using quitting success as the dependent variable and group membership as the independent variable of interest controlling for group differences. Results: The number of visitors (37,325), visits (44,172), page views (107,600), and downloads (3,937) of the app indicated that the campaign was successful in reaching and engaging young adults. However, only 21 BIO visitors connected to a quitline. Survey and focus group findings revealed interactivity and satisfaction with the campaign as well as insights such as reasons for lack of quitline utilization. BIO participants (32%) were significantly more likely than quitline participants (14%) to have quit smoking (30-day point prevalence abstinence) at 3 month follow-up (adjusted odds ratio = 2.08, 95% CI 1.01 – 4.29). Conclusions: The campaign was successful in reaching young adults and in motivating them to quit smoking, increase quit attempts, and achieve abstinence. Important insights were revealed. BIO demonstrated that use of an innovative intervention has the capacity to engage young adults who may not be reached by other cessation interventions.

FUNDING: No Funding.

JUSTIFICATION: Because total NNAL is a biomarker of cancer risk, the optimal cut point for NNAL may ultimately contribute to prediction of cancer risk in smokers in various demographic groups.

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POS1-184
SURVEY OF MICROORGANISMS PRESENT IN DOMESTIC AND INTERNATIONAL SMOKELESS TOBACCO PRODUCTS USING 16S DNA SEQUENCE ANALYSIS

Stephen B. Stanfill, Robert E. Tyx, Peter Kuklenyk, Maria Morel-Espinosa, and Clifford H. Watson, Centers for Disease Control and Prevention, Tobacco and Volatiles Branch, Tobacco Analysis Laboratory

Smokeless tobacco (ST) products are agricultural products that contain bacteria, mold, and fungi due to exposure from the soil, the environment, and tobacco processing. Over one hundred different microorganisms have been identified in tobacco and tobacco products. The presence of microorganisms in ST is of concern for several reasons: (1) presence of microorganisms results in a net production of nitrite in the product that results in the formation of TSNAs and other nitrosamines; (2) microorganisms can produce toxins; and (3) microorganisms in some situations may contribute to disease. In this presentation, we will present bacteria reported in previous research and microorganisms recently identified in various ST products using 16S Ribosomal DNA Sequence Analysis. In this presentation we will also present the levels of nitrate, nitrite, and TSNAs present in these products. Our recent research has found that domestic and international vary widely in the types and population sizes of microorganisms
that are present and the resulting levels of nitrite and TSNAs. An understanding of product microbiology is critical to determining means of reducing the levels of nitrite and carcinogenic TSNAs in ST products.

FUNDING: CDC Funding

JUSTIFICATION: The presence of microorganisms in smokeless tobacco products has a wide range of implications for clinical research and public health. The presence of microbes can greatly increase the carcinogenicity of smokeless tobacco products and the product can act as a vector for transferring microorganisms into the user. This has implications for potential disease formation as the result of exposure to toxicants (cancer) and microorganisms.

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POS1-185
INCREASING DISPARITY IN SMOKING PREVALENCE BY INCOME AND EDUCATION WHILE PARALLELED REDUCTION IN CIGARETTE CONSUMPTION, 1997-2012

Yuyan Shi, Ph.D.1,2, Yue-lin Zhuang, Ph.D.2, and Zhu Shu-hong, Ph.D.1
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Background: Although smoking prevalence has continued to decline in the United States, disparities across socio-economic status are still prevalent. Populations in low education or low income subgroups are at a substantially higher risk of being smokers and of consuming more cigarettes. It is unclear, however, whether the disparities are widening over time. Methods: With data from the National Health Interview Survey (1997-2012), the study examined the trends in smoking prevalence among the general adult population and in average cigarettes consumption among adult smokers by income and education categories. Comparisons were made among three income levels (low income=household income below federal poverty level, middle income=between 100% and 400% poverty level, and high income=above 400% poverty level) and among three education levels (low education=less than high school diploma, middle education=high school diploma, and high education=at least some college), respectively. The analysis was restricted to the non-Hispanic white population to avoid possible confounding factors from variations in ethnic composition within the study period. Results: Multivariate regressions showed that the gaps in the linear trend in smoking prevalence was diverging between the low and middle income (p<0.01), low and high income (p<0.01), and low and high education (p<0.01), with the smoking prevalence declining the fastest in the highest income and education subgroups. The differences in the trend in past-month cigarette consumption among current smokers were not statistically significant across the three income groups or across the three education groups. Conclusions: The findings suggest that tobacco control policies and cessation programs have had the greatest impacts on people with the highest socio-economic status with respect to their likelihood to smoke, but have had comparable effects on different income or education subgroups with respect to smokers' cigarette consumptions. Programs and programs are needed to reduce the disparity in smoking prevalence between socio-economically disadvantaged and advantaged groups while maintaining a parallel reduction in their cigarette consumption.

FUNDING: This work is partially supported by a grant from National Cancer Institute U01 CA154280.

JUSTIFICATION: This study suggests differential impacts of tobacco control policies and cessation programs on different socioeconomic groups with respect to reduction in smoking prevalence, but comparable impacts with respect to reduction in cigarette consumption among smokers.

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POS1-186
TRENDS IN NONSMOKER EXPOSURE TO SECONDHAND SMOKE — UNITED STATES, 1999-2012

Kevin T. Caron*, B. Rey deCastro, Connie S. Bosnoff, Lanqing Wang, James R. Akins, and John T. Bernert, National Center for Environmental Health, Centers for Disease Control and Prevention, Atlanta, GA

Secondhand smoke (SHS) causes lung cancer and heart disease in nonsmoking adults as well as sudden infant death syndrome, middle ear disease, acute respiratory infections, exacerbation of asthma, and decreased lung function in children. In January, 2006, the Surgeon General of the United States released a report concluding that there is no risk-free level of exposure to SHS. The objective of this study was to characterize the trends in exposure of nonsmokers in the U.S. to SHS using serum cotinine (COT) concentrations measured in a series of National Health and Nutrition Examination Surveys (NHANES) from 1999 to 2012. COT, the proximate metabolite of nicotine, is widely regarded as the best biomarker for assessing SHS exposure. Since becoming a continuous, biennial program in 1999, NHANES has collected interview data and measurements of serum COT to evaluate the SHS exposure of nonsmoking individuals in the U.S. civilian, non-institutionalized population, greater than or equal to 3 years of age. Previously we reported that the 1999-2000 NHANES data revealed a median nonsmoker serum COT concentration of 0.059 ng/mL. This represented a decline of more than 70% from the first estimate of SHS exposure based on NHANES 1988-1991 serum COT data. Data from subsequent NHANES surveys showed an additional decline from 1999 to 2002 and then a leveling off from 2002 to 2008 to 2. However, we analyzed the most recent NHANES surveys, 2009-2010 and 2011-2012, and found that the geometric mean COT level of U.S. nonsmokers has continued to decline and is approximately 30% lower than the level measured in 2007-2008. Although SHS exposure remains elevated in groups with traditionally high exposure (i.e., children and non-Hispanic blacks), decreases can be observed for each sex, race, ethnicity, and age group studied. Additionally, new trends in combined survey data suggest that the vast majority of SHS exposure to children happens in the home. Therefore, while these findings are consistent with our belief that public health efforts have been effective, continued progress will require eliminating exposure to SHS in the home.

FUNDING: No Funding

JUSTIFICATION: Understanding trends in nonsmoker exposure to secondhand smoke is valuable when creating effective public health policies like smoking bans.

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POS1-187
QUANTIFICATION OF DNA DAMAGE CAUSED BY CIGARETTE SMOKE USING PRIMER-ANCHORED DNA DAMAGE DETECTION ASSAY

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Background: Cigarette smoke causes several types of DNA damage and is the main risk factor for lung cancer and head and neck cancer, two of the world’s most common malignancies. Secondhand smoke is typically divided into mainstream (MS), the smoke that smokers exhale from their lungs, and sidestream (SS), the smoke emitted from the smoldering end of the cigarette. Cigarette smoke contains a complex mixture of several thousands of chemicals, most of them can induce DNA damage. Detection of DNA damage might provide one of the most accurate biomarkers for cancer risk and prevention studies. However, due to technical limitations, it has not been possible to precisely quantify in vivo DNA damage caused by MS or SS smoke. Recently, we developed a novel and highly sensitive primer-anchored DNA damage detection assay (PADD) to map and quantify in vivo levels of DNA damage. In this study, we used this assay to quantify the levels of DNA damage induced by MS and SS smoke. Methods: To determine the effects of MS and SS on human cells, oral cells were exposed to escalating doses of MS
and SS smoke extracts (0.3, 1.5, 3, 15 and 30 μg/ml), and then the DNA damage in the p53 gene was quantified using PADDa. Cell survival was determined by MTT assay. Statistical analysis was performed using Student's t test and exact non-parametric tests. Results: We observed a dose-dependent increase in DNA damage in human oral cells treated with MS and SS smoke extracts. We demonstrated that our novel assay PADDa efficiently detects DNA damage in the p53 transcribed and non-transcribed strands in cells exposed to MS and SS smoke extracts. More interestingly, we observed significant differences in the levels of DNA damage induced by MS and SS smoke. Conclusion: Our study demonstrated that PADDa is a novel and sensitive assay to detect and quantify in vivo DNA damage caused by MS and SS. This technical development opens novel horizons in the field of secondhand smoke biomonitoring and physiological consequences. More importantly, our study emphasizes the need to support smoking cessation and highlights the importance to prevent or reduce the exposure of non-smokers to second-hand smoke.

FUNDING: Grant support: This work was supported by the Oklahoma Tobacco Research Center (LQ), the OUHSC Vice President for Research Fund (LQ) and the Oklahoma Center for the Advancement of Science and Technology (LQ). Dr. Queimado holds a Presbyterian Health Foundation Endowed Chair in Otorhinolaryngology.

JUSTIFICATION: The novel assay validated in this study has potential to become a practical population screening tool for the identification of early biomarkers of susceptibility to tobacco-induced disease, which can guide preventive and diagnostic strategies.

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POS1-188 HOOKAH AND HOPS: A SYSTEMATIC REVIEW OF HOOKAH AND ALCOHOL USE AMONG YOUNG ADULTS AND ADOLESCENTS

Eric K. Soule, M.P.H.1, Tracey E. Barnett, Ph.D., Barbara A. Curbow, Ph.D., Michael D. Moorhouse, Ph.D., and Robert M. Weiler, Ph.D., University of Florida

Hookah use is emerging as a public health concern for adolescents and young adults in the U.S. Researchers are beginning to explore associations regarding hookah use and other health behaviors, including alcohol use. Hookah and alcohol are conducive to concurrent use given they share similar social appeals. We conducted a systematic review of peer-reviewed studies published between January 1, 2003 to May 31, 2013 that examined hookah and alcohol use among adolescents and young adults. We searched Academic Search Premier, PsychINFO, PubMed, and Web of Science databases for studies that included a combination of hookah keywords, alcohol keywords, and young adult/adolescent keywords. We identified a total of 574 articles in the initial search. Non-hookah related articles and duplicates were removed (n=460). Of the remaining 114 studies, studies not examining alcohol use among hookah smokers (n=29), intervention studies (n=2), reviews, commentaries or opinion articles (n=13), and studies examining non-North American populations (n=27) were excluded leaving 14 studies for analysis. We sorted the studies into three categories: (1) studies on college students and/or young adults (average age between 18 and 25); (2) adolescents; and (3) ‘other.’ Overall, the included studies reported positive associations between hookah and alcohol use including frequent alcohol use reported by adolescent and young adult hookah smokers. Eight studies identified statistically significant associations between hookah use and alcohol use. Two studies found alcohol users were approximately 2 – 5.5 times more likely to use hookah than non-alcohol users. These results indicate young people frequently engage in both hookah and alcohol use. Studies are needed to identify underlying factors shared by the two behaviors for theoretical development and future policy reasons. While questions regarding the effects of hookah and alcohol concurrent use on health, reaction time, and perceived drunkenness remain unexplored, policy makers should consider introducing laws and ordinances which seek to restrict or prohibit the sale of alcohol at hookah smoking establishments.

FUNDING: No funding

JUSTIFICATION: This study shows that hookah use is positively associated with alcohol use and policy makers should consider prohibiting sales of alcohol at hookah smoking establishments.

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POS1-189 ASSESSING NICOTINE EXPOSURE AND METABOLISM USING HIGH-THROUGHPUT ANALYSIS OF NICOTINE AND ITS METABOLITES BY LC/MS/MS

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Tobacco users’ behavior impacts their exposure to tobacco and the toxic chemicals that are present. The metabolism rate of nicotine, the major addictive component of tobacco, may affect the frequency and intensity of tobacco use. Information on nicotine metabolite profile could help identify individuals at high risk for developing tobacco use related to tobacco use, as well as those amenable to tobacco cessation programs. A wide range of nicotine metabolic phenotypes was observed between individuals, and thus large epidemiological studies such as Population Assessment of Tobacco and Health (PATH) and National Health and Nutrition Examination Survey (NHANES) are important for health scientists to learn how tobacco use affects health and to inform policy decisions. In order to carry out these studies, we developed a high-throughput, low cost, stable-isotope dilution LC/MS/MS method for quantification of urinary nicotine and its eight main metabolites, which reflect more than 95% of total nicotine exposure. In this method, glucuronide metabolites were hydrolyzed into their deconjugated form, and total amounts of nicotine, cotinine, trans-3’-hydroxy-cotinine, nicotinone-N-oxide, cotinine-N-oxide, normocotine and 4-hydroxy-4-(3-pyridyl)butanoic acid were quantified. High-throughput sample preparation for this analysis is achieved on a custom-designed, fully automated robotic system, which includes a Scioline liquid handler, a Mitsubishi robotic arm, and peripheral equipment such as shaking incubators, a centrifuge, and an evaporator. Mass spectrometric parameters for these metabolites were optimized so that all analytes of interest can be measured with one analysis, even though the typical concentrations of nicotine metabolites vary dramatically in urine samples. To evaluate its performance, the method was applied to 91 urine samples from tobacco users; the detection rates for these compounds are 87% or higher. This fully validated method will be applied to 10,000 tobacco users from PATH and NHANES 2013-14 to help establish the relationship between nicotine exposure and its metabolic phenotype among U.S. population.

FUNDING: This study was funded through an interagency agreement by the U.S. Food and Drug Administration Center for Tobacco Products.

JUSTIFICATION: Analytical method developed in this paper will be applied to large epidemiological studies such as Population Assessment of Tobacco and Health (PATH) and National Health and Nutrition Examination Survey (NHANES), which are important to learn how tobacco use affects health and to inform policy decisions.

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POS1-190 TOBACCO SMOKE IS A MAJOR CONTRIBUTOR TO HARMFUL CHEMICAL EXPOSURES IN THE U.S. POPULATION

Ben Blount1,2, Roy de Castro1, Connie Sosnoff1, Udeni Alwis1, Tiffany Seyler1, David Chambers1, Yang Xia1, Lancing Wang1, and Dana van Bemmelen1, 2, Tobacco and Volatiles Branch, Centers for Disease Control, 1 Center for Tobacco Products, Food and Drug Administration

Tobacco smoke is a major cause of premature death and disease in the United States and globally because of harmful chemicals in tobacco smoke. Many of these chemicals are also found in other environmental sources such as mobile and facility emissions, as well as biomass burning and food cooking. To explore the relative importance of tobacco smoke exposure (both active and secondhand
smoke), we evaluated data from the National Health and Nutrition Examination Survey (NHANES)—which is representative of the civilian United States population—for a comprehensive set of biomarkers of exposure to harmful or potentially harmful chemicals known to be in cigarette smoke. Utilizing sample-weighted statistical techniques, we estimated correlations between these chemicals and serum cotinine, a specific and robust marker of exposure to nicotine, the main addictive agent in tobacco. These analyses show that active smoking is the primary source of exposure of US smokers to many of these harmful chemicals, including VOCs (e.g., cyanide, butadiene, benzene, acrylonitrile); aldehydes (e.g., acrolein, crotonaldehyde); aromatic amines (e.g., 4-aminobiphenyl, o-toluidine; 2-aminonaphthalene); PAHs (e.g., naphthalene, pyrene, chrysene); heavy metals (e.g., cadmium); and tobacco-specific nitrosamines (e.g., NNN, NNK). Even among nonsmokers, secondhand exposure was associated with increased internal dose of many of these chemicals. These data demonstrate the toxic impact of tobacco smoke on the US population, and provide a baseline for tracking changes in harmful exposures related to future interventions to reduce tobacco use.

FUNDING: 1. U.S. Centers for Disease Control and Prevention, Tobacco and Volatiles Branch 2. U.S. Food and Drug Administration, Center for Tobacco Products

JUSTIFICATION: These data demonstrate the toxic impact of tobacco smoke on the US population, and provide a baseline for tracking changes in harmful exposures related to future interventions to reduce tobacco use.

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The rats then underwent three challenge days after the brief withdrawal period in nicotine. After the initial drug-testing period, rats were then given seven days of were affected by PCP, nicotine, and specifically the combination of PCP and nicotine use in humans as well as in rodent models and sensitivity to this effect enhancement by nicotine of the rewarding effects of other stimuli). The reward-enhancement effect of nicotine has been shown to be a significant contributor to the high rates of smoking in this subpopulation. However, the behavioral and neurological mechanisms behind these effects are largely unclear. Here, we propose that THS constituents can potentially alter bone development similar to FHS and SHS. Putative adverse effects of the three THS constituents named above were tested using osteogenically induced human embryonic stem cells as an in vitro model for bone development. MTT analysis coupled with calcium measurements determined that exposure to NNN and NNK exhibited a concentration-dependent teratogenic effect, while NNA demonstrated a cytotoxic effect. Astonishingly, this is the first finding, to our knowledge, that a THS constituent can perturb bone development. Ultimately, these results require further elucidation of the molecular mechanisms behind these effects.

FUNDING: Tobacco-Related Disease Research Program (TRDRP); International Foundation for Ethical Research (IFER); Center for Alternatives to Animal Testing (CAAT);

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Poster Session 2 • Thursday, February 6, 2014 • 4:15 p.m.–5:45 p.m.

POS2-1
SKLELETAL TERATOGENICITY OF THIRDHAND SMOKE
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Over the last few decades, research regarding cigarette smoke has been mainly focused on firsthand (FHS) and secondhand smoke (SHS). Toxins found in FHS and SHS have been implicated in several tobacco-related health risks including cancers, respiratory complications, cardiac diseases, and osteogenic diseases, such as osteoporosis. While the molecular mechanisms behind FHS and SHS teratogenicity are still being elucidated by us and others, recent studies have identified novel constituents implicating in tobacco-related health hazards termed thirdhand smoke (THS). THS is a toxic mixture derived from nicotine and other tobacco ingredients that have reacted with common indoor pollutants. THS and its constituents are absorbed into everyday common household items and then are released back into the environment through physical contact. Infants and young children are highly susceptible to the health-related risks associated with THS because they have increased contact with THS saturated surfaces. This results in various routes of exposure to the putative toxicants, such as inhalation, ingestion, and dermal transfer. Research studies have described three common THS constituents: 1-(N-methyl-N-nitrosamino)-1-(3-pyridinyl)-4-butanal (NNA), 4-(methylnitrosamino)-1-(3-pyridinyl)-1-butanoic acid (NNK), and N-nitroso nicotine (NNN). In vivo studies have already suggested that these compounds are carcinogenic and pose risks to a person's health, but how these affect bone development is largely unclear. Here, we propose that THS constituents can potentially alter bone development similar to FHS and SHS. Putative adverse effects of the three THS constituents name above were tested using osteogenically induced human embryonic stem cells as an in vitro model for bone development. MTT analysis coupled with calcium measurements determined that exposure to NNN and NNK exhibited a concentration-dependent teratogenic effect, while NNA demonstrated a cytotoxic effect. Astonishingly, this is the first finding, to our knowledge, that a THS constituent can perturb bone development. Ultimately, these results require further elucidation of the molecular mechanisms behind these effects.

FUNDING: Tobacco-Related Disease Research Program (TRDRP); International Foundation for Ethical Research (IFER); Center for Alternatives to Animal Testing (CAAT);

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POS2-2
COMORBIDITY BETWEEN NICOTINE AND SCHIZOPHRENIA: THE INTERACTION BETWEEN PCP AND NICOTINE ON 50 KHZ VOCALIZATIONS
Natasha Swalve*, Cindy Chou, and Ming Li, University of Nebraska-Lincoln

Patients with schizophrenia have a much higher smoking rate than the general population. However, the behavioral and neurological mechanisms behind this comorbidity are in debate. We hypothesized that this comorbidity is due to increased sensitivity to the reward-enhancement effect of nicotine (i.e., the enhancement by nicotine of the rewarding effects of other stimuli). The reward-enhancement effect of nicotine has been shown to be a significant contributor to nicotine use in humans as well as in rodent models and sensitivity to this effect could be a factor contributing to the high rates of smoking in this subgroup. We tested this hypothesis priclinically by inducing behavioral changes resembling symptoms of schizophrenia through pencyccline (PCP). Male Sprague-Dawley rats were injected with PCP (20 mg/kg), and/or one of two doses of nicotine (0.2 mg/kg or 0.4 mg/kg), or the corresponding saline groups for a total of seven days. The rats were then placed in a conditioned avoidance response chamber for thirty minutes and received eighteen presentations of a brief visual stimulus. The total numbers of 50 kHz and 22 kHz vocalizations were examined in relation to rewarding and aversive states respectively. In addition, 50 kHz vocalizations were categorized into 14 subgroups to determine if specific subtypes of vocalizations were affected by PCP, nicotine, and specifically the combination of PCP and nicotine. After the initial drug-testing period, rats were then given seven days of withdrawal where they remained in their home cages and received no injections. The rats then underwent three challenge days after the brief withdrawal period in which all rats received nicotine at one of two doses (0.2 mg/kg and 0.4 mg/kg) and a final challenge of PCP (2.0 mg/kg). PCP decreased vocalizations overall while nicotine did not affect the number of vocalizations. The subtypes of vocalizations were differentially affected by nicotine, PCP, and the combination of both, suggesting that categorizing vocalizations might help illuminate the differential effects of drugs in this paradigm.

FUNDING: This research was funded by NRSA grant F31DA034407-01 awarded to Natasha Swalve.

JUSTIFICATION: Using preclinical means, we are trying to determine potential factors involved in the high rate of smoking in the schizophrenia patients to potentially better inform nicotine cessation treatments in this population.

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POS2-3
SMOKELESS TOBACCO, CIGARETTE, AND NARCOTIC PAIN MEDICATION EXPECTATIONS AMONG NON-USING COLLEGE STUDENTS
Joshua C. Gottlieb*, Noreen L. Watson, Aaron K. Haslam, Nicole L. Harris, Michael A. Sustaita, and Lee M. Cohen, Texas Tech University

A well-established relationship exists between substance use and substance use outcome expectancies. Specifically, individuals reporting higher positive or negative reinforcement expectancies regarding substance use are more likely to use a particular substance when compared to individuals with a greater expectation of negative consequences resulting from use. This association has been observed across many substances of abuse including various types of tobacco products, such as cigarettes (Brandon & Baker, 1991) and smokeless tobacco (Gottlieb, et al., 2013). While most studies have examined substance users' expectancies towards their substance of choice, few have looked at non-users' substance use expectancies. Despite the fact that research exists indicating that non-users' attitudes towards smokeless tobacco use are significantly more positive than cigarette smoking (Kury, et al., 1998), no study, to our knowledge, has compared tobacco-related expectancies to other substances of abuse. Thus, the purpose of the current study was to examine differences in positive and negative outcome expectancies among cigarettes, smokeless tobacco, and narcotic pain medications among a sample of 115 undergraduate students who reported never using tobacco products or narcotic pain medications. Participants were asked to complete the Short Form of the Smoking Consequences Questionnaire (S-SCQ; Myers, et al., 2003), the Smokeless Tobacco Expectancies Scale (Gottlieb et al., 2013), and the Pain Medication Expectations Questionnaire (PMEQ; Ilgen et al., 2011). Results indicated that smokeless tobacco use was believed to lead to significantly more positive outcomes when compared to smoking cigarettes or using narcotic pain medication. However, no significant differences were observed with respect to negative consequences resulting from cigarette or smokeless tobacco use. Future research should continue to examine the substance use outcome expectancies of non-using youth and other vulnerable populations, in order to gain insight that may lead to improved programs and ad campaigns designed to keep these individuals off drugs.

FUNDING: No funding.

JUSTIFICATION: Non-users' positive expectancies towards smokeless tobacco can inform researchers and clinicians about what makes these products appealing to even those who do not use.

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POS2-4
THE EFFECTS OF ENVIRONMENTAL ENRICHMENT ON ADOLESCENT NICOTINE SENSITIZATION IN A RODENT MODEL OF SCHIZOPHRENIA


Our lab has shown that neonatal treatment with quinpirole, a dopamine D2/D3 agonist, to rats resulted in an increase in dopamine D2-like receptor sensitivity that persists throughout the animal’s lifetime without a change in receptor number, consistent with schizophrenia. Approximately 80-85% of schizophrenics smoke cigarettes, and there is no delineated mechanism for this observation. Our lab has also shown more robust sensitization and accumbal dopamine release in response to nicotine in adolescent rats neonatally treated with quinpirole compared to controls. This study analyzed whether environmental enrichment, known to reduce sensitization to psychostimulants, may also reduce or block enhanced sensitization to nicotine in this model. Male and female rats were treated with either quinpirole (1 mg/kg) or saline from postnatal day (P)1-21. After weaning at P21, animals were raised in either environmentally enriched or isolated housing throughout the experiment. Beginning at P33, animals were ip administered either nicotine (0.5 mg/kg free base) or saline 10 min before placement in a square locomotor arena and behavioral activity measured every second day from P33-49. Results revealed that animals given neonatal quinpirole treatment and reared in an enriched environment demonstrated more robust sensitization to nicotine than all other groups. Animals given neonatal quinpirole or saline treatment followed by nicotine in adolescence and raised in isolated housing conditions were equivalent, but demonstrated more robust sensitization compared to enriched rats neonatally treated with saline and administered nicotine in adolescence. Results here show that environmental enrichment enhanced nicotine sensitization in rats neonatally treated with quinpirole, which is in contrast to the blockade of sensitization to nicotine which has previously been shown in normal animals. Importantly, these results show that increases in D2 receptor sensitivity interacts with environmental enrichment differently than in normal animals and the manner in which the animal responds to nicotine, which may have implications towards smoking cessation in schizophrenia.

FUNDING: East Tennessee State University Honors College

JUSTIFICATION: This study is the first to analyze the effects of experience on the behavioral response to nicotine in adolescence, and may ultimately have implications towards treatment of smoking cessation in this population.

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POS2-5
A BEHAVIORAL ECONOMICS APPROACH TO THE STUDY OF NON-NICOTINE CIGARETTE CONSTITUENTS: IMPLICATIONS FOR A NICOTINE REDUCTION POLICY

Tracy T. Smith*, Rachel L. Schasburger, Alan F. Sved, and Eric C. Donny, University of Pittsburgh

The Food and Drug Administration has the authority to reduce the nicotine content in cigarettes to any non-zero level. From a behavioral economics perspective, nicotine reduction is an increase in the cost of nicotine. An exponential equation describes consumption of the reinforcer at a given cost, and the two free-parameters estimate consumption when the reinforcer is free (Q0) and the sensitivity of consumption to increases in cost (alpha). One unknown is how non-nicotine cigarette constituents might affect a nicotine reduction policy. Results reveal that nicotine and most non-nicotine constituents tested here in combination with MAO inhibition are unlikely to negatively affect the impact of a nicotine reduction policy.

FUNDING: U54 DA031659 to E.C.D.

JUSTIFICATION: These data provide information about how non-nicotine tobacco constituents might affect a nicotine reduction tobacco control policy.

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POS2-6
A TWO-DAY CHRONIC NICOTINE INFUSION IS SUFFICIENT TO ELICIT NICOTINE WITHDRAWAL IN RATS

Peter Mueliken, Claire E. Schmidt, David Shelley, Laura Tally, and Andrew C. Harris*, Minneapolis Medical Research Foundation, Department of Ecology, Evolution, and Behavior, University of Minnesota, Department of Neuroscience, University of Minnesota, Department of Medicine, University of Minnesota Medical School

While development of the nicotine withdrawal (NW) syndrome is typically thought to require long-term, daily smoking, recent evidence suggests that NW symptoms may occur during initial tobacco experimentation. Consistent with the notion that NW develops rapidly, we have found that rats exhibit NW signs following a single dose of nicotine. The goal of this study was to determine the minimal duration of chronic nicotine infusion required to demonstrate NW, and to compare magnitude of effects with those elicited in traditional models involving 7+ days of chronic nicotine infusion prior to NW testing. NW was measured as elevations in intracranial self-stimulation (ICSS) thresholds, a measure of the diminished interest or pleasure in rewarding stimuli (anhedonia) associated with NW. Administration of the nicotinic acetylcholine receptor antagonist mecamylamine (3.0 mg/kg, s.c.) elicited elevations in ICSS thresholds following 2 days, but not 1 day, of a chronic nicotine infusion (3.2 mg/kg/day, s.c.), reflecting antagonist-precipitated NW. Magnitude of antagonist-precipitated NW following a 2-day chronic nicotine infusion was similar to that observed following a 14-day chronic nicotine infusion. In a separate study, rats exhibited a transient increase in ICSS thresholds following cessation of a 2-day chronic nicotine infusion (spontaneous NW), with magnitude of this effect similar to that observed in rats undergoing spontaneous NW from a 9-day chronic nicotine infusion. These data demonstrate that rats exhibit antagonist-precipitated and spontaneous NW following a relatively short-term (2-day) chronic nicotine infusion, with magnitude of effects similar to those observed in traditional models of NW involving more prolonged nicotine exposure. Our findings suggest that the amount/duration of nicotine exposure required to elicit NW in animals is less than previously estimated, and complement human studies indicating that NW develops during initial tobacco use. These models may be useful for studying the neurobiological and behavioral mechanisms underlying the development of the NW syndrome.

FUNDING: Supported by the Minneapolis Medical Research Translational Addiction Research Program and the University of Minnesota Undergraduate Research Opportunities Program.

JUSTIFICATION: These studies emphasize the need to understand the role of nicotine withdrawal in the development of regular tobacco use.

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PO2-7
ASSESSING ACQUISITION OF NICOTINE SELF-ADMINISTRATION AT VERY LOW NICOTINE DOSES IN ADOLESCENT AND ADULT RATS
Patricia E. Grebenstein1,2, Danielle Burroughs1, Christine Hernandez1, Paul R. Pentel1,3, and Mark G. LeSage1,4. Minneapolis Medical Research Foundation; 1University of Minnesota Department of Medicine; 2University of Minnesota Departments of Pharmacology and Medicine; 4University of Minnesota School of Public Health

The FDA is considering policies to reduce the nicotine content in cigarettes below a threshold for reinforcement in order to prevent tobacco addiction in adolescents. However, the nicotine reinforcement threshold for nicotine is not well established. Acquisition of nicotine self-administration (NSA) in adolescent rats is sensitive to unit dose, but a lack of saline controls or a wide range of doses in extant studies limits estimating a reinforcement threshold. In the present study, acquisition of NSA was studied in adolescent and adult rats using a range of low unit doses that we have found encompass the reinforcement threshold for maintenance of NSA in adults. Six groups each (N=7-8/group) of male adolescent or adult rats were trained for NSA during 23-hr sessions for 1 week each under fixed-ratio (FR) 1, FR2, and FR3 schedules. Each group had access to saline or one of five unit doses, including two below threshold for maintenance of NSA (0.001 and 0.002 mg/kg), two above threshold (0.004 and 0.007 mg/kg), and 0.03 mg/kg as a positive control dose. After acquisition, single-dose (0.1 mg/kg i.v.) nicotine pharmacokinetic parameters were measured in each rat. The dose-response curves were generally similar between ages, but adolescents exhibited a higher rate of NSA overall (F=7.7, p<0.01). For both ages, only the 0.03 mg/kg dose maintained NSA above saline levels, and the two lowest doses were not reinforcing in any rat. A somewhat lower percentage of adults acquired NSA at 0.004 and 0.007 mg/kg compared to adolescents (50-63% vs 29-33%). Adolescents showed lower serum nicotine concentrations than adults up to 15 min post infusion (F=23.1, p<0.01), suggesting age differences in level of NSA may be due to pharmacokinetic factors. These findings suggest the nicotine reinforcement threshold for acquisition of NSA may be (a) similar in adult and adolescent rats and (b) higher than the threshold for maintenance of NSA in adults. Therefore, the policy implication of this study is that setting the nicotine content in cigarettes below a threshold for maintaining smoking in adults may be sufficient to prevent initiation in adolescents.

FUNDING: This study was supported by NIH/NIDA grant R01-026444.

JUSTIFICATION: The policy implication of this study is that setting the nicotine content in cigarettes below a threshold for maintaining smoking in adults may be sufficient to prevent initiation in adolescents.

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PO2-8
SMOKING CHARACTERISTICS AND DELAY DISCOUNTING IN HOMELESS SMOKERS
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Smokers prefer smaller but immediate rewards over larger, delayed rewards more than nonsmokers, that is, they discount the value of delayed rewards more steeply than nonsmokers. Although over 70% of homeless individuals smoke, few studies have examined delay discounting in this vulnerable population. The purpose of this study was to examine the relationship between delay discounting, smoking measures, and abstinence in homeless smokers, as well as to compare the effectiveness of shelter-based smoking cessation clinic usual care (UC) to an adjunctive contingency management (CM) treatment that offered UC plus small financial incentives for smoking abstinence. Sixty-eight homeless individuals in Dallas,TEXAS (recruited in 2012 and 2013) were assigned to UC (n=58) or UC plus financial incentives (CM; n=10) groups and were followed for 5 consecutive weeks (1 week pre-quit through 4 weeks post-quit). Delay discounting was assessed 1 week pre-quit and 4 weeks post-quit. Logistic regression models were used to assess whether baseline delay discounting predicted abstinence at each time point. Correlations were assessed between discounting and measures of daily cigarettes smoked, smoking urges, and withdrawal. Participants were primarily male (61.8%) and African American (58.8%), and were 49 years of age on average. Baseline discounting rates were not significantly different from discounting rates at the 4 weeks post-quit follow-up visit and were similar to those reported for non-homeless smokers. Logistic regression analyses indicated that baseline measures of delay discounting were unrelated to abstinence (all ps > 0.05). However, baseline delay discounting was correlated with baseline measures of smoking urges (p = 0.01), but not baseline measures of smoking or withdrawal (ps > 0.05). Discounting rates did not predict relapse despite the relationship with smoking urges; however, low abstinence rates in this sample make interpretation difficult. Future research should examine the relation between delay discounting, homelessness, length of homelessness, and smoking cessation with larger samples.

FUNDING: This work was funded by the University of Texas School of Public Health in the form of a PILOT grant and start-up funds (to M.S. Businelle). Additional support for this work was provided by the American Cancer Society (Grant # MRS-GT-12-114-01-CPBP to M.S. Businelle).

JUSTIFICATION: Determining the relationship between delay discounting and smoking in the homeless population examined, may increase smoking cessation rates in this vulnerable population.

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PO2-9
THE ACRYLAMIDE CONTENT OF SMOKELESS TOBACCO PRODUCTS
Kevin McAdam1, Hamlet Kimppton1, Carl Vas1, and Brad Rodu2, British American Tobacco; 1University of Louisville

Acrylamide has been identified as a cause for concern within the public health community following its identification in cooked foods and tobacco smoke. It has been classified by IARC as Group 2A (probably carcinogenic to humans), with sufficient evidence of carcinogenicity in animals. Acrylamide is formed when food or plant materials are heated, with reactions of asparagine and sugars considered the main source. Tobacco contains both and experiences elevated temperatures during processing. Acrylamide has been detected in a limited range of tobacco products in two small analytical method development studies. Given the public health concerns over human exposure to acrylamide and its presence in tobacco, further information is needed to understand whether oral exposure during smokeless tobacco product (STP) use is a significant contributor to daily acrylamide exposure. As a first step towards this goal we have conducted a study examining the acrylamide content of the major STP categories currently consumed in the US and Sweden. 78 STPs were sampled from the USA and Sweden in 2008-10. The products sampled included all major contemporary STP categories (moist and dry snuffs, chewing tobacco and plug, hard and soft pellet products, and loose and pouched snus), and represented approximately 90% market share of the major STP categories. Acrylamide contents were determined by aqueous extraction, non-polar solvent wash, SPE clean-up, and analysis by LC-MS/MS. All 78 STPs contained acrylamide. Contents ranged from ~80 to 760 ng/g dry-weight basis, with the highest concentrations found in some US snus products. Other than this difference, levels were found to be largely comparable between the STP product styles examined. In contrast, there were significant differences in the contents of products within an STP category, and within a manufacturers product portfolio. This study establishes that acrylamide is a common constituent of STPs, at the sub-ppm level. These data provide a starting point from which daily exposure can be estimated, and, therefore, a means with which to estimate the contribution of STP use to overall acrylamide exposure.

FUNDING: The study was funded by British American Tobacco; the authors KM, HK and CV are full-time employees of British American Tobacco. Brad Rodu’s research is supported by unrestricted grants from Tobacco Manufacturers (including BAT) to the University of Louisville, and by the Kentucky Research Challenge Trust Fund.

JUSTIFICATION: This study highlights for the first time the widespread presence of a probable human carcinogen (acrylamide) in Smokeless Tobacco Products;

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these findings inform and add to the science-base supporting FDA policy developments in the area of Harmful or Potentially Harmful Constituents of tobacco.

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POS2-10
RELIABILITY AND VALIDITY WITHIN AND ACROSS SMOKING AND ALCOHOL PICTURE CUE SETS
Idan Ariel*, Jason A. Oliver, Thomas H. Brandon, and David J. Drobes, Moffitt Cancer Center; Tobacco Research and Intervention Program

Studies of cue-reactivity have used a variety of substance-related stimuli (e.g., pictures, videos, objects, etc.) to study participants’ subjective, behavioral, physiological, and neural responses. The widespread use of different stimuli makes it difficult to compare findings across studies. In addition, studies often use stimulus sets with unknown psychometric characteristics (e.g., reliability). Furthermore, studies that employ multiple sessions would benefit from parallel validated cue sets. To address these issues, the present study was designed to establish equivalent sets of reliable images for the study of smoking and alcohol cue-reactivity. As part of a larger study, 87 participants who exhibited a range of smoking and drinking patterns attended four laboratory sessions (separated by approximately 1 week) during which they viewed unique sets of smoking, alcohol, and neutral/control pictures drawn from existing cue sets and other sources. Each cue set consisted of eight pictures of each type (i.e., a total of 32 images per type across the four sessions), with an explicit effort to develop sets with highly similar content. Alcohol images were tailored to participants’ preferred type of alcoholic beverage (i.e., beer, wine, liquor). Craving to smoke and craving to drink was rated for each image. Findings indicated that high craving-related strength showed strong test-retest reliability with Cronbach’s alpha ranging from .89 to .98. High alphas were also observed for average ratings across cue sets (with values ranging from .91 to .98), indicating reliability between cue sets as well as within. Ratings of smoking craving correlated with number of cigarettes smoked per day, as well as scores on the Wisconsin Inventory of Smoking Dependence Motives (WISDM) and the Fagerström Test for Nicotine Dependence (FTND). Ratings of craving to drink correlated with number of drinks per week, and scores on the Alcohol Dependence Scale (ADS). These correlations provide initial evidence of concurrent validity for these image sets. In light of these results, these picture sets can be considered reliable and valid tools for the examination of cue reactivity in single or multi-session studies.

FUNDING: NIH funded, Grant#: AA011157
JUSTIFICATION: To provide a reliable tool for the study of alcohol and smoking cue-reactivity,

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POS2-11
ADOLESCENT ACQUISITION OF LOW DOSE NICOTINE SELF-ADMINISTRATION IN RATS
Rachel L. Schassburger*, Tracy T. Smith, Edda Thiels, Eric C. Donny, and Alan F. Sved, University of Pittsburgh

Of the millions of current daily smokers in the US, the great majority initiated tobacco use prior to the age of 18. Although national rates of tobacco product use by adults have declined in recent years, adolescent initiation remains high. Surveys of human tobacco product use have shown that adolescent females exhibit increased vulnerability to the initiation of tobacco product use compared to male counterparts. Nicotine (NIC), the primary psychoactive compound in tobacco products, has primary rewarding actions, and also acts to enhance the reinforcing properties of environmental and non-pharmacological stimuli. The present study sought to evaluate the acquisition of NIC self-administration (SA) in adolescent and adult Sprague-Dawley rats in the presence of a mildly reinforcing visual stimulus (VS, a 5-cue light, 60-s of white house light) or an initially neutral stimulus that is not itself reinforcing (15+ cue light). Adolescent male and female rats arrived on post-natal day (P) 21-22, were implanted with jugular vein catheters on P23-25, and began SA testing on P30. Adult rats started SA on approximately P60. Food and water were available ad libitum, except during the daily 1-h SA session. Rats were allowed to respond (nose poke) for infusions of NIC (10 ug/kg, i.v.) with VS presentations or just the cue light on a fixed ratio 2 schedule of reinforcement. Male adolescent rats responding for NIC with VS presentations acquired NIC more quickly than female adolescents. Male adults did not acquire SA at this dose when NIC was delivered with VS presentations. All other groups, receiving NIC without VS pairing, did not acquire SA. These results demonstrate that adolescent rats will respond more for a low dose of NIC when combined with VS presentations than adults. Our finding that a low dose of NIC may enhance responding for VS presentations in adolescent animals suggests that enhancement of reinforcing properties of mild rewards, such as visual cues, by NIC in adolescents can lead to increased exposure to NIC, and, as a result, support NIC self-administration, even at low doses of NIC.

FUNDING: R01 DA10464 (ECD), U54 DA031659 (AFS and ECD)
JUSTIFICATION: The vast majority of current daily smokers initiated tobacco product use prior to the age of 18, during the period of adolescence; these experiments use a rodent model to systematically explore how age may be a factor in the susceptibility to initiate nicotine use.

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POS2-12
EFFECTS OF BUPROPION VERSUS NRT ON ABSTINENCE SYMPTOMS: MODERATION BY GENDER AND TRAIT ANGER/HOSTILITY
David G. Gilbert* and Norka E. Rabinovich, Department of Psychology, Southern Illinois University, Carbondale

Using highly controlled procedures explicitly designed to accurately characterize smoking-abstinence symptoms and their modulation by bupropion SR (BUP) and transdermal nicotine patch (NRT), we aimed to better characterize individual differences in response to BUP and NRT to assess whether these medications work by different psychological mechanisms. To accomplish these aims, we randomly assigned 127 dependent smokers to one of four conditions: (1) bupropion SR, (2) NRT, (3) placebo, and (4) delayed-quit control. Large financial incentives were used to maximize sustained abstinence across the 67-day study period. Approximately 50% of the participants in each group completed the study with biochemically-verified smoking abstinence. Abstinence symptoms were assessed with the Profile of Moods States Questionnaire (POMS) and the Shiffman-Jarvik Withdrawal Questionnaire (SJWQ). For POMS Anger symptoms, a MANCOVA (Group x Gender x Time with Zuckerman-Kuhlman Personality Questionnaire (ZKPQ) Anger-Hostility as the covariate) revealed a significant interaction of Group x Gender x Anger-Hostility, p < 0.05. A follow-up ANOVA and subsequent contrasts using trichotomized ZKPQ trait Anger-Hostility level revealed that, relative to placebo: (1) there were no beneficial effects of BUP or NRT in individuals with low trait Anger-Hostility; (2) NRT reduced POMS Anger symptoms in both men and women who were at intermediate levels of trait Anger-Hostility; and (3) in women who were high in trait Anger-Hostility, BUP increased POMS Anger symptoms. Psychological Withdrawal Symptom scale scores on the SJWQ were significantly reduced by NRT (p < 0.05), but not by BUP. SJWQ Withdrawal Symptoms were not moderated by ZKPQ trait Anger-Hostility or by Gender. Overall these findings are consistent with a growing literature indicating that trait Anger-Hostility is an important moderator of the effects of nicotine and smoking abstinence symptoms and that trait Anger-Hostility may be especially important in the moderation of the efficacy of BUP and NRT in treating anger and hostility mood states associated with smoking abstinence.

FUNDING: National Institute on Drug Abuse Grant R01 DA012289-06A1 awarded the first author.

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POS2-13
REINFORCER DEVALUATION IN NICOTINE WITHDRAWAL
Ari Kirshenbaum*, Parks Angelique, Jessie Phillips, Jason Stone, Jesse Suhaka, and Tessa Roy, Saint Michael’s College

Rats chronically exposed to nicotine exhibit dysphoria and amotivation, and this is a reliable finding in the preclinical literature (e.g., Bazou & Bruijnzeel, 2012; Lesage et al., 2006). The objective of the present series of investigations was to determine whether nicotine-induced amotivation is related to the processes of incentive learning (Balleine, 1992; 2001) and nAChR occupation. Furthermore, we sought to determine whether amotivation was sequentially related to the emergence of somatic symptoms. Sucrose was used to maintain progressive-ratio (PR) schedule responding in rats (N = 36). Amotivation was assessed by PR schedule performance relative to a pre-nicotine-exposure baseline. The magnitude and the development of amotivation was witnessed over the course of 10 consecutive days of nicotine dosing (0.1 or 0.3 mg/kg s.c.), and somatic symptoms were also assessed across this period of time. PR schedule performance gradually and successively degraded over the 10 consecutive days, and the degree of amotivation was relative to dose. Furthermore, the magnitude of amotivation was also dose-dependent in that concomitant nicotine was experienced in the presence of nicotine (i.e., pre-session nicotine administration) or in the absence of nicotine (post-session administration). The results suggest that amotivation is a product of reinforcer (sucrose) devaluation. Furthermore, somatic symptoms did not coincide with the emergence of nicotine-induced amotivation, and this result may provide further evidence that somatic and affective symptoms of nicotine withdrawal are not interrelated phenomenon.

FUNDING: Research reported in this presentation was supported by an Institutional Development Award (IDeA) from the National Institute of General Medical Sciences of the National Institutes of Health under grant number 8P20GM103449.

JUSTIFICATION: The dysphoria associated with tobacco-use cessation may be a predictable consequence of reinforcer devaluation, and a recharacterization of the withdrawal syndrome as a product of aberrant incentive learning may help to elucidate new opportunities for treatment.

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POS2-14
DEVELOPMENT OF B CELL-BASED ASSAYS FOR PRE-IMMUNIZATION SCREENING OF VACCINE’S EFFICACY AGAINST NICOTINE
Marco Pravetoni*1,2, F.I. Carroll1, and Paul Pentel1,2, 1Minneapolis Medical Research Foundation, 2University of Minnesota, Departments of Medicine and Pharmacology, 2Research Triangle Institute, Center for Organic and Medicinal Chemistry

Vaccination against nicotine shows efficacy in animal studies, yet clinical studies did not meet expectations because only fewer immunized subjects achieve clinically effective serum antibody titers. A barrier to translation is the lack of pre-vaccination assays or biomarkers that predict the most effective vaccines or subjects amenable to vaccination. To address this obstacle, we are developing a fluorescent antigen-based enrichment method paired with flow cytometry to characterize B cells specific for nicotine hapten in naïve and immunized subjects.

In rats, structurally-close nicotine haptens conjugated to the keyhole limpet hemocyanin (KLH) carrier protein generated nicotine-specific serum antibodies that showed different pre-clinical efficacy blocking nicotine distribution to the brain. We used these nicotine model hapten in rats to test the hypothesis that the pre-immunization number of hapten-specific B cells, or their affinity for nicotine, may correlate with vaccine efficacy. In mice, we found that prior to vaccination naïve B cells showed higher affinity for the more effective hapten and immunogens. These early pre-clinical findings suggest that the pre-immunization analysis of high affinity hapten-specific naïve B cells may provide screening tools to predict conjugate vaccine clinical efficacy against nicotine.

FUNDING: MMRF Translational Addiction Research Program (Pravetoni)

POS2-15
ESTIMATION OF THE AMOUNT OF 210PO RELEASED WITH THE SMOKE STREAM INTO SMOKER’S LUNGS FROM CIGARETTE TOBACCO AND SOME SMOKING-PASTES IN SAUDI ARABIA
Mohamed Al-Arifi*, King Saud University, Clinical Pharmacy Department

To estimate the amount of 210Po released with the smoke stream to smoker’s lungs, 210Po was measured in some types of tobacco, jurak, and mehassel samples, and in the post-smoking ashes, butts, and water filters. Jurak is a paste mixture composed of 30% tobacco, 50% molasses, and 20% spices and minced fruits. Mehassel is a local name of a paste mixture of unknown ratios of tobacco to spices and minced fruits. Both jurak and mehassel are used for smoking by Shisha (pipe used for smoking and has a water filter). 210Po activity concentration in cigarette tobacco, jurak, and mehassel ranged from about 14.7-19.2, 3.1-4.8, and 6.4-8.6 Bq/kg dry weight, respectively, with mean values of about 16.4, 3.8, and 7.2 Bq/kg, respectively. The results indicated that about 68% of the 210Po content released with the smoke stream in case of cigarette and mehassel samples. This value was about 40% in jurak samples. The obtained results are discussed in detail and some conclusions are drawn.

FUNDING: No Funding

JUSTIFICATION: This research revealed the risk of cancer for smoker due to the presence of the radioactive isotope Polonium 210 in the tobacco used for smoking both cigaretes and Shisha or hubble bubble hooka or nargile

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POS2-16
THE DISCRIMINATIVE STIMULUS FUNCTIONS OF NICOTINE-ALCOHOL SEQUENCES IN RATS
Joseph R. Troisi, II* and Greg LeMay, Department of Psychology, Saint Anselm College

Nicotine (N) and ethanol (E) are frequently self-administered in differing tandem orders among humans. Using drug discrimination methodology, 32 rats were trained to discriminate sequential orders of nicotine and ethanol by alternating food-reinforcement (VI-30 sec) (S+) and non-reinforcement (S-) sessions. For 16 rats (Experiment 1), sessions were occasioned by IP nicotine (0.3 mg/kg) (N) that was followed, or was preceded by, a 10 min interval of ethanol (1.0 g/ kg) (E). For 8 rats the N->E sequence functioned as S+ on half of the sessions and the E->N sequence functioned as S- on the remaining intermixed sessions. The average % responding in the S+ sequences was 61 (discrimination index). N and E were later individually tested (i.e., as preceded or followed by saline) over four 5-min non-reinforcement tests. The average % responding in the S+ sequences was 61 (discrimination index). N and E were later individually tested (i.e., as preceded or followed by saline) over four 5-min non-reinforcement tests and shown to produce no consistent stimulus control over responding. For the rats in Experiment 2, there was a significant difference in responding between the S+ and S- drug sequences [t(15)=2.51;p=0.02] during two separate counterbalanced 5-min non-reinforcement tests. The average % responding in the S+ sequences was 61 (discrimination index). N and E were later individually tested (i.e., as preceded or followed by saline) over four 5-min non-reinforcement tests and shown to produce no consistent stimulus control over responding. For the rats in Experiment 2, there was a significant difference in responding between the S+ and S- drug sequences [t(15)=12.21;p<0.001] and the discrimination index averaged 97%. Responding partially generalized individually to N and E, but nicotine produced greater stimulus control. These findings suggest that different drug sequences of nicotine and ethanol (N->E or E->N) can establish reliable discriminative stimulus control over operant responding and that rats appear to be sensitive to the order in which nicotine is preceded or followed by ethanol at doses that have been shown to be equally salient. These results are
Poster Session 2 • Thursday, February 6, 2014 • 4:15 p.m.–5:45 p.m.

POS2-17
THE PERSONAL AUTOMATIC CIGARETTE TRACKER (PACT): INITIAL VALIDATION AND COMPARISON OF AN INNOVATIVE SMOKING ASSESSMENT DEVICE WITH TRADITIONAL PUFF TOPOGRAPHY ASSESSMENT

Julie C. Gass1, Lisa J. Germeroth1, Paulo Lopez-Meyer, Ph.D.2, Yogendra Patil1, Edward Sazonov, Ph.D.3, and Stephen T. Tiffany, Ph.D.4, 1University at Buffalo, SUNY, 2University of Alabama, and 3University of Maryland.

The Personal Automatic Cigarette Tracker (PACT) device uses innovative technology to monitor smoking behavior for extended periods in free-living conditions. This non-invasive wearable system, attached to an adjustable garment, relies on breathing and hand-to-mouth gestures to collect several cigarette smoking topography variables, including puff duration and interpuff interval. The Clinical Research Support System (CReSS pocket), often viewed as the "gold standard" of puff topography devices, is restricted to puffing behavior generated by the mouth. Smoke exposure that occurs after air is no longer drawn through the cigarette, such as smoke holding, cannot be assessed by the CReSS. PACT allows researchers to determine the duration of time that a person holds smoke in his or her lungs, which contributes to a more comprehensive estimate of smoke exposure. In this pilot study, daily smokers (n = 30) were outfitted with the PACT device and smoked four cigarettes over the course of two sessions in the laboratory: two with the CReSS pocket and two without. Preliminary analyses revealed that, on variables shared by CReSS and PACT, both devices produced highly comparable data; at both sessions, measures of puff number (r = 0.84 and 0.91, ps < .001), puff duration (r = 0.63 and 0.64, ps < .01), and interpuff interval (r = 0.93 and 0.96, ps < .001) were significantly correlated, thereby supporting the validity of the PACT device. Use of the CReSS did not significantly alter the way a person smoked cigarettes for any outcome variable. Across the four cigarettes, PACT detected the amount of time that participants held smoke in their lungs for each puff (M = 6.5 seconds, SD = 2.2, range = 3.8 – 12.7). This variable was significantly correlated with expired carbon monoxide (r = 0.46, p < .05). The CReSS measurement of puff volume was not significantly related to expired carbon monoxide (r = 0.21, p > .05), suggesting that PACT produces a puff-level measure of smoke exposure not available through the CReSS. These data suggest the PACT system is a feasible and valid way to assess smoking puff topography. These and other implications of the research will be discussed.

FUNDING: This research was supported by grant R21 DA029922 from the National Institute on Drug Abuse, National Institutes of Health.

JUSTIFICATION: The device and analysis system described in this research allows for the noninvasive detection of smoking as it occurs in the natural environment and may be used to monitor smoking treatment outcomes or evaluate natural smoking patterns.

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POS2-18
MEDIATORS OF STRESS AND URGE TO SMOKE: AN EXPERIMENTAL INVESTIGATION UTILIZING THE PASAT-C TASK TO INDUCE NEGATIVE AFFECT IN SMOKERS

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Smoking craving is impacted by the presence of environmental and other cues associated with smoking (Cepeda-Benito & Tiffany, 1996). Previous research experiments, usually conducted with adults as part of smoking cessation studies (Britt et al., 2001, Morissette et al., 2005), present both self-reported and psychological increases in craving when confronted with smoking-related cues such as laboratory induced stress (Niaura et al., 2002, Conkin & Tiffany, 2001). This study aimed to examine the impact of a laboratory induced negative affective task (PASAT task) on smoking cravings among a sample of college student smokers (not presently attempting to quit smoking). The hypothesis was that increased laboratory induced stress will be associated with increased urges to smoke, but that this link will be mediated by the degree to which the individual experiences negative affect. It is also suggested that the association may be mediated by individual difference characteristics, specifically a sensitivity to anxiety-related experiences and the desire to avoid such unpleasant internal events (i.e., experiential avoidance). Thirty-five participants (Mage = 20.83, SD = 1.71; 25 female) underwent a stress and frustration induction procedure (PASAT, Lejuez, Kahler & Brown, 2003) while their physiological reactions (e.g., skin conductance, heart rate, corrugator) and subjective responses (e.g., SUDS ratings, Questionnaire of Smoking Urges, PANAS) were measured. As level of PASAT-C difficulty increased, so did the participant's physiologic (SCR) and subjective responses of stress, negative emotions, and urge to smoke. Smoking urges were found to increase from pre- to post-test and corresponded to changes in negative affect, which ANCOVAs showed to be the only significant mediator of the association between induced stress and smoking cravings (smoking dependence, anxiety sensitivity, and experiential avoidance did not mediate this association). Results verified the widely accepted claim that stress is related to increased urges to smoke and may sustain smoking behaviors through a model of negative reinforcement.

FUNDING: The preparation of this report was supported, in part, by a grant from the Cyprus Research Promotion Foundation and European Union structural funds to Maria Karekla, PhD.

JUSTIFICATION: Findings highlight the importance of learning ways to better deal with stress and negative emotions both as part of preventive and intervention efforts for smoking cessation.

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Joshua C. Gottlieb* and Lee M. Cohen, Texas Tech University

The relationship between smoking and stress is well documented. Specifically, it has been observed that smokers experiencing stress have a decreased ability to resist their urges to smoke (Cohen & Lichtenstein, 1990; McKee et al., 2011). Individuals who smoke also report experiencing increased levels of stress when they make a quit attempt (Hajek, Taylor, & McRobbie, 2010). Moreover, individuals who smoke report higher levels of perceived stress when compared to individuals who have never smoked (Naquin & Gilbert, 1996). While, this relationship has been clearly established among cigarette smokers, it has not yet been established among smokeless tobacco users. The purpose of the current study was to examine differences in the level of perceived stress among college freshmen who smoke cigarettes or use a smokeless tobacco product. To measure perceived stress, the 10-item Perceived Stress Scale (PSS; Cohen & Williamson, 1988) was used. No significant differences were observed regarding level of perceived stress across individuals who use smokeless tobacco and non smokeless tobacco users (F(1, 381) = .47, p = .49). Further, no significant differences were observed with respect to the frequency of smokeless tobacco use (F(5, 377) = 2.02, p = .08). This finding indicates that the level of perceived stress experienced by daily users was not different from the level of stress experienced by those that used infrequently. A
significant difference was found however, between individuals who smoke and those who do not smoke \[F(1, 381) = 3.86, p < .05\]. Significant differences was also found based on frequency of smoking \[F(5, 377) = 2.37, p < .05\]. These findings indicate that individuals who use smokeless tobacco and those who do not may not differ in levels of perceived stress. Smokers, however, differ significantly from non-smokers and level of stress is influenced by how much an individual smokes. Results should be noted by treatment designers and providers that programs designed for smokeless tobacco cessation based on existing smoking cessation programs may need to be fully tailored to smokeless tobacco users, including modules on stress management.

**FUNDING:** No funding.

**JUSTIFICATION:** Results may inform treatment developers and providers about the need to fully tailor smokeless tobacco cessation programs to that specific population rather than using existing smoking cessation protocols.

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**POS2-20**

**EFFECTS OF SELF-ADMINISTERED NICOTINE ON CHOW AND SUCROSE INTAKE IN ADULT MALE RATS**

Patricia E. Grebenstein1,2, Danielle Burroughs1, Christine Hernandez2, and Mark G. LeSage1,2. 

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Cigarette smoking is characterized by decreased sweet food preference and consumption, which is reversed during cessation. These changes in food intake may mediate weight gain and risk for Type II Diabetes in individuals who quit smoking. Attempts to model these effects in rodents have been limited to investigations of noncontingent nicotine administration. The purpose of this research is to characterize changes in ad libitum chow and sucrose pellet intake in rats during a 24-hour access model of IV nicotine self-administration (NSA). Male Holtzman rats were placed in operant chambers for 24 hours a day, and were given ad libitum access to water and either sucrose and chow (S+G group) or chow only (C group), on an FR1 schedule. Baseline food intake was assessed for a minimum of 10 days and until stable for at least 5 days. After this baseline period, access to nicotine was made available on an FR1 schedule for 5 days. Sucrose and/or chow intake were recorded daily. Total baseline food intake was greater in the S+G group compared to the C group \((t=4.32; p<0.001)\). The chow intake between the groups was not significantly different; indicating that increased total food intake in the S+G group was due to sucrose consumption. Nicotine administration produced a significant decrease in both chow \((t=9.48; p<0.0001)\) and sucrose \((t=0.94; p=0.0001)\) intake compared to baseline in the S+G group. Similar decreases were also observed for chow intake in the C group \((t=5.73; p<0.05)\). Nicotine decreased total food intake to a greater degree in the S+G group, resulting in similar levels of total food intake between groups during NSA. In the S+G group, sucrose intake remained low and stable during NSA, whereas chow intake gradually increased (significant difference in slope, \(F=7.93; p<0.05\)), indicating differential tolerance to nicotine. NSA decreases sucrose and chow intake in rats, and tolerance to this appetite suppressant effect of nicotine is dependent on the type of food consumed. The differential tolerance of intake of different food types to nicotine indicates the importance of using a varied diet to better understand the effects of nicotine on food motivation.

**FUNDING:** Supported by NIH/NIDA grant R01 DA019632.

**JUSTIFICATION:** This study highlights the importance of targeting maternal stress and hostility for mothers who smoked during pregnancy in order to reduce potential negative behavioral outcomes for their children.

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**POS2-21**

**PRENATAL CIGARETTE EXPOSURE AND PARENT CHARACTERISTICS: IMPACT ON CHILD EXTERNALIZING BEHAVIOR AT 16 MONTHS**

Stephanie Godleski1,2, Rina D. Eidin1,3, Craig R. Colders3, and Pamela Schuetze3.

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Maternal hostility and aggression are associated with persistent smoking during pregnancy. Further, prenatal cigarette exposure (PCE) and negative parent behavior both pose risk for later developmental sequelae including inattention, oppositional behavior, and physical aggression. We examined a conceptual model in which PCE, parent stress at 2 months of child age, and parent hostility at 2 months of child age would be inter-related and each subsequently predict higher levels of child externalizing behavior problems at 16 months. The sample consisted of 203 mother-infant dyads recruited prenatally and assessed once in each trimester of pregnancy and at 2 and 16 months of infant age. PCE was assessed using a combination of self-report, maternal salivary cotinine during pregnancy, and infant meconium. There were no direct associations between cigarette exposure (average/day during pregnancy, smoking group status, infant meconium positive for smoking or not) and externalizing problems. However, average number of cigarettes smoked per day across the entire pregnancy was significantly positively associated with parent hostility at 2 months and tended to be associated with parent stress at 2 months. Further, mothers who smoked during pregnancy reported significantly higher levels of hostility and tended to have higher levels of stress at 2 months of child age. Parent hostility and stress at 2 months significantly positively predicted child externalizing at 16 months. Together, PCE, parental hostility, and stress accounted for 9% of the variance in child externalizing. Results indicate that higher levels of smoking during pregnancy are associated with higher levels of hostility and potentially higher stress during the early months of parenting. Parent hostility and stress are then subsequently associated with future child externalizing problems. In this early stage of development, it may be that the direct effect of PCE on the development of externalizing problems has not yet emerged. However, the current findings support the association between smoking during pregnancy and maternal hostility and reinforce the importance of parents in the development of externalizing behavior.

**FUNDING:** No funding.

**JUSTIFICATION:** Results may inform treatment developers and providers about the need to fully tailor smokeless tobacco cessation programs to that specific population rather than using existing smoking cessation protocols.

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**POS2-22**

**SOCIOSEXUALITY AMONG MALE SMOKELESS TOBACCO USERS AND NON-USERS IN THEIR FIRST YEAR OF COLLEGE**

Joshua C. Gottlieb*, Aaron K. Haslam, Noreen L. Watson, Michael A. Sustaita, Nicole L. Harris, and Lee M. Cohen, Texas Tech University

Sociosexuality is defined as an individual’s disposition towards casual, uncompromised sex (Penke & Asendorpf, 2008). When compared to women, men report a stronger desire for casual sex and are more comfortable seeking a variety of sexual partners (Schmitt et al., 2003). Such behaviors are considered dangerous, as engaging in sex with multiple partners without protection can lead to HIV/AIDS, other sexually transmitted diseases, and unplanned pregnancies. Young adult substance users (including college students) are more likely than other groups to engage in these risky sexual behaviors (Grelo, Welch, & Harper, 2006; Kraft & Rise, 1994; Tapert et al., 2001). While several substances of abuse have been studied with regards to relationship, no study to date has specifically examined the role of smokeless tobacco and risky sexual behaviors. The current study examined sociosexuality among first year college males \((N = 145)\) who reported using smokeless tobacco \((ST; n = 43)\) or reported never using ST \((NU; n = 111)\). The Sociosexual Orientation Inventory – Revised (Penke & Asendorpf, 2008) was used to measure sociosexuality. This scale consists of 9-items as well as three facets (Behavior, Attitude, Desire) comprised of three items each. A global sociosexual orientation score that is comprised of all 9 items can also be obtained. Results indicated that ST users report having sex with more short-term partners \([F(1, 143) = 4.96, p < .05]\), have a more positive attitude towards having sex with
**POS2-23**

**REACTION TIME TO CRAVING ITEMS AS AN IMPLICIT MEASURE OF CRAVING RELATED PROCESSES**

Lisa J. Germeroth*, Jennifer M. Wray, and Stephen T. Tiffany, University at Buffalo, The State University of New York

Craving assessments rely predominantly on explicit, self-reports of craving levels. Some implicit measures of craving, such as psychophysiological and neurobiological responses, have also been explored. A concern with existing implicit measures is that they may not directly reflect craving-related processes. This study examined reaction time to craving items (an implicit measure more proximal to the craving experience) and the role of uncertainty in responding to craving items. We evaluated the impact of a cue-reactivity manipulation and level of nicotine dependence on reaction time and uncertainty, and the associations between craving level and both reaction time and uncertainty. At each of 5 sessions, cigarette smokers (N = 260; mean age = 25.6) completed a cue-reactivity procedure (6 smoking, 6 neutral trials). After each cue, participants rated 4 craving items and reaction time for each item response was assessed. Dependence was indexed with the Nicotine Addiction Taxon Scale and uncertainty with a measure of inter-item variability. Faster reaction times and less uncertainty emerged after neutral relative to smoking cues for nondependent smokers (N = 197) and after smoking relative to neutral cues for dependent smokers (N = 63). Analyses indicated quadratic relationships between craving level and both reaction time and uncertainty regardless of dependence level. This provided evidence of inverted-U reaction time and uncertainty effects such that smokers had fast reaction times and less uncertainty when reporting very low or high craving and slower reaction times and greater uncertainty when reporting moderate craving. Additional analyses indicated that reaction time and uncertainty were positively correlated. Our results suggest that reaction time to craving items may reflect certainty in responding. Fast reaction times and lower uncertainty emerged for nondependent smokers after neutral cues, which produced very low levels of craving, and for dependent smokers after smoking cues, which generated very high levels of craving. The theoretical implications and future validation of this new, implicit index of craving processing will be discussed.

**FUNDING:** This research was funded by an NIH grant to S. Tiffany (R01 CA120412)

**JUSTIFICATION:** This research demonstrates the potential of a new implicit measure of craving processes that may compliment traditional explicit self-report measures of craving.

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**POS2-24**

**MONOAMINE OXIDASE (MAO) INHIBITION INCREASES SENSITIVITY TO BOTH THE PRIMARY REINFORCING AND REINFORCEMENT ENHANCING EFFECTS OF NICOTINE**

Tracy T. Smith*, Rachel L. Schassburger, Deanne M. Buffalari, Alan F. Sved, and Eric C. Donny, University of Pittsburgh

Nicotine (NIC) acts as both a primary reinforcer, supporting behaviors that result in its delivery, and a reinforcement enhancer, increasing the value of other reinforcers. MAO is partially inhibited in chronic smokers, but the effect of MAO inhibition on these distinct reinforcement-related properties of NIC is poorly understood. Rats treated with tranylcypromine (TCP), an irreversible MAO inhibitor, have higher rates of low-dose NIC self-administration (SA). We used the timing of the TCP injection to investigate the mechanism behind TCP-induced increase in NIC SA, because previous data suggested that acute effects of TCP, unrelated to MAO inhibition, may contribute to the effect of TCP on NIC SA. Rats experienced daily 1 hr NIC SA sessions (10 ug/kg/intraperitoneal), and were given an injection of saline or TCP (1 mg/kg), 1- to 23-hr before the session, when TCP’s acute effects are likely absent. Both TCP groups similarly earned more infusions than the group receiving saline, consistent with a NIC-dependent effect. We also investigated the effect of TCP on the NIC dose-response curve for primary reinforcement. Rats responded (nose-poke) for NIC (dose increased across sessions) and an initially neutral cue light. Rats received a pre-session injection of TCP or saline. The dose-response curve for rats receiving TCP was shifted up and to the left; rats receiving TCP self-administered a lower dose of NIC than rats receiving saline, indicating that TCP increased sensitivity to the primary reinforcing effect of NIC. Finally, to investigate the effect of TCP on reinforcement enhancement, rats responded for a moderately-reinforcing visual stimulus (VS) and received a 1-hr pre-session injection of TCP or saline, and 5-min pre-session injection of NIC or saline. Rats receiving both TCP and NIC earned more VS presentations than all other groups at a low dose of nicotine, indicating that TCP increased sensitivity to the reinforcement enhancing effects of NIC. Together, these studies suggest that cigarette constituents causing MAO-inhibition may increase a smoker’s sensitivity to both the primary reinforcing and reinforcement enhancing effects of NIC.

**FUNDING:** U54 DA031659 to E.C.D.

**JUSTIFICATION:** These data provide information about how tobacco constituents causing MAO inhibition may affect interact with nicotine to increase the reinforcing potential of cigarettes.

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**POS2-25**

**INFLUENCES OF CHRONIC USE OF TOBACCO AND KHAT (CATHA EDULIS) ON SUBJECTIVE SLEEP QUALITY**

Motohiro Nakajima, Ph.D.*, and Mustafa al’Abi, Ph.D., University of Minnesota Medical School

Identifying determinants associated with habitual substance abuse is useful in reducing its harm and minimizing its economic and health care burdens. Khat (Catha edulis) is a substance widely used in East African and Middle Eastern countries as well as in immigrant communities in Europe. Khat is commonly used as an important means of socializing, and is often accompanied by smoking. While sleep disturbance has been shown to be significantly linked to habitual khat use, a mechanistic understanding of this association remains absent. Both smoking and khat use are linked with sleep disturbances. The results indicated that concurrent users of tobacco and khat, 141 (76 female) khat-only users, and 92 (52 female) nonusers in Yemen. Measures on subjective mood were also collected. A series of ANOVAs and chi-square tests were conducted to test whether tobacco and khat use were linked with sleep disturbances. The results indicated that concurrent users and khat-only users showed greater sleep disturbances than nonusers as assessed by the PSQI global scores (ps < .001). Similar group differences were found in PSQI component scores such as sleep quality, sleep disturbances, daytime dysfunction. The PSQI global scores as well as component scores were correlated with negative and positive mood (ps < .004). In addition, there were trends of positive associations of the global PSQI scores with reported days of khat use per week and number of cigarettes smoked per day (ps = .05). These
results suggest that tobacco and khat use are associated with deterioration in subjective sleep quality. Our findings also provide initial support for the use of the Arabic version of PSQI.

FUNDING: This work was supported in part by the Fogarty International Research Collaboration Award (ROI TW007219) and by the National Institute for Drug Abuse under Award Number R21 DA024626.

JUSTIFICATION: Identifying psychosocial determinants associated with habitual tobacco and khat use are useful in the development of effective prevention and harm reduction approaches, which could minimize economic and health care burdens associated with tobacco and khat use.

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**POS2-26**

**AGE MODERATES NICOTINE DEPRIVATION EFFECTS ON NEURAL MARKERS OF ERROR PROCESSING**

David E. Evans, Ph.D.*, Kade G. Jenlink, B.S., Jason A. Oliver, M.A., David A. MacQueen, M.A., and David J. Drobes, Ph.D., Moffitt Cancer Center and University of South Florida

Cognitive control is diminished amongst nicotine deprived smokers and is restored by smoking. It has been posited that this restoration of cognitive control contributes to the reinforcing effects of smoking. A critical aspect of cognitive control involves the capacity to identify errors, thereby enabling the modification of subsequent behavior. Amplitude of the error-related negativity (ERN) and error positivity (Pe) components of the event-related brain potential (ERP) are associated with earlier and later stages of error processing, respectively. Models of nicotine self-medication of cognitive control posit that smokers lower in cognitive control show greater nicotine deprivation induced decrements in cognition. Coincident with age-related declines in cognitive control, ERN and Pe amplitudes decline across adulthood. Thus, in addition to examining the direct effects of nicotine deprivation on neural processing of errors, the present study explored age as a cognitive control-related moderator of these effects. Nineteen nicotine dependent 18-49 year-old smokers attended two experimental sessions following 12-hour smoking/nicotine deprivation. In a counterbalanced and doubleblind fashion, participants smoked nicotine containing cigarettes during one session and placebo cigarettes during the other. A flanker task that evokes ERN and Pe was completed by participants at both sessions. Surprisingly, no direct nicotine deprivation effects on ERN or Pe were found. However, age was shown to moderate the effect of nicotine deprivation on both ERN and Pe. Older participants exhibited smaller ERN amplitudes but larger Pe amplitudes during nicotine deprivation, relative to younger participants. We interpreted this pattern of findings as suggesting that during nicotine deprivation the initial processing of errors is diminished and that later more elaborate awareness related to processing of errors is enhanced among older smokers. Failure to flag errors earlier rather than later in the processing stream may serve as a marker of greater cognitive disruption in response to nicotine deprivation as a function of age.

FUNDING: NIH grants R21 DA027001 and R21 DA024226

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**POS2-27**

**A NOVEL METHOD TO INDUCE NICOTINE DEPENDENCE BY INTERMITTENT DRUG DELIVERY USING OSMOTIC MINIPUMPS**

Julia K. Brynildsen*, Li-Ming Hsu1, Julie Najjar1, D. Bruce Vaupel, Ph.D.1, Harbing Lu, Ph.D.1, Yihong Yang, Ph.D.1, Elliot A. Stein, Ph.D.1, and Allison C. Hoffman, Ph.D.2, ‘Neuroimaging Research Branch, National Institute on Drug Abuse-Intramural Research Program, NIH/ODHS; *Addiction Branch, Office of Science, Center for Tobacco Products, FDA

Osmotic pumps have been routinely used to automatically deliver various drugs and hormones systemically in preclinical neuroscience models, including rodent models of nicotine, cocaine, and opiate dependence. However, this continuous method of drug administration fails to accurately mimic the typical pattern of nicotine intake in humans and also does not incorporate the rapid nicotinic receptor alterations that are known to occur in vivo. Intermittent drug delivery in rodents provides a more authentic model, but requires labor intensive intravenous surgery as well as instrumentation for and training with passive or self-administration procedures. In order to determine whether nicotine dependence can be induced by a simpler intermittent delivery system, rats were implanted (i.p.) with an osmotic pump attached to a Lynch coil (Lynch et. al., 1980), which was filled with alternating nicotine solution and mineral oil in volumes calculated to deliver a single nicotine injection every hr for 14 days. Two doses of nicotine (0.1 mg/kg/hr and 0.2 mg/kg/hr) and saline vehicle were administered (n=6 per group) using a model 2ML4 pump (Alzet). Animals were challenged with mecamylamine (1.5 mg/kg s.c.) and observed for somatic signs of nicotine withdrawal for 50 min (Malin et. al., 1992) at 7, 14, and 21 days after pump implantation. The summation of these signs gave a withdrawal score for each rat, which was used to compare the degree of dependence between treatment groups and time points. A Group x Day ANOVA revealed a significant main effect of Group, whereby both low and moderate nicotine dose groups had significantly greater withdrawal scores than the saline group at 7, 14, and 21 days [F (2, 15) = 8.87, P <0.05]. Though somatic signs showed a trend for increased scores in a dose-dependent manner, the two nicotine groups did not significantly differ from one another. To our knowledge, this is the first study to demonstrate dose-dependent nicotine dependence following noncontinuous delivery via an osmotic pump. Future studies will utilize neuroimaging methods to investigate functional changes in neural circuitry during dependence and withdrawal from intermittent nicotine.

FUNDING: Supported by the NIDA-IRP and the FDA Center for Tobacco Products.

JUSTIFICATION: This noncontinuous method of nicotine administration in rodents closely mimics human smoking behavior and may be used to investigate neurobiological mechanisms of nicotine dependence in the interest of developing more effective cessation treatments.

