Physician Counseling to Prevent Overweight in Children and Adolescents:

American College of Preventive Medicine Position Statement

Outline

Abstract

The American College of Preventive Medicine (ACPM) presents this position statement to guide physicians in counseling children and adolescents to prevent overweight. Rigorous reviews of the published literature have found insufficient evidence to permit the development of formal recommendations by the U.S. Preventive Services Task Force (USPSTF) and others. However, numerous public health and physician organizations have developed recommendations based on expert opinion, professional judgment, and the available scientific evidence. This paper presents the position of the ACPM in light of these ambiguities. ACPM will review and modify its recommendations as new scientific evidence emerges.

Key Words: Children; Overweight; Physician Counseling; Position Statement

"Overweight and obesity must be approached as preventable and treatable problems..."
David Satcher, MD, PhD, from The Surgeon General's Call to Action to Prevent and Decrease Overweight and Obesity, 2001

Introduction

Overweight is epidemic among children, adolescents and adults in the United States. Sixteen percent of children and adolescents 6-19 years old and 10.3% of 2-5 year olds are overweight (BMI-for-age and gender at or above the 95th percentile).[1] The prevalence of overweight is greater among children of certain racial and ethnic groups. In 1999-2002, the prevalence of overweight among non-Hispanic black (21.1%) and Mexican American (22.5%) adolescents 12-19 years old was significantly greater than that among non-Hispanic white adolescents (13.7%) in the same age group. Similarly, the prevalence of overweight in non-Hispanic black and Mexican-American children ages 6-11 years (19.8% and 21.8% respectively) was much greater than that seen in non-Hispanic white children (13.5%) the same age.[1] Overweight is on the increase in all pediatric age groups. From the time of the National Health and Nutrition Examination Survey in 1976-80 (NHANES I) to the NHANES survey of 1999-2000, overweight prevalence more than doubled in children 6-11 years old (from 6.5 % to 15.3%) and tripled in adolescents 12-19 years old (from 5% to 15.5%).[2] An even more alarming trend has been the rise in prevalence of overweight among children 6-23 months of age (from 7.2% in NHANES I to 11.6% in the 1999-2000 Survey).[2] This increase in excessive weight has been attributed to environmental and behavioral factors which influence diet, exercise, and

leisure-time activities.[2,3,4,5,6] Children and adolescents tend to consume more fat (especially saturated fat) and calories, eat fewer fruits and vegetables, watch more television, and participate in less physical activity than are recommended.[7,8,9,10,11]

Identifying the children and adolescents at greatest risk of becoming overweight is complex. Pediatric overweight is an expected feature of inherited syndromic and monogenetic disorders including Prader-Willi syndrome, Down syndrome, Duchenne Muscular Dystrophy and congenital leptin deficiency, and is common in endocrine disorders such as Cushing syndrome, hypothyroidism and hyperinsulinemia. These secondary causes of obesity account for only 1-2% of cases in children and adolescents.[12,13] Clinicians should also be alert to the potential for excessive weight gain in patients with physical disability, poorly controlled type 1 diabetes, and psychosocial problems, or who are being treated with centrally-acting drugs (anti-depressants, anti-psychotics, sodium valproate), insulin, or glucocorticoids.[12] However, the majority of cases of overweight are "primary." Potential population level risk factors include ethnicity, parental obesity, gestational diabetes, smoking during pregnancy, low birth weight, and low socio-economic status.[12] Although parental obesity is considered the strongest predictor of childhood and adolescent overweight, it has not yet emerged as a clinical screening tool.[13]

In children and adolescents, overweight is associated with cardiac risk factors such as atherosclerosis, asymptomatic coronary artery disease, hypertension, dyslipidemia, and hyperinsulinemia.[14,15,16] Knowledge that the pathological changes of type 2 diabetes and

cardiovascular disease can begin in childhood and adolescence has hastened interest in preventing overweight in.children.[17,18] Other conditions associated with pediatric overweight include asthma, obstructive sleep apnea, gallstones, type 2 diabetes, menstrual irregularities, orthopedic problems, and psychosocial problems.[6] Pediatric overweight is predictive of adult obesity with its associated risks of increased all-cause mortality and cardiovascular, endocrine, gastrointestinal, respiratory and neoplastic disease.[19] The probability of an overweight child becoming an obese adult increases with age, from approximately 30% in the preschool years, to 50% at school age, to 80% as an adolescent.[20]

Adult obesity and overweight are estimated to account for 9.1% of health expenditures (51.5 to 78.5 billion dollars annually) in the United States.[21] Remarkably, 27% of the rise in inflation-adjusted per capita medical spending between 1987 and 2001 is attributable to changes in the prevalence and intensity of care for obesity.[22] Total medical costs attributable to pediatric overweight have not been estimated, but the annual cost of youth (6-17 years of age) hospital admissions for overweight has risen from $35 million in 1979-1981 to $127 million in 1997-1999.[23]