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**POS2-29**

**SEX HORMONES, SALIVARY CORTISOL & SMOKING-RELATED SYMPTOMATOLOGY IN PREMENOPAUSAL SMOKERS**

Alicia Allen*, Sharan Allen, Dorothy Hatsuksami, and Mustafa al'Absi, University of Minnesota

While sex hormones (SH), salivary cortisol (CORT), and smoking-related symptomatology (SRS) have all been implicated as risk factors for smoking relapse, there is limited research on the association between all three of these factors. Thus, the goal of this project was to (1) determine the relationship between SH (progesterone/estradiol ratio [PE] and allopregnanolone [ALLO]) and CORT, and (2) examine the associations between SH and CORT on SRS during ad libitum smoking and acute smoking abstinence. Women, ages 18-40, who smoked ≥ 5 cigarettes/day and reported regular menstrual cycles were enrolled in a controlled cross-over study. Participants completed two testing sessions during the follicular and luteal menstrual phases (order randomly assigned). On the day before quit participants collected five CORT samples and attended a clinic visit to provide a blood sample (PE and ALLO) and subjective SRS data. The following day participants abstained from smoking and attended a clinic visit to provide subjective SRS data. Analyses included repeated measures random-intercept models. Participants (n=71) were, on average, 29.4±6.9 years old and smoked 12.3±5.0 cigarettes/day. PE had a positive association with both morning
CORT and the change in CORT during the day (p<0.001) whereas ALLO had a negative association with both (p<0.001). Numerous associations were observed between SH, CORT, and SRS. Most notably, on the day before quit, PE was negatively associated with anticipated relief from negative affect (β=-4.67, p<0.001), and CORT was positively associated with depressed symptoms (β=0.41, p<0.001). On quit day, PE was positively associated with positive affect (β=70.8, p<0.001), ALLO was negatively associated with perceived stress (β=-4.67, p<0.001), and CORT was negatively associated with perceived stress (β=-1.09, p<0.001). The patterns of associations found here suggest buffering effects of CORT and ALLO on withdrawal symptoms and reported stress. Additional research is needed to explore the impact of these relationships on smoking cessation.

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POS2-30
TARGETING THE NORADRENERGIC SYSTEM FOR STRESS-PRECIPITATED RELAPSE: AN EXAMINATION OF GENDER DIFFERENCES
Sherry McKee, Ph.D.*, Mehmet Sofuoglu, M.D., Marina Picciotto, Ph.D., Andrea Weinberger, Ph.D., and Meaghan Lavery, B.A., Yale School of Medicine

Stress and negative affect are recognized as primary mechanisms involved in the maintenance of, and relapse to, drug use. Emerging evidence identifies that affect regulation plays an especially critical role in the ability of women to initiate abstinence and avoid relapse. Targeting stress-reactivity for treatment development is a critical, yet underdeveloped, area of research which may serve to increase rates of smoking cessation for women. Preclinical findings support the hypothesis that noradrenergic pathways are involved in stress-induced relapse, and that their manipulation may be of potential benefit in the prevention of stress-related drug relapse. Using our validated human laboratory model to examine stress-induced smoking, we evaluated whether guanfacine (an alpha2a agonist) preferentially counteracted stress effects on smoking in women compared to men. We then evaluated whether guanfacine significantly reduced smoking behavior during a brief 4-week treatment period. During the treatment phase, results demonstrated that guanfacine equally reduced smoking in women and men, but appeared to target gender-sensitive mechanisms. During the laboratory component, guanfacine preferentially reduced the effect of stress on smoking in women compared to men. In men compared to women, guanfacine preferentially reduced smoking-related reinforcement. We will also present results examining gender differences in mechanisms underlying stress-precipitated smoking lapse and smoking-related reinforcement (e.g., craving, mood, withdrawal, cardiovascular reactivity, hypothalamic-pituitary-adrenal axis reactivity, catecholamines, cognitive function, and ovarian hormones). Results such as these provide important evidence that targeting gender-sensitive mechanisms is a viable medication development strategy, and support the further testing of noradrenergic agents for tobacco dependence.

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POS2-31
EFFECTS OF MENSTRUAL CYCLE ON CORTISOL RESPONSE TO STRESS AND WITHDRAWAL SYMPTOMS: COMPARING SMOKERS AND NONSMOKERS
Motohiro Nakajima, Ph.D.*,1, Sharon Allen, M.D., Ph.D.2, Alicia Allen, Ph.D., M.P.H.2, Elizabeth Ford, B.A.1, and Mustafa al’Absi, Ph.D.1, Department of Biobehavioral Health and Population Sciences, University of Minnesota Medical School, 1Department of Family Medicine and Community Health, University of Minnesota

Accumulating evidence indicates the role of menstrual cycle in severity of withdrawal symptoms among female smokers. While research has shown that these smokers report greater withdrawal symptoms in the luteal phase than in the follicular phase, this hypothesis has not been directly examined in context of psychobiological stress response. In this study, 37 habitual smokers (mean age = 31.7 years; SD = 11.5) and 17 nonsmokers (31.2 years; SD = 12.6) were asked to complete a laboratory session which lasted 120 min. In each group, approximately half of the participants were tested when they were in the follicular phase and the others were tested in the luteal phase. The laboratory session included resting baseline, stress (in the order of public speaking, mental arithmetic, and pain assessments) and recovery periods. Saliva samples were collected at the end of the baseline, mental arithmetic, pain, and recovery, for the measurement of cortisol. Self-report mood and withdrawal symptoms were collected at the end of baseline, stress period, and recovery. A series of repeated measures analysis of variance (ANOVA) found a significant smoking group x menstrual cycle x sampling time interaction in cortisol levels (p<.05). Follow-up changes score analysis indicated attenuated cortisol stress response in the luteal phase group relative to the follicular phase group in smokers (p<.02); however, this difference was not found in nonsmokers. There was a menstrual cycle x time effect in reported distress (p<.05) reflecting greater increase in response to stress in the luteal phase group than in the follicular phase group for both smokers and nonsmokers. Also, among smokers, a trend of menstrual cycle by time effect (p=.08) in craving suggested greater levels during recovery in the luteal than in the follicular phase groups. Correlational analysis in smokers found inverse relationships of cortisol with craving and withdrawal symptoms during recovery in the luteal phase group, but this was not observed in the follicular phase group. These results suggest that blunted hormonal stress response plays a role in the link between menstrual cycle and smoking withdrawal symptomatology.

FUNDING: This work was supported in part by a grant from the National Institute of Health (R01DA016351 and R01DA02732).

JUSTIFICATION: While research has shown the link between menstrual cycle and withdrawal symptoms, the role of psychobiological response to stress in this association has not been investigated.

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POS2-32
NICOTINIC RECEPTOR EXPRESSION FOLLOWING CHRONIC NICOTINE AND/OR VARENICLINE TREATMENT
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Varenicline (VAR) is a high affinity partial agonist at alpha4beta2 neuronal nicotinic receptors (a4b2-nAChR) with lower affinity but higher agonist activity at a3beta4- and a7-nAChRs. Chronic treatment of mice with VAR increases epibatidine (EPI) binding similar to chronic nicotine (NIC) (Turner et al, Nic Tob Res 13:41-46, 2011). Inasmuch as VAR interacts with several nAChR subtypes, we examined the effect of chronic treatment with NIC (1 mg/kg/hr), VAR (0.2 mg/kg/hr), and NIC plus VAR on multiple nAChR subtypes. C57BL/6J mice were implanted with jugular catheters; drugs were administered by constant infusion for 10 days. Brains were frozen for subsequent sectioning and autoradiographic analysis of total [125I]EPI binding (primarily a4b2-nAChR sites), cystamine-resistant (non a4b2-nAChR sites) [125I]EPI binding, [125I]-a-bungarotoxin (BGT), a7-nAChR sites) and [125I]-a-conotoxin MII binding (MII, primarily a6b2*-nAChR sites).

FUNDING: Supported by NIH grants P50DA033945 (ORWH & NIDA), R21DA033597, RL1DA024857, UL1DE019586, PL1DA024859, PL1DA024860, UL1 RR024139

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POS2-33
USING A COMBINATION THERAPY WITH N-ACETYLCYSTEINE AND VARENICLINE TO INHIBIT CUE-INDUCED NICOTINE RELAPSE

Cassandra D. Gipson*, Nicholas Allen1, Erin McClure1, Kevin Gray1, Brett Froeliger1, and Peter W. Kalivas1. Medical University of South Carolina

Cigarette smoking is a leading cause of preventable death, and addiction to nicotine produces long-lasting, stable changes in brain synaptic physiology that might contribute to the vulnerability to relapse. While targeting glutamatergic signaling has shown somewhat effective in preventing cocaine relapse, there is limited utilization of compounds targeting the dysregulation of glutamatergic signaling in promoting smoking cessation. As well, existing smoking cessation treatments are insufficient as relapse rates remain high. Thus, we examined the efficacy of a glutamatergic (the antioxidant N-Acetylcysteine; NAC) and a nicotine replacement agent (varenicline) in reducing both nicotine self-administration and reinstatement of cue-induced nicotine seeking in a preclinical model nicotine relapse. Compared to either compound alone, we found that the combination of NAC+VARE significantly decreased the proportion of animals receiving a nicotine reward during both the reinstatement and self-administration tests. These results suggest that a combination therapy with NAC and varenicline may be an important pharmacotherapeutic avenue in reducing nicotine relapse.

FUNDING: DA033690 (CDG), DA012513 (PWL), DA015369 (PWL)

JUSTIFICATION: This study has the potential to reveal novel pharmacotherapeutic strategies in preventing nicotine relapse.

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POS2-35
EFFECTS OF SELF-CONTROL DEPLETION AND NICOTINE DEPRIVATION ON BEHAVIORAL ECONOMIC INDICES AND RELAPSE/RELAPSE BEHAVIOR

Bryan W. Heckman, M.A.*, Nicole S. Marquezine, B.S., David A. MacQueen, M.A., Brittany H. Anderson, Catherine A. Lim, Marian E. Osimen, Mannette Joseph, Caylen D. Hanshaw, Maria E. Tsambarlis, Amanda L. Brennan, and Thomas H. Brandon, Ph.D., University of South Florida and H. Lee Moffitt Cancer Center & Research Institute

The need to understand the reinforcing properties of smoking and potential precipitants of relapse is exemplified by evidence that relapse rates exceed 90%. The Self-Control Strength model may offer insight, which proposes that self-control is dependent upon limited resources and susceptible to fatigue (e.g., coping with craving). Indeed, there is clear empirical support that engaging in a task that requires self-control (e.g., emotional suppression), relative to a comparable control (e.g., acting naturally), results in performance decrements on subsequent self-control tasks. The primary goal of the current study was to test whether self-control depletion (SCD) may serve as a novel antecedent for smoking lapse/relapse behavior, using a validated laboratory analogue task that requires self-control to resist smoking (McKee, 2006). We also aimed to compare SCD effects to those of a well-established relapse precipitant (i.e., nicotine deprivation), and test craving and behavioral economic indices as mechanisms for increased smoking behavior.

METHOD: We used a 2 x 2 (12-hour deprivation vs. no deprivation; SCD vs. no SCD), crossed-factorial, between-subjects design (N=128 smokers; CPD M=20; 51% Female). Post-manipulation assessments included: craving, cigarette demand, delay discounting, and smoking lapse/relapse behavior (i.e., latency and consumption). RESULTS: Replicating prior research, nicotine deprivation significantly increased craving, demand, discounting, and lapse behavior (ps < .05). Furthermore, craving was the only mediator of deprivation effects on lapse behavior (i.e., greater craving led to decreased latency). Finally, the primary hypothesis of the study was supported, as SCD increased lapse behavior (p = .04). Interestingly, this brief manipulation and the 12-hour nicotine deprivation manipulation had similar effect sizes on lapse behavior (d’s= 39 and .40). However, no main effects were found for SCD on putative mediators (i.e., craving, demand, discounting). CONCLUSIONS: SCD appears to play an important role in smoking behavior and may be a viable candidate for intervention, but the mechanisms through which it acts should be further delineated.

FUNDING: This project was supported by Grant No. F31 DA033058 awarded to Bryan W. Heckman by the National Institute on Drug Abuse.

JUSTIFICATION: Coping with various stressors/demands may limit the ability to resist smoking.

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POS2-36
PREDICTING CIGARETTE SELF-ADMINISTRATION USING NICOTINE PHARMACOLOGY AND NON-PHARMACOLOGICAL COMPONENTS OF A NICOTINE REPLACEMENT THERAPY

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Objective: The effectiveness of nicotine replacement therapies (NRTs) as smoking cessation aids is often considered to stem from nicotine’s ability to alleviate craving and withdrawal. However, non-pharmacological components, such as smoking history and beliefs about the effectiveness of NRTs, may also contribute to changes in smoking behaviour resulting from NRT use. The aim of this study was to assess the extent to which nicotine pharmacology and non-pharmacological factors were predictive of cigarette smoking behaviour following the administration of nicotine and placebo lozenges. Method: 41 NRT naïve daily non-treatment seeking smokers (20 male) were informed that they received a 4mg nicotine lozenge after overnight smoking abstinence. Half the study participants (n=20) received a nicotine-containing lozenge and the other half received a pharmacologically inert placebo lozenge. Thirty minutes after lozenge consumption, participants were allotted an hour to self-administer their preferred brand of cigarettes using a progressive ratio task, in which puffs were earned through
repeated button presses. Multiple regressions were used to predict cigarette self-administration from gender, nicotine consumption, age of first cigarette, number of cigarettes smoked/day, Fagerstrom Test for Nicotine Dependence score, years as a daily smoker, and e-prior beliefs regarding the effectiveness of NRTs. Results: Beliefs regarding the effectiveness of NRTs uniquely predicted breakpoint (number of button presses required to earn the final puff; $r^2=0.47$, $F(7,33)=4.20, p=0.002$) and number of puffs self-administered ($r^2=0.55$, $F(7,33)=5.82, p<0.001$) during the progressive ratio task, such that stronger beliefs about the effectiveness of NRTs were associated with a lower breakpoint and lower number of puffs self-administered. Conclusions: Findings suggest that varying beliefs regarding the effectiveness of NRTs can predict subsequent smoking behaviour following the administration of a lozenge purported to contain nicotine regardless of its actual nicotine content and raise the possibility that such beliefs could impact smoking cessation outcomes aided by NRTs.

FUNDING: This study was funded by a discovery grant from the Natural Sciences and Engineering Research Council of Canada.

JUSTIFICATION: This research hopes to contribute toward an improved understanding of factors impacting responses to nicotine lozenges.

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POS2-37

A PROTEOMIC APPROACH TO IDENTIFY $2\ast$ NICOTINIC ACETYLCHOLINE RECEPTOR INTERACTING PROTEINS IN HUMAN TEMPORAL CORTEX FROM INDIVIDUALS WITH MOOD DISORDERS

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Neuronal nicotinic acetylcholine receptors (nAChRs) containing $\beta2$ subunits represent the principal class of ionotropic neurotransmitter receptors in the central nervous system (CNS) with high affinity for acetylcholine (ACh). $\beta2$ nAChRs are also the primary interface for nicotine in the CNS, and are directly responsible for many of the behavioral consequences associated with both acute and chronic nicotine exposure. Cholinergic neurotransmission mediated by nAChRs is involved with a number of neuropsychological conditions, including mood disorders. Several studies have demonstrated that nAChR accessibility is limited in human subjects with major depressive disorder and that individuals in a depressive cycle of bipolar disorder present with elevated cholinergic tone in the CNS. This shift appears without any apparent change in nAChR expression or acetylcholinesterase activity, indicating that mood disorders may alter functional regulation of $\beta2$ nAChRs. Moreover, epidemiological research has established significant comorbidity of nicotine dependence and mood disorders. Since cholinergic neurobiology has been clearly implicated in both nicotine dependence and mood disorders, we examined the expression of $\beta2$ nAChRs and their co-immunopurified proteins in post-mortem samples of temporal cortex from four distinct groups: (1) nonsmokers, no mood disorder diagnosis; (2) smokers, no mood disorder diagnosis; (3) nonsmokers, mood disorder; (4) smokers, mood disorder. We identified several classes of proteins that reliably co-purified with $\beta2$ nAChRs and then stratified their expression based on quantified $\beta2$ nAChR protein abundance to establish ratios of protein interaction on a per-receptor basis. We identified dynamic regulation of measured abundances of sets of proteins whose expression was significantly affected by smoking status, mood disorder, and smoking x mood disorder, as well as proteins unique to each sample group. This study represents the first use of quantitative proteomics to map human $\beta2$ nAChR expression and interactions impacted by cholinergic dysregulation as a function of smoking and/or mood disorder phenotypes.

FUNDING: DA14241, DA018343, AA07464, NS011323, AA017889

JUSTIFICATION: We investigated the identity and dynamic regulation of high affinity nAChRs and associated proteins across a cohort of samples varied by smoking status and mood disorder diagnosis as a discovery-phase experiment to identify novel targets for future neuropharmacological evaluation.

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POS2-38

RNA DEEP SEQUENCING ANALYSIS REVEALS THAT NICOTINE RESTORES IMPAIRED GENE EXPRESSION BY VIRAL PROTEINS IN THE BRAINS OF HIV-1 TRANSGENIC RATS

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Persons infected with HIV-1 often develop neurologic disorders despite receiving high-dose anti-retroviral therapy. Although the underlying mechanism is largely undetermined, our previous RNA-seq-based study showed that the expression of many genes was altered in the central nervous system (CNS) of HIV-1 transgenic (HIV-1Tg) rats. Because nicotine, a natural agonist of nicotinic acetylcholine receptors, exhibits a neuroprotective effect, we presently tested the hypothesis that nicotine restores the expression of altered genes in the CNS of HIV-1Tg rats. Adult male HIV-1Tg and F344 control strain rats were injected with either nicotine (0.25 mg/kg) or saline subcutaneously twice a day for 17 days. Gene expression in the prefrontal cortex (PFC), dorsal hippocampus (HIP), and dorsal striatum (STR) was evaluated using the RNA deep sequencing technique. We found that about 20% of the altered genes in the HIV-1Tg rat were affected by nicotine in each brain region, with the expression of most restored. Analysis of the restored genes showed distinct pathways corrected by nicotine in different brain regions of HIV-1Tg rats. Specifically, the two most significantly restored pathways were Wntβ-catenin signaling and ephrin B signaling in the PFC, cAMP-responsive element-binding protein (CREB) signaling and glutathione metabolism pathway in the HIP, and tricarboxylic acid (TCA) cycle and calcium signaling in the STR. Together, our findings indicate that cholinergic modulators such as nicotine have beneficial effects on HIV-1-induced neurologic deficits.

FUNDING: This study was supported by NIH grant DA026356.

JUSTIFICATION: This study will inform how nicotine may impact learning and memory in HIV-1 infected patients.

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POS2-39

THE EFFECT OF ORAL NICOTINE CONSUMPTION ON THE DEVELOPMENT OF ETHANOL-INDUCED CONDITIONED PLACE PREFERENCE IN DBA/2J MICE

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Nicotine (NIC)-containing tobacco products and alcohol (ethanol, ETOH) share a high rate of co-abuse. We tested the hypothesis that continuous exposure to NIC, through the drinking water, would enhance the development of an ETOH-induced conditioned place preference (CPP). This experiment was based on a study which found that oral NIC increased the development of a cocaine-induced CPP. Our study used a standard CPP procedure, where specific environmental stimuli (floor type) were paired with ETOH (1 g/kg) or vehicle and preference for the drug-associated cues was then determined. These studies were performed in group housed DBA/2J mice, an inbred strain that develops robust EtOH-induced CPP. Starting seven days before CPP testing, mice were given continuous (24hr) access to one of two drinking conditions, water or NIC (50 ug/ml tap water). Mice had continuous access to these solutions on all days including CPP training and testing days. They consumed 0.82 mg NIC/kg/day on average. There were 6 drug and 6 saline conditioning sessions and CPP was assessed after every 4 conditioning sessions (3 preference tests). Both the water and NIC drinking groups developed significant but similar CPPs to 1 g/kg ETOH. These results did not support our hypothesis that NIC in the drinking water would enhance the development of
EIOH-induced CPP in DBA/2J mice. This result is in contrast to the published data for NIC and cocaine, which showed enhancement of COC-induced CPP in NIC drinking C57BL/6j mice (Levine et al., 2011, Sci Transl Med 3: 107-109). It is possible that the effects of NIC drinking are cocaine-specific or dependent upon genotype, or that higher levels of NIC consumption are needed to see effects on ethanol-induced CPP.

FUNDING: Support: Department of Veterans Affairs, P60AA010760, R24AA020245, and F31AA020732.

JUSTIFICATION: This study examines the combined effect of nicotine and ethanol on drug reward-related behavior with the goal of understanding why these drugs share such a high rate of co-morbid use.

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POS2-40 CONSISTENCY OF LABELED NICOTINE CONTENT IN ELECTRONIC CIGARETTES: REGULATORY CHALLENGES

Skyler Reinhardt, and Maciej L. Goniewicz, Ph.D.*, Roswell Park Cancer Institute

Significance: Electronic cigarettes (e-cigarettes) are new nicotine-delivery devices that utilize vaporization of nicotine solution in place of tobacco combustion. Currently, the Food and Drug Administration (FDA) does not regulate e-cigarettes though it is anticipated that this status will change. New regulations would require accurate labeling of nicotine content in e-cigarette refill solutions. Our goal was to measure the actual nicotine concentrations of various refill solution brands and compare the results with labeled values. Materials and Methods: Thirty-two e-cigarette refill solutions were purchased from online vendors located in the U.S. From each product, 10 μl samples were taken and diluted with methanol following the addition of quinoline as an internal standard. The solutions were then analyzed using gas chromatography with a nitrogen-phosphorous detector. We calculated the amounts of nicotine and compared with the labeled nicotine content in each product. Results: The determined nicotine concentrations ranged from 0.5 (detection limit) to 37 mg/ml. In the three samples that were labeled nicotine-free, traceable amounts of nicotine were found. Discrepancies with labeled content were between -92% and +103%. One in four products differed in nicotine concentration by more than 20% with its labeled value. Conclusions: The FDA may enforce accurate labeling of nicotine content in e-cigarettes.

FUNDING: This work was supported by Roswell Park Cancer Institute, National Cancer Institute (NCI) grant #P30 CA016056, and JP Morgan Chase (SR).

JUSTIFICATION: The findings of this study will inform regulators about the need for prevent adolescents’ access to e-cigarettes and inhibiting progression to tobacco use.

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POS2-42 DEVELOPMENT AND INITIAL VALIDATION OF MEASURES ASSESSING ATTITUDES TOWARD CONTRABAND TOBACCO

Sarah E. Adkison, M.A.1, Richard J. O’Connor, Ph.D., Michael Chaiton, Ph.D.2, and Robert Schwartz, Ph.D.1, Roswell Park Cancer Institute, University of Toronto

Background: As regulation of tobacco products tightens, the possibility for illicit markets to develop may increase. Therefore, it is important to generate knowledge about when and why people choose to purchase and use contraband tobacco (CT), that is, tobacco obtained outside regulated markets and/or purchased without appropriate taxation. At present, research on attitudes toward and correlates of CT use has been limited due to a dearth of validated measures. Methods: In May, 2013, a pilot survey was administered via Amazon Mechanical Turk among 483 respondents in the US and Canada to assess prevalence of CT use and evaluate the internal consistency and validity of proposed contraband attitude measures. Respondents were classified as having purchased CT if they directly indicated purchase of CT, reported having purchased smuggled or stolen cigarettes, obtained cigarettes from another non-retail source, or purchased cigarettes on an Indian Reservation or out of their home country. Results: Prevalence of having purchased CT was high (40.6%) and more likely among males (M:50.2%, F:30.7%; p<0.000). T-tests indicated CT purchasers were significantly more likely to report higher subjective norms supportive of counterfeit products, higher levels of behavioral intentions toward purchasing counterfeit products, lower perceived risk associated with these products, and to have more positive attitudes toward contraband cigarettes. EFA showed dimensionality was present for 5 of the proposed measures to assess CT attitudes and CFA indicated the measures provided a good fit for the data (CFI 0.979, RMSEA 0.042). Each measure had a high internal consistency (α: 0.77-0.94). Measurement invariance was established across sex, CT purchase behaviors, and performance on the social desirability scale suggesting that the same construct was measured across groups. In addition, convergent (AVE: 0.537-0.843) and discriminant validity (AVE+ASV for each construct) were present. Conclusions: The proposed measures effectively captured differences between CT buyers and non-buyers and tap into varying attitudinal elements that may be associated with an intention to purchase these products.

FUNDING: Funded by National Cancer Institute (NCI) grant #P30 CA016056
POS2-43
ARE MOVIES WITH TOBACCO, ALCOHOL, DRUGS, SEX AND VIOLENCE RATED FOR YOUTH?: A COMPARISON OF RATING SYSTEMS IN ARGENTINA, BRAZIL, MEXICO, AND THE UNITED STATES

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Background: The degree of concordance between the US and Latin American rating systems with respect to tobacco and associated youth risk behaviors such as drug use, alcohol use, sex, and violence is unknown. This study aimed to determine between-country differences and changes over time in the portrayal of youth risk behaviors in films rated for youth in Argentina, Brazil, Mexico, and the United States in order to understand how between-country differences in rating systems affects potential youth exposure to these risk behaviors in each country.

Methods: Content and ratings were analyzed for 362 films that were popular across all four countries from 2002-2009. Country-specific ratings were classified as either youth or adult, and Generalized Estimating Equations were used to determine between-country differences in the presence of tobacco, alcohol, drugs, sexual content, and violence in youth-rated films. Within-country differences in this content over time were also assessed, comparing films released from 2002-2005 with those released from 2006-2009. Results: In the US, films rated for youth were less likely to contain all five risk behaviors than in youth-rated films in Argentina, Brazil, and, when the "15 and older" rating was considered a youth rating, in Mexico. When examining films rated for adults in the US, evidence for "downrating" was found in all three Latin American countries. Nevertheless, tobacco and drug use in youth-rated films declined over time in all countries, whereas moderate to extreme alcohol use and violence involving children or youth increased in all countries. Conclusions: Tobacco and drug use have declined in popular US films, but these behaviors are still prevalent in films rated for youth across the Americas. The apparent success of advocacy efforts to reduce tobacco and other drugs in films suggests that similar efforts be directed to reduce alcohol portrayals.

FUNDING: Content analysis of films was supported by the U.S. National Cancer Institute (CA 77026) and a grant from the American Legacy Foundation.

CORRESPONDING AUTHOR: James Hardin, Ph.D.

Poster Session 2 • Thursday, February 6, 2014 • 4:15 p.m.–5:45 p.m.

POS2-44
USE OF DISTRIBUTED LABOR TECHNOLOGY TO MEASURE COMPLIANCE WITH A SMOKE-FREE SIGNAGE REGULATION

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The monitoring of compliance with smoke-free laws in large cities can be a labor-intensive and expensive process, especially challenging in low- and middle-income countries. In 2009, Bogor City passed the first comprehensive smoke-free law in Indonesia. One component of the law requires that all 3,412 of the city’s public transportation mini-buses be smoke-free and display an official smoke-free sticker on their entry door. In this study, we piloted a new technology to measure compliance with the signage requirement on the mini-buses. We took photographs of the doors of all passing mini-buses at a busy intersection for 30 minutes. We then used a distributed labor system, Amazon Mechanical Turk (AMT) to analyze the photos. AMT is an internet-based service which employs people internationally to engage in small tasks. We asked the AMT workers to code the photos for the placement of the smoke-free sticker and to indicate whether the sticker was torn, covered, or otherwise obscured. We analyzed 139 images for this study, AMT workers coded the placement and visibility of the stickers. The returned data was easily analyzable, and the cost for the project was nominal. Accuracy of the coding, as checked manually by researchers, was sufficient. In this proof-of-concept test, AMT was successfully used to analyze photos for basic characteristics.

FUNDING: No funding.

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POS2-45
CRITICAL LESSONS FROM A TOBACCO-FREE HOSPITAL GROUNDS POLICY IMPLEMENTATION – LEARNINGS FROM WATERLOO REGION (CANADA)

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BACKGROUND: In April, 2013, Grand River Hospital (GRH) in Waterloo Region (Canada) implemented a tobacco-free grounds policy at all 4 of its properties. An evaluation was conducted to examine the impact of this policy and understand what implementation processes were critical or insufficient. METHODS: A mixed-methods approach was used that included an online pre- and post-policy survey with all staff and management at GRH; the survey included qualitative open-ended survey responses to measure impact from the policy and gain insight into what implementation strategies could or should be improved. Survey comments were analyzed using the Framework Approach to identify themes based on pre-identified questions. The emerging themes were further explored using focus groups with hospital personnel including leadership and staff. RESULTS: The online survey was completed by 1075 of 3337 hospital staff (32% response rate). Responses were organized around three a priori classifications of data including challenges, benefits, and supports. Subthemes included enforcement, property specific geographic challenges, physical migration of smokers off-property, neighborhood relations, patient challenges including special mental health and palliative patient issues, and policy promotion including the rationale of the policy. Focus group findings helped identify critical implementation lessons including staff communication, campus-community outreach, and integrating tobacco use cessation processes with the smoke-free grounds. CONCLUSIONS: Awareness campaigns within the GRH staff community helped communicate the new smoke-free grounds and the rationale for the policy. Pro-active efforts to liaise with neighbors were important. It was determined after implementation that not all campuses provided a safe adjoining space off-property for patients, visitors, and staff to smoke requiring alterations in the policy. Although the accompanying smoking cessation program that was introduced simultaneously

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with the smoke-free grounds was important to support the policy, general uptake was minimal with patient populations suggesting additional staff training may have been beneficial.

FUNDING: This study was funded in part by the Propel Centre for Population Health Impact through a major grant from CCSRI (Canadian Cancer Society Research Institute - Grant #701019) and the Grand River Hospital.

JUSTIFICATION: This study will provide insights into how smoke-free outdoor space policies are developed, and may provide beneficial information for those trying to implement similar policies in their own hospitals or communities.

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POS2-46
A QUALITATIVE INQUIRY INTO THE EFFECT OF RELIGIOUS LEADERS’ STATEMENTS ABOUT SMOKING ON PUBLIC ACCEPTANCE OF SMOKE-FREE LAWS

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Regulations to reduce exposure to secondhand smoke are now being attempted in low- and middle-income countries where pro-smoking secular norms may be strong. In Indonesia, where 67% of men and 5% of women smoke, the secular norm is quite accepting of smoking. However, a number of prominent Muslim leaders and organizations have recently spoken against tobacco use. In a country of 247 million people where 87% of the population is Muslim, these leaders may have a large influence on compliance with smoke-free laws and other tobacco control measures. Indonesia’s first comprehensive smoke-free law was passed in the city of Bogor in 2009. In the same year the top Muslim clerical body in Indonesia ruled smoking in public to be forbidden according to Islamic law. Then, in 2010 one of the major Muslim social organizations declared all smoking forbidden. We sought to qualitatively learn how these religious rulings affected the public’s opinion about Bogor’s smoke-free law. We conducted 11 focus group discussions with 89 Bogor city residents, 15 interviews with restaurant and mall managers, and 35 interviews with government, religious, and NGO leaders. We found that public awareness about the smoke-free law was low and that smoking was generally seen as a somewhat discouraged, but not forbidden, behavior for Muslims. The religious leaders’ opinions do appear to be influential to the public, and may be having some effect in discouraging tobacco use and increasing acceptance of smoke-free laws. Many participants said that the Muslim leaders themselves often smoke, setting a poor example. Participants also said that it is important to support the policy, general uptake may be minimal with patient populations suggesting additional staff training may have been beneficial.

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

JUSTIFICATION: Joint efforts with religious leaders to promote smoke-free laws and other tobacco control measures may be an effective approach for public health professionals and policymakers.

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POS2-47
RECENT FINDINGS FROM THE INTERNATIONAL TOBACCO CONTROL POLICY EVALUATION PROJECT (ITC PROJECT)

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The International Tobacco Control Policy Evaluation Project (the ITC Project) is a research collaboration of over 100 researchers across 22 countries and 6 continents, 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 22 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 from India, where existing tobacco control policies such as the comprehensive smoke-free law, implemented in 2008, are low in effectiveness, compared to other ITC countries, 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 Wave 1 ITC Surveys in Zambia and Kenya have been completed and initial findings indicate the challenges ahead for efforts to limit the growth of the tobacco epidemic in these two Sub-Saharan African countries. Looking ahead, the ITC Project has been tracking the emergence of new tobacco/nicotine delivery products such as e-cigarettes across multiple countries, and the ITC Project continues to conduct analyses of the contents of cigarettes across the ITC countries including analyses of heavy metals. The implications of these findings for policy across the world will be discussed.

FUNDING: US National Cancer Institute, Canadian Institutes of Health Research, National Health and Medical Research Council of Australia, Cancer Research UK, Ontario Institute for Cancer Research, Canadian Cancer Society Research Institute

JUSTIFICATION: The ITC Project is the only international research effort to evaluate the impact of the WHO Framework Convention on Tobacco Control (FCTC), the world’s first health treaty, and its findings have been used to promote evidence-based tobacco control efforts by governments and Civil Society throughout the world.

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POS2-48
SECONDHAND SMOKE EXPOSURE, INDOOR SMOKING BAN AND SMOKING RELATED KNOWLEDGE IN CHINA

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BACKGROUND: Smoke-free policies and better knowledge about smoking have been linked to reduced risk of indoor secondhand smoke (SHS) exposure. In China, limited studies have reported the smoking bans at home, and the population knowledge level about smoking. Although some cities have implemented smoke-free policies in public places, the policies are ambiguous, excluding workplaces and not supported with adequate public education and enforcement. Thus, to evaluate the tobacco-free environment and knowledge level of Chinese people is needed. OBJECTIVES: The objectives of this study were to examine (1) the level of knowledge of the harmful effects of smoking and secondhand smoke (SHS) exposure among smokers and non-smokers, (2) the prevalence of in-home and workplace smoking bans, and (3) the prevalence of exposure to SHS in public places (e.g., restaurants, schools, etc.). METHODS: We used data from the 2010 Global Adult Tobacco Survey-China, which included 13,354 subjects. Chi-square tests were used to analyze the differences in smoking and SHS-related knowledge, presence of a smoking ban at home and at work,
and exposure to smoking in public places by demographic and geographic factors. The survey weights and design features of strata and clustering were accounted. RESULTS: Over half of the population had little knowledge of the harmful effects of smoking (56.8%) and SHS exposure (51.5%). Younger, well-educated, non-smoking individuals appeared to be more aware of the harmful effects of smoking and SHS exposure (p<.001). About 78.6% of the households had no smoking restrictions. Households in urban areas and with a higher socioeconomic status were more likely to implement in-home smoking bans (p<.001). In public places, exposure to SHS was high, particularly in rural areas and in the Southwest (p<.001). CONCLUSION: These results suggest that Chinese individuals are not well informed of smoking and SHS associated risks and are regularly exposed to SHS at various places.

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Pos2-49
A DISCRETE CHOICE EXPERIMENT TO ASSESS PREFERENCES FOR A SMOKING CESSATION PROGRAM IN A LEBANESE UNIVERSITY

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Background: Cigarette and waterpipe smoking rates in Lebanon are 31% among women and 46% among men. Few smoking cessation programs are offered in Lebanon and little is known about the preferences of Lebanese smokers for smoking cessation treatment. Objective: To establish which attributes of smoking cessation programs are most important to Lebanese smokers. Methods: Smokers at the American University of Beirut campus were surveyed (N=191) to elicit their preferences for, and tradeoffs between the attributes of a hypothetical smoking cessation program. These included medication type/mechanism, risk of benign side effects, availability of support, distance traveled to obtain medication, and price of complete treatment. The discrete choice experiment design was chosen for this exercise. Results: The smokers' responses to changes in attributes were statistically significant. Smokers were willing to pay LBP 103 000 (USD 69) for cessation support and willing to give up LBP 105 000 (USD 70) to avoid an additional 10% risk of minor side effects and LBP 18 000 (USD 12) to avoid an addition km of travel to the nearest pharmacy. Heavy smokers were the least responsive group and had the lowest demand elasticities. Conclusion: Smokers were willing to participate in a relatively complex exercise that weights the advantages and disadvantages of a hypothetical smoking cessation program. Overall, they were less favorable to the pill form of smoking cessation treatment, but they were willing to make tradeoffs to be smoke-free.

FUNDING: This work was supported by the Cancer Care Quality Training Program from the National Cancer Institute at the National Institutes of Health [grant number R25 CA116339].

JUSTIFICATION: Results from this study help inform public health professionals and policy makers about preferences for smoking cessation programs.

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Pos2-50
MODELING THE HEALTH BENEFITS OF A NICOTINE STANDARD FOR TOBACCO PRODUCTS SOLD IN CANADA


Many experts agree that reducing the nicotine content of cigarettes to non-addictive levels could have a significant beneficial impact on public health. Among the acknowledged gaps in research on this topic is the need for simulation or forecasting models to estimate the population-level effects of reduced nicotine content cigarettes. This paper presents the results of an initial attempt to model, i.e., quantify and value, the potential health benefits of a standard that would restrict the nicotine content of cigarettes sold in Canada to levels insufficient to establish or sustain addiction. The analysis draws on recent clinical studies of very low nicotine cigarettes and interviews with experts in the field to characterize the potential impact of the standard on annual rates of smoking initiation and cessation in Canada. It then employs a dynamic simulation model to estimate the impact of the resulting reduction in smoking prevalence on fatal and non-fatal health effects over a specified period (e.g., 30 years). The analysis tests the sensitivity of the results to different assumptions concerning the impact of the standard on smoking initiation and cessation, including variation in impact by gender. It also considers the impact of a number of potential second-order effects, such as increased use of smokeless tobacco or emergence of a black market in non-compliant products, on the estimated benefits of the standard. The paper concludes by noting additional refinements that would augment the model's ability to illustrate the potential effects of a nicotine standard on the Canadian population as a whole, as well as on specific subgroups.

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Pos2-51

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Cigarette brand line extensions were first introduced as a marketing strategy in the 1950s when manufacturers began offering longer, filtered cigarettes. As tobacco marketing became more restricted, manufacturers increasingly relied on modifying existing brands to target specific consumer groups to maintain and expand sales. Recent studies have suggested that about 1 in 5 smokers report switching brands per year. However, those studies report only switching between brands; none have examined the switches within brand families. This study determines the prevalence of brand switching both between and within brand families and assesses factors associated with switching. Data for this analysis are from the International Tobacco Control 2006-2011 US adult smoker cohort survey waves 5-6 (N=3248). Changes in brand families and characteristics within brand families were coded between successive wave pairs with sufficient information. A switch between brands was defined as reporting two different brand families for two successive waves. Switching within brands was defined as reporting a change in the brand style (e.g., strength, flavor, etc.) of the same brand for successive waves. Generalized estimating equations were used to determine factors associated with both switch types. A total of 1,475 participants reported at least two successive waves of data on brand family and style. Switches between brands increased from 16% in 2006-7 to 30% in 2010-11, while switches within brands was fairly constant, ranging from 28% to 31%. For within-brand switching, 21-26% of changes were in cigarette length, and 16-19% were in the cigarette strength. Between-brand switching was associated with younger age, lower income, and use of a discount brand. Within-brand switching was associated with younger age and lower nicotine addiction. Brand switching is more frequent than previously reported. Close to half of smokers in the US switch their cigarette brand or style

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within a year. Switching between brands seems to be motivated primarily by price marketing, whereas switching within brands may be more directly related to the appeal of brand features, such as the perception of lower tar.

FUNDING: This research was supported in part by National Cancer Institute Grants R01CA100362, P50CA111236 and P01CA136389 and funding from the Canadian Institutes of Health Research (57897, 79551) Justification: The availability of new brand styles with greater appeal may decrease the effectiveness of tobacco control policies aimed at promoting cessation and decreasing the uptake of smoking.

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POS2-52 CARBON MONOXIDE EXPOSED! THE EFFECTS OF HOOKAH BAR SMOKING

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Background: Hookah smoking is a social form of tobacco smoking that continues as a public health threat. The constituents of hookah smoke derived from waterpipe use include a higher content of nicotine, tar, carbon monoxide (CO), volatile organic compounds, and polycyclic aromatic hydrocarbons (PAH) compared to traditional cigarette smoking. CO is extracted during the incomplete combustion of charcoal. The CO binds to hemoglobin with an affinity 243 times greater than oxygen. The oxygen carrying capacity of the blood is substantially reduced by the binding of CO to hemoglobin and prevents the transportation of oxygen throughout the body, leading to tissue hypoxia. Methods: Exhaled CO measurements were conducted among fifty-two hookah bar participants (N=52) outside of hookah bars using an exhaled CO monitoring device. Measurements were conducted twice on each participant before and after their hookah bar participation. The measurements were recorded in CO (ppm) and translated to carboxyhemoglobin (COHb), representative of the CO in the alveolar air and COHb in the arterial blood. Results: A paired samples t-test was conducted to assess the mean difference in CO change from before to after exiting the hookah bar. Statistically significant increases in exhaled CO were found in this sample (p < .001). Mean CO levels increased from 10.4 ppm (SD = 9.2) pre hookah bar to 60.7 ppm (SD = 29.8) post hookah bar, with a mean CO boost of 484%. Mean COHb levels also increased from 2.3% (SD = 1.5%) to 10.3% (SD = 4.7%), with a mean COHb boost of 348%. Conclusion: Post-hookah bar measurements of CO and COHb levels of smokers elevated to concerning levels after smoking in hookah bars. Serious adverse health effects may be experienced by the smokers due to the CO exposure inside the hookah bars. The findings of this study demonstrate the need for policy changes to close the loopholes in hookah bar exemptions. Increased media attention is warranted to raise awareness of the deleterious effects of hookah smoking.

FUNDING: University of South Florida Area Health Education Center and American Lung Association

JUSTIFICATION: This study represents the importance of policy initiatives to close the loopholes in hookah bar exemptions.

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POS2-53 DO YOUNG PEOPLE’S BELIEFS ABOUT MENTHOL CIGARETTES PREDICT INTENTIONS TO USE TOBACCO?

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Background: Little is known about young people’s beliefs about menthol cigarettes, despite particularly high menthol use among this group. Methods: In an online survey of 1,142 13-17 year old non-smokers and 1,050 18-25 year old never smokers (weighted), we measured awareness (“have you ever heard of menthol cigarettes?”) and 9 beliefs about menthol cigarettes/smokers. For each belief question (e.g., “How easy to smoke are menthol cigarettes compared to non-menthol cigarettes”), respondents selected 1 of 5 statements comparing menthol and non-menthol cigarettes/smokers. Two of the 5 statements represented pro-menthol beliefs, and these responses were combined. We also measured intentions to use tobacco and to smoke menthol cigarettes over the next year. Logistic regression analyses examined whether endorsing pro-menthol beliefs was associated with a greater likelihood of having at least some intention to use tobacco and to smoke menthol cigarettes/smokers separately among 13-17 and 18-25 year olds. Results: Approximately half of the sample (13-17: 49%; 18-25: 57%) had heard of menthol cigarettes. Among these respondents, endorsement of pro-menthol beliefs ranged from 7% (menthol smokers are more attractive than non-menthol smokers) to 33% (menthol cigarettes are more refreshing in sensation than non-menthol cigarettes). Less than a third of respondents had any intention to use tobacco (13-17: 32%; 18-25: 24%), and even fewer had any intention to smoke menthol cigarettes (13-17: 6%; 18-25: 4%). However, endorsing pro-menthol beliefs was positively and significantly associated with intentions to use tobacco for 6 of 9 beliefs for both 13-17 and 18-25 year olds, and with intentions to smoke menthol cigarettes for 3 of 9 beliefs for 13-17 and 7 of 9 beliefs for 18-25 year olds. Conclusions: Pro-menthol beliefs are associated with greater intentions to use tobacco, indicating that efforts to reduce favorable beliefs about menthols—whether through communication interventions, marketing regulations, or the removal of menthol cigarettes from sale—may lead to reductions in youth smoking initiation.

FUNDING: The authors wish to acknowledge the funding support of the National Cancer Institute through the Center of Excellence in Cancer Communication (CECC) P20-CA095856 as well as the funding support from the Food and Drug Administration (FDA) P20CA095856-0951.

JUSTIFICATION: Communication or policy interventions that reduce favorable beliefs about menthol cigarettes may reduce the risk of smoking initiation among 13-17 and 18-25 year old non-smokers.

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POS2-54 TRAINING PROVIDERS TO PROMOTE CESSATION AND DELIVER TOBACCO DEPENDENCE TREATMENT: AN INTERNATIONAL SURVEY OF TRAINING PROGRAMS

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BACKGROUND: Article 14 of the Framework Convention on Tobacco Control (FCTC) stipulates that countries should deliver “adequate treatment for tobacco dependence.” Trained providers in clinical and community settings are needed to reach this goal. We measured the content, methods, and perceived challenges faced by tobacco treatment training programs around the world.

METHODS: We identified tobacco control experts in 118 countries (including 115 [65%] of 177 parties to the FCTC) from their participation in prior surveys about tobacco treatment. In May, 2013, we invited them to complete an online or paper survey about training programs. RESULTS: 63 countries (53%) responded and data did not differ by WHO region (p=0.23) or income (low/LIC, middle/MIC).
PUBLIC OPINION ABOUT FDA REGULATION OF MENTHOL AND NICOTINE

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The Family Smoking Prevention and Tobacco Control Act granted the Food and Drug Administration (FDA) the authority to regulate tobacco products, including the authority to set standards for the content of cigarettes. One of the first actions taken, was to ban characterizing flavors in cigarettes, other than menthol. In July of 2013, the FDA set the stage for regulating menthol by issuing an advance notice of proposed rulemaking and soliciting input. There has also been discussion of reducing nicotine in cigarettes to a level that would not support addiction. Understanding how the public would respond to either action is an important step in the rulemaking process. As part of a larger population survey about new tobacco products, we conducted a mail survey of a representative sample of 1074 adults in two major metropolitan areas. Respondents indicated which FDA actions on cigarette content they would support as a way to reduce smoking in the population: immediate, gradual, or no elimination of menthol; and immediate, gradual, or no reduction in nicotine. Among both smokers and nonsmokers, there was more support for reducing the nicotine content of cigarettes (79%) than for reducing or removing menthol (59.5%). The majority of smokers (59.2%, 95% CI 50.7-67.2) and more than a third of nonsmokers (36.1%; 95% CI 31.7-40.8) opposed eliminating menthol, but fewer than a quarter of smokers (23.8%) and nonsmokers (20.3%) were opposed to reducing nicotine to “a very low level.” Those smokers supportive of removing menthol were significantly more likely to prefer gradual reduction over a period of years to immediate removal (p<0.001). No such preference was expressed with regard to nicotine. The greater smoker support for reductions in nicotine than menthol could be due to inaccurate beliefs about the disease risk associated with the two substances (i.e., a belief that nicotine is more harmful than menthol), or to greater awareness of the sensory role that menthol plays in smokers’ satisfaction. In any case, if FDA goes ahead with regulations to remove menthol, it will be important to develop strategies to reduce smoker resistance.

FUNDING: This study was supported by a grant from the National Cancer Institute.

JUSTIFICATION: Strategies for reducing smoker resistance to removing menthol in cigarettes will be an important component of any future menthol regulation.

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POS2-56

DECREASE EFFICACY OR REACTANCE MODERATE THE RELATIONSHIP BETWEEN SMOKELESS TOBACCO USE AND SMOKELESS TOBACCO INHIBITION?

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BACKGROUND: Pictorial health warning labels (HWL) stimulate quit attempts, but their effects are unexamined among smokers with low self-efficacy to quit or with high levels of reactance (i.e., message rejection because it is perceived as threatening behavioral freedoms). METHODS: The sample for this study comprised adult smokers with at least one wave of follow-up in the first three waves (n=2374 observations) of survey of adult smokers, age 18 – 64, from online panels of consumers from Australia and Canada. HWL responses included two outcomes that predict smoking cessation attempts (i.e., HWLs stopping smokers having a cigarette; a 3-item scale on thinking about smoking risks, thinking about cessation benefits, and thinking about quitting because of HWLs, alpha=.901). Logistic and linear GEE models were estimated to assess whether self-efficacy and reactance were associated with HWL responses. Logistic GEE models regressed attempting to quit and the follow-up period on reactance, HWL responses and interactions between them, while controlling for socio-demographics and smoking-related variables (e.g., quit intentions, smoking intensity). RESULTS: Smokers with relatively higher self-efficacy were more likely than those with lower self-efficacy to report strong HWL responses. In adjusted models predicting quit attempts during followup, dose-response relationships were found for relatively higher self-efficacy (AORHigh vs. low=1.98, 95%CI: 1.25 – 3.16), relatively stronger HWL responses (OR1st vs. 4th quartile=2.16, 95%CI: 1.58 – 2.96; AORlow vs high=2.3, 95%CI: 1.67 – 3.16). Reactance was uncorrelated with HWL responses and did not predict quit attempts. In models predicting quit attempts, no statistically significant interactions were found between HWL responses and either self-efficacy or reactance. CONCLUSIONS: Self-efficacy, but not reactance, appears to be associated with cessation-related responses to pictorial HWLs. However, neither of these factors moderate the relationship between HWL responses and subsequent quit attempts. Future research should investigate the feasibility and benefits of enhancing self-efficacy through HWLs.

FUNDING: Data collection and analyses for this project were supported by a grant from the U.S. National Cancer Institute (R01 CA167067).

JUSTIFICATION: Self-efficacy and reactance are two important factors that matter as to how smokers react to the HWL.

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POS2-57

SMOKE-FREE AFFORDABLE HOUSING IN CANADA: PROMOTING HEALTH AND HEALTH EQUITY

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While smoke-free housing is increasing in Canada, knowledge is limited on how different policy approaches impact perspectives, experiences, and behaviours of tenants and housing staff. We present research on two Canadian affordable housing...
case studies with different smoke-free policy approaches. In case study 1, only new leasehold units were designated non-smoking (including balconies/patios); in case study 2, new and current leasehold units were designated non-smoking (not including balconies/patios). During 2012-13, we conducted semi-structured in-person interviews with 58 smoking and non-smoking tenants and 11 individuals waiting for housing, and held focus groups with 24 housing and public health staff involved in policy development and implementation. Transcripts were analyzed using a framework approach, including a priori research questions and emergent themes. We identified four themes most relevant to smoke-free policy development and implementation. (1) Policy Framing: in both case studies, tenants and staff indicated disconnections between the framing of the policy and perceptions of the policy by tenants. (2) Compliance: tenant noncompliance was associated with accommodating visitors who smoke, poor weather, mobility, health issues and stress. (3) Complaints: tenants were reluctant to lodge formal complaints due to concerns about social implications, labeling, process requirements, and poor outcomes. (4) Smoking Behaviour: some new lease tenants were motivated to quit in preparation for obtaining a non-smoking lease; others attributed their smoking reduction to decreased social smoking opportunities and inconveniences of going outside to smoke. Overall, exempting existing leases was perceived as a barrier to compliance and enforcement. Both smoking and non-smoking tenants preferred that the policy be fully enforced by housing and not rely on the formal complaints process. A clear understanding and communication of policy provisions and staff responsibilities for enforcement are important for effective policy implementation. Our findings will inform the development of smoke-free housing policies at the local, municipal and provincial levels. Funding: This research was supported by the Canadian Institutes of Health Research (CIHR). JUSTIFICATION: The findings from this study will inform evidence-based recommendations for Canadian affordable housing providers and policy makers at the local, municipal and provincial levels to guide the development and adoption of no-smoking housing policies. CORRESPONDING AUTHOR: Pamela Kaufman, PhD, Professor, University of Toronto, 155 College Street, Toronto, ON M5T3M7, Canada, Phone: 416-978-6137, Email: p.kaufman@utoronto.ca

POS2-58 EFFECTS OF SMOKEFREE POLICIES ON SMOKING BEHAVIORS IN SEXUAL AND GENDER MINORITIES
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Background: Many studies have reported that local, comprehensive smoke-free workplace policies (including bars and restaurants) decrease smoking prevalence in the general population. The literature also finds that sexual and gender minority (SGM) individuals have a higher smoking prevalence and are less supportive of smoke-free policies compared to the general population. The purpose of this study is to explore the relationship between living in a community with a smoke-free ordinance, cigarette consumption, overall smoking prevalence, and personal rules about smoking among SGM individuals living in Missouri. Methods: Data were from the 24-item Out, Proud and Healthy anonymous survey collected from four pride festivals in Missouri during the summer of 2010 (N=2,340 SGM participants). Differences were examined between participants living in a ZIP code with a comprehensive smoke-free policy and those without policies. Chi-square tests were calculated for characteristics between the two groups and a Wilcoxon Two-Sample test was calculated for the number of cigarettes smoked per day. Results: SGM individuals living in communities with comprehensive smoke-free policies (N=316) had a higher prevalence of never smokers (p<0.001), a lower prevalence of current smokers (p=0.001), a higher proportion of support for comprehensive smoke-free policies (p<0.001), a higher proportion of respondents indicating they did not allow smoking in vehicles in which they traveled or in their homes (p<0.01), and smoked fewer cigarettes per day (p=0.05) compared to SGM individuals living in communities without ordinances (N=2,024). There was no difference between the two groups in the proportion of current smokers who were trying to quit. Additional trend analysis using data collected from 2008-2012 will evaluate these same characteristics in relation to when the ordinances were enacted. Conclusions: Our findings demonstrate that, similar to the general population, comprehensive smoke-free policies decrease smoking among SGM individuals. Passing local smoke-free policies is an effective approach to reducing smoking in at-risk and minority populations. FUNDING: Missouri Foundation for Health JUSTIFICATION: Passing local smoke-free policies is an effective approach to reducing smoking in at-risk and minority populations. CORRESPONDING AUTHOR: Jenna Jordan, MPH, Graduate Research Assistant, University of Missouri, Family & Community Medicine, MA306 Medical Sciences Bldg., Columbia, MO 65212, United States, Phone: 573-884-0089, Email: jnjxv6@mail.missouri.edu

POS2-59 EXAMINING FDA TOBACCO RETAILER COMPLIANCE CHECKS USING A NOVEL WEB-BASED TOOL
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The purpose of this study is to describe the emerging trends in the Food and Drug Administration’s (FDA) retailer compliance check inspection program and present a new publicly available web-based tool that facilitates examination of temporal and spatial patterns in the implementation of FDA’s tobacco regulations at the retailer-level. After downloading compliance check inspections (N=189,594) conducted from October, 2010 through July, 2013 from the FDA website, we extracted additional data (i.e., dates, statutes violated and amount of proposed fine) from all warning letters and civil money penalty notifications utilizing a customized text analysis script and crowdsourcing technology based on Amazon’s Mechanical Turk system. We batch geocoded the addresses for all FDA compliance check inspections using ArcGIS Online geocoding services. The resulting data were used to develop a publicly available web-based tool that allows users to visually explore the implementation of FDA compliance and enforcement in the tobacco point-of-sale environment. Since 2010, 42 states (including DC) and 3 U.S. territories have received state contracts for over $1 million to conduct retailer compliance checks. FDA compliance inspections have resulted in 10,094 warning letters issued to retailers for first-time violations and 761 civil money penalty notifications for repeated or subsequent violations. In the 10,049 available warning letters, 96% of violations cited were related to prohibition of sales to minors. Of specific relevance to the 2009 Family Smoking Prevention and Tobacco Control Act, there were 35 warning letters citing violation of the ban on flavored cigarettes and 83 letters citing violation related to modified risk tobacco products, including the ban on “light,” “low,” and “mild” pack descriptors. The Legacy web-based tool serves to enhance accessibility of FDA’s compliance and enforcement data for tobacco control stakeholders and shows that nationwide enforcement is unfolding dynamically over time and place as compliance patterns interact with local policy environments and evolving landscape of product marketing and availability. FUNDING: Funding for this study was provided by the American Legacy Foundation. JUSTIFICATION: This web-based resource provides a novel set of tools for the dissemination of information about the FDA’s retailer compliance program. CORRESPONDING AUTHOR: Andrew Anesetti-Rothermel, MPH, Pre-doctoral Research Fellow, American Legacy Foundation, Schroeder Institute, 1724 Massachusetts Avenue, NW, Washington, DC 20036, United States, Phone: 202-454-5594, Email: arothermel@legacyforhealth.org
Poster Session 2 • Thursday, February 6, 2014 • 4:15 p.m.–5:45 p.m.

POS2-60
TOBACCO INDUSTRY INFLUENCE ON FOOD FLAVOR RESEARCH: CAN WE TRUST THE SCIENCE?

Elena O. Lingas, Dr.P.H., M.P.H.1,2, and Lisa A. Bero, Ph.D.2, 1Touro University California, 2University of California, San Francisco

The tobacco and food industries have previously shared the same corporate owners and have a common interest in flavorings; we wanted to learn about the nature of the relationship between tobacco and food companies when it comes to the science and regulation of flavor ingredients. We conducted a qualitative data analysis of publicly available sources including the Legacy Tobacco Documents Library (LTDL) at the University of California San Francisco. Documents in the LTDL were retrieved through snowball sampling and triangulated with data from other sources including federal government sites (e.g., FDA) and industry sites (e.g., Flavor and Extract Manufacturers Association). Tobacco companies implied ingredient safety by invoking the common use of flavorings in both food and tobacco products, and stating these ingredients were GRAS or “generally recognized as safe” for their intended use in food. An ingredient designated GRAS can be added to food products without pre-market approval and private organizations can designate a substance as GRAS. The Flavor and Extract Manufacturers Association (FEMA) is a private organization that makes GRAS assessments for new flavor ingredients. FEMA members include flavor and extract manufacturers, food and beverage companies (e.g., The Coca-Cola Company and The Proctor and Gamble Company), and tobacco companies (e.g., Philip Morris and RJ Reynolds). The FEMA Expert Panel evaluates the safety of flavors and includes as recently as 2010, four of the eight members of the FEMA Expert Panel had independent ties to tobacco companies. Philip Morris USA is an active funder of research on flavors and food additives. While tobacco industry activities are often viewed as unique, we found that other companies conducting flavor research and making GRAS designations have much in common with the tobacco industry. Recent research found that GRAS determinations are impacted by conflicts of interest and the self-regulatory GRAS determination process as they consider increased regulation of food and tobacco products, particularly as industry self-regulation has been viewed as a means to forestall government regulation.

FUNDING: This study was conducted while the first author was at the University of California, San Francisco. Supported by NIH grant R25CA113710-04 and by the NIDA San Francisco Treatment Research Center (P50 DA009253).

JUSTIFICATION: This research has direct relevance for public health policy and regulation as it further documents the ties between the tobacco and food industries, the tobacco industry’s involvement in funding flavor research, and the two industries’ mutual interest in the self-regulatory GRAS determination process.

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POS2-61
SURVEILLANCE OF TOBACCO INVESTMENT USING GOOGLE TRENDS

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Efforts to track tobacco investment in real time are an important endeavor that could assist key stakeholders with making informed decisions about prevention and policies. Google Trends data is an innovative surveillance system with unique potential to monitor and predict important public occurrences. We sought to determine whether Google Trends can additionally detect regional trends in youth and adult tobacco investment. Cigars, cigarillos, and little cigars (CCLC) and smokeless tobacco are two non-cigarette tobacco products that are widely consumed, second to cigarettes in terms of tobacco use prevalence. Therefore, we compared 2011 Google Trends search volume data for CCLC’s and smokeless tobacco with state prevalence of youth (grades 9-12) and adults (age 18 and older ) use of these products using data from the 2011 state Youth Risk Behaviors Surveillance System and the 2010-2011 National Survey on Drug Use and Health (NSDUH), respectively. The Pearson correlation coefficient was used to measure the association between state Google Trends search volume for the non-cigarette tobacco products with prevalence of their use. There were significant positive correlations found between state Google Trends cigar search volume and prevalence of CCLC use among youth (r=0.39, p<.018) and adults (r=0.49, p<.001). Similarly, the correlations found between state Google Trends smokeless tobacco search volume and prevalence of smokeless tobacco use among youth and adults were both positive and significant (r=0.46, p<.003 and r=0.48, p<.001, respectively). The results of this study provide evidence that Google Trends data has the potential to be a valuable surveillance tool for tobacco use. The real-time surveillance features of Google Trends in conjunction with traditional survey methods could allow researchers and public health officials to stay abreast of emerging trends in tobacco use.

FUNDING: Supported by NIH grant #: UL1 RR024992 and KL2 RR024994. Other NIH support includes: K01DA025733 and R01 DA032843 (PCR), K02 DA021237 (LB), R01 DA031288 (RG)

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POS2-62
STATE-LEVEL TOBACCO CESSATION PROGRAMS FOR INDIVIDUALS IN SUBSTANCE ABUSE TREATMENT FACILITIES

David Krauth, M.P.H. and Dorie Apollonio, Ph.D., M.P.P., University of California San Francisco

At least three American states currently require that substance abuse treatment centers provide tobacco cessation treatment as a condition of licensure. Linking tobacco cessation treatment to licensure was a policy pioneered by the state of New Jersey, a policy later spread to New York and Virginia. The policy was developed in response to research demonstrating that individuals in substance abuse treatment were more likely to die of tobacco addiction than from their primary addiction, yet tobacco addiction was rarely treated. Research from the original New Jersey program suggests that requiring tobacco cessation treatment for individuals in substance abuse treatment can reduce tobacco addiction and associated deaths. In this paper, we review the diffusion of state policies mandating the provision of tobacco cessation treatment as a condition of state licensure in substance abuse treatment facilities, and describe the current landscape of policies relating to tobacco cessation in state-licensed substance abuse treatment facilities. Our data are drawn from interviews with state substance abuse treatment agencies, and a content analysis of statewide licensing regulations. We find despite the well-publicized success of the New Jersey policy, that diffusion of similar policies has been slow and is geographically concentrated around New Jersey.

FUNDING: This research was supported by National Cancer Institute grant #K07CA140236.

JUSTIFICATION: Our findings suggest the strengths and limitations of statewide policies for addressing tobacco addiction in substance abuse treatment facilities, and provide insights into the ways that public health policy diffuses through organizations and systems.

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POS2-63
EXPOSURE TO POINTS OF SALE ADVERTISEMENT AND CIGARETTE USE: CROSS SECTIONAL STUDY WITH GLOBAL YOUTH TOBACCO SURVEY (GYTS) AMONG SOUTH KOREA ADOLESCENTS

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Introduction: Adolescent period is important because most smokers start smoking in adolescent period and it usually continues into adulthood. To prevent smoking in adolescents, it is important to restrict the exposure to tobacco advertisements. However, there is no restriction on points of sale (POS) advertisement of tobacco
in South Korea. We aimed to determine the association between exposure to POS advertisements and cigarette use in adolescents with Global Youth Tobacco Survey (GYTS) South Korea data. Methods: This study is a cross-sectional study using GYTS South Korea conducted in 2008. GYTS is a school-based survey among students aged 13-15 years developed by the World Health Organization and the US Centers for Disease Control and Prevention. The exposures to POS advertisement were identified using a single question: “During the past 30 days (one month), how many advertisements for cigarettes have you seen on billboards or points of sale?” Because billboard advertisement of tobacco is banned in South Korea, this question can be considered to be related to POS advertisement. For adolescents with smoking experience, we documented the associations between the days of cigarette smoking, trial of quit smoking (past year), and exposure to POS advertisements. Also, we identified the association between exposure to POS and idea of becoming smokers among adolescents without smoking experience. Results Of 5922 students, 13.7% answered that their exposure to POS were high. Adolescents with high exposure to POS tended to be male, experienced cigarette smoking, had smoking parents, and friends. Moreover, adolescents with high exposure to POS underestimated the harmfulness of smoking. In multiple logistic regression analysis, adolescents with high exposure to POS (vs. low and no exposure) had more days of smoking (OR 1.66, 95% CI 1.16-2.38), fewer trials of quit smoking (OR 1.95, 95% CI 1.21-3.15), and more thinking of becoming smoker in the future (OR 2.20, 95% CI 1.41-3.42). Conclusion: Exposure to POS was associated with smoking susceptibility in adolescents regardless of smoking experience. It is important to regulate POS advertisements more strictly.

FUNDING: No Funding

JUSTIFICATION: To ban points of sale advertisements

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POS2-64 TRENDS IN US YOUTH TOBACCO USE, ACCESS AND MEDIA EXPOSURE FROM 2004 TO 2011

Thalia Farietta, M.S.*, Bo Lu, Ph.D., and Amy Ferketch, Ph.D., The Ohio State University College of Public Health

INTRODUCTION: The 2009 Family Smoking Prevention and Tobacco Control Act aims to prevent and reduce youth tobacco use by imposing FDA regulations on its manufacture, distribution, and marketing. It established standards and restrictions on tobacco advertising, labels, ingredients, and new products. Specifically, the Youth Access and Advertising Regulation limits the sale and distribution of cigarettes and smokeless tobacco. It has been suggested that there be investigation of the impact of the Tobacco Control Act on tobacco use, access, and exposure. METHODS: The data were collected as part of the National Youth Tobacco Survey (NYTS) which surveys students in grades 6-12 across the United States. Trends in tobacco use, exposure and access were compared using a two-tailed chi-square test for years 2009 and 2011. RESULTS: There were notable trends in reported tobacco use, access and media exposure. There was a significant association between current kretke and use and year (5.4% in 2009 vs. 4.5% in 2011) showing decreased use. There was a significant association between year and cigarette sale refusal (29.8% in 2009 vs. 18.8% in 2011); fewer youth were refused sale in 2011. Ads exposure increased; there was a significant association between year and internet and print ads (36.8% and 46.8% in 2009 vs. 40.6% and 51.7% in 2011). There was a significant association between often seeing screen actors use tobacco and year (77.6% in 2009 vs. 73.5% in 2011) indicating decreased use. DISCUSSION: NYTS data show that although cigarette use decreased, youth still use tobacco. Kretke use decreased over time, particularly between 2009 and 2011; these findings support the goals of the Tobacco Control Act. Despite stricter regulations on advertising and access of tobacco products, increases in both areas highlight potential policy gaps and limitations of using the NYTS to measure trends over time.

FUNDING: No Funding

POS2-65 ENDING THE TOBACCO EPIDEMIC: REDUCING TOBACCO USE IN BEHAVIORAL HEALTH POPULATIONS

Yvonne M. Hunt, Ph.D., M.P.H.*, and Doug Tipperman, M.S.W.†, ‡National Cancer Institute, National Institutes of Health; †Center for Substance Abuse Prevention, Substance Abuse and Mental Health Services Administration

Persons with mental health and substance use disorders account for almost half of the 438,000 annual tobacco-related deaths in the US, and consume 40% of all cigarettes sold in the US, reflecting both very high prevalence rates plus heavy smoking by users. Despite declining smoking prevalence in the general U.S. population, smoking rates among smokers with behavioral health disorders have shown little change over time. Targeted efforts are urgently needed to increase quit attempts and cessation rates within the mental health and substance abuse communities. In November, 2010, the US Department of Health and Human Services (HHS) unveiled its first ever comprehensive plan for national tobacco control, Ending the Tobacco Epidemic: A Tobacco Control Strategic Action Plan for the U.S. Department of Health and Human Services. In this report, HHS outlined a broad department-wide strategy aimed at promoting the effectiveness of smoking cessation interventions in populations carrying a disproportionate burden of tobacco use and dependence, including persons with mental illnesses and substance abuse disorders. This presentation will review recent efforts by HHS to reduce tobacco use among behavioral health populations, as part of its ongoing commitment to ending the tobacco epidemic. First, we will review the results of national surveillance activities undertaken by HHS to describe the relationship between smoking, mental illness, and substance abuse, using data from the National Survey on Drug Use and Health (NSDUH). Next, we will describe a successful partnership between the Substance Abuse and Mental Health Services Administration and the Smoking Cessation Leadership Center at the University of California, San Francisco, to establish State Leadership Academies for Wellness and Smoking Cessation. The Academies are intended to support statewide partnerships among behavioral health providers, consumers, and other stakeholders to more effectively reach and treat smokers with behavioral health conditions. Finally, we will provide up-to-date information on federal funding mechanisms for researchers who are working in this area.

FUNDING: No funding

JUSTIFICATION: Policymakers, health care providers, and tobacco control researchers can use the information presented to contribute to a coordinated, national effort to improve tobacco surveillance, research, and treatment in this vulnerable population.

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POS2-69 MAPPING THE SMOKING STATUS OF TRIBAL CASINOS ACROSS THE UNITED STATES

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American Indian tribes are recognized as sovereign nations and therefore not required to implement state smoke-free laws in enclosed public spaces. This issue is of particular significance for tribal casinos which continue to offer indoor smoking to patrons. Despite the well-documented dangers of second-hand smoke in the workplace to both patrons and employees, and the disproportionate burden of tobacco-related disease in Native American and Alaskan Native populations, efforts to ban indoor smoking in tribal casinos have been met with resistance. There has been no known effort to date to track or analyze tribal casino smoking
POS2-70
DEFINITIONS OF ELECTRONIC CIGARETTES, ALTERNATIVE NICOTINE PRODUCTS, VAPOR PRODUCTS, AND TOBACCO PRODUCTS IN STATE YOUTH ACCESS LAWS: ANOTHER TROJAN HORSE?
Rachel Grana, Ph.D., M.P.H.*, Lauren Lempert, J.D., M.P.H., Stan Glantz, Ph.D., and Pamela Ling, M.D., M.P.H., University of California, San Francisco

Aims: To study definitions of electronic cigarettes, alternative nicotine products, and vapor products in state laws and explore the implications of these definitions. Methods: Conducted searches in StateNet for state-level bills that address electronic cigarettes, using the terms "electronic cigarette," "e-cigarette" and "vapor product." Each bill was analyzed to determine the main purpose of the bill, the bill’s status, and the exact wording of the definitions used in early versions and enacted versions of the bill. Results: The data show that 25 bills were enacted since 2009 that established a definition for electronic cigarettes. Seventeen laws defined electronic cigarettes using the term "electronic cigarette," 2 used the term "electronic smoking devices," 2 defined them as "tobacco-derived," 3 called them "vapor products," and 5 used the term "alternative nicotine products." Three laws included electronic cigarettes in the definition of "tobacco products," and 3 created an exemption for e-cigarettes from an existing or new "tobacco product" definition. Eight laws included definitions of "electronic cigarette" or "alternative nicotine product," that excluded products that are regulated as tobacco products, drugs, or devices, and 17 definitions of e-cigarette required nicotine to be in the device. Three bills included using electronic cigarettes in definitions of "smoking." Discussion: Many of the bills nominally aimed at establishing a minimum age for purchase of e-cigarettes included definitions of electronic cigarettes, tobacco products, and created new categories of nicotine containing products including e-cigarettes. Some of these definitions explicitly exclude e-cigarettes from the definition of a "tobacco product," which could be used to exclude electronic cigarettes from tobacco control laws (existing or proposed). This activity mirrors previous efforts to thwart effective tobacco control policies, such as including pre-emption of local policies in state legislation introduced ostensibly to limit youth access to tobacco. Vigilant review and careful drafting of laws governing e-cigarettes is needed.

FUNDING: National Cancer Institute

JUSTIFICATION: E-cigarette use has increased dramatically, and this presentation will discuss whether policies that are implemented to control their public use could have unintended consequences

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POS2-73
PREVALENCE AND REASONS FOR E-CIGARETTE USE: RESULTS FROM THE 2011 TOBACCO USE SUPPLEMENT (TUS) TO THE CURRENT POPULATION SURVEY (CPS)
Anne M. Hartman, M.S., M.A.*1, Jennifer Pearson, M.P.H., Ph.D.2,3, Shu-Hong Zhu, Ph.D.4, Michael Pesko, Ph.D.5, Cindy M. Chang, Ph.D., M.P.H. 6, Bridget Ambrose, Ph.D., M.P.H.6, and James T. Gibson, B.S.7, 1Division of Cancer Control and Population Sciences, National Cancer Institute, Bethesda, MD, 2The Schroeder Institute for Tobacco Research and Policy Studies, Legacy, Washington, DC, 3Department of Health, Behavior and Society, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, 4Center for Research and Intervention in Tobacco Control, University of California, San Diego, 5Weill Cornell Medical College, Cornell University, New York, 6Office of Science, Center for Tobacco Products, U.S. Food and Drug Administration, Rockville, MD, 7Information Management Services, Inc., Calverton, MD

Accumulating evidence has indicated that the prevalence of e-cigarette (e-cig) use is increasing. Yet, little is known about its public health impact and reasons for use. We present data on adult e-cig prevalence and reasons for use based on the May, 2011 National Cancer Institute sponsored TUS to the Census Bureau’s and Bureau of Labor Statistics’ CPS. The TUS-CPS is a national household probability sample drawn from the U.S. civilian non-institutionalized adult population. The sample included 6,451 current tobacco product (cigarettes, cigars, regular/hookah pipes, smokeless tobacco) users and recent former users (who quit smoking cigarettes ≤ 3 years ago or using cigars/smokeless tobacco ≤ 1 year ago), of whom 4,441 were current cigarette smokers. All were asked if they had ever tried e-cigs, and those responding “yes” were asked separately if they had ever used e-cigs to help them (a) quit smoking or other tobacco use and (b) when they weren’t allowed to smoke cigarettes, cigars or pipes. About 10% of current and recent former tobacco users had ever tried an e-cig, with a range of 6.6% in the Northeast to 14.7% in the West. About 9.9% of males and 10.7% of females had ever tried an e-cig. Younger adults (18-34 year olds), those with more than a H.S. education, and non-Hispanic whites tended to have higher estimates of ever trying an e-cig than older, less educated, and non-Hispanic blacks and Hispanics, respectively. Among those who had tried an e-cig, 37.1% reported ever using e-cigs to help quit smoking, and 28.6% reported use when not allowed to smoke. A considerable number of current or recent former tobacco users have ever tried new e-cigs. In considering the net population health impact of e-cig use, 37% of respondents reported using e-cigs to help them quit smoking, while about 30% reported using when unable to smoke, possibly contributing to delayed cessation. Future research is needed to understand e-cig use impact on tobacco use initiation, dual use, and cessation, and to evaluate health risks. Such research will help to inform national tobacco control and regulatory efforts.

FUNDING: No specific funding was received for this analysis. The U.S. National Cancer Institute funded the May 2011 Tobacco Use Supplement (TUS) to the U.S. Census Bureau’s and Bureau of Labor Statistics’ Current Population Survey (CPS).

JUSTIFICATION: Our results on the prevalence and reasons for use of e-cigarettes has implications for tobacco control, public health, policy-making, and regulations.

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POS2-74
QUITTING SMOKING AND PROXIMITY TO A TOBACCO RETAIL OUTLET: A LONGITUDINAL POPULATION BASED COHORT STUDY
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Objectives: Interest has been increasing in regulating the location and number of tobacco vendors as part of a comprehensive tobacco control program. However, no studies have examined how proximity to a tobacco retail outlet is associated with quitting smoking in a longitudinal cohort. Methods: The study used the Ontario Tobacco Survey which followed smokers selected using random digit dialing every 6 months for 3 years. The sample was limited to urban, daily smokers at baseline...
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POS2-75
RATES WITHOUT REASON: UNEXPLAINED VARIABILITY IN STATE FDA COMPLIANCE INSPECTIONS IN RETAIL STORES

Joseph G.L. Lee, M.P.H., C.P.H.*, Leah M. Ranney, Ph.D., and Adam O. Goldstein, M.D., M.P.H., UNC School of Medicine

The Family Smoking Prevention and Tobacco Control Act (Tobacco Control Act) grants the Food and Drug Administration (FDA) regulatory authority over the manufacture, marketing, and distribution of tobacco products. Regulatory authority is intended to protect the public health, reduce tobacco use by minors, and curb the tobacco use epidemic. FDA regulates the advertising and labeling and underage purchase of tobacco products in retail locations that sell tobacco. We examined 57,966 publically available inspection results from 41 states conducted between January 1 and July 31, 2013. These states are contracted to inspect approximately 20% of tobacco retailers annually for the FDA. Violation rates range from 0% (HI, ID, NM) to less than one percent (SC, ME) to over 13% (CT, MI, MO, WI). Low rates contrast with existing underage purchase surveys, and neighboring states often show major differences in rates. We suggest potential reasons for these unexplained differences, including potential differences in state implementation of FDA protocols. We suggest the need for (1) pressure on states to utilize FDA inspections to childproof the retail environment, (2) standardization of protocols or inspection strategies, and (3) implications for retailer licensing policies.

FUNDING: No Funding

JUSTIFICATION: This is relevant to state implementation of FDA tobacco retail compliance inspections.

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POS2-76
AVOIDANCE OF CIGARETTE PACK HEALTH WARNINGS AMONG REGULAR SMOKERS

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Aims: Previous research with adults and adolescents indicates that plain cigarette packs increase visual attention to health warnings among non-smokers and non-regular smokers, but not among regular smokers. This may be because regular smokers (1) are familiar with the health warnings, (2) preferentially attend to branding, or (3) actively avoid health warnings. We sought to distinguish between these three explanations using eye-tracking technology. Methods: In a repeated measures experimental design, with eye gaze location (health warning or branding), pack type (branded, plain or blank), and health warning familiarity (familiar or unfamiliar) as within-subjects factors, 30 tobacco dependant adult smokers (smoking at least five cigarettes a day and smoking within one hour of waking), viewed images of cigarette packs for 10 seconds each. Using eye-tracking technology, the number of fixations to health warnings and branding on branded, plain, and blank cigarette packs was measured. Results: Analysis of variance indicated that regular smokers were biased towards fixating the branding location rather than the health warning location on all three pack types (p < 0.002). This bias was smaller, but still evident, for blank packs, where smokers preferentially attended to the blank region over the health warnings. Time-course analysis showed that, for branded and plain packs, attention was preferentially directed to the branding location for the entire 10 seconds of the stimulus presentation, while for blank packs this occurred for the last 8 seconds of the stimulus presentation. Familiarity with health warnings had no effect on eye gaze location. Conclusion: Smokers actively avoid cigarette pack health warnings, and this remains the case even in the absence of salient branding information. Smokers may have learned to divert their attention away from cigarette pack health warnings.

FUNDING: 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.

JUSTIFICATION: This research highlights a need for health warnings on cigarette packs to be made more effective for smokers.

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POS2-78
USE OF TOBACCO CESSION INTERVENTIONS BY MEDICAID-ENROLLED ADULTS, WITH AND WITHOUT OPIOID DEPENDENCE

Deborah Scharf, Ph.D.*, Mark Sorbero, M.S., and Bradley Stein, M.D., M.P.H., Ph.D., RAND Corporation

Tobacco use is a tremendous problem for Medicaid programs throughout the U.S. Increasing Medicaid enrollee use of tobacco cessation interventions (TCIs) can improve enrollee health and reduce tobacco-related healthcare costs. State Medicaid policies regarding TCI coverage vary widely and may affect TCI use, but little is known about between-state differences in TCI use and whether such between-state policy differences similarly affect high-risk populations such as persons with opioid dependence. To address these questions, we examined Medicaid TCI medication claims from the year 2009, across 14 states, for persons with and without a diagnosis of opioid dependence. TCI medication (NRT-O TC) claims were categorized as (1) Nicotine replacement therapy - over the counter (NRT-OTC), (2) Nicotine replacement therapy - prescription (NRT-Rx), (3) bupropion, and (4) varenicline. Overall, results showed substantial between-state variation in TCI prescriptions per enrollee (median = 0.10, range 0.02 – 0.19). States also differed in the types of TCIs prescribed, with most prescriptions for NRT-OTC (median = 59% of within-state prescriptions; range <1% - 83%), varenicline (38%; 10% - 94%), bupropion (3%; <1% - 24%), and lastly NRT-Rx (1%; 0% - 5%). Among persons with opioid dependence, rates and types of TCI use also varied between states. Further analyses showed relationships between TCI-related Medicaid policies and between-state variations in TCI use. State Medicaid programs may be able to improve enrollee use of TCIs by making modest changes to their current TCI-related policies.

FUNDING: NIDA grant R01DA032881 to B. Stein.

JUSTIFICATION: Policymakers may be able to use this information to make Medicaid enrollee use of tobacco cessation medications.

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POS2-79
PROXIMITY TO A TOBACCO RETAIL OUTLET AND SMOKING BEHAVIOUR AMONG CLIENTS OF A NICOTINE DEPENDENCE CLINIC

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Background and Aims: Availability of tobacco may be associated with increased smoking. Little is known about how proximity to a retail outlet is associated with smoking behaviours among smokers seeking treatment. Methods: Chart data were extracted for 734 new clients of the CAMH nicotine dependence clinic from between April, 2008 and June, 2010. Using a tobacco retail licensing list, clients were coded as to whether the closest retail outlet was located more than 250m or 500m from their postal code address. Logistic analysis was used to assess the association between proximity and quit status, number of previous quit attempts, number of cigarettes per day, and time to first cigarette, controlling for demographic characteristics. Results: 93% of patients lived within 500 metres of a retail outlet. Those who lived within 500m of a retail outlet were less likely to have 5 or more lifetime quit attempts (OR=0.67; 95% CI: 0.27-0.80; p=0.036) and were less likely to be abstinent at the initial assessment (OR=0.28; 95%CI: 0.10 - 0.77; p=0.014), both before and after adjustment for covariates. There was no significant association between living within 500m of an outlet and number of cigarettes smoked per day. Conclusions: Proximity to a tobacco retail outlet was associated with smoking behaviours among a heavily addicted, treatment seeking population. Environmental factors may have a substantial impact on the ability of smokers to quit smoking.

FUNDING: Funding was received from the Ontario Ministry of Health and Long Term Care and the Canadian Institutes for Health Research

JUSTIFICATION: This study contributes to the body of knowledge with respect to regulating tobacco retail availability.

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POS2-80
THREE ERAS OF GLOBAL TOBACCO CONTROL: USING DYNAMIC VISUALIZATION TO STUDY HOW SOCIO-POLITICAL PROCESSES INFLUENCE GLOBAL NETWORKING

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Global tobacco control has benefitted from a strong online network, Globalink (GL). GL’s member referral system provides a rich source of data for network analysis. Membership required a multi-step process where two existing members were required to vouch for new applicants. Previous research examined the relationship between membership and adoption of FCTC, suggesting that investment in social network interaction increases rate of policy adoption and diffusion of global policy efforts. Aims: To analyze the impact of sociopolitical events occurring in global tobacco control on the structure of the GL network. We examined FCTC process in relation to global networking centrality and if the introduction of Bloomberg Initiative changed the network. Methods: We developed a Java script to retrieve a list of all GL members over 20 years, and mined the data to find referral information and self-reported country data. We explored membership patterns to see if global tobacco control-related events influenced the network structure. Furthermore, longitudinal dynamic visualization techniques were used to examine changes in the structure related to three key time periods (1992-99), (2000-05), and (2005-12). Results: We found strong correlation between global tobacco control processes and changes in the structure of GL. Prior to 2000 and FCTC negotiations, membership was driven largely by founders and a small number of advocates promoting the expansion of GL in high-income countries (clustering coefficient [CC] equaled 0.215, average degree [AVGD] was 1.908, and density [D] was 0.030). Between 2000 and 2006, GL is defined by increasing clusters of countries from all income levels, largely related to regional ties (CC=0.253, AVGD=2.824, and D=0.021). Since 2006, GL has increased centrality of the US (CC=0.310, AVGD=3.414, D=0.023). The results are most evident with dynamic visualization videos produced from the longitudinal GL data. Conclusion: The FCTC process resulted in greater diversity and regional clusters while the Bloomberg Initiative resulted in dramatic rise in centrality of US-based members. The shifts signify diffusion of global tobacco control policies and norms.

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JUSTIFICATION: The implication for this case study include lessons on how to better utilize online social networks, capitalizing on strengths of the approach, and identifying what limitations might exist in using this medium for future advocacy work.

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POS2-81
ECONOMIC ASPECTS OF TOBACCO USE IN LOW AND MIDDLE INCOME COUNTRIES

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The symposium draws on papers from the upcoming NTR Special Supplement on economic aspects of tobacco use in low and middle income countries (LMICs). We examine questions of tobacco tax and price policy effects in these countries. Although there is long-standing literature on the economics of tobacco use in the United States and other high-income countries, such evidence on LMICs has historically been difficult to obtain. The present symposium studies present new opportunities for filling the gaps in economic research on LMICs and aiding the transition from research to policy to action. In the first paper, Chaloupka et al. examine the role of tax structure on a major determinant of cigarette consumption—the price variability across cigarette brands—and identify the type of tax structure that is most likely to achieve the goals of tobacco control in LMICs. Kostova et al. use a cross-section of 13 LMICs to evaluate the magnitude of the negative relationship between prices and adult cigarette demand and the corresponding price elasticity, also providing evidence on the role of socioeconomic status on smoking in LMICs. Nikaj and Chaloupka provide up-to-date estimates of the price elasticity of demand for cigarettes among youth in a large set of 38 LMICs. Ross et al. examine smoking cessation rates and their response to tax policy in Poland, Russia, and Ukraine. These studies add new evidence to the growing literature on economic aspects of tobacco control in LMICs, helping to fill critical research gaps.

JUSTIFICATION: This topic provides applied economic evidence on questions pertaining to fiscal tobacco control policy in developing countries.

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POS2-82
CIGARETTE EXCISE TAX STRUCTURE AND CIGARETTE PRICES - EVIDENCE FROM THE GLOBAL ADULT TOBACCO SURVEY AND THE U.S. NATIONAL ADULT TOBACCO SURVEY

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Introduction: The importance of tobacco tax structure in determining the relative prices of different tobacco products and brands has become increasingly recognized. The structure of tobacco tax across products and brands within a country can impact the variability of prices within a country, shaping consumption and influencing tobacco users’ incentives to switch down to cheaper alternatives in response to tax and price increases. Methods: Brand-specific data on the average prices paid for the top five cigarette brands in 13 countries were obtained...
from the Global Adult Tobacco Survey (GATS) and, for the US, from the National Adults Tobacco Survey. The variability of cigarette prices paid across brands was analyzed in the context of each country's tobacco tax structure. Results: Countries with simpler cigarette tax structures, particularly those that emphasize specific taxes and do not involve tier-based taxes, exhibit less variability in the prices smokers pay for cigarettes across brands. Conclusions: Increases in cigarette taxes in countries with simpler tax structures will be more effective in reducing cigarette smoking and its health and economic consequences than will comparable tax increases in countries where tax structures are more complicated and there are greater opportunities for switching to cheaper brands in order to avoid a tax increase.

FUNDING: Funding for the Global Adult Tobacco Survey (GATS) is provided by the Bloomberg Initiative to Reduce Tobacco Use, a program of Bloomberg Philanthropies. Governments of Brazil and India contributed to GATS implementation in their respective countries. The Bill and Melinda Gates Foundation provided additional funding for GATS implementation in China and for analysis.

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**POS2-83**

**THE EFFECT OF PRICES ON CIGARETTE USE AMONG YOUTHS IN THE GLOBAL YOUTH TOBACCO SURVEY**

Silda Nika¹ and Frank J. Chaloupka², ¹Department of Economics, Texas Christian University, ²Department of Economics, Health Policy Center, Institute for Health Research and Policy, University of Illinois at Chicago

Introduction: We estimate the impact of cigarette prices on youth smoking in 38 countries of the Global Youth Tobacco Survey. Methods: We use a 2-part model of cigarette demand. In the first part, we estimate the impact of prices on the decision to smoke. Conditional on smoking, we then estimate the effect of price on the number of cigarettes smoked. We employ 2-way fixed effects to address country-level time-invariant heterogeneity and control for an array of local-level variables to address local-level heterogeneity. Results: The estimated total price elasticity is ~1.5 for a sample that contains both high-income and low- and middle-income countries. Constraining the sample to only low- and middle-income countries, we find a total price elasticity of ~2.2, suggesting that smoking among youths in low-income countries is more responsive to cigarette price changes. Conclusion: Cigarette price increases are highly effective in reducing smoking prevalence and consumption among youths globally, and particularly among youths in low- and middle-income countries.

FUNDING: No Funding

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**POS2-84**

**INNOVATIVE MOBILE PHONE BASED SMOKING CESSATION FOR VETERANS**

Jean C. Beckham, Ph.D.¹, Dana E. Christofferson, Ph.D.², Kim Hamlott Berry, Ph.D.², Vickie L. Carpenter, M.S.², Jeffrey S. Hertzig, B.A.¹, and Erik Augustson, Ph.D., M.P.H.², ¹Duke University Medical Center & Durham Veterans Affairs Medical Center, ²VHA Clinical Public Health, Tobacco & Health: Policy and Programs; ³Durham Veterans Affairs Medical Center, ⁴National Cancer Institute, National Institutes of Health.

Due to the rapid adoption of mobile phones in the US, it is important to examine the efficacy of various intervention methods available via mobile phone. This presentation will describe two interventions utilizing smartphone technology to treat tobacco use among Veterans: (1) a mobile contingency management intervention for smokers with PTSD, and homeless smokers; (2) SmokefreeVet, a text-message based smoking cessation texting intervention. Contingency Management (CM) refers to the use of vouchers or currency as reinforcement for smoking abstinence. CM has shown consistent short-term efficacy in hard-to-treat populations. However, one barrier to using CM for smoking cessation is the need to verify abstinence multiple times a day via hospital visits. A mobile contingency management approach that uses a smartphone application and a CO monitor to assess abstinence makes the intervention more widely accessible. Pilot data evaluating this approach for veterans with posttraumatic stress disorder (PTSD) showed three month quit rates of 50% (compared to 18%). Preliminary data from a second pilot study using mobile CM for homeless veteran smokers reveal 44% of participants have 7-day bio-verified abstinence following a 4-week treatment period. The overall compliance rate during treatment was 87%, with a 76% abstinence rate for all CO readings taken. SmokefreeVET is a text-messaging based cessation intervention created by NCI and VHA Clinical Public Health that delivers tips and support specifically tailored towards veterans. Messages are timed around participants’ quit date, to help them prepare and to prevent smoking relapse. Participants are surveyed several times throughout their weeks in the study to inquire about smoking, mood and cravings. Of 125 veterans who have used SmokefreeVET for at least four weeks after quit date, 15% have reported abstinence. The program has been widely adopted with users in forty-seven states and one territory. The primary age group is 45-64. Taken together, these initiatives suggest that individuals with psychiatric disorders, homeless veterans, and veterans can benefit from innovative technological approaches to reduce smoking.

FUNDING: National Cancer Institute, 2K01 CA081959, National Institute of Drug Abuse, 2K2DA016366, and the Department of Veterans Affairs.

JUSTIFICATION: The evidence presented in this paper has the potential to inform new tobacco treatment approaches for behavioral health populations, as well as increase the reach and impact of existing treatments through the use of mobile technology.

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**POS2-85**

**CHANGES IN NON-SMOKERS' SELF-REPORTED TOBACCO SMOKE EXPOSURE AFTER A SMOKING BAN IN PUBLIC HOUSING: A NATURAL EXPERIMENT**

Douglas E. Levy, Ph.D.¹,²,³, Andre B. Araujo, Ph.D.³,⁴, Gay Adamkiewicz, Ph.D.⁴, Jonathan P. Winicoff, M.D., M.P.H.⁴,⁵, and Nancy A. Rigotti, M.D.⁶,⁷,⁸,⁹, ¹Morgan Institute for Health Policy, Massachusetts General Hospital, Harvard Medical School, ²Tobacco Research and Treatment Center, Massachusetts General Hospital, ³New England Research Institutes, ⁴Department of Environmental Health, Harvard School of Public Health, ⁵MassGeneral Hospital for Children, Harvard Medical School, ⁶Department of Medicine, Massachusetts General Hospital

BACKGROUND: Non-smoking residents of multiunit public housing are at high risk of involuntary tobacco smoke exposure (TSE). To reduce this, the Boston Housing Authority (BHA) banned smoking in residents’ apartments in October, 2012. We hypothesized that this would reduce residents’ TSE, improve their housing satisfaction, and improve resident health compared to residents in a control site without an in-unit smoking ban (Cambridge Housing Authority, CHA).

METHODS: The FreshAir study is a natural experiment comparing changes in TSE among non-smoking residents of the BHA smoking ban site (n=100) vs. the CHA (control, n=36). In surveys, residents were asked about smelling tobacco smoke in their apartment (subjective proxy for TSE), complaining to management about smoking where it was not allowed, their housing satisfaction, and their housing satisfaction, and self-reported health. Data were collected from both groups 4m before BHA policy implementation and at 12m follow-up. Changes from baseline to follow-up were compared for the two groups (difference-in-differences, DiD), adjusting for resident demographics (age, sex, language, US birth, race/ethnicity, work/volunteer outside the home, and tenure in public housing). RESULTS: Regression-adjusted declines from baseline to follow-up in 8% of the past 7 residents report smelling smoke in their apartments were smaller in the BHA than CHA (1.6 to 1.1 vs 1.3 to 0.4, p=0.009). However, complaints to management about smoking where it was not allowed during the 6m prior to interview decreased from 44% to 20% in the BHA and increased from 10% to 13% in the CHA (DiD ~27%, p=0.03). Housing satisfaction was high (68% BHA, 83% CHA) and stable in both groups over the study period. There were no detectable changes in self-reported fair/poor health status or prevalence of wheeze symptoms for subjects at either site over the study period. CONCLUSIONS: In the year following adoption of a smoke-free policy in BHA public housing, we detected no policy-related decline in self-reported...
POS2-86
THE INFLUENCE OF FINANCIAL INCENTIVE ON SMOKING CESSATION TREATMENT AND OUTCOMES

Chih-Kuan Lai and Shi-Tzu Tsai, Department of Family Medicine, Taipei Veterans General Hospital, Taiwan.

Introduction: Smoking cessation treatment (TACTS) has increased monetary incentive to subsidize attempted smokers 80% of pharmacotherapy cost since March 2012. A retrospective cohort study was designed to understand the influence of new financing policy on endpoint abstinence. A total of 9,805 smokers seeking treatment in TACTS were recruited for analysis, including 6,719 of intervention group (new policy, Mar-Dec, 2012) and 5,086 of control group (before new policy Mar-Dec 2011). A hierarchical generalized linear mixed analysis was used to account for geographic and occupational variations. The 30-day abstinence at 6 months, obtained by telephone interview, increased from 23.2% to 26.9% after implementing new financing policy. The unadjusted odds ratio was 1.20 (95% CI=1.10-1.31, p<0.0001). After adjustment of covariates including age, gender, education, marital status, degree of nicotine addiction (FTND score <=5, 6-7 and 8-10) and smokers in household, the odds ratio was 1.21 (95% CI=1.11-1.32; p<0.0001). Age >50 years, gender female, education with college or above were significant factors for better cessation outcome. More household smokers and cigarettes per day impacted negatively on endpoint abstinence. An interaction between the financing incentive policy and subject’s degree of nicotine addiction was identified. For subjects with mild to moderate (FTND<5) and high (FTND 6-7) addiction on nicotine, the new financing policy provide a positive effect on 30-day abstinence at 6 months. The odds ratios were 1.19 (95% CI=1.03-1.38, p=0.021) and 1.38 (95% CI=1.19-1.61, p=0.0001) respectively. For those with very high addiction (FTND 8-10), the effect of financing intervention on 30-day abstinence was not significant, OR 1.07 (95% CI=0.92-1.24, p=0.3673). Decreased financial barrier to access pharmacotherapy is an effective strategy to promote cessation outcome for treatment seekers with “mild to moderate” or “high” addiction on nicotine. The effect is even more prominent for those with high addiction. However, financial incentive cannot improve abstinence outcome among smokers of “very high” addiction.

FUNDING: Health Promotion Administration, Ministry of Health and Welfare, Taiwan.

JUSTIFICATION: Health Promotion Administration, Ministry of Health and Welfare, Taiwan.

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JUSTIFICATION: This natural experiment was designed to assess the impact on residents’ health and other outcomes of a ban on smoking inside apartments in Boston public housing.

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POS2-87
ARE STATE-WIDE RESTAURANT AND BAR SMOKING BANS ASSOCIATED WITH REDUCED CIGARETTE SMOKING AMONG THOSE WITH MENTAL ILLNESS?

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Background: Smoke-free air laws have effectively reduced cigarette consumption at the population level; however, the influence of these policies on smoking among those with mental illness is unclear. We examined whether associations between state-wide restaurant/bar smoking bans and cigarette smoking varied by psychiatric diagnoses and gender. Methods: We analyzed data from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC, Wave 1: 2001-2002, Wave 2: 2004-2005; n = 7,317 smokers). All analyses were stratified by gender. We examined whether tobacco cessation was associated with the interaction between ban implementation and Wave 1 psychiatric diagnoses (alcohol use disorder (AUD), anxiety disorder (AD), or mood disorder (MD)), adjusting for relevant covariates. Among those who continued to use tobacco at Wave 2, we examined associations between Wave 2 cigarettes per day (CPD) and the diagnoses X ban interactions, controlling for Wave 1 CPD and other relevant covariates. Results: Among men with an AUD and women with an AD, ban implementation was associated with 6% and 10% greater probability of tobacco cessation at Wave 2, respectively. Among men in the overall sample, ban implementation was associated with smoking 0.8 fewer CPD at Wave 2. Associations with CPD were non-significant among women. Interactions between ban implementation and psychiatric diagnoses were also non-significant when examining CPD. Conclusions: This study provided the first evidence that state-wide restaurant/bar smoking bans may be associated with reduced smoking, among those with select psychiatric disorders.

FUNDING: This research was funded by NIDA (P50-DA033945-02, PI: Sherry McKee) and NIMH (T32-MH014235-39, PI: Heping Zhang).

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POS2-88
THE USE OF TRADITIONAL AND TECHNOLOGY BASED RECRUITMENT OF ADOLESCENTS FOR A SMOKING STUDY

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Introduction: Recruiting adolescents into research studies on substance use presents a number of challenges. Because of the popularity of social media among adolescents, advertising on sites such as Facebook has become an increasing popular recruitment method. We sought to compare the use of traditional and technology based recruitment strategies to enroll adolescents into a longitudinal substance use study, and examined the cost of recruitment methods. Methods: The target population was adolescents aged 13-17 years old, living in the San Francisco bay area. Participants were recruited through traditional and technology based methods, including advertising on social media (i.e., Facebook), a website, flyers, classroom talks, bus advertisements, and referrals. Results: 1,265 potential participants contacted study personnel regarding enrolling in the study; 629 were determined to be ineligible for participation based on study inclusion/exclusion criteria. Two hundred participants enrolled. Facebook advertising generated the highest number of people contacting the study (N=557), but had among the lowest proportion of people enrolling in the study (8%). School talks had the highest number of people screened for eligibility (N=28), but had one of the highest proportions of people enrolling in the study (36%). Referrals were the most cost-effective recruitment strategy ($7 per enrolled participant), while Facebook cost $150 per enrolled participant. Conclusion: Technology based recruitment such as Facebook can offer an innovative way to expand the reach and provide more focused targeting of potential participants. This method generated more responses than any other recruitment method. However, such a strategy may come at a cost since it was more expensive and was less effective at generating actual enrollees compared with the success rates of traditional recruitment methods. Referrals.
were the most cost effective as well as the most successful recruitment method, indicating that overall, traditional methods still appear to be the more successful way to recruit adolescents.

FUNDING: This study was conducted while the authors were at the University of California San Francisco. Supported by R01CA140216.

JUSTIFICATION: Although social media marketing allows for a larger and more targeted recruiting strategy, it may be less successful than traditional means.

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POS2-89
RANKING SHS/THS TOXICANTS BY HARM IN THE RESIDENTIAL ENVIRONMENT: RESEARCH TRANSLATION OF CHAMBER MEASUREMENTS

Jennifer M. Logue*, Mohamad Sleiman, Hugo Destaillats, and Lara Gundel, Lawrence Berkeley National Lab

One way to predict the health impacts of exposure of non-smokers to SHS and THS is to translate research findings into disability-adjusted life years (DALYs) population-wide. This metric has been developed by the World Health Organization to assess the global burden of disease. We present a proof of concept of a methodology to estimate the harm due to exposure to SHS/THS and rank toxicants by their impact. This presentation shows how DALYs can be derived for SHS/THS starting with laboratory data on composition of tobacco smoke and its residues, along with what is known about human behavior (time activity patterns) to predict exposure to SHS and THS. Exposure scenarios, intake estimates, and existing toxicity data become the inputs for computing the DALYs for each toxicant. Using this approach, we predicted that a nonsmoker living with a smoker for fifty years could lose up to several life years due to inhaling constituents of SHS/THS, depending on how much each occupant stays at home. This preliminary application of the DALYs approach also suggests that the most harmful known constituents of inhaled SHS/THS would be fine particles, acrolein, furan, acrylonitrile, and 1,3-butadiene. The presentation will also show how the fraction of the total damage attributed to THS depends on when and how THS is differentiated from SHS. This method allows ranking toxicants by harm, supporting the development of policy to mitigate exposures to SHS and THS toxicants and their precursors.

FUNDING: TRDRP

JUSTIFICATION: This work presents a method for translating small scale chamber measurements to in home exposures and resulting harm allowing for policy development to restrict emissions of toxicants that cause the most harm to health.

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POS2-90
E-CIGARETTE INITIATION AND DISCONTINUATION: A QUALITATIVE STUDY

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The use of novel tobacco products such as e-cigarettes is rapidly increasing in popularity among youth. Understanding reasons for initiation and discontinuation may be crucial in conceptualizing e-cigarette prevention messages to youth who are at risk for developing lifelong tobacco use behaviors. We conducted 16 focus groups in two high school and two colleges, separated by smoking status and gender to assess reasons for e-cigarette initiation. In one middle school, we conducted 2 focus groups separated by gender but not by smoking status because of low tobacco use rates. The transcripts of the focus groups were examined by independent raters using thematic analysis. All groups, regardless of gender, age, and smoking status, reported curiosity as a reason for experimenting with e-cigarettes. Social influences from friends and family members were a common factor related to initiation among college and high school students.

Other reasons for initiation included easy access, desire to quit smoking, and availability of flavors. College and high school students (mostly males) stated that advertisements on TV, Internet, and even mail inserts may promote initiation among their peers and younger adolescents. Other reasons for others' e-cigarette initiation included: ability to use e-cigarette indoors at parties and when alcohol is involved, similarity to cigarettes, experimenting before trying a real cigarette, flavors, and being younger. Middle school boys stated that e-cigarettes were novel and trying them was a sign of independence. Reasons for discontinuation included not being as satisfying or same as real cigarettes. College non-smokers stated “not liking it” once the novelty wore off. This qualitative study indicated several reasons for e-cigarette initiation and discontinuation with some common themes among groups but also with different themes by age group and gender.

FUNDING: P50DA009241

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POS2-91
A QUALITATIVE STUDY ON MARKETING E-CIGARETTES TO ADOLESCENTS AND YOUNG ADULTS

Dana Cavallo*, Grace Kong, Deepa Camenga, Amanda Palmer, Meghan Morean, and Suchitra Krishnan-Sarin, Yale University

The use of e-cigarettes is increasing among adolescent and young adult smokers and non-smokers. The aim of this study was to identify sources of information about e-cigarettes and aspects of advertising that affect product perception. We conducted a study using 18 focus groups with middle school, high school, and college students stratified by gender and smoking status for all groups except the middle schools due to limited tobacco use. A standard guide was used to lead the discussion about sources of information regarding e-cigarettes and themes and details recalled in the ads. Transcripts of the audio-taped focus groups were examined by independent raters using thematic analysis. The preliminary analyses indicated that all groups, regardless of gender, age, and smoking status, saw advertisements for e-cigarettes in multiple venues. Television, gas stations, convenience stores, magazines, the mall, and the internet were all mentioned, with magazines more common among college students and television more common among younger students. The mall was a recurrent initial response by all groups, except the college male smokers. The internet was a prevalent source of advertisements in all groups, including social media (facebook, twitter, etc), email ads, coupons, and YouTube commercials. The internet was also a starting point for acquiring information about the health risks, with search engines that included Yahoo, Google, and Bing. Common advertisement themes recalled by most students were that e-cigarettes are healthier and more convenient than cigarettes. Non-smokers made comments about the ads highlighting the design of the product, describing it as “cool”, “sleek”, “colorful”, with males more likely to comment on the ad being pleasant and appealing than females. Smokers were more likely than non-smokers to presume that the advertisements were promoting a healthier alternative to smoking. However, many smokers of all ages also acknowledged peers and siblings as alternate sources of information. This preliminary qualitative data suggests that smokers and non-smokers can identify several sources and aspects of advertisements for e-cigarettes.

FUNDING: This study was funded by the National Institute on Drug Abuse grant P50DA009241

JUSTIFICATION: This qualitative study provides insight into the perceptions of adolescents and young adults regarding the marketing of electronic cigarettes.

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POS2-92
WHO CAN RESIST? PHARMACOLOGIC AND CUE-BASED INFLUENCES ON SMOKING AND DRINKING IN THE LABORATORY

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Substantial cross-reactivity between alcohol and nicotine has been observed in numerous studies, suggesting that interactive pharmacological effects and cross-drug environmental factors (i.e., cue reactivity) may play an important role in motivating smoking and drinking behavior. Yet few studies have examined the respective influence of these factors simultaneously, precluding firm conclusions regarding the roles of pharmacological effects and cues in alcohol and nicotine use. In the present study, 70 participants with a wide range of smoking and drinking patterns were each randomly assigned to complete 6 out of 16 possible laboratory sessions wherein they consumed one alcohol (Male: 0.3 g/kg; Female: 0.27 g/kg) or placebo beverage, smoked one nicotine (0.6 mg) or placebo (0.05 mg) cigarette and approximately 30 minutes later were exposed to one of four possible combinations of smoking, drinking, and neutral cues. Immediately following this, participants entered a 50 minute period in which they were provided with funds they could use to “purchase” drinks or cigarettes and were able to accrue additional money by deferring consumption over this time. Exposure to cues continued throughout this period. The presence of either smoking or drinking cues increased the likelihood of alcohol consumption, but no pharmacological effects of alcohol or nicotine on drinking behavior were observed. In contrast, pharmacological effects impacted the likelihood of smoking, with participants being more likely to smoke following consumption of alcohol and less likely to do so following administration of nicotine. However, cues had no effect on the likelihood of smoking. A number of individual difference variables directly affected the likelihood of smoking and drinking and also moderated the pharmacological and cue effects. Together, results suggest differential influences of pharmacology and environment on smoking and drinking behavior. Potential clinical and theoretical implications of the findings are discussed.

FUNDING: This study was funded by NIH Grant #AA011157
JUSTIFICATION: Results identify factors that influence ongoing use of alcohol and tobacco and thus may be appropriate intervention targets.
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POS2-93
VALIDATION OF A SMOKING PUFF ANALYZER FOR USE WITH AN ELECTRONIC CIGARETTE PROTOTYPE

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The objective of this study was to determine the suitability and validity of the Sodim Smoking Puff Analyzer Mobile (SPA-M) for use with an electronic cigarette (EC) prototype. The accuracy and precision of SPA-M topography device for measurement of puff duration, puff volume, and puff profile of EC prototype was evaluated. First, the SPA-M device flow and pressure differential sensor calibration was verified with a Sodim flow calibrator. The SPA-M device demonstrated accuracy and precision within ± 2% of the target value. A 20-port linear and a single port existing machine were used to create standard puff profiles with the EC prototype and 3R4F reference cigarette. The linearity of the SPA-M device with the EC and 3R4F cigarette was verified for a range of puff volume (35–140 mL), puff duration (2-5 sec), flow rate (7–65 mL/sec) under sine and square wave puff profiles. The performance of the SPA-M with standard settings was acceptable for use with 3R4F cigarettes but was not acceptable for use with the EC prototype. The optimal EC configuration was then evaluated using single-hole and proprietary multi-port quad-hole mouth pieces. No valid SPA-M data were acquired with a single-hole mouth piece configuration so a proprietary multi-port quad-hole mouth piece was used in all further testing. A K-coefficient, which compensated for EC aerosol and temperature, was determined for use with the SPA-M software. Using the derived K-coefficient, the accuracy and precision of SPA-M with the EC prototype was observed to be within ± 10% of puff volume targets. The repeatability and intermediate precision across all puff profiles was below 5%. Results of this investigation demonstrate that puff topography instrumentation can be validated for use with electronic cigarettes. The aerosol temperature and the position of aerosol generation in relation to pressure transducer sensors impacts data acquisition. Therefore, the K-coefficient for different ECs will have to be established for accurate and precise topography measurements.

FUNDING: This study was funded by Altria Client Services, Inc.
JUSTIFICATION: Smoking puff analyzers used to study the puff profile of electronic cigarette users must be validated prior to conducting studies.
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POS2-94
PERCEPTIONS OF MENTHOL CIGARETTES AMONG ADULT SMOKERS AND YOUTH IN THE UNITED STATES: AN EXPERIMENTAL STUDY

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Background: The US Tobacco Control Act banned artificial or natural flavors in cigarettes, excepting menthol. However, the FDA is currently considering extending the flavor ban to include menthol. There is concern that menthol cigarettes may be perceived by smokers as less harmful, and may be more appealing to youth. This analysis assessed perceptions of menthol cigarettes, including packs currently on the market (among youth and adults), as well as experimentally-manipulated packs (among adult smokers). Methods: Adult smokers (n=378) and youth smokers, and non-smokers (n=757) in the US completed an online survey in December, 2010. Adult respondents were presented with pairs of images of experimental cigarette packs that varied on one element (regular or menthol descriptor), and were asked to comparatively rate which cigarettes (if either) would: taste better, be less harmful, be higher quality, and be easier to quit. All respondents were also presented with a pair of packs (regular vs menthol) currently on the US market, and asked to comparatively rate them on the same measures; youth were asked which they would rather try instead of easier to quit. Chi square analysis and logistic regression models were used. Findings: When comparing real cigarette brand variants (Camel Filters vs Camel Menthol), adult smokers were more likely to select regular cigarettes as higher quality (p<0.01), but youth rated the menthol variant as significantly better tasting, less harmful, higher quality, and would rather try (p<0.01 for all). Youth smokers reported menthol would taste better (p<0.01) and would rather try (p<0.01), but did not think they were less harmful or higher quality. However, youth non-smokers selected the menthol brand as tasting better, higher quality, less harmful, and would rather try (p<0.01 for all). When adult smokers compared experimental packs with “regular” and “menthol” descriptors, “regular” cigarettes were rated as significantly less harmful (p<0.01). Conclusions: The findings highlight positive perceptions of menthol cigarettes among youth, including reduced harm and product appeal, and suggest a public health benefit from banning menthol cigarettes.

FUNDING: This research was funded by the National Institutes of Health (Grant number: 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) and the Canadian Cancer Society Research Institute Junior Investigator Award (Hammond).
JUSTIFICATION: The Tobacco Products Scientific Advisory Committee is currently considering extending the existing ban on flavors in cigarettes to include menthol; this analysis provides evidence that lends support for banning menthol cigarettes as an intervention for youth smoking prevention.
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**POS2-95**

**EXPLORING RELATIONSHIPS BETWEEN THE TOBACCO INDUSTRY, THE ARGENTINEAN MOVIE INDUSTRY, AND POLICIES TO LIMIT TOBACCO USE IN MOVIES**

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Background: Smoking in movies promotes youth smoking. For the last 90 years tobacco companies promoted smoking and cigarette brands in collaboration with major motion picture studios in the US. While smoking has decreased in US-produced films, it is substantially higher in Argentine films. The objective of this study was to explore opportunities for tobacco companies to influence the Argentinean movie industry and for policies to limit tobacco use in Argentine movies. Method: We conducted semi-structured interviews about the movies motion industry with 2 film producers, 1 director, 1 actor, the director of the Universidad del Cine (Film Arts University), 2 officers of the INCAA (National Film Institute of Cinema and Art), the Director of the Ministry of Health, and 2 Ministry of Health representatives. We reviewed public documents about film industry and the annual reports of INCAA. Proposed legislation and related from Argentina’s Ministry of Health were reviewed. Results: In 2010, 353 movies were released in Argentina, 138 made in Argentina. The primary funding for national films came from public funds through INCAA-administered grants; however, INCAA’s funding decisions do not consider tobacco or alcohol content Industry payment for the placement of tobacco products in movies is prohibited, but brands for tobacco and other products may appear in movies as an unpaid exchange for services or other support provided. None of the respondents had heard about such agreements with tobacco industry. The movie rating system is defined and applied by INCAA, and the criteria for rating a film as inappropriate for youth do not include tobacco or alcohol content. Distributors are not involved in decision-making about movie content, tobacco industry influence through distributors appears unlikely. Conclusion: In Argentina tobacco industry influence over movie production and distribution is not apparent, which may facilitate adoption of policies to limit youth exposure to tobacco imagery in entertainment media.

**FUNDING:** International Tobacco and Health Research and Capacity Building Program, NIH (USA, Grant 1 R01 TW009274-01)

**JUSTIFICATION:** Argentina has a strong movie industry, for which it is necessary to explore tobacco industry interference with the movie making process and opportunities to promote policies that reduce youth exposure to tobacco imagery in entertainment media.

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**POS2-96**

**A GENOME-WIDE META-ANALYTIC STUDY OF SMOKING BEHAVIOR IN ADOLESCENTS**

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Background: Twin and family studies have provided overwhelming evidence for the genetic basis of individual differences in smoking behavior, with estimates of heritability typically higher for adults than for adolescents. Genome-wide association studies (GWAS) of smoking behavior have shown significant associations with several genomic regions, such as the nicotinic receptor loci, in adults. To our knowledge, no GWAS of smoking behavior results have been published on data collected in adolescence. Methods: We harmonized phenotypic data on smoking from three longitudinal studies, including a twin sample (Virginia Twin Study of Adolescent Behavior Development, ABD), and two epidemiological samples, (Great Smoky Mountain Study, GSMS & Christchurch Health and Development Study, CHDS), resulting in a combined sample size of 2541 individuals. Genotypic data were collected according to the same protocol and genotyping platform for all studies. Merlin-online, capable of handling related observations, was used to test for associations between over 2 million SNPs, after imputation, and three smoking phenotypes: smoking initiation, age of onset, and number of cigarettes. Results: Prevalence for smoking initiation was comparable across studies with about 70% having tried cigarettes by young adulthood. Age of onset of smoking was earlier in CHDS than in GSMS and ABD, with respectively 43%, 41% and 35% initiating smoking prior to age 15. However, less than 10% smoked more than 10 cigarettes per day during adolescence. Each of the datasets was analyzed separately and GWAS results were combined in a meta-analysis. Analyses were corrected for the effects of population stratification and sex. Results did not show any p-value that reached genome-wide significance for any of the phenotypes studied. Conclusions: Even though genetic factors contribute significantly to smoking behavior, sample sizes of GWAS studies in adolescence have not yet reached the critical level to identify specific genetic variants with the required level of genome-wide significance. Furthermore, SNPs found to be significant in adult samples did not approach statistical significance in adolescence.

**FUNDING:** This research was supported the National Institute on Drug Abuse (DA024413, DA025109, DA169777, DA/MH11301) by the National Institute of Mental Health (MH63970, MH63671, MH48085, MH065821, K01MH093731 and K23MH080230), NARSAD, and the William T. Grant Foundation. The CHDS was supported by the Health Research Council of New Zealand, National Child Health Research Foundation, Canterbury Medical Research Foundation, New Zealand Lottery Grants Board, University of Otago, Carney Centre for Pharmacogenomics, James Hume Bequest Fund and NIH grant MH077874.

**JUSTIFICATION:** Identification of genetic variants associated with smoking behavior may lead to tailored prevention and intervention efforts.

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**POS2-97**

**HEALTH CARE PROVIDERS’ VIEWS ON DIGITAL SMOKING CESSATION INTERVENTIONS FOR PREGNANT WOMEN**

Idilko Tombor1, Joanne Neale, Lion Shahab, Milagros Ruiz, and Robert West, University College London

Introduction: Digital smoking cessation aids may benefit pregnant smokers who do not wish to receive face-to-face behavioural support. Health care providers (HCPS) who interact with pregnant smokers may have useful insights to help with their development. This study aimed to explore HCPS’ views of using digital smoking cessation interventions with pregnant women in order to inform the design and delivery of digital smoking cessation interventions. Methods: Two semi-structured focus groups were conducted with HCPS (n=16) who provide smoking cessation support for pregnant women. Participants were from 11 different NHS Trusts across London and South East England. Topics discussed included views regarding digital smoking cessation interventions, how these might be used for smoking cessation support for pregnant smokers, and recommendations for future intervention development. Transcripts were analysed thematically. Results: HCPS identified a variety of ways in which digital interventions could benefit pregnant smokers, such as by providing anonymity, offering consistent quality of advice, providing convenient access to support, and being available on demand. Limitations of digital smoking interventions included lack of access among those most economically disadvantaged, the need for high levels of self-motivation and confidence, and various issues associated with the lack of human contact. Addressing pregnant smokers’ negative perceptions of smoking cessation support and nicotine replacement therapy, providing different types of positive reinforcements and social support, as well as tailoring the intervention to level of smokers’ confidence and pregnancy stage were among HCPS’ recommendations. Conclusions: HCPS indicated that digital interventions offer a range of potential benefits that could make them useful for pregnant smokers. Nonetheless, important limitations and recommendations regarding the design and delivery of digital smoking cessation support were identified that need to be addressed.

**FUNDING:** Idilko Tombor’s PhD is funded by the Society for the Study of Addiction.
POS2-98  
COTININE OR A COTININE METABOLITE INHIBITS NNK-INDUCED DNA STRAND BREAK IN METABOLICALLY COMPETENT CELLS BY INHIBITING CYP ENZYMES

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Background: Nicotine is not considered to directly participate in tumor initiation; however, nicotine has been reported to enhance the growth and tumor multiplicity in A/J mice treated with the tobacco nitrosamine NNK, an IARC class I carcinogen. Other in vivo studies conducted with A/J mice and a K-ras mutant strain concluded that nicotine had no influence on NNK-induced tumor multiplicity, size, and progression. Previous work using A/J mice has also suggested a protective effect of nicotine against metabolic activation of NNK. Recent in vitro work using purified enzymes have reported that a nicotine metabolite could interfere with CYP2A13/2A6-dependent NNK bioactivation by a mechanism-based inhibition. Consequently, we have designed a study to determine whether cotinine could contribute to the inhibition of NNK-induced DNA strand breaks by inhibiting CYP2A enzymes. Methods: An IC50 curve was established to evaluate the inhibitory effect of cotinine on CYP2A13-dependent metabolism of NNK. The effect of cotinine and an isothiocyanate control (PPITC) on DNA strand break was then compared using the COMET assay in CYP2A competent HepaRG cells incubated with bioactive CYP-independent NNKOAc and bioactive CYP-dependent NNK. Results: 50% of CYP2A13-dependent metabolism of NNK was lost at a concentration of cotinine of 3.6 uM. This concentration is considered physiological but on the high end of human plasma concentration. Using the COMET assay, we observed that NNK-induced DNA strand break was inhibited by cotinine at concentrations between 1 and 10 uM but this was not observed with CYP-independent NNKOAc. The CYP2A inhibitor PPITC offered protection against NNK DNA strand break but not against NNKOAc. Conclusions: Using the COMET assay, we showed that cotinine or one of its metabolites can protect against NNK-induced DNA strand breaks by inhibiting enzymes of the CYP2A family. This result illustrates the potential antagonistic effect of nicotine on carcinogenesis with inhibition of NNK-induced DNA break on one hand, and reported anti-apoptotic activity on the other hand. This highlights the limitations of the classical paradigm of single toxicants assessment.

FUNDING: This research was funded by the National Institutes of Health (Grant number: 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) and the Canadian Cancer Society Research Institute Junior Investigator Award (Hammond).

JUSTIFICATION: As many countries implement new policies in accordance with the FCTC, this analysis contributes evidence on the misleading marketing tactic of slim cigarettes, and lends support for the introduction of plain packaging.

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POS2-100  
EFFECT OF THE AMOUNT OF CATALYST ON THE MAINSTREAM SMOKE FROM A REFERENCE TOBACCO AND A COMMERCIAL TOBACCO BRAND

Antonio Marcilla, Mª Isabel Beltran, Amparo Gómez-Siurana, Isabel Martinez-Castellanos, and Deseada Berenguer, University of Alicante

Two synthesized catalysts (C1 and C2) have been mixed with two different tobaccos, a reference tobacco (3R4F) and a Spanish commercial brand of tobacco (Fortuna) in order to study the modifications in the components of the mainstream tobacco smoke. Cigarettes with different percentages of catalyst were prepared and smoked in a smoking machine, and the mainstream smoke was collected and analyzed. The mainstream smoke was divided into three fractions; the gaseous compounds and the total particulate matter condensed in the filter tip and in the traps. The results obtained show that the studied catalysts, directly mixed with tobacco, are capable of reducing the yield of most of the compounds which could be inhaled by active smokers, including carbon monoxide, nicotine and tar. The reductions obtained are positively correlated with catalyst concentration and porous texture (i.e., pore volume and size), within the range studied. The amount of catalyst to be effective must be higher than a minimum level. Major reductions in the gaseous fraction appear with the addition of around 8% of both catalysts. With such catalyst loadings the concentration of almost all individual compounds, including carbon monoxide, nicotine, and tar, as well as all the families of compounds (grouped according to their chemical nature) significantly decrease. Acknowledgements Financial support for this investigation has been provided by the Spanish “Comisión de Investigación Científica y Tecnológica” of the “Ministerio de Ciencia e Innovación” and the European Community (FEDER refunds) (CTQ2008-01023/PPQ and MAT2011-24991), and PROMETEO/2012/015. 

FUNDING: No Funding
JUSTIFICATION: Study of the effect of the concentration on the addition of a catalyst on the mainstream smoke.

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POS2-101
CHARACTERISTICS AND COMPOSITION OF THE MAINSTREAM SMOKE OF TEN RYO TOBACCO BRANDS SOLD IN SPAIN. EFFECT ADDITIVES CAPABLE OF REDUCING THE EVOLUTION OF CARBON MONOXIDE, NICOTINE, AND TAR

Antonio Marcilla*, Mª Isabel Beltrán, Amparo Gómez-Siurana, Deseada Berenguer, and Isabel Martínez-Castellanos, University of Alicante

In this study 10 commercial roll-your-own (RYO) tobacco brands sold and representing the 40% of this market in Spain have been smoked under ISO conditions. The 3R4F reference tobacco of the University of Kentucky has been also smoked for comparison. The main components of the gas and the particulate matter collected in the filters and the traps from the mainstream tobacco smoke have been analyzed. Two types of tubes have been used. The first one with no ventilation holes in the filters has been used with all commercial brands, and the second one with ventilation holes, was used with 2 commercial brands and with the 3R4F reference tobacco in order to determine the diluting effect of the holes. The results obtained have been compared with those obtained in a previous study where 10 brands of cigarettes commercialized in Spain were studied. The results show that RYO of tobacco provides larger yields of nicotine, tar, and carbon monoxide than the tobaccos used in commercial cigarettes. The addition to the tobacco of additives of siliceous or carbonaceous origin with a highly developed meso and macroporous structure has proven to be very effective (as was the case when studying the tobaccos used in conventional cigarettes) in reducing the amount of carbon monoxide, nicotine, and tar evolved when smoking such mixtures. Tar was collected in the filters of the tubes and in the Cambridge filters traps located downstream. The compounds measured in both samples have been analyzed and grouped in several chemical families. The catalysts used have proven to reduce the amount of almost all individual compounds analyzed, and all families in both samples, as well as in the collected gasses. Acknowledgements Financial support for this investigation has been provided by the Spanish “Comisión de Investigación Científica y Tecnológica” of the “Ministerio de Ciencia e Innovación” and the European Community (FEDER refunds) (CTQ2008-01023/PPQ and MAT2011-24991), and PROMETEO/2012/015.

FUNDING: No Funding

JUSTIFICATION: ANALYSIS ON THE SMOKE COMPOSITION OBTAINED AFTER SMOKINGOF TEN RYO TOBACCO BRANDS SOLD IN SPAIN.

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POS2-102
DETERMINATION OF TWO METABOLITES OF THE TOBACCO-SPECIFIC NITROSAMINE NNA (4-(METHYLNITROSAMINO) )-(3-PYRIDYL) BUTANAL) IN MOUSE URINE: APPLICATION TO A DERMAL ABSORPTION STUDY IN MICE

Peyton Jacob, III**, Christopher Havel¹, Lisa Yu¹, Manuela Martins-Green¹, and Neal Weitkunat¹, ¹University of California, San Francisco, Department of Medicine, Division of Clinical Pharmacology, ²University of California, Riverside, Department of Cell Biology and Neuroscience

NNA is a tobacco-specific nitrosamine (TSNA) that can be formed in the environment from nicotine adsorbed on surfaces. Unlike other TSNA, it is generally not found in tobacco products or their smoke. However, NNA has been measured in thirdhand smoke (THS) samples, and recent studies have shown that NNA can damage DNA in human cells. Consequently, NNA and its metabolites have the potential to serve as biomarkers of exposure to THS. We developed liquid chromatography–tandem mass spectrometry (LC-MS/MS) methods for measuring concentrations of two NNA metabolites, iso-NNAL, (4-(methylthiuroniumoxy))-4-(3-pyridylyl)butanal and iso-NNAC (4-(dimethylnitrosamino))-(3-pyridyl)butanoic acid. The methods will be described, and data from a study of dermal absorption of NNA in mice will be presented.

FUNDING: The California Consortium on Thirdhand Smoke, California Tobacco Related Disease Research Program 20PT-0184

JUSTIFICATION: This study demonstrates dermal absorption of a genotoxic substance derived from tobacco smoke, and may lead to methods for assessing exposure to thirdhand smoke.

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POS2-103
CHARACTERIZING SMOKING TOPOGRAPHY: COMPARISON OF SELF-REPORT AND OBJECTIVE MEASUREMENTS

Stefanie De Jesus* and Harry Prapavessis, Western University

Characterizing smoking behaviour is integral to understanding the relationship between how tobacco products are consumed and the associated health complications. Smoking topography (ST) provides a representation of the physical attributes of this behaviour including puff volume, velocity, and duration. Although ST measurement has evolved to sophisticated and portable instruments, these instruments can be costly and impractical for population studies. One study examined the validity of self-report ST using fairly crude items which were weakly correlated (r<.4) to objectively measured ST. The aim of this study was to assess ST using a more precise self-report and compare this modality to ST data collected using the CReSS Pocket in a larger sample. Participants (N = 205, Mean age = 38.96, FTCO = 5.19, Mean 17.23 cigarettes/day) provided demographic information and ST data with the CReSS Pocket. Self-reported ST was completed immediately after. Pearson correlation and Spearman’s rho coefficients (for non-parametric items) were employed to investigate relationships between self-reported and machine determined ST. Overall, there were small to moderate, positive associations between the following corresponding self-report items and CReSS parameters: number of puffs (r =.284, p = .000); interpuff interval (r =.334, p =.000); peak flow (r =.180, p =.010); average flow (r =.173, p = .013); total smoking duration (r =.334, p =.000); and puff duration (r =.375, p =.000). Subjectively measured puff volume and time to first puff were not correlated with their objectively measured counterparts. This study increases the association between subjectively and objectively measured ST and improves this relationship with more refined measures of self-report. Smokers can reasonably discern their smoking behaviour through a more precise self-report measure; however, there is insufficient evidence to strongly recommend using self-report at this time.

FUNDING: CIHR Cancer Research and Technology Transfer, Population Interventions for Chronic Disease Prevention, Ontario Tobacco Research Unit Ashley Studentship, Ontario Graduate Scholarship, Canadian Foundation for Innovation

JUSTIFICATION: To gain better insight into smoking behaviour measurement, machine-derived data is recommended.

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POS2-104
PERCEIVED RISKS SCALE ON USE OF TOBACCO AND CONTAINING PRODUCTS: QUALITATIVE RESEARCH FINDINGS

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Background: New forms of tobacco products (TPs) or nicotine-containing products (NCPs) are developed with the intention to reduce smoking-related morbidity and mortality. To understand how consumers perceive the risks of using...
such products, psychometric scale development was undertaken, as currently no validated instruments are available for that purpose. The development aims for one instrument to accurately quantify perceived risks, allowing for comparisons across different subpopulations as well as different TP and NCPs. Methods: A range of qualitative studies were used to support developing a conceptual framework and subsequently a pilot version of the new instrument. These included consumer focus groups (in the US, the UK, Italy, and Japan with subpopulations of adult smokers, former smokers, and never smokers), expert panels (Key Opinion Leader meetings), a literature review, and cognitive debriefing interviews. Results: The derived conceptual framework included five key domains of the perceived risks associated with various TP and NCPs: three related to health (physical risks to self, to others, and addiction risks) and two that are non-health-related (social risks and practical risks). Independent pilot version scales were developed to include the items that best represented the elements of each domain. Cognitive Debriefing Interviews (UK-based) provided useful information to improve scale content, the comprehensibility of the draft items, to refine self-report instructions, and improve the response options of the instrument. Conclusions: Because currently neither a consensus on the conceptualization of perceived risks nor any validated instruments exist, the present development fills an important gap. The qualitative research findings extend previous conceptualizations of risk perception of TP and NCPs, especially on relevant non-health-related issues that potentially influence smoking behavior. The next step will be quantitative studies in order to validate the conceptual framework and to ensure the reliability and validity of the instrument based on state of the art psychometric methods.

FUNDING: PMI

JUSTIFICATION: Development of a scale to measure risk perception.

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**POS2-105**

GLOBAL BRIDGES HEALTHCARE ALLIANCE FOR TOBACCO DEPENDENCE TREATMENT: NETWORK ANALYSIS OF AN INTERNATIONAL HEALTHCARE PROFESSIONAL TRAINING NETWORK

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Global Bridges is a worldwide science-based initiative to help healthcare professionals treat tobacco dependence and advocate for effective tobacco control policies. Methods: An online survey was implemented with Global Bridges members, who registered to be a part of the network via the Global Bridges website, in order to better understand how members communicate and interact with each other and to assess member participation in Global Bridges activities.

Results: A total of 233 network members completed the survey, with responses from all six WHO regions. Twenty-seven percent of respondents were physicians, with another 15% who were non-physician clinicians. The remaining respondents were primarily comprised of researchers and academic faculty and executive leaders and program managers. Seventy-four percent of respondents reported tobacco dependence treatment network ties, with 27% of those ties a direct result of involvement with Global Bridges. Sixty percent of respondents reported tobacco policy/advocacy network ties, with 17% of those ties a direct result of involvement with Global Bridges. Network centrality is high for the interaction network among Global Bridges members (0.85) and for the tobacco dependence treatment communication network (0.87). This indicates there is likely a dependence on the members of the Global Bridges executive committee (tobacco control experts/researchers based in the U.S.) and the regional directors as key points of contact and connection among the different regions.

Discussion: Understanding the how professionals and researchers in these countries are connected and communicating within both their regions and with other regions.

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**POS2-106**

CORRELATION OF MATERNAL COTININE AND NEONATAL NNAL LEVELS: PRELIMINARY FINDINGS FROM THE MAMA STUDY

Christie Flanagan**, Timothy Thomas¹, Kathryn Koller¹, Nean Benowitz², and Christi Patten³, 'Alaska Native Tribal Health Consortium, 'University of California San Francisco, 'Mayo Clinic Rochester

The prevalence of tobacco use during pregnancy is higher among Alaska Native (AN) women compared to other ethnic populations in the U.S. In response to requests by tobacco-using AN women for more specific information about fetal exposure to tobacco, we are developing and testing a novel intervention to motivate tobacco cessation among pregnant AN women. We present preliminary findings from Phase I of this study, which examines biomarkers of exposure (maternal cotinine, a nicotine metabolite; and newborn NNAL, a carcinogen) in urine samples, obtained from postpartum AN women and their newborns. We are recruiting pregnant AN women, 18 years of age and older, receiving care at Southcentral Foundation prenatal clinic in Anchorage, Alaska and planning to deliver at the Alaska Native Medical Center. The targeted enrollment is 165 women with 55 in each of three self-reported tobacco use categories: non-tobacco user (to assess secondhand smoke [SHS] exposure), cigarette user, and smokeless tobacco (ST) user (i.e., commercial chewing tobacco or homemade tobacco mix called iqmik).

Urine is obtained from the mother and neonate within 24 hours of delivery. As of November 2013, 139 women had been enrolled. In a preliminary analysis, 72 paired urine samples were analyzed for maternal cotinine and infant NNAL levels. Maternal cotinine and infant NNAL correlation r value was 0.59 among smokers (n=24) and 0.79 among commercial ST users (n=4). Among iqmik users (n=8) infant NNAL levels remained low regardless of maternal cotinine levels. Among the 36 non-tobacco user paired samples 25% (n=8) had quantifiable maternal cotinine levels, indicating SHS exposure. These preliminary findings demonstrate neonatal NNAL exposure correlates with maternal cotinine levels among AN women who smoke cigarettes during pregnancy. Infant NNAL levels appear to differ depending on product used among ST users; commercial versus iqmik. This is consistent with other published findings. Recruitment of ST users is ongoing to provide more data. Subsequent study phases will aim to work with AN women and their partners to develop and assess interventions using findings from Phase I.

FUNDING: U54CA153605 NIH/NCI

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**POS2-107**

THE EFFECT OF EXERCISE ON CIGARETTE CRAVINGS AND AD LIBITUM SMOKING FOLLOWING CONCURRENT STRESSORS

Angela J. Fong, M.A.*, Stefanie De Jesus, M.A., and Harry Prapavessis, Ph.D., Western University

The health consequences of smoking are well documented, yet quitting success rates are modest (10%). Although quitting smoking itself is a stressor, it is likely that other stressors in one’s environment occur concurrently and deplete self-regulatory resources in those attempting to quit. Failure to cope may lead to smoking relapse and an eventual return to normal smoking behaviour. An acute bout of exercise has been shown to attenuate cravings and withdrawal symptoms in previous research; however, it has yet to be examined following concurrent stressors (i.e., temporary abstinence plus environmental manipulation). This study examined the effect of an acute bout of moderate intensity exercise on psychological withdrawal symptoms (manipulation check for concurrent

FUNDING: Global Bridges receives funding and in-kind support from multiple sources, which include Mayo Clinic, the American Cancer Society, the King Hussein Cancer Center, national and subnational governmental agencies, and an unrestricted grant from Pfizer Medical Education Group.

JUSTIFICATION: This study has implications and the potential to inform tobacco control efforts in low- and middle-income countries by providing information about how professionals and researchers in these countries are connected and communicating within both their regions and with other regions.

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stresses, cravings (strength of desire to smoke) and ad libitum smoking (time to first cigarette upon leaving the laboratory) following concurrent stressors. In this study, 25 (>10 cigarettes per day) smokers were asked to temporally abstain for 18 hours. Following temporary abstinence (stress condition 1), subjects were exposed to a computerized, Stroop task and cue-elicited cigarette stimulus (stress condition 2) then randomized to receive 15 minutes of moderate intensity exercise (n = 12) or 15 minutes of passive sitting (n = 13). Results showed a significant time effect for psychological withdrawal symptoms, such that participants were significantly exacerbated after temporary abstinence and again after the environmental manipulation, F (2, 23) = 24.3, p < .0001, eta squared = .50. A significant group x time interaction effect was found for cravings favouring the exercise condition, F (6, 16) = 13.4, p < .0001, eta squared = .82. Exercise had no effect on ad libitum smoking, t(17) = −2.62, p < .05, eta squared = .05. This is the first study to show craving reductions after an acute bout of exercise after concurrent stressors and represents a more ecologically valid lab-based scenario than previous research. Future work is needed where momentary assessment is used in participants’ natural environment to examine changes over time in cravings following acute bouts of exercise.

FUNDING: This study was conducted while Angela J. Fong was at Western University. Supported by the Canadian Foundation for Innovation and Canadian Cancer Society Research Institute.

JUSTIFICATION: Supports an acute bout of exercise as a treatment to decrease cravings in a more ecologically valid lab-based setting.

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POS2-108 EVERDAY DISCRIMINATION IS ASSOCIATED WITH NICOTINE DEPENDENCE IN AFRICAN AMERICAN, LATINO, AND WHITE SMOKERS

Darla E. Kendzor, Ph.D.1,2, Michael S. Businel1, Ph.D.1, Lorraine R. Reitzel, Ph.D.2, Debra M. Rios, M.S.3, Taneisha S. Scheuermann, Ph.D.3, Kim Pulvers, Ph.D.4, and Jasjit S. Ahluwalia, M.D.5. 1The University of Texas Health Science Center, School of Public Health; 2The University of Houston, College of Education; 3The University of Kansas Medical School; 4California State University San Marcos, Department of Psychology; 5The University of Minnesota Medical School.

Introduction: Greater nicotine dependence is associated with a reduced likelihood of smoking cessation and an increased likelihood of developing tobacco-related disease. Previous research has linked stress with substance dependence, and discrimination is a commonly perceived stressor among African Americans and Latinos. Although studies have shown a link between discrimination and smoking prevalence, little is known about the relation between discrimination and nicotine dependence. Methods: A total of 2,376 African American (33.4%), Latino (33.1%), and White (33.5%) smokers completed an online survey. Everyday discrimination experiences were characterized overall and by race/ethnicity. Covariate-adjusted linear regression analyses were conducted to evaluate the association between everyday discrimination and several indicators of nicotine dependence. Interactions between race/ethnicity and everyday discrimination on measures of nicotine dependence were also examined. Results: Most participants, regardless of race/ethnicity, reported at least some everyday discrimination (79.1%). However, total scores on the discrimination measure were higher among Latinos and African Americans than Whites (p<0.001). Race/ethnicity/national origin was the most commonly perceived reason for everyday discrimination among African Americans and Latinos, whereas physical appearance was the most commonly perceived reason among Whites. Regression analyses indicated that everyday discrimination was positively associated with indicators of nicotine dependence including the Heaviness of Smoking Index (HSI; p<0.001), and the Brief Wisconsin Inventory of Smoking Dependence Motives (WISDM) scales (all p<0.001). There was a significant interaction between race/ethnicity and discrimination, such that discrimination was related to the HSI only among Latinos. Similarly, discrimination was most strongly related to the WISDM scales among Latinos. Conclusions: Discrimination is a common stressor that is associated with nicotine dependence. Findings suggest a potential pathway through which discrimination may influence health.

FUNDING: This work was supported by Pfizer’s Global Research Awards for Nicotine Dependence (to JSA) and the National Institutes of Health/National Institute for Minority Health Disparities (grant 1P60MD003422 to JSA). Data analysis and manuscript preparation additionally were supported, in part, by the American Cancer Society (grant numbers MRSSTG-10-104-01-CPHPS to DEK, MRSSTG-12-114-01-CPPB to MSB).

JUSTIFICATION: Findings suggest that dependence may be a potential pathway through which discrimination influences health and contributes to tobacco-related health disparities.

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POS2-109 EXAMINING THE ‘ACTIVE INGREDIENTS’ OF AN ONLINE SMOoking INTERVENTION: A RANDOMIZED FACTORIAL TRIAL

Jennifer B. McClure, Ph.D.1,2, Susan Shortreed, Ph.D.1, Do Peterson, M.S.1, Karin Rigg, M.S.W.1, Jackie Saint-Johnson, B.S.1, Holly Derry, M.P.H.1, Vijay Nag, Ph.D.2, and Larry An, M.D.3. 1Group Health Research Institute, 2University of Michigan.

The empirical evidence on the effectiveness of online smoking cessation programs is mixed. To advance this field, we must move beyond asking if these programs are effective and begin systematically identifying the components that can increase intervention effectiveness (the ‘active ingredients’). This study explores the effects of four potentially important design features in an Internet-based, population-level smoking cessation intervention. Smokers (n = 1865) were recruited from a large healthcare organization, regardless of their interest in quitting. Using a full factorial design, participants were randomized to one of two levels of each experimental factor (message tone [prescriptive vs. motivational], navigation autonomy [dictated vs. not]), email reminders [yes vs. no], and receipt of personally-tailored testimonials [yes vs. no]), and provided access to the online intervention. Primary outcomes were self-reported 7-day point prevalent smoking abstinence and confirmed utilization of adjunct treatment (pharmacotherapy or phone counseling) available through the health plan. Outcomes were examined among all enrolled participants (intent to treat [ITT]) and all who actually viewed the intervention (modified ITT) at 2, 6, and 12 months. At one year, 13.7% were abstinent and 26.0% had utilized the provided adjunct treatment. None of the experimental factor levels increased abstinence or treatment utilization in either analyzable sample. However, in the modified ITT sample, smokers receiving tailored testimonials were less likely to use the available adjunct treatment at 6 months (OR = 0.54, 95% CI 0.30-0.98, P = 0.04). OR’s at 2 and 12 months were similar, but non-significant (2 month OR = 0.51, 95% CI 0.26-1.04, P = 0.06; 12 month OR = 0.66, 95% CI 0.39-1.11, P = 0.12). None of the design features significantly enhanced treatment outcome. The negative effect observed for testimonials is provocative, but should be viewed with caution. This study offers a model for future research testing the ‘active ingredients’ of online interventions.

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

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POS2-110 POLYGENIC ANALYSES OF SMOKING BEHAVIOR IN ADOLESCENCE

Roseann E. Peterson1, Hermine H. Maes1, Lindon J. Eaves1, Judy L. Silberg1, Daniel E. Adkins1, Shaunna L. Clark1, David M. Fergusson2, Youfang Liu3, Patrick S. Sullivan3, and Kevin Conway3. 1Virginia Commonwealth University, 2Duke University, 3University of North Carolina at Chapel Hill.

Cigarette smoking is a serious public health problem that is associated with numerous co-morbid conditions including cancer, lung diseases, and cardiovascular disease. Genetic factors have consistently been demonstrated to influence individual differences in smoking behavior (SB), with twin and family...
studies estimating heritabilities in the order of 0.50-0.70 for smoking initiation (SI) and 0.60 for nicotine dependence (ND). The genome-wide association (GWAS) approach has been applied to smoking behaviors yielding several putative risk variants of small effects accounting for a fraction of the heritability in adults. Adolescence represents an important developmental period to study smoking behavior as more than 80% of adult smokers initiate before the age of 18. Therefore, the purpose of this research was to utilize longitudinal designs to (1) evaluate association of validated SB-SNPs in adolescence, (2) assess the accumulative effect via an aggregate risk score, (3) compare the variance explained by all genotyped SNPs (GCTA) to estimates of heritability derived from classical twin modeling. Smoking data from three longitudinal studies were harmonized, including a twin sample, the Virginia Twin Study of Adolescent Behavior Development (ABD), and two epidemiological samples, the Great Smoky Mountain Study (GSMS) and the Christchurch Health and Development Study (CHDS), yielding a combined sample of N=2,541. Of 25 SB-associated SNPs cataloged from meta-analyses, only two were nominally associated with smoking quantity across adolescence (empirical P < 0.03): rs7780099 on 7p14.3 in PDE1C and rs7182567 on 15q25.1 near CHRNA3 and CHRNA5. In aggregate, the 25 SB-associated SNPs were not significantly associated with adolescent smoking. However, the GCTA approach accounted for 42.0-69.7% of the variance in SB (P < 1.0x10^-8). Future research will utilize longitudinal data through mixture modeling and incorporate environmental effects. Improved understanding of the genetic and environmental components of smoking, particularly in a developmental context, will aid in identifying vulnerability time-points and facilitate targeted prevention and treatment efforts.

FUNDING: This research was supported by the National Institute of Mental Health (MH63970, MH63671, MH48085, KO1MH093731 and K23MH080230), the National Institute on Drug Abuse (DA/MH11301), NARSAD, and the William T. Grant Foundation. The CHDS was supported by the Health Research Council of New Zealand, National Child Health Research Foundation, Canterbury Medical Research Foundation, New Zealand Lottery Grants Board, University of Otago, Carney Centre for Pharmacogenomics, James Hume Bequest Fund and NIH grant MH077874.

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POS2-111
SMOKING ANTICIPATION AND ACTUAL SMOKING BOTH LOWER PHYSIOLOGICAL AND PSYCHOLOGICAL REACTIVITY TO STRESS FOR SMOKERS IN WITHDRAWAL

Daniel E. Bradford, M.S.1, Katherine P. Magruder, B.S.1, Oliva S. Subramani, B.A.1, Nicole M. Marek, B.A.1, John J. Curtin, Ph.D.1, and Megan E. Piper, Ph.D.1
1Psychology Department, University of Wisconsin Madison, 2Center for Tobacco Research and Intervention, School of Medicine and Public Health, University of Wisconsin Madison

Smokers frequently report stress as a smoking cue and a primary cause of relapse when attempting abstinence. The belief that smoking will reduce stress could be a powerful motivator for smoking that is separable from the pharmacological effect of nicotine. In fact, recently emerging Cognitive Behavioral Therapy approaches to cessation are often aimed at targeting maladaptive beliefs about smoking. However, connections between stress, beliefs about smoking and the pharmacological impact of smoking are not well understood. We hypothesized that the anticipation of smoking would be sufficient to alter both physiological and psychological components of stress reactivity in withdrawn smokers. To examine the effects of withdrawal, anticipation and smoking on stress reactivity, we recruited 108 participants (34 deprived smokers withdrawn for 24 hours, 37 satiated smokers, and 37 nonsmokers). We measured stress reactivity via eye-blink startle potentiation, an index of implicit physiological processes, as well as self-reported anxiety during a cued shockessor task. After completing the task once, smokers anticipated smoking a cigarette placed in front of them while they completed the task again and then smoked before completing the task a final time. Nonsmokers anticipated and drank water for the second and third task presentations, respectively. Smoking anticipation and actual smoking both significantly attenuated physiological stress reactivity and self-reported anxiety to stressors, relative to baseline, for deprived smokers compared to satiated smokers and nonsmokers (p < .05). Nicotine dependence moderated the anticipation effect; more dependent smokers showed greater effects of anticipation on dampening of physiological stress reactivity (p < .05). These results clearly demonstrate that even the implicit physiological components of heightened sensitivity to stressors seen in deprived smokers can be significantly attenuated through higher order cognitive pathways. This has important implications for cognitive behavioral therapy approaches to smoking cessation and addiction treatment generally.

FUNDING: This research was supported in part by grant 1UL1RR025011 from the Clinical and Translational Science Award (CTSA) program of the National Center for Research Resources (NCRR), National Institutes of Health (NIH), and by faculty start-up funds from the University of Wisconsin.

JUSTIFICATION: The evidence presented here suggests that physiological symptoms of nicotine withdrawal related to stress responding could be ameliorated by top down cognitive influences (e.g., beliefs about smoking).

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POS2-112
VALIDATION OF LABORATORY CUE-INDUCED CRAVINGS WITH DIARY DATA DURING A QUIT ATTEMPT

Joel Erblitch1 and Alexandra Milalowski2, 1Hunter College and Graduate Center, City University of New York, 2Mount 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 some uncertainty as to whether or not these laboratory-based cravings are meaningfully related to real-world outcomes. In this study, we examined the relationship between laboratory-based smoking cue-induced cigarette cravings and daily diary reports of cravings during smoking lapses in the context of a quit attempt. We hypothesized that smokers who exhibit heightened cravings following laboratory-based cue exposures will report cue-induced cravings in the context of a lapse during a quit attempt. To that end, nicotine dependent smokers (n=111) preparing to make an unassisted, cold-turkey quit attempt in the following week, completed a laboratory cue-induced craving task, in which they were exposed to smoking and neutral cues, and reported their craving levels (0-100) before and after each cue exposure. On Days 1 and 14 following their quit date, participants completed diaries detailing any lapses that they had experienced on that day. Results indicated that 47% of the sample (n=52; Mean age=41.5, 44.4% African American, 14.58 Caucasian, 14.8% Hispanic, 18.8 cigs/ day, FTND=7.2) experienced a lapse within the first 14 days. Participants reported the degree to which their lapses were triggered by changes in affect, the presence of cues, boredom, and/or “other triggers.” Consistent with the study hypothesis, participants with the highest levels of laboratory-based cue-induced cravings reported higher levels of cue-induced lapses (p < 0.002), but not stress-induced, boredom-induced or other-induced lapses (p’s > 0.16) on Days 1 and 14 following their quit attempt. Findings provide further validation of the relevance of laboratory-based cue-induced craving as a model of real-world cravings and their relationship to lapses during the early trajectory of a quit attempt.

FUNDING: This study was conducted while the first author was at the Mount Sinai School of Medicine. Supported by NCI grants: K22CA124800 and R21CA118703

JUSTIFICATION: Laboratory assessment of cue-induced craving may be a useful tool for identifying individuals at risk for smoking cessation failure when faced with smoking cues in their environment.

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POS2-113

ADOLESCENTS’ TOBACCO SUPPLY SOURCES IN A CHANGING POLICY ENVIRONMENT

Janet Hoek\textsuperscript{1}, Philip Gendall\textsuperscript{1}, Richard Edwards\textsuperscript{2}, Benjamin Healey\textsuperscript{1}, and Louise Marsh\textsuperscript{1}, \textsuperscript{1}University of Otago, Dunedin, \textsuperscript{2}University of Otago, Wellington

Purchase age restrictions have reduced youth access to tobacco and played an important role in denormalizing smoking, yet do not always reduce smoking prevalence among young people, who may turn to other supply routes. Continued focus on youth access restrictions may overlook these alternative supply sources, such as peers, family, and even strangers, which influence smoking initiation, experimentation, and progression to regular smoking. To examine patterns in young people’s supply sources and whether these changed as excise tax increases were introduced, we analysed data from seven consecutive years (2006-12) of the New Zealand ASH Year 10 survey, a cross-sectional annual survey of students aged 14 and 15 years. Overall youth smoking prevalence declined over the period examined and reduced more rapidly following the introduction of excise tax increases in 2011. Nevertheless, the proportion reporting having usually purchased their own cigarettes from a retail outlet remained stable at around ten percent over the seven years. While friends and peers remained the dominant source of tobacco, they declined in relative importance as a supply source, and supply via caregivers and other immediate family sources increased. Family members were a more important tobacco source for young M\text{\text{"o}}ri women, the demographic with the highest smoking prevalence. As only a small proportion of young people source tobacco from commercial outlets, increased retail monitoring is unlikely to have a marked effect on youth smoking prevalence. Evidence that tobacco supply via family sources grew in relative importance reinforces the need for a policy approach that reduces smoking prevalence among the general adult population, which in turn would make it more difficult for young people to access and use tobacco. Examples of policies to achieve this outcome could include restricting the number of tobacco outlets to decrease tobacco’s availability, implementing regular and increasingly larger excise tax increases to decrease its affordability, and increasing smoke-free spaces, to reduce the ease of consumption.

FUNDING: No Funding

JUSTIFICATION: The findings inform debate over the desirability of increased enforcement of youth tobacco access restrictions as opposed to stronger population level measures; we suggest the latter may more effectively counter young people’s access to tobacco through social sources and outline specific policy measures that could be implemented.

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Depression in smokers is associated with lower quit rates during smoking cessation attempts. Stress effects on smoking were partially mediated by NA, but not PA. Results suggest that depressed smokers may experience more SE and react more negatively to SE in terms of affect and smoking lapses during smoking cessation attempts.

FUNDING: The project described was supported by Award Number RC1DA028129 from the National Institute on Drug Abuse awarded to Danielle E. McCarthy, Ph.D.

JUSTIFICATION: Interventions that help reduce reactivity to stress during a quit attempt may improve cessation success in smokers high in depressive symptoms.

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POSTER SESSION 3 • FRIDAY, FEBRUARY 7, 2014 • 5:15 p.m.–6:45 p.m.

POS3-2
PRENATAL CIGARETTE EXPOSURE AND STRESS REACTIVITY IN LATE INFANCY

Rina D. Eiden1, Douglas A. Granger2, Pamela Schuetze1, Craig R. Colcher3, and Stephanie Godleski1.1Research Institute on Addictions, State University of New York at Buffalo; 2Department of Psychology, Arizona State University; 3Dept. of Psychology, Buffalo State College; 4Department of Psychology, State University of New York at Buffalo;

Prenatal cigarette exposure (PCE) may be associated with increased allostatic load (risk associated with repeated physiological adaptations in response to chronic stress) from the combination of high prenatal stress due to fetal hypoxia and ischemia, and continued postnatal stress from cumulative environmental and maternal risks. Based on current literature, we hypothesized that PCE infants would exhibit higher amplitude trajectory for cortisol and higher cortisol reactivity in response to stress, and that this association would be stronger for boys. The sample consisted of 212 mother-infant dyads recruited prenatally and assessed once in each trimester of pregnancy and at 9 months of infant age. Saliva samples were collected at four time points at 9 months, after the infant arrived at the laboratory (T1), before an anger/frustration paradigm (T2), 20 minutes after frustration (T3), and 40 minutes after frustration (T4). Results from repeated measures ANCOVA indicated a significant PCE by time interaction on cortisol, with PCE infants having significantly lower cortisol values compared to non-exposed infants at the first three time points and marginally lower values at T4. Exposed infants displayed a significant linear increase in cortisol from T1 to T4, while unexposed infants displayed a marginal linear decrease with a significant cubic trend in cortisol from T1 to T4, while unexposed infants exhibited stronger association between stress and cortisol levels or changes depressive symptoms and withdrawal, suggesting that decreasing smoking-specific EA (Avoidance and Inflexibility Scale, AIS) did not predict post-quit average levels of AIS, but not AAQ, significantly moderated the relations between internal distress, assessed by post-quit depressive symptoms and three subscales of withdrawal symptoms (negative affect, physical withdrawal, craving), and smoking. Participants: 40 adult smokers, failed to quit for more than 3 days in the past 10 years, who participated in a randomized controlled trial of Distress Tolerance treatment. Results: Multilevel models showed that pre-quit levels of AIS, but not AAQ, significantly moderated the relations between all predictors, except craving, and smoking for 13 weeks post-quit. However, only the moderating effect of AIS on physical withdrawal-smoking relations remained significant through 26 weeks. Marginal effect plots revealed that significant positive associations between internal distress (depressive symptoms, negative affect, physical withdrawal) and smoking were found only in those with high pre-quit smoking-specific EA. Moreover, pre-quit AIS did not predict post-quit average levels or changes depressive symptoms or withdrawal, suggesting that decreasing smoking-specific EA pre-quit may not reduce internal distress, but reduce a smoker’s response (i.e., not smoking) to such distress during a quit attempt. Conclusions: Results mainly supported the hypothesized mechanisms, but only for smoking-specific EA for a limited time. Reducing EA below a certain threshold may be crucial to reduce lapse risk associated with internal distress. Smoking cessation interventions focusing on EA reduction may especially benefit those who are vulnerable to greater post-quit depressive and withdrawal symptoms, and smoke to regulate aversive internal states. Improving ways to reduce reactivity to EA may help increase treatment efficacy.