The US federal government has therefore addressed overweight and obesity in its Healthy People 2010 objectives. The Healthy People 2010 objectives call for a reduction in the proportion of children, adolescents, and adults who are overweight and obese; an increase in the proportion of Americans consuming the recommended levels of whole grains, vegetables, fruits and total and saturated fat; a decrease in sedentary behavior; and an

increase in physical activity.[24] The Institute of Medicine believes that the health care system can have a significant impact on the problem of childhood overweight and has called for physicians to make overweight prevention a routine and longitudinal aspect of their pediatric care.[25]

Background

The magnitude and pace of the current epidemic and its implications for child and adult health have caused many public health and physician organizations to issue guidelines that encourage counseling to prevent and treat pediatric obesity. Various approaches have been suggested to improve diet, increase physical activity and reduce sedentary behaviors among children and adolescents. The American Medical Association Guidelines for Adolescent Preventive Services (GAPS) recommend that clinicians interview *adolescents* regarding body image and dieting patterns and provide annual dietary counseling to promote healthy eating, safe weight management techniques and improved physical fitness. Annual screening for BMI and in-depth clinical assessment of adolescents found to be overweight or at risk of overweight are also recommended.[26]

A recent American Academy of Pediatrics policy statement similarly suggests the use of counseling to prevent overweight in *children.* As part of routine health supervision, the AAP recommends that health care providers promote: breastfeeding and healthy eating patterns; the autonomy of children in decisions about food intake; care-giver modeling of

healthy food choices; physical activity in diverse settings; and a maximum of 2 hours of television and video time per day. [27] This stance is consistent with extensive health supervision guidelines produced by the AAP and HRSA's Maternal and Child Health Bureau, which outline techniques for assessing eating habits and patterns of physical activity and providing developmentally appropriate counseling.[28] These recommendations incorporate *the Dietary Guidelines for Americans,* the USDA *Food Guide Pyramid* and the *Nutrition Facts Label* as useful tools to optimize nutritional status. The American Dietetic Association (ADA) recently affirmed the relevance and safety of the *Dietary Guidelines for Americans,* for children 2-11 years old.[11,29] The guidelines recommend eating a variety of grains, fruits and vegetables every day, and moderating dietary intake of fat, sugar and salt. The ADA recommends that the principles of the USDA *Food Guide Pyramid* be followed, with use of the Food Guide Pyramid for Young Children as a tool for those aged 2 to 6 years.[11]

All consensus groups agree that young people must have regular physical activity. The International Consensus Conference on Physical Activity Guidelines for Adolescents recommends daily physical activity as part of structured or unstructured activities as well as at least 20 minutes of moderate to vigorous exertion three times per week.[30] The National Association for Sport and Physical Education (NASPE) takes the position that "all children birth to age five should engage in daily physical activity that promotes health-related fitness and movement skills," but the unique characteristics and needs of developing infants, toddlers, pre-schoolers and elementary school-aged children should inform the intensity, frequency, duration and mode of physical activities.[31] NASPE

recommends daily physical activity for infants involving environmental exploration with parents or other caregivers. Infants' movement should not be restricted for prolonged periods (for example by placing the infant in a seat). Toddlers are encouraged to engage in at least 30 minutes of structured physical activity (caregiver-directed activity that accommodates developmental level) and 60 minutes to several hours of unstructured physical activity (child-initiated environmental exploration) each day. Toddlers should not be sedentary for more than 60 minutes at a time when awake. Preschoolers are encouraged to do 60 minutes of structured physical activity per day and 60 minutes to several hours of unstructured physical activity (child-initiated environmental exploration) each day.[31] Similarly, *elementary school-aged children,* "should accumulate at least 60 minutes, and up to several hours, of age-appropriate and developmentally appropriate physical activity from a variety of activities on all, or most days of the week," and should avoid extended inactive periods of two hours or more.[32] Childhood physical activity is intermittent in nature (activity bursts of seconds to minutes alternating with rest periods), even when moderate to vigorous, and adults should not expect or prescribe sustained programs. The 2005 Dietary Guidelines for Americans and the ADA similarly recommend at least an hour of moderate to vigorous physical activity on most days of the week, as explained in the USDA Kid's Activity Pyramid.[11,33]