FUNDING: Supported in part by grant DA017332 from the National Institute on Drug Abuse to Richard A. Brown.

JUSTIFICATION: Smoking cessation interventions focusing on EA reduction may especially benefit those who are vulnerable to greater post-quit depressive and withdrawal symptoms, and smoke to regulate aversive internal states.

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POS3-3
ECOLOGICAL MOMENTARY ASSESSMENT OF STRESS REACTIVITY AMONG SMOKERS LOW VS. HIGH IN DEPRESSIVE SYMPTOMS DURING A QUIT ATTEMPT

Haruka Minami, Ph.D.1, Vivian M. Yeh, Ph.D.2, Krysten W. Bold, M.S.2, Gretchen B. Chapman, Ph.D.1, and Danielle E. McCarthy, Ph.D.1. 1Alpert Medical School of Brown University; 2Scahn School of Medicine at Mount Sinai; 3Rutgers, the State University of New Jersey

Depression in smokers is associated with lower quit rates during smoking cessation attempts. Stress is a relapse precipitant and greater reactivity to stress may mediate depression effects on cessation success. The current study examined relations among stressful events (SE), affect, and smoking reported in real time during an attempt to quit smoking by 20 smokers high and 51 smokers low in depressive symptoms. Multilevel models indicated that SE predicted increases in negative affect (NA) and decreases in positive affect (PA) within 2 hours, regardless of baseline depressive symptoms. Only smokers high in depressive symptoms (HD) continued to show elevated NA and decreased PA up to 24 hours after an SE, however. The persistence of NA appeared to be mediated by increased odds of subsequent SEs among HD smokers, but the positive affect suppression was independent of later SE. Stressful events predicted increased smoking up to 24 hours later for all smokers, but this was particularly strong among smokers high in depressive symptoms. Stress effects on smoking were partially mediated by NA, but not PA. Results suggest that depressed smokers may experience more SE and react more negatively to SE in terms of affect and smoking lapses during smoking cessation attempts.

FUNDING: The project described was supported by Award Number RC1DA028129 from the National Institute on Drug Abuse awarded to Danielle E. McCarthy, Ph.D.

JUSTIFICATION: Interventions that help reduce reactivity to stress during a quit attempt may improve cessation success in smokers high in depressive symptoms.

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POS3-4
ROLE OF EXPERIENTIAL AVOIDANCE ON RELATIONS AMONG DEPRESSIVE SYMPTOMS, WITHDRAWAL SYMPTOMS, AND SMOKING BEHAVIOR DURING A QUIT ATTEMPT

Haruka Minami, Ph.D.1, Erika Litvin Bloom, Ph.D.2, Kathleen M. Palm Reed, Ph.D.2, Steven C. Hayes, Ph.D.2, and Richard A. Brown, Ph.D.1. 1Alpert Medical School of Brown University, Butler Hospital, 2Clark University, 3University of Nevada

Smoking cessation interventions that aim to reduce experiential avoidance (EA) (i.e., inability to tolerate internal distress) are purported to improve cessation success through decreased reactivity (i.e., smoking) to internal distress. Yet, this hypothesized mechanism has rarely been tested directly. This study examined whether pre-quit general EA (Acceptance & Action Questionnaire, AAQ) and smoking-specific EA (Avoidance and Inflexibility Scale, AIS) moderated the relations between internal distress, assessed by post-quit depressive symptoms and three subscales of withdrawal symptoms (negative affect, physical withdrawal, craving), and smoking. Participants: 40 adult smokers, failed to quit for more than 3 days in the past 10 years, who participated in a randomized controlled trial of Distress Tolerance treatment. Results: Multilevel models showed that pre-quit levels of AIS, but not AAQ, significantly moderated the relations between all predictors, except craving, and smoking for 13 weeks post-quit. However, only the moderating effect of AIS on physical withdrawal-smoking relations remained significant through 26 weeks. Marginal effect plots revealed that significant positive associations between internal distress (depressive symptoms, negative affect, physical withdrawal) and smoking were found only in those with high pre-quit smoking-specific EA. Moreover, pre-quit AIS did not predict post-quit average levels or changes depressive symptoms or withdrawal, suggesting that decreasing smoking-specific EA pre-quit may not reduce internal distress, but reduce a smoker’s response (i.e., not smoking) to such distress during a quit attempt. Conclusions: Results mainly supported the hypothesized mechanisms, but only for smoking-specific EA for a limited time. Reducing EA below a certain threshold may be crucial to reduce lapse risk associated with internal distress. Smoking cessation interventions focusing on EA reduction may especially benefit those who are vulnerable to greater post-quit depressive and withdrawal symptoms, and smoke to regulate aversive internal states. Improving ways to reduce reactivity to EA may help increase treatment efficacy.

FUNDING: Supported in part by grant DA017332 from the National Institute on Drug Abuse to Richard A. Brown.

JUSTIFICATION: Smoking cessation interventions focusing on EA reduction may especially benefit those who are vulnerable to greater post-quit depressive and withdrawal symptoms, and smoke to regulate aversive internal states.

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**POS3-5**

ASSOCIATION OF DAYS ABSTEMENT DURING SHORT-TERM STUDY QUITTING WITH SUBSEQUENT INITIATION OF A PERMANENT QUIT ATTEMPT

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Formal clinical trials show that duration of abstinence in the first weeks of a permanent quit attempt predicts quit status later in that same attempt. However, unclear is whether more days of abstinence during short-term quit attempts for study purposes are associated with quit status in a subsequent permanent quit attempt. In a crossover procedure designed to test initial sensitivity to medication versus placebo during two separate week-long (5 days) quit periods, we examined the association between number of days quit during these brief attempts with success in being able to subsequently quit (permanently) at post-study follow-up. Subjects were 54 adults from two similar studies, testing nicotine patch or varenicline versus the respective placebo, administered blind in counter-balanced order. At screening, all smoked at least 10 cigs/day, had CO>10 ppm, and intended to quit permanently within the next 2 months (i.e., those already high in quit interest). Subjects’ quit status was confirmed daily by CO<5 ppm during each study period, with feedback but no other consequence provided, and a week or more of ad lib smoking resumption separated the two quit periods. After completing the study, all were offered brief cessation counseling to help make their permanent quit attempt a benefit of study participation. The total days quit during these two study quit weeks were compared between those able vs. unable to quit for at least 24 hrs in the subsequent permanent attempt when contacted within a few days after their target quit date. Since dependence level could explain quit ability both during the study quit weeks and the post-study quit attempt, FTND was included as a covariate in the ANCOVA. We found more days quit during the short-term study attempts among those 36 who later successfully quit post-study compared to those 18 who were unable to quit post-study, means (SE) of 4.1±0.5 vs 0.6±0.7 quit days, respectively, F (1,51) = 14.55, p<.001. These results suggest that number of days quit during week-long assessments in a crossover test is a potentially meaningful clinical measure in predicting successful initiation of a permanent quit attempt.

FUNDING: Supported by NIH Grant P50 CA143187.

JUSTIFICATION: Quit duration during short-term tests of smoking cessation relates to success in initiation of a permanent quit attempt.

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**POS3-6**

PREDICTORS OF FOLLOW-UP SMOKING ABSTINENCE FOR HOSPITALIZED PATIENTS

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Background: Patients who resume smoking following hospitalization are at risk of complications, poorer treatment outcomes, and re-admission. Oregon Health & Science University Hospital (Portland, OR) has supported a Tobacco Dependence (TD) Consult Service for hospital patients since 2007 in order to enhance follow-up abstinence. Patients with a current history of tobacco use at admission are referred to the TD Service for bedside cessation assessment/education, brief behavioral intervention, medication recommendations, and telephone follow-up at 2 weeks post-discharge. Objective: To analyze predictors of follow-up smoking abstinence in hospital patients seen by the Tobacco Dependence Consult Service to assist with improving services and outcomes. Methods: Analysis was conducted for selected variables including age, gender, type of insurance coverage, type of admission, length of stay, and discharge diagnoses of patients seen by the TD Service between January, 2011 and December, 2012. Results: Of patients referred, 1683 (80%) completed TD consults. Of these 886 (53%) agreed to be contacted at 2 wks post-discharge. Following discharge 613 (69%) patients were reached with 32% reporting abstinence. Those significantly more likely to report abstinence at follow-up were older (p<.012), had a longer hospital stay (p<.001), and had a discharge diagnosis of cardiovascular disease (p<.001). Those significantly less likely to be abstinent were patients admitted through the Emergency Department (ED) (p<.001) and patients with orders for stop smoking medications while hospitalized (p=.015). In addition, ED admitted smokers reached for follow-up were more likely than other smokers to be uninsured (p<.015) have a history of psychiatric disorders (p<.001), and have shorter hospitalizations (p<.031).

Conclusion: Patient characteristics and diagnoses impact follow-up abstinence rates. Admission through the ED also impacts follow-up abstinence rates suggesting the possibility of unique characteristics of these patients. Because one-third of hospitalized smokers are admitted through the ED, more research is needed to help improve outcomes for these patients.

FUNDING: This research was supported by OHSU hospitals and the OHSU Division of Pulmonary & Critical Care Medicine

JUSTIFICATION: The results of this analysis can help improve implementation of Joint Commission measures and national health care policies.

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**POS3-7**

INDIVIDUAL DIFFERENCES IN NEGATIVE AFFECT RELATED TO SMOKING: THE ROLE OF EMOTIONAL

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A large body of literature supports that negative affect plays a critical role in nicotine dependence. Smokers report feeling intense episodes of negative affect and that this affective state is a primary motivation to keep smoking. The purpose of this study was to examine the relationship between individual differences in emotional experience, in particular emotional clarity and differentiation (individuals’ ability to understand, describe, and differentiate between emotions), and smoking motivation. A second goal was to test the ability of an emotional-labeling intervention to reduce the negative affect that results from a negative emotion induction, and the ability of emotional clarity to moderate the effect of a negative affect manipulation upon smoking-related variables. We hypothesized that emotional clarity would be related to affect, craving, and smoking satisfaction. Also, we hypothesized that emotional clarity would moderate the relationship between the emotional-labeling manipulation and affect, craving, and smoking satisfaction. We believed that labeling emotions would result in an increase in positive affect and reduced cravings among individuals low in emotional clarity. A correlational and two-group between-subjects design was used. Participants (170 participants; 86 males) first completed baseline measures, then went through a mood induction procedure (watching a video), and lastly, were randomized to one of two conditions (labeling emotions experienced from watching the video vs. describing the acting in the video). Emotional clarity was related to affect, craving, and smoking satisfaction ratings, such as those higher on emotional clarity reported more positive affect, less cravings, and having experienced aversive effects after smoking. Additionally, the writing task, regardless of condition, resulted in more positive affect ratings, decreased negative affect relief, and higher urges. We have replicated findings from previous studies showing a relationship between emotional clarity and mood. This study is the first one to establish such a relationship with craving for a cigarette and aspects of smoking satisfaction.

FUNDING: No funding

JUSTIFICATION: The findings of this study could be applied to developing interventions for smoking cessation. It can also be used to identify individuals that are more prone to continuing smoking and relapse.

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POS3-8
CHARACTERISTICS OF ADOLESCENT INTERMITTENT AND DAILY SMokers

INTRODUCTION: Intermittent smoking is common among adolescent smokers, but little is known about intermittent smoker (ITS). This study describes a cohort of adolescent ITS and compares them to adolescent daily smokers (DS) for the purpose of providing a more detailed characterization of adolescent ITS. METHODS: Participants were 124 adolescent (13-17 years old) ITS and 55 DS enrolled as part of a larger study on the effect of nicotine metabolism. ITS were defined as smoking at least monthly but < 28 days per month; DS as smoking daily. Participants completed demographic, smoking and addiction surveys, including the Hooked on Nicotine Checklist (HONC) and Modified Fagerstrom Tolerance Questionnaire (mFTQ). RESULTS: ITS started smoking at an older age (14.5 versus 13.3 years old, p<.001). ITS reported smoking a mean of 12.1 days per month (median= 10.00, SD=8.3) and smoked significantly fewer cigarettes than DS on days when they smoked (1.62 CPD versus 5.79 CPD, p<.001). ITS also scored significantly lower on the mFTQ (1.89 versus 3.75, p<.001) and HONC (3.34 versus 6.56, p<.001) addiction scales. Importantly, all of these findings were independent of years of smoking. Similar percentages of ITS and DS reported having made a quit attempt since beginning to smoke (60.2% versus 70.9%, p=.17) and the absolute number of quit attempts was similar between groups (5.8 versus 4.8, p=.67). ITS were equally likely to report being high on smoking when drinking alcohol (OR=0.95, CI =0.48, 1.88), but less likely to smoke when angry (OR=0.43, CI=0.21, 0.88). CONCLUSIONS: We document significant differences in smoking related behaviors between adolescent ITS and DS. These behaviors are independent of years of smoking. Given the risks from light and intermittent smoking, it is essential that we develop a greater understanding of adolescent ITS, including their difficulty quitting and the contextual factors influencing their smoking so that we may develop new interventions targeted towards their unique needs.

FUNDING: This study was conducted while the author was at the University of California San Francisco. Supported by NIH/NCI RO1 CA140216 and NIH/NCCR UCSF-CTSI Grant Number UL1 RR024131.

JUSTIFICATION: Understanding the different smoking patterns among adolescents will allow for the development of more tailored and successful smoking cessation programs.

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POS3-9
HIGH SCHOOL AND COLLEGE STUDENTS' KNOWLEDGE ABOUT AND PERCEPTIONS OF FLavored ELECTRONIC Cigarettes
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Electronic cigarette (i.e., Ecig) use is on the rise; 10% of high school students (CDC, 2011) and 5% of college students (Sutfin, 2013) report lifetime use. The increased popularity of Ecigs among young people may be due, in part, to the availability of flavored Ecigs. We ran 16 focus groups (6-8 students each) in 2 high schools and 2 colleges. We stratified groups by sex and smoking status. Independent raters coded group transcripts using thematic analysis. For the current study, we reviewed themes related to flavor and taste (descriptions of flavor). Students were aware that Ecigs come in myriad flavors, except for 2 college female non-smokers. All groups mentioned 3 flavor categories: 1) tobacco or menthol/mint; 2) fruits (e.g., cherry); and 3) candy (e.g., cotton candy). Students found the concept of flavors inherently appealing, but raised 3 primary concerns about their use in Ecigs: (1) The chemicals used to flavor Ecigs may be toxic (female college smokers); (2) Flavors may lead some people who otherwise would not smoke traditional cigarettes to become addicted to nicotine (male/female college smokers); and (3) Regularly using flavored Ecigs may make transitioning to smoking cigarettes more appealing and easier (e.g., less coughing; male college non-smokers). With respect to taste, most smokers who had tried Ecigs described their flavor negatively (e.g., gross, weird), although some suggested that brand and cost influence flavor quality. When comparing Ecigs to regular cigarettes, smokers largely agreed that they taste different but disagreed whether Ecigs taste better or worse. In sum, this study suggests that Ecig flavors appeal to youth and may increase risk for experimentation in non-smokers and smokers. However, among smokers who have tried Ecigs, many disliked their flavor both independently and relative to regular cigarettes.

FUNDING: This work was supported by the National Institute on Drug Abuse grant P50DA009241

JUSTIFICATION: The current study provides important information on high school and college students’ knowledge about flavored electronic cigarettes and their perceptions of how the wide range of available flavor options may encourage or deter youth from using electronic cigarettes.

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POS3-10
TIME DEPENDENCY OF CRAVING AND RESPONSE INHIBITION DURING NICOTINE ABSTINENCE
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Background: Nicotine withdrawal produces increased craving for cigarettes and deficits in response inhibition, a measure of impulsivity, and these withdrawal symptoms are predictive of relapse. Although these symptoms emerge during the early withdrawal period, there is mixed evidence regarding whether they occur simultaneously. Given the importance of the early withdrawal period, this study examined craving and response inhibition at 24 and 72 hours abstinence. Methods: Twenty-one (5 female) non-treatment seeking adult smokers (mean age = 35 years; mean CPD = 16; mean FTND = 4.8) were evaluated at baseline, 24 hours, and 72 hours abstinence for smoking behavior (verified by breath carbon monoxide), craving, and response inhibition. Craving was measured using the two factors from the Questionnaire on Smoking Urges - Brief (QSU-B) and response inhibition was measured using Stop Signal Reaction Time (SSRT) derived from the Stop Signal Task. Generalized linear regression models were used for the primary outcomes and Pearson correlations were used to examine the association between craving and response inhibition. Results: There was a significant increase in urges to smoke to relieve negative affect (factor 2) from Baseline to 24 hours abstinent (p=0.004), which subsided by 72 hours (baseline vs. 72 hours, p=0.08). There were no changes in factor 1 craving at 24 or 72 hours (ps>0.3). Marginal deficits in response inhibition did not emerge until 72 hours (p>0.056; baseline vs. 24 hours, p=0.32). No correlation was found between response inhibition and craving (ps>0.15). Conclusions: We observed an increase in urges to smoke to relieve negative affect, which peaked at 24 hours, suggesting a need to target negatively reinforced motivation for smoking during early abstinence. In contrast, the prolonged course of deficits in response inhibition indicates a need to address the cognitive impact of nicotine withdrawal over an extended period of abstinence (i.e., 72 hours). Characterizing the profile and time course of cognitive, affective, and physiological withdrawal symptoms may guide development of targeted treatments to help more people quit smoking.

FUNDING: P50 CA143187 (Lerman) Clinical Neuroscience Training Program, Perelman School of Medicine at the University of Pennsylvania (Tsaur)

JUSTIFICATION: This study provides information about the time course of cognitive and affective nicotine withdrawal symptoms.

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POS3-11
FRONTO-STRIATAL CIRCUITRY STRENGTH RELATES TO THE ROLE OF REWARD DEPENDENCE AND IMPULSIVITY ON NICOTINE DEPENDENCE

Moxi Zhou*, Vani Pariyadath, and Elliot A. Stein, National Institute on Drug Abuse

Individuals with high impulsivity are more likely to be addicted to smoking. In addition, the trait of reward dependence (RD) has also been linked to addictive behavior, and both these traits are associated with fronto-striatal circuitry. However, no studies have attempted to link the two traits together in the context of addiction. We compiled a dataset of 262 individuals (126 smokers) where one group consisted of healthy controls and the other of nicotine dependent individuals. We measured impulsivity through the Barratt Impulsivity Scale (BIS) and RD through the Temperament and Character Inventory (TCI). A linear regression analysis revealed a significant reward dependence by impulsivity interaction (RD x BIS) effect on smoking status. Next, to understand the neural mechanisms underlying this RD x BIS effect, we employed functional magnetic resonance imaging to study differences in resting-state functional connectivity (rsFC) between a cohort of smokers (n = 20) and nonsmokers (n = 21). Regions of interest (ROIs) were placed in six areas of the striatum: dorsal caudate, ventral caudate, nucleus accumbens, dorsal caudal putamen, dorsal rostral putamen, and ventral rostral putamen. We focused on the rsFC between these ROIs and the PFC using a linear mixed effect model involving a three-way interaction between smoking status, RD, and impulsivity, and found a significant interaction effect in functional connectivity strength between the ventral caudate to the dorsolateral PFC. Interestingly, the smoker and nonsmoker group showed opposite patterns of interactions within this circuit: for the nonsmoker group, the RD x BIS effect is in an inverted “U-shaped” curve, whereas an upright curve was observed in the smoker group. We did not observe an effect of nicotine addiction severity (measured with FTND) or cigarettes per day on the strength of this circuit, suggesting that the interaction effect may indicate a predisposition to smoking and nicotine addiction. Future studies will examine how the strength of this RD x BIS circuit influences performance on impulsivity and reward learning tasks.

FUNDING: This work was supported by the National Institute on Drug Abuse, Intramural Research Program, NIH/NIHSS.

JUSTIFICATION: By using the traits and brain pathways involved, our findings have implications for prevention and early intervention strategies of nicotine addiction.

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POS3-12
RANDOMISED TRIAL OF A DECISION AID FOR SMOKERS UNDERGOING SURGERY

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Elective surgery provides an excellent opportunity to address patients’ smoking behavior to improve both short- and long-term outcomes. Decision aids (DA), tools designed to facilitate patient participation in decision making about health care, have been applied to increase the involvement of patients in decisions related to their tobacco use behavior. The purpose of this study was to design and test a DA for smokers undergoing elective surgical procedures. After initial formative work and pilot testing, a DA for the perioperative setting was formulated, including three choices: continue to smoke, “quit for a bit” (abstinence from the morning of surgery to one week after surgery), and quit for good. It was comprised of 3 cards, distributed to the patient by nursing staff at the time of patient rooming, that were used by physicians to initiate and support conversations about perioperative tobacco use. After development, the DA was tested in a trial of 130 cigarette smokers being evaluated preoperatively for elective surgery. Subjects were randomized to receive either the DA or usual care, both delivered by regular clinical staff physicians and residents with minimal training in tobacco control. Primary outcomes included the Decisional Conflict Scale (DCS, reflecting the state of uncertainty regarding a given course of action) and the COMRADE scale (assessing risk communication and treatment decision making). We found that compared with usual care, the DA significantly decreased the DCS score (from 30.2 ± 9.8 [M±SD] to 26.7 ± 7.9, p= 0.029, t-test) and the COMRADE score (from 17.1 ± 7.1 to 14.0 ± 4.8, p=0.006), indicating that the DA was efficacious in improving decisional quality. Assessments found good acceptance of the DA by both patients and physicians. Given the efficacy of this approach in terms of decisional quality, further studies are indicated to explore the role of DAs in tobacco control, especially with clinician-delivered tobacco interventions.

FUNDING: Supported by R21 CA143171

JUSTIFICATION: This Decision Aid hopes to facilitate conversation about perioperative smoking between the patient and the clinician.

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POS3-13
VARIATIONS IN NICOTINE METABOLISM AMONG MALE AND FEMALE CAUCASIAN SMOKERS

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Significance: Sex is an important factor that mediates the neurobiological response to nicotine, and ultimately the course of dependence behavior in humans that smoke cigarettes. Basic science research has demonstrated nicotine-induced sex differences in animal models by measuring various behavioral and non-behavioral indices. Epidemiological research also strongly suggests sex differences in tobacco use and abuse. Estrogen-induced alterations in the expression of cytochrome P450 enzymes have been reported, and these perturbations in hepatic enzyme expression may alter nicotine metabolism. Because little is known about the variations in nicotine metabolism among male and female Caucasians, we conducted a study to characterize rate of nicotine metabolism among Polish smokers. Materials and Methods: In a cross-sectional study of 187 daily cigarette smokers (102 females), we collected spot urine samples and measured 3'-trans-hydroxycotinine and cotinine levels with LC-MS/ MS method. We calculated Nicotine Metabolite Ratio (NMR), a phenotypic and noninvasive indicator of nicotine metabolism rate, defined as a molar ratio of two major metabolites of nicotine: trans-3'-hydroxycotinine over cotinine. We analyzed variations in NMR among various groups of smokers using analysis of variances with sex and age as independent variables. Results: In a whole study group, an average NMR was 4.77 (95% CI: 4.35 – 5.22). Statistical analysis revealed significant difference between the group of women below 40 years, and the rest of the female population (6.20; 95%CI: 6.12 - 7.91 vs. 4.47; 95% CI: 4.42 - 5.91). No statistical changes were found in male smokers of various ages. Conclusions: This is a first study to describe variations in nicotine metabolism among Polish smokers. Our findings suggest that young Caucasian women metabolize nicotine faster than the rest of the population. The increased nicotine metabolism in female relative to male smokers may be mediated by circulating gonadal hormones. Clinical trials are needed to assess whether young Caucasian women require higher doses of NRT during smoking cessation treatment.

FUNDING: The study was supported by the Medical University of Silesia grants KGW-2-185/09 and KGW-2-185/09.

JUSTIFICATION: This is a first study to describe variations in nicotine metabolism among Polish smokers suggesting that young Caucasian women might require higher doses of NRT during smoking cessation treatment.

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POS3-14  PREDICTION OF SMOKING CESSTION OUTCOMES USING POSITRON EMISSION TOMOGRAPHY MEASUREMENT OF BRAIN NICOTINIC ACETYLCHOLINE RECEPTOR LEVELS

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Background: Up-regulation of nicotinic acetylcholine receptors (nAChRs), including the common alpha4beta2 nAChR subtype, is one of the most well-established effects of smoking on the human brain. While subjective aspects of tobacco dependence have been extensively examined as predictors of quitting smoking with treatment, we are not aware of studies determining the relationship between pre-treatment up-regulation of nAChRs and smoking cessation with a standard course of treatment. Method: 81 tobacco-dependent smokers underwent positron emission tomography (PET) scanning with the radiotracer (2-FA for labeling alpha4beta2 nAChRs) followed by double-blind, placebo-controlled treatment with nicotine patch (random assignment). Results: Smokers with less up-regulation of nAChRs were found to have a greater likelihood of quitting smoking with treatment, regardless of treatment group assignment. Furthermore, mean 2-FA binding provided greater ability to predict treatment response above and beyond pre-treatment subjective measures known to predict response (i.e., levels of nicotine dependence, craving, and self-efficacy). Discussion: Study results demonstrate that smokers with less severe up-regulation of alpha4beta2 nAChRs had a greater likelihood of quitting smoking than smokers with more severe up-regulation. While we recognize that the costly, time-consuming PET procedure used here is not likely to be used clinically, simpler PET or single photon emission computer tomography methods with shorter scanning times could be tested and applied to help guide treatment for cigarette smoking in the future.

FUNDING: This study was supported by the National Institute on Drug Abuse (A.L.B. [R01 DA028723]), the Tobacco-Related Disease Research Program (A.L.B. [10XT-0134]), and the Department of Veterans Affairs, Office of Research and Development (CSR&D Ment Research Award 101 CX000412 [A.L.B.]). The sponsors had no role in the design and conduct of the study; collection, management, analysis, and interpretation of the data; or preparation, review, or approval of the manuscript.

JUSTIFICATION: The biological marker here (up-regulation of nicotinic acetylcholine receptors) was found to provide information as to which smokers are more or less likely to quit smoking with standard treatment.

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POS3-15  EXPERIMENTAL EVIDENCE THAT WITHDRAWAL SYMPTOMS MEDIATE THE EFFECT OF TOBACCO ABSTINENCE ON MOTIVATION TO INITIATE SMOKING

Jillian Madrid*, Claudia Aguirre*, and Adam M. Leventhal, Ph.D., University of Southern California

BACKGROUND: Withdrawal-based theories of addiction assume that the motivation to resume drug use following acute abstinence is mediated by withdrawal symptoms. Extant tests of this hypothesis often rely on between-subject analyses of clinical trial data, which are prone to unmeasured confounds, testing order effects, and sample bias caused by more dependent users failing to obtain abstinence. Within-subject experimental designs are not prone to such limitations. AIM: This within-subject lab study examined the extent to which three core components of withdrawal (i.e., low positive affect, negative affect, and urge to smoke) mediated the effect of experimentally manipulated abstinence on motivation to smoke. We also tested if each withdrawal component mediated motivation to resume smoking via unique pathways. METHOD: Daily smokers (N=286) attended two counterbalanced lab sessions (16 hr smoking abstinence and ad lib smoking). At both sessions, subjects reported withdrawal symptoms, affect, and urge and then completed a behavioral task in which they were monetarily rewarded for delaying smoking at 5-min intervals, with shorter latency to smoking reflecting stronger motivation to resume smoking. RESULTS: Within-subject generalized estimating equation models indicated that abstinence reduced latency to smoking and positive affect and increased composite withdrawal symptom level, urge, and negative affect (p<.0001). When each withdrawal component was examined in isolation, product of coefficients analyses indicated that the effect of abstinence on latency to smoking was significantly mediated by each withdrawal component. Combined multiple mediator analyses showed incremental mediational effects through urge (Beta = .23, p < .0001) and diminished positive affect (Beta = .023, p < .05), but not negative affect. CONCLUSION: This study provides the first experimental evidence that within-person variation in abstinence impacts motivation to resume smoking by impacting withdrawal symptoms. Urge and diminished positive affect that ensues upon abstinence may be unique withdrawal-mediated mechanisms underlying tobacco addiction.

FUNDING: This research was supported by NIDA grant R01-DA26831

JUSTIFICATION: Understanding urge and diminished positive affect following acute abstinence may be helpful in understanding the withdrawal-mediated mechanisms underlying tobacco addiction which in turn helps in creating more effective cessation programs.

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POS3-16  USE OF MEDIATIONAL MODELS IN PREDICTING SMOKING CESSTION TREATMENT ATTENDANCE

Aaron K. Haslam*, Josh Gottlieb, Michael Sustaita, Charlene M. Key, Nicole Harris, Noreen Watson, Gabriella Grimaldo, and Lee M. Cohen, Texas Tech University

Smoking cessation interventions can help cigarette smokers quit (Valery et al., 2008); however, attendance in treatment sessions is critical if one is to be successful long term (Patterson et al., 2003). Despite this, research has shown that poor attendance rates are common problems in smoking cessation programs (Curtin et al., 2000). The purpose of the present study was to use mediational models to better understand what may predict attendance. Depressive symptoms, nicotine dependence level, perceived health risks of smoking, and age have all been shown to predict treatment attendance (e.g., Peterson et al., 2003; Wagner et al., 1990). Pilot data were used from an ongoing smoking cessation study that is comparing the differential effectiveness of a 10-week cognitive behavior therapy (CBT) smoking cessation protocol to the same protocol with an additional smoking therapy (CBT) smoking cessation protocol to the same protocol with an additional emphasis on the use of either exercise or on confectionery chewing gum as adjuncts to treatment. The bias-corrected bootstrap method of mediation was utilized using the Process macro (Hayes, 2012) in SPSS (V.20). Five-separate mediation analyses were conducted. Results indicated that nicotine dependence mediated the relationship between age and attendance with the 95% confidence interval (CI) of the indirect effect spanning from -.036, -.0008. However, neither perceived health risks of smoking or number of health problems were shown to mediate the relationship between age and treatment attendance (95% CI -0.322, .0018; -.2666, .005 respectively). Depression scores and nicotine dependence scores also did not mediate the relationship between number of reported health problems and attendance (95% CI -1.218, -1.226; -.0531, .3098 respectively). Results revealed that the level of nicotine dependence, as a person reports is a mediating factor for the relationship between age and attendance. Specifically, reducing nicotine dependence may improve attendance among older smokers wishing to quit. Future research should assess additional mechanisms of attendance as this information could help improve upon the poor attendance rates currently observed in smoking cessation programs.

FUNDING: The Laura W. Bush Foundation & The Cancer Research and Prevention Institute of Texas

JUSTIFICATION: This study found that level of nicotine dependence mediated the relationship between age and treatment attendance, indicating that addressing issues related to nicotine dependence may reduce the effect age has on attendance.

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POSTER SESSION 3 • FRIDAY, FEBRUARY 7, 2014 • 5:15 P.M.–6:45 P.M.

POS3-17
ASSOCIATION BETWEEN NICOTINE DEPENDENCE SEVERITY AND STRIATAL RESPONSE TO REWARD AMONG SMOKERS WITH AND WITHOUT ADHD

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Smoking and attention deficit-hyperactivity disorder (ADHD) are highly comorbid conditions, and both have been associated with alterations in neural pathways involved in reward processing. Individuals with ADHD have been shown to exhibit attenuated striatal response to reward anticipation relative to healthy controls. Similar hypoactivation to reward has been observed among smokers, but little is known about how reward processing may differ between smokers with and without ADHD or how these differences may be moderated by severity of nicotine dependence. Here, we examined striatal activation in anticipation of monetary reward during an fMRI monetary incentive delay task among 32 daily smokers (15 ADHD+, 17 ADHD-). Analyses focused on a satiated scan conducted as part of a larger study examining dopaminergic functioning in adolescents with and without ADHD. Nicotine dependence was measured using the Fagerstrom Test for Nicotine Dependence (FTND). We hypothesized that ADHD+ smokers would exhibit decreased striatal activation in anticipation of monetary reward compared with ADHD- smokers and that striatal response to reward would be negatively correlated with FTND scores among both groups. Analyses conducted using FSL and cluster-corrected for P < .05 within the ventral and dorsal striatum revealed robust reward-related activation among both groups, but no difference between ADHD+ and ADHD- smokers. ADHD+ and ADHD- smokers also did not differ on FTND scores. Among ADHD- smokers, higher scores on the FTND were associated with reduced striatal activation to reward; no association was seen among ADHD+ smokers. Lack of group differences in reward processing between ADHD+ and ADHD- smokers could reflect underlying deficits in reward processing common to both disorders, rather than an additive effect of smoking and ADHD. Variability in nicotine dependence may be an important correlate of reward functioning among otherwise healthy smokers, whereas individuals with ADHD may experience reward deficits regardless of dependence level. Future research should target deficits in reward functioning as a potential mechanism contributing to difficulty quitting among smokers with ADHD.

FUNDING: This research was supported by R01 DA024838.

JUSTIFICATION: Deficits in reward processing may be an important mechanism underlying to comorbidity between ADHD and smoking, and future research in this area may contribute to improved treatments.

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POS3-18
PRELIMINARY RESULTS FROM A PILOT STUDY OF AN ACCEPTANCE AND COMMITMENT THERAPY SMOKING CESSION TREATMENT FOR VETERANS WITH POSTTRAUMATIC STRESS DISORDER

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Veterans with posttraumatic stress disorder (PTSD) have high rates of smoking and low rates of quitting. Acceptance and mindfulness-based techniques may enhance tobacco cessation approaches for people with PTSD as they are designed to improve emotion regulation skills related to coping with elevated negative affect and withdrawal symptoms associated with quit attempts. Veterans with current PTSD and smoking ≥ 15 cigarettes/day (N=19) participated in an open trial of Acceptance and Commitment Therapy for Veterans with PTSD and Tobacco Use (ACT-PT). Participants attended nine weekly individual counseling sessions and received eight weeks of the nicotine patch. Primary outcomes included expired-air carbon monoxide confirmed seven-day point prevalence abstinence and number of cigarettes/day. Intent-to-treat analyses also examined the following pre-treatment to post-treatment: PTSD symptoms (PTSD Checklist), health-related quality of life (SF-36), and smoking urges (Questionnaire of Smoking Urges). At the end of treatment (one month after targeted quit date), 37% (7/19) of participants were abstinent from smoking, 37% (7/19) were abstinent from smoking at the one month follow-up, and 16% (3/19) were abstinent at the three month follow-up. Subjects reduced from 26 cigarettes/day at baseline to 10 cigarettes/day at the end of treatment (p<.001), and 15 cigarettes/day at the 3-month follow-up (p<.002). PTSD symptoms and smoking urges due to positive reinforcement significantly decreased from baseline to the end of treatment (p<.001), and continued to remain significantly decreased at the 3-month follow-up (p=.011 and p=.013). Smoking urges due to negative affect significantly reduced at the end of treatment (p=.005), but not the 3-month follow-up. Veterans indicated that their general health significantly improved at the one-month follow-up (p=.023). The retention rate (74%), client satisfaction ratings and qualitative feedback from subjects indicated that the treatment was acceptable. Although preliminary, these results suggest that ACT-PT is a promising smoking cessation treatment for Veterans with PTSD. Longer follow-up and randomized controlled studies are needed.

FUNDING: This material is based upon work supported by the Department of Veterans Affairs, Veterans Health Administration, VISN 1 Early Career Development Award and MIRECC funding to Megan M. Kelly.

JUSTIFICATION: Results from this pilot study show that tailored approaches to treating Veterans with PTSD who smoke may be effective and enhance tobacco cessation approaches for this treatment refractive group.

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POS3-19
THE RESTING STATE FUNCTIONAL CONNECTIVITY AND ADDICTION DATABASE (RAD): A NEUROIMAGING REPOSITORY OF STUDIES OF NICOTINE DEPENDENCE AND OTHER ADDICTIONS

Joseph McClernon, Ph.D.*,1, Allen Song, Ph.D.2, Brett Froeliger, Ph.D., Christina Meade, Ph.D.1, Matt Hallyburton1, Chris Petty1, Syam Gadde1, and Rachel Kozink1, 1Duke Medicine, 2Medical University of South Carolina

Research on resting state functional connectivity (RSFC) from BOLD-fMRI signal is revealing new information regarding the neurobiology of complex behavioral phenotypes including psychiatric disorders and addiction. The task-free nature of RSFC makes it possible to analyze data across sites and samples and has led to the creation of large-scale repositories, e.g., 1000 Functional Connectomes and the ADHD-200. We have designed and developed an RSFC of Addiction Database (RAD) for storing, managing, and sharing RSFC data acquired from addiction research studies. RAD is implemented in XNAT—an open source informatics platform for imaging data. The repository currently consists of 800 RSFC scans from 380 smoker and nonsmoker adults; samples of additional patient populations including psychostimulant users and HIV+ individuals are currently being added. In addition to RSFC scans acquired under different drug states (satiation, withdrawal), the repository includes a broad range of phenotypic data including self-report measures of drug history and psychiatric symptoms, biochemical variables, and clinical outcomes (e.g., course of addiction, treatment outcomes). Structural (T1) and functional connectivity (fMRI) images are also included. The functionality, goals, and plans for RAD will be further presented including plans for incorporating data from additional labs and patient populations, and for sharing of RAD datasets.

FUNDING: This research was supported by R21 DA033083-S1, R21 DA033083, R01 DA025876, R01 DA024838, R01 DA023516, P50 DA027840-5961 & K23 DA017261 (FJM); and R01 DA033459 & R03 DA026536 (BF).

JUSTIFICATION: This database will provide an new and unique resource for analyses of the neural basis of nicotine dependence and related phenotypes.

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POS3-20

PROCESSES PROMOTING SMOKING CESSATION AFTER SMOKING VERY LOW NICOTINE CONTENT CIGARETTES

Sarah S. Dermody*, Eric C. Donny1, Dorothy Hatuskami2, University of Pittsburgh, 2University of Minnesota

Very low nicotine content (VLNC) cigarettes appear to reduce smoking and facilitate cessation. The processes promoting cessation after smoking VLNC cigarettes have not been evaluated. In addition to reduced nicotine exposure, interrelated processes may facilitate quit attempts such as co-occurring reductions in smoking rate and cigarette reward. The present study examined these potential mechanisms among individuals who smoked VLNC cigarettes for 6 weeks. Data from two studies examining the effects of VLNC cigarettes (0.05–0.09 mg nicotine yield) on smoking outcomes were combined (N=125;[Hatuskami et al., 2010; Hatuskami et al., 2013]). Treatment-seeking smokers made a quit attempt after smoking VLNC cigarettes for 6 weeks. Using logistic regression, this study examined predictors of self-reported abstinence at week 6 and biomarker-confirmed abstinence at week 10 among participants who completed the 6 week intervention (n=86). Predictors included difference scores (baseline – week 6) of cigarettes per day (CPD), nicotine dependence level excluding CPD (FTND), cotinine levels, and self-reported cigarette satisfaction (e.g., satisfaction, taste) and reward (e.g., mood regulation, reducing hunger, etc.). When examined separately, reductions in CPD (OR:1.15; OR:1.12) and cotinine (OR:1.78; OR:2.33) predicted abstinence at weeks 7 and 10, respectively, controlling for baseline levels of each predictor. Reductions in satisfaction predicted abstinence at week 6 only (OR:2.60). When examining the significant predictors in one model, only changes in cotinine consistently predicted abstinence at weeks 7 (OR:1.94) and 10 (OR:1.87). Reductions in satisfaction also predicted abstinence at week 7 (OR:1.68). The effects were not moderated by gender. As expected, reductions in nicotine exposure appear to be the critical factor promoting abstinence while smoking VLNC cigarettes. Reductions in smoking reward may also be important during early quit attempts. Future research should evaluate factors that may undermine the extent of nicotine reduction during treatment, such as non-compliance and nicotine metabolism, to facilitate successful quit attempts.

FUNDING: The study was funded by Altria Client Services.

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POS3-22

A PHARMACOKINETIC STUDY TO DETERMINE PLASMA NICOTINE PROFILE FROM TWO ELECTRONIC CIGARETTE PROTOTYPE PRODUCTS IN ADULT CIGARETTE SMOKERS

Jianmin Liu*, Qiwei Liang, Chris Connell, Lonnie Rimmer, Jeffery Edmiston, and Mohamadi Sarkar, Altria Client Services Inc., Research, Development & Engineering, Richmond, VA

This study evaluated the exposure to nicotine in adult smokers following the use of two electronic-cigarette (EC) prototypes relative to own cigarettes and Nicotrol® Inhaler (NI) use. The study was designed as an open label, 4-way randomized crossover study. Adult smokers (n=24), generally in good health (age 21–65 years) smoking ≥15 cigarettes daily were enrolled. Subjects were randomly assigned to use each of the four products: “A” =subjects’ own brand cigarette; “B” =NI [10 mg]; “C” = EC prototype (containing 2% tobacco derived nicotine); and “D” = EC prototype (containing 2% tobacco derived nicotine and 2% menthol). Each product was used 12 times with a washout day in-between. Product use conditions were: “A” - 10 puffs over 5 minutes; “B” - 80 inhalations over 20 minutes (as described in the product label), or “C” and “D” - 10 5-second puffs over 5 minutes. Blood samples were collected before and for 1 hour after the first and for 2 hours after the 12th product use. Adverse events (AEs) were monitored throughout the study. Following the first product use, the Cmax_1, (ng/mL) Tmax_1 (h) and AUC0-1 (ng·h/mL) were calculated for each EC prototype. The Cmax_2, (ng/mL) and AUC0-2 (ng·h/mL) were calculated for both EC products. The Cmax_1, for the NI inhaler was calculated with the use of 10 puffs over 5 minutes. The Cmax_2, was calculated for the NI inhaler using the use of 80 inhalations over 20 minutes. The Cmax and AUC values were compared between the two EC prototypes and the NI inhaler using ANOVA with Bonferroni post hoc analysis. The limitations of this study were the short duration of study limit the conclusions from this study.

FUNDING: This study was funded by Altria Client Services.

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POS3-21

SIMULTANEOUS ASSESSMENT OF PUFFING TOPOTOGY AND INHALATION/EXHALATION AND COMPARISONS WITH BIOMARKERS OF EXPOSURE

Jianmin Liu*, Qiwei Liang, and Mohamadi Sarkar, Altria Client Services Inc., Research, Development & Engineering, Richmond, VA

It has been reported that puff topology may be useful to estimate the delivery of smoke constituents. The change in inhalation/exhalation process has also been suggested to influence the uptake of certain smoke constituents. However, the two distinct phases of smoking (puffing followed by inhalation) are generally not considered when evaluating smoking behavior. The objective of this double-blind randomized two-way crossover study was to evaluate the effect of switching cigarettes with different machine-measured tar yields (tar) on puff volume (PV), number of puffs (NP), puff duration (PD), inter-puff interval (IPI), peak flow rate, inhalation (IV) and exhalation volume (EV), nicotine equivalents (NE, nicotine and five metabolites), and carboxyhemoglobin (COHb). The study was approved by an IRB and all subjects gave informed consent. Twenty male adult smokers (AS) smoked their own cigarettes (tar > 13 mg) at baseline (BL, Day -1), and then were randomly assigned to either smoke test cigarette 1 (TCH, tar=15.8 mg) for two days followed by test cigarette 2 (TCL, tar=6.8 mg) for another two days, or smoke TCL followed by TCH. The inhalation/exhalation was characterized using the LifeShirt® device for the 1st through the 7th cigarettes, at ~1h interval. Puffing topography was assessed using the PlowShare® CreSS microdevice for the 1st, 3rd, 5th, and 7th cigarettes. 24h urinary excretion of NE and evening blood COHb were measured at all study days. The PV were (mean±SD) 69.3±18.6 (BL), 59.4±18.3 (TCH), and 69.3±19.2 (TCL, p<0.05 vs TCH, ANCOVA) mL, respectively. The IPI were 38.6±10.8 (BL), 37.2±10.2 (TCH), and 33.3±9.0 mL, respectively. The IV were 1104±566.2 mL, 967.9±353.6 mL, and 1145.6±562.3 mL, respectively. The NE were 24.9±8.1, 25.0±8.0 and 22.9±7.1 mg/24h, respectively. Statistical significant differences were observed in some of the topography parameters between TCH and TCL, but not in IV and EV. In this study, smoking cigarettes with different machine measured tar yields did not impact inhalation/exhalation parameters. However, the small sample size and short duration of study limit the conclusions from this study.

FUNDING: The study was funded by Altria Client Services.

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POS3-23

ASSESSMENT OF DOXAZOSIN XL AS A TREATMENT FOR NICOTINE DEPENDENCE

Jin H. Yoon*, Thomas F. Newton, Rollin Y. Hawkins, and Richard De La Garza, II, Baylor College of Medicine

Growing evidence suggests that the adrenergic system plays an important role in stimulant dependence, including nicotine. The purpose of the current, ongoing study is to assess the efficacy of an adrenergic compound (4 mg, doxazosin XL) as a potential treatment for nicotine dependence. Participants will consist of otherwise healthy, treatment-seeking, nicotine-dependent volunteers. Participants will be randomized to receive the study medication or placebo in a double-blind...
manner for two weeks. Across 4 visits, participants will receive cognitive-behavioral therapy and smoking will be assessed via self-report, breath CO, and salivary cotinine. Additionally, ecological momentary assessment (EMA) will be utilized to assess daily changes in smoking, withdrawal, craving, and anhedonia. 11 participants have completed the study to date, and we project reaching our target (N=30) by January, 2014. To date, 92.7% of participants have completed the study with 95.8% session attendance. Among relevant baseline smoking measure, FTND scores were 5.5±1.1 (Mean±SD), years smoke was 23.6±11.7 yrs, cigs/day was 17.3±5.9, and breath CO was 19.5±5.0 ppm. Relative to baseline, significant decreases in smoking have been observed by the end of treatment as measured by breath CO (7.6±5.0 ppm; p<.0001) and cigs/day (4.9±5.4; p<.0001). Additionally, 91% (219/241) of EMA questions were answered and adverse events have been reported. The preliminary results are promising and show that our treatment is both readily tolerated and effective at reducing cigarette smoking. Based on these initial findings, we predict we will be able to ascertain any effects of doxazosin XL on nicotine dependence once we reach our target sample size.

FUNDING: Baylor College of Medicine, Junior Faculty Funding

JUSTIFICATION: The current study may identify a novel medication for treatment of nicotine dependence.

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POS3-24
CONFIDENCE IN ABILITY TO USE SKILLS TO QUIT (CAUS-Q): A NEW MEASURE OF SELF-EFFICACY FOR QUITTING SMOKING
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INTRODUCTION: Self-efficacy reliably predicts smoking abstinence in smokers trying to quit and a brief, valid measure of self-efficacy may be a useful tool for clinicians treating tobacco dependence. METHODS: Participants were 476 adult smokers seeking treatment in a tobacco dependence treatment clinic who completed a new 6-item measure of self-efficacy for quitting smoking. Tobacco use was assessed by telephone at one- and six-months after their initial appointment. RESULTS: The 6-item measure demonstrated good internal consistency reliability (Chronbach’s alpha = 0.844). In addition, it was significantly related to a one-item measure of confidence for quitting smoking, r(399) = 0.313, p < 0.0001, thus demonstrating good concurrent validity. We evaluated the predictive validity of the CAUS-Q through a stepwise logistic regression model with CAUS-Q score as a predictor of abstinence. Cigarettes smoked per day, single-item measures of importance of quitting smoking, and of confidence in ability to quit were included in the model as covariates. The CAUS-Q score predicted six-month, OR = 1.087, 95% CI (1.015 - 1.164), p = 0.0174, but not one-month abstinence. We re-ran the stepwise logistic regression analyses after assigning non-abstinent status to all missing cases. In this penalized imputation strategy, neither the one- nor the six-month relationships were statistically significant. There were no differences on any baseline variables between those who did and those who did not provide follow-up data (all p > .05). CONCLUSIONS: This study examined a new, reliable and valid 6-item measure of self-efficacy for quitting smoking. We were surprised that this measure predicted abstinence at a longer (6-months), but not at a shorter-term follow-up (1-month). Because this study was conducted in a clinic, rather than as part of a trial, there was no standard target quit date. It is therefore possible that many participants did not attempt to quit within the first month, therefore reducing the association between self-efficacy and quitting at that early time point.

FUNDING: No Funding

JUSTIFICATION: A brief, valid measure of self-efficacy may be a useful tool for clinicians treating tobacco dependence.

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POS3-25
THE EFFECT OF A VERY LOW NICOTINE CONTENT EXPECTANCY ON CIGARETTE HEALTH RISK PERCEPTIONS, SUBJECTIVE EFFECTS, AND PREDICTED QUITTING
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Very low nicotine content (VLNC) cigarettes have been shown to decrease smoking rate and dependence (Hatsukami, 2010), and the FDA may consider a reduced nicotine product standard to reduce public harm. However, most studies of VLNC cigarettes to date have blinded subjects to the nicotine content, so little is known about how smokers perceive cigarettes with known very low nicotine levels and how this knowledge impacts cigarette use. The present study was a within-subjects experimental design in which 68 adult daily smokers tried two identical Quest 3 (0.05 mg nicotine yield) cigarettes in a single session (counterbalanced order). Before smoking, they were told that one cigarette contained “average” nicotine, and the other contained “very low” nicotine. Smokers rated each cigarette on several measures after sampling them. Analyses included paired samples t-tests, Wilcoxon matched pairs test, and McNemar’s test. Smokers rated the cigarette associated with “very low” nicotine as less risky to their health overall than the cigarette associated with “average” nicotine (p<0.001), and this held true for specific disease risks including lung cancer, heart disease, emphysema, stroke, chronic bronchitis, and other cancers (all p’s <0.001). In addition, smokers rated the cigarette associated with “very low” nicotine as having lower desirable subjective effects than the cigarette associated with “average” nicotine, including reduced satisfaction, overall enjoyment, taste, flavor, enjoyment of respiratory sensations, calming effects, and awakening effects (all p’s< .05). Moreover, smokers predicted having greater interest in quitting smoking in 1 month, 6 months, and 1 year (all p’s <0.02) when considering exclusive availability of the cigarette associated with “very low” nicotine. Similarly, smokers predicted actually quitting smoking in 5 years more frequently when considering exclusive availability of the cigarette associated with “very low” nicotine (p<0.04). In conclusion, explicit knowledge of very low nicotine content changes the smokers’ perception of VLNC cigarettes, resulting in reductions in predicted harm, subjective effects, and likelihood of continued use.

FUNDING: NIDA U54DA031659

JUSTIFICATION: This study may help inform policy makers about the effects of labeling and marketing very low nicotine content cigarettes, and may also help inform research designs in the future exploring the behavioral effects of very low nicotine content cigarettes.

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POS3-26
DEPRESSION AND ANXIETY SYMPTOMS MODERATE THE RELATION BETWEEN NEGATIVE REINFORCEMENT SMOKING OUTCOME EXPECTANCIES AND NICOTINE DEPENDENCE
Raina D. Pang, Ph.D.*, 1,2 Casey R. Guillot, Ph.D., 1, and Adam M. Leventhal, Ph.D.* 1Department of Preventive Medicine, University of Southern California Keck School of Medicine, 2Department of Psychology, University of Southern California Keck School of Medicine

BACKGROUND: Expectations of the reinforcing effects of smoking are thought to act as powerful motivational factors driving smoking behavior and can be parsed into (1) relief of negative affect and (2) production of pleasure. Similarly, emotional disorder symptoms can be parsed into anxious arousal, general distress anxiety, general distress depression, and anhedonia. The extent to which smoking reinforcement expectancies impact nicotine dependence may be amplified in depressed and anxious smokers who are motivated to delimit appetitive deficits and aversive excesses associated with their emotional disturbance. This study examined emotional disorder symptom components as moderators of the relation between smoking reinforcement expectancies relations and nicotine dependence.

METHODS: In a cross-sectional design, 317 daily smokers completed self-report measures of smoking reinforcement expectancies, mood and anxiety symptoms, and nicotine dependence. RESULTS: Linear regression models showed that anxious arousal and anxiety- and depression-related forms of general distress
Moderated relations between negative reinforcement smoking expectancies and nicotine dependence severity \( (β_s = .13-14; p_s = .02-.03) \), such that with increasing symptom level, the association between negative reinforcement expectancies and nicotine dependence was strengthened. By contrast, depression or anxiety symptoms did not moderate relations between positive reinforcement expectancies and dependence. Anhedonia did not moderate relations between either reinforcement smoking expectancy measure and nicotine dependence \( (β_s = .05-.09; p_s = .10-.35) \). CONCLUSIONS: Distinct components of anxiety and depressive symptoms interact differently with smoking reinforcement expectancies. Anxiety and depressive symptoms characterized by excesses in aversive (but not deficits in appetitive) functioning may amplify the tendency to act on reinforcement expectancies by smoking. Cessation treatments that target negative reinforcement expectancies may be useful for emotionally distressed smokers.

FUNDING: FUNDING: NIH Grant R01-DA033296, American Cancer Society Grant RSG-13-163-01, and TRDRP Grant 22FT-0062.

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**POS3-28**

**DEPENDENCE MOTIVES ARE RELATED TO ENVIRONMENTAL REWARD AND TO AVOIDANCE IN LOW-INCOME ADULT TREATMENT-SEEKING SMOKERS**

Alexandra Houston-Ludlam, B.S., Aaron Lim, B.A., Nailah Harrell, M.A., Fernanda Oliveira, B.A., and Laura MacPherson, Ph.D., University of Maryland, College Park

Introduction: Depressive symptoms remain a risk factor for poor cessation outcomes. Behavioral activation (BA) -based cessation interventions may benefit smokers with elevated depressive symptoms though reinforcement-contingent mechanisms of action. However, the relationships between measures of access to and availability of environmental rewards, which are fundamental targets of BA, with nicotine dependence motives, have yet to be examined. We expected that in particular secondary nicotine dependence motives, focused on functional and situational factors, would be associated with lower availability of reward in one’s environment. Method: The sample included 139 adults daily smokers (38.2% female, 80.3% African-American, Age M(SD)=43.2(12). Median Income = $20,000 – 29,999) with elevated depressive symptoms (baseline BDI-II score >= 10) enrolled in an RCT of a behavioral smoking cessation program. Participants completed at baseline the WISDM, and measures of smoking behavior as well as the Reward Probability Index (RPI) which assesses the dimensions of reward probability and environmental suppressors (ES). We also included the Behavioral Activation for Depression Scale (BADS), Avoidance/Rumination subscale, or avoidance of negative appetitive states and engaging in rumination rather than active problem solving. Results: Partial correlations co-varying for depressive symptoms and cigarette consumption indicated that WISDM Secondary Motives of Social Environmental Goals, Positive Regulation, Negative Regulation, Affiliative Attachment, and Behavioral Choice subscales correlated with the Avoidance/Rumination subscale of the BADS, and both subscales and total score of RPI. Correlations ranged from .17 to .46 \( (p_s < .05) \). Conclusion: Smokers with higher levels of nicotine dependence had higher levels of avoidance/rumination, and perceived lower environmental rewards and higher environmental suppressors. Findings remain after controlling for depressive symptoms and smoking behavior, suggesting that secondary nicotine dependence motives may be particularly relevant to BA intervention.

FUNDING: R01 DA018730 (MacPherson)

**JUSTIFICATION:** The objective of this presentation is to provide an examination of smoking dependence motives and their relationship with essential behavioral activation intervention targets including access to and availability of reward as well as engagement in avoidance behaviors.

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**POS3-29**

**IMPACT OF EXERCISE ON CHANGING FOOD CRAVINGS IN POSTMENOPAUSAL WOMEN DURING SMOKING CESSATION**

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Fear of weight gain is a primary barrier to successful smoking cessation for women. A major cause of post-cessation weight gain is increased food intake, which is generally associated with cravings for sweet or rich foods. Exercise may be a useful smoking cessation intervention to limit weight gain, as it increases overall caloric output and affects appetite. However, research exploring the relationship between exercise, appetite, and smoking cessation is lacking. This study investigates the impact of an exercise program (versus relaxation as control) on food cravings during smoking cessation in postmenopausal female smokers. Postmenopausal women who smoked ≥10 cigarettes per day and who were in stable physical/mental health were enrolled in this prospective, randomized study. Participants were assigned to a smoking cessation intervention group which was randomized to use exercise or relaxation as an adjunct. The intervention also included a pre-labeled variety of snacks (in Italy) and cognitive behavioral therapy. Participants completed the Questionnaire on Cravings for Sweet or Rich Foods (QCSRF) weekly for four weeks and once three months after quit-date to assess cravings for sweet, rich, and salty foods. Analysis of results included descriptive statistics and logistic regression models adjusting for smoking history and status and medication compliance. Participants (n=103) were mostly non-Hispanic white (98%) with an average age of 56.6±5.4 and baseline BMI of 28.0±5.7. Preliminary results showed a decrease in food cravings from baseline at all time points \( (p<0.05) \). Participants randomized to exercise had greater reductions in intensity of cravings for sweet foods compared to those randomized to relaxation \(-1.2, 95\% CI = -2.5 to 0.1, p = 0.08\). Participants randomized to exercise showed a greater decrease in cravings for sweet foods compared to relaxation \(-1.3, 95\% CI = -2.5 to 0.0, p = 0.03\) one week post-quit. No other significant differences were noted. Overall, significant decreases in food cravings following cessation of smoking were observed, regardless of intervention assignment. Further research should explore the role of energy intake and output in relation to food cravings and weight gain following smoking cessation.

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**JUSTIFICATION:** If exercise were effective to reduce the food cravings frequently associated with smoking deprivation, and therefore limit calorie intake and prevent post-cessation weight gain, this type of cessation intervention may be effective for helping women maintain their new smoke-free status.

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**POS3-30**

**TOBACCO SMOKING AMONG SCHIZOPHRENIA PATIENTS: PREVALENCE AND HEALTH CO-MORBIDITY**

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Smoking is highly prevalent in schizophrenia patients and is associated with medical and psychiatric morbidities. In this descriptive study, 368 schizophrenia patients were interviewed. Information on demography and tobacco smoking, medication adherence, and self-reports of chronic common health conditions were obtained. The PANSS was used to determine type and level of psychopathology. Bivariate associations were determined using Chi square statistics and multivariate analysis was used for further exploration of variables that were significant during univariate analysis. All analyses were performed using the SPSS (17.0). Results show that both lifetime and current tobacco use were respectively significantly associated with young age, education, male gender, being unmarried, medication adherence, haematological diseases, respiratory diseases, gastrointestinal diseases, infections, and all PANSS scales. Only negative subscale of PANSS, OR = 2.3, 95% CI (1.1–5.2), \( p = 0.03 \) remained associated with lifetime tobacco use and general psychopathology subscale of PANSS with current tobacco use OR =
3.5, 95% CI (1.2-6.5), p = 0.02 after adjusting for gender. In conclusion, tobacco use in schizophrenia patients is associated with health problems and correlated with severity of psychosis.

FUNDING: New World Specialists Hospital Ltd Nigeria

JUSTIFICATION: Schizophrenia patients require additional screening for drugs to achieve a comprehensive mental health care for them.

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### POS3-31

**TOBACCO CESSATION STRATEGIES IN PATIENTS WITH SCHIZOPHRENIA: A SYSTEMATIC REVIEW**

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Introduction: Smokers with schizophrenia have high nicotine dependence due to the fact they smoke heavily and extract more nicotine from each cigarette compared to general population. Smoking cessation and reduction may interact with antipsychotic medications; nicotine withdrawal symptoms may alter their psychiatric symptoms. The primary aim of this review is to summarize smoking cessation and reduction interventions available for schizophrenic patients and the secondary aim is to review the effects of smoking cessation on psychiatric symptoms. Methods: A systematic literature search was conducted in PubMed, Cochrane Central Register of Controlled Trials and Embase through November, 2012 for randomized controlled trials and observational studies (either cohort or case-control) evaluating the use of tobacco cessation strategies (nicotine replacement, bupropion, or varenicline) in patients with schizophrenia or schizoaffective disorder. Characteristics and results of the included studies were described qualitatively. Results: 23 trials (N= 1301) met inclusion criteria. Mean ages ranged from 33.9-50.4 years in the trials and the proportion of males in the trials ranged from 33%-100%. The duration of study ranged from a single session to 6 months, and the studies evaluated various forms of therapy (nicotine patches, nasal sprays, bupropion, and varenicline). Bupropion trials alone or in combination showed that smoking cessation rates after bupropion treatment were significantly higher than placebo at the end of the treatment. Expired carbon monoxide level and number of cigarettes smoked were significantly lower with bupropion or in combination. Nicotine replacement studies showed significant heterogeneity in the treatment and outcomes. Varenicline studies showed significant reduction in number of cigarettes and abstinence varied; common adverse events reported include nausea, vomiting, and dry mouth. Conclusions: There is limited data available to draw conclusions regarding the efficacy and safety of tobacco cessation strategies in this unique patient population. Additional research is necessary to elucidate the optimal therapeutic approach in this population.

FUNDING: No Funding

JUSTIFICATION: Available Tobacco cessation treatment options in schizophrenic patients

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### POS3-32

**LOW DISTRESS TOLERANCE PREDICTS POSITIVE SMOKING OUTCOME EXPECTANCIES AMONG YOUNGER ADOLESCENTS**

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Background: Distress tolerance (DT) is the pursuit of goal-directed behavior in the face of affective distress. Despite attention to the role of low DT in adult smoking outcomes (Brock et al., 2009), little is known of the underlying mechanisms by which low DT may relate to the development of adolescent smoking. Drawing from the acquired preparedness model (Smith & Anderson, 2001), which argues broadly that early individual trait differences influence learning processes even prior to direct use of a substance, we expected that low childhood DT would predict learned smoking associations in the form of more positive smoking outcome expectancies, particularly negative affect reduction (NAR) and boredom reduction (BR) expectancies in youth naïve to smoking. Method: This study employed data from a community sample of 277 5th-6th graders (M age = 11.0 years; 46.5% female, 51.3% White, 33.9% Black) at initial enrollment and assessed at annual waves participating in a larger prospective study of HIV-related risk behaviors. Participants completed a modified YRBS to measure smoking behavior; the Behavioral Indicator of Resiliency to Distress (BIRD), a computer-based behavioral measure of psychological DT for youth; and the Adolescent Smoking Consequences Questionnaire (ASCQ) for smoking outcome expectancies. Hierarchical Linear Model (HLM) analyses included baseline DT, gender, age, the effect of time, and any change in smoking status as predictors of smoking outcome expectancies across three subsequent waves. Results: After controlling for covariates, lower DT was associated with more positive NAR expectancies (B = -0.06, SE = .003, p = .04) and more positive BR expectancies (B = -.030, SE = .001, p = .001) across subsequent years. There were no linear effects of time (p's >.10). Lower DT was also unrelated to negative outcome expectancies. Conclusions: Lower DT is associated with heightened expectancies for reinforcement from smoking, specifically in domains related to avoidance or escape of negative affect and lower tolerance for boredom. Future research is needed to examine these positive expectancies as potential mediators between low DT and smoking onset.

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### POS3-33

**ARE VA MENTAL HEALTH PATIENTS WITH HIGHER HEALTH LITERACY MORE LIKELY TO QUIT SMOKING AFTER 6 MONTHS?**

Karishma Kurowski, M.P.H.*, Erin Rogers, M.P.H., and Scott Sherman, M.D., M.P.H., NYU School of Medicine, Department of Population Health/ VA New York Harbor Healthcare System

Background: Health literacy affects both health care utilization and health outcomes. We studied whether health literacy of mental health patients enrolled in a telephone smoking cessation program predicted long-term abstinence. Methods: We implemented a telephone care coordination program for smokers using mental health clinics at 6 Veterans Administration (VA) facilities. Enrolled participants received cessation medications and were randomized into 2 arms: multisession VA telephone counseling or transfer to their State Quitline. Participants completed a telephone survey at baseline and 6 months that assessed smoking status and health literacy (assessed with a 3-point Likert type scale that asked about difficulty understanding, communicating, or reading health information). We calculated a total health literacy score by summing the score on each question (total range: 0 – 6). We then coded each participant’s total score as either high (4-6) or low (0-3). We used multiple logistic regression to analyze the association between health literacy and abstinence at 6-months. We also tested for an interaction between health literacy and treatment status. Results: Among the 375 participants in both treatment arms combined (178 VA counseling, 197 Quitline counseling), there was no effect of health literacy on 6-month abstinence (low literacy 24% vs. high literacy 22%). However, in the VA arm, 19% with low health literacy reported abstinence at 6 months, compared to 27% with high health literacy. The opposite was found in the Quitline arm: 29% with low health literacy were abstinent at 6 months versus 17% with high health literacy. Conclusions: The level of health literacy appeared to have little effect on long-term abstinence, and patients with high and low levels of health literacy achieved excellent abstinence rates. However, in the VA arm patients with high health literacy were more likely to be abstinent at 6 months, while in the Quitline arm the odds of abstinence at 6 months was higher among those with low health literacy. Future research should examine this interaction in more detail.

FUNDING: VA QUERI SDP07-034
POSTER SESSION 3 • Friday, February 7, 2014 • 5:15 p.m.–6:45 p.m.

POS3-34 EVALUATION OF AN INTENSIVE PHARMACIST MANAGED TELEPHONE TOBACCO CESSATION CLINIC


Purpose: The Veteran Health Administration (VHA) have adopted policies to enhance tobacco cessation treatment. In response to this, a comprehensive (behavioral with integration of medications) pharmacist managed telephone tobacco cessation clinic (PMTTCC) was created at the Veterans Affairs San Diego Healthcare System (VASDHS) in 2005. As part of the national Tobacco Cessation Clinical Resource Center (TCCRC) at VASDHS, the PMTTCC was modified and intensified in 2009 to function as a proactive clinic. The objective of this study was to assess the effectiveness of a proactive PMTTCC. Methods: A retrospective chart review was conducted comparing smokers enrolled in the PMTTCC to Standard of Care (SOC). All patients enrolled in PMTTCC were included in the analysis from February, 2010 to July, 2010. SOC consists of Veterans that received medication and brief intervention by their primary care providers during the same time period. Excluded were patients who used non-cigarette tobacco or who were concurrently enrolled in other tobacco cessation programs. Patients enrolled in the PMTTCC received treatment calls at 0, 1-2 weeks, months 1-6, 9, and 12. Study end points were the proportion of Veterans who achieved self-reported continuous abstinence at months 1, 3, 6, and 12. Results: 196 patients and 201 patients were enrolled for the PMTTCC and SOC groups, respectively. The average age for patients treated by SOC was 53.46 (SD, 11.81) years and 51.86 (SD, 11.99) years for patients treated by the PMTTCC (p = 0.18). No significant difference in baseline demographics for ethnicity and comorbidities were observed. For the primary outcome, the PMTTCC group had greater abstinence rates than the SOC group at 1 month (70.9% vs 17.4%, p < 0.001), 3 month (48% vs 15.4%, p > 0.001), 6 month (31.6% vs 9.5%, p < 0.001) and 12 month (20.4% vs 5.5%, p < 0.001). Conclusion: The proactive PMTTCC demonstrated significantly better outcomes than the SOC cessation program. Abstinence rates declined over time, emphasizing the importance of continual adaptive follow up. These data suggest the value of a PMTTCC that provides both behavioral and medication treatment. FUNDING: No funding.

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POS3-35 STAFF ATTITUDES AND AGENCY CAPACITY FOR SMOKING CESSATION IN BEHAVIORAL HEALTH TREATMENT SETTINGS

Catherine M. Corno, B.A.1, Meagan M. Graydon, B.A.1, Janine C. Delahanty, Ph.D.1,2, Carlo C. DiClemente, Ph.D.1, and Neil E. Grunberg, Ph.D.1, *MidQuit Resource Center, University of Maryland Baltimore County, 1Uniformed Services University of the Health Sciences

Despite the decline in smoking in the U.S., behavioral health populations continue to smoke at elevated rates compared to the general population (CDC, 2013). However, there continue to be many barriers, including provider attitudes, in successfully implementing smoking cessation in BH treatment settings. Provider attitudes have been explored and found to have both mental health and substance use providers in the same analysis. This study examined perceptions of smoking cessation treatment capacity and employee attitudes towards client smoking at Mental Health Administration (MHA) and Alcohol and Drug Abuse Administration (ADAA) agencies in Maryland. An anonymous online survey was developed by the Steering Committee of SCLC’s Maryland Leadership Academy for Smoking Cessation, using a regional sampling strategy by agency type to ensure representation across the state. In total, 768 (474 MHA and 294 ADAA) staff members (80% female; 72% White, 17% Black) completed the online survey. We examined perspectives on capacity and attitudes by agency (ADAA vs. MHA), role (administrator, provider, support staff, or other), and smoking status (current, former, and never). Compared to MHA staff, ADAA staff were more likely to endorse the presence of a smoke-free policy, enforcement of policy, and cessation programming (p's < .001). MHA providers were significantly more likely to endorse that smoking eases clients’ side effects of medications (p < .05) relative to ADAA providers. Role was not related to smoke-free policy or enforcement, yet administrators perceived more tobacco cessation programming (p = .001). Roles were also significantly related to the endorsement of reasons behavioral health clients have difficulty quitting (e.g., stress). Staff smoking status was related to perception of smoke-free policies (p < .001), with smokers less likely to say their agency has a smoke-free policy and less likely to believe that clients are motivated to quit. Effective implementation of tobacco cessation programming in behavioral health treatment settings will require attention to agency differences as well as individual difference of staff members. FUNDING: No Funding.

JUSTIFICATION: The results from this study may allow for the development of interventions to overcome the barriers to cessation treatment in behavioral health settings.

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POS3-36 CIGAR, CIGARILLO, AND LITTLE CIGAR (CCLC) USE AMONG UNDERAGE CURRENT CIGARETTE SMOKERS IN MARYLAND

Janine C. Delahanty, Ph.D.*, Carlo C. DiClemente, Ph.D., Krystle Nickles, M.P.P., Angela Petersen, M.A., and Shayla Thrash, M.A., M.D., Quit Resource Center, University of Maryland Baltimore County

Cigar, cigarillo, and little cigar (CCLC) use is prevalent among adolescents, especially among youth who also smoke cigarettes. In Maryland, while rates of cigarette smoking among underage high school youth have significantly decreased over the past decade (23.0% in 2000 to 14.1% in 2010), CCLC use has steadily increased with 2010 estimates (15.9%) being comparable to cigarettes (14.1%). This study examined lifetime and current CCLC use among current cigarette smokers. A subsample of underage (< 18) youth who reported current cigarette use (i.e., past month) cigarette use (N=6,840) were classified into one of three groups: (1) current users of both CCLC and cigarettes (64.3%); [DUAL]; (2) lifetime CCLC users without current CCLC use (31.0%), [EVER CCLC]; and (3) current cigarette use without lifetime or current CCLC use (15.8%), [NEVER CCLC]. This study explored group differences on demographic characteristics, use of OTP, use of other substances, and peer use. Boys were more likely to be DUAL users (61%), while girls were more likely to be NEVER CCLC users (67%). In general, non-White youth were more likely to be DUAL users. All three groups reported current use of alternative tobacco products and other substances. RYO (roll your own) was most commonly used by all 3 groups (28% DUAL, 19% EVER, & 16% NEVER). One in five and one in 10 DUAL users reported using e-cigarettes and hookah, respectively. The majority of youth reported past month alcohol use (86% DUAL, 74% EVER, and 67% NEVER), with 76% DUAL, 58% EVER, and 44% NEVER reporting one or more past month binge (i.e., 5+ drinks on one occasion). Past month marijuana use was also commonly reported (78% of DUAL, 58% NEVER, and 42% NEVER). For alcohol and marijuana use comparisons, DUAL > EVER > NEVER, p's < .001. DUAL users reported similar numbers of friends who use cigarettes and cigars (2.7 vs. 2.4, respectively); while EVER and NEVER users reported having more friends smoke cigarettes (2.4, 2.1) than cigars (1.0, .4). Respectively. Prevention and intervention efforts targeting youth CCLC users should address unique characteristics, needs, and risks of these users. FUNDING: No Funding.

JUSTIFICATION: Health literacy is important to study in regards to treatment outcomes and healthcare utilization.

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FUNDING: No Funding.

JUSTIFICATION: The results from this study may allow for the development of interventions to overcome the barriers to cessation treatment in behavioral health settings.
**POS3-37**

**A HISTORY OF MAJOR DEPRESSIVE DISORDER IN CURRENT POSTMENOPAUSAL SMOKERS AND THE ASSOCIATION WITH BODY COMPOSITION AND OTHER MALADAPTIVE BEHAVIORS**

Lindsay Jarvis, B.S., Alicia Allen, Ph.D., M.P.H.,* Sharon Allen, M.D., Ph.D., Mark Litt, Ph.D., Anne Kenny, M.D., and Cheryl Oncken, M.D., M.P.H., University of Minnesota

Current evidence suggests that tobacco use may moderate the relationship between depression and obesity. Postmenopausal smokers are at high risk for depressive symptoms, obesity and other maladaptive behaviors. Therefore, we sought to examine the factors that could lead to obesity in postmenopausal smokers who either have a history of major depressive disorder (M-MDD) versus those without (no-MDD). Postmenopausal women >40 years of age, in stable health and who reported a desire to quit smoking, were recruited to participate in a smoking cessation study. At screening, participants completed the Structured Clinical Interview for DSM-IV (SCID) interview with study staff and were classified as Hx-MDD or no-MDD. At baseline, the following outcome measures were collected: percent lean body mass and body fat were measured using a dual-energy x-ray absorptiometry (DXA); fitness test measures included a grip test, step test, and chair rise; and self-report of exercise and relaxation minutes/day over the last 7 days. Descriptive statistics and ANOVA/ANCOVAs were computed using SAS 9.2. Participants (n=126) were an average of 56.5±5.7 years old, 95.1% white, and 20.5% had an income ≤ $20,000. Participants reported smoking an average of 19.1±7.7 cigarettes/day and had an average FTND score of 5.1±1.8. Two trends were noted. First, the Hx-MDD group (n=61) self-reported exercising fewer minutes per day compared to the no-MDD group (n=64; 9.45±18.43 v. 17.73±27.65, p=0.090). Second, the Hx-MDD group had a lower waist-hip ratio than the no-MDD group (0.80±0.06 v. 0.83±0.08, p=0.083). No statistically significant differences were found in smoking behaviors nor the fitness, or body composition. Overall, there were no significant differences found in any obesity-related measures between those who have a history of MDD and those who did not. Our results indicated that smokers with Hx-MDD do not appear to be at a higher risk for maladaptive behaviors than those without. More research is needed to examine these relationships in postmenopausal smokers by comparing current, former, and never smokers.

**FUNDING:** No Funding

**JUSTIFICATION:** We performed the intensive inpatient cessation program with telephone follow-up and identified that more follow-up counseling related to the higher cessation rates.

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**POS3-39**

**PHYSICAL ACTIVITY IMPROVES CESSATION OUTCOME AMONG WEIGHT-CONCERNED WOMEN SMOKERS RECEIVING CESSATION TREATMENT**

Rebecca L. Emery, B.A., B.S.,*†, Yu Cheng, Ph.D.,† Michele D. Levine, Ph.D.,† Marsha D. Marcus, Ph.D.,† and Kenneth A. Perkins, Ph.D.,* †University of Pittsburgh, †University of Pittsburgh Medical Center

Despite the health consequences associated with smoking, many women report that their concerns about postcessation weight gain prevent them from quitting. Indeed, weight-concerned women smokers make fewer quit attempts, have poorer cessation outcomes, and tend to gain more weight following cessation than do smokers without weight concerns. Resultantly, numerous treatment approaches for smoking interventions have been augmented to include weight control components. For instance, physical activity has received increasing consideration as an aid for smoking cessation due to its association with weight control, reduced craving, and withdrawal symptoms, and improved depressed mood. Given the potential for physical activity to reduce postcessation weight gain, physical activity may be a particularly important cessation aid among weight-concerned women smokers. Participants for the current investigation (n = 215) consisted of weight-concerned women smokers who were recruited for a randomized, double-blind, placebo-controlled trial examining the efficacy of combining a cognitive behavioral therapy for smoking-related weight concerns with bupropion. On average, participants were 42.6 (SD = 10.3) years old and 83% were white. Participants provided biochemical validation of cessation and reported current estimates of weekly physical activity at the initiation of treatment. The repeated binary outcomes obtained from point-prevalence abstinence were analyzed using a generalized estimating equations model. The model included physical activity as the primary predictor of cessation and controlled for the effects of time, treatment group, relevant baseline parameters, and participant weight over the course of treatment. Results indicated that physical activity concurrently predicted cessation outcome (p < .05), over and above the covariate effects. Specifically, women who reported higher levels of physical activity were more likely to remain abstinent than those who reported lower levels of physical activity. Thus, physical activity may improve cessation outcome among weight-concerned women smokers receiving cessation treatment.

**FUNDING:** This research was supported by grant R01DA04174 from the National Institute on Drug Abuse (Dr. Marcus) and by grant K01DA15396 from the National Institute on Drug Abuse (Dr. Levine). GlaxoSmithKline provided bupropion hydrochloride SR, 150 mg, and matching placebo oral administration free of charge.

**JUSTIFICATION:** These results may help assist in the development of targeted and tailored interventions for dual cigarette and cigar, cigarillo, and little cigarette (CCCL) users.

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**POS3-38**

**THE RESULTS OF INPATIENT SMOKING CESSATION PROGRAM: 3 MONTH CESSATION RATE AND PREDICTORS RELATED WITH SUCCESSFUL CESSATION**

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Background: Smokers have a good opportunity to initiate smoking cessation during hospitalization. We studied the smoking cessation effect of intensive counseling during admission and telephone follow-up after discharge. We also analyzed the factors related to it. Methods: An intensive counseling service was provided for 30 minutes by the third year family medicine resident. The follow up telephone counseling services were provided at week 1, week 4, and 3 months by nurses trained for smoking cessation counselling. Smoking habits and nicotine dependency were gathered by questionnaires, and sociodemographic variables were collected from electronic medical records. Results: Total 125 patients (118 males and 7 females) admitted to departments of neurology, cardiology, and pulmonary were consulted to our smoking cessation clinic in Asan Medical Center from September, 2011 to February, 2013. The average age was 57.7 and smoking duration was 36 years. Daily tobacco consumption was 23.4 cigarettes. Three month smoking cessation rates were 45.3%. In univariate analysis, successful cessation group tends to have longer admission duration (p=0.034) and more counselings after discharge (p<0.001). In multiple logistic regression analysis, patients who were diagnosed with neurologic disease (p=0.017, OR(Odds Ratio,7.249 [95% CI(Confidence Interval),1.415–37.126]) and followed up more than 3 times after discharge(p<0.001, OR,42.602 [95% CI, 9.894–183.433]) had better smoking cessation rates. Conclusions: Intensive smoking cessation counseling during admission and telephone follow-up after discharge contributed to greater smoking cessation rate.

**FUNDING:** No Funding

**JUSTIFICATION:** We analyzed the factors related to the 3-month smoking cessation.

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**POSTER SESSION 3 • FRIDAY, FEBRUARY 7, 2014 • 5:15 P.M.–6:45 P.M.**
Poster Session 3 • Friday, February 7, 2014 • 5:15 p.m.–6:45 p.m.

JUSTIFICATION: The findings from this study suggest that smoking cessation interventions may improve abstinence rates by promoting increased physical activity.

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POS3-40
SMOKING PREVALENCE AND EXPOSURE TO SECOND HAND SMOKE DURING PREGNANCY IN MEXICAN WOMEN

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There are no published data on the prevalence of smoking among pregnant women in Mexico. This study assesses the prevalence of tobacco smoking and exposure to second hand smoke among pregnant women in a major pre-natal care clinic in Guadalajara, Mexico. METHODS: To investigate smoking status and exposure to second hand smoke during pregnancy, face-to-face interviews were conducted with 1450 women attending the pre-natal care clinic. RESULTS: We studied 1450 pregnant women with a mean age of 24.3 ± 7.2 years who had a mean of 6.6 ± 1.9 months of pregnancy. Regarding smoking 29.8 % had smoked before pregnancy (lifetime tobacco use), 16.16 % of the women smoked during pregnancy, with the majority (12.44 %) stopping smoking during pregnancy at a mean 1.5 ± 0.9 months; 1.79 % were active (current) smokers. Regarding SHS, 47.2 % were exposed to SHS at home living on average with 1.4 ± 0.9 smokers who smoked a mean 5.6 cigarettes in their presence. That included a husband/partner (33.8%), father (19.9%), mother (12.9 %), parents in-law (7.5 %), brothers (9.9%), sisters (5.2 %), brothers and sisters in-law (3.8 %), and other relatives (11.7 %). Outside their homes, 26.5% of the women were exposed to a mean of 3.5 ± 3.9 persons who consumed a daily mean of 7.9 ± 9 cigarettes in their presence. DISCUSSION: The prevalence of smoking of Mexican women during pregnancy in this sample is similar to the prevalence in other western countries. Most of the women reporting lifetime histories of smoking stopped smoking early during pregnancy. Thus, becoming pregnant seems to be an important factor to stop smoking early in the course of pregnancy. Nevertheless, exposure to second hand smoke was higher than in the general population (47.2 % vs. 34 %). CONCLUSIONS: New tobacco smoking prevention and intervention programs should be developed and aimed at relatives and co-workers of pregnant women besides existing prevention programs stressing the benefits of quitting smoking during pregnancy. The findings from this sample need to be expanded and replicated at other sites.

FUNDING: Funded by PROMEP 2012 from the Mexican Education Department (SEP).

JUSTIFICATION: The epidemiological data on tobacco smoking and second hand smoke exposure in mexican pregnant women presented herein should be taken into account by health authorities to design, modify or apply prevention programs.

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POS3-41
PROVIDER SATISFACTION WITH AN INPATIENT TOBACCO TREATMENT PROGRAM


Effective tobacco treatment requires an increase in identification, counseling, and follow-up of hospitalized patients who use tobacco. Systematic reviews show that hospitalization is an optimal time for patients to start tobacco cessation treatment. The UNC Inpatient to Outpatient (I2O) hospital-based tobacco use treatment program has given providers including physicians, nurses, students, clinical case managers, and other hospital team members the training and opportunity to provide inpatients with support to reduce their tobacco use both during their hospital stay and after discharge. In November, 2010, the I2O program began providing inpatient bedside tobacco cessation consults. Three years after initial implementation, the I2O Program continues to expand and demonstrates the importance of this service for patients and the health care system. From July, 2010 through July, 2013, providers made 2085 tobacco cessation consults, with a 62% increase from the first to third year. Provider satisfaction and feedback is an important component to program sustainability. We will present data based on a provider survey given to the 285 attending physicians, residents, and interns that have ordered tobacco cessation consults from July, 2012 – June, 2013. Data include frequency of consult orders, factors influencing utilization, and satisfaction with the consult service. By better understanding provider utilization and perceptions of the inpatient tobacco treatment service, the program continues to evolve in a way that optimally coordinates with the medical team and better serves patients. Provider feedback influences program efficiency, marketing, feedback loops, and provider training. Conference participants will gain understanding how the inpatient consults have a positive impact on provider behavior by increasing the likelihood of prescribing tobacco cessation medications and incorporating the patient’s tobacco use in their documentation. Additionally, conference participants will learn how to involve and gain support from providers for integrating tobacco use treatment during hospitalization and after discharge in ways that meet and exceed Joint Commission guidelines.

FUNDING: The UNC NDP programs are funded by the UNC Department of Family Medicine, UNC Health Care, and the Lineberger Comprehensive Cancer Center.

JUSTIFICATION: Participants will gain important information on how to involve and gain support from health care providers in the integration of tobacco cessation counseling within the patient’s overall plan of care during hospitalization and after discharge in ways that meet and exceed Joint Commission guidelines.

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POS3-42
SOCIAL PHOBIA AND CIGARETTE SMOKING: AN EXPERIMENTAL INVESTIGATION

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Background: Individuals with Social Phobia (SP) represent a large group with both elevated rates of cigarette smoking and lower cessation success. To better understand the functional relationship between SP and smoking, experimental studies are needed. Further, a negative reinforcement framework is useful as smoking may be used to manage SP symptoms. The purpose of the present study was to utilize an experimental paradigm to examine the functional relationship between SP and smoking for individuals with a range of SP in the context of social stress. Methods: We recruited daily smokers ages 18-21 who scored in either a clinical or normative range on the Social Interaction Anxiety Scale (SIAS). Participants included 73 smokers (38.4% female, 65.8% White, Age M(SD)=19.8(1.2), CPSD M(SD)=7.4(4.7), 42.5% high SP). Participants attended two sessions: one social stress session and one neutral. Social stress session order was (1) Smoke a cigarette through a topography device, (2) Rate positive affect (PA) and negative affect (NA) on the Positive and Negative Affect Scale (PANAS), (3) Complete a Trier Social Stress Task (TSST) variant, (4) Complete PANAS, (5) Smoke a cigarette through a topography device, (6) Complete PANAS. Neutral session protocol was identical except that participants watched a neutral video in place of the TSST. Results: We used repeated measures ANOVA covarying for session protocol was identical except that participants watched a neutral video in place of the TSST. Results: We used repeated measures ANOVA covarying for session order, age, race, and SIAS to examine group differences (High vs. Normative SP) in affect across time points as a function of experimental condition. In the social stress condition, NA increased compared to the neutral condition, p=.04. This effect was specific to high SP individuals and was not observed in the normative SP group, p=.9. There was no effect observed for PA. Conclusion: Tobacco smoking during the social stress session was associated with higher NA in the social stress condition compared to the neutral condition. Further research is needed to determine if this effect is a mediating or moderating factor in the relationship between SP and smoking.
POSTER SESSION 3 • FRIDAY, FEBRUARY 7, 2014 • 5:15 P.M.–6:45 P.M.

POS3-43
AN EXPLORATION OF PERSONALITY TYPE AND GENERALIZED BELIEFS WITHIN A SAMPLE OF SMOKERS RECRUITED FOR A TRIAL OF COMPUTER TAILORING FOR SMOKING CESSATION

Hazel M. Gilbert, Ph.D.* and Stephen Sutton, Ph.D., UCL

Introduction: Research has suggested a relationship between personality characteristics and a variety of health behaviours. It has also been suggested that certain personality types may respond differently to different programs of self-change, and that materials matched to traits may produce more satisfaction and better response in terms of behaviour change. Further investigation is needed to understand why tailored messages are not consistently more effective than standard, and a better understanding of individual differences within smokers might facilitate improved effectiveness. Method: The Big Five Inventory (BFI-10) and a short version of the Multivariate Health Locus of Control (MHLC) were added to the 6-month follow-up in a large population based randomised trial evaluating the effect of individual computer-tailored feedback reports on quit rates compared with generic self-help materials (ESCAPE). A total of 6697 smokers were recruited into the trial, and 52.1% (3492) returned the 6-month postal questionnaire containing the BFI-10 and MHLC. Analysis explored associations between personality and beliefs, and smoker characteristics measured at baseline and smoking status at follow-up. Results: Significant differences were found between BFI and MHLC scores and demographic characteristics. Dependence was significantly associated with higher Neuroticism scores and lower Extraversion scores, and was positively associated with the Chance and Powerful Others subscales of the MHLC. Desire to quit and self-image were also related to Extraversion and Neuroticism and to all three subscales of the MHLC. Abstinence and quit attempts could be predicted by Neuroticism and Agreeableness scores and by Chance and Powerful Others subscales of the MHLC. All associations were significant at the p<.001 level. There were no significant interactions between treatment and outcome. Conclusion: A useful direction for future research would be to explore these individual differences and their effect on health behaviour, and to consider how these traits can be matched to treatment programmes to improve outcomes.

FUNDING: CRUK

JUSTIFICATION: Assessing personality and beliefs may enable tailoring to be matched to personality traits in an attempt to improve outcomes from tailored interventions.

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POS3-44
BIOCHEMICAL VALIDATION OF SELF-REPORTED SMOKELESS TOBACCO ABSTINENCE AMONG SMOKELESS TOBACCO USERS: RESULTS FROM A CLINICAL TRIAL OF VARENICLINE IN INDIA


Background: The validity of self-reported tobacco use is often questioned given the potential for under-estimation of use. Thus, biochemical validation of self-report is strongly recommended for intervention studies where cessation outcome is to be measured. This study used data from a double-blind placebo-controlled clinical trial of varenicline for smokeless tobacco dependence in India to evaluate the accuracy of self-reported smokeless tobacco cessation using biochemical validation procedures and to evaluate correlates of reporting inaccuracy. Method: 237 smokeless tobacco users attending a dental clinic at the All India Institute of Medical Sciences, New Delhi, were randomized to placebo or varenicline; all participants received counseling. Participants were biochemically verified to be smokeless tobacco users and non-cigarette smokers at study initiation. Detailed smokeless tobacco use was recorded and abstinence was defined as cotinine-verified 7-day point prevalence cessation (cotinine <50ng/ml) and breath CO <10 ppm at the end of 12 weeks of treatment. Results: Self-report and urinary cotinine were analyzed for 165 completers; 82/165 participants (49.7%) self-reported abstinence. Biochemical verification confirmed that only 54 subjects (65.9%) provided accurate self-reports while nearly one-third of participants (n=28) were under-reporting tobacco use. These data indicate poor agreement between self-reported and biochemically confirmed abstinence (κ=0.191). Under-reporters of tobacco use had significantly higher baseline cotinine (p<0.05), total craving (p<0.012), and negative reinforcement craving (p<0.001), vs. participants whose self-reports were correctly verified. No significant differences between false and verified reports of tobacco use were seen in demographic characteristics, nicotine dependence, or on other measures of tobacco use history. Conclusion: These findings provide evidence to support the need for biochemical validation of self-reported abstinence outcomes among smokeless tobacco users in cessation programs in India and identify high levels of pre-treatment cotinine and craving levels as potential correlates of false reporting.

FUNDING: This research was supported by a grant from the National Institute on Drug Abuse (R21 DA026404) and Pfizer provided the study medication and placebo for this study free of charge.

JUSTIFICATION: Research involving assessments of abstinence from smokeless tobacco use in India should use procedures to biochemically verify self-reported tobacco abstinence.

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POS3-45
MAIN OUTCOME FINDINGS FROM A PILOT STUDY EVALUATING A DEPRESSION-FOCUSED SMOKING CESSATION INTERVENTION FOR SMOKERS WITH CURRENT CHRONIC DEPRESSIVE DISORDERS

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Individuals with Major Depressive Disorder (MDD) are twice as likely to smoke, have higher rates of daily smoking and nicotine dependence, and are significantly less likely to quit than smokers without psychiatric disorders. Although a number of studies have examined tailored smoking cessation interventions for smokers with lifetime MDD, few studies have evaluated interventions for smokers with current depressive disorders. In this pilot study, we compared the effect of a 12-session Cognitive Behavioral Analysis System of Psychotherapy in combination with standard smoking cessation treatment (CBASP/ST) versus a 12-session combined Health and Wellness Psycho-education and standard smoking cessation condition (HW/ST) on smoking and mood-related outcomes in 49 smokers with current chronic depressive disorders (MDD and dysthymia). Participants in both groups received 8 weeks of nicotine replacement therapy starting at Week 6. On average, participants were 42 years of age, smoked 20 cigarettes per day and had a mean FTND score of 5.3. The majority of participants were white (69%), had some college or bachelor’s level education (69%) and were unmarried (66%). The average BDI-II score at study entry was 26, and the average global assessment of functioning score was 57.1, indicating moderate to severe psychiatric impairment. In addition to depressive disorders, participants had an average of 1.8 comorbid Axis I disorders. Mean 7-day point prevalence abstinence rates were 33% at 3-months and 27% at 6-months follow-up. There was no effect of treatment on abstinence through 6 months. However, participants in the CBASP/ST group smoked fewer cigarettes and reported less craving. In addition, participants in the CBASP/ST condition reported significantly lower BDI-II scores through 6 months, relative to HW/ST. Results suggest that although a depression-focused smoking cessation intervention was more effective than a therapist...
POS3-46
ASSESSING THE USE OF INTERACTIVE VOICE RESPONSE TECHNOLOGY IN A SMOKING CESSATION INTERVENTION

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BACKGROUND: Each year 4 million smokers are hospitalized, giving doctors a chance to promote cessation after discharge. Hospital-initiated cessation programs are effective when paired with post-discharge (post-d/c) follow-up but are not widely adopted. A scalable cost-effective model for delivering post-d/c tobacco treatment is needed. The current study used automated telephone technology with interactive voice response (IVR) to facilitate delivery of free cessation counseling and meds. Study outcomes were utilization, satisfaction, and dose-response effect of an IVR-based cessation program for hospitalized smokers. METHODS: We analyzed data from 197 subjects in the intervention arm (IA) of Helping HAND, an MGH-based RCT (2010-2012) that enrolled 397 patients (pts) who were >18yo, daily smokers, and planned to quit post-d/c. IA subjects received a 1-month supply of smoking cessation meds and 5 IVR calls that offered counseling and med refills (x2). Outcomes were assessed at 1, 3, and 6 months (mo) post-d/c. We measured the proportion of IVR calls completed, services requested, and pt-reported satisfaction. We assessed impact using logistic regressions on 7-day self-reported smoking abstinence at 6-mo follow-up, with the number of IVR calls completed as the independent variable. RESULTS: Of over half of IA pts completed ≥4 calls; 9% took only 1 call and 12% took no calls. Males (p=0.03) and older pts (p=0.04) took more calls. Pts were more likely to use IVR calls to request med refills (72%) than counseling (37%), though women requested counseling more often than men (45% v. 30%). 75% of subjects found IVR calls useful. Each additional IVR call completed was associated with a 1.38-fold increase (95%CI:1.09-1.74, adjusting for sex, age, and education) in the odds of 7-day abstinence at 6-mo follow-up. CONCLUSION: Using IVR to deliver smoking cessation programs post-d/c is well-utilized and acceptable to a broad range of pts, and taking more calls is associated with increased odds of cessation. IVR offers a feasible way to deliver tobacco treatment routinely and systematically to hospitalized smokers.

FUNDING: Funded by NIH/NHLBI grant #1 RC1 HL096668

JUSTIFICATION: This abstract identifies interactive voice response (IVR) technology as a way to translate research about the benefit of hospital-initiated smoking cessation programs into routine clinical practice and allow hospitals and health care systems to meet the U.S. Joint Commission hospital quality measure for addressing tobacco use.

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POS3-47
PREDICTORS OF SMOKING ABSTINENCE FOLLOWING AN EXERCISE-AIDED PHARMACOTHERAPYCESSATION TRIAL FOR WOMEN

Stefanie De Jesus*, Lyndsay Fitzgeorge, Guy Falkner, Ralph Maddison, and Harry Papavassili, Western University

Tobacco smoking is the leading cause of preventable death, killing approximately 6 million individuals each year worldwide. Regardless of numerous compromises to health, most smokers find it difficult to quit smoking and failure rates are consistently high. The objective of the present study was to determine predictors of smoking cessation success in an exercise-aided pharmacotherapy smoking cessation trial (Getting Physical on Cigarettes, NCT01305447). Inactive female smokers (N = 411, mean age = 42.4 years, mean 16.8 cigarettes smoked/day) exercised in a supervised facility where their workload progressively increased to 70-75% of their maximum heart rate over a 14-week period. This trial employed a 10-week transdermal patch program, starting at week 4. Baseline assessments included questionnaires (sociodemographic, cognitions, smoking behaviour), spirometry (FEV1/FVC%), peak VO2, nicotine metabolite ratios, and smoking topography. Smoking abstinence following the 14-week program was confirmed by expired breath carbon monoxide (CO < 6 ppm). Independent t-tests revealed significant baseline differences between smokers and non-smokers (55.4% at week 14) for CO, cigarette dependence and consumption, smokers' social network, alcohol consumption, employment status, and FEV1/FVC%. Logistic regression was employed to predict smoking abstinence with the aforementioned variables. The model was statistically significant (chi square (11, N = 315) = 42.681, p = .000), with baseline CO levels (B = -0.034) and employment status (B = -0.586) making significant contributions to the model; a trend (p = .090) was evident for alcohol consumption (B = -0.502). Therefore, higher CO levels and unemployment are associated with a lower likelihood of smoking abstinence at the end of the program. Considering gender differences for tobacco-related health risks and quit rates, understanding the determinants of smoking cessation will allow for targeted tobacco control strategies.

FUNDING: Canadian Cancer Society Research Institute grant awarded (#019876) and Canadian Foundation Innovation.

JUSTIFICATION: Understanding the determinants of smoking cessation will allow for targeted tobacco control strategies.

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POS3-48
ENDOTHELIAL EFFECTS OF ACUTE RESPIRATORY EXPOSURE TO THIRDHAND CIGARETTE SMOKE IN HUMAN SUBJECTS

Suzaynn F. Schick, Ph.D.*, Namita Malik, Ph.D.*, Jayasudha Gude, M.D.*, Catherine Donovan, B.S.¹, John R. Balmes, M.D.¹, Niyati Patel², Daniel Brenner, M.D.², Stephen W. Waldo, M.D.¹, and Peter Ganz, M.D.¹, University of California, San Francisco, Department of Medicine, ¹Brookdale University Hospital, ²Stanford University, School of Medicine, ³Massachusetts General Hospital, Division of Cardiology

Thirdhand smoke (THS) is the complex mixture of cigarette smoke chemicals that linger in the environment after smoking. In a pilot study, we assessed the effects of head-only exposure to THS on flow-mediated dilatation of the brachial artery (FMD), activation of endothelial nitric oxide synthase (eNOS) and urinary cotinine levels in healthy nonsmokers. Using a randomized cross-over design, we compared the effects of 3-hour exposures to THS and to conditioned, filtered air in 5 subjects. THS aerosol was generated by filling a 6 m3 stainless steel chamber with conditioned filtered air and re-emission of smoke. The THS aerosol contained particles, carbonyls and volatile organic compounds and was supplied to human subjects through an exposure hood. Initial particle concentrations averaged 0.381 mg/m3 and decayed to zero by one hour. Respiratory exposure to THS particles caused a significant decrease in FMD of approximately 1.2% at 30 minutes, that resolved by the end of the exposure. Clean air exposure had no effect. THS exposure increased average urinary cotinine levels by 2 pg/ml. We used the methods of venous endothelial biopsy, flow cytometry, and quantitative immunofluorescent microscopy to...
test the effects of THS exposure on phosphorylation of eNOS at serine1177. Phosphorylation at serine1177 is associated with activation of eNOS. We developed an improved method for isolating endothelial cells from biopsy samples using flow cytometry with a panel of 7 antibodies that differentiate endothelial cells from leukocytes. The endothelial fraction contains intact, viable single cells (based on nuclear red staining) that contain mRNA for von Willebrand factor (endothelial marker), but not CD45 (leukocyte marker). Serine 1177-phosphorylated eNOS levels were 5-fold higher in THS-exposed subjects. Our pilot data suggest that acute exposure to THS can increase urinary cotinine levels, impairs endothelium-dependent vasodilation despite compensatory activation of eNOS and may thus increase risk of cardiovascular disease.

FUNDING: Supported By: The California Tobacco-Related Disease Research Program Grants # 21ST-011 and 20PT-0184 (Drs. Schick and Malik), an Individual Investigator Grant from the University of California San Francisco Academic Senate (Dr. Schick and Ms. Donovan), the Nina Ireland Fund (Dr. Schick), Northern California Center for Occupational and Environmental Health (Dr. Balmes), The American College of Rheumatology, the Northern California Chapter of the Arthritis Foundation and the University of California, San Francisco Center of Excellence in Vascular Research (Drs. Ganz, Brenner and Waldo).

JUSTIFICATION: Our finding, that thirdhand cigarette smoke exposure alters vascular reactivity, provides support for policies that reduce the exposure of the public to thirdhand cigarette smoke.

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POS3-50
SMOKING CESSATION INCREASES SERUM BILIRUBIN, AN ENDOGENOUS ANTIOXIDANT ASSOCIATED WITH HEALTH OUTCOMES

Stephanie S. O’Malley, Ph.D.*, Ran Wu, Ph.D., and Peter Jatlow, M.D., Yale University School of Medicine

Bilirubin is a powerful endogenous antioxidant that has also been inversely associated with cardiovascular disease and all cause mortality. Low levels of serum bilirubin, for example, have also been associated with lung cancer risk in smokers (AACR, 2013, April 7). Epidemiological studies find that smokers have lower bilirubin levels than non-smokers. Importantly, serum bilirubin levels are intermediate for past smokers, suggesting that smoking cessation may lead to increases in bilirubin. Despite this provocative finding, no one has yet evaluated whether smoking cessation leads to increases in bilirubin. To test this hypothesis, smokers were identified from a large placebo controlled trial of naltrexone for smoking cessation (O’Malley et al, 2006). 385 participants who reported smoking at least 20 cigarettes per day with an expired CO > 10ppm were enrolled and provided data post-randomization. Participants were randomly assigned and received four doses of naltrexone (0.25, 50, 100 mg) daily in conjunction with 21 mg nicotine patch and weekly smoking cessation counseling for six weeks. Serum bilirubin was measured at baseline and at weeks 1, 4 and 6 following the quit date. Change in indirect bilirubin from baseline was compared for the 161 participants who were continuously abstinent over the six-week trial (confirmed by CO level <10 ppm) to the 224 participants who did not maintain abstinence using mixed model analysis. Gender and Medication Condition were entered as covariates in the analysis. The results revealed a main effect of quit status (F = 6.37, p = 0.01) such that those who were continuously abstinent had a larger increase in bilirubin than those who did not. The increase was greatest at week 4 (mean increase = 0.08ng/mL, sd = 0.18 for abstainers vs. 0.006; sd = 0.17 for smokers). Our data demonstrate for the first time that quitting smoking leads to increases in bilirubin levels. Although mean bilirubin values were in the reference range, the magnitude of the increase has been associated with reduced cardiovascular risk in epidemiological studies and reflects a potential benefit of cessation.

FUNDING: Supported By: The California Tobacco-Related Disease Research Program Grants # 21ST-011 and 20PT-0184 (Drs. Schick and Malik), an Individual Investigator Grant from the University of California San Francisco Academic Senate (Dr. Schick and Ms. Donovan), the Nina Ireland Fund (Dr. Schick), Northern California Center for Occupational and Environmental Health (Dr. Balmes), The American College of Rheumatology, the Northern California Chapter of the Arthritis Foundation and the University of California, San Francisco Center of Excellence in Vascular Research (Drs. Ganz, Brenner and Waldo).

JUSTIFICATION: Given that bilirubin is a routine liver function test and was shown to improve following smoking cessation, personalized feedback about bilirubin potentially could be used to motivate smoking cessation and promote continued abstinence with further research.

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POS3-51
EXAMINING DELAY DISCOUNTING AS A PREDICTOR OF SPONTANEOUS QUITTING AMONG PREGNANT SMOKERS

Thomas J. White, Ph.D.1, Ryan Redner, Ph.D.,1 Joan Skelly, M.S.2, and Stephen T. Higgins, Ph.D.1, 2 Department of Psychiatry, 2Department of Medical Biostatistics, and 3Department of Psychology, University of Vermont

Objective: About 20% of women who are smokers when they learn of their pregnancy have already quit smoking by the time of their first prenatal care visit. This phenomenon is known as spontaneous quitting in the smoking and pregnancy literature. The present study examined the relative influence of three potentially important determinants of success in discontinuing cigarette use: delay discounting (DD), a measure of impulsivity; daily smoking rate pre-pregnancy, a measure of addiction severity; and educational attainment, a measure of socioeconomic status. We were particularly interested in whether these variables interact with each other in their influence on spontaneous quitting. Methods: 349 pregnant women (231 continuing smokers and 118 spontaneous quitters) who were enrolled in clinical trials of monetary incentives for smoking cessation and relapse prevention, respectively, reported sociodemographics and completed a DD task. Results: Each of the three variables of interest (DD, smoking rate and education) was a significant predictor of spontaneous quitting at the univariate level in logistic regression (ORs and 95% CIs: DD, .87, .79-.96; smoking rate, .82, .78-.86; education, 1.45, 1.28-1.85). When all three variables were entered
POS3-52 CONCERN ABOUT GAINING WEIGHT AFTER SMOKING CESSATION AND ITS ASSOCIATION WITH SEEKING TREATMENT

Susan Veldheer, M.S., R.D.*; Jessica Yingst, Georgia Foulds, Shari Harbavsky, R.N., M.S.N.; Arthur Berg, Ph.D.; Christopher Sciamanna, M.D.; and Jonathan Foulds, Ph.D., Penn State University College of Medicine, Department of Public Health Sciences

Background: Concern about weight gain after quitting smoking is often cited as a barrier to smokers making a quit attempt or seeking treatment. Aim: To identify whether smokers who are non-treatment seekers (NTS) are more concerned about weight gain and have lower confidence in their ability to maintain their weight after quitting than smokers who are treatment seekers (TS). Methods: Smokers were recruited from Penn State Hershey Medical Center and family practice outpatient clinics. 102 NTS and 186 TS, who participated in a smoking cessation trial, completed a survey regarding tobacco use, weight concern, confidence to maintain weight after quitting, and diet. Stepwise logistic regression was used to identify variables associated with treatment seeking, overall and stratified by those who gained and did not gain weight on a previous quit attempt. Results: NTS were slightly younger than TS (42 v. 48 years, p<.001) and smoked slightly fewer cigarettes per day (15 v. 17, p=.015). There were no differences in diet or weight-related characteristics. In the overall model, there was no difference between NTS and TS with regard to weight gain concern. Confidence to maintain weight after quitting was significantly lower for NTS compared to TS (OR 0.76, CI 0.64-0.90) after adjusting for significant factors including years smoked and importance to quitting. 50% of the total sample had gained weight on a prior quit attempt. In the stratified model, among those who had gained weight, higher weight gain concern and lower confidence in ability to maintain weight were significantly associated with being a NTS after adjusting for other factors (OR 1.35, CI 1.02-1.78; OR 0.64, CI 0.47-0.86, respectively). Conclusion: Among smokers who gained weight on a previous quit attempt, non-treatment seekers had greater concern about gaining weight and less confidence in their ability to maintain their weight after quitting than treatment seekers. Clinicians can identify smokers for whom weight gain concern may be a barrier to seeking treatment by asking if they gained weight on a previous quit attempt. These smokers should be advised that this issue will be addressed in treatment.

FUNDING: N/A

JUSTIFICATION: This study can inform clinical practice by suggesting that clinicians can identify smokers for whom weight gain concern may be a barrier to seeking treatment by asking if they gained weight on a previous quit attempt.

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POS3-53 NICOTINE BLOOD LEVELS AND SHORT-TERM SMOKING REDUCTION WITH AN ELECTRONIC NICOTINE DELIVERY SYSTEM

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Over the past several years, the use of electronic nicotine delivery systems (ENDSs), commonly known as e-cigarettes, has dramatically increased because they have the potential to deliver significant levels of nicotine and mimic many of the sensory and behavioral characteristics of cigarettes. (e.g., realistic puffing and inhalation, taste, a “hit” or scratchiness in the back of the throat, and a visible mist that closely resembles smoke). Only a few studies have measured the nicotine blood levels and pharmacokinetic profiles of ENDS. The results have varied from very little if any nicotine to levels approaching traditional cigarettes after 5 minutes of use. Some studies suggest that experienced users obtain higher nicotine levels than novices. The current study evaluated nicotine delivery from the currently marketed NJOY® King Bold ENDS and its short-term potential for smoking reduction or cessation. One week of ad libitum use was followed by measurements of plasma nicotine, heart rate, and craving and withdrawal after 12 hours of nicotine abstinence in 25 adult smokers not interested in quitting. The results showed that after 5 minutes of use, blood nicotine levels increased by a mean of 3.5 ng/mL (p < .001), heart rate increased significantly, and craving was reduced by 55%. Cigarettes per day were reduced by 39% during the test week, including males who did not smoke any cigarettes on the final day. Perceptions of use for reduction or cessation were positive. The results of this study suggest that this ENDS product delivers enough nicotine to suppress craving, was generally liked, resulted in few adverse events, and resulted in significant smoking reduction during a 1-week trial. Nicotine delivery was comparable to that provided by some current FDA-approved nicotine replacement products. Thus, this ENDS has potential use as an aid to smoking reduction and cessation, but larger trials of the product are needed.

FUNDING: This research was supported by Research Grant R01DA009378 and Institutional Training Grant T32DA07242 from the National Institute on Drug Abuse. JUSTIFICATION: These results suggest that the influence of impulsivity in spontaneous smoking cessation is consistent across socioeconomic strata, but is constrained to lower levels of addiction severity.

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POS3-54 RELATIONS BETWEEN IMPULSIVENESS AND TOBACCO DEPENDENCE IN ADULT SMOKERS TRYING TO QUIT

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Background: Cross-sectional research using behavioral and self-report measures of impulsiveness suggests that smokers are more impulsive than non-smokers. Few studies have examined relations between impulsiveness and continuous measures of tobacco dependence or tested impulsiveness as a predictor oflater smoking status. The purpose of this study was to investigate relations between impulsiveness and tobacco dependence and abstinence in adult smokers trying to quit. Method: Baseline self-report and behavioral measures of impulsiveness were administered at baseline in a longitudinal study that followed smokers to 12 weeks following a target quit date. The sample included 109 adult (18 years old or older) daily smokers who received nicotine lozenge treatment and cessation counseling as part of the study. Multi-modal measures of impulsiveness included the Barratt Impulsiveness Scale, a delay discounting task to assess impulsive choices, and a go/no-go task to assess behavioral disinhibition. Measures of tobacco dependence included pack years smoked, the Fagerström Test of Nicotine Dependence, and the Wisconsin Inventory of Smoking Dependence Motives. The smoking status outcome assessed was biochemical verified seven-day point-prevalence abstinence 12 weeks post-quit. Results: Scores on the measures of impulsiveness were only weakly to moderately correlated. Smokers who discounted delayed rewards steeply (a
form of impulsive decision-making) had lower odds of abstinence at the end of the study than did those who devalued delayed rewards less. Self-reported nonplanning impulsiveness (a tendency not to plan for the future) was unexpectedly associated with lower scores on the cue exposure subscale of the WISDM capturing self-reported exposure and reactivity to smoking cues. Conclusions: Impulsive decision-making is a risk factor for smoking during a quit attempt. The lack of association across impulsiveness measures and inconsistency in relations between impulsiveness and tobacco dependence measures including abstinence suggest that impulsiveness is multifaceted, with some facets more closely related to markers of dependence than others.

FUNDING: Supported by RC1DA028129 from the National Institute on Drug Abuse. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institute on Drug Abuse or the National Institutes of Health. Justification: This may help identify ways to identify smokers at risk for relapse based on specific forms of impulsiveness that may be changeable through treatment in the future. Learner objectives: Learn about various facets of impulsiveness, ways to measure them, and their differential relations with measures of tobacco dependence including the ability to quit smoking.

JUSTIFICATION: This may help identify ways to identify smokers at risk for relapse based on specific forms of impulsiveness that may be changeable through treatment in the future.

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POS3-55
PERCEIVED BENEFITS FROM SMOKING IN A BIRACIAL SAMPLE OF LIGHT VS. HEAVY SMOKERS

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Patterns of smoking differ across ethnicities. For example, African American smokers smoke fewer cigarettes per day and begin smoking later than Caucasians. African American smokers are also more likely to be classified as light (<10 cigarettes per day) and intermittent (non-daily) smokers. Many studies have explored differences between light/intermittent smokers (LITS) and heavy smokers. However, few have estimated the effects of ethnicity separately from those of smoking intensity. This was the purpose of this study. Data came from the Memphis Health Project, a longitudinal study of tobacco use. One year after the cohort finished high school, we collected data on the intensity of smoking. In addition, we measured the extent to which they thought smoking could increase their (1) perceived maturity, (2) fitness, (3) concentration, (4) weight control, and (5) sociability. Procedures for the study have been reported elsewhere. Of the entire cohort, 186 (6.1%) LIT smokers and 145 (4.8%) heavy smokers (using ten or more cigarettes per day) were identified. Among these participants, we conducted a series of ANOVAs to explore the main effects of ethnicity and intensity of smoking, along with their interaction. Far more differences appeared in perceived benefits by ethnicity than did by smoking intensity. Overall, African American smokers, regardless of their level of smoking, were more likely to believe that smoking enhanced relaxation, improved concentration, and made one look more athletic (all p<.05). In contrast, Caucasian young adults were more likely to believe that smoking reduced body weight, p<.05. Only two main effects occurred for intensity of smoking, after ethnic differences were controlled. Heavy smokers were more likely to report that smoking produced relaxation and improved concentration, ps < .05. A significant interaction occurred for the perception that smoking makes one look mature. African Americans and Caucasians who were LIT smokers scored similarly. Among heavy smokers, African Americans were far more likely to believe they would look mature if they smoked than were Caucasians. The implications for prevention are discussed.

FUNDING: Funding Information: This research was supported by a grant from NHLBI, HL50723.

JUSTIFICATION: Given that young African Americans are still undergoing onset in late adolescence, and that they have more positive views of tobacco than Caucasian smokers, it is important to implement prevention programs at the high school level.

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POS3-56
USING FACEBOOK TO RECRUIT YOUNG ADULTS FOR A CESSION INTERVENTION PILOT: A SUCCESSFUL CASE-STUDY

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Introduction: We examined Facebook (FB) as a mechanism to recruit young adults for a smoking cessation intervention tailored to readiness to quit. Method: A campaign was designed to target young adult smokers to enroll in a pilot cessation trial. Advertising was chosen based on consumer and target marketing strategies. Ad content utilized specific messaging (i.e., informative, call to action, scarcity, social norms). Images were selected to appeal to the target audience (e.g., groups of young smokers, lit cigarettes), mirror demographics (gender, race), and varied in medium (carousel, photography, study logo). Most ads mentioned study incentive (up to $180). We used FB’s Ads Manager over 7 weeks (6/10/13 - 7/29/13), employing multiple types (newsfeed, traditional, promoted posts), keywords, targeted by age (18-25), location (U.S.), and language (English). Ads linked to the online screening survey or study FB page. We ran five different ads each week for 4 weeks, and nine total ads in the last 3 weeks with picture/text/ad type combinations chosen initially for variety, and then based on previous success. Results: The 29 different ads generated a total of 3,198,373 impressions, yielding 5,895 unique clicks, at an overall cost of $2,024 ($0.34/click). The most successful ad was a newsfeed post that reached >90,000 people with >2500 unique clicks ($0.17/click). The least successful ad made 500 impressions with 0 clicks. 5,895 unique clicks yielded 586 (10%) eligible participants of whom 230 (39%) signed consents and 78 (13%) completed baseline assessments. The final cost per completed baseline was $26. The sample was 77% Caucasian, 69% male, averaging 11 cigarettes/day (SD=7.7) and 2.7 years smoking (SD=6). Participants had a median of 2 lifetime quit attempts; 42% were in precontemplation; 45% were in contemplation, and 13% were in preparation. Conclusions: At ~$30 per enrolled participant, FB was a useful, cost-effective recruitment source for young adult smokers. Ads posted via newsfeed posts were particularly successful, likely because they were viewable via mobile phone. Efforts to engage more ethnic minorities, women, and smokers motivated to quit are needed.

FUNDING: National Institute on Drug Abuse K23 DA032578; National Center for Advancing Translational Sciences, UCSF-CTSI Grant Number UL1 TR000004

JUSTIFICATION: This work demonstrates that Facebook can be successfully employed to recruit young adults to smoking cessation intervention studies.

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POS3-57 EFFECTS OF ACUTE NICOTINE DEPRIVATION ON CRAVING, WITHDRAWAL, AND VIRTUAL-REALITY-BASED CUE REACTIVITY

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Acute nicotine deprivation is marked by craving and withdrawal symptoms. Additionally, increased craving can occur as a result of cue reacti

POS3-58 MOTIVATIONAL PROCESSES UNDERLYING SMOKING AMONG ADOLESCENTS

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Automatic behavioral tendencies towards smoking stimuli have been associated with cigarette smoking among adult smokers. Data on adult alcohol users showed that automatic behavioral tendencies toward alcohol stimuli could be retrained and doing so could improve treatment outcome. Given these findings, we sought to understand these associations among adolescents. We conducted 2 studies in the United States and the Netherlands to assess whether (1) approach-bias exists between smoking and non-smoking adolescents, and (2) retraining automatic behavioral tendencies among adolescent smokers will improve cessation rates. Study 1: A total of 125 adolescents (53% smokers) ages 13-18 years completed a smoking Approach-Avoidance Task (AAT), the Stroop Colour Naming Task, Delay Discounting Task, Balloon Analogue Risk Taking, and questions assessing level of nicotine dependence and smoking behaviors. Study 2: Adolescent smokers (n=63) participated in a 4-week smoking cessation program combining weekly CBT with retraining to avoid smoking stimuli or placebo condition with no training. Treatment outcome was determined by cotinine confirmed 7-day point prevalence abstinence. Study 1: Repeated-measure ANOVA showed that US adolescents did not have any bias towards smoking stimuli, whereas the Dutch adolescents displayed avoidance bias. There was no difference in approach-bias towards smoking stimuli between smokers and non-smokers. No gender differences or interactions were found. Hierarchical linear regressions among smokers showed that impulsivity did not moderate the relation between smoking and approach-bias.
Poster Session 3 • Friday, February 7, 2014 • 5:15 p.m.–6:45 p.m.

POS3-60
PASSIVE EXPOSURE TO E-CIGARETTE USE INCREASES SMOKING URGE IN YOUNG ADULT DAILY SMOKERS

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Electronic cigarette (e-cigarette) use has increased exponentially, particularly among young adults. While the risks and/or benefits associated with e-cigarettes remain uncertain, advertisers convey that users have the freedom to use them indoors when smoking bans have largely restricted the use of combustible cigarettes. Given the potential for increased secondhand exposure to e-cigarettes, we examined the impact of passive exposure to e-cigarette use on urge ratings compared with that of combustible cigarette use. In this single-blinded, between-subjects design, we examined smoking urge and mood ratings in smokers exposed to a research confederate drinking water (control cue) followed by the same confederate smoking either an e-cigarette or a combustible cigarette (active cue). Participants (N=30, 40% female) were young adult (M=24.7±4.5 SD yrs) daily smokers (M=9.2±2.8 cig/day). At baseline, after 2 hours of smoking abstinence, participants completed the Brief Questionnaire of Smoking Urges and several visual analogue subjective scales. These measures were repeated immediately after the participant engaged in conversation with the confederate after both the control and active cues. The control cue increased positive affect (p<0.01) but did not affect BQSU scores or desire to smoke ratings. However, both active cues increased BQSU scores and ratings of desire to smoke (p<0.05), with desire to smoke ratings directionally higher after exposure to the e-cigarette vs. combustible cigarette (increases of +12 vs. +5, respectively). Positive affect ratings remained high after both active cues. In sum, this was the first investigation to our knowledge demonstrating that passive exposure to e-cigarette use may act as a potent elicitor of smoking urges that rival or exceed that of exposure to combustible cigarettes. Future policy governing the use of e-cigarettes indoors or on television should consider the potential harm and impact on smokers to this exposure.

FUNDING: This research was supported in part by National Institutes of Health grants R01-AA013746; P30-CM14599.

JUSTIFICATION: This research has the potential to inform policy regarding the use of e-cigarettes in the media and in public spaces.

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POS3-62
EXCELLENT CONCORDANCE BETWEEN TIMELINE FOLLOW-BACK AND SINGLE QUESTION ASSESSMENT OF SELF-REPORTED SMOKING IN A CLINICAL TRIAL

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Introduction: Smoking cessation trials assess tobacco abstinence using both self-report and biomarkers. Optimum methods for each are unclear; a common question asks about smoking in the prior 7 days (i.e., “point prevalence abstinence”). In contrast, timeline follow-back (TLFB) is another technique commonly used to assess use of alcohol in treatment trials, but it is less commonly used in studies of smoking cessation. The goal of this study was to assess the concordance between the 7-day smoking question and a 7-day smoking TLFB. Methods: Secondary analysis of data from a randomized clinical trial of smoking cessation conducted at a busy, urban hospital emergency department (ED) from October, 2010-December, 2012. For this analysis, we compared smoking status at 1 month for subjects in response to 2 questions asked concurrently, addressing 7-day tobacco use, and a 7-day TLFB. Results: Of 780 subjects, 666 (85.4%) were available for 1-month follow-up. Of these, 99 (14.9%) reported no smoking in response to the 7-day question, and 96 (14.4%) reported no smoking in response to the 7-day TLFB. The overall proportionate agreement between the 2 methods was 98.6%, with a kappa of 0.95 (95% CI 0.91-0.98). Conclusions: A single question that assesses smoking at 7 days provides excellent concordance with the more detailed TLFB. The single question appears adequate to assess self-reported tobacco use in clinical trials of smoking cessation.

FUNDING: NIH/National Cancer Institute R01CA141479

JUSTIFICATION: This study confirms the utility of a single question to assess self-reported tobacco use in cessation trials.

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POS3-61
A PILOT STUDY OF A TAILORED SMOKING CESATION INTERVENTION FOR OPIATE DEPENDENT SMOKERS IN METHADONE TREATMENT

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Among smokers in methadone treatment (N=59), we conducted a pilot randomized controlled trial of a new, tailored, smoking cessation intervention based on the Information-Motivation-Behavioral Skills (IMB) Model of behavior change (intervention group; n=30). Outcomes in the intervention group were compared to outcomes among smokers randomized to receive a facilitated referral to the New Jersey Quitline (control group; n=29). The 3-month, tailored, IMB Model based intervention included 8 individual counseling sessions that incorporated psychoeducation, motivational interviewing, and cognitive-behavioral skills training. Intervention group participants also received nicotine lozenges and patches. Three-month follow-up data revealed, biochemically verified, 7-day point prevalence smoking abstinence rates of 7% in the intervention group, and 0% in the control group. In addition, a significantly higher percentage of intervention group participants were smoke free for 20 or more days in the past 3 months as compared to control (23% versus 0%). Among those in the intervention group, 40% completed 0-3 sessions; 33% completed 4-7 sessions; and 27% completed all 8 counseling sessions. The most commonly endorsed reasons for missing sessions, among intervention group participants, were forgetting the appointment (47%), transportation issues (53%), conflicting appointments (58%), and mood (42%). On a scale from 0 (not at all) to 4 (extremely), the intervention group was significantly more satisfied with the smoking cessation intervention than the control group, M(SD) = 3.35(99) versus 1.53(1.50). The tailored intervention was effective for helping methadone maintained smokers have more smoke free days, and results for cessation were in the hypothesized direction. The low cessation rates suggest the IMB Model based intervention and NRT alone may be inadequate for helping most opiate dependent smokers quit long-term. New smoking cessation interventions that address treatment engagement and further address the complex issues and barriers to quitting among opiate dependent smokers need to be developed.

FUNDING: This study was supported by National Institute on Drug Abuse Grant# K23DA025049.

JUSTIFICATION: Findings from this study indicate that new smoking cessation interventions that address treatment engagement and further address the complex issues that are barriers to quitting among opiate dependent smokers need to be developed.

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ASSOCIATION AND INTERACTION ANALYSES OF 5-HT3 RECEPTOR AND SEROTONIN TRANSPORTER GENES WITH ALCOHOL, COCAINE, AND NICOTINE DEPENDENCE USING THE SAGE DATA

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Previous studies have implicated genes encoding the 5-HT3AAB receptors (HTR3A and HTR3B) and the serotonin transporter (SLC6A4), both independently and interactively, in alcohol (AD), cocaine (CD), and nicotine dependence (ND). However, whether these genetic effects also exist in subjects with comorbidities remains largely unknown. We used 1,136 African-American (AA) and 2,426 European-American (EA) subjects from the Study of Addiction: Genetics and Environment (SAGE) to determine associations between 88 genotyped or imputed variants within HTR3A, HTR3B, and SLC6A4 and three types of addictions, which were measured by DSM-IV diagnoses of AD, CD, and ND and the Fagerström Test for Nicotine Dependence (FTND), an independent measure of ND commonly used in tobacco research. Individual SNP-based association analysis revealed a significant association of rs2066713 in SLC6A4 with FTND in AA (beta = -1.39; P = 1.6E-04). Haplotype-based association analysis found one major haplotype formed by SNPs rs3891484 and rs3758887 in HTR3B that was significantly associated with AD. In the AA sample, and another major haplotype T-T-G, formed by SNPs rs7118530, rs12221649, and rs2085421 in HTR3A, that showed significant association with FTND in the EA sample. Considering the biologic roles of the three genes and their functional relations, we used the GPu-based Generalized Multifactor Dimensionality Reduction (GMDR-GPU) program to test SNP-by-SNP interactions within the three genes and discovered two- to five-variant models that have significant impacts on AD, CD, ND, or FTND. Interestingly, most of the SNPs included in the interaction model for each addictive phenotype are either overlapped or highly correlated, suggesting the presence of consistent and significant interactive effects among HTR3A, HTR3B, and SLC6A4 in AAs and EAs across multiple addictions.

FUNDING: This project was supported by NIH grant DA-012844.

JUSTIFICATION: How genetics influences smoking.

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CHARACTERIZATION OF ELECTRONIC CIGARETTE PROTOTYPE PUFF TOPOGRAPHY IN ADULT EXCLUSIVE CIGARETTE SMOKERS AND ADULT EXCLUSIVE ELECTRONIC CIGARETTE USERS

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No published reports have described systematic evaluation of puff topography of electronic cigarettes (ECs) using a validated topography recording instrument. The purpose of the current study was to characterize EC puff topography under ad lib use conditions in exclusive cigarette smokers (CS) and exclusive EC users. The SODIMC Smoking Puff Analyzer Mobile (SAP/M), validated for use with an EC prototype, was used to assess puffing behavior. Puff volume, duration, and flow rate were computed using the SodAC 41.20.05 software. The amount of e-liquid used during the session was also determined, based on change in cartomizer weight. Adult exclusive CS (n=13) and adult exclusive EC users (n=10) completed one session in which they used an EC prototype with e-liquid containing 2% (w/w) tobacco-derived nicotine with the SAP/M, ad lib for 7 hours. Exclusive CS also smoked one cigarette of their own brand with the SPA/M. Student’s t test was used to compare the ECs and to compare EC and conventional cigarette topography in the exclusive CS. Exclusive EC users took significantly larger (e.g., 53.7±27.8 ml, p < 0.05) and longer (3.32±2.66 vs. 2.44±1.24 seconds, p < 0.001) puffs than the exclusive CS. The exclusive EC users had lower average puffing topography in both groups while using EC prototypes (e.g. %CV was 77% in the exclusive CS and 82% in the exclusive EC). The exclusive CS took significantly larger (53.7±27.8 ml, p < 0.05) and longer (3.32±2.66 vs. 2.44±1.24 seconds, p < 0.001) puffs from the EC than their own brand cigarette. There was a high degree of inter-subject variability in puff topography in both groups while using EC prototypes (e.g., %CV was 77% for puff volume in exclusive EC users and 51% in CS). Results demonstrate that puffing topography of ECs can be evaluated in the laboratory setting similar to that for conventional cigarettes.

FUNDING: This study was funded by Altria Client Services Inc.

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POS3-66

IMPULSIVITY PREDICTS DROPOUT AMONG HEAVY DRINKING SMOKERS IN A SMOKING CESSATION TRIAL

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Heavy alcohol use is associated with poorer treatment outcomes in smoking cessation. However, the mechanisms underlying this association are unclear. Impulsivity is a multidimensional construct which includes a preference for immediate gratification at the expense of larger long-term gains, and may contribute to poorer smoking cessation outcomes among heavy drinking smokers (HDS), relative to light- or non-drinkers. The present study examined the role of impulsivity in predicting treatment dropout among smokers who varied according to alcohol use in a smoking cessation clinical trial. Participants (n = 271) in the present analysis were drawn from a larger 12-week study examining the efficacy of naltrexone versus placebo for smoking cessation. Participants were classified based on alcohol quantity-frequency for the 6 months before enrolling, and included HDS (n = 62; >12 binge episodes), light/moderate drinking smokers (LMDS; n = 176; 1-11 binge episodes), or non-drinking smokers (NDS; n = 33; no alcohol use). Participants received placebo or naltrexone for the duration of the trial, as well as cognitive behavioral therapy for smoking cessation and nicotine replacement therapy during the first 4 weeks. Baseline impulsivity was assessed using the Monetary Choice Questionnaire. We hypothesized that greater impulsivity would be associated with increased likelihood of dropout through 12 weeks, and that this effect would be largest among HDS. Dropout rates (16% overall) did not differ between drinker groups. However, logistic regression analyses revealed that impulsivity predicted treatment dropout among HDS (B = 0.41, SE = .16, odds ratio = 1.51, p = .009) but not LMDS and NDS (p = .21). The effect in HDS remained significant when accounting for the effects of drug group and demographic variables (age, race, education). These data suggest that impulsivity is an important individual difference factor predicting dropout from smoking cessation treatment among HDS. Addressing impulsivity in HDS in smoking cessation may improve treatment retention and outcomes in this group.

FUNDING: National Institute of Drug Abuse/the National Institutes of Health (R01-DA016834).

JUSTIFICATION: Impulsivity predicts dropout from smoking cessation treatment among heavy-drinking smokers, and addressing impulsivity may improve treatment retention and outcomes in this group.

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POS3-67

SPITTING INTO THE WIND: THE UTILITY OF SALIVARY COTININE ANALYSIS TO ASSESS ABSTINENCE FROM SMOKING

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Background: Biochemical verification of abstinence has been considered the ‘gold standard’ for results reporting in smoking cessation trials. However, performing biochemical verification is resource-intensive and subject to bias. To compare self-reported cessation status with biochemical verification is resource-intensive and subject to bias. The present study examined the relationship between self-reported and biochemical verified abstinence status and determine the utility of biochemical verification, we performed salivary analysis on a subsample of participants in a smoking cessation trial with high-intensity efforts to optimize sample collection. Methods: As part of the 6-month outcome assessment in a smoking cessation clinical trial, we asked all self-identified quitters (7-day point-prevalence abstinence) to submit saliva samples for verification of quit status. We offered to meet participants at a public place to collect the samples in person or provided materials for participants to collect the samples at home and mail them. Samples had to be received within 30 days, and participants received $100. We sent the saliva samples to Salimetrics, Inc. for salivary cotinine analysis. Results: We collected 129 samples (42 in-person, 87 by mail) from persons who claimed to be 7-day nicotine-free on phone interview (84% of those invited). Seventy-four (57%) claimed to have quit smoking 6 months prior, 37 (29%) claimed to be smoke-free for 30 days, and 13 (10%) reported abstinence for 7 days. At the time of saliva collection, 15/23 (65%) reported continued abstinence during the previous 7 days; 1/3 of these had a saliva cotinine level indicating ongoing smoking. Range of salivary cotinine was 0.11-1538.9 ng/mL (mean 191.6). Using a 4 ng/mL cutoff, 41% of self-reported quitters were verified nicotine-free. Participants who submitted samples in-person were less likely to be biochemically verified nicotine-free than those who submitted by mail (OR 0.25, 95% CI 0.09-0.66). Duration of reported smoke-free time was also associated with lower likelihood of biochemically verified quit (p<.01). Conclusions: Biochemical verification may be necessary for results reporting in smoking cessation studies, since self-report of quit status seemed to be inaccurate in a high percentage of self-reported quitters.

FUNDING: NHLBI U01HL105229-01 (Sherman, PI)

JUSTIFICATION: This study will be useful for researchers planning smoking cessation studies, for interpretation of self-reported smoking status in ongoing and past studies, and for understanding predictors of misreporting.

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POS3-68

SMOKING URGES INCREASE PSYCHOSOCIAL RISKS AND DECREASE CESSATION AMONG AFRICAN AMERICANS IN TREATMENT

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African American smokers experience greater difficulty quitting smoking compared to Whites. Although urges to smoke maintain current smoking and increase the risk of relapse, no studies have examined their impact in this population. This study tested smoking urge as a predictor of (a) psychosocial risk factors and (b) cessation among African Americans enrolled in a randomized controlled trial (N = 282). The intervention included 8 sessions of group cognitive behavioral therapy, plus 8-weeks of transdermal nicotine patches (TNP). Urges to smoke and TNP use were measured at each session. End-of-counseling (EOC) measures included perceived stress, depressive symptoms, smoking-related attitude change, 7-day point prevalence abstinence (ppa), and 1-month continuous abstinence. A series of regression analyses (controlling for intervention condition) were conducted to examine the influence of smoking urges at sessions 1 and 8 (EOC) on outcomes. Results demonstrated that greater urges at session 1 positively predicted perceived stress and depressive symptoms at the EOC. Urge at session 1 and 8 (EOC) were not predictive of smoking-related attitude change, TNP use, or 7-day ppa at the EOC. We also found that smoking urges at session 8 were positively correlated with perceived stress and depressive symptoms. Inverse associations were found between session 8 urges and attitude change, TNP use, 7-day ppa, and 1-month continuous abstinence. These findings highlight the strong impact of urges to smoke as African Americans undergo treatment. Urges at the first session are significant risk factors for stress, depressive symptoms, and low TNP adherence. Session 1 urges also predicted participants who were less likely to quit for 1-month. Thus, the assessment of urges at the start of treatment may signal future psychosocial difficulties and risk factors for relapse. The strength of urges at the end-of-counseling is also related to significant psychosocial risks and smoking cessation success. These findings should be considered in the design and implementation of cessation interventions among African Americans.

FUNDING: National Institutes of Health R01CA151614

JUSTIFICATION: Findings from this study have the potential to inform clinical research and practice among African American smokers who are interested in cessation.

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POS3-69
THE EFFECT OF PROGRESSIVELY LOWER NICOTINE CONTENT CIGARETTES ON SMOKING BEHAVIORS AND BIOMARKERS OF EXPOSURE

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The Family Smoking Prevention and Tobacco Control Act gave the Food and Drug Administration the authority to regulate cigarettes, including reducing nicotine levels. However, research is needed to better understand how the use of low nicotine content cigarettes affects smoking behaviors and toxin exposure. The current study was an open label, within-subject design where participants (current daily cigarette smokers, not intending to quit, n=160) were randomized to either their own brand cigarette (control) or to use Quest cigarettes (experimental) in progressively decreasing nicotine levels (0.6mg, 0.3mg, and 0.05 mg) in successive 10 day periods. All participants completed an initial 5 day period of own brand cigarette smoking to establish individual baseline. Smoking behaviors were assessed by daily cigarette consumption and smoking topography. Biomarkers of exposure included cotinine, 1-hydroxypyrene (1-HOP), 4-(methyl nitrosamino)-1-(3-pyridyl)-1-butanol (NNAL), and carbon monoxide (CO). Results indicate a significant increase in daily cigarette consumption for the experimental group when smoking the 0.6mg (period 1) and 0.3mg (period 2) nicotine cigarettes, and a significant decrease in cigarette consumption when smoking the 0.05mg (period 3) nicotine cigarettes, relative to the control group (p<.001). Total puff volume significantly decreased in periods 1 and 2 for the experimental group (approximately 25%) and increased during period 3 to near baseline level (p<.001). Cotinine and NNAL significantly decreased in the experimental group (p<.01); however, 1-HOP did not differ by group or period (p>.3). In the experimental group, CO boost had a trend toward increasing between baseline and period 1, a significant increase at period 2, and a significant decrease at period 3 (p<.02). Outcome measures were stable across periods in the control group. Results from this study show a complex pattern of behavioral changes when smoking low nicotine content cigarettes. Biomarkers did not change uniformly by period and illustrate the need to carefully and rigorously assess the impact of progressively decreasing nicotine content of cigarettes in daily smokers.

FUNDING: This study was funded by the US National Cancer Institute, R01-CA120594, Strasser AA, Principal Investigator

JUSTIFICATION: Results from this study will provide important empirical knowledge to regulatory and policy makers regarding the regulation of low nicotine content in cigarettes.

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POS3-70
SEVERITY OF INCONTINENCE SYMPTOMS IN SMOKERS: WHAT IS THE ROLE OF RESPIRATORY SYMPTOMS & TOBACCO EXPOSURE?

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Urinary incontinence affects 25-45% of women and 11-34% of men. Smokers have higher rates of both stress and urge urinary incontinence; however, the mechanisms remain unclear. Therefore, we sought to examine the relationship between urinary incontinence and two possible causal factors - respiratory symptoms (self-reported cough) and tobacco exposure (urinary cotinine, pack-years). We hypothesized that increased respiratory symptoms and tobacco exposure would be associated with increased urinary incontinence. Men and women, ages 18-70, who smoked 10-40 cigarettes daily for the past year, were recruited to participate in a smoking cessation study. At screening, participants reported smoking behavior history, urinary symptoms via two validated International Consultation on Incontinence Questionnaires (ICIQ), respiratory symptoms, medical history, and demographics. Height and weight were obtained along with urine sample (for analysis of cotinine). Descriptive statistics and ANOVA/ANCOVAs, adjusting for sex, BMI, age, diuretics, and current health problems were conducted using SAS 9.2. Participants (n=202) were, on average, 47.3±11.7 years old, 58% female, and smoked an average of 19.3±7.3 cigarettes per day. Compared to those without symptoms of stress incontinence (SI; n=168), those with symptoms of SI (n=34) had significantly higher levels of urinary cotinine (3861.2±1433.3 ng/mL vs. 4506.2±2433.6 ng/mL; p=0.002) and a trend towards higher self-reported cough severity (3.6±2.4 vs. 4.3±2.4; p=0.060). Compared to those without symptoms of overactive bladder (OAB; n=68), those with symptoms of OAB (n=132) had significantly more pack-years of smoking (26.4±15.6 vs. 31.5±19.4; p=0.042). We observed those with symptoms of urinary incontinence had significantly higher levels of cotinine and pack-years, as well as a trend towards a higher self-rated cough compared to those without symptoms. More research is needed with a larger cohort to further explore the relationships between tobacco exposure, urinary symptoms, and respiratory symptoms, and how these associations may change with smoking cessation.

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POS3-71
POSTPARTUM SMOKING RELAPSE: AN ECOLOGICAL MOMENTARY ASSESSMENT STUDY

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Background: The goal of this pilot project was to utilize ecological momentary assessments (EMA) administered on a personal digital assistant (PDA) to assess the role of affective and situational stimuli on the relapse process in postpartum women who achieved smoking abstinence during pregnancy. We also assessed cognitive processes during EMA. Methods: Eight pre-pregnancy smokers who achieved abstinence during pregnancy were asked to complete 4 daily random assessments (RAs) on a PDA that collected data on craving, attentional bias (utilizing the smoking Stroop), inhibitory control (using the classic Stroop task), affect and environmental factors for 2 weeks after delivery. Women also completed assessments at participant-initiated “temptation” episodes. Outcome measures include self-reported mood and anxiety, self-reported craving, and number of cigarettes smoked during the trial. Results: The median compliance on random assessments was 76%. The 8 participants completed 342 assessments. Two subjects relapsed 1 week after delivery, 3 reported one lapse, and the remaining 3 remained abstinent. As expected, the subjects who lapsed/relapsed reported higher levels of craving both prior to delivery and at 2-weeks postpartum, along with heightened anxiety and parenting stress. Using linear mixed models, participants who reported higher craving exhibited a greater smoking Stroop effect (attentional bias) (p < 0.05), but not a greater classic Stroop effect, than participants reporting lower craving. Conclusion: These preliminary data indicate that attentional bias is associated with craving and may provoke craving in this population, which in turn may increase relapse risk. Heightened anxiety and parenting stress were also associated with lapses and increased craving. Understanding the underlying triggers for relapse in the postpartum period is crucial in ensuring abstinence and creating interventions for women that relapse.

FUNDING: This research is supported by NIDA grant K12 DA 000167-21 (PI Potenza)

JUSTIFICATION: Ecological momentary assessments can be utilized to understand the underlying triggers for relapse to smoking in the postpartum period, which is crucial in ensuring abstinence and creating interventions for women that relapse.

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POS3-74
BARRIERS TO TELEPHONE QUITLINE USE AMONG METHADONE MAINTAINED SMOKERS

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Background: Telephone quitlines are a cornerstone of population-based smoking cessation interventions, but their reach among drug users is unknown. Objective: To assess barriers and facilitators of telephone quitline utilization in methadone maintained smokers. Methods: Opioid dependent smokers enrolled in a randomized placebo controlled trial of varenicline were offered referral to a free, proactive quitline. Quitline staff contacted smokers, and provide telephone counseling and educational materials. Mixed methods included survey of tobacco use, barriers to quitline use, psychiatric symptoms, and past 30 day drug use; open-ended query of reasons for declining quitline referral; and quitline records on quitline contacts. We defined at least one quitline interview with a complete interview with a complete contact. Factors associated with quitline utilization were analyzed using chi square and T tests. Results: Of the 112 subjects enrolled, 53% were female, 54% Hispanic, 28% black, and they smoked a median of 15 cigarettes/day. Forty-two (38%) refused quitline referral. Of the 70 participants referred to the quitline, only 25 (22.3% of all study subjects) utilized the quitline. Reasons for quitline refusal included: lack of perceived efficacy, lack of consistent telephone access, and competing life demands. Quitline utilizers (v. non utilizers) were significantly more likely to have landline phone service (72 vs 42%, p=0.01), interest in quitline participation (92 v 62%, p<0.01) and willingness to receive calls (96 v 76%, p=0.02). Non-utilizers were significantly more likely to report barriers including cell phone service lapse (38 v 14%, p=0.04), and challenges changing cell phones (19 v 0%, p=0.02). More non-utilizers had a lifetime history of agoraphobia (22 v 12%) or social phobia (6 v 0%) but numbers were small and differences not significant. There was no association between heroin, cocaine, marijuana, or hazardous alcohol use and quitline utilization. Conclusions: Despite the demonstrated efficacy of telephone quitlines, there are limitations to quitline access among methadone maintained smokers. Efforts to expand quitline access are warranted.

FUNDING: NIH UL1 Grant # R02025750 and K23 Grant # DA025736.

JUSTIFICATION: This abstract evaluates the dissemination and reach of telephone quitlines among smokers in methadone maintenance treatment.

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POS3-75
DOES A PREFERENCE FOR MENTHOL CIGARETTES IMPACT SMOKING PATTERNS AND SUSTAINED ABstinence AMONG LATINO SMOKERS LIVING WITH HIV?

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Menthoking is higher among racial ethnic minorities and those from low SES backgrounds. Adult menthol smokers have been found to be less likely than non-menthol smokers to successfully quit smoking, despite increased quit intentions and quit attempts. The FDA is calling for additional data on menthol use, particularly in vulnerable populations. Smoking is highly prevalent among people living with HIV (LWH) and poses unique health risks including rising lung cancer rates. Research is limited in the area of HIV among Latinos, with even less known regarding tobacco use in this vulnerable population. This study examines menthol use and associations with smoking patterns and smoking abstinence after participation in a cessation RCT comparing a culturally-tailored intervention to standard care among 302 Latinos LWH recruited from 9 Northeastern immunology clinics (mean age = 45, SD=8 years; 64% male; 51% not born in USA; 56% Puerto Rican). The vast majority of this sample endorsed smoking menthol cigarettes (76%), with those born in the U.S. smoking menthol about 10% more than foreign born (81% vs. 71%; p=0.026). Compared to non-menthol smokers, menthol smokers tended to be younger (p=0.00), have lower monthly income (p=0.04), be less adherent to HIV meds (p=0.04). Multivariate logistic regression results indicated the odds of daily vs. non-daily smoking was higher for menthol smokers (OR = 3.27, 95% CI = 1.42-7.49; p = .005) even after controlling for dependence and motivation to quit. Biochemically verified 7-day ppi quit rates at 6-months (16%) and 12-months (10%) were low with no treatment group differences. Dose of NRT used in the trial predicted 6-month abstinence and menthol smokers were significantly less likely to adhere to NRT (p=0.00) compared to non-menthol smokers. The heavy use of menthol cigarettes and poor cessation outcomes in this HIV-positive low income population provides compelling support that tobacco control policies, such as banning menthol and counter-marketing programs, are needed to address disparities in tobacco-related disease and mortality in vulnerable populations.

FUNDING: Supported by NIDA (R01DA018079) and NCI (K07CA091831; P30CA051008) awards.

JUSTIFICATION: The heavy use of menthol cigarettes and poor cessation outcomes in this HIV-positive low income population provides compelling support that tobacco control policies, such as banning menthol and counter-marketing programs, are needed to address disparities in tobacco-related disease and mortality in vulnerable populations.

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HOW DO SELF-EFFICACY EVALUATIONS PERFORM LONGITUDINALLY IN A SMOKING CESSATION TRIAL?

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Self-efficacy is a core construct in health behavior change theories and is commonly assessed pre-treatment in behavioral studies of smoking cessation. Cessation treatment in smokers recently diagnosed with cancer and scheduled for surgical resection presents a unique opportunity to examine the predictive performance of self-efficacy on cessation outcomes. We report data from a multicomponent, randomized, controlled smoking cessation intervention trial (Ostroff et al., 2013) with this population comparing best practices (counseling + NRT) to best practices + scheduled reduced smoking, a behavioral treatment administered via a mobile, electronic device. Treatment began at a minimum of one week before hospitalization and continued for 3 months. Because no differential treatment effect was observed, analyses were conducted with combined trial participants. 185 recently diagnosed cancer patients (mean age 55.9, 53% female, 87% White) were enrolled and intention-to-treat, biochemically verified, 7-day point prevalence smoking status was the outcome. Self-efficacy was measured at baseline, hospital admission and discharge, and 3 and 6 months after treatment using a modified confidence questionnaire, Form S (Baer & Lichtenstein, 1988). We hypothesized that self-efficacy scores would predict later smoking status. Self-efficacy scores overall increased from baseline to hospital admission but decreased at 3 and 6 months. Logistic regression failed to find a relationship between self-efficacy scores and future smoking status (p>0.05). However, analyses of changes in self-efficacy scores between time points showed that the greater the increase in self-efficacy scores, the more likely a patient was to be abstinent; conversely, the greater the decrease in self-efficacy, the less likely a patient was to be abstinent (p<0.01). These findings suggest caution in this context for the use of static self-efficacy scores, especially pre-treatment, to predict abstinence and tailor behavioral treatment. Rather, ongoing self-efficacy assessment is important, and intervention to boost quitting self-efficacy and prevent declines may increase the chances of longer-term smoking abstinence.

FUNDING: This study was conducted at Memorial Sloan-Kettering Cancer Center and supported by R01 CA09514 and T32 CA009461-27.

REASONS FOR SMOKING AMONG TRI-ETHNIC DAILY AND NONDAILY SMOKERS

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Nondaily smokers experience adverse effects from tobacco use, yet they have been under-studied compared to daily smokers. Reasons for smoking are important determinants of smoking behavior, and understanding how they differ between subgroups could inform tailored interventions. The present study compared reasons for smoking by nondaily and daily smoking levels, gender, and ethnicity. A cross-sectional survey was administered through an online panel survey agency to 2,376 current smokers at least 25 years of age. The sample was stratified to equal numbers of three racial/ethnic groups (African American [AA], Latino, White) across smoking level (nondaily vs. daily), gender (male vs. female), and race (AA vs. Latino vs. White). The seven-factor structure (Tension Reduction/Relaxation; Habit/Automatism; Pleasure to Smoke; Handling; Stimulation; Addictive Smoking; Social Stopping) of a 20-item Modified Reasons for Smoking Scale (MRSS) was confirmed (each subscale alpha > 0.80). Each factor of the MRSS varied by smoking level, with nondaily smokers endorsing all reasons for smoking (RS) less frequently than daily smokers (p < 0.0001). The four smoker subgroups incrementally differed from one another (p < 0.05) with several exceptions: converted nondaily vs. daily light smokers were comparable on Habit/Automatism, Handling, Stimulation, and Social Smoking (p > 0.05). Males reported stronger RS on five out of seven reasons (p < 0.05). Females had higher scores on Tension Reduction/Relaxation (p < 0.0001) and there were no gender differences on Addictive Smoking (p > 0.05). Ethnic differences across all RS were observed (p < 0.0001). Latinos reported stronger RS than Whites and AAAs on all reasons (p < 0.05) except for Tension Reduction/Relaxation, in which AA and Latino scores were comparable (p > 0.05). AAs and Whites were comparable on all RS (p > 0.05). The present study highlights considerable variability across smoker type, gender, and ethnicity in strength of reasons for smoking. Addressing subgroup differences in reasons for smoking may contribute to more sensitive and effective prevention and treatment efforts.

FUNDING: This research was funded by Pfizer’s Global Research Awards for Nicotine Dependence (Ahluwalia). Dr. Ahluwalia is also supported in part by the National Institute for Minority Health Disparities (NCMHD/NIMH - 1P60MD003422). Statistical support was obtained through the Biostatistics Core, Masonic Cancer Center, University of Minnesota funded by the National Institutes of Health/ National Cancer Institute Grant P30 CA75798.
8-weeks of transdermal nicotine patch therapy. Key aspects of the intervention were tools for managing the emotional aspects of smoking cessation. Participants were mostly non-married, middle-aged, at least high school educated, and lower-income. They smoked an average of 20 daily cigarettes for 27 years, and were moderately nicotine dependent. Halfway through the 4-week counseling program, participants completed measures assessing aspects of impulsivity (urgency, lack of perseverance, and self-control) and emotional regulation (languor, reflective reactions to feelings, distractibility, and affect). Smoking cessation (7-day point prevalence abstinence [ppa]) was assessed at the end of counseling and at a 6-month follow-up. Logistic regression analyses indicated that both impulsivity and emotional regulation predicted smoking cessation. At the end-of-counseling, the odds of 7-day ppa were greater among participants who had less difficulty controlling impulses, and who were less lethargic, distractible, and likely to react reflexively to emotions. Six-months post-counseling, smoking cessation was greater among participants with more self-control and positive affect, and who were less likely to react reflexively to emotions. Overall, cognitive control over emotions and behavior were predictive of successful smoking cessation among treatment-seekers. In contrast, smokers who reported difficulty regulating their emotions were less likely to quit over a 6-month period. Impulsivity and emotional regulation may be important targets on which to individually tailor interventions.

**POS3-79 TIMING AND AMOUNT OF PRENATAL CIGARETTE EXPOSURE AND BEHAVIORAL CONCERNS IN TODDLERS**

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Background: Prenatal cigarette exposure has been linked to attention and behavior problems in children and adolescents. These problems emerge over time and cannot be reliably measured or diagnosed prior to school age. Sensation seeking, a major component of both attention and conduct problems, emerges during the second year of life as a developmental precursor of later attention and behavior problems. Goal: The goal of this study was to examine the association between prenatal cigarette exposure and sensation seeking behavior in toddlers, controlling for potential confounders. Additionally, we sought to examine the influence of timing and amount of exposure on sensation seeking. Methods: Study participants were children of women recruited early in pregnancy as part of a longitudinal study. 226 children (121 exposed to cigarettes prenatally) were evaluated on Sensation Seeking at age 15 months using the Infant-Toddler Sensory Profile. Results: Over one quarter (27%) of children prenatally exposed to 10+ cigarettes/day scored clinically high on Sensation Seeking, compared with only 11% of those with lower levels of exposure, and 15% of those with no exposure. This difference was significant (p<.05) even after control for significant background differences. In addition, effects were seen only for those exposed to smoking during the first trimester, with no significant effects associated with any level of second or third trimester exposure. Conclusion: Early gestational exposure to a high level of cigarette smoking predicted abnormally high levels of sensation seeking behavior in this sample of 15 month old children, possibly indicating a risk for later attention and conduct problems. While findings need replication and examination long term, they suggest a way of identifying prenatally exposed children with a high likelihood of developing later attention and conduct problems, allowing for earlier intervention to possibly minimize the risk of these predispositions interfering with later academic achievement and social competence.

**FUNDING:** State of Tennessee Department of Health

**JUSTIFICATION:** Findings in the present study translate to clinical practice by providing possible targets of attention for smoking prevention and treatment efforts.