Several authoritative panels have systematically reviewed the literature on diet, physical activity and lifestyle counseling in the pediatric population. Although early recommendations by the USPSTF suggested that all children over the age of 2 should receive dietary counseling, the USPSTF reversed its recommendations in 1996 because the scientific evidence was insufficient to warrant such a recommendation.[34,35] Similarly,

the USPSTF's 1996 recommendation for behavioral counseling to promote physical activity in children was revoked in 2002 due to insufficient evidence.[36] In 2005, the Task Force found insufficient evidence to recommend (for or against) the routine screening of children and adolescents for overweight, because of "the paucity of good-quality evidence on the effectiveness of interventions for this problem in the clinical setting." The task force did not re-address primary prevention in its 2005 recommendations.[37]

Two recent Cochrane Reviews examined the success of published interventions designed to prevent or treat pediatric overweight. The first review included randomized controlled trials (RCTs) and non-randomized trials with a concurrent control group, which observed children in overweight *prevention* programs (educational programs, health promotion or counseling) for at least three months.[38] No trials with clinic-based or physician-delivered interventions met the inclusion criteria and no generalizable conclusions on the effectiveness of overweight prevention programs (focusing on "diet, physical activity and/or lifestyle support") could be drawn from the review. This review was updated in 2005, but inclusion criteria again resulted in the selection of studies which were school, family and community-based. Some of the studies showed a "small positive impact on BMI," and almost all showed some improvement in diet or physical activity, but the authors conclude, "that the interventions employed to date have, largely, not impacted on weight status of children to any significant degree."[39]

A second Cochrane review examined *treatment* of childhood overweight through diet, physical activity, and/or behavioral therapy interventions.[40] The review included

randomized controlled trials of at least six months duration. Many of these trials took place in specialized hospital-based clinics. No direct conclusions could confidently be made on the basis of the review, in part, due to the size and homogeneity of the study populations. The authors noted however, that behavioral therapy giving parents the primary responsibility for behavioral change supports a reduction in their children's sedentary activity. The review also notes that physical activity is, in general, recommended for everyone because of its health benefits. Another similar systematic review looked at nonrandomized studies with a concurrent control group, in addition to RCTs, and found similarly equivocal results.[41]

However, there are studies to suggest that, in general, counseling may be effective in reducing harmful behaviors or increasing healthy ones.[42] Guidance and ongoing support from a health care provider can moderately increase cardio-respiratory fitness and self reported physical activity among healthy people 16 and older.[43] Calfas et al. found that physician-based counseling, specifically, was efficacious in producing increases in physical activity among sedentary patients.[44] Dietary counseling of healthy adults improves cardiovascular risk profile and produces beneficial changes in dietary intake over the near term (median study length of 9 months).[45] When intensive physical activity and dietary counseling are provided to adults who are obese or at-risk for diet-related chronic disease, the balance of benefits and potential harms is even more favorable. The USPSTF found fair evidence to recommend intensive behavioural dietary counseling by primary care clinicians, nutritionists or dieticians, for adult patients with hyperlipidemia and other known risk factors for cardiovascular and diet-related chronic disease[35]; in

cases of adult obesity, there is fair to good evidence to recommend high-intensity counseling (about diet, exercise or both) when coupled with behavioural interventions.[46]

Other studies suggest that encouragement by health care providers may lead to improvements in problem drinking, dietary fat or fiber content, and smoking cessation.[47-50] Although the bulk of studies on behavior change interventions in community and clinical settings have been conducted in adults,[51,52,53] primary care-based counseling on injury prevention in children[54,55] and breastfeeding in lactating mothers[56] have demonstrated positive outcomes. Similarly, research by Epstein et al. found that children who received behavioral family-based interventions consisting of diet, nutrition, and exercise training had improvement in overweight over 5 year and 10 year intervals when compared to control groups.[57,58]

Both the Canadian Task Force on Preventive Health Care and the U.S. Preventive Services Task Forces (CTFPHC and USPSTF) have addressed the evidence for behavioral counseling in primary care settings. The USPSTF finds that physician counseling, particularly when coupled with the advice of other health care professionals and reinforced with telephone calls, repeat visits or multimedia materials, may increase the prevalence of salutary behaviors and decrease the prevalence of behaviors that have negative affects on health.[51] In addition, they argue that physician-patient interactions lend themselves to behavioral counseling: patients look to physicians for information and guidance on health behaviors; physicians have come to "accept and value" this role; and continuity of care provides for numerous opportunities to intervene and monitor progress.[51] These statements are even more germane to the pediatric setting where

anticipatory guidance and a schedule of visits are entrenched aspects of practice. The CTFPHC suggests that, "there is evidence that even brief counseling can be effective in busy primary care settings, that a triage approach for evaluating a patient's status regarding predisposing, enabling and reinforcing factors is effective in appropriately targeting education and counseling strategies, and that the use of office support tools and programs improves the delivery and effectiveness of counseling in the primary care setting." [53]