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**POS3-80 REGULATORY CONTROL OVER EMOTION AND SMOKING CESSATION FOLLOWING GROUP COGNITIVE BEHAVIORAL THERAPY**

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There are several evidence-based intervention methods for promoting smoking cessation. However, some smokers are unable to quit using these approaches. The influence of common traits among smokers, including impulsivity and emotional dysregulation, are not well understood in the context of treatment. The purposes of this prospective study were to examine impulsivity and regulatory control over emotions as predictors of smoking cessation. A sample of 130 ethnically diverse smokers received group cognitive behavioral therapy (CBT) plus 8-weeks of transdermal nicotine patch therapy. Key aspects of the intervention

**FUNDING:** National Institutes of Health SR01CA151614
POS3-82  
**DISCUSSING TOBACCO PREVENTION AND SECONDHAND SMOKE EXPOSURE WITH PATIENTS AND PARENTS: ASSESSING THE TRAINING AND CONFIDENCE OF INCOMING PEDIATRIC AND FAMILY MEDICINE INTERNS**

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**BACKGROUND:** Limited information is available assessing physician training and confidence related to discussing smoking cessation and second-hand smoke exposure with children and families. The purpose of this study was to compare incoming family medicine (FMIs) and pediatric interns’ (PIs) training and confidence in these areas. **METHOD:** Incoming medical interns completed questions about previous training in tobacco prevention/secondhand smoke exposure and levels of confidence in their ability to provide education and assistance about smoking cessation. Confidence in addressing smoking cessation was assessed using a 6-item, Likert scale, with item scores ranging from 1 (Not confident at all) to 7 (Very confident). **RESULTS:** Twenty-five (82.6%) participants completed this study. Sixty percent were PIs and 40% were FMIs. Participants had a mean age of 26.7 years (SD=1.83) and 68% were female. Twelve (80%) PIs reported previous training/education in tobacco prevention and control or second hand smoking during undergraduate or medical school, compared to 5 (50%) FMIs. Also, mean confidence scores for addressing smoking cessation in patients >12 years and parents were 5.71 (SD=2.75) and 5.59 (SD=2.87), respectively. These findings indicated that although new interns were “moderately confident” discussing this topic with patients and families, there was still some room for improvement. For individual items, PIs were slightly less comfortable prescribing nicotine replacement medications to both children (M=4.87) and parents (M=4.73) than FMIs (child M=6.00 and parent M=5.40). Other item scores related to providing guidance, advice, assessment, recommendations, and referral to a quit line for smoking cessation were generally consistent between both groups, ranging from 5.2 to 6.2 for PIs and 5.10 to 6.30 for FMIs. **CONCLUSION:** This study identified the importance of training in tobacco use prevention and secondhand smoke exposure during residency. Also, interns could benefit from additional experiences addressing smoking cessation in order to improve their level of confidence with these important topics, specifically in prescribing nicotine replacement medications.

**FUNDING:** None

**JUSTIFICATION:** This study supports the idea that faculty responsible for training incoming residents may have misconceptions regarding the relative harm of traditional tobacco products and therefore should be educated regarding the risks of such products.

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POS3-83  
**NICOTINE REPLACEMENT THERAPIES, E-CIGARETTES, AND OTHER TOBACCO PRODUCTS: ASSESSING PERCEPTIONS OF PEDIATRIC AND FAMILY MEDICINE INTERNS**

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E-cigarettes, which deliver nicotine through inhaled vapor, have been viewed as both a threat and a potential benefit to public health. Despite significant strides made in researching these products over the last several years, many questions remain unanswered, including questions regarding the effects of e-cigarette use over time. **Aims:** To examine the effects of duration of e-cigarette use on several factors including current tobacco cigarette use, dependence to e-cigarettes, frequency of e-cigarette use, and the strength of nicotine solution used in e-cigarettes. **Design and setting:** Individuals were recruited at e-cigarette retail locations in a large metropolitan city in the Midwestern U.S. in July, 2013. One-hundred and fifty-nine participants with a mean age of 35.8, 84.8% Caucasian, 53.7% male completed a brief (29 item) self-report measure assessing behaviors and perceptions regarding e-cigarette and traditional cigarette use as well as demographic information. **Findings:** Increased duration of use was associated with decreased current cigarette use. Additionally, past heavy smokers (i.e. ≥ 10 cigarettes per day) and past light smokers demonstrated significantly different patterns of dependence with duration of use. Overall, e-cigarette users decreased the strength of nicotine in their e-cigarette products; however, duration of use was not associated with changes in strength of nicotine, as some decreased nicotine strength very quickly while others took much longer. Frequency of e-cigarette use increased with increasing duration of use; however, this finding was not significant when traditional cigarette use was added as a covariate. Conclusions: Duration of e-cigarette use appears to be associated with decreased cigarette use and differing patterns of dependence contingent on past smoking history. Likely a function of individuals transitioning from traditional cigarettes to e-cigarettes over time, reported frequency of e-cigarette use increased with increased duration of use.

**FUNDING:** None

**JUSTIFICATION:** This study shows that medical attendings should be aware that incoming residents may have misconceptions regarding the relative harm of traditional tobacco products and therefore should be educated regarding the risks of such products.

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POS3-84  
**SMOKING CESSATION OUTCOMES AMONG MENTHOL AND NON-MENTHOL SMOKERS IN COMBINED SMOKING TREATMENTS**

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Menthol additives in cigarettes may increase addiction potential through greater nicotine absorption. Menthol cigarettes may also contain more carcinogens, resulting in higher cancer risk. A limited number of treatment- and population-based studies have reported conflicting results on whether menthol use is associated with lower abstinence rates. Moreover, most studies report relatively short-term follow-up assessments. The present study is a secondary data analysis comparing the efficacy of pharmacological and behavioral treatments among menthol and non-menthol smokers. Data from four clinical trials were combined to increase statistical power and generality of the findings. All trials included counseling and pharmacological treatment. Study 1 (N = 402) compared extended counseling, extended NRT, and extended combined counseling +NRT in smokers age 50 years and older. Study 2 (N = 406) compared extended active or placebo bupropion SR alone, or combined with extended counseling for 40 weeks. Study 3 (N = 160) compared active and placebo nortriptyline combined with brief or extended behavioral treatment. Study 4 (N = 360) compared brief and extended NRT, with and without psychosocial support. Follow-up assessments...
were conducted at Weeks 12, 24, and 52, with biochemically-verified 7-day abstinence as the outcome. Of the 1330 participants, 73% were Caucasian and 9% African American. Nineteen percent reported smoked menthol cigarettes. Baseline mean daily cigarettes = 20.5 and mean FTND score = 5.05. Overall, abstinence rates did not differ significantly between menthol and non-menthol smokers. Rates for menthol users were 54% at Week 12, 47% at Week 24, and 41% at Week 52. Rates for non-menthol smokers were 58% at Week 12, 45% at Week 24, and 37% at Week 52. Conclusions: This work is consistent with previous studies showing menthol smokers appear to achieve similar abstinence rates as non-menthol smokers and adds to the literature by providing data up to one year post enrollment. However, generality is limited due to the smaller proportion of African American smokers who smoke menthol cigarettes at a higher rate.

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POS3-85 TOBACCO CESSATION COUNSELING IN PRIMARY CARE: IDENTIFYING OPPORTUNITIES TO IMPROVE EFFICIENCY AND EFFECTIVENESS

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Background: Clinical practice guidelines for treating tobacco use and dependence advocate for counseling tobacco users during each visit. Counseling should be tailored to the patient’s readiness to quit. No prior study has evaluated the delivery of guideline-recommended cessation assistance or motivational counseling approaches in routine clinical practice. Objective: To evaluate the application of the clinical practice guideline-recommended tobacco use screening and counseling interventions in primary care. Methods: Eligible clinician and patient participants were those enrolled in an observational study of primary care patients due for colorectal cancer screening (2007 – 2009). That study audio-recorded 484 routine periodic health examinations delivered by an integrated health system in southeast Michigan. The subset of tobacco users (N=91) were identified via a combination of the pre-visit survey and visit audio-recordings. Office visit transcripts were coded for delivery of counseling interventions. We then assessed whether counseling interventions received were tailored appropriately to the patients’ readiness to quit. Findings: The majority of tobacco users in our sample had their smoking status discussed (n=84) and a subset had their willingness assessed (n=77), and most received some sort of tobacco-related counseling during the visit. However, 15% received only the recommended counseling tailored to their readiness to quit (i.e., appropriate use reflecting efficiency and effectiveness). Others received less counseling than recommended (i.e., underuse, 19%) or inappropriate counseling (i.e., misuse, 7%) which could indicate waste of time or effort. The majority of patients who did not receive the recommended counseling received nonindicated counseling in addition to that which was indicated (i.e., overdose reflecting effectiveness as well as waste of time or delivering unindicated interventions, 59%). Conclusion: Results indicate not only a gap between what is delivered in clinical practice and guideline-recommended tobacco use counseling, but an opportunity to improve both the effectiveness and efficiency of tobacco-related counseling in primary care practice.

FUNDING: This study was conducted while the first author was at the Virginia Commonwealth University. Supported by National Cancer Institute grant # R01 CA112379.

JUSTIFICATION: Through improving the effectiveness and efficiency of targeted tobacco use cessation counseling, we can overcome the frequently cited barriers of lack of time and physicians self efficacy in tobacco use counseling.

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POS3-86 WEIGHT CONTROL SMOKING IN A BIRACIAL URBAN SAMPLE OF LIGHT AND INTERMITTENT SMOKERS

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Despite decreased smoking rates over the past 10 years, light (<10 cigarettes per day) and intermittent (non-daily) smoking has increased, predominantly for young adults (CDC, 2011). Light and intermittent smoking (LIT) can result in decreased arterial functioning (Coggins, Murrelle, Carchman, & Heidbreder, 2009), and increases the risk of cardiac disease and cancer (Bjartveit & Tverdal, 2005). Weight concern has been highlighted as an important risk factor for light and intermittent smoking (Thomas et al., 2008). However, limited research has explored whether the role of weight control is different for Caucasian vs. African American LIT smokers. Data for this study were derived from the Memphis Health Project, a longitudinal study of smoking onset in a biethnic cohort of approximately 7,000 teens. In the 10th year of the study, the young adults were asked whether they had smoked to lose weight and how much they believed smoking reduces weight. Data were also collected on smoking behavior. The study procedures have been outlined elsewhere. LITs were selected in this dataset, and a binary logistic regression was performed in order to determine whether the belief that smoking reduces weight and actual smoking to reduce weight differs by ethnicity. There were a total of 186 young adult light smokers in our sample who reported race and our other relevant variables. Results indicated that there was no significant relationship between ethnicity and the belief that smoking helps people control their weight. However, there was a significant relation between ethnicity and smoking in order to control weight among these LIT smokers, OR= 5.55, p = .016. Our results indicated that for each point increase in weight-control smoking, the odds that the student was Caucasian increased more than five times. Our results suggest that among LITs, weight control smoking is primarily an issue for Caucasian young adults. However, research has shown that smoking does not in fact reduce weight (Gruber & Frakes, 2006; Perkins, 1993). We recommend that smoking prevention programs targeted to Caucasian young adults address the importance of the myth that smoking can reduce weight.

FUNDING: This research was supported by a grant from NHLBI, HL50723

JUSTIFICATION: The results of this study may inform clinical practice, and cessation and prevention program curriculum.

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POS3-87 USING EXPIRED AIR CARBON MONOXIDE TO DETECT PREGNANCY SMOKING: VALIDATING A CUT-POINT AND ESTIMATING SMOKING AMOUNT

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Background: Carbon monoxide (CO) in expired air samples is a non-invasive and cost-effective biochemical marker for smoking. Cut points of 6ppm-8ppm in the general population have been established, however, the CO level at which a pregnant woman can be considered positive for smoking is uncertain due to increased metabolism rates and altered respiratory capacity. We recently reported preliminary findings that a lower 4ppm CO cut-point best identified pregnant smokers, regardless of trimester. The purpose of this report was to further validate, in a larger sample, an appropriate CO cut-point for pregnant smokers. In addition, we examined if CO levels could accurately predict number of cigarettes smoked per day. Methods: Pregnant women (N=620) completed a validated self-report assessment of smoking, a urine drug screen for cotinine (UDS), and provided an expired air sample during pregnancy. Results: 44% of the sample reported smoking, and this was confirmed by UDS. Using a traditional CO cut-points of 6ppm+ and 8ppm+, only 5% (6ppm+) and 2% (8ppm+) of non-smokers were incorrectly identified as smokers, but only 74%/59% of all smokers, and 64%/71% of those who had smoked at least 5 cigarettes in the previous 24 hours, were identified. However, at a cut-point of 4ppm+, only 9% of non-smokers were misclassified as smokers. In addition, 88% of all smokers, 96% of those who had smoked 5+ cigarettes in the previous 24 hours, and 98% who had smoked 10+ cigarettes in the previous 24 hours were identified. Most false positives involved
marijuana use or high levels of environmental tobacco smoke exposure. Finally, an equation was modeled on half the sample using CO levels to predict number of cigarettes smoked in the previous 24 hours. This equation fairly accurately predicted number of cigarettes smoked in the hold out sample (CI: < 6; shrinkage: < 5%; cross validation coefficient > 8). Conclusions: Based on these findings, a lower 4ppm CO cut-point appears to best identify pregnant smokers, further validating expired air CO as a valid, low cost, and non-invasive method for determining both smoking status and possibly daily smoking amount in pregnant women.

FUNDING: State of Tennessee Department of Health

JUSTIFICATION: Based on the study findings, a lower 4ppm CO cut-point appears to best identify pregnant smokers, further validating expired air CO as a valid, low cost, and non-invasive method for determining both smoking status and possibly daily smoking amount in pregnant women.

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POS3-88 DESIGN AND IMPLEMENTATION OF DECISION SUPPORT FOR TOBACCO DEPENDENCE TREATMENT IN AN INPATIENT ELECTRONIC MEDICAL RECORD

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Background: Tobacco dependence treatment for hospitalized smokers results in long-term quits if the intervention continues at least 30 days after discharge. Electronic medical records (EMRs) may allow leveraging of inpatient interventions into outpatient settings. Objective: To describe the design and feasibility of an EMR-based decision support intervention for tobacco dependence treatment in inpatients. Methods: A 2-arm randomized trial of 200 physicians and 960 patients treated by those physicians. The physician is the unit of randomization. An MLM/order set was developed and embedded in the Epic medical record used at a single urban 962-bed hospital. When a patient 18 years or older is admitted to a medical service, an MLM fires if the patient is noted to be a smoker. The MLM offers to take intervention arm physicians to an order set that includes tobacco dependence treatment medications. If the physician accepts, the order set fires and additional functions occur: a referral is sent to the state smokers’ quitline (QL), “tobacco use disorder” is added to the patient’s problem list, an email is sent to the patient’s primary care provider, text addressing tobacco dependence treatment is added to the patient’s discharge papers, and a provider calls the subject 2-3 days after discharge. Control arm physicians are tagged by the MLM for reporting control arm smokers are tagged by the MLM for reporting

FUNDING: NIH/National Heart, Lung, and Blood Institute R18HL105208

JUSTIFICATION: Decision support embedded in electronic medical records may allow hospitals to extend inpatient tobacco dependence treatment into outpatient settings, thus increasing the likelihood of sustained quits.

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POS3-89 TOBACCO QUALITY OF LIFE IMPACT TOOL (TQOLIT®v1): PRELIMINARY TESTS OF AN IMPROVED METHOD FOR DIFFERENTIATING THE QUALITY OF LIFE EFFECTS AMONG CURRENT, FORMER, AND NEVER SMOKERS

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Background: TQOLIT®v1 has been developed and validated to integrate symptoms and quality of life (QOL) impact attributed to smoking with widely-used SF-36v2 and new general measures. We report its first use in a 6-month clinical study (ISRCTN72157353) of healthy current smokers (CS), former smokers (FS) and never smokers (NS). Objective: Evaluate the usefulness of TQOLITv1 in differentiating the QOL outcomes across three groups. Methods: An electronically-administered German translation of TQOLIT was completed by 128 CS, 58 FS, and 57 NS. The CS were aged 23 to 55 years whereas FS and NS were aged 28 to 55 years. ‘Healthy’ concurrent status was determined by medical screening and the previously-validated TQOLIT chronic conditions checklist. CS completed the survey at baseline, 3 and 6 months whilst baseline for FS and NS was 3rd month and follow-up at 6th month. Performed data quality evaluation and applied appropriate statistics. Results: Data quality in terms of completeness, responses within allowable limits and estimable scores were high. Among CS, 96.9% smoked daily (mean:21 cigarettes/day, duration of 22 years). FS quit smoking for 5 or more years, having previously smoked for an average of 15 years. Chronic conditions were self-reported most often in the sequence of current>former>never. At baseline, smoking-specific measures were significantly worse in CS (F(3,184)=55.75) than FS (F(3,184)=28.4) with effect sizes of .23 and .013 for symptoms and QOL impact, respectively. Improved general physical function measure discriminated across the three groups, as hypothesized, with CS scoring significantly lower than NS (Cohen’s d effect size 0.36). The latter differentiation was not observed for the physical function or other 7 general SF-36v2 measures. These findings were replicated at 3 and 6 months follow-ups. Significant correlations between symptoms, impact and general measures were observed. Correlations over time showed significant stability in smoking-specific and most general measures. Conclusion: In support of its discriminant validity, TQOLITv1 is useful in differentiating between current, former and never smokers, as hypothesized.

FUNDING: Funded by British American Tobacco (BAT), BAT authors are current employees. BAT provided an unrestricted research grant to John Ware Research Group for developing TQOLIT®v1 and reporting the findings.

JUSTIFICATION: TQOLIT®v1 measures will be useful in interpreting Health-related Quality of Life outcomes in tobacco research to support the clinical evaluation of reduced toxicant prototype cigarettes or other alternative nicotine products.

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POS3-90 SPONTANEOUS REDUCTIONS IN SMOKING DURING DOUBLE-BLIND BUPRENORPHINE DETOXIFICATION

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Prevalence of cigarette smoking among opioid-dependent individuals is 4-fold that of the general population. Prior research has suggested an association between opioids and smoking, whereby opioid administration increases smoking and opioid dose reductions are followed by decreases in smoking. We recently completed a 12-week double-blind trial evaluating an outpatient buprenorphine (BUP) taper for prescription opioid (PO) abusers (Sigmon et al., in press). Seventy PO abusers received initial BUP stabilization (Stabilization Phase), followed by
randomization to a 1-, 2- or 4-week BUP taper (Taper Phase) and subsequent naltrexone therapy (Naltrexone Phase). While the primary aim was illicit opioid abstinence, the trial provided an opportunity to examine naturalistic change in smoking during opioid detoxification. The study did not include any smoking-cessation services and participants were not encouraged to alter their smoking in any way. Upon study completion, all urine specimens were re-analyzed for urinary cotinine as an objective measure of smoking during the study. To avoid confounding by illicit opioid use or taper duration, data were analyzed for smokers who received the same 4-week BUP taper and tapered without resumption of illicit opioid use. Participants (n=10) were 24.8 (SD= 2.0) years old, 60% male, 100% Caucasian, and smoked 21.0 (SD= 7.7) cigarettes/day. There was a significant main effect of study phase on mean cotinine levels (p<0.01), with significantly lower cotinine levels during taper and naltrexone phases vs. stabilization. More specifically, mean cotinine decreased by 40% between intake and end-of-study (1648.5 vs. 1015.8 ng/ml, respectively), reflecting an approximate 8 cigarette/day reduction. Spontaneous reductions in smoking were observed among PO abusers who successfully tapered from opioids. These data provide additional support for the smoking-opioid association, particularly under rigorous double-blind conditions. They also suggest that, while detoxification represents a challenging approach to treating opioid dependence, those who successfully taper may also experience concurrent reductions in smoking.

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**POS3-91**

**EFFECTS OF CIGARETTE MENTHOLATION ON BRAIN NICOTINE ACCUMULATION**

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Menthol cigarettes are likely associated with greater risks of smoking dependence than non-menthol cigarettes. We sought to test the hypothesis that menthol may increase the rate of brain nicotine accumulation during smoking and thereby enhance its addictive effects. In a counter-balanced cross-over design, 10 menthol and 10 non-menthol smokers (5 males/group; mean age 44.9; 10+ cigarettes per day) underwent a menthol and a non-menthol cigarette study phase. In each phase the participant smoked exclusively either Basic non-menthol Gold or Basic Menthol Gold 100’s cigarettes (equal in FTC nicotine yield) for approximately 1 week prior to a PET scan session, during which the subject’s head was scanned over 12 min (245 frames) after inhalation of a single puff of smoke (puff volume 30 mL; inhalation volume 550 mL) from a cigarette that was of the same type as smoked in the preceding days but contained 11C-(S)-nicotine. No differences in initial (15 sec) slope, Cmax, and T1/2 of brain nicotine accumulation were found between inhalation from menthol and non-menthol cigarettes across all subjects. However, there were sex differences in smoking behavior and Cmax values for menthol but only for non-menthol cigarettes in males (mean±SE: 0.14±0.03 vs. 0.12±0.02 %ID/kg issue/sec, p = .015; 4.77±0.45 vs. 4.29±0.41 %ID/kg issue, p = .045). In contrast, females had slightly lower initial slope and Cmax values with menthol than non-menthol cigarettes (0.16±0.01 vs. 0.19±0.02 mg; 5.86±0.31 vs. 6.37±0.49 mg). Moreover, there were main effects of sex on initial slope (p = .051) and Cmax (p = .009). Averages of both measurements were greater in females than males (0.19±0.02 vs. 0.13±0.02; 6.11±0.35 vs. 4.53±0.42). Our findings suggest that the effects of menthol on the rate of brain nicotine accumulation may vary by sex. Overall, female smokers also have markedly faster brain nicotine kinetics than male smokers. Further studies of the relations between menthol, sex differences in smoking behavior and smoking exposure, as well as pulmonary absorption of nicotine are warranted.

FUNDING: This study was supported by NIDA Grant 1R03DA029676-01A1 to YZ. It was also supported in part by an unrestricted grant from Philip Morris USA to JER.

**JUSTIFICATION:** This study suggests that the impact of menthol on addictive effects of smoking may vary by sex and further studies of the relations between menthol, sex differences in smoking behavior and smoke exposure, as well as pulmonary absorption of nicotine are warranted.

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**POS3-92**

**CONTENT ANALYSIS OF OPEN-ENDED RESPONSES DESCRIBING REASONS FOR POST-PARTUM SMOKING ABSTINENCE OR RELAPSE**

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Although a significant proportion of pregnant women quit smoking, some relapse during the postpartum period. Using data collected during an RCT of a self-help relapse prevention intervention designed for pregnant women (Brandon et al., 2012), the primary aim of the current study was to conduct a content analysis of open-ended questions asking participants why they returned to smoking or what helped them to remain smoke-free. Responses were obtained at each follow-up assessment: 1, 8, and 12-months postpartum. A secondary objective was to assess patterns of response in terms of demographic or psychosocial risk factors for post-partum smoking relapse. Of the 504 participants enrolled in the parent study, 94% responded to at least one open-ended question. All responses were coded by two independent raters, and disagreements were resolved using a third independent rater. Content analyses revealed several themes that emerged for participants’ reasons for relapse (e.g., cravings, stress) and for abstinence (e.g., use of coping strategies, health concerns for family). Consistent with prior research, stress was the most frequently cited reason for smoking relapse across follow-ups. Health concerns for children and family was the most common reason provided for staying smoke-free. Chi-square analyses revealed group differences in response patterns as related to several demographic and psychosocial characteristics. For example, participants aged 18-24 years old were more likely to report stress as a reason for relapse, whereas those 25 and older were more likely to cite lack of social support. Another example involves household income, such that participants of low socioeconomic status were more likely to cite treatments for personal reasons (e.g., cravings, stress) and for abstinence (e.g., use of coping strategies, health concerns for family).

**FUNDING:** This research was supported by National Cancer Institute grant R01 CA94256.

**JUSTIFICATION:** These data provide insights into reasons why women who quit smoking during pregnancy might relapse post-partum; therefore, they are informative for clinical practice, for future intervention development, and for understanding whether certain populations are more vulnerable to post-partum relapse than others.

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**POS3-93**

**CORRELATES OF INTENTION TO USE AN ONLINE SMOKING CESSATION SERVICE AMONG HISPANIC DAILY LIGHT AND INTERMITTENT SMOKERS**

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Few studies have assessed intentions to use online cessation services (OCS) among daily light (≤10 cigarettes per day; DLS) and intermittent smokers (nondaily smoking; ITS), and even fewer within minority groups. This study assessed potential correlates of the intention to use OCS among Hispanic DLS/ITS on the U.S./México border. Data from 354 Hispanic DLS/ITS (51.1% male; Mage= 34.2 years, SD= 14; range 18-68 years) who participated in an efficacy trial of a brief cessation intervention are presented here. Participants recruited from a family clinic, hospital, or university) randomly received either an immediate or delayed intervention consisting of motivational enhancement, trigger management, and...
CELL PHONE OWNERSHIP AND SERVICE PLANS AMONG LOW-INCOME SMOKERS: THE HIDDEN COST OF QUILINES

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Background: Quitlines (QLs) are promoted as free, effective sources of behavioral and pharmacologic treatment for tobacco dependence. Although the QL number is toll-free, the widespread use of cellphones as the sole source of telephone use for low-income smokers may impose an unintended cost, in terms of cell minutes. Objectives: To quantify the calling plans, and telephone use for low-income smokers may impose an unintended cost, in terms of cell minutes. Methods: A convenience sample survey of smokers age >= 18 years visiting an urban hospital, quantify the calling plans, and telephone use for low-income smokers may impose an unintended cost, in terms of cell minutes. Results: 773 smokers were surveyed, of whom 563 (72.6%) were low-income, defined as having Medicaid or no insurance. Of these low-income smokers, 291 (51.7%) were female, mean age 41.1 years, race 355 (63.1%) white, 201 (35.7%) African-American, and 103 (18.3%) Hispanic. Median daily cigarette consumption was 8 [IQR 4, 15]. All low-income smokers had at least 1 phone: 48 (8.5%) reported land-lines only, 159 (28.2%) land-lines and cells, and 356 (63.2%) cells only. Of the cellphone owners, monthly calling plans provided unlimited minutes for 339/515 (65.8%), <250 minutes for 124 (24.1%), and >250 minutes for 52 (10.0%). 138 smokers had Medicaid-issued cellphones, which provide 250 minutes/month of calls. Using data from another recent clinical trial by our group, callers who engaged in QL services were on the phone for a median of 38 minutes, with the 75th and 90th percentiles of minutes used at 56 and 86.2 minutes, respectively. Thus, robust use of QL services could consume 15-34% of a low-income smoker's typical 250 monthly cell minutes. Conclusion: Among low-income smokers, cellphone plans are often the sole means of telephone access, with many individuals having calling plans that limit the number of available minutes. Robust use of the QL may impose a substantial burden on low-income smokers, and may deter their use. A policy change exempting calls to quitlines from counting against smokers' plans may help promote quitline utilization.

FUNDING: NIH/National Cancer Institute R01CA141479

CONTINGENCY MANAGEMENT IMPROVES SMOKING CESSATION OUTCOMES FOR IMPULSIVE ADOLESCENTS RELATIVE TO COGNITIVE BEHAVIORAL THERAPY

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Most adolescent smokers (61%) have made a quit attempt, but less than 12% are able to quit successfully (CDC, 2009). Prior research suggests that quitting may be particularly difficult for impulsive teens (Krishnan-Sarin et al., 2007). To determine how best to treat impulsive teen smokers, we evaluated whether the relationship between impulsivity and treatment efficacy (conceptualized as % days abstinent) is influenced by the type of treatment teens receive. In the current study, we focused on two commonly delivered smoking cessation treatments (cognitive behavioral counseling [CBT] and contingency management [CM]). Teen smokers (N = 72; mean age 16.50 [IQR 17.4]; mean cigarettes/day = 14.11 [3.0]; 42% male; 91.7% Caucasian) participated in a 4-week smoking cessation trial (Krishnan-Sarin et al., 2013). We randomly assigned teens to receive CBT (n = 23), CM (n = 21), or both (CM/CBT, n = 21). To improve clarity, the current analyses include participants receiving CM alone or CBT alone. We assessed impulsivity using a brief version of the Barratt Impulsiveness Scale that comprises two subscales: behavioral impulsivity and poor cognitive control (Morean et al., in preparation). Using univariate GLM, we examined main effects and interactions of impulsivity and treatment condition in predicting abstinence. Behavioral impulsivity and poor cognitive control at baseline predicted a lower percentage of days abstinent. A significant interaction between treatment condition and behavioral impulsivity indicated that treatment efficacy was dependent on impulsivity. For behaviorally impulsive teens, CM was significantly more effective than CBT in encouraging abstinence (75% vs. 30%). There was no difference in treatment efficacy for teens low on impulsivity (83% CM vs. 77% CBT). The current study suggests that smoking cessation programs that employ CM to encourage abstinence may improve treatment outcomes for behaviorally impulsive teens. Although the mechanism of action is not known, the immediate and consistent nature of a monetary reinforcer may help bolster behavioral control when impulsive teens experience triggers and cravings to smoke.

FUNDING: P50DA009241

EFFECTS OF TIMING OF INITIATION AND PLANNING ON SMOKING CESSATION OUTCOMES: A RANDOMISED CONTROLLED TRIAL

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Recent theoretical and empirical work has led to debate over the benefit of delaying the implementation of a decision to quit smoking in order to plan the attempt. These two need not be linked, as planning can occur before a commitment to quit is made, or after if it is implemented, as well as in between. In this ongoing randomised trial, a recommendation to quit immediately (or not) and encouragement to use structured planning tools (or not) were tested as additions to standard care, a web-based automated tailored advice program (QuitCoach). Participants were recruited from Australian QuitCoach users who were at least
open to the possibility of quitting. The Immediate arm was open to those who had not committed to quit within 2 days, while the Planning arm was open to all smokers, as well as those who had quit within the last 4 days. Here, we report short-term outcomes for the fully-randomised subsample eligible for the immediate arm (n=1611), of whom 49% (n=794) were followed up 2 weeks after their initial quit date (or 4 weeks after initial program use, for those without a quit date). Point-prevalence abstinence among those followed up differed by group, highest in those who received both the structured planning and immediate recommendations (47.4%) and lowest in the standard care control (35.2%), though the effect did not reach significance (p=0.078). No group difference was found in the proportion making a quit attempt (p=0.66). Logistic regression revealed almost-significant main effects, of identical magnitude, for immediate (OR=1.49, 95% CI 1.00-2.24) and planning (OR=1.49, 95% CI 1.00-2.24) but no evidence of an interaction (OR 0.72, 95% CI 0.41-1.27). Of those offered the option to quit immediately, 35.8% did so, while a further 18.7% brought their quit attempt forward, but this was not clearly related to short-term outcome. Ongoing analyses will explore whether these effects remain after controlling for baseline characteristics and the extent of uptake of both interventions. The findings provide some preliminary evidence that smokers may benefit from encouragement to quit as soon as practically possible as well as to plan their attempt.

FUNDING: The study was funded by the National Health and Medical Research Council (Australia), Project Grant 1009767. JUSTIFICATION: If smokers should be encouraged to quit spontaneously rather than delaying in order to plan, it would demand that help programs have the capacity to respond rapidly, rather than place people in queues to be managed on the service’s timeline.

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POS3-97 PRELIMINARY VALIDATION OF REAL-TIME MEASURES OF DELAY DISCOUNTING AND BEHAVIORAL DISINHIBITION IN ADULT SMOKERS TRYING TO QUIT

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Impulsiveness is a risk factor for smoking and relapse to smoking. Impulsiveness is typically treated as a stable trait despite evidence that impulsiveness can fluctuate within subjects, particularly in motivational drive states (e.g., hunger). The current project tested two brief ecological momentary assessment measures of impulsiveness adapted from validated laboratory measures of delay discounting (a form of impulsive choice) and behavioral disinhibition (a form of impulsive action). The study assessed the stability and covariation in these two facets of impulsiveness during the course of an attempt to quit smoking. Participants were 110 adult daily smokers who received nicotine lozenges and cessation counseling. Participants completed both full laboratory assessments and novel, brief, momentary measures of delay discounting and behavioral disinhibition. The momentary measures of impulsiveness were an eight-item delay discounting task using monetary rewards and a two-minute go/no-go task. Both tasks were administered on a paintshop computer at four investigator-prompted times daily for one week pre- and three weeks post-quit. Multilevel models examining mean discount rates and change in discounting rates over days showed that daily discounting rates were significantly higher among steeper discounters at baseline. Daily discounting rates were also more volatile among those who exhibited steeper discounting at baseline; discounting rates increased more pre-quit and jumped higher on the quit day among smokers who were steeper discounters at baseline. Momentary measures of behavioral disinhibition were similarly related to baseline measures, with those making more impulsive commission errors at baseline also displaying more commission errors on the momentary measure. Commission error rate increased from pre- to post-quit, on average. Delay discounting and disinhibition were not positively correlated and were not strongly related to self-reported impulsiveness. Within-measure correlations across time support the validity of these measures but the lack of covariation among measures suggests their relation to latent impulsiveness is less clear.

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JUSTIFICATION: Valid measures of momentary impulsiveness may help identify periods of high risk for relapse during cessation attempts and inform just-in-time relapse prevention interventions.

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POS3-98 CHALLENGES IN RECRUITMENT FOR A PHASE II TRIAL OF BUPROPION FOR SMOKING CESSION IN PREGNANCY

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A randomized, double-blind, parallel-group pilot study of bupropion for smoking cessation in pregnant women was conducted to assess feasibility, effectiveness, and safety. In addition to evidence-based counseling, the women were randomized to receive an 8-week course of either bupropion (SR generic [150 mg BID]) or matching placebo tablets. The study site was a university-based clinic serving an urban, minority, Medicaid population. The study faced significant recruitment difficulties. Over the course of 16 months, 820 women were screened for eligibility. Approximately 10% (n=78) met initial inclusion criteria: (1) >18 years of age, (2) self-reported gestational age between 14 and 26 weeks, and (3) currently smoking >1 cigarette a day. Only 12 women were eligible and consented to participate in the study. The remaining 67 women who were approached declined to participate (n=59) or met one of the following exclusion criteria: had a psychiatric disorder requiring psychotropic medication (n=14), were outside of 14-26 weeks gestational range as confirmed by ultrasound (n=11), used illicit substances since receiving knowledge of pregnancy (n=5), denied smoking 1 or more cigarettes per day post screening (n=5), had a current major depressive disorder or were at suicidal risk (n=44), were unable to communicate with research staff or attend research visits (n=44), experienced fetal demise or spontaneous abortion (n=4), were carrying twins/multiples (n=3), used alcohol regularly (>1 drink/week; n=2), had a current unstable medical problem (n=2), had a fetal abnormality on ultrasound (n=2), planned to deliver at another hospital (n=1), or were undecided when the study closed (n=1). Necessarily conservative eligibility criteria posed significant challenges to this investigation with a complex smoker population, prompting questions with regard to the broad applicability of bupropion, and perhaps pharmacotherapy in general, as a smoking treatment during pregnancy. Future efforts are needed to determine an adequate balance between safety and validity, and large multi-site studies will likely be needed to conduct definitive pharmacotherapy studies.

FUNDING: This study was supported by the Center for Clinical and Translational Sciences (CCTS) funded by CTSA awarded to the University of Texas Health Science Center at Houston (UL1 RR 024148) and the Larry C. Gilstrap M.D. Center for Perinatal and Women’s Health Research of the University of Texas Medical School at Houston.

JUSTIFICATION: This presentation will inform researchers about key feasibility issues when conducting pharmacotherapy research with pregnant smokers, which has direct impact on clinical practice.

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We have completed a single-blinded, single-centre controlled study with occasional clinical confinement assessing within participant and between group changes in biomarkers of exposure (BoE) to some tobacco smoke toxicants, and biomarkers of biological effect (BoBE) related to smoking-related diseases. Healthy adult smokers were forced switched to a reduced toxicant prototype (RTP) cigarette and compared to smokers who continued to smoke conventional cigarette. Groups of both ex-smokers and never smokers were also studied for levels of the biomarkers. We observed the smoking participants for six months following the switch. The study was registered (ISRCTN81226226) and the study protocol has been published (Shepperd et al., BMC Public Health, 13, 690, 2013). As previously reported (SRNT 2013, POS3-125), many smokers significantly increased cigarette consumption during the study. However, the group switched to the RTP showed some large (around 56% to 75%) and persistent reductions in biomarkers of exposure to some vapour phase tobacco smoke toxicants such as acrylonitrile and crotonaldehyde, some persistent but more modest reductions in some particulate phase toxicants such as NNK, and some increases in some other particulate biomarkers for toxicants such as 2-hydroxynaphthalene. Several of the BoBE including white blood cell count and 8-iso-PGF2 type III showed clear differences between smokers and non-smokers. For these BoBEs the levels found in the ex-smoker and never smoker groups were similar; however, there was no difference between levels in the control group of smokers (who continued to smoke conventional cigarettes) and the test group (who switched to the RTP cigarettes) after six months. Several other BoBEs, measured as part of the secondary objectives of the study, showed no difference between smokers and non-smokers throughout the study suggesting that they may not be useful markers of biological effect. We conclude that any changes in exposure to tobacco smoke toxicants resulting from the switch to the test product in this study were insufficient to produce changes in BoBE over a period of six months.

FUNDING: The study was entirely funded by British American Tobacco, a tobacco manufacturer

JUSTIFICATION: In this study, reductions in exposure in cigarette smokers to certain tobacco smoke toxicants did not reduce biomarkers of biological effect.

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POS3-100
CESSION SUPPORT VIA MOBILE PHONE TEXT MESSAGING: RESULTS FROM A PILOT PROGRAM IN SUZHOU, CHINA

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Survey data indicate that there are over 300 million smokers in China with smoking prevalence rates for men at approximately 50%. It is estimated that China’s death toll from tobacco-related diseases will exceed 2 million per year by 2020 if current smoking rates continue. Although historically, intention to make a quit attempt in the next 12 months has been quite low in China (2010 China GATS :16% of current smokers), recent media attention to harms of tobacco use and secondhand smoke and broad increases in smoke-free policies within China will likely lead to increases in motivation to quit. However, the logistics and costs of providing cessation services within China are daunting and the existing cessation infrastructure is minimal. Mobile phone-based treatment has shown positive results in helping smokers to quit in other countries. Given China’s wide-spread use of mobile phones, the technology has the potential to provide low-cost, in vivo support to smokers seeking cessation assistance. To assess usability and possible benefit, in summer 2012 Suzhou offered a text-based cessation program to 665 smokers participating in their annual cessation competition. The messages were based on the QuitNowTXT program developed by the US National Cancer Institute which was revised to reflect cultural norms and translated into Chinese. Smokers enrolled in the text-based program received one text message per day, three days per week, for a total of ninety-two unique messages. At the end of the contest, 38% of the smokers who received the text messages reported complete abstinence. Analyses of baseline variables found that quit success was associated with lower indicators of nicotine dependence and employment context. Overall, high user satisfaction with the text program was reported. Although preliminary, these results suggest that text-based cessation interventions hold substantial promise in China.

FUNDING: Funded by NCI Contract No. HHSN2612010000135

JUSTIFICATION: This projects adds to the growing support for the use of text-message based interventions as a means to provide population-level cessation services and is particularly relevant to tehir potential within countries with minimal tobacco control infrastructure.

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POS3-101
ACCEPTABILITY OF REMOTE MONITORING TECHNOLOGY AMONG ADOLESCENTS ENROLLED IN SMOKING CESSTION TREATMENT

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Despite the public health relevance of studying smoking in adolescents, this group remains understudied and underserved. Studies with adolescent smokers suffer from several limitations, including poor retention, inaccurate self-report, and largely ineffective cessation results. High technology utilization among adolescents may be harnessed as a tool for better understanding of relapse and cessation; yet little is known regarding the acceptability and feasibility of mobile health (mHealth) technology integration with this population. Participants enrolled in an ongoing smoking cessation clinical trial (target N=166) were approached to provide feedback on their technology utilization and comfort with technology incorporated into treatment, specifically a carbon monoxide (CO) device interfaced with a smartphone application to remotely monitor smoking. Participants to date (N=21) are an average of 19 years old (SD=1.8), mostly male (71%), and Caucasian (91%). Thirty-one percent of participants reported having a smartphone, and 95% reported at least weekly use of the internet (65% daily internet usage). Despite this, 57% reported that they had never searched for smoking cessation resources online. When asked how likely they were to complete remote monitoring sessions and provide remote CO breath samples, 71% felt that they were likely to complete these tasks. Sixty-seven percent of participants felt that they could carry the two devices (i.e., cell phone and portable CO monitor) throughout the day. Privacy concerns were low (rated as 2.0 [SD=2.8] on a 10-point scale, 1 being “not at all concerned”). The majority of participants (57%) responded positively regarding research staff being able to remotely monitor their smoking. Adolescent smokers are ideally suited for mHealth integration, and our results reveal that adolescents have high technology utilization, favorable attitudes towards remote monitoring, and minimal privacy concerns. Adolescents tend to be accepting of new technology outlets, and this integration should be pursued to accomplish the goal of providing maximally effective and just-in-time smoking cessation interventions.

FUNDING: NIDA grantsU01DA031779 (Pi, Gray) and U10DA013727 (Pi, Brady)

JUSTIFICATION: Further research on the acceptability and feasibility of remote monitoring technology among adolescent smokers will contribute to the eventual goal of providing maximally effective and just-in-time smoking cessation interventions for this underserved population.

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POS3-102
DETERMINING THE POST-DISCHARGE SMOKING STATUS OF HOSPITALIZED SMokers
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Biochemical verification of smoking abstinence is the gold standard for smoking cessation randomized controlled trials (RCTs). Some populations (e.g., study participants and patients with coronary heart disease) are more likely to misreport their smoking status than the general population. However, no studies have examined the prevalence and correlates of misreporting among hospitalized smokers. Participants were hospitalized smokers in a RCT testing the effects of warm handoff (direct referral) vs. fax referral to a tobacco quitline. Among 640 study participants at the 6 month assessment, 265 met criteria for cotinine verification (7-day abstinence and no recent nicotine replacement therapy (NRT) or other tobacco use). Of these, 214 provided saliva and completed a survey, but 40 (18.7%) indicated that they relapsed. 48% of participants self-reporting abstinence at month 6 were cotinine-confirmed using 10ng/ml cut-off and 51% at 15ng/ml. We examined differences on demographics, smoking characteristics, and recent nicotine exposure between cotinine-verified quitters and discrepant reporters among the remaining 174 participants. They were predominantly female (57%), White (67%), with a high school education or greater (80%), mean age of 51.3 (SD = 21.5), and smoked 15.0 cigarettes per day (SD = 12.3). Fifty-one participants had discrepant results using 10ng/ml and 43 using 15ng/ml. Survey data on smoking characteristics, and recent nicotine exposure between cotinine-verified quitters and discrepant reporters. Correlational differences suggest that some participants may be more responsive to demand characteristics of a study.

FUNDING: The project described was supported by Award Number U01HL105232 from the National Heart, Lung, and Blood Institute.

JUSTIFICATION: The Joint Commission and meaningful use require tobacco use assessment and intervention in hospitals; policy makers and practitioners are encouraged to explore ways to reduce perceived demand characteristics and better serve patients who relapse post-discharge.

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POS3-103
ENGAGING PRIMARY CARE NETWORKS TO ENHANCE TOBACCO USE AND DEPENDENCE TREATMENT
Carol Ripley-Moffitt, M.Div., CTTS*, Jacqueline Halladay, M.D., M.P.H., and Adam O. Goldstein, M.D., M.P.H., University of North Carolina School of Medicine

Offering evidence-based tobacco use treatment remains underutilized in clinic settings. This session reports the results of translating clinical practice guidelines for tobacco use treatment into a physician network clinic and discusses a model for engaging such networks in quality improvement (QI) around tobacco use treatment. University of North Carolina (UNC) investigators and UNC Physicians’ Network (UNC PN) stakeholders utilized quality improvement techniques and practice based research methods to implement an effective and low burden pilot program in one clinic that can be disseminated to clinics across the practice network. After establishing guidelines for engagement with the pilot clinic, survey data and staff focus group interviews captured current processes and identified challenges for offering behavioral counseling, prescribing appropriate cessation medications, and billing for tobacco use treatment. An educational curriculum delivered in 5 lunch session workshops for the entire clinic staff included updates on cessation medications, recommended immunizations and screenings related to tobacco use, and use of motivational interviewing. A pharmacotherapy/motivational interviewing webinar was offered to providers across the network. Qualitative interviews and chart audits assessed project implementation acceptability and results. Physician networks provide an optimal structure to introduce appropriate tobacco use treatment interventions that can be tailored to individual clinics while meeting the network demands for quality improvement, including meaningful use of electronic health records. Results from our pilot suggest that practice based research efforts such as this increase provider confidence for addressing tobacco use with appropriate medications and counseling and improve rates of counseling, billing, and referral to external supports such as quitlines.

FUNDING: This project was supported by Health-e-NC, an initiative of the University Cancer Research Fund at the University of North Carolina at Chapel Hill.

JUSTIFICATION: The recent trend for health care systems to establish provider networks through purchase of private medical practices offers the opportunity to implement clinic quality improvement initiatives aimed at increasing evidence-based tobacco use treatment in greater numbers and efficiency.

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POS3-104
SMOKING AND CESSATION HISTORY IN TREATMENT SEEKING SMOKERS: THE ROLE OF MENTAL ILLNESS
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Objectives: Those with a history of mental illness have higher rates of smoking, and may have a more difficult time successfully quitting. Using data obtained from treatment seeking smokers enrolled in a randomized control trial, we investigated differences on smoking status and cessation history, in smokers with (MH+) or without a history of mental illness (MH-) Methods: 737 treatment seeking smokers (aged 18+) were recruited via the University of Ottawa Heart Institute (UOHI) Smoking Cessation Clinic and media advertisements in the community. Smoking information obtained included cigarettes smoked per day, number of past attempts, cessation methods employed previously (e.g., pharmacotherapy), reasons attributed to relapsing, nicotine dependence (Fagerstrom Test), withdrawal symptoms, and smoking self-efficacy. Current and previous mental illness was assessed with the Mini International Psychiatric Interview (MINI 5.0). Analysis of Variance and Chi-Square analyses were employed for between-group comparisons (MH+ vs. MH-). Results: 59.8% of our study sample had current or past history of mental illness. Those in the MH+ group were heavier smokers (M = 24.05, p < 0.01), and more likely to report stress (p < 0.001), negative affect (p < 0.001), and drinking caffeine (p < 0.05) as reasons for relapse. The MH+ group displayed higher levels of current nicotine dependence (M = 5.75, p < 0.001), heavier withdrawal symptoms (M = 12.76, p < 0.001), and lower self-efficacy to quit (M = 34.21, p < 0.05) compared to the MH- group. No differences were found for age of initiation or number of previous quit attempts. Conclusion: Those with a history of mental illness were heavier smokers, more nicotine dependent, reported more withdrawal symptoms, and scored lower self-efficacy for cessation questionnaires. Targeted interventions for smokers with a history of mental illnesses may be warranted to address their unique profile and needs. Cessation interventions should monitor stress and negative affect during quit attempts, as well as address the physical symptoms of nicotine dependence/withdrawal with appropriate pharmacotherapy, to reduce the risk of relapse in this population.

FUNDING: Funding provided by the Heart and Stroke Foundation of Ontario.

JUSTIFICATION: Individually with a history of mental illness may have different smoking profiles and histories than individuals without and therefore may require tailored services to aid in cessation.

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POS3-105
COMPREHENSIVE ANALYSIS OF RELATIONSHIPS BETWEEN THE NICOTINE METABOLITE RATIO AND DEMOGRAPHICS IN 1500 TREATMENT-SEEKING ADULT SMOKERS
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The nicotine metabolite ratio (NMR) strongly correlates with nicotine clearance. Higher NMR, indicative of faster nicotine clearance, is associated with heavier smoking. NMR is influenced by a number of demographic and hormonal factors, as well as BMI. To date, a comprehensive analysis to characterize these relationships simultaneously in one large population of smokers has not been undertaken. We investigated this in 1500 treatment-seeking smokers of African American and Caucasian descent. Participants were 55% male and 35% African American, with a mean age of 46 and BMI of 29. Caucasians had higher mean NMR than African Americans (0.42 vs. 0.34; P<0.001). Females had higher mean NMR than males in the total group (0.42 vs. 0.37; P <0.001), and in African American (0.36 vs. 0.32; P<0.01) and Caucasian (0.46 vs. 0.40; P<0.001) sub-groups. Birth control pill (BCP) use (N=19) and hormone replacement therapy (HRT) use (N=16) were each associated with lower NMR (P=0.03) and NMR, respectively, among females. BMI was negatively associated with NMR in the total group (Rho=-0.15; P<0.001), and in African American (Rho=-0.14; P<0.001) and Caucasian (Rho=-0.11; P<0.001) sub-groups. Alcohol use (range=1-25 standard drinks/week) was positively associated with NMR in the total group (Rho=0.08; P=0.03). Using hierarchical multiple regression, the following variables were entered sequentially and accounted for 7.3% of the variation in NMR: gender, 1.6%; ethnicity, 3.1%; hormonal use (BCP and HRT), 1.3%; BMI, 0.6%; and alcohol consumption, 0.7%. Overall, higher BMI (>26; N=1086) vs. lower BMI (≤0.26; N=412), an NMR cut-point associated with cessation outcomes, was associated with higher mean cigarette per day (19.2 vs. 17.2; P<0.001) and carbon monoxide (23.5 vs. 22.5; P<0.04), but similar FTND score (5.3 vs. 5.2; P=0.14). Sub-group analyses in Caucasian males revealed higher mean FTND score (5.4 vs. 5.0, respectively; P=0.04) among those with higher NMR (N=431) vs. lower NMR (N=123). Overall, we have replicated and extended sources of variability in NMR, as well as associations between NMR and smoking, in a large population of treatment-seeking smokers.

FUNDING: We acknowledge the support of the Endowed Chair in Addictions for the Department of Psychiatry (RFT), CIHR-CGSQ and Ontario Graduate Scholarship (MJC), CIHR grants MOP86471 and TMH-109787, NIH grant DA020830, CAMH, the CAMH Foundation, the Canada Foundation for Innovation (#20289 and #2037373574, Email: meghan.chenoweth@utoronto.ca

POS3-106
ASSOCIATION BETWEEN INTENSITY OF QUITLINE SERVICES AND PROBABILITY OF SMOKING ABstinence
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Background: Quitlines (QL) are effective and cost-effective for smoking cessation. There is a paucity of research regarding the “effective dose” of QL services needed to induce tobacco abstinence. Objective: To study the relationship between tobacco abstinence and intensity of use of QL services among low-income adult smokers enrolled in a clinical trial. Methods: Secondary analysis of a 2-arm randomized clinical trial of subjects age 18 years or older affirming every- or some-day smoking visiting a busy urban Emergency Department in the northeastern US. Inclusion criteria included self-pay or Medicaid insurance. Intervention arm subjects received a motivational interview delivered by a trained research assistant, 6 weeks of nicotine patches and gum, a referral to the state smokers’ QL, a nurse-delivered booster call 3 days later, and a cessation brochure. Control arm subjects received the brochure. Smoking status was assessed by phone at 1 and 3 months, with in-person confirmation via exhaled carbon monoxide testing at 3 months for those reporting tobacco abstinence. At 3 months, smokers were asked about use of QL services. Quitline-reported data included numbers of phone sessions and call duration. Subjects lost to follow-up were considered to be smoking. Results: Of 170 subjects with data at 3 months, 197 (25.3%) reported any use of QL services. Subjects were stratified: no QL usage, 1 call only, and >1 call (583, 99, and 98 subjects, respectively). The biochemically confirmed quit rates at 3 months in these low, medium, and high-use groups were, respectively, 5.7%, 14.1%, and 19.4% (P<0.0001). Subjects who used the QL had a median of 28 total minutes of telephone contact. Subjects were also stratified by minutes of QL contact: 0, 1-27, and 28-143 minutes (583, 98, and 99 subjects, respectively), with respective quit rates of 5.7%, 13.3%, and 20.2% (P<0.0001). Conclusion: Greater intensity of use of QL services is associated with higher quit rates. The direction of the association is unclear, however. The QL appears to have helped subjects quit, although QL-using subjects may be more motivated to quit.

FUNDING: NIH/National Cancer Institute R01CA141479

POS3-107
ACHIEVING SMOKING ABSTINENCE IS ASSOCIATED WITH DECREASED COCAINE USE IN COCAINE-DEPENDENT PATIENTS RECEIVING SMOKING-cessation TREATMENT
Theresa Winhusen, Ph.D.*, Frankie Kropp, M.S., Jeff Theobald, B.S., and Daniel Lewis, B.A., University of Cincinnati

Background: Past research suggests that a significant relationship exists between cigarette smoking and illicit-stimulant abuse. The present study evaluated the association between achieving smoking abstinence in response to smoking-cessation treatment (SCT) and illicit-stimulant abuse in cocaine- and/or methamphetamine-dependent participants. Methods: Secondary analysis of a randomized clinical trial, 10-week, all carried at 12 substance use disorder (SUD) treatment programs. Two hundred and sixty seven adults, meeting DSM-IV-TR criteria for cocaine and/or methamphetamine-dependence and interested in quitting smoking were randomized to SUD treatment as usual plus SCT consisting of weekly individual smoking cessation counseling, extended-release (XL) bupropion (300 mg/day), nicotine inhaler, and contingency management for smoking abstinence. Illicit-stimulant-abstinence was measured by self-report and urine drug screens. Smoking abstinence was assessed via self-report and carbon monoxide levels. Results: A significant effect was found for the cocaine-dependent subsample (N=147) in which participants who continued smoking averaged 63.6% illicit-stimulant abstinence weeks during the post-smoking-quit phase (weeks 4-10) relative to 78.2% in participants who stopped smoking (chi square(1)=8.55, p<.01, d=0.36). No significant effects were found for the sample as a whole (N=267) or for the methamphetamine-dependent subsample (N=102). The association between smoking-abstinence and illicit-stimulant abstinence did not differ on route of administration. Conclusions: The present results suggest that cocaine-dependent patients achieving smoking abstinence in response to SCT might evidence not only improved smoking outcomes but improved cocaine-use outcomes as well. Future research to replicate this finding may be warranted.

FUNDING: Funding for this study was provided by the National Institute on Drug Abuse (NIDA) Clinical Trials Network: U01-DA013732 to University of Cincinnati (Dr. Winhusen); U10-DA020036 to University of Pittsburgh (Dr. Daley), U10-DA013720 to University of Miami School of Medicine (Drs. Szapocznik and Metsch); U10-DA013045 to University of California Los Angeles (Dr. Ling); U10-DA013727 to Medical University of South Carolina (Dr. Brady); U10-DA020024 to
University of Texas Southwestern Medical Center (Dr. Trivedi); U10-DA015815 to University of California San Francisco (Dr. Sorensen and McCarty).

JUSTIFICATION: A majority of cocaine-dependent patients smoke and the present results suggest that an effective smoking-cessation intervention might improve not only smoking abstinence but also cocaine-use outcomes in cocaine-dependent smokers.

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POS3-108
TRAINING PSYCHIATRISTS RESULTS IN INCREASED TOBACCO TREATMENT
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Since 2008, we have conducted 2-day Continuing Medical Education programs to train Psychiatrists and Advanced Practice Nurses to deliver tobacco treatment services and better meet the needs of smokers with mental illness. To examine the effectiveness of this training program in changing provider behavior we conducted chart reviews of 14 prescribers who attended this 13 hour training in March-April, 2012. Prescribers were unaware of the chart review although they did consent to a training evaluation study. For each prescriber, we reviewed a random sample of computerized medical records from their outpatient practice at a large behavioral health system. Ten charts were reviewed per prescriber: five charts from tobacco users seen in 6 months prior to training and five charts from tobacco users seen in 6 mos after training. Records were electronically searched using keywords: cigarette, nicotine, tobacco, quit, smoking, and smoke. A total of 140 charts were reviewed. Results were compared using Chi-Square tests and for all results p<0.05. At least half of smokers who were asked, indicated that they were interested in quitting, although baseline rates of tobacco treatment were very low. Nearly all charts (99%) had brief documentation of tobacco use which is a required part of the clinical assessment. Documentation of tobacco on the problem list (30 vs. 71 %) and treatment plan (17 vs. 60%) increased significantly after training. Significantly more patients were advised to quit (9 vs. 43%) and received individual or group counseling in the post-training period. Discussion of nicotine replacement (10 vs 27%) and prescriptions for tobacco treatment medications including varenicline increased significantly in the post-training period although overall prescribing remained low. Patients making quit attempt(s) also significantly increased in the post-training (11 vs 40%) period suggesting that providers were giving more tobacco treatment than was reflected in the chart. An intensive training program for psychiatric prescribers increases tobacco treatment and patient quit attempts. Strategies beyond training may be needed to enhance prescribing by these practitioners.

FUNDING: This work was supported by an unrestricted educational(CME) grant from Pfizer.

JUSTIFICATION: This work can be used to support larger efforts to train behavioral health professionals in treating tobacco.

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POS3-109
MARIJUANA USE AND TOBACCO ADDICTION AMONG ADOLESCENT TOBACCO SMOKERS
Mark L. Rubinstein, M.D.①,②, Michelle A. Rait, M.A.①, Saunak Sen, Ph.D.①, and Judith J. Prochaska, Ph.D., M.P.H.①, ①University of California, San Francisco, ②Stanford University

INTRODUCTION: Marijuana and tobacco are the substances used most commonly by adolescents and co-occurring use is common. Use of one substance may potentiate the addictive properties of the other. The current study examined the severity of tobacco addiction among teen smokers as a function of co-occurring marijuana use. METHODS: Participants were 194 adolescents (13-17 years old) who reported smoking at least 1 cigarette per day (CPD) in the past 30 days enrolled in a longitudinal study of adolescent tobacco addiction. Unadjusted and adjusted logistic regression models controlling for race, alcohol use, and years smoking cigarettes examined the association of marijuana use with multiple measures of tobacco addiction including the Modified Fagerström Tolerance Questionnaire (mFTQ), Hooked on Nicotine Checklist (HONC), and the Nicotine dependence syndrome scale (NDSS). RESULTS: Adolescent tobacco smokers (mean age=16.1 years, SD=0.95) smoked a mean of 2.65 CPD (SD=2.96) for an average of 1.95 years (SD=1.52). Marijuana use was reported as never or no use in past 3 months n= 34 (17.5%), once a week or less n= 47 (24%), one or more times a week n= 50 (26%), and daily use n= 63 (32.5%). Frequency of marijuana use was associated with nicotine addiction as measured by the mFTQ (OR=1.40, CI= 1.18-1.67, p<.001) even after removing the question about CPD (OR=1.39, CI=1.18-1.67, p<.001); the HONC (OR=1.11, CI= 1.02-1.20, p=.01); and the NDSS (OR= 1.36, CI= 1.05-1.77, p=.02). Associations between marijuana use and the mFTQ (OR=1.34, CI= 1.10-1.64, p<.001), HONC (OR= 1.12, CI=1.02-1.23, p=.01), and NDSS (OR= 1.51, CI=1.10-2.08, p=.02) remained significant after adjusting for race, alcohol use, and years of smoking. CONCLUSIONS: Marijuana use was associated with greater reported tobacco addiction among adolescents. This relationship remained after controlling for relevant covariates. The findings suggest a role of marijuana in potentiating tobacco addiction and underscore the need for treatments that address use of both smoked substances.

FUNDING: This study was conducted while the author was at the University of California, San Francisco. Supported by NIH/NCI R01 CA140216 and NIH/NCCR UCSF-CTSI Grant Number UL1 RR024151.

JUSTIFICATION: The findings suggest a role of marijuana in potentiating tobacco addiction and underscores the need for treatments address use of both smoked substances.

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POS3-110
ANGER NOW PREDICTS SMOKING LATER: A NINE-YEAR LONGITUDINAL STUDY
Kimberly S. Wallitzer*, Kathleen Shyhalla, and Jaye L. Derrick, University of Buffalo, Research Institute on Addictions

Although the role of negative affect in smoking behavior has been appreciated in the smoking literature, less is understood about the role of anger emotions such as irritations, annoyances and anger. This paper investigates, in a nine-year longitudinal sample, whether smoking status predicts future anger and/or whether previous anger predicts smoking status. 634 couples filing for marriage licenses in Massachusetts between the ages of 16 and 21 were surveyed in 1980. 54% of men and 51% of women were still followed. The first analysis examined whether smoking status at time 0 predicted future anger and/or whether previous anger predicted time 0 smoking status. Such analyses indicated that, for both men and women at time 0, smokers scored higher on the anger measure relative to non-smokers (ps < .05). The second analysis examined whether previous smoking predicted future anger, controlling for anger at time 0 (final model trimmed). Pertain significant effects revealed that earlier smoking increased anger (p < .001). Further, a significant interaction term indicated that the effect of smoking status on anger was more pronounced earlier in the marriage (p<.05). The third analysis examined whether previous anger predicted smoking status (0, 1), after controlling for smoking at time 0 (final model trimmed). Importantly, earlier anger increased the probability of smoking (p < .001). Further, a significant interaction revealed that the effects of anger were more pronounced among time 0 nonsmokers (p < .05). Implications include that anger may be a risk factor for the onset of smoking and smoking relapse. No conflict of interest.

FUNDING: National Institute on Alcohol Abuse and Alcoholism
The potential influence of e-liquid ingredients on human puffing behavior is unknown. The purpose of the current study was to assess the possible impact of added water and/or menthol on electronic cigarette (EC) prototype puff volumes under specified puffing conditions. The specified puffing conditions replicated those employed in a previous pharmacokinetic study for the same EC prototype. Twelve adult exclusive cigarette smokers completed two sessions in which four e-liquid formulations were used with an EC prototype in a randomized, cross-over fashion. Formulations were propylene glycol/glycerin based, containing approximately 2% nicotine (w/w) and differed by %menthol (w/w), and % added water (w/w): (A) 0% menthol, 15% water; (B) 2.25% menthol, 15% water; (C) 0% menthol, no added water; (D) 2.25% menthol, no added water. The SODIM Smoking Puff Analyzer Mobile, validated for use with this EC prototype, was used to assess puffing behavior. Puff topography data were processed using the SodAfc 41.3.20.5 software. For each formulation, participants were instructed to take one set of 10 puffs (5-second duration puffs at 30-second inter-puff intervals), on three occasions, with one hour between each set. Participants received the four formulations in random order over two separate study days (2 formulations per day). Based on the recorded puff durations, inter-puff intervals and puff counts, participants complied with the specified puffing regimen. No significant differences (p > 0.05, ANOVA) were observed between the puff volumes, (mean ± SD: 56.7±22.8, 58.1±20.48, 56.3±20.1, and 55.6±21.7 mL for formulations A, B, C, and D, respectively). These results suggest that, when used under these specified puffing conditions, water, and menthol content of e-liquids does not impact EC puff volumes. A limitation of this investigation is the focus on just two specific e-liquid ingredient levels.

FUNDING: This study was funded by Altria Client Services Inc.

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**POS3-114**

ACCURACY OF SELF-REPORTED SMOKING CESSATION DURING PREGNANCY AMONG WOMEN WHO RECENTLY DELIVERED IN ARGENTINA AND URUGUAY

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Background: Studies in high-income countries have documented differences in self-reported and biochemically-verified quitting. However, we are not aware of any study validating self-reported smoking cessation during pregnancy in middle-income countries. We sought to evaluate self-reported smoking cessation during pregnancy using biochemical verification and to compare characteristics of women with and without biochemically-confirmed quits in Argentina and Uruguay. Methods: As part of a two-arm, parallel cluster randomized-controlled trial of implementation of a smoking cessation intervention, data were collected from women who attended one of 21 prenatal clinics and delivered at selected hospitals in Buenos Aires and Montevideo from October, 2011-May, 2012. Women who self-reported quitting smoking as soon as they learned of the pregnancy (spontaneous quitter) or sometime during the pregnancy (later quitter) and who provided saliva cotinine samples were included in this analysis. Analyses were sampled by linear chromatography tandem mass spectrometry. Active smoking was defined as saliva cotinine ≥10 ng/mL. Analyses were conducted using SURVEYFREQ and SURVEYFREQ procedure in SAS version 9.3 to account for the clustered study design, and differences were assessed by Wald chi-square test (p<.05). Results: Of 441 women who self-reported quitting smoking during pregnancy, 67.1% were spontaneous quitters and 32.9% were later quitters. Overall, 10.0% (44/441) of these women had evidence of continued smoking (cotinine >10 ng/mL). A significantly higher proportion of later quitters had evidence of continued smoking (17.2%) than spontaneous quitters (6.4%) (chi-square, p<0.05). Women with evidence of continued smoking were more likely than biochemically-confirmed quitters, respectively, to have at least one prior live birth (77.5% versus 60.3%) and evidence of continued smoking were more likely than biochemically-confirmed quitters (77.5% versus 60.3%) and to allow smoking in their house (59.1% versus 38.9%). Conclusion: Approximately one in ten women, who reported that they quit smoking during pregnancy, at their delivery visit had cotinine levels consistent with active smoking. Later quitters were less likely to disclose their smoking than spontaneous quitters.

FUNDING: The study was supported through CDC cooperative agreement 5U48DP001948-04 (SIP09-18) to Tulane University.

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**POS3-115**

AFFECITIVE REGULATION AND REWARD RESPONSIVITY IN DEPRESSION-PRONE SMOKERS

Janet Audrain-McGovern*, E. Paul Willeyto, Rebecca Ashare, Jocelyn Cuevas, and Andrew A. Strasser, Perelman School of Medicine, University of Pennsylvania

There is a disproportionately high smoking prevalence among individuals who are prone to depression. While depression has been conceptualized as a disorder of dysregulated positive affect and disrupted reward processing, little research has been conducted to determine the role of smoking in these processes among depression-prone smokers. Depression-prone smokers (DP+; n = 34) and smokers not depression-prone (DP-; n=49) underwent a laboratory session to assess the relative reinforcing value of smoking. Via experience sampling, both groups also completed self-report measures of positive affect, negative affect, and subjective reward at random times in their natural environment for three days while smoking as usual and for three days while smoking a lower nicotine content cigarette was counterbalanced. DP+ were twice as likely to work for cigarettes versus money in a progressive ratio, choice task (OR 2.05; CI 95% 1.04 to 4.06, p=0.039) compared to DP-. Subjective reward from self-selected activities in the participants’ natural environment did not significantly change across the 3-day abstinence phase or the for 3-day smoking ad libitum phase for DP- (p > .45). Subjective reward did not significantly decrease across the abstinence days for DP+ (β=0.036; CI =−0.14 to 0.663, p=0.47), but was significantly greater during for the 3-day smoking ad libitum phase for those DP+ (β=0.105; CI= 0.05 to 0.25, p=0.003). Positive and negative affect were modeled jointly using multivariate linear regression, while controlling for withdrawal symptoms. Compared to DP+, DP+ had higher positive affect (β=−0.269; CI =−3.20 to 0.84, p<0.001), and higher negative affect (β=−0.045; CI = 2.48 to 5.61, p<0.001) across the 3-day abstinence phase. These findings suggest that DP+ may be less able to sustain smoking abstinence because they experience a loss of smoking reinforcement, diminished pleasure from other reinforcers, and decreased positive mood. The present study uncoers unique vulnerabilities to achieving and maintaining smoking abstinence and highlights novel targets for smoking cessation treatment in this population.

FUNDING: This study was supported by National Institute on Drug Abuse R21 DA031946 (JAM).

JUSTIFICATION: The present study uncoers unique vulnerabilities to achieving and maintaining smoking abstinence and highlights novel targets for smoking cessation treatment in this population.

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**POS3-116**

HEALTHCARE PROVIDER INTERVENTION ON SMOKING AND QUIT ATTEMPTS AMONG HIV POSITIVE AND NEGATIVE SMOKERS IN CHENGDU, CHINA

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The smoking rates among men who have sex with men (MSM) in China have been documented to be as high as 66%; rates of HIV in this group are also high. Given the implications for smoking among HIV+ individuals, we examined differences in smoking-related and psychosocial factors between MSM smokers with or without HIV; those who received some sort of healthcare provider interaction regarding smoking vs. not; and those who had made a past year quit attempt vs. not. Using a cross-sectional convenience sampling design, 400 MSM (200 HIV+ and 200 HIV-) were recruited by a non-governmental organization in Chengdu, Sichuan province to participate in a survey in 2012-2013. Eligible individuals were MSM ≥18 years old who had smoked ≥100 cigarettes in the lifetime and ≥1 day in the past 30 days. Participants reported HIV-status; tobacco, drug, and alcohol use; social factors, depressive symptoms (Center for Epidemiologic Studies Depression Scale – Short Form [CES-D]), motivation (Treatment Self-Regulation Questionnaire-TSRQ), recent quit attempts, and healthcare provider interactions on smoking. HIV+ individuals were more likely to have had a healthcare provider assess their smoking, advise to quit, or provide quitting assistance (p<.001). Those who received some intervention from a provider were more likely to have attempted to quit ever (p<.009) or in the past year (p<.001). Those HIV+ were more likely to have made a quit attempt since diagnosis if a healthcare provider had ever intervened (p<.001). In the multivariate regression predicting healthcare provider intervention, being HIV+ was an important predictor (p<.001). In the regression indicating correlates of having attempted to quit in the past year, having received some healthcare provider intervention (p<.001) was a predictor; however, HIV status was not. Thus, while HIV+ individuals are more likely to have a doctor intervene on smoking, whether a doctor intervened – and not HIV status – was related to having made a quit attempt. Interventions to address smoking in the clinical setting should be delivered consistently and potentially in other settings in order to promote cessation among MSM smokers.

FUNDING: This study was supported by a grant from the Emory Center for AIDS Research (P30 AI050409) to the first author and the Georgia Cancer Coalition DA031946 (JAM).

JUSTIFICATION: These findings highlight that, while HIV+ individuals are more likely to have a doctor intervene on smoking, whether a doctor intervened – and HIV+ status – was related to having made a quit attempt. Interventions
to address smoking in the clinical setting should be delivered consistently and potentially in other settings in order to promote cessation among MSM smokers.

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POS3-117
DAILY CIGARETTE SMOKING IS ASSOCIATED WITH CURRENT MAJOR DEPRESSIVE DISORDER AMONG INPATIENT SUBSTANCE USERS

Elana Hoffman, B.A.*, Melanie C. Morse, M.S., Claudia Choque, B.S., Carl Lejue, Ph.D., and Laura MacPherson, Ph.D., Center for Addictions, Personality, and Emotion Research (CAPER), Department of Psychology, University of Maryland, College Park

An estimated 45.3 million people in the United States smoke cigarettes, and smoking is the leading cause of preventable death in the U.S. (CDC, 2010). Major Depressive Disorder (MDD) is associated with increased rates of daily smoking (Fergusson et al., 2003), and people with MDD are more likely to smoke and have more difficulty quitting compared to individuals without MDD (Pratt & Brody, 2010; Covey, 2008). Cigarette smoking is especially problematic in low income substance users (prevalence rates ranging from 70-90%) (Budney et al., 1993; Kalman et al., 2005; Lejue et al., 2008). Furthermore, the incidence of drug dependence and comorbid psychopathology within an inpatient treatment setting is high (80%) (Chen et al., 2011). However, the influence of cigarette smoking and drug use on MDD remains unclear. The current study aims to examine cigarette smoking as a predictor of current MDD in a sample of low-income adult smokers in a residential treatment facility above and beyond the influence of past year drug use. Participants completed an interview to assess demographics, the Structured Clinical Interview for the DSM IV-TR Non-patient edition (SCID-I/NP), the Drug Use Availability (DUA) measure of drug use frequencies, and an item regarding how many cigarettes they would smoke on a daily basis when they could smoke freely. Our sample composed of 237 participants (38% female, 86.6% African American, Mage=41.94, SDage=10.96) who reported smoking one or more cigarettes on a daily basis (MoCigs=10.95). Individuals with MDD were significantly more likely to smoke cigarettes (F(1,232)=7.08, R²=.03, p=.008) than those without MDD. Further analysis examined whether cigarette smoking was associated with MDD above and beyond type of drugs used. Analyses indicated that cigarette smoking remained significantly related to MDD above and beyond cocaine, marijuana, and alcohol use (F(5,224)=3.930, R²Adj=.08, p=.03). However, opioid use was also significantly related to MDD (p=.02). Results suggest that cigarette smoking has a significant relationship to MDD among a sample of inpatient substance users, and highlight the need for smoking cessation efforts in this setting.

FUNDING: This research is supported by the American Cancer Society (ACS) Grant R55GT-11-011-01-CPPB (awarded to Laura MacPherson)

JUSTIFICATION: This research is important to inform policy in the field of substance use treatment because it emphasizes the importance of smoking cessation as a treatment target.

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POS3-118
THE EFFICACY OF A BRIEF INDIVIDUAL OR GROUP INTERVENTION IN LIGHT AND INTERMITTENT SMOKERS


Few studies assessing smoking cessation in light (<10 cigarettes per day) and intermittent smokers (nondaily smoking: LITS) exist. This study assessed the efficacy of a brief smoking intervention for LITS in a predominantly Hispanic sample. Smoking cessation was assessed. Participants were one hundred thirty-eight college student and community LITS (78% Hispanic, 53% male, Mage=35.91 SD=15.64). Participants were randomly assigned to receive either the individual (II) or group (GI) intervention. The II consisted of motivational enhancement, trigger management, and social support. Participants received two booster calls (at months 1 and 2 after baseline), along with two “quit-tips”, and 1 and 3 month follow-up assessments. The GI consisted of three one-hour sessions at baseline, weeks 2 and 4 (with similar content to II), and 1 and 3 month follow-ups. Chi square analyses assessed cessation, smoking reduction, and motivation to change relative to intervention condition. Logistic regressions assessed these same relationships including age, sex, and cigarettes per month at baseline. Cessation rates were low overall (10.9%), with no significant differences between intervention conditions, (χ²(1)=.89, n.s.). Smoking reduction was significantly higher in the GI compared to the II group, (χ²(1)=5.0, p<.05). No significant differences in motivation to change were observed between intervention groups, (χ²(1)=2.83, n.s.). The logistic regression model assessing smoking reduction was significant, (χ²(1)=11.29, p<.05), although no significant predictors were observed. The remaining models were not significant. Attrition was high (63.9%) despite strong retention efforts. No differences in cessation rates or motivation to quit were observed between groups. Although some studies have suggested higher cessation rates in group-format interventions, not enough power to detect a potential effect may have been present. Nevertheless, smoking reduction has been associated with quit attempts and cessation. Future directions include enhancing retention efforts, strengthening motivational intervention components, and promoting cessation after reduction in LITS.

FUNDING: This project was funded by A Smoke Free Paso del Norte Grant No. 26-8113-61.

JUSTIFICATION: This study informs the growing literature on light and intermittent smoking cessation in a predominantly Hispanic sample.

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POS3-119
ABILITY TO CONTACT LOW-INCOME SMOKERS BY TELEPHONE VARIES BY TIME OF MONTH

Kathryn Hawk, M.D.*, Ruizhi Shi, M.B., M.S., June Rosner, M.A., M.Ed., Stephanie O'Malley, Ph.D., Gail D’Onofrio, M.D., Susan Busch, Ph.D., Benjamin Toll, Ph.D., Robert Makuch, Ph.D., and Steven L. Bernstein, M.D., Departments of Emergency Medicine and Psychiatry, Yale School of Medicine; Yale School of Public Health; Yale Cancer Center, New Haven, CT

Background: Minimizing loss-to-follow-up is crucial in evaluating smoking cessation trials. Low-income populations can be difficult to reach, especially if public assistance or cellphones (a primary contact source) are discontinued. Objectives: To determine whether low-income smokers are easier to reach by phone earlier in the month, after paychecks or public assistance support arrive by mail. Methods: We reviewed data from subjects age 18 years and older enrolled from October, 2010-December, 2012 in a completed trial of emergency department-initiated tobacco dependence treatment. Subjects were contacted by phone at 1, 3, and 12 months after discharge. Each subject received multiple calls over a two-week period to obtain follow-up data. We recorded the date of each call, and divided each month into 4 time blocks: Week 1, Week 2, Week 3, and Week 4 (days 22-31). Data are presented for the one-month follow-up in this abstract, because contact rates were maximal. Data were analyzed with descriptive statistics and using generalized estimating equations (GEE) using SAS to account for multiple calls/subject. Results: A total of 2049 phone calls were made to reach 769 subjects. Of these calls, 677 (33%) resulted in subject contact. Overall, 88% of all subjects were contacted. The proportion of successful calls made at Weeks 1, 2, 3, and 4 were, respectively, 34.4%, 30.8 %, 32.1%, and 34.4%. Using GEE modeling with Week 4 as reference, the odds of a successful contact at Weeks 1, 2, and 3 were, respectively, 1.52 (p<0.001, 95% CI=[1.18 - 1.96]), 1.30 (p<0.024, 95% CI=[1.01 - 1.66]), and 1.37 (p=0.007, 95% CI=[1.07 - 1.76]). Conclusions: Time of month affects likelihood of successful subject contact. This may reflect low-income smokers’ improved financial position earlier in the month, although we did not ask about this. Follow-up strategies for low-income smokers should include aggressive follow-up throughout the month, perhaps with “front-loading” of calls earlier in the month.

FUNDING: NIH/National Cancer Institute R01CA141479
JUSTIFICATION: These results suggest that efforts to contact low-income smokers by phone may be more successful if the calls are placed earlier in the month.

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**POSTER SESSION 3**
**FRIDAY, FEBRUARY 7, 2014 • 5:15 P.M.–6:45 P.M.**

**POS3-120**
CORTISOL, MENSTRUAL PHASE AND RESPONSE TO NICOTINE AMONG FEMALE SMOKERS
Eileen Huttlin*, Nicole Tosun, M.S., Alicia Allen, M.P.H., Ph.D., Sharon Allen, M.D., Ph.D., and Mustafa al’Absi, Ph.D., Tobacco Research Programs, University of Minnesota

Previous research indicates that stress may increase cigarette craving and smoking pleasure, and some reports suggest that cortisol may modulate a smoker’s response to nicotine. The present study analyzes the relationship between salivary cortisol levels with subjective responses to nicotine among female smokers during ad libitum smoking. We hypothesize that higher cortisol levels will be associated with increased positive and decreased negative subjective responses to nicotine in both phases of the menstrual cycle. Females aged 18-40 who smoked at least 5 cigarettes per day, reported regular menstrual cycles and were not taking oral contraceptives or psychotropic medications were recruited. Participants completed two identical weeks of testing, one during the follicular phase (F) and one during the luteal phase (L) of the menstrual cycle. On day 2 of each testing week, participants self-collected salivary cortisol samples at specific times throughout the day and completed a nicotine response lab session. This lab session involved administration of nicotine nasal spray and completion of surveys, specifically the Subjective State Scale (SSS) and Visual Analog Scale (VAS), to assess subjective response to nicotine. Ad libitum smoking was allowed during this day. Descriptive statistics and correlation coefficients were computed using SAS 9.2. Participants (n=99) were 29.1± 6.9 years old and smoked an average of 12.3± 5.5 cigarettes per day. During the F phase, higher morning salivary cortisol levels were significantly associated with decreased negative affect and decreased withdrawal scores in response to the nicotine nasal spray (r= -0.212, p=0.034 and r= -0.295, p=0.003, respectively). This was not seen in the L phase (p>0.05). Results from this analysis indicate that the association between salivary cortisol and subjective response to nicotine varies by menstrual phase. Therefore, cortisol may play a role in the phase effects on smoking previously reported. Additional research is warranted to evaluate how these observations may apply to smoking cessation efforts in premenopausal women.

FUNDING: NIH/NIDA R01-DA008075 NIH/NIDA/OHWR P50-DA033942 NIH/NCR- M01RR00400 NIH/NCCR 1UL1RR033183 NIH/NCATS 8UL1TR000111 Minnesota Medical Foundation Student Research Grant

JUSTIFICATION: The results from this study inform clinicians that the relationship between cortisol and response to nicotine differs between phases of the menstrual cycle, suggesting that cessation attempts may be more effective at certain times during the cycle.

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**POS3-121**
EMOTION REGULATION, SMOKER PERCEPTION OF HEALTH WARNING LABELS, AND QUIT ATTEMPTS
Amanda R. Mathew*, Erika N. Abad-Vivero, Brett Froeliger, and James F. Thrasher,1 Department of Neurosciences, Medical University of South Carolina,1 Arnold School of Public Health, University of South Carolina

Pictorial health warning labels (HWLs) that depict consequences of smoking on cigarette packaging are an important public health tool for tobacco control. However, limited research has explored individual differences in smokers’ response to HWLs. Emotion regulation is one individual difference factor relevant to tobacco use and cessation. In the current study, we examined the relationship between emotion regulation strategy, responses to HWLs, and attempts to quit smoking. Data were drawn from a large, international sample of smokers participating in a study on cigarette warning label policy (N=851). Emotion regulation strategy was assessed with two subscales of the Emotion Regulation Questionnaire (ERQ): Reappraisal and Suppression. ERQ-Reappraisal was positively associated with the following general responses to HWLs over the past month: namely, increased attention to images, images stopping one from smoking, and changes in cessation-related expectancies due to images (i.e., thinking about smoking risks, thinking about quitting smoking, and thinking about benefits of quitting). ERQ-Suppression was not significantly associated with any of these HWL responses. In individual regression models, the following responses to HWLs were positively associated with making a quit attempt: namely, increased attention to images, images stopping one from smoking, and changes in smoking-related expectancies. The interaction of ERQ strategy with response to HWLs was not significant in predicting quit attempts. In summary, HWLs appear to achieve intended message more effectively among those who use reappraisal strategies in emotion regulation, while HWLs may be limited in effectiveness among those who use suppression strategies. Results have implications for interventions targeting emotion regulation deficits (e.g., mindfulness training), which may ultimately bolster response to smoking cessation tools such as HWLs and improve quit rates.

FUNDING: Funding through NCI grant R01-CA167067 (PI: Thrasher).

JUSTIFICATION: In addition to guiding potential clinical interventions to augment standard smoking cessation counseling (i.e., those addressing emotion regulation skills), findings add to our understanding of the impact of pictorial health warning labels, an important public health tool for tobacco control.

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**POSTER SESSION 3**
**FRIDAY, FEBRUARY 7, 2014 • 5:15 P.M.–6:45 P.M.**

**POS3-122**
A SELF-REPORT SCALE TO MEASURE THE EFFECT OF NICOTINE ON REWARDING EVENTS
John R. Hughes, M.D.*,1, Peter W. Callas, Ph.D.,1 James R. Fingar, M.D.,1 Stacey C. Sigmion, Ph.D.,2,1 Jean-Francois Ettner, and Alan J. Budney, Ph.D.,1 University of Vermont,1 University of Geneva,2 Geisel School of Medicine at Dartmouth

In nonhumans, nicotine administration increases and nicotine withdrawal decreases the reinforcing effects of non-drug reinforcers. To test whether these results occur in humans, a self-report scale to measure the reinforcing effects of various activities would be helpful. Although there are many scales that ask about anhedonia (i.e., decreased pleasure from events), these sample only a few events, fail to include more recent activities (e.g., various social media), and ask about traits not states. We used prior scales and other methods to develop a list of 476 possible rewarding events. Qualitative work reduced this list to 99 activities based on frequency, clarity of questions, overlap in descriptions, floor and ceiling effects, etc. We then asked 182 current and former smokers to rate each activity on a 5 point Liking scale, and on a 5 point Wanting Scale (or visa versa), and on a 5 point Frequency scale on three occasions with a mean of 3.5 days between ratings. Factor analysis indicated 10 factors (alcohol/drug use, amusements, food consumption, hobbies, media-related, sexual, social connections, socializing, solitary relaxing, and sports) and 1 individual event (smoke tobacco). The Liking Scale had high internal consistency (Cronbach alphas > 0.92) and test-retest reliability (ICCs > 0.87). The median time to complete the Liking Scale was 4.3 minutes. Similar results occurred with the Wanting Scale. Construct validity was tested by the correlation between Liking and Wanting scores (r > 0.86) and between Liking or Wanting vs frequency of the event (r > 0.36). Further work is needed to examine the validity of the scale by assessing concordance with anhedonia scales and operant measures of reinforcing effects. We believe this brief, updated scale will be useful in testing whether nicotine administration increases, or nicotine withdrawal decreases, the reinforcing effects of various human activities.

FUNDING: Funded by NIDA grant DA-031687

JUSTIFICATION: This scale will be useful to tests of whether nicotine administration increases or nicotine withdrawal decreases the reinforcing effects of non-drug rewards.

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POS3-123

HOOKAH USE PREDICTS CIGARETTE USE PROGRESSION AMONG LESS THAN DAILY COLLEGE SMOKERS

Neal Doran, Ph.D. and Mark G. Myers, Ph.D., VA San Diego Healthcare System and U.C. San Diego

Hookah use is increasingly common among college students in the US. Previous studies have documented prevalence and characteristics of use, yet little is known regarding the relationship between hookah and cigarette use. Since hookah use is a particularly high nicotine content tobacco product, the added exposure to nicotine may accelerate the uptake of cigarettes. In the present study we examined whether hookah use predicted progression from less-than-daily to daily smoking among a sample of college students. Students were recruited for a longitudinal study of college smoking self-change. The full sample consisted of 324 students, of whom 190 were less-than-daily-smokers (LITS). Of the 190 baseline LITS, 154 (81%) completed the 6-month interview and were included in the present analyses. The sample averaged 19.7 (1.44) years of age and included 68 females (44%), 37% Asian and 30% Non-Hispanic White participants. Current hookah use (any use in past 30 days) was reported by 38% of participants at the baseline that they would have used cigarettes. Hookah use was a significant predictor of daily smoking progression from being a LITS to daily smoking (OR = 4.54; p = 0.002, 95% CI = 1.73 - 11.92). Next, we conducted a multiple regression predicting change in smoking days per month from baseline to 6 month follow-up. Again, the overall model was significant (p < .001) and current hookah use was a significant predictor of progression to daily smoking. The estimated prevalence of cigarette smoking among individuals in substance use disorder (SUD) treatment is > 70%; yet, the availability of smoking cessation services in SUD treatment settings remains limited. In Phase 1 of the current study, we conducted qualitative interviews with 19 smokers in SUD treatment to inform the development of a brief, tablet computer intervention to motivate engagement in tobacco quitline use (TIME-TQ). In Phase 2, we developed a prototype of TIME-TQ and delivered it to 10 smokers in SUD treatment. Phase 1 interview topics included pros and cons of smoking, benefits and barriers to quitting, life priorities and values, and familiarity with and receptivity to a referral to a tobacco quitline. Phase 1 participants reported barriers to quitting similar to the general population of smokers, but had additional concerns about jeopardizing abstinence from alcohol and other drugs. Most (14 of 19; 73.7%) were not familiar with the local tobacco quitline. After providing a brief description of the quitline and sharing information about barriers to quitting, 14 of 19 (73.7%) reported that they would consider using the quitline if they decided to make a quit attempt and 10 of 19 (52.6%) expressed an interest in a referral to the quitline upon discharge from SUD treatment. Results of Phase 2 piloting of the TIME-TQ with 10 smokers indicated high levels of acceptability and satisfaction. For example, Phase 2 participants reported that TIME-TQ was interesting, relevant, respectful, and helpful (M = 4.25-4.88 on 5-pt scale with 1 = not at all and 5 = very much). Additionally, participants reported significant increases in self-reported likelihood of quitting within the next 30 days (M = 35.1 to 44.2, t(9) = -2.61, p = .03) and perceived importance of quitting (M = 65.5 to 79.5, t(9) = -3.92, p = .003) on 100-pt visual analogue scales administered before and after the intervention. Finally, among Phase 2 participants, 4 of 10 (40%) accepted a tobacco quitline referral following the intervention. After finalizing the TIME-TQ, we will conduct a randomized controlled trial of this intervention vs. a computer tablet nutrition control. FUNDING: Supported by grants 1R01-DA04312 from the National Institute on Drug Abuse to Richard A. Brown.

POS3-124

PROVIDER AND PATIENT REPORTS OF PROVIDER ADHERENCE TO PHS GUIDELINES FOR TOBACCO CESSATION

Bharat Narang, M.P.H.1, Sarah Borderud, M.P.H.1, Deanna Jannat-Khah, M.S.P.H.2, Yuelin Li, Ph.D.1, Jamie Ostroff, Ph.D.1,2, and Donna Shelley, M.D., M.P.H.3,1
Memorial Sloan-Kettering Cancer Center (MSKCC), 1New York University School of Medicine (NYUSOM), 2Multiple Principal Investigators

Provider adherence to the PHS Guidelines for Treating Tobacco Use and Dependence is highly variable and accurate assessment is essential for measuring quality of tobacco treatment care delivered in clinical settings. As part of an ongoing cluster-randomized trial, we conducted a modified 15-item Patient Exit Interview (PEI; Pbert, 1999) to 292 patients in three public dental clinics. The PEI assessed patients’ report of tobacco cessation interventions (5A’s) received from their dental care provider. We also created a parallel survey for collection of providers’ report of 5A’s delivery. Providers were asked what percentage of their patients they delivered each of the 5A’s on a 5-category response scale: <20%, 21-40%, 41-60%, 61-80%, and >80%. Our weighted average data show that provider adherence to the PHS guidelines is inadequate. Providers reported asking 51% of patients about their tobacco use and roughly equal percent of patients reported being asked (52%) about their tobacco use. Conversely, providers reported that they advise 60% of current tobacco users to quit smoking, whereas only 43% of current tobacco users reported being advised to quit. Providers reported that they assess 52% of their patients’ readiness to quit, but only 32% of patients reported that their quitting readiness was assessed. Guideline adherence and provider-patient concordance decrease even further for delivery of cessation assistance with 23% of providers reported giving written cessation information to their patients, while only 10% of patients reported receiving quitting information from their provider. Similarly, providers estimated that they referred 18% of their patients to the NYS Quitline, but only 9% of patients reported receiving a Quitline referral. Providers reported that they give cessation medication prescriptions to 12% of patients, but only 2% of their patients report receiving a prescription. Our data illustrate two important findings: Provider adherence to the PHS guidelines must be improved; and Providers’ self-reports of adherence may be positively biased such that multiple sources of data are needed to accurately assess provider delivery of tobacco treatment.

FUNDING: NCI R01CA162035
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POS3-125

DEVELOPMENT OF A BRIEF, TABLET COMPUTER INTERVENTION TO MOTIVATE TOBACCO QUITLINE USE AMONG SMOKERS IN SUBSTANCE ABUSE TREATMENT

Richard A. Brown, Ph.D.*1, Jacki Hecht, R.N., M.S.N., Erika Litvin Bloom, Ph.D., Haruka Minami, Ph.D., Stephen V. Matakao, B.S.A., Ana M. Abrantes, Ph.D., Christopher K. Ophuls, Ph.D., J. O. Edleson, J. L., Donna Shelley, M.D., M.P.H., Lawrence H. Price, M.D., Alpert Medical School of Brown University/Butler Hospital

The estimated prevalence of cigarette smoking among individuals in substance use disorder (SUD) treatment is > 70%; yet, the availability of smoking cessation services in SUD treatment settings remains limited. In Phase 1 of the current study, we conducted qualitative interviews with 19 smokers in SUD treatment to inform the development of a brief, tablet computer intervention to motivate engagement in tobacco quitline use (TIME-TQ). In Phase 2, we developed a prototype of TIME-TQ and delivered it to 10 smokers in SUD treatment. Phase 1 interview topics included pros and cons of smoking, benefits and barriers to quitting, life priorities and values, and familiarity with and receptivity to a referral to a tobacco quitline. Phase 1 participants reported barriers to quitting similar to the general population of smokers, but had additional concerns about jeopardizing abstinence from alcohol and other drugs. Most (14 of 19; 73.7%) were not familiar with the local tobacco quitline. After providing a brief description of the quitline and sharing information about barriers to quitting, 14 of 19 (73.7%) reported that they would consider using the quitline if they decided to make a quit attempt and 10 of 19 (52.6%) expressed an interest in a referral to the quitline upon discharge from SUD treatment. Results of Phase 2 piloting of the TIME-TQ with 10 smokers indicated high levels of acceptability and satisfaction. For example, Phase 2 participants reported that TIME-TQ was interesting, relevant, respectful, and helpful (M = 4.25-4.88 on 5-pt scale with 1 = not at all and 5 = very much). Additionally, participants reported significant increases in self-reported likelihood of quitting within the next 30 days (M = 35.1 to 44.2, t(9) = -2.61, p = .03) and perceived importance of quitting (M = 65.5 to 79.5, t(9) = -3.92, p = .003) on 100-pt visual analogue scales administered before and after the intervention. Finally, among Phase 2 participants, 4 of 10 (40%) accepted a tobacco quitline referral following the intervention. After finalizing the TIME-TQ, we will conduct a randomized controlled trial of this intervention vs. a computer tablet nutrition control.

FUNDING: Supported by grant 1R34-DA04312 from the National Institute on Drug Abuse to Richard A. Brown.

JUSTIFICATION: Given that > 70% of individuals in substance abuse treatment are cigarette smokers and smoking cessation is only infrequently addressed in the course of their treatment, the development of a highly disseminable, brief computer tablet intervention to motivate quitting smoking would have high public health significance.

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POS3-126
DIFFERENTIAL EFFECTS OF SMOKING CESSATION COUNSELING AND MEDICATION COMPLIANCE BY RACIAL GROUPS: IMPLICATIONS FOR TREATMENT
K.L. Cropyse1, A. Lahti1, C.B. Clark1, P.S. Hendrick1, L. Trent2, and E.N. Stevens3, 1University of Alabama at Birmingham; 2University of Mississippi; 3Northern Illinois University

African American smokers prefer behavioral interventions over pharmacotherapy for smoking cessation and have lower abstinence rates compared to White smokers, although few studies have directly compared racial groups on smoking cessation. The goal of this project was to determine if four sessions of standard behavioral counseling plus 12 weeks of bupropion would be differentially effective to aid smoking cessation for African American vs. White smokers under community corrections supervision. We randomized 500 smokers to either bupropion plus four sessions of behavioral counseling or bupropion plus brief physician advice to quit smoking. Our sample was comprised primarily of African American (68%) men (67%) who were 37.4 (SD = 11.3) years of age and smoked 14.8 (SD=9.5) cigarettes/day. We obtained low quit rates across all time points (average of 4.5% seven-day point prevalence abstinence at any period), suggesting that neither intervention was particularly effective. We found a significant three-way Race X Treatment X Time interaction, such that African Americans who received bupropion plus counseling had increasing quit rates across time relative to the other groups. In addition, we also found a significant three-way Race X Medication Compliance X Treatment interaction, such that African Americans who reported greater Medication compliance had higher biochemically confirmed cessation (CO < 2 ppm) across time compared to similarly compliant Whites (end-of-treatment 12-week cessation rates of 12% vs. 6%; Wald Chi-Square=126.3; p<0.001). The results from this trial suggest three important findings: (1) standard behavioral counseling in combination with bupropion was more effective for African Americans relative to Whites; (2) similar to previous studies, medication compliance is extremely important for smoking cessation and suggests an important therapeutic target (increasing medication compliance) for improving cessation rates; and (3) African American smokers who are complaint with medications can achieve, and indeed, exceed smoking cessation rates of similarly compliant White smokers.

FUNDING: This study was supported through NIH/NCl funding R01CA141683.

JUSTIFICATION: This study can help explain smoking cessation treatment disparities and ways to tailor treatment to more effectively treat African American smokers.

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POS3-128
BEHAVIORAL COUPLES THERAPY FOR SMOKING CESSATION: A RANDOMIZED PILOT STUDY
Patricia A. Cioe1, Heather LaChance1, Erin Tooley1, Suzanne Colby2, Christopher W. Kahler2, and Timothy J. O’Farrell2, 1Brown University, 2National Jewish Health, Denver, Harvard University

BACKGROUND: Behavioral couples therapy (BCT), a manualized couples intervention for substance abuse, has been found to improve long-term continuous abstinence rates for up to two years post-intervention in alcohol- and other substance-dependent populations, but has not been tested for smoking cessation. The goal of the current study was to test the efficacy and feasibility of a BCT intervention for cohabiting couples in which one partner smoked. METHODS: Forty-nine smokers (smoking at least 10 cigarettes per day) with non-smoking partners were randomly assigned to receive either a traditional, individually-delivered smoking cessation intervention (IND) or a social support smoking cessation intervention (BCT-S). The heterosexual couples were either married or cohabiting for a period of at least one year. We included only partners who had never smoked or had not used tobacco in the past five years. All participants attended seven 60-minute weekly sessions and received 8-weeks of nicotine replacement therapy via transdermal patch. In the BCT-S arm, couples completed an I Quit contract together and participated in couples exercises designed to support the quit attempt. Participants in the IND arm received individual smoking cessation counseling based on federal guidelines along with relaxation training. Participants were followed for 6 months post-treatment. RESULTS: Enrolled smokers were 67% male, 86% White. 26.5% college graduates. Mean age was 42.8, cigarettes smoked daily averaged 18.1, and mean FTND score was 4.9. Mean number of sessions attended was 6.1 in both conditions. Biochemically-verified cessation rates were 40.9%, 50%, and 45% in the BCT-S arm and 59.1%, 50%, and 55% in the IND arm, at end of treatment, 3-months, and 6-months, respectively. Abstinence rates did not differ significantly between treatment arms at any time point (all p > .05). CONCLUSIONS: Although we found no significant differences in abstinence rates across intervention groups, cessation rates were high and were maintained over time. The results indicate that BCT is feasible in smoking cessation treatment. Further research is warranted.

FUNDING: This study was funded by the National Institute on Drug Abuse R01 DA021265 (Dr. LaChance). This work was partially funded by NIDA T32 DA016184 (Dr. Cioe).

JUSTIFICATION: Most smokers relapse within the first 5 months after initiating quitting - behavioral couples therapy has the potential to improve long-term abstinence rates.

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POS3-127
SOCIOECONOMIC AND MEDICAL ILLNESS PROFILES IN TREATMENT SEEKING SMOKERS: THE IMPACT OF MENTAL HEALTH.
Matthew Clyde, M.Sc.1,*, Brigitte Corran, B.Sc.2, Andrew Pipe, M.D.2, Robert Reid, Ph.D.2, M.B.A.2, Charli Els, M.D.1, and Heather Tulloch, Ph.D.1,1Department of Clinical Psychology, University of Ottawa, 2Minto Prevention and Rehabilitation Centre, University of Ottawa Heart Institute, 3Faculty of Medicine and Dentistry, University of Alberta

Objectives: Smoking is more common in disadvantaged groups, particularly in those with a history of mental illness. These individuals also have higher rates of smoking compared to the general population. Using data from a randomized control trial in treatment seeking smokers, we investigated differences in sociodemographic and medical illness profiles between smokers with current or previous (MH+) and those without a history of mental illness (MH-). Methods: Treatment seeking smokers (aged 18+) were recruited via the University of Ottawa Heart Institute (UOHI) Smoking Cessation Clinic and media advertisements in the community. At baseline, participants provided sociodemographic and medical information, and were assessed for current or previous psychiatric illness using the MINI International Psychiatric Interview (MINI 5.0). Chi-square analyses were performed to determine group differences (MH+ vs. MH-). Results: 737 smokers (M age = 48.8; 53.7% male) met the inclusion criteria (smoke >10/day, no use of smoking cessation medications in last 72 hours, willing to make quit attempt in next 2-4 weeks). 59.8% of our sample had a history of mental illness. The MH+ group were more likely to be female (p < 0.001), single (p < 0.001), unemployed or on disability leave (p < 0.001), and have fewer years of formal education (p < 0.001). In terms of chronic medical illness, the MH+ group had poorer overall medical profiles, including higher prevalence of cardiovascular disease (p < 0.05), higher cholesterol and blood pressure (p < 0.001), respiratory problems (p < 0.01), gastrointestinal issues (p < 0.001), endocrine problems (p < 0.05), arthritis (p < 0.001), and chronic pain (p < 0.001). Conclusions: Treatment seeking smokers with a history of mental illness had poorer sociodemographic and medical profiles as compared to those without. As a result, cessation success and treatment options (e.g., financial resources for pharmacotherapy) may be impacted. Clinicians need to be aware of this unique profile of smokers, and better coordination of smoking cessation efforts and mental health treatment is warranted to assist this population in their cessation efforts.

FUNDING: The project was funded thanks to the Heart and Stroke Foundation of Ontario.

JUSTIFICATION: Prepare clinicians for the difficult profiles that accompany community dwelling treatment seeking smokers, particularly those with a history of mental illness.

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POS3-129  
SMOKING PATTERNS AND EFFECTS AMONG LITTLE CIGAR AND CIGARETTE DUAL USERS
Bartosz M. Koszowski*, Jennifer L. Potts, Lauren Viray, Zachary R. Rosenberry, and Wallace B. Pickworth, Batelle Memorial Institute, Baltimore Health and Analytics.

Introduction: There has been a substantial increase in the use of little cigars (LC) over the past 5 years. Some people continue to smoke cigarettes (CG) as well as the little cigar products. In this study we compared puffing parameters, physiologic effects, and nicotine plasma levels and subjective effects of CG and LC smoking. Methods: Nine daily smokers (7 men) participated in the study. Participants were self-identified dual users that smoked cigarettes daily and a little cigar product at least once a week. Volunteers reported to the lab for two experimental sessions separated by at least 24 hours. In one session they smoked their usual brand of cigarette and in the other they smoked a Winchester Little Cigar (84mm, 0.9g, filtered). Puffing patterns as well as physiologic measures were recorded and blood for nicotine assay was collected. Results: Participants’ average age was 50±8.4; average FTND score was 6.9±1.5. All smoked an average of 40±3.2 cigarettes per day and 50% smoked LC daily. The laboratory smoking of CG and LC was similar. Average mass of tobacco smoked was 0.7±0.1 and 0.8±0.1g, respectively. The number of puffs to consume CG averaged: 15±4.0 and to consume LC: 12±3.0. The average time to smoke was 319±54 and 286±106sec., respectively. No statistically significant differences were observed for puff volume: 53±7.6 and 42±19ml, respectively. However, the average total puff duration was significantly (p<0.01) higher for CG: 769±168 than for LC: 454±91ML. Finally, the average puff duration, puff velocity as well as average interpuff interval for both CG and LC were similar: 2.2±0.7; 27±6.3; 21±6.4 and 1±9.0±4.5sec., 23±7.6mL/sec; 23±11sec., respectively. Both products smoking resulted in similar CO boost: 6.0±3.1ppm during CG and 6.7±4.5ppm during LC smoking. Neither product significantly changed heart rate or blood pressure. Nicotine plasma levels are pending analyses. Conclusions: These data suggest that in a laboratory setting LC are smoked very similarly to CG. Smoking either CG or LC exposes the user to tobacco related toxins, including carcinogens and cause similar health consequences.

FUNDING: This work was supported by the National Institutes of Health under grant 1R01CA158945-01A1.

JUSTIFICATION: Inform public health and policy about cigarette and little cigars smoking patterns

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POS3-130  
VARENICLINE FOR SMOKING REDUCTION IN SMOKERS NOT YET READY TO QUIT
Marc L. Steinberg, Ph.D.*, Jennifer L. Potts, Lauren Viray, Zachary R. Rosenberry, and Wallace B. Pickworth, Batelle Memorial Institute, Baltimore Health and Analytics.

Introduction: Varenicline has demonstrated efficacy for quitting smoking. Its agonist and antagonist effects also suggest that it would be efficacious for reducing cigarettes per day in smokers not yet ready to quit. Methods: In a double-blind, randomized clinical trial, smokers (N=53) were randomized to receive either 28-days of varenicline plus brief counseling or 28-days of placebo plus brief counseling. They were instructed to reduce their cigarettes per day with the goal of reducing by 50% from baseline to end-of-treatment (28 days). Results: At end-of-treatment, patients taking varenicline smoked significantly fewer cigarettes per day and had significantly lower carbon monoxide levels compared to those taking placebo; however, when substituting baseline cigarettes per day for missing data, this effect was no longer significant. Those who reduced their cigarette intake by at least 50% and those who reduced their carbon monoxide levels by at least 50% showed significantly greater self-efficacy at end-of-treatment than did those who did not achieve these goals. As compared to those taking placebo, those taking varenicline had significantly lower levels of nicotine dependence at end-of-treatment. There were no differences in groups with respect to meeting a goal of 50% cigarette reduction or in number of quit attempts. Conclusions: These data indicate that while taking varenicline for a brief time, participants are able to reduce the number of cigarettes they smoke substantially. These effects were not maintained over time and indicate that even for a reduction goal, using varenicline for longer periods of time may be warranted. These data also indicate that successful cigarette reduction is associated with greater self-efficacy for quitting and therefore may be a useful intermediate step in the quit process.

FUNDING: This study was supported by a Global Research Award for Nicotine Dependence (GRAND) grant (WS777117), an independent competitive grants program sponsored by Pfizer, Inc. awarded to the first author.

JUSTIFICATION: These data indicate that smokers not yet ready to quit are willing to and able to use varenicline to reduce their smoking and increase their self-efficacy for quitting.

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POS3-131  
A COMPARISON OF REPORTING AND PARTICIPANT CHARACTERISTICS IN RANDOMIZED CONTROLLED TRIALS AND LABORATORY-BASED STUDIES INVESTIGATING VARENICLINE

Randomized-controlled trials (RCTs) have established varenicline as an efficacious medication for smoking cessation, and many laboratory studies have examined the processes by which varenicline may exert its clinical effects. The applicability of RCT findings to the general population of smokers wishing to quit smoking and the validity of findings from laboratory studies with regard to the clinical efficacy of varenicline depend on the recruiting criteria and sample characteristics of these studies. We reviewed empirical studies that examined the effects of varenicline (vs. placebo) among adult smokers. RCTs administered varenicline for at least 11 weeks after a target quit date and focused on long-term cessation and safety/tolerability. Laboratory mechanistic-process studies (LMPs) typically had shorter treatment duration and focused on basic processes (e.g., craving, cognitive performance, pharmacokinetics). Reviewers identified 15 RCTs (avg n = 460) and 28 LMPs (avg n = 48) and extracted eligibility criteria and participant characteristics. Several statistically and clinically meaningful differences emerged. LMPs reported less than half as many inclusion/exclusion criteria as RCTs (10 vs. 25). However, this difference may be due to deficiencies in reporting among LMPs (e.g., 36% reported n screened, cf., 93% of RCTs), rather than the use of less restrictive exclusion criteria. Importantly, LMPs and RCTs differed markedly in participants’ motivation to quit smoking. RCTs more often reported excluding smokers who were not motivated to quit (67% vs. 25%), whereas a third of LMPs explicitly recruited smokers who were not motivated to quit (36% vs. 0%). Participants in LMPs were also younger, had lower BMIs, smoked fewer cigarettes per day, and had lower scores on the FTND than those in RCTs. These findings suggest that LMPs deviate from RCTs in ways that may compromise our understanding of the mechanisms through which varenicline aids smoking cessation. In addition, both LMPs and RCTs restrict their samples such that they limit generalizability. Recommendations for selection and reporting standards in clinical research on smoking interventions will be addressed.

FUNDING: No Funding

JUSTIFICATION: This review directly addresses the applicability of laboratory-based studies of the clinical efficacy of varenicline to the clinical outcome literature.

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POS3-132

SEX-SENSITIVE COMT GENOTYPE EFFECTS ON RESPONSE TO OVERNIGHT ABSTINENCE AND INTRAVENOUS NICOTINE DELIVERY

Elise E. DeVito, Ph.D.*, Ayeh I. Herman, M.S.C.P., Psy.D., and Mehmet Sofuoglu, M.D., Ph.D., Yale University School of Medicine

COMT (rs4680) Val158Met, a functional polymorphism with well-established sexually-dimorphic effects on dopamine levels, has been proposed to contribute to sex differences in addiction. We investigated the influences of sex and COMT genotype on response to intravenous (IV) nicotine delivery. Non-treatment-seeking nicotine dependent individuals (N=182) received two intravenous doses of nicotine (0.5 and 1.0 mg/70 kg) as well as an intravenous delivery of saline placebo, following biochemically-confirmed overnight nicotine abstinence. Subjective drug effects and vital statistics were collected at pre-infusion baseline and at multiple intervals during the nicotine administration testing session. Cognitive measures and self-reported measures of withdrawal and craving were collected at baseline and at the end of the testing session. Sex-sensitive effects of COMT genotype were observed across several modalities of IV nicotine response. Relative to women with at least one Met allele, women with the Val/Val genotype reported greater nicotine withdrawal and craving symptoms, as well as more robust subjective effects of nicotine. In addition, women with the Val/Val genotype performed worse than Met-carrier women on a measure of sustained attention (CPT) following overnight abstinence from nicotine. In contrast, COMT genotype did not significantly affect men's subjective or cognitive responses to acute nicotine administration or overnight abstinence, on these measures. COMT genotype significantly affected both men's and women's physiological responses to IV nicotine, but did so in a sex-sensitive manner; with Val/Val women and Met men showing greater physiological reactivity (heart rate) to IV nicotine relative to their same-sex peers of the opposing genotype. These findings provide evidence of several genetically moderated mechanisms by which women with the Val/Val genotype display enhanced sensitivity to nicotine withdrawal and delivery. Future research should assess whether the Val/Val genotype in women contributes to greater vulnerability to initiation or maintenance of smoking behaviors through these mechanisms.

FUNDING: R01 DA12690 R01 DA12849 R03 DA027447 K12 DA00167 K12 DA031050 Veterans Administration Mental Illness Research, Education and Clinical Center (MIRECC)

JUSTIFICATION: Understanding sex differences in the genetic (COMT) effects on response to short-term nicotine abstinence or acute nicotine administrating may aid development of individualized treatments for nicotine dependence.

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POS3-133

INTEGRATING TOBACCO INTO SUBSTANCE ABUSE TREATMENT IMPROVES OUTCOMES

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The majority of clients in substance abuse treatment use tobacco on a daily basis; have high rates of tobacco-related illnesses and mortality; and are interested in quitting tobacco use. However, most substance abuse treatment programs fail to provide tobacco dependence treatment. In reality, most people do not consider seeking substance abuse treatment until they experience serious consequences from their substance use. In addition, most people find it difficult to make a decision to quit using a substance, while they are actively using it. For these reasons patients in substance abuse treatment often continue using tobacco while they are attempting to quit other substances. It is difficult to convince them that this would be a good time to quit everything, including tobacco. Inpatient and residential treatment settings have the unique ability to provide a safe and totally drug and tobacco free environment where individuals can experience freedom from the drug driving its use and can begin to make better decisions about whether they want to quit or not. In spite of this, few inpatient or residential programs actually provide a tobacco free environment and require abstinence from tobacco during treatment. Recent surveys of treatment programs have identified significant ambivalence by staff about the use of tobacco, which makes it difficult for programs to effectively address tobacco. This session will describe a 90-day, tobacco free, dual-diagnosis, inpatient treatment program that has fully integrated tobacco into substance abuse and mental health treatment, addressing it as seriously and in the same fashion as other drugs of abuse. The author will discuss how tobacco is incorporated into several evidence-based treatment approaches utilized in the program. Outcome data obtained on 140 patients (96% using tobacco daily on admission) during a one year follow-up after treatment provide evidence that fully integrating the concept of tobacco cessation in a tobacco free environment for people with mental illness in substance abuse treatment helps move them in their stage of change regarding tobacco use and improves overall outcomes related to their substance abuse.

FUNDING: State of Colorado

JUSTIFICATION: The evidence presented in this paper will inform the design and implementation of tobacco cessation treatments for addiction care settings, as well as policies related to the large-scale adoption of these treatments.

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POS3-134

EVOLUTION OF QUITLINES: EVIDENCE FOR EXISTING SERVICES AND GAPS IN RESEARCH

Susan M. Zbikowski, and Alere Wellbeing

The first quitline (QL) in the US, the California Helpline, became operational over 20 years ago. Today, there is a network of QLs available (1-800-QuitNow) that provides free, public access to QL services in every state, the District of Columbia, and two US territories (Guam, Puerto Rico). In addition to publically funded QLs, numerous health plans and employers sponsor private QLs. QLs have evolved beyond delivering only phone-based tobacco cessation counseling. Many QLs today include FDA approved cessation medications, self-help guides, web-based and text messaging (SMS) programs, emailing with a coach, and use a variety of social media (e.g., Twitter, Facebook). In addition, QLs are embedded in complex state and federal tobacco control policies (including promotional campaigns, state and federal taxes on tobacco, and smoking bans) which further encourage quit attempts and support cessation. Based on data from the recent North American Quitline Consortium (NAQC) annual survey, over 440,000 smokers received counseling through a state tobacco QL and quit rates are nearly 30% (among survey responders). Numerous meta-analyses also have demonstrated QLs are effective (2006 Cochrane Review, 2008 PHS Clinical Practice Guidelines). The growing body of QL-related research has shown (1) phone- based counseling is effective alone and in combination with cessation medications, (2) a dose response for counseling and cessation medications with more calls and more medications resulting in improved cessation outcomes, (3) free medications, tobacco taxes, and smoke-free policies drive calls to QLS, and (4) mixed results for web-based services. Due to budget pressures and consumer demand, state program officials need to continuously modify and re-define what a QL provides. Thus, QL services often change or new services become available with insufficient scientific evidence. It is important for researchers to understand what is considered standard practice among QLS and what research is needed to advance this type of public service. This talk will review the evolution of QLS in the US, services available, evidence supporting available services, and research gaps.

FUNDING: No funding

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POS3-135
OPTIMIZING EnROLLMENT IN QUITLINE COUNSELING: THE IMPACT OF WARM HANDOFF
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Background: Quitlines are falling short of their potential public health impact because of limited utilization. Proactive referrals by health care providers could dramatically increase reach but there is little evidence regarding effective and efficient referral methods. Objective: This study examines the impact of "warm hand-off" and fax referral on quitline enrollment and counseling adherence. Method: Hospitalized smokers (N=1054) were randomized to receive one of two quitline referral methods. Patients in warm hand-off received incoming referral: hospital staff called the quitline and transferred the call to the patients' bedside phone for inpatient enrollment and counseling. Patients in the control group received inpatient counseling and then post-discharge fax referral to the same quitline. Here we report a blinded and pooled preliminary analysis of referral success and counseling adherence among the first 280 participants. Counseling data were derived from reports provided by the quitline provider, Alere. Results: Most participants were Caucasian (70%), 58% were female, and 51% had a high school or lower level of education; (52%) screened positive for depression and one-third for hazardous drinking. Most participants (80%) enrolled in the quitline. Over half of participants (67%) completed one counseling call; 38% completed two, 19% completed 3, 12% completed 4, and 4% completed 5 sessions. The mean number of calls completed by all participants was 1.4 (SD = 1.41). Conclusion: Combined, warm handoff and fax referral enrolled a higher proportion of smokers than previously reported fax referral programs, and achieved good participation in at least one counseling session. We will unfold the study in December and at the conference present findings based on all 1054 participants, including the relative impact of warm handoff versus fax referral on enrollment and counseling adherence. We will also compare and contrast results to the outcomes of other strategies designed to increase access to cessation services.

FUNDING: Clinical Trials Registration NCT01305928

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POS3-136
ENLISTING TOBACCO QUITLINES TO PROMOTE ORAL HEALTH AND TOBACCO CESSATION: AN EMPIRICALLY-BASED ARGUMENT
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Smokers are at particularly high risk for oral disease as a result of their tobacco use and other lifestyle choices (e.g., poor dental care utilization and oral hygiene; alcohol use; poor dietary choices). As a result, smokers are a priority target audience for population-level, public oral health promotion efforts. Within the US, more than 440,000 smokers receive free tobacco cessation treatment annually through publically-funded state tobacco quitlines. Moreover, there is good reason to expect that addressing smoking cessation and oral health promotion concurrently can have synergistic effects, improving oral health and cessation outcomes. For example, some oral hygiene behaviors such as brushing and flossing are good distraction techniques for managing cigarette cravings. Thus, we propose it is time to consider a new public oral health intervention strategy—enlisting tobacco quitlines to jointly counsel smokers about tobacco cessation and oral health promotion. To assess the feasibility of this proposition, we interviewed key stakeholders at the largest provider of US tobacco quitlines and 21 of their state quitline sponsors. We also surveyed callers to a state-funded tobacco quitline (n = 816) and a commercially funded tobacco quitline (n = 455) to understand their oral health needs and interest in services. Convergent data from these sources demonstrate a clear need and opportunity to work with tobacco quitlines to deliver an integrated oral health-promotion-tobacco cessation program. For example, 83.9% of dentate respondents from the state quitline failed to meet recommendations for daily brushing and flossing and 52.6% had not visited a dentist in the prior year. Similar results were observed among commercial quitline callers. Additional empirical evidence supporting this proposition will be presented and discussed, as well as pragmatic design considerations for an integrated oral health-tobacco cessation intervention program. Expanding quitline services in this way could improve health outcomes of smokers and introduce new revenue streams to support the US tobacco quitline infrastructure.

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POS3-137
PILOT RANDOMIZED TRIAL OF TELEPHONE-DELIVERED ACCEPTANCE AND COMMITMENT THERAPY FOR SMOKING CESSATION: TRIAL DESIGN FEASIBILITY, SATISFACTION, AND PRELIMINARY OUTCOMES
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Introduction: Quitlines serve 500,000 US smokers each year. But low quit rates stifle their impact. A new telephone counseling approach is needed to boost quit rates and, in turn, population-level impact. Accordingly, the current study tested a promising counseling approach called Acceptance & Commitment Therapy (ACT) in a pilot study of trial design feasibility, satisfaction, and preliminary outcomes. Methods: We recruited 121 uninsured South Carolina State Quitline callers who were adult smokers (at least 5 cigarettes/day) wanting to quit within the next 30 days. Participants were randomized to five sessions of telephone counseling consisting of either standard cognitive behavioral therapy (CBT) or ACT. All participants were offered two weeks of Nicotine Replacement Therapy (NRT). Results: The follow-up data retention rate at 3 and 6 months was 66% and 67%, respectively (vs. 50% in typical quitline studies). Data retention did not differ by group (p < 0.05). ACT participants accepted more calls than CBT participants (Mean = 3.25 in ACT vs. 2.23 in CBT; p =.001). Regarding treatment satisfaction, 100% of ACT participants reported their assigned treatment was useful for quitting smoking (vs. 87% for CBT; p =.03) and 97% of ACT participants would recommend their assigned treatment to a friend (vs. 83% for CBT; p =.06). The primary outcome was 30-day point prevalence abstinence at 6 months post randomization using the standard missing=smoking imputation. The overall quit rates were 31% in ACT vs. 22% in CBT (OR=1.5, 95% CI=0.7-3.4). Among participants scoring low on acceptance of cravings at baseline, the quit rates were 36% in ACT vs. 17% in CBT (OR=2.8, 95% CI=0.6-12.4). Consistent with ACT’s theoretical model, among participants scoring low on acceptance of cravings at baseline, the quit rates were 37% in ACT vs. 10% in CBT (OR=5.3, 95% CI=1.3-22.0). Conclusion: ACT is feasible to deliver by phone, acceptable to quitline callers, and shows promising quit rates compared to standard CBT quitline counseling. A fully-powered comparative effectiveness trial is the next natural step in the testing of this promising new intervention.

FUNDING: NIDA R21 DA030646, NIDA K23DA026517, NIMH T32MH082709, and Fred Hutchinson Cancer Research Center

JUSTIFICATION: Results of this pilot trial stimulate the development of a fully-powered comparative effectiveness clinical trial of telephone-delivered Acceptance & Commitment Therapy for smoking cessation

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Improving quitline counseling’s impact on smoking cessation: acceptance and commitment therapy counseling processes that predict number of cigarettes smoked per day

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Introduction: The impact of quitlines can be maximized by understanding how telephone counseling influences smoking cessation. To date, no studies have explored session-to-session counseling predictors of quitting. To address this gap, we examined to which extent General Acceptance and Commitment Therapy (ACT) telephone counseling components in a given call predicted subsequent cigarettes smoked per day (CPD) reported at the next call. Methods: One hundred and thirty telephone counseling sessions of ACT across 42 subjects were coded by trained raters as part of a larger randomized controlled trial testing the effects of an ACT intervention for smoking cessation. Two key intervention components were rated on a 5-point Likert scale. Component 1: the use of techniques to help individuals accept their urges and manage their thoughts more effectively. Component 2: The use of techniques to help individuals be mindful of their cravings and adopt a more flexible sense of self-awareness in relation to smoking. Regression models with robust standard errors clustering on subject variability and adjusting for baseline CPD were used to estimate the effect of each component during any given telephone session (t-1), on CPDs for tth, following telephone session (t). Results: A unit increase in Component 1 led to a 0.58 decrease in CPDs (95% CI=1.06,-1.67), and a unit increase in Component 2 led to a 1.31 decrease in CPDs (95% CI=1.74,0.89). Conclusion: Consistent with ACT therapy, using techniques to help smokers accept their urges and relate to their thoughts more effectively, as well as mindfulness and sense of self techniques, predicts substantial decreases in smoking. Overall, results highlight the value of examining telephone counseling processes with the goal of maximizing the impact of quitlines on smoking cessation.

Funding: NIDA R21 DA030646, NIDA K23DA026517, NIMH T32MH082709, and Fred Hutchinson Cancer Research Center

Justification: Results inform the development of telephone counseling processes that may predict number of cigarettes smoked per day.

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Pos3-139

Smoking Topography and Effects of Cigarillo and Cigarette Smoking in Dual Users

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Recently, there has been an increase in the use of cigarillos especially among African Americans and younger people. Dual users smoke both cigarillos and cigarettes. We compared puffing parameters, physiologic effects, nicotine plasma levels and subjective effects of cigarette and cigarillo smoking in self-identified dual users in two experimental sessions separated by at least 24 hr. In one session they smoked their usual brand of cigarette; in the other they smoked a Black & Mild cigarillo whose tip was removed to accommodate the mouthpiece of a smoking topography instrument. The length and weight of the Black & Mild (without the tip) was 100 mm and 3000mg respectively; their cigarette weight averaged 700mg and its length averaged 97 mm. One woman and 14 men participated in the study. Their average age was 33 yr (range 19-49). Subjects were dependent on nicotine as judged by their FTND score that averaged 6.4 (range 5-10). Participants smoked an average of 16.4 cigarettes/day. Cigarillo smoking varied between 1week to everyday. The laboratory smoking of cigarettes and cigarillos was dissimilar in most smoking topography parameters. Participants took more puffs to consume the cigarillo compared to the cigarette; 26 and 16, respectively. Participants also took more time to smoke cigarillos compared to cigarettes; 639s and 331s, respectively. Puff duration was significantly longer (2.5s) for cigarillos than cigarettes (2.1s). Total puff volume was also significantly different: cigarillos 1184mL; cigarettes 727mL. Differences between the size of the cigarillos and cigarettes partially accounted for the topography differences. No significant differences were found in average puff volume, puff velocity, and inter puff interval. There were also no significant differences in heart rate and blood pressure boost after smoking. However, exhaled CO increased 9ppm after smoking cigarillos (18 to25ppm) and 27ppm after smoking cigarette (18 to 47ppm). Nicotine plasma levels are pending analyses. These data suggest cigarillos are smoked differently than cigarettes and may create a higher risk for carcinogen exposure compared to cigarettes.

Funding: This research was funded by a grant from the National Cancer Institute 1ROI1CA158045-01A1. The authors declare no conflict of interest.

Justification: These data suggest that toxicant exposure from cigarillo smoking may exceed that of cigarette smoking.

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Pos3-140

Process Evaluation of a Multi-site Clinical Trial to Pilot Test a Prenatal Smoking Status Assessment Tool

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Design and conduct of clinical trials that are integrated into routine delivery of care pose many challenges. A process evaluation is vital in ensuring fidelity to protocols, uniformity in implementation, and collection of reliable data. Purpose: To evaluate the feasibility of testing the reliability and validity of a prenatal smoking status assessment tool at multiple sites, and to assess recruitment strategies, the availability and willingness of subjects to enroll, provider compliance, the ease of survey administration via the iPad, and collection of urine samples for cotinine.

Methods: Study was conducted in an urban obstetrical clinic serving high risk, low income patients, as well as in two OB/GYN offices in rural and semi-rural areas serving predominantly private pay populations. All women presenting for their first prenatal visit regardless of smoking status were eligible. After IRB approval, training sessions for the clinic staff were held. Incentives to participate were provided to each patient enrolled and to each nurse/clinic for urine specimens obtained. A procedure manual was provided with reference material as well as forms for the staff to log patients, catalogue acceptance rates, and document problems, comments, and suggestions. Results: Data were collected by nursing staff; 105 patients were enrolled. The staff at all three sites were very receptive to being co-investigators, but completion of human subjects training delayed implementation of the study, as did the set up of laboratory accounts for each separate site. Patient willingness to participate was dependent on site (100% of eligible subjects signed consent forms in rural site, 90% in urban, and 60% in semi-rural). There were no problems with administration of the survey including use of the iPad. Issues of urine specimen collection, labeling, transport, and analysis required vigilance and resulted in modification of urinary assay method. Conclusion: Results underscore the value of ongoing detailed evaluation of studies in progress. They will be used to enhance future study of the perinatal smoking status assessment tool.

Funding: Binghamton University’s Academic and Faculty Development Fund

Justification: Because of unreliability of self-reported smoking status in the pregnant population it is crucial that perinatal clinicians use a valid and easy-to-administer tool verified by an objective referent to assess tobacco use; this study documents the first processes in testing such a tool which will inform clinical practice.

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Nicotine Concentrations with Electronic Cigarette Use
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Introduction: Electronic cigarette (ecig) use is rapidly growing in the US. Although two laboratory studies did not show an increase in nicotine concentrations with ecig use, these studies were conducted in naïve ecig users. We evaluated the pharmacokinetics of acute ecig use among smokers who had been given a period of adaptation to ecigs. Methods: The Institution Review Board at the University of Connecticut Health Center approved the study. We recruited non treatment seeking smokers who were willing to try ecigs for two weeks and abstain from conventional cigarette smoking. After baseline cotinine measurements, subjects were randomized to either menthol tobacco or non-menthol tobacco flavored ecig use for 7-10 days, and the next week they were crossed over to the other condition. The ecig utilized was Joye eGo-C and the ejuce (18 mg/mL nicotine) was purchased online from American eLiquid. On the last day of ecig use of each flavor, subjects completed a monitoring session in which nicotine concentrations were obtained 5 minutes before, and 5, 10, 15, 20, and 30 minutes after the onset of ecig use. Ecig use was limited to 5 minutes at each monitoring session. Monitoring sessions occurred at approximately the same time each day. Subjects were asked to abstain from ecig use for at least 1 hour prior to each session. Results: Subjects (n=17) were on average 42 (SD=10) years of age, and smoked 16 (SD=8) cigarettes per day. Seventy percent of subjects were white, and 59% of subjects were men. There was a maximal increase in nicotine concentration for 5 minutes after the onset of ecig use at visit 3 [mean 5.5 ng/mL (SE 1.6) to 10.1 ng/mL (SE 2.45)] and at visit 4 [mean 4.8 ng/mL (SE 0.84) to 10.36 ng/mL (SE 2.7)] (F=12.73; p=0.001). Percent nicotine replacement, as calculated by cotinine values compared to the baseline visit, was 54% at visit 3 and 60% at visit 4. Conclusion: In this study, there was a significant increase in nicotine concentrations 5 minutes after the onset of ecig use, suggesting a relatively fast nicotine delivery system. Percent nicotine replacement was comparable to that observed in medicinal nicotine replacement systems.

FUNDING: Funding was provided from Academic Enhancement Funds at the University of Connecticut Health Center

JUSTIFICATION: This study shows a significant increase in nicotine concentrations 5 minutes after the onset of ecig use, suggesting a relatively fast nicotine delivery system. Percent nicotine replacement was comparable to that observed in medicinal nicotine replacement systems. These findings have significant implications for clinical research, clinical practice, and public health.

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Behavioral Smoking Treatment Based on Perceived Risks of Quitting: A Preliminary Study with Female Smokers
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Background: Even treatments showing proven efficacy leave the majority of female smokers unable to quit. There has been a call for novel behavioral treatments, particularly those targeting barriers to quitting faced by women. Significant barriers for female smokers include perceived “risks” associated with cessation, such as managing stress and cravings. The purpose of this treatment development study is to test a novel, individualized smoking intervention for female smokers targeting risk perceptions. Methods: Twenty treatment-seeking female daily cigarette smokers were randomly assigned to receive either a new manualized treatment based on individual perceived risks of quitting (n=14) or standard counseling based on the Mayo Clinic’s “Smoke Free and Living It” manual (n=6). Primary outcomes were point prevalence smoking abstinence at the end of treatment and at a one month follow-up, and changes in smoking from baseline to one month follow-up. Results: The perceived risk treatment demonstrated good acceptability and more participants receiving this treatment were abstinent at trial end than those receiving the standard counseling condition (28.6% versus 16.7%). Abstinence rates did not differ at one month follow-up. Among participants who did not quit smoking, those receiving the perceived risk counseling reported a greater reduction in smoking at the one month follow up (Cohen’s d=0.67). Discussion: This initial study demonstrated that an intervention targeting perceived risks of quitting was feasible to administer, acceptable to female smokers, and showed promise with regard to smoking outcomes. Reducing perceived risks of quitting, in particular, may represent a critical target for smoking treatment development.

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Cue-Reactivity in the Natural Environment of Cigarette Smokers: Difference in Craving Response to Smoking and Stress Cues Across Genders
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Female smokers appear to be less responsive to smoking cessation interventions than males. The relationships between stress, craving, and smoking are recognized as potential factors underlying these gender differences. In the current project, we evaluated the experience of craving in response to cues in the natural environment of smokers, and examined whether craving in response to smoking and stress cues differs between males and females. We hypothesized that female smokers would be more reactive to smoking and stress cues (i.e., higher craving) than male smokers. Cigarette smokers carried an iPhone equipped with Cue Reactivity Ecological Momentary Assessment (CREMA) software to assess real-time responses to cues. Photographic cues were randomly presented four times per day over the course of two weeks. Three cue types were presented: smoking photographs (pictures with smoking behavior or objects), stress photographs (unpleasant images), and neutral photographs (images devoid of smoking or unpleasant content). Self-reported craving was assessed on a 5-point scale after each cue was presented. Participants (n=30) completed 84% of trials administered in the natural environment. Male and female participants did not differ on cigarettes smoked per day, baseline expired carbon monoxide, or pre-cue craving. A repeated measures ANOVA demonstrated a main effect of cue type, F (2.27)= 27.8, partial r2 =.49; with craving after smoking cues significantly higher than craving after neutral cues (p<.01, post smoking craving M=2.38, SD=.90; post neutral craving M=1.51, SD=.50). Consistent with our hypotheses, there was a significant cue type by gender interaction, F (4,25)=5.55, p=.001, partial r2 =.29. Post-hoc tests revealed that women endorsed stronger craving follow both smoking cues and stress cues than males (p<.01). Findings from this project may address a key gender-related health disparity and contribute to the development of gender-specific interventions to enhance female smokers’ responses to cessation treatments. Additionally, implications of the novel iPhone-based CREMA methodology for cue reactivity research will be discussed.

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POS3-145

NICOTINE DEPENDENCE AND BARRIERS TO CESSATION DIFFERENCES BETWEEN EXCLUSIVE CIGARETTE SMOKERS AND DUAL (WATER-PIPE) SMOKERS AMONG ARAB AMERICANS

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Purpose: Evidence suggests that dual cigarette and waterpipe use is growing among minority groups, particularly among Arab American. Nicotine dependence and barriers to smoking cessation could be different among such dual users. We examined potential differences that may exist between exclusive cigarette smokers and dual smokers (cigarette and waterpipe) pertaining to nicotine dependence and barriers to cessation, among Arab Americans. Methods: We conducted a cross sectional study using a convenient sample self-identified Arab immigrants (n=131) smokers living in the Richmond, VA metropolitan area. We collected 4 questionnaires: Demographic and cultural information questionnaire, tobacco use questionnaire, Fagstrom test for nicotine dependence (FTND) questionnaire, and barriers to cessation questionnaire. We examined the difference in nicotine dependence and barriers to cessation between the two smoker groups. Further, we explored the correlations with select variables. Results: There was a significant difference in the FTND scores between the exclusive cigarette smokers (M= 2.55, SD= 2.10) and dual smokers (M= 3.71, SD= 2.42) groups; t (129) = (2.51), p = 0.0064. There was also a significant difference in the barriers to cessation scores between exclusive cigarette smokers (M= 38.47, SD= 13.07) and dual smokers (M= 45.21, SD= 9.27) groups; t (129) = (2.56), p = 0.0058. Further, there was a high significant correlation between FTND scores, barriers to cessation, and past quit attempts in the dual smokers group. Conclusions: Waterpipe use seems to be adding a significant potential to the addictiveness of cigarette smoking and enhancing barriers to cessation among our study sample. Further, the high correlation between quit attempts and FTND and barriers to cessation suggests that dual smokers might be using waterpipe in their transition to quit smoking. While there are previous studies that suggested that, longitudinal design studies can explore this assumption further.

FUNDING: This work was completed while the first author was working at Virginia Commonwealth University and was supported by a grant from the Virginia Tobacco Settlement Foundation.

POS3-146

INATTENTION, HYPERACTIVITY, AND SITUATIONAL FACTORS AS ANTECEDENTS OF SMOKING LAPSES IN ADOLESCENT SMOKERS MAKING A QUIT ATTEMPT

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Introduction: Symptoms of attention-deficit hyperactivity disorder (ADHD) are an important factor in the prediction of tobacco initiation and continued use. While ADHD symptoms increase risk for relapse in adult dependent smokers, little is known about the role of ADHD in lapsing in adolescent smokers early in the dependence process. This study examined associations among ADHD inattention (IN), hyperactivity-impulsivity (HI) symptoms, and antecedents to smoking lapses in adolescent smokers making an unassisted quit attempt. Methods: Participants (n=164, M(SD) age=16.6 (1.2) years, 84% White, M(SD) daily cigarettes=11.1 (5.6)) provided self-report measures of IN and HI at baseline and daily diary data using ecological momentary assessment (EMA) to report on antecedents to cigarette smoking (including craving, concentration, positive affect, and negative affect) during an unassisted quit attempt. To assess associations among ADHD symptoms and antecedents to the first and subsequent smoking lapses, separate generalized estimating equations regressed ADHD symptom level, smoking vs. non-smoking situations, and their interaction on pre-situational levels of craving, concentration, and negative and positive affect. All models controlled for baseline level of daily smoking. Results: With regard to first lapses, IN was associated with smoking in situations when craving was elevated and HI was associated with smoking in situations where positive affect was decreased (p's < .05). For subsequent lapses, IN and HI were both associated with smoking in situations with elevated craving and negative affect (p's < .01). Discussion: These results from an EMA study suggest contextual antecedents that may be associated with risk for lapsing in adolescents with ADHD symptoms. In particular, lapses in adolescents with high levels of ADHD symptoms were preceded by craving, decreased positive affect, and increased negative affect. Further, these ADHD-lapse relations were present in a general sample of adolescent smokers, suggesting that gradations in ADHD symptom level that may not meet diagnostic thresholds are associated with important cessation outcomes in adolescents.

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POS3-148

SMOKING TO REGULATE ADHD SYMPTOMS: EXECUTIVE FUNCTIONING AND EMOTION DYSREGULATION IMPACT CHANGE IN SYMPTOMS AFTER SMOKING

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Attention-deficit/hyperactivity disorder (ADHD) is a risk factor for smoking. The self-medication hypothesis posits that those with ADHD smoke in part to regulate ADHD symptoms. Emotion dysregulation and executive functioning (EF) are also proposed to influence smoking for those with ADHD. We aimed to (a) assess group differences in emotion dysregulation and EF between smokers with and without ADHD and (b) address the role of emotion dysregulation and EF when smokers reported on changes in their ADHD symptoms after ad lib smoking using ecological momentary assessment (EMA). In study 1, smokers with (n=23, M(SD) age=33.04 (9.87) years) and without (n=13, M(SD) age=29.92 (8.09) years) ADHD completed measures of emotion dysregulation (i.e., Difficulties in Emotion Regulation Scale [DERS]) and EF (i.e., Deficits in Executive Functioning Scale [DEFS]). A series of ANCOVAs covarying nicotine dependence indicated that ADHD smokers yielded higher scores than non-ADHD smokers on the following emotion dysregulation facets: lack of emotion acceptance, inability to engage in goal-directed behavior when distressed, impulse control difficulties, ineffective emotion regulation strategies, and lack of emotional clarity (p's < .001). They also reported greater EF problems (p <.001). In study 2, 17 smokers with ADHD (M(SD) age=32.29 (9.66) years) completed baseline measures of emotion dysregulation and EF, then provided EMA ratings of change in ADHD symptoms after smoking. Multi-level modeling analyses covarying nicotine dependence indicated that those higher in DERS Lack of Emotion Acceptance at baseline reported a greater reduction of hyperactive-impulsive (p=.02) and inattentive (p=.001) symptoms after smoking than lower scorers. Those higher in EF problems at baseline reported a greater reduction of inattentive symptoms (p=.02) after smoking. Elevations in EF difficulties and emotion dysregulation have implications for the self-medication hypothesis for ADHD smokers. In particular, adults with ADHD smoke to regulate symptoms of inattention and hyperactivity-impulsivity, although these effects are most pronounced for ADHD smokers who report poorer EF and emotion regulation.

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an anxiety, smoking dependence motives, and perceived barriers to quitting among severity, and confer risk for smoking relapse; (3) relations between pain-related neurobiological and physiological mechanisms that may predict nicotine withdrawal in the context of an experimental smoking deprivation manipulation; (2) pain-relevant relations between chronic pain, nicotine withdrawal and acute pain reporting in the context of clinical pain treatment. Collectively, these data are consistent with a recently proposed reciprocal model, in which pain and smoking are hypothesized to interact in the manner of a positive feedback loop, resulting in greater pain and the maintenance of tobacco dependence. Discussion will address the specific implications of these findings for future research and intervention efforts in the broad domains of chronic pain and tobacco dependence.

**JUSTIFICATION:** Tobacco dependence and chronic pain are both highly prevalent and comorbid conditions, and emerging research on complex interactions between pain and tobacco smoking has the potential to inform clinical research and practice in these respective domains.

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**POS3-149**

HYPNOSIS FOR SMOKING RELAPSE PREVENTION: A RANDOMIZED TRIAL

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The purpose of this study was to determine whether hypnosis would be more effective in helping smokers to stay quit than standard behavioral counseling for relapse prevention. A total of 140 current smokers were enrolled in a randomized controlled smoking cessation trial at an urban Veterans Affairs medical center. Participants (n = 102) who were able to quit for at least three days participated in either a hypnosis or behavioral relapse prevention intervention. Both relapse prevention interventions consisted of two 60-minute face-to-face sessions and four 20-minute follow-up phone calls (two phone calls per week). At 26 weeks, the validated point-prevalence quit rate was 35% for the hypnosis group and 43% for the behavioral counseling group (relative risk [RR] = 0.83; 95% confidence interval: 0.51-1.36). At 52 weeks, the validated quit rate was 29% for the hypnosis group and 28% for the behavioral group (RR = 1.03; 95% CI: 0.56-1.91). The prolonged abstinence rate was significantly higher for the hypnosis group (19%) than for the standard behavioral group (2%), and 5% difference was statistically significant (p = .004). OR = 12.2 (95% CI: 1.8 to 100.6). It was concluded that hypnosis compares favorably with standard behavioral relapse prevention counseling in facilitating maintenance of quitting.

**FUNDING:** This study was funded by the California Tobacco-Related Diseases Research Program (16RT-0074).

**JUSTIFICATION:** Hypnosis warrants further study as a relapse prevention intervention.

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**POS3-150**

INTERACTIONS OF PAIN PERCEPTION AND TOBACCO SMOKING: IMPLICATIONS FOR THE STUDY AND TREATMENT OF CHRONIC PAIN AND TOBACCO DEPENDENCE

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Tobacco dependence and chronic pain are both highly prevalent and comorbid conditions, and complex interactions between pain and tobacco smoking have been of increasing interest to researchers and clinicians across the medical and behavioral sciences. For example, there is mounting evidence that smoking is a unique risk factor for chronic pain; that situational pain can be a potent motivator of smoking urge and behavior; and that pain may interact with nicotine withdrawal to impede smoking cessation. This symposium will inform the audience regarding convergent experimental, epidemiological, and clinical research in the burgeoning domain of pain and tobacco smoking. Four papers will examine: (1) relations between chronic pain, nicotine withdrawal and acute pain reporting in the context of an experimental smoking deprivation manipulation; (2) pain-relevant neurobiological and physiological mechanisms that may predict nicotine withdrawal severity; and confer risk for smoking relapse; (3) relations between pain-related anxiety, smoking dependence motives, and perceived barriers to quitting among persons with and without chronic pain; and (4) relations between smoking status (current, former, never), mood factors (e.g., depression and anxiety), and pain severity in the context of clinical pain treatment. Collectively, these data are consistent with a recently proposed reciprocal model, in which pain and smoking are hypothesized to interact in the manner of a positive feedback loop, resulting in greater pain and the maintenance of tobacco dependence. Discussion will address the specific implications of these findings for future research and intervention efforts in the broad domains of chronic pain and tobacco dependence.

**JUSTIFICATION:** Tobacco dependence and chronic pain are both highly prevalent and comorbid conditions, and emerging research on complex interactions between pain and tobacco smoking has the potential to inform clinical research and practice in these respective domains.

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**POS3-151**

EFFECTS OF CHRONIC PAIN AND SMOKING DEPRIVATION ON NICOTINE WITHDRAWAL AND ACUTE PAIN INTENSITY

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There is accumulating evidence that chronic pain may pose a barrier to smoking cessation. For example, there is reason to suspect that nicotine withdrawal may amplify pain, and situational pain has been shown to be a potent motivator of smoking. The goal of the current study was to test relations between chronic/acute pain and withdrawal severity, in the context of a nicotine deprivation manipulation. We hypothesized: (1) that chronic pain status would predict greater withdrawal scores, and (2) that greater withdrawal would be associated with greater acute pain. METHOD: Participants were 128 smokers (M CPD = 21.0; 51% Female), who were randomized to either 12-hour nicotine deprivation or satiated experimental conditions. Measures included self-reported chronic pain status (e.g., pain on >90 of past 180 days), nicotine withdrawal (MWNS-R), and acute pain intensity. RESULTS: (1) As expected, we observed a main effect for the deprivation manipulation on withdrawal (p < .01). Interestingly, chronic pain was also observed to predict scores on the withdrawal measure (p < .01), even after controlling for FTND and gender. The chronic pain x deprivation interaction was not significant (p = .90), indicating that smokers who endorsed chronic pain also scored higher on the withdrawal measure, regardless of deprivation condition. (2) We further observed a significant indirect effect of the deprivation manipulation on acute pain via withdrawal (BC 95% CI = .09-.87), such that nicotine deprivation increased withdrawal severity (p < .01), which, in turn, was associated with greater acute pain intensity (p < .01). CONCLUSIONS: Chronic pain may serve as an individual difference factor that predicts greater endorsement of withdrawal symptoms. In addition, nicotine deprivation may serve to exacerbate acute pain, possibly as a function of increased withdrawal severity. These data provide support for the notion that relations between pain and smoking are likely complex and bidirectional. Discussion will address the differential effects of chronic pain on specific withdrawal symptoms (e.g., craving and negative affect), along with clinical implications of these and related findings.

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POS3-152

NICOTINE WITHDRAWAL AND STRESS-INDUCED CHANGES IN PAIN SENSITIVITY: AN INVESTIGATION BETWEEN ABSTINENT SMOKERS AND NONSMOKERS

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Chronic smoking has been linked with dysregulated stress response and endogenous pain regulation mechanisms. These alterations may be pronounced when individuals quit smoking as nicotine withdrawal produces a variety of psychological and physiological symptoms. However, psychobiological response to stress and its associations with pain sensitivity during the initial phase of a quit attempt has not been directly tested. METHOD: Ninety-eight smokers interested in smoking cessation and 37 nonsmokers completed a laboratory session which included pain assessments [cold pressor (CPT) and heat thermal pain]. Smokers set a quit day and were required to be abstinent for at least 48 hours prior to the session. Smoking status was verified biochemically (e.g., carbon monoxide levels). Participants completed the pain assessments twice: one after rest and one after acute stress. The order of pain assessments were counterbalanced across participants. Blood and saliva samples, cardiovascular measures, and subjective measures related to mood and nicotine withdrawal were collected multiple times. RESULTS: The results indicated that smokers exhibited attenuated cardiovascular responses to stress and lower pain tolerance to CPT than nonsmokers (ps < .05). While nonsmokers indicated greater pain tolerance to CPT after stress than after rest (p < .02), this was not found in smokers. Correlational analyses revealed that lower systolic blood pressure, adrenocorticotropin hormone, and cortisol levels were associated with lower pain tolerance, and greater withdrawal symptoms were linked with enhanced pain (ps < .05). CONCLUSIONS: These findings suggest that blunted stress response and reduced stress-induced analgesia observed in abstinent smokers may reflect one mechanism of withdrawal symptoms, which may increase risk for smoking relapse.

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POS3-153

RELATIONS BETWEEN PAIN-RELATED ANXIETY AND SMOKING DEPENDENCE MOTIVES AMONG PERSONS WITH AND WITHOUT CHRONIC PAIN

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Pain-related anxiety is described as a cognitive factor that promotes anxious and fearful responses to pain, and there is initial evidence that pain-related anxiety may play a role in the maintenance of tobacco dependence. For example, pain-related anxiety has been positively associated with smoking-related outcome expectancies, and the endorsement of smoking as a pain-coping strategy. The goal of the current investigation was to evaluate the explanatory relevance of pain-related anxiety in relation to scores on the Wisconsin Inventory of Smoking Dependence Motives (WISDM). METHOD: Two separate studies were conducted to test relations between pain-related anxiety and smoking dependence motives among smokers who (1) were screened for chronic pain, and completed an online assessment battery (N = 56, M CPD = 15.0, 41% Male), and (2) were recruited from the community for a laboratory-based smoking study (N = 122, M CPD = 16.0, 65% Male). Although Study 2 participants were not selected based on pain status, nearly 20% endorsed moderate-severe past month pain. The Pain Anxiety Symptoms Scale-20 and WISDM were administered in both studies. Study 2 further incorporated the Barriers to Cessation Scale and excluded CO. RESULTS: In both studies, hierarchical linear regression revealed that pain-related anxiety accounted for significant unique variance in WISDM Total scores, even after controlling for sociodemographic, anxiety, and pain characteristics (ps < .05). Similar results were observed for WISDM composite scores, with some evidence of a stronger association between pain-related anxiety and secondary dependence motives. Study 2 also revealed a positive association between pain-related anxiety and perceived barriers to quitting (p < .01). CONCLUSIONS: The results of both studies indicate that pain-related anxiety may be related to essential and specific features of tobacco dependence, possibly independent of chronic pain status. These data also suggest that pain-related anxiety may function as a situational motivator of smoking, which may pose a barrier to quitting. Discussion will address how these findings may inform the development of tailored interventions.

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POS3-154

CURRENT, FORMER, AND NEVER SMOKERS: THE ASSOCIATION BETWEEN SMOKING AND CHRONIC PAIN AND WHY CESSATION MATTERS

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Decades of research suggests that smoking and pain are associated. Given the likely involvement of multiple overlapping biological and psychosocial processes, it follows that understanding the nature of this association is challenging. Therefore, further consideration of the complex relation between smoking and pain is important in order to inform cessation efforts and pain treatment. The aim of the current study was to establish smoking rates in a pain clinic and investigate the association between smoking status and clinical symptoms. METHOD: We used questionnaire data collected from 1709 new patients evaluated at an outpatient pain clinic. Smoking status (current, former, never) was determined by patient responses to questions about current and past smoking behavior. Pain severity and interference were measured using the Brief Pain Inventory, neuropathic pain was measured with the PainDETECT, and symptoms of depression and anxiety were assessed with the Hospital Anxiety and Depression Scale. RESULTS: Current smoking was reported by 31% of patients. Of the patients reporting being nonsmokers, 30% were former smokers and 39% reported being a never smoker. Current smokers reported greater pain severity, pain interference and more neuropathic pain compared to both groups of nonsmokers. Additionally, current smokers reported more symptoms of depression and anxiety. Former smokers did not differ on any of the measures from never smokers; however, a longer duration of quitting was associated with lower scores on pain severity, neuropathic pain, and anxiety. CONCLUSIONS: Current smoking rates were high among patients seeking treatment at a pain clinic, and smoking was associated with a worse clinical presentation. The finding that former smokers were indistinguishable from those who never smoked, and that longer duration of quitting was associated with lower pain and anxiety, suggests that quitting smoking may have important benefits in this population. In conclusion, a multidisciplinary approach is likely needed when treating chronic pain patients who smoke, and should include smoking cessation and treatment for co-occurring mood disorders.

FUNDING: This project was supported by the University of Michigan, Department of Anesthesiology.

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POS3-155

ASSESSMENT OF PSYCHOPHYSIOLOGICAL AND SELF-REPORT INDICES OF EMOTIONAL RESPONSE IN ADOLESCENT SMOKERS: MECHANISMS, MOTIVES, AND PREDICTIVE VALIDITY

Jon D. Kassel, Ph.D., Megan Conrad, M.A., Natania A. Crane, M.A., Grace Giedgowd, M.A., and Robin J. Mermelstein, Ph.D.,* University of Illinois at Chicago, Department of Psychology, University of Illinois at Chicago, Institute for Health Research and Policy

While tobacco smoking remains the most preventable cause of death and disease in the United States today, we still know relatively little about the mechanisms underlying smoking initiation, maintenance, and development of nicotine dependence. It is clear, however, that the vast majority of adult, nicotine dependent smokers begin smoking as adolescents. As such, increasing our understanding of the reinforcing processes subserving smoking behavior in the critical developmental phase of adolescence remains a research imperative. As
observed in their adult counterparts, burgeoning evidence points to the importance of emotion regulation as a key motive governing cigarette smoking among adolescents. Toward addressing this research need, Dr. Kassel and his doctoral students will present data from a study imbedded within a National Cancer Institute Program Project. The overall project addresses issues pertinent to the social and emotional contexts of adolescent and young adult smoking. This symposium will present both cross-sectional and longitudinal results from our lab-based study examining the effects of cigarette smoking on emotional response in adolescent smokers. Ms. Conrad will present data on the acute effects of smoking on respiratory sinus arrhythmia (RSA), an indicator of self-regulatory capabilities and affective processing. Ms. Crane will follow with a talk on her longitudinal findings providing preliminary evidence that lower baseline RSA may serve as a risk biomarker in predicting heavier cigarette use 5 years later. Ms. Giedgowd will share findings examining the correspondence between negative-affect-reduction outcome expectancies and actual changes in negative affect due to smoking as assessed under controlled laboratory conditions. Dr. Kassel will then present findings on acute effects of smoking on emotional response, as assessed within a multidimensional framework, employing both self-report and psychophysiological measures of affect. Finally, Dr. Mermelstein will cast the presented findings within a developmental context and discuss the theoretical and clinical implications of the data.

JUSTIFICATION: The findings presented in this symposium hold the potential to inform theory and clinical research.

CORRESPONDING AUTHOR: Jon Kassel, Ph.D., Professor, University of Illinois at Chicago, Department of Psychology

Aims and Methods: Respiratory sinus arrhythmia (RSA) is the rhythmic fluctuation of heart rate during the respiratory cycle and has emerged as an indicator of how well the organism maintains homeostasis so that the body can flexibly respond to environmental demands. Previous research has shown that cigarette smoking has both acute and chronic effects on RSA in adults, and that these effects might be particularly salient during adolescence, a critical developmental period marked by numerous social and biological transitions. Given that RSA is often conceptualized as a marker of self-regulatory capabilities, examination of how smoking in adolescents influences RSA may foster a better understanding of reinforcing mechanisms governing tobacco use in this vulnerable population. The goal of the current study was to examine the acute effects of smoking on RSA and mean heart rate (HR) in a group of high-risk adolescent smokers (N=93; mean age=15.7; 52 females) who participated in a longitudinal study examining the social and emotional contexts of adolescent smoking. Two experimental sessions were separated by 6-10 weeks and resting electrocardiogram (ECG) data were collected before and after smoking or not smoking a single cigarette ad libitum. Results and Conclusions: Results revealed that smoking served to significantly reduce RSA (relative to not smoking). Age of smoking onset was a marginal moderator of this relationship, as those who started smoking earlier evidenced a greater decrease in RSA during their smoking session. As anticipated, smoking resulted in significant HR increase. Further, smoking frequency proved a significant covariate, indicating that greater smoking frequency was associated with larger increases in HR over the course of the session. Importantly, these findings are largely consistent with the adult literature, and further studies are needed to fully elucidate the relationship between smoking/nicotine and RSA in youth.

FUNDING: Supported by NIH grants T32MH067631 (to NAC) & 5P01CA098262 (PI: Mermelstein).

JUSTIFICATION: Findings from this study could inform both theory development and clinical research.

CORRESPONDING AUTHOR: Jon Kassel, Ph.D., Professor, University of Illinois at Chicago, Department of Psychology

Aims and Methods: Among adolescent smokers, previous research has pointed to critical associations between negative-affect-relief expectancies (NAREs) attributable to smoking and amount of cigarette use and nicotine dependence. The current study evaluated sex differences in NAREs, change in affect as a result of smoking, and prediction of future tobacco use based on their affective indices. Adolescents (n = 85, 51 female; Mean age = 15.70 yrs) participated in a laboratory session (baseline) as a part of a larger study evaluating the social and emotional contexts of smoking. Subsequent to four hours of tobacco abstinence, participants were offered one cigarette to smoke ad libitum. Negative affect (NA) was assessed before and after smoking, NAREs, as measured by the Smoking Consequences Questionnaire – Negative Affect scale (SCQ-NA), nicotine dependence, and recent cigarette use were assessed at baseline, six, and fifteen months later. Repeated measures ANOVA was used to evaluate change in affect over time, with sex employed as a between-subjects factor. Results: NA significantly decreased from pre-to post-smoking, and was qualified by a sex X smoking interaction. NA relief was greater for females than males, despite no differences in regular or recent use of cigarettes, dependence, or smoking topography. Females reported higher SCQ-NA than males; however, SCQ-NA was only related to actual NA relief as assessed in the lab for males. Change in NA was related to daily cigarette use.
THE ACUTE EFFECTS OF CIGARETTE SMOKING ON EMOTIONAL RESPONSE IN ADOLESCENT SMOKERS: A MULTIDIMENSIONAL ANALYSIS

Jon D. Kassel*, Margaret C. Wardle, Jennifer C. Veilleux, Justin E. Greenstein, Adrienne J. Heinz, Daniel P. Evatt, Ashley R. Braun, Donald Hedeker, Michael L. Berbaum, and Robin Mermelstein, University of Illinois at Chicago, Department of Psychology

Aims and Methods: Whereas adolescent smoking is most often attributable to social factors and motives, there is growing reason to believe that young smokers, like their adult counterparts, may smoke as a means of emotion regulation. We sought to examine the extent to which cigarette smoking confers acute benefits in emotional response. All participants attended two laboratory sessions, separated by 6 – 8 weeks. Qualified smokers were randomized to a smoking session at one of the two sessions; nonsmokers were never asked to smoke. We employed a multidimensional approach to the assessment of emotional response in a sample of high-risk (for smoking and other health-compromising behavior) adolescent smokers (n=97; 54% female; Mean age=15.9) and never-smokers (n=38; 58% female; Mean age=15.5). Dependent measures included positive (PA) and negative (NA) affect, craving, amplitude, and latency of the startle eyeblink response on cin conductance level, and heart rate. Multilevel modeling was used to assess per-pre-smoking/nosmoking differences in the dependent variables. Results: Findings revealed significant smoking effects on most variables; smoking a cigarette, relative to not smoking, marginally reduced startle amplitude, and significantly reduced NA, craving, and cin conductance level, while also increasing startle onset latency and heart rate. Correlational analyses further suggested that, even among young, relatively light smokers, constructs central to dependence and withdrawal seem to cohere, tentatively pointing to early signs of the emergence of nicotine dependence. Conclusions: This is among the first studies to reveal significant acute effects of cigarette smoking on craving and emotional response in adolescent smokers. As such, the findings go some way toward elucidating motivational processes subserving smoking in this vulnerable population. Future research should attempt to replicate and extend these findings, as well as assess the predictive validity (i.e., increased smoking behavior, development of nicotine dependence) of these affective indices.

FUNDING: This research was supported by the National Cancer Institute of the National Institutes of Health under award #5PO1CA098262.

JUSTIFICATION: Findings from this study could inform both theory development and clinical research.

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SMOKING AND QUITTING HISTORY CHARACTERISTICS AMONG CURRENT ELECTRONIC CIGARETTE USERS IN A NATIONAL MULTI-ETHNIC ADULT SMOKER SAMPLE

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Electronic cigarette (EC) use has become increasingly popular particularly among current smokers. Because many ECs have prematurely been marketed as a cessation aid, it is important to examine characteristics of smokers who already choose to use them. Little research has examined the smoking, quitting, medical, or psychosocial characteristics among current EC users, which would likely impact cessation. Thus, we examined correlates of current EC use among a multi-ethnic adult smoker sample. Participants (N=2,376) from a research survey panel completed an online cross-sectional survey between June and August, 2012. Sampling was stratified to recruit nearly equal numbers of participants by race/ethnicity (African-American, Hispanic, and Caucasian) and smoking frequency (nondaily and daily). Current EC use was reported by 9.2% (n=219) of the sample with monthly use averaging 7.7 days (median=4; range 1-30 days). Current EC use was significantly associated with greater nicotine dependence (OR = 1.45, 95%CI [1.1-1.9]), greater perceived addiction (OR = 1.006, 95%CI [1.001-1.01]), and concurrent poly-tobacco use (OR = 1.49, 95% [1.4-1.6]). More post-year quit attempts (OR = 1.02, 95%CI [1.005-1.03]) and past use of multiple cessation methods (OR = 1.47, 95%CI [1.3-1.6]), including using ECs for cessation (OR = 14.5, 95%CI [10.5-20.17]), were also significantly associated with current EC use. Having a medical illness was associated with greater odds of using ECs (OR ranged from 1.49 (asthma) to 2.56 (heart attack)). Greater depressed mood (OR = 1.14, 95%CI [1.06-1.22]) and greater alcohol use (OR = 1.06, 95%CI [1.01-1.12]) were also associated with EC use. Finally, although results only approached significance, compared to Caucasians (33%), Hispanics (42%) were more likely to use ECs, and African-Americans (26%) were less likely to use ECs. These data suggest that current EC users have risk factors that have made smoking cessation attempts difficult and who will likely continue to have difficulty in the future. These characteristics should be considered when examining the effectiveness of ECs on cessation and in designing future cessation trials using ECs.

FUNDING: This research was supported by a Pfizer GRAND award to Jasjit Ahluwalia, MD, MPH.

JUSTIFICATION: Understanding characteristics of current EC users will inform electronic cigarette message development and dissemination policies.

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E-CIGARETTE USE AMONG CURRENT AND FORMER SMOKERS

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E-cigarette use, or vaping, has quickly surpassed the adoption of other non-combustible cigarette tobacco products such as snus and dissolvables. Preliminary evidence indicates that many smokers are currently using e-cigarettes as a cessation aid, however, more extensive and generalizable investigations of prevalence and reasons for use are needed. We analyzed cross-sectional data from the Oklahoma Behavioral Risk Factor Surveillance System (BRFSS) for January-June, 2013. Both landline and cell phone households were included in the sampling and the data were weighted to ensure representation of the state’s normative population. To capture interest in emerging non-combustible tobacco products and cessation attempts, additional questions were added to the standard BRFSS survey. Current smokers and recent former smokers (within the last 12 months) were asked about the use of non-combustible cigarette products in places where smoking is not allowed and cessation strategies during the most recent quit attempt. Thirty-five percent of current smokers (N = 338) and 47% of recent
POS3-162
ELECTRONIC CIGARETTE USE BEFORE AND AFTER HOSPITALIZATION BY SMOKERS PLANNING TO QUIT SMOKING, 2010-2013

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BACKGROUND: Little is known about electronic cigarette (e-cig) use patterns especially among smokers with medical comorbidity or those who plan to quit and have access to cessation treatment. METHODS: We analyzed past 30 day e-cig use before and after hospital admission in 2 RCTs free post-discharge cessation treatment (counseling and meds) versus usual care for smokers who wanted to quit. Study 1 enrolled 397 smokers at 1 hospital in MA (7/2010-4/2012). Study 2 (ongoing) enrolled 643 smokers in 1/2013-9/2013 at 3 hospitals (2 in MA, 1 in PA). We assessed past 30-day e-cig use before hospital admission and 1, 3, and 6 months (mon) after discharge. Multiple logistic regression was used to identify correlates of e-cig use before and after a hospital stay. RESULTS: Prevalence of e-cig use 30 days before admission to the 1 hospital in both studies rose from 5.8% in study 1 (2010-12) to 20.5% in study 2 (2013; AOR 2.47, 95%CI 1.89-3.21, adjusting for sex, race, education, cig/d, and drinks/d). E-cig prevalence at all study 2 sites (2013) was 21.5% and did not vary by site (17.7%, 20.5%, 23.7%, p=.42). Pooling across study 2 sites, e-cig use before admission was higher among smokers who had previously tried to quit smoking (22% vs 9%, p<.04) but was not associated with sex, race, education, cigarettes/d, non-cigarette tobacco or other substance use, prior smoking cessation counseling or med use, or self-efficacy for quitting. In study 1 (2012-12) the prevalence of e-cig use was 5.8% pre-admission and 3.7% (1 mon), 4.9% (3 mon), and 3.8% (6 mon) post-discharge, it did not vary by treatment group. At 1-mon follow-up, self-reported 7-day cigarette abstinence was lower in e-cig users vs. non-users (23% vs 54%, p<.03, OR 0.50 [95% CI 0.26-0.97] adjusting for group). The effect was borderline at 3 mon (31% vs 53%, p<.09) and absent at 6 mon (50% vs 46%, p>.77). CONCLUSIONS: Recent e-cig use increased dramatically in 2013 compared with 2010-12 among hospitalized smokers who planned to quit smoking, mirroring national data. E-cig use continued after discharge even with access to free cessation treatment and was associated with less tobacco abstinence at 1 month follow-up.

FUNDING: Funded by NIH/NHLBI grants #R1-RC1HL099686 and #R01HL111821

JUSTIFICATION: Understanding how e-cigarettes might aid or impede the efforts of smokers who are trying to quit smoking and have access to standard cessation treatment will help inform policymakers addressing the regulation of e-cigarettes and clinical researchers seeking to determine how they impact smoking cessation efforts by current smokers.

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POS3-163
ARE HEALTH CARE PROVIDERS PREPARED TO COUNSEL ADOLESCENT PATIENTS ABOUT ELECTRONIC CIGARETTES?

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BACKGROUND: Electronic cigarettes (e-cigarettes) are battery-powered nicotine delivery systems that may serve as a “gateway” to tobacco use by adolescents. Use of e-cigarettes by U.S. adolescents rose from 3% in 2011 to 7% in 2012. We sought to describe health care providers’ beliefs about the safety of e-cigarettes, as well as their awareness of and comfort discussing e-cigarettes with adolescent patients and their parents. Methods: A statewide sample (n=561) of Minnesota health care providers (36% family physicians, 20% pediatricians, and 34% nurse practitioners) who treat adolescents completed an online survey in April, 2013. Results: Nearly all providers (92%) were aware of e-cigarettes, and 11% reported having treated an adolescent patient who had used them. Respondents most often learned about e-cigarettes from patients, news stories, and advertisements, rather than professional sources. Providers expressed moderately low levels of knowledge about and comfort discussing e-cigarettes with patients and their parents. While many providers believed that e-cigarettes are at least somewhat less harmful than regular cigarettes (65%) or smokeless tobacco (64%), most (75%) felt that e-cigarettes could be a gateway to tobacco use. Respondents who were more concerned about e-cigarettes being a gateway to tobacco use were more likely to feel it was important to discuss e-cigarettes with adolescent patients (r=.29, p<.001) and parents (r=.31, p<.001). Nearly all respondents (92%) wanted to learn more about e-cigarettes. Conclusions: Given the dramatic increase in e-cigarette use, health care providers who treat adolescents are faced with the task of incorporating screening and counseling about these novel nicotine delivery devices into routine preventive care. At present, low levels of knowledge about, and comfort discussing, e-cigarettes could be barriers to providing such guidance.

FUNDING: This study was funded through a 2012 Young Investigator Award from the Academic Pediatric Association, supported by the Maternal and Child Health Bureau and the American Academy of Pediatrics (Federal Grant U4MC07853-03). The study was further supported by a NRSA in Primary Medical Care from HRSA (T32HP22223; PI: Borowsky); UNC Lineberger Cancer Control Education Program (R25 CA57726); and Clinical and Translational Science Institute grant support (UL1RR033183) to the University of Minnesota from the National Center for Research Resources.

JUSTIFICATION: Health care providers who treat adolescents want to know more about electronic cigarettes and receiving education on this topic could help them counsel patients about the risks of tobacco use.

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POS3-164
PERCEPTIONS ABOUT E-CIGARETTE ADVERTISING AND INTEREST IN PRODUCT TRIAL AMONG US ADULTS

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BACKGROUND: Electronic cigarettes (e-cigarettes) have risen in popularity in the U.S. While recently published studies have described the prevalence and demographics of e-cigarette users, no studies to date have evaluated the impact of advertising on perceptions and interest in trial. This pilot study was conducted to

FUNDING: Oklahoma Tobacco Settlement Endowment Trust

JUSTIFICATION: E-cigarette use, or vaping, has become a common practice among current smokers and recent quitters. As such, state and national tobacco surveillance systems should include questions related to vaping.

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explore whether exposure to e-cigarette ads influenced intention to use and interest in product trial. Methods: A web-based survey was completed by 600 respondents recruited from an internet panel in the US. Respondents answered questions assessing tobacco use and were then assigned to randomly view 9 magazine ads for Blu e-cigarettes or Camel snus. After viewing each ad, respondents were asked a series of questions about their perceptions, beliefs, and product expectancies. At the end, respondents were asked to choose a free sample product (hypothetical) from the following options: an e-cigarette, smokeless tobacco (SLT), pack of cigarettes, or no product. Results: Among respondents, 31% reported current cigarette use, 8% reported current SLT use, and 7% reported current e-cigarette use. An ad receptivity score showed few differences between individual ads within each product condition (ad receptivity score range: 0-25). Mean ratings for snus ads ranged from 11.11-11.84; mean ratings for e-cigarette ads ranged from 12.06-12.67. Respondents exposed to e-cigarette ads had increased odds of reporting interest in trying the product shown compared to those exposed to snus ads (OR: 3.21, 95% CI:1.50-6.85). E-cigarettes were the most popular product selected (34%), followed by cigarettes (8%) and SLT (3%); 331 respondents (55%) chose no product. We observed statistically significant differences in product selection between current smokers and current nonsmokers (Pearson Chi-Square = 212.566, p-value<.001). Conclusions: These findings suggest that exposure to e-cigarette ads may be associated with interest in e-cigarette trial. Continued widespread marketing in magazines, on television, and at the point-of-sale may increase appeal among non-smokers and recent quitters for nicotine delivery devices such as e-cigarettes.

FUNDING: This work was supported by Roswell Park Cancer Institute and National Cancer Institute (NCI) grant #R03 CA016956

JUSTIFICATION: These data provide a basis for future studies examining e-cigarette advertising and interest in trial, which could inform policies surrounding e-cigarette marketing and promotion.

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POS3-165
CO-USE OF TOBACCO AND OTHER SUBSTANCES AMONG SMOKERS WITH SEVERE MENTAL ILLNESS: BEHAVIORAL PATTERNS AND INTERACTION EXPECTANCIES
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Persons with serious mental illness (SMI) are at elevated risk for tobacco and other drug use. The co-use of tobacco and other drugs has not been well explored in this vulnerable group. Clarifying how users expect their tobacco and other substances to interact may inform treatment strategies. This study examined (1) behavioral patterns of tobacco and other substance co-use in those with SMI, (2) drug co-use interaction expectancies, and (3) relationships between use patterns and expectancies. Participants were 816 adult smokers of 5+ cigarettes/day assessed during an acute psychiatric inpatient stay for alcohol and/or illicit drug use in the 30 days prior to hospitalization. Drug interaction expectancies were measured with the Nicotine and Other Substance Interaction Expectancy (NOSIE) subscales on (a) Substances increase tobacco use/urges and (b) Smoking to cope with substance urges. Latent class analysis estimated latent groups of alcohol and drug use based on patterns of past-month use and examined differences in interaction expectancies by class. In the past month, 12% were non-users, 61% used alcohol, 45% cannabis, 32% sedatives, 30% opiates, 24% stimulants, and 8% other substances; 48% were polysusers. Participants reported moderate to high expectations that substances would increase tobacco urges (M=3.9, SD=1.2; range: 1, 5), and reported smoking to cope with urges to use alcohol/drugs (M=2.4, SD=1.3; range: 1, 5). A four-class model of drug use patterns fit the data best: 34% wide-range users; 8% alcohol/cannabis users; 7% opiate/sedative users; and 52% non-users. For the substances increase tobacco use/urges subscale, opiate/sedative users (M=4.17, SD=1.3) and alcohol/cannabis users (M=4.08, SD=3.73) had higher expectations that substances would increase tobacco use and urges than non-users (M=3.73, SD=.07), class comparison χ2=17.8, p<.001. There was no class difference for Smoking to cope with substance urges (χ2=2.8, p=.62).

Findings highlight the utility of examining patterns of substance use, the varied nature of substance use among smokers with SMI, and differences in expectations of how substances will interact with tobacco by different types of users.

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JUSTIFICATION: Clarifying how persons with SMI expect their tobacco and other substances to interact may inform treatment strategies tailored to this particularly at-risk group.

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POS3-166
NEGATIVE URGENCY MEDIATES RELATIONS BETWEEN ANXIETY SENSITIVITY AND NEGATIVE REINFORCEMENT-RELATED SMOKING OUTCOME AND ABSTINENCE EXPECTANCIES
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BACKGROUND: Anxiety sensitivity—fear of anxiety symptoms—may increase motivation to smoke by influencing the development of cognitive expectations regarding smoking’s negative reinforcing effects. It is critical to understand the nature and mechanisms underlying the relation between anxiety sensitivity and smoking expectancies to advance theoretical models of psychiatric comorbidity regarding smoking’s negative reinforcing effects. It is critical to understand the nature and mechanisms underlying the relation between anxiety sensitivity and negative reinforcement-related smoking expectancies would be mediated by negative urgency, i.e., a trait tendency to act impulsively during negative affect.

METHOD: In a cross-sectional design, we administered self-report measures of anxiety sensitivity, negative urgency, and negative reinforcement-related smoking outcome and abstinence expectancies to a racially diverse sample of 206 smokers (> 10 cigs/day, 34% female, mean age = 44.4). RESULTS: Linear regression models indicated that anxiety sensitivity was associated with stronger expectancies that smoking alleviates negative affect (beta = .30, p < .0001) and smoking abstinence exacerbates aversive withdrawal symptoms (beta = .24, p = .0004). Product of coefficient analyses indicated that negative urgency statistically mediated the relation between anxiety sensitivity and both types of negative reinforcement-related smoking expectancies (betas > .067, ps < .007). Results remained significant after statistically controlling for anxiety and nicotine dependence symptoms. CONCLUSIONS: Smokers high in anxiety sensitivity tend to display negative urgency, which, in turn, is related to greater expectations of negative reinforcement consequences of smoking and smoking abstinence. Treatments that mitigate fear of anxiety symptoms and the tendency to act impulsively in response to negative affect (e.g., interoceptive exposure, distress tolerance skills training, and mindfulness training) may be useful in assisting with smoking cessation for high-anxiety sensitivity smokers.

FUNDING: National Institutes on Drug Abuse Grant R01-DA026831 and American Cancer Society Grant RSG-13-163-01

JUSTIFICATION: Treatments that mitigate fear of anxiety symptoms and the tendency to act impulsively in response to negative affect (e.g., interoceptive exposure, distress tolerance skills training, and mindfulness training) may be useful in assisting with smoking cessation for high-anxiety sensitivity smokers.

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 POS3-167  
FROM PICTURES OF THE WORLD TO PICTURES OF THE BRAIN: ENVIRONMENTS ASSOCIATED WITH SMOKING ELICIT CRAVING AND DISTINCT PATTERNS OF BRAIN ACTIVATION

F. Joseph McClernon, Ph.D.1, Cynthia Conklin, Ph.D.1, Rachel Kozink1, Anthony De Vito1, and Matt Hallyburton1.1Duke Medicine; 1University of Pittsburgh Medical Center

Environments in which smoking occurs can become associated with drug effects and thus become conditioned stimuli, or stimuli that signal the availability of smoking (occasion setters). Whereas the brain systems that underlie the learning and processing of environment-drug associations have been explored in animal models, these same associations have not been similarly evaluated in humans. In previous research, we showed that both standard and personal smoking-related environments elicit self-reported craving at levels similar to proximal (e.g., lit cigarette) smoking cues (Conklin et al., 2008/2010). In the present study, we continued this line of research by investigating brain reactive response to standard and personal smoking environments. Fourteen (n=14) adult smokers completed a structured interview in which they indicated locations in which they routinely smoke or refrain from smoking; they then used digital cameras to acquire images both approaching and from within these environments. Participants then underwent fMRI scanning while viewing smoking and non-smoking personal and standard smoking environment pictures; and pictures of smoking and non-smoking proximal cues. Preliminary analyses in FSL revealed distinct patterns of brain cue-reactivity for smoking versus non-smoking contrasts (z ≥ 3; uncorrected) for each stimulus type: Personal Environments (dACC, R anterior insula, R supramarginal gyrus), Standard Environments (L/R occipital cortex; lingual gyrus; L/R precurus, and Proximal Cues (L/R occipital cortex). Cue-provoked craving (smoking – nonsmoking) was robust (Personal Environments d=3.0; Standard Environments d=2.4; Proximal Cues d=1.7) and did not differ significantly across stimulus types. The results of this analysis preliminarily replicate previous work showing that smoking environments (even when devoid of proximal cues) elicit robust craving, but advances our understanding of how drug-context associations are processed in the brain. Implications for incorporating smoking context into cessation treatment will be discussed.

FUNDING: This research was supported by R21 DA033083 (FJM).

JUSTIFICATION: This study informs on the use of environment stimuli in exposure based therapies for smoking and other addictions.

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 POS3-169  
CHARACTERISTICS OF NONDAILY AND DAILY SMOokers

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Tobacco control efforts have resulted in a reduction in smoking prevalence to its current rate of 19.8% in the US. Nondaily smokers represent a growing proportion of current smokers and nondaily and light smokers now comprise approximately 40% of current U.S. smokers. Efforts to further decrease US smoking prevalence will require a better understanding of changing smoking levels across smoker demographics, but few studies have provided comparative data by smoking level. This study examined characteristics of nondaily, light daily, and moderate to heavy daily smokers in a sample of African American, White, and Latino smokers. Smokers were recruited for a web-based survey using an online panel survey company. Quotas were established to obtain equal numbers of daily and nondaily smokers of each race and ethnicity. Participants were 1,201 nondaily smokers (smoking 4-24 days/month), 578 light daily smokers (<10 cigarettes per day; cpd), and 597 moderate to heavy daily smokers (≥10 cpd). Multivariate regression (linear, logistic, or multinomial logistic regression, as appropriate) adjusting for race/ethnicity were conducted using Bonferroni-Hommel’s method to control for family-wise type-I error rate at 5%. Nondaily smokers were most likely to limit their smoking to reduce their health risks (52.9%) compared to light (49.8%) and moderate to heavy daily smokers (29.8%; p<0.001). Smoking dependence, using time to first cigarette, was seen in nondaily smokers with a stepwise increase from nondaily (38.3%) to light daily (63.5%) to moderate to heavy daily smoking (87.4%; p<0.001). Nondaily smokers were most likely to intend to quit in the next six months (29.1%), followed by light smokers (24.9%), then heavier smokers (22.9%; p<0.001). Scores from three measures of dependence and addiction highlight that nondaily smokers have significant levels of dependence and a substantial subset of them are addicted to nicotine. Differences between nondaily, light daily, and moderate to heavy smokers on nicotine dependence, tobacco use behavior (e.g., harm reduction), and readiness to quit represent important considerations for informing interventions and the clinical setting.

FUNDING: Pfizer’s Global Research Awards for Nicotine Dependence (GRAND) awarded to JSA.

JUSTIFICATION: Nondaily and light smokers differ from those who smoke 11 or more cpd and researchers should investigate targeting lighter smokers for smoking cessation using knowledge of their dependence, use of harm reduction strategies, and readiness to quit.

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 POS3-170  
NONDAILY AND DAILY SMOkerS’ IDENTITY AND CLASSIFICATION OF A SMoker

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Smoker identity, or the strength of beliefs about oneself as a smoker, is a robust marker of smoking behavior. However, many nondaily smokers do not identify as smokers, underestimating their risk for tobacco-related disease and resulting in missed intervention opportunities. Assessing underlying beliefs about characteristics used to classify smokers may help explain the discrepancy between smoking behavior and smoker identity. This study examines the Classifying a Smoker scale among a diverse sample of experienced smokers. A cross-sectional survey was administered through an online panel survey service to 2,376 current smokers at least 25 years of age. The sample was stratified to obtain equal numbers of three racial/ethnic groups (African American, Latino, White) across smoking level (nondaily and daily smoking). Classifying a smoker and smoking experience scores significantly increased at each level of smoking (p<0.001). Classifying a smoker and smoker identity were both significantly associated with stronger dependence on cigarettes, greater health risk perceptions, more smoking friends, and being more likely to carry cigarettes. Smoking identity was a stronger correlate of smoking and behavioral outcomes; however, classifying a smoker explained unique variance for these same outcomes above and beyond smoker identity. The positive association between classifying a smoker and smoker identity (r=0.23, p<0.001) was strongest among nondaily smokers, and the link between these variables became weaker the longer one smoked. Nondaily smokers had the least rigid criteria for classifying a smoker of any smoker subgroup. In contrast, previous studies with college smokers found that nondaily smokers had more rigid criteria for classifying a smoker than daily smokers. Theory-based explanations for the discrepant results between studies are provided. Prospective studies are needed to examine variations in smoker classification by smoking experience and the association of these constructs with smoking cessation to inform prevention and treatment efforts. The present study supports the use of the Classifying a Smoker scale among diverse, experienced smokers in such work.

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POS3-171
CORRELATES OF CONVERTED AND NATIVE NONDAILY SMOKING

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Introduction: Nondaily smokers constitute 30% of adult smokers in the US and their proportion is increasing yet little is known about distinguishing characteristics between never daily smokers (native nondaily smokers) and former daily smokers (converted nondaily smokers). To address this issue, this study contrasted native and converted nondaily smokers on demographic, psychosocial, tobacco-related characteristics, and quit intentions and behaviors in a sample of smokers. Methods: Smokers were recruited for a web-based survey using an online panel survey company. Participants were 904 converted nondaily smokers and 297 native nondaily smokers. Logistic regression analyses were used to examine associations between demographics, smoking behavior, and psychosocial variables between native vs converted nondaily smokers. Results: Logistic regression indicated that greater number of days smoked in the past month (OR = 1.03 95% CI = 1.01 - 1.06), more years smoking cigarettes (OR = 1.07 95% CI = 1.04 - 1.09), identifying as a smoker (OR = 1.05 95% CI = 1.02 - 1.09), having a higher WISDOM score (OR = 1.32 95% CI = 1.16 - 1.49), and higher perceived vulnerability for developing lung cancer (OR = 1.13 95% CI = 1.02 - 1.26) were correlates of being a converted nondaily smokers. However, more years smoking nondaily was related to being a native nondaily smoker (OR = 0.98 95% CI = 0.94 - 0.99). Conclusion: Our analyses indicated significant differences between converted and native nondaily smokers further showing the heterogeneity of nondaily smokers. Differing psychosocial and cigarette use characteristics have implications for the quitting patterns and behaviors of both the converted and native nondaily smokers.

FUNDING: Pfizer’s Global Research Awards for Nicotine Dependence (GRAND) awarded to JSA

JUSTIFICATION: The findings underscore the heterogeneity of nondaily smokers and the need to consider these variations when designing and implementing intervention efforts targeting this smoking population.

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POS3-173
FREQUENCY AND PREDICTORS OF SMOKING CESSATION ATTEMPTS IN A SOCIOECONOMICALLY DISADVANTAGED SAMPLE

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Introduction: There is some research which shows 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. 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, embedded in a randomised controlled trial of smokers and ex-smokers attending a non-government 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, 309 smokers completed the survey (86% 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, 94% main source of income from government benefits, 52% living in government housing, 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%). The odds of a female having made multiple quit attempts were 1.73 times the odds of a male (95%CI 1.07-2.80) and those experiencing high levels of financial stress had 2.81 times more the odds of making multiple quit attempts than those experiencing low financial stress. Other significant predictors of multiple quit attempts included Indigenous status and motivation. Conclusion: 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.

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POS3-174
FORMATIVE EVALUATION OF A TEXT MESSAGING INTERVENTION TO PROMOTE CESSATION MEDICATION ADHERENCE AND SMOKING ABSTINENCE AMONG TOBACCO-DEPENDENT PERSONS WITH HIV


Background: Despite high motivation to quit smoking among people living with HIV/AIDS (PLWHA), research demonstrating effective approaches to treating nicotine dependence in this population is minimal. This study reports formative evaluation data from tobacco-dependent PLWHA (N=29) regarding a text message intervention to increase adherence to smoking Varenicline and increase cessation rates. Methods: Four focus groups were conducted to assess (a) beliefs and preferences regarding use of Varenicline, (b) preferences for receiving tobacco-related texts, and (c) acceptability of 100 draft text messages. We drafted messages based on the Information-Motivation-Behavioral Skills model hypothesized to influence the primary study outcomes of Varenicline adherence and smoking cessation and drew from the National Cancer Institute’s QuitNowTXT library. Results: Themes that emerged from the focus groups included participants have misgivings and want to discuss Varenicline carefully with healthcare providers, they prefer simple messages that were positive and encouraging, messages should emphasize tobacco cessation and not Varenicline adherence, and that texts would serve as a reminder about goals and foster support and connectedness with the healthcare team. Overall, 46 out of the 100 messages received a grade of C or less (rated on 5 point scale from A-F), the majority of which focused on medication adherence. All participants reported that they were likely to read the messages and 77% felt that the messages (non adherence-related) were designed for them or other people like them. Conclusion: Receiving participant feedback provides critical input in intervention planning. Participants were enthusiastic about the possibilities for texting to assist in meeting their cessation goals. However, our data also indicate that existing text libraries, for which there is no published formative work regarding the acceptability of these messages, may not generalize well across different populations and contexts.

FUNDING: This research was supported by the National Heart, Lung, and Blood Institute.
Mobile health-related interventions for understudied high-risk populations will benefit from use of participatory research to properly target message content and timing.

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POS3-175
ADJUNCTIVE FINANCIAL INCENTIVES FOR ABstinence AMONG SOCIOECONOMICALLY DISADVANTAGED INDIVIDUALS PARTICIPATING IN SMOKING CESSATION TREATMENT

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Socioeconomic disadvantage is associated with elevated smoking prevalence and a reduced likelihood of smoking cessation. The current study evaluated the efficacy of offering financial incentives for abstinence (contingency management [CM]) as an adjunct to a smoking cessation program offered at a safety net hospital. Study participants (N = 146) were randomized to either Usual Care (UC; hospital cessation program; n = 71) or CM (hospital cessation program + financial incentives; n = 75), and followed weekly from 1 week pre-quit through 4 weeks post-quit. A subset of participants (n = 128) was asked to return for a 12-week follow-up visit. Individuals randomized to the CM intervention earned gift cards for biochemically verified abstinence. Participants could earn a $20 gift card for abstinence on the quit day, and this amount increased by $5 weekly at each successive abstinence visit ($150 total over 4 weeks). Participants who were non-abstinent at any visit were able to earn incentives at the next visit if abstinence criteria were met, though the payment was reset to $20. Participants smoked an average of 17.5 cigarettes per day, were primarily of Black (62.3%) or White (28.1%) race, and 57.5% were female. A total of 52.1% of participants were uninsured, and 55.5% had an annual household income of <$31,200. After controlling for pharmacological treatment, race, gender, age, education, and pre-quit cigarettes smoked per day, participants randomized to the CM intervention had significantly higher abstinence rates than those assigned to UC at all visits following the quit date (all p's < .05). Biochemically verified 7-day point prevalence abstinence rates in the CM and UC groups were 47.6% vs. 29.6% (week +1), 40% vs. 22.5% (week +2), 40% vs. 19.7% (week +3), 49.3% vs. 25.4% (week +4), and 32.8% vs. 14.1% (week +12). Participants in the CM group earned an average of $63.40 (out of $150 possible) for abstinence during the first 4 weeks post-quit. Findings indicate that providing small financial incentives for abstinence may be an effective means to improve abstinence rates among socioeconomically disadvantaged individuals participating in smoking cessation treatment.

FUNDING: Funding for this research was provided by the University of Texas Health Science Center, School of Public Health. Data analysis and manuscript preparation additionally were supported by American Cancer Society grants MRSST-10-104-01-CHPS (D de K) and MRSST-12-114-01-CPBP (to MSB).

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POS3-177
UNDERAGE SMOKERS SEEKING TO QUIT WITH NRT IN PRIMARY CARE: CO-MORBIDITY AND QUIT RATES

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INTRODUCTION: Most smokers get addicted as adolescents but little is known about treatment seeking among adolescents in clinical practice. RCTs have generally been inconclusive. METHODS: Data from 150 primary care sites in Ontario, Canada, offering 26 weeks of free NRT as part of the STOP study to smokers motivated to quit within 30 days (N~23,700) from 2011-13. We analyzed baseline, 3 and 6 month follow up data from teens younger than the legal age to smoke (13-19 yrs.) who were enrolled by the practice. RESULTS: There were 237 teen smokers, mean age 17.7, 51% females, who had smoked for 3.6 years on average, HSI= moderate to high. Most (63%) had at least one quit attempt in the previous year, most of which were “cold-turkey” but 18% used NRTs, and 6% used prescribed medication. Almost none attended any behavioral counseling. They were highly motivated (importance (8.7/10) and confident (7/10) with 82% preparing to quit in 30 days. The most frequent concurrent medical conditions were asthma (33%), chronic pain (5%), and seizures (3%). Most frequent reported mental illnesses were depression (41%), anxiety (34%), ADHD (25%), and bipolar disorder (7%). The most frequent reported concurrent substances used were caffeine (89%), alcohol (66%), and marijuana (41%). Second hand smoke exposure was most frequent in social situations (60%), home (52%), car (37%), and school (12%). Major stressors were family (56%), financial (33%), illness (26%), and school (12%). 7 day point prevalence quit rates to date (N=68 and 36, at 3 and 6 months) were 16% (11) and 13% (5), whereas 30% (20) and 0.05% (2) were still using NRTs, at 6 and 6 months respectively. No adverse events were reported. More complete follow-up data will be presented. CONCLUSIONS: Underage teen smokers have high comorbidity and use NRT to quit but might need more motivational support.
require at least 3 months of NRT and a small percentage will use it for up to 6 months. These high risk teens might need tobacco addiction treatment integrated within their overall treatment plan and primary care providers should treat them. FUNDING: Ministry of Health and Long term Care, Ontario to P1- Selby.

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POS3-178
AN EVALUATION OF THE TEST-RETEST RELIABILITY AND STABILITY OF THE NICOTINE METABOLITE RATIO AMONG TREATMENT-SEEKING SMOKERS

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The nicotine metabolite ratio (NMR), a ratio of 3-hydroxycotinine/cotinine, is a promising biomarker in smoking cessation research, with several retrospective studies suggesting that NMR moderates treatment outcome. To be maximally useful in tailoring treatment, NMR should exhibit high test-retest reliability among treatment-seeking smokers. Although plasma NMR exhibits acceptable stability among ad libitum smokers (~70 over 8 weeks), the present study is the first to examine the short-term stability and test-retest reliability of NMR in a treatment-seeking sample. Plasma NMR was assessed twice, approximately 18 days apart and prior to any intervention, among 72 healthy adult smokers (49% female; 35% racial/ethnic minority) enrolled in a multi-site cessation trial (ClinicalTrials.gov ID: NCT01314001). Replicating prior findings, log-NMR was lower among minorities compared to Caucasians (p = 0.02). In addition, log-NMR decreased modestly from baseline to retest (p = 0.10). Raw NMR showed neither effect. Most importantly, the test-retest correlations for raw NMR and log-transformed NMR were .88 and .92, respectively. Because clinical studies to date have broken the continuous NMR distribution into categories, either by dichotomizing slow versus normal metabolizers or by quartiles, we also examined the reliability of these metrics. For the slow versus normal dichotomizing cutpoint of NMR (.25), classification was stable for 96% of the sample (Spearman ρ=.89) while quartile membership at baseline and retest was identical for 67% of participants (Spearman ρ=.87). These data suggest that individual differences in plasma NMR exhibit excellent short-term reproducibility, supporting the potential clinical utility of a single NMR assessment for informing treatment selection.

FUNDING: This research was supported by a grant from the National Institute on Drug Abuse, the National Cancer Institute, the National Institute of General Medical Sciences, and the National Human Genome Research Institute (U01 DA020830) TO CL and RT.

JUSTIFICATION: This study informs the clinical utility of NMR as a stable biomarker by assessing its reliability in treatment-seeking smokers.

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POS3-179
COMPARISON OF SELF-REPORTED CESSATION STATUS TO THAT REPORTED BY SPOUSES AFTER A CESSATION INTERVENTION IN ARGENTINA: AN ALTERNATIVE TO BIOCHEMICAL VALIDATION

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Background: The ‘Russell Standard’ defined a set of criteria that has been used to report results of smoking cessation trials. Self-report of smoking abstinence with biochemical verification is the principal criteria used. Because obtaining biochemical verification is challenging and costly in community studies, we compared self-reported cessation to the smoking status reported by the participant’s spouse or proxy. Method: Participants in this study were smokers attending a smoking cessation clinic based at a university hospital primary care clinic or were patients seen by physicians who had participated in a study on tobacco cessation training based in private practices in Buenos Aires. All participants reported having quit smoking at a telephone interview 12 months after the date on which they had quit smoking. The spouses of these participants were then interviewed by telephone to ask about their partner’s smoking status. We compared the responses from the proxy respondents (spouses) and self-respondents. Results: At 12 months 172 patients were called by phone and 181 were nonsmokers, then we asked for their proxies and we did not contact 21 proxies. A total of 140 non-smoking participants and their proxies were interviewed at 12 months. They had an average age of 51yrs., 69% were women, and 49% had >12 years of education. Mean number of cigarettes per day was 20.1 (SD=9.9) and the average number of quit attempts was 2.4 (SD=1.2). Cessation methods were medical advice or behavioral only (21%), bupropion (56%), nicotine replacement therapy (20%), and varenicline (3%). At 12 months, of the 140 spouses interviewed, 10 (7.1%) reported that their partners were actually smokers. The agreement between self-responses and proxies was 92.85%. Kappa = 0.9266 Conclusion: These results suggest that proxy-reported data on smoking status could be used to validate self-reported smoking cessation trials in low-resource countries in place of biochemical verification.

FUNDING: NIH/Fogarty International Center, USA Grant #R01 DA024877-06

JUSTIFICATION: Obtaining biochemical verification of smoking abstinence in community studies is very difficult in low and middle income countries. Self report validated by proxies report could be an alternative in these countries.

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POS3-180
ORGANIC CATION TRANSPORTER GENE VARIATION AND RESPONSE TO SMOKING CESSATION THERAPIES

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Objectives: Evaluate relations of organic cation transporter (OCT) genes SLC22A1, SLC22A2 and SLC22A3 with response to smoking cessation therapies (SCTs) in smokers: We considered prior evidence related to evidence- and smoking-related linkage analyses, genome-wide association scans, functional assessments of non-synonymous substitutions, and available genotype data from a candidate gene database, to select six chr2q23.5 organic cation transporter gene single nucleotide polymorphisms (SNPs) for analysis. We assessed relations of SNP genotypes with seven day point prevalence abstinence at end of treatment (EOT) and at six months (6MON) in 1,839 self-identified European ancestry individuals smoking ≥10 cigarettes per day and randomized to placebo, varenicline, bupropion, nicotine replacement therapy (NRT), or combined SCTs from six randomized controlled trials (RCTs). Analyses were adjusted for anthropometric, demographic, behavioral, population genetic, and trial covariates. Results: We observed significant association (P<0.05) of two SLC22A2 SNPs with abstinence, over all therapies at 6MON [rs316019, Odds Ratio(OR)=1.30, 95%CI (1.03-1.65) P=0.03], among individuals prescribed varenicline at EOT and 6MON [rs316006: OREOT=1.47 (1.06-2.02) P=0.02, OR6MON=1.42 (1.03-1.94) P=0.03], and among individuals randomized to NRT at 6MON [rs316019, OR=1.86 (1.11-3.13) P=0.02]. Analyses of SNP effect heterogeneity by SCT, of abstinence in other SCTs, or of mediation of significant associations by nicotine dependence, nausea, or medication compliance, were non-significant. Conclusions: SLC22A2 variation associated with functional OCT2 activity improves smoking cessation success in European-ancestry treatment-seeking smokers overall and in individuals randomized to NRT and to varenicline. Replication in additional RCTs of SCTs from multiple continental populations is a research priority to confirm these findings.

FUNDING: We acknowledge the financial support of DA020830 (Caryn Lerman, Rachel F. Tyndale), DA15732 (Sharon Hall), DA9253 (Sharon Hall), CA84724 (Timothy
B. Baker), CA139871 (Timothy B. Baker), DA19706 (Timothy B. Baker), and DA33813 (Andrew W. Bergen). This work was supported in part by the Centre for Addiction and Mental Health and an endowed Chair in Addictions (Rachel F. Tyndale), and the Wolfe Medical Research Chair in Pharmacogenomics (Richard B. Kim). RCTs 5, 9A, 9B, and 9C were funded by the National Cancer Institute and RCTs 6A and 6B were funded by the National Institute of Drug Abuse. Varenicline and nominal support for recruiting RCT 5 participants was provided by Pfizer. GlaxoSmithKline provided medication for RCTs 9B and 9C.

JUSTIFICATION: Replication of association in additional randomized clinical trials and nominal support for recruiting RCT 5 participants was provided by Pfizer. GlaxoSmithKline provided medication for RCTs 9B and 9C.

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POSTER SESSION 3 • FRIDAY, FEBRUARY 7, 2014 • 5:15 P.M.–6:45 P.M.

POS3-182
DOES QUANTITY OF SMOKING REDUCTION PREDICT LATER ABSTINENCE: A POSTERIORI EVIDENCE FROM A RANDOMIZED CONTROL TRIAL

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Background and aim: Behavioral and nicotine replacement therapy (NRT) are effective in helping smokers reduce smoking first before complete cessation. We examined whether the percentage reduction in cigarette consumption predicted later abstinence. Methods: A posteriori analysis was done on 928 smokers who did not want to quit and participated as subjects in the intervention group of a randomized controlled trial of counseling and free NRT for 8 weeks. Reduction was analysed as the percentage of decrease in self-reported daily cigarette consumption at different follow-ups (1-week, 1- & 3-month) compared with that at baseline. Logistic regression model was used to examine if smoking reduction predicted quitting for those who intended to quit smoking. Reducing smoking by less than 50% in all the early follow-ups was not significant predictors of abstinence. Smoking reduction by 50% or more at 1 week (OR=1.95, 95%CI:0.96-3.95) and 1 month (OR=5.96, 95%CI:1.37-25.98), and reduction by 75% or more at 3 months (OR=7.24, 95%CI:1.94-27.01) were predictive to abstinence. Progressively increasing the reduction quantity from 1 week to 3 months (OR=2.68, 95%CI:1.37-5.25), or from 1 month to 3 months (OR=2.34, 95%CI:1.24-4.43) can increase the chance of abstinence. Conclusions: Greater smoking reduction predicted greater success in cessation. To increase the effectiveness of the smoking reduction intervention, clinicians should advise the smokers who do not wish to quit to reduce smoking by 50% or more, and to reduce further until total abstinence is achieved.

FUNDING: The project was funded by the Health and Health Services Research Fund, Hong Kong SAR (Project no. 01030611). Nicotine gum/patches provided free of charge to the subjects were provided free from McNeil AB (Helsingborg, Sweden), which had no other role in this trial.

JUSTIFICATION: To increase the effectiveness of the smoking reduction intervention, clinicians should advise the smokers who do not wish to quit to reduce smoking by 50% or more, and to reduce further until total abstinence is achieved.

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POS3-183
EVALUATING CRAVING, WITHDRAWAL, AND AFFECT AS MEDIATORS OF TOBACCO cessation in a randomized double-blind placebo-controlled clinical trial of Varenicline for Smokeless Tobacco dependence in India

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Background: The rate of smokeless tobacco use in India is 20%. We have reported that varenicline is safe for treating smokeless tobacco dependence in India and that it is effective for those who adhere to treatment. Here, we examined changes from pre- to end-of-treatment (EOT) in tobacco craving, withdrawal, and negative and positive affect as mediators of varenicline efficacy and tobacco cessation. Method: 237 smokeless tobacco users attending a dental clinic at the All India Institute of Medical Sciences, New Delhi, were randomized to placebo or varenicline; all participants received counseling. Nicotine craving, withdrawal, and positive and negative affect were measured at pre-treatment and EOT. Abstinence was defined as cotinine-verified 7-day point prevalence cessation at EOT. General Linear Model repeated measures assessed the main effects of time, treatment condition (placebo vs. varenicline), and abstinence state (abstinence vs. relapsed), and interaction effects on changes in craving, withdrawal, and negative and positive affect from baseline to EOT. Results: For all participants there was a significant reduction in withdrawal (p<0.001), total craving (p<0.001), positive reinforcement craving (p<0.001), and negative affect (p<0.02), and an increase in positive affect (p=0.04) from baseline to EOT. Significant interaction
effects between time and abstinence state were found for total craving (p=0.008), positive reinforcement craving (p<0.001), and withdrawal (p=0.001), indicating significant reductions in these processes among those abstinent at EOT vs. those still chewing tobacco. There were no significant interaction effects in these processes for treatment arm (p>0.05). Conclusion: Participants who were able to achieve cessation from smokeless tobacco dependence were significantly more likely to show a decrease in nicotine craving (total and positive reinforcement) and withdrawal, vs. participants who relapsed to tobacco use. These changes were not associated with treatment arm allocation. Overall craving, positive reinforcement craving, and withdrawal effects are appropriate targets for smokeless tobacco intervention.

FUNDING: This research was supported by a grant from the National Institute on Drug Abuse (R21 DA026404) and Pfizer provided the study medication and placebo for this study free of charge.

JUSTIFICATION: The results support the targeting of overall craving, positive reinforcement craving, and withdrawal effects to promote abstinence from smokeless tobacco in India.

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POS3-184  SUCCESSFUL TOBACCO DEPENDENCE TREATMENT ACHIEVED VIA PHARMACOTHERAPY AND MOTIVATIONAL INTERVIEWING IN LOW-INCOME EMERGENCY DEPARTMENT PATIENTS

Steven L. Bernstein, M.D.*, June Rosner, M.A., M.Ed., Stephanie O’Malley, Ph.D., Gail D’Onofrio, M.D., Robert Makuch, Ph.D., Susan Busch, Ph.D., and Benjamin Toll, Ph.D., Departments of Emergency Medicine and Psychiatry, Yale School of Medicine; Yale School of Public Health; Yale Cancer Center

Background: Tobacco use is common in patients who visit emergency departments (EDs), many of whom are low-income and have limited access to care. Prior research studying the efficacy of ED-initiated tobacco dependence treatment has shown mixed results. Objective: To study the efficacy of an intervention incorporating motivational interviewing, multimodal nicotine replacement, and active quitline (QL) referral for adult smokers in an ED. Methods: A 2-arm randomized clinical trial of subjects age 16 years or older who smoke and were self-pay or had Medicaid insurance was conducted in a busy urban ED in the northeastern United States. Intervention arm subjects received a motivational interview delivered by a trained research assistant, 6 weeks of nicotine patches and gum, a referral to the state smokers’ quitline, a booster call 3 days later, and a brochure. Control arm subjects received only the brochure. Smoking status was assessed by telephone self-report at 1 and 3 months. The primary outcome, at 3 months, included in-person confirmation via exhaled carbon monoxide testing for subjects self-reporting tobacco abstinence. Subjects lost to follow-up were considered to be smoking. Results: From October, 2010-December, 2012, 778 subjects were enrolled, of whom 774 were alive at 3 months. Demographics included 407 (52.2%) female, median age 41 years, 305 (39.1%) White/non-Hispanic, 308 (39.5%) Black/non-Hispanic, 159 (20.2%) Hispanic ethnicity; median daily cigarette use was 11 (IQR 8-20). Treatment arms had comparable baseline characteristics. At 3 months, the prevalence of biochemically confirmed abstinence was 12.2% (47/386) in the intervention arm vs. 4.9% (19/388) in the control arm (P<0.001). The proportion of subjects using QL services in the intervention and control arms was, respectively, 32.1% (124/386) and 18.8% (73/388) (P<0.0001). Conclusion: An intensive multicomponent intervention was more efficacious than usual care in treating tobacco dependence in adult ED smokers. Intervention arm subjects were more likely to engage with a QL. One-year follow-up is ongoing.

FUNDING: This research was supported by a grant from the National Institute on Drug Abuse (R21 DA026404) and Pfizer provided the study medication and placebo for this study free of charge.

JUSTIFICATION: Emergency departments, which treat many low socioeconomic status smokers, may be effective loci to initiate treatment.

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of pharmacological aids. Results: 254 physicians (124 interns, 57 family physicians, 73 gynecologists) were randomized; average age was 44.6 yrs. 133 were women, and 12% smoked. There was no previous training on tobacco cessation among 24. A total of 1,378 smoking patients were surveyed; 91% were women, 46% had > 12 years of education, 81.3 % had rated their health status as good or excellent. At 1 month, most (76%) reported daily smoking, 21% smoked some days and 3% had quit smoking. Mean number of cigarettes per day was 12.9 (SD=8.8) and 63.1% thought they would quit within the next 6 months. Quit rates at 6 months were 12.1% in control group and 13.8% in the intervention group; 12.2% and 11% had made a quit attempt. Quit rates at 6 months increased to 16% in both groups; there was no intervention-by-time effect at 6 months (?2 (df = 2.89, p= 0.24). Pooling across intervention groups, patients seen by internists/ family physicians were more likely to quit among daily and non-daily smokers (?2 (df= 13.6, p=0.0002) and ?2 (df = 10.03, p=0.002, respectively). Conclusion: Providing standardized training in tobacco cessation to physicians did not improve the cessation rates among their patients at 6-12 months. Emphasis should be placed on alternative public health interventions to control tobacco use.

FUNDING: NIH/Fogarty International Center, USA Grant R01 DA024877-06

JUSTIFICATION: In Argentina, and probably in other Latin American countries it is necessary to explore other interventions to increase cessation rates of patients in primary care

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POS3-187
VARENICLINE IN SMOKERS WITH DIABETES
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Introduction: Smoking contributes to cardiovascular disease in diabetic patients and nearly doubles the risk of mortality. Despite these risks, smoking prevalence does not appear to differ in people with or without diabetes. Varenicline increases quit rates in healthy smokers but it has not yet been extensively studied in smokers with diabetes. Objective: This pooled analysis of 12 previously conducted prospective, double-blind, randomized, placebo-controlled studies assessed the efficacy and safety of varenicline in adults (aged 18–83 years) with diabetes. Methods: Subjects who had smoked ≥10 cigarettes/day were randomized to varenicline 1 mg BID or placebo for 12 weeks treatment and 40 weeks non-treatment follow-up. Two cohorts were analyzed: subjects with diabetes or taking anti-diabetes medication and non-diabetic subjects. The primary endpoint was carbon monoxide-confirmed continuous abstinence during the last 4 weeks of treatment (Weeks 9–12). Results: Of 5,321 subjects, 262 had diabetes (Type 1 diabetes n=68; Type 2 diabetes n=194) and 72% were taking anti-diabetes medication. At 12 weeks, continuous abstinence rate (CAR) for varenicline versus placebo was 12.2% and 11% had made a quit attempt. Quit rates at 6 months increased to 16% in both groups; there was no intervention-by-time effect at 6 months (?2 (df = 2.89, p= 0.24). Pooling across intervention groups, patients seen by internists/ family physicians were more likely to quit among daily and non-daily smokers (?2 (df= 13.6, p=0.0002) and ?2 (df = 10.03, p=0.002, respectively). Conclusion: Providing standardized training in tobacco cessation to physicians did not improve the cessation rates among their patients at 6-12 months. Emphasis should be placed on alternative public health interventions to control tobacco use.

FUNDING: NIH/Fogarty International Center, USA Grant R01 DA024877-06

JUSTIFICATION: In Argentina, and probably in other Latin American countries it is necessary to explore other interventions to increase cessation rates of patients in primary care

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POS3-188
IS SMOKING CESSATION ASSOCIATED WITH WORSE CO-MORBID SUBSTANCE USE OUTCOMES AMONG HOMELESS ADULTS?
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Smoking prevalence among the homeless is exceedingly high (up to 78%). Although many homeless smokers are interested in quitting, high rates of co-morbidity substance use are among the barriers to smoking experienced by this group. Moreover, smoking is not commonly addressed among the homeless, and some clinicians fear that ‘taking cigarettes away’ will result in an escalation of co-morbidity substance use. Consequently, it is important to examine how successful smoking cessation affects non-nicotine substance use among the homeless inasmuch as it might provide support for addressing smoking in this population and alleviate concerns about compensatory behaviors. This study examined how smoking abstinence affected alcohol, cocaine, marijuana/hashish, and heroin use during the course of a smoking cessation intervention trial. Participants were 430 homeless adult smokers (mean age=44; 75% male). At baseline, the average number of days of co-morbid substance use (over the previous 30 days) was 4.9 (+/-8.7) for alcohol, 10.4 (+/-2.1) for cocaine, 3.1 (+/-7.0) for marijuana/ hashish, and 0.01 (+/-0.16) for heroin. A series of linear mixed models were used to examine relations between smoking abstinence and the number of days of other self-reported substance use across weeks 4, 8, and 26 post-enrollment. Analyses controlled for the number of days of the respective substance use at baseline as well as age, sex, race/ethnicity, education, income, tobacco dependence at baseline, treatment group, length of time homeless, and time. CO-verified 7-day point prevalence abstinence rates were 11%, 14%, and 12% at the 3 follow-ups. Results indicated that smoking abstinence was marginally associated with a reduction in the number of drinking days over time (p=.07). Smoking abstinence was not associated with a change in the number of days of cocaine (p=.38), marijuana/hashish (p=.27), or heroin use (p=.38) over the course of the cessation intervention. Results suggest that clinical interventions to address smoking among the homeless will not lead to compensatory increases in co-morbidity substance use, and may facilitate improved alcohol outcomes even without direct intervention.

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JUSTIFICATION: Clinicians and administrators need not fear that facilitating smoking cessation among homeless adult smokers will lead to compensatory increases in co-morbid non-nicotine substance use; in fact, achieving smoking abstinence may facilitate improved alcohol outcomes even without direct intervention.

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POS3-189
ARE ADDICTIONS AGENCY CLIENTS ENROLLED IN A SMOKING CESSATION PROGRAM A HOMOGENOUS GROUP? A LATENT CLASS ANALYSIS
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Introduction: Concurrent tobacco smoking and substance abuse confer particularly high risk of harm and, thus, tobacco dependence treatment is imperative. Within addictions agencies, enrollees in a smoking cessation program may be considered one homogeneous group. However, significant heterogeneity may exist among such enrollees. The aim of this paper is to describe groups enrolled in a smoking cessation program provided by addictions agencies using latent class analysis (LCA). Methods: The sample consisted of 647 addiction agency clients from 9 agencies across Ontario, Canada, who enrolled in a smoking cessation program incorporating no-cost NRT with counseling. LCA, with one to five class solutions, was used to create categorical latent variables
that describe homogeneous groups of smokers with similar patterns of baseline indicators. Varying user defined starting points and multiple iterations were used to find the maximum likelihood parameter estimates. Selection of number of classes was guided by information criteria and parsimony. Results: Three classes were identified and labeled as: comorbid (47%), worker (33%), and low income (20%). Characteristics that varied among these groups were age, mental and physical health diagnoses, employment status, income, and heaviness of smoking index (HSI), with the comorbid class more likely to be middle aged, unemployed, less educated, with higher HSI and very high mental and physical health diagnoses. The worker class was more likely to be of working age, employed, have more education, and greater income. The low income class was most likely to have annual income of less than $20,000, be unemployed, and be younger. Current alcohol use was more common among workers and low income, with an inverse association between the comorbid class and alcohol. Current substance use was similar across classes, indicating that tobacco is the primary substance of concern in a portion of addiction agency clients. Discussion: The results highlight the heterogeneity of addiction agency clients who enroll in smoking cessation programs. We will present analyses of the predictive value of these latent classes with respect to cessation outcomes.

FUNDING: The STOP program is funded by the Health Promotion Branch of the Ministry of Health and Long Term Care of the Province of Ontario, Canada.

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POS3-191 RACE AS A MODERATOR OF THE RELATIONSHIP BETWEEN DISTRESS TOLERANCE AND CIGARETTE SMOKING IN BLACK AND WHITE WOMEN


Overview: Cigarette smoking is a major public health concern and Black women disproportionately experience smoking-related health consequences despite approximately equivalent smoking rates when compared to White women. Previous research has suggested that cigarette use may represent a stress management strategy for Blacks, but less so for Whites, yet the underlying mechanism of this relationship remains unknown. To that end, the present study examined the role of distress tolerance (DT) and race in relation to smoking. Method: 717 women recruited from the community (62.1% White, 37.9% Black) completed a computerized test of DT (PASAT-C) and self-reported lifetime cigarette use. Smoking status was defined with standard criteria as smoking 100 or more cigarettes during one’s lifetime and DT was dichotomized according to whether the participant quit (low DT) or did not quit (high DT) the PASAT-C. Results: Approximately half of the sample (49.7%, n = 76) quit the PASAT-C and were labeled as “low DT.” The remaining half of the sample persisted and were labeled as “high DT” (40.3%, n = 77). 68.0% (n = 104) of participants reported smoking less than 100 cigarettes during their lifetime (“non-smokers”), while 32.0% (n =49) reported smoking 100 or more cigarettes during their lifetime (“smokers”). To determine the unique predictors of lifetime smoking status, we conducted a logistic regression with two smoking categories, (1) non-smoker and (2) lifetime smoker. In the final model, low DT (OR = 0.23, p =.03), and the interaction between DT and race (OR = 4.58, p = .05) were related to greater odds of being a smoker, such that Black women, but not White women, with low DT were at increased risk for being a lifetime smoker. Discussion: While previous literature has suggested that low DT is a general risk factor for cigarette smoking, these findings suggest a unique interaction between race, smoking, and DT. These findings add further support to recent work suggesting that negative health behaviors may serve a function to help manage stress. Importantly, increasing DT level (over the preceding week cessation assessment) was associated with a 23% increase in the odds of being abstinent (OR 1.23 [1.05-1.45]; p=.01). This effect was driven primarily by nicotine patch-treated (OR 1.37 [1.05-1.78]; p=.02) vs. varenicline-treated (OR 1.13 [93-1.38]; p=.22) individuals. Conclusions: The results are consistent with existing human laboratory studies and are the first to identify an association between progesterone level (increasing) and abstinence outcomes in freely cycling women smokers participating in a medication-based treatment. Furthermore, it appears that the potential benefits of progesterone (increases) may vary across different pharmacotherapies. Implications of these findings for smoking cessation intervention in women will be discussed.

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POS3-193 FACTORS INFLUENCING TOBACCO USE TREATMENT PATTERNS AMONG VIETNAMESE HEALTH CARE PROVIDERS WORKING IN COMMUNITY HEALTH CENTERS

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Background: Almost half of adult men in Viet Nam are current smokers, a smoking prevalence that is the second highest among South East Asian countries (SEAC). Although Viet Nam has a strong public health delivery system, according to the 2010 Global Adult Tobacco Survey, services to treat tobacco dependence are not readily available to smokers. The purpose of this study was to characterize current tobacco use treatment patterns among Vietnamese health care providers and factors influencing adherence to guideline recommended tobacco use screening and cessation interventions. This is the first study assessing smoking cessation practice patterns among Vietnamese health care providers. Methods: A cross sectional survey of 134 health care providers working in 23 community health centers in Viet Nam. Results: 23% of providers reported screening patients for high risk groups with unique smoking-related vulnerability factors.
for tobacco use, 33% offered advice to quit, and less than 10% offered assistance to half or more of their patients in the past three months. Older age, attitudes, self-efficacy, and normative beliefs were associated with screening for tobacco use. Normative beliefs (e.g., most of the staff think that promoting smoking cessation is part of their job and my supervisors think that helping smokers quit is a priority) were associated with offering advice to quit. However in the logistic regression analysis only normative beliefs remained significant for both screening and offering advice to quit. Over 90% of providers reported having never received training related to tobacco use treatment. Major barriers to treating tobacco use included lack of training, lack of referral resources and staff to support counseling, and lack of patient interest. Conclusions: Despite ratifying the Framework Convention on Tobacco Control, Viet Nam has not made progress in implementing policies and systems to ensure that smokers are receiving evidence-based treatment. This study suggests a need to change organizational norms through changes in national policies, training, and local system-level changes that facilitate treatment.

FUNDING: No Funding

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POS3-194
AN EXAMINATION OF THE MECHANISM THROUGH WHICH PRE-QUIT PATCH USE AIDS SMOKING CESSION

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Nicotine patches are traditionally started on the day a quit attempt begins. Recently, a number of studies have established that the effectiveness of patch is improved by starting treatment prior to quitting; known as pre-quit patch (PQP) use. The objective of this study was to investigate a proposed mechanism through which PQP use might promote abstinence: specifically, that PQP use leads to reduced satisfaction with smoking, which in turn leads to smoking reduction, and that smoking reduction then promotes abstinence. We also examined whether the relationship between daily cigarette consumption and satisfaction with smoking is mediated by craving intensity. In this single group study, 57 interested quitters used a hand-held computer to monitor their smoking satisfaction, feelings of withdrawal, and cigarettes smoked in real-time for 17 days leading up to a quit attempt. All participants received 21mg/24hr patches for two weeks prior to quitting and for up to 10 weeks post-quit. CO-verified 28-day abstinence was assessed at a post-quit follow-up visit. During the PQP treatment phase participants reported significant reductions in both the satisfaction gained from smoking (p<0.001) and their daily cigarette consumption (p=0.001). Cigarette craving did not decrease significantly during the PQP treatment phase. Multilevel structural equation modelling revealed a direct effect of satisfaction on smoking rate: a decrease of one point on the 0-100 point satisfaction scale was associated with a decrease of 0.07 cigarettes. Craving intensity did not mediate this relationship. Smoking reduction during the PQP treatment phase was not significantly associated with abstinence at follow-up. These results suggest that the reduction in daily cigarette smoking typically observed during PQP treatment is due to reductions in the satisfaction gained from smoking. Additional controlled studies will need to confirm whether this pattern is driven by patch treatment itself. Unlike previous studies, however, reductions in smoking were not related to later abstinence. Potential clinical implications of these findings will be discussed.

FUNDING: This work was supported by an internal grant from the University of Tasmania awarded to SGF. Additional funding support was provided by Cancer Council Tasmania (SF). Through his work at PinneyAssociates, SGF provides support was provided by Cancer Council Tasmania (SF).

JUSTIFICATION: The findings of the present study suggest that using online social media is a viable recruitment method for smoking studies and compliments other more traditional recruitment methods.

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POS3-195
EXPLORING THE VIABILITY OF USING ONLINE SOCIAL MEDIA ADVERTISING AS A RECRUITMENT METHOD FOR SMOKING CESSATION CLINICAL TRIALS

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Introduction: The aim of the present study was to explore the viability of using social media as a recruitment tool in a clinical research trial. Socio-demographic data and smoking characteristics were assessed in 266 participants recruited to investigate the effectiveness of a behavioural support program for smoking cessation. Methods: For analysis, participants were separated into two groups based on whether they were recruited using either traditional means (flyers, word of mouth, or newspaper advertisement; n=125, 47.0%) or by advertisements in online social media (n=138, 51.9%). Results: Participants recruited via social media were significantly younger but there were no differences in other socio-economic variables or smoking characteristics, compared to participants recruited via traditional means. Conclusions: The findings of the present study suggest that using online social media is a viable recruitment method for smoking studies and compliments other more traditional recruitment methods.

FUNDING: This work was supported by a project grant from the National Health & Medical Research Council (NHMRC; 1002674) awarded to SF & JW. JW is supported by an NHMRC Primary Health Care Fellowship. Additional funding support was provided by Cancer Council Tasmania (SF).

JUSTIFICATION: The findings of the present study suggest that using online social media is a viable recruitment method for smoking studies.

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POS3-196
INTEGRATED SMOKING CESSATION AND BINGE DRINKING INTERVENTION FOR YOUNG ADULTS: A PILOT Efficacy TRIAL

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Alcohol consumption is strongly associated with cigarette smoking in young adults. The primary aim of this investigation was to complete a pilot evaluation of the efficacy of an integrated intervention that targets both cigarette smoking and binge drinking on the cigarette smoking and binge behavior of young adults at 6-month follow-up. Participants were 95 young adult smokers (> or equal to 1 cigarettes per day) who binge drink (> or equal to 1 times per month) who were randomly assigned to standard treatment (n=47) involving six individual treatment visits plus eight weeks of nicotine patch therapy or the identical smoking cessation treatment integrated with a binge drinking intervention (integrated intervention; n=48). Using an intent-to-treat analysis for tobacco abstinence, at both 3 month end of treatment and 6 month follow-up, more participants who received integrated intervention were biochemically confirmed abstinent from tobacco than those who received standard treatment at 3 months (19% vs. 9%, p=0.06) and 6 months (21% vs. 9%, p<0.05). At 6 months, participants who completed the study and who received integrated intervention consumed fewer drinks per month (p<0.05) and number of binge drinking episodes per month (p<0.05) than those who received standard treatment. Preliminary data support that integrated intervention enhances smoking cessation and reduces binge drinking compared to standard treatment.

FUNDING: This work was supported by James and Esther King Biomedical Research Program.

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A BRIEF VALUES INTERVENTION IMPROVES SELF-EFFICACY AND SMOKING CESSATION INTENT: A PILOT STUDY

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Youth present with higher smoking rates than ever before and existing interventions may not suffice in reducing smoking behavior. Acceptance and Commitment Therapy (ACT), recently gained interest for smoking cessation especially as it targets the experiential avoidance or more thoroughly deals with the emotional cues associated with smoking. Yet, there is no research on which of its components may influence smoking parameters and cessation. This study aimed to examine the effectiveness of the values component of ACT compared to a psychoeducational intervention for increasing intent to quit smoking and quitting self-efficacy among youth. Participants were randomly assigned to either a values or a psychoeducation group (30 in each) and completed questionnaires assessing smoking behavior, intention to quit, and self-efficacy prior to, after the completion, and one month post-intervention. Results showed an increase in participants’ self-efficacy for quitting and higher intentions to quit, with the values intervention resulting in modest but greater increases. At one month follow-up, self-efficacy and intention to quit decreased compared to post-intervention but did not reach pre-intervention levels. The potential and effectiveness of a one-session values intervention in increasing self-efficacy and intention to quit smoking among young people is discussed.

FUNDING: The preparation of this report was supported, in part, by a grant from the Cyprus Research Promotion Foundation and European Union structural funds to Maria Karekla, PhD.

JUSTIFICATION: Results suggest that incorporating a values clarification component as part of a smoking cessation program for youth, potentially aids in increasing self-efficacy and intention to quit smoking among young smokers.

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PHARMACOKINETIC MODELING OF NICOTINE AND PHARMACODYNAMIC OF URGE TO SMOKE OF A TOBACCO HEATING SYSTEM (THS 2.1) AND CONVENTIONAL CIGARETTES (CC)

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Aim: To develop a population pharmacokinetic model for plasma nicotine concentrations following single and ad libitum use of THS 2.1 and CC and to explore the relationship between nicotine concentration and urge-to-smoke.

Method: Nicotine plasma concentrations from 68 smokers (ClinicalTrials.gov, numbers NCT01780688 and NCT01780714) were measured during single and ad libitum use of THS 2.1 and CC. The model was developed using non-linear mixed-effect modeling with proportional and additive error. Goodness-of-fit (GoF) criteria (including plausibility, parameter estimate precision, and minimum objective function value) were used to select the model. The final model included cytochrome P450 2A6 (CYP2A6) activity (%) and body weight as covariates. The model was used to predict nicotine concentrations at the time urge to smoke was assessed using the Questionnaire of Smoking Urges-brief (QSU-b). The correlation between the predicted nicotine concentration and urge to smoke was then assessed. Results: The nicotine PK model best meeting the GoF criteria was a two-compartment model with first-order absorption and elimination. The model better describes the high nicotine concentrations for ad libitum use. The apparent clearance increased with CYP2A6 activity (power coefficient: 0.26), while the volume of the peripheral compartment increased with body weight (pc: 1.13). Age, sex, laboratory values, creatinine clearance, and baseline smoking characteristics (i.e., cigarettes/day and CC nicotine content) did not influence the nicotine PK in this analysis. Exploratory evaluations do not suggest a significant association between predicted nicotine concentrations and urge-to-smoke. Conclusions: Nicotine PK was adequately described by a linear two-compartment model with first-order absorption and elimination, with the best fit with ad libitum use. CYP2A6 activity and body weight were identified as possible covariates in the model to predict nicotine concentrations. Further evaluation of the model with a larger sample size and a longer exposure could help refine the model and should be considered to further explore the relationship between nicotine and urge-to-smoke.

FUNDING: PMI

JUSTIFICATION: DEVELOPMENT OF A POPULATION PHARMACOKINETIC MODEL FOR PLASMA NICOTINE CONCENTRATIONS AND RELATIONSHIP WITH URGE TO SMOKE

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POS3-201
URINARY LEVELS OF 2-CYANOETHYL MercAPTURIC ACID (CEMA): A POTENTIAL BIOMARKER OF EXPOSURE TO ASSESS CIGARETTE SMOKING ABSTINENCE IN HUMANS?
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Introduction: The assessment of exposure to harmful and potentially harmful smoke constituents (HPHCs) in real-life conditions is part of the scientific evidence to support modified risk tobacco product (MRTP) claims. In smokers switching to MRTPs, levels of biomarkers of exposure (BoE) to HPHCs should be reduced in a variety of smoking behaviors, including actual use of only MRTPs and concomitant smoking/use of both (dual use) non-combustible MRTPs and combustible tobacco products. In smoking cessation studies, smoking abstinence is assessed by self-reporting questionnaires and exhaled carbon monoxide measurements. There is a need to get additional biomarkers of compliance (BoC) to verify the self-reported smoking behavior, with the ability to discriminate dual users from exclusive non-combustible MRTP users. The main source of exposure to acrylonitrile is from the combustion of cigarettes. Its 2-cyanoethylmercapturic acid (CEMA) metabolite has been identified as a BoE and as a potential BoC. Characteristics of the BoE CEMA were investigated in a 5-day dose titration study (NCT01465880). Methods: CEMA urinary concentrations (CEMAC) were assessed in 44 smokers, smoking 2 (Day1) or 4 (Day5) CCs after a 3-day smoking abstinence (Day1 -3). In smokers, CEMAC urinary concentrations (CEMAC) were increased in smokers who abstained from smoking, mean CEMAC decreased from 127 (Day1) to 20 µg/L (Day5). After smoking 2 or 4 cigarettes, mean CEMAC increased to 32 and 45 µg/L, respectively. Only 1 subject had a quantifiable CEMAC in the non-smoker group. A biphasic profile was observed for the CEMA excretion rate, with a terminal τfrac12; longer than 1 day. Conclusion: CEMAC levels increased proportionally with the number of CCs smoked. Results suggest that CEMAC τfrac12; is much longer than the 8 hours previously reported. CEMA is a promising qualitative biomarker of exposure to combustible tobacco products.

FUNDING: PMI
JUSTIFICATION: cema is a new potential qualitative biomarker of exposure that could be used to assess the previous use of commercially available cigarette

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POS3-202
IMPROVING THE DELIVERY OF EVIDENCE-BASED TOBACCO TREATMENTS IN PRIMARY CARE PRACTICE: ‘THE OTTAWA MODEL FOR SMOKING CESSATION’
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Background: There is a well-documented practice gap in the rates at which evidence-based smoking cessation treatments are delivered to patients in primary care settings. The ‘Ottawa Model for Smoking Cessation’ is a multi-component intervention designed for use in busy primary care practice setting. Methods: A pre-post evaluation was conducted to examine the effectiveness of ‘Ottawa Model for Smoking Cessation’ in a sample of thirty-five family medicine clinics in Ontario, Canada. Clinics were supported with implementing a multi-component intervention program that involved outreach facilitation visits, provider training, real time provider prompts and patient tools, and performance feedback. Pre-post patient exit survey measurements was used to document improvements in evidence-based smoking cessation treatments (5As: ask, advise, assess, assist, arrange) before and after the multi-component intervention program was implemented. All data were analyzed using multi-level hierarchical modeling. Three-level models were used to examine the association between patient, provider, clinic factors on study outcomes. Results: A total of 4347 patients completed the exit surveys. The odds ratios (OR) and 95% confidence intervals (CI) for 5As delivery between the pre- and post-assessments were: “ask” (OR 1.5; 95% CI 1.1 - 2.0; 55.3% vs 70.7%, p<0.001); “advise” (OR 2.0; 95% CI 1.5 - 2.7; 39.9% vs. 62.5%, p<0.001); “assess” (OR 2.1; 95% CI 1.8 - 2.9); “assist” with cessation (OR 2.30; 95% CI 1.6 - 2.9); “arrange” (OR 1.9; 95% CI 1.2 - 3.0; 10.4% vs. 21.2%, p<0.01). The study documented significant intra-clinic and intra-provider variability in the rates at which evidence-based smoking cessation treatments are delivered to patients. Conclusions: The introduction of the ‘Ottawa Model for Smoking Cessation’ within busy primary care clinics was associated with significant improvements in the rates at which providers deliver evidence-based smoking cessation treatments.

FUNDING: Heart and Stroke Foundation of Ontario and Pfizer Global
JUSTIFICATION: This study provides new information on the effectiveness of multi-component intervention programs in primary care and may assist with describing variation in practice and provider performance.

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POS3-203
FROM BENCH TO BEDSIDE: USING DIFFUSION THEORY TO STUDY BARRIERS TO 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. New 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=146) of primary care providers recruited at professional conferences in the Los Angeles area. Both scenarios were presented to all participants in an online survey. Secondary aims were conducted to identify more specific clinical and theoretical associations with intention to use. Results: Providers were more likely to offer the metabolic biomarker test to patients than the genetic test (78.86% versus 75.01%). Using a paired t-test, the P value equaled 0.0075, which is statistically significant. Additional analyses identified specific predictors of intention to use personalized medicine in smoking cessation. The characteristics of the tests, according to diffusion theory, included relative advantage, complexity, and trialability were considered. We also compared intention to use ratings with self-report of preventive practices. Conclusions: Results will guide future health professional education planning and will shape clinical practice guidelines. By speeding the rate of dissemination and uptake of these new technologies, we can improve smoking cessation outcomes in patients. Future research should investigate the impact of public policy and provider education on the utilization of innovative cessation approaches involving biomarkers and genetics.

FUNDING: The project described was supported by the National Center for Research Resources and the National Center for Advancing Translational Sciences, National Institute of Health (NIH), 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. Molly 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.
JUSTIFICATION: Results will guide future health professional education planning and will shape clinical practice guidelines. By speeding the rate of dissemination and uptake of these new technologies, we can improve smoking cessation outcomes in patients.

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A NURSE-DELIVERED INTERVENTION TO ADDRESS SECONDHAND SMOKE EXPOSURE AMONG NONSMOKERS HOSPITALIZED WITH CORONARY HEART DISEASE

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BACKGROUND: Secondhand smoke (SHS) exposure increases nonsmokers' risk of cardiovascular disease (CVD) and worsens outcomes after hospitalization for acute coronary syndrome (ACS), but this risk factor is rarely assessed in cardiac care settings. We developed and implemented a brief nurse-delivered intervention to increase nonsmokers' awareness of SHS as a CVD risk factor.

METHODS: In October, 2011, a system-level change in the admission form on 2 cardiac units at a large Boston, MA, hospital prompted nurses to document SHS exposure at admission, provide a pamphlet about SHS risks, and advise nonsmokers to make home and car smoke-free. To assess the impact, we surveyed nonsmokers admitted to the units before (5/2010-1/2011) and after (11/2011-3/2012) intervention implementation. Primary outcome was patient report of advice to keep home or car smoke-free received during hospital admission. Secondary outcomes were awareness and attitudes about SHS risks.

RESULTS: We enrolled 190 nonsmokers before and 142 nonsmokers after implementation. Groups were similar in age, sex, race, but pre-implementation patients were less educated (p=.002) and less likely to already have a smoke-free home policy (p<.001). Compared with pre-implementation patients, patients admitted after the system change were more likely to recall being asked if anyone in their household smoked (25% vs 10%, p=0.0006) and being advised to keep their home or car smoke-free (28% vs 2%, p<.0001). Both effects were significant after adjusting for pre-admission home smoking policy, SHS exposure, and the presence of a smoker at home. Patients' awareness of SHS as a CVD risk factor for nonsmokers was higher after the intervention (53% vs 27%, AOR 3.1 [1.8-5.4]), as was their belief that SHS increased their own CV risk (49% vs 27%, AOR 2.6 [1.5-4.5]), but their knowledge of the risk of SHS to overall health did not change (58% vs 57%).

CONCLUSION: A brief nurse-delivered intervention was successfully implemented and increased awareness of the CV risk of SHS exposure among hospital patients with CVD. This model could be adopted by other hospitals to address SHS exposure, a neglected CVD risk factor.

FUNDING: Funded by a grant from the Flight Attendant Medical Research Institute (#082472-CIA)

JUSTIFICATION: This brief intervention to increase cardiac patients' awareness of their risk of SHS exposure could be adopted in hospitals nationwide to address a neglected CVD risk factor.

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