Because a child or adolescent's life and patterns of behavior are governed not only by personal choices, but also by physical and social environments beyond their control, parents are a necessary target of diet, physical activity and lifestyle counseling for the pediatric population. In terms of nutrition, parents and caregivers play a role in the "availability and accessibility of foods, meal structure, adult food modeling, food socialization practices and food-related parenting style."[11] Similarly, parents control placement of televisions in children's bedrooms, influencing time spent watching or playing video games.[59] An understanding of the parent-child dyad and of the differences between pediatric and adult populations is crucial to the success of counseling efforts. Although the possible harms of counseling to prevent overweight in children and adolescents have not been adequately researched,[38,40,60] the risk associated with counseling is likely to be minimal compared to the risk associated with pediatric overweight in the short and long-term. Environmental and policy initiatives, although beyond the scope of this statement, are also crucial targets for intervention.

Statement

ACPM takes the position that physicians should counsel children, adolescents and their parents about healthy behaviors that may prevent overweight. These behaviors include decreased television viewing, decreased time playing video and computer games, increased physical activity, and the adoption of a healthful, balanced dietary pattern.[61,62] ACPM believes that the potential benefits outweigh any potential risks. Physicians should assess the family's readiness for change, and act accordingly.[63,64] Anticipatory guidance should be routinely provided on developmentally appropriate physical activity, healthy eating habits and the reduction of sedentary behaviors, based on the guidelines outlined here.

Rationale

Evidence-based practice requires, "the integration of best research evidence with clinical expertise and patient values."[65.] Thus far, well-designed clinical trials remain insufficient to determine the impact of counseling on the primary prevention of overweight in children and adolescents. There are however several studies that suggest that counseling by physicians and other health professionals can reduce risky behaviors, and promote healthy ones. Professional judgment therefore suggests that even before the literature conclusively reveals effective interventions, physicians should work with other health professionals to promote healthy diet, lifestyle and physical activity patterns in children

and adolescents. ACPM asserts that physicians should take an active stance in the primary prevention of overweight in children. A number of factors were considered before taking its position. The magnitude and pace of the epidemic heightens the urgency of developing effective responses; ACPM fully supports research efforts to develop effective interventions. However, clinicians and patients cannot wait for the results of well-designed studies. There is a risk in urging clinicians to take time during the periodic health exam for a counseling intervention that is not fully endorsed by the evidence-based scientific literature at the expense of another intervention that has the full support of the science. However, in this case, the risks of the intervention must be weighed not only against the potential benefits, but also against the risks of morbidity and mortality posed by inaction. The need for age-appropriate dietary, lifestyle and physical activity counseling is made all the more urgent by research showing that overweight among children and adolescents leads to obesity in adults.

Clinicians must take advantage of every opportunity to extol the virtues of a balanced lifestyle that includes a healthy diet and adequate physical activity. The current recommendation for primary prevention is made with the knowledge that research is sorely needed in the pediatric setting to develop strategies for the prevention of overweight in children and adolescents.

References

[1]Hedley AA, Ogden CL, Johnson CL, Carroll MD, Curtin LR, Flegal KM, Prevalence of Overweight and Obesity among US Children, Adolescents and Adults, 1999-2002. JAMA 2004;291:2847-2850.

[2]0gden CL, Flegal KM, Carroll MD, Johnson CL. Prevalence and Trends in Overweight Among US Children and Adolescents, 1999-2000. *JAMA* 2002;288:1728-1732.

[3]National Institute for Health Care Management. Childhood Obesity-Advancing Effective Prevention and Treatment: An Overview for Health Professionals. Washington DC: National Institute for Health Care Management Research and Educational Foundation, April 9, 2003. Available at: http://www.nihcm.org/ChildObesityOverview.pdf. Accessed 15 February 2006.

[4]Taith MS, Tepper BJ, Hoffman DJ, Pietrobelli A. Genetic and Environmental Influences on Childhood Obesity. *Clinics in Family Practice.* June 2002;4:277-294.

[5]Hill JO, Peters JC. Environmental Contributions to the Obesity Epidemic. *American Association/or the Advancement of Science* 1998;280:1371-74.

[6]Strauss, RS. Childhood Obesity. *Pediatric Clinics of North America.* Feb. 2002; 49:175-201.

[7]Grunbaum JA, Kann L, Kinchen SA, Ross J, Hawkins J, Lowry R, Harris WA, McManus T, Chyen D, Collins J. Youth Risk Behavior Surveillance-United States, 2003. *MMWR Surveill Summ.* May 21 2004;53:21-25. Available at: http://www.cdc.gov/mmwr/PDF/SS/SS5302.pdf. Accessed 15 February 2006.

[8] Katz, DL. Nutrition in Clinical Practice. Philadelphia: Lippincott Williams & Wilkins; 2001.

[9]Certain LK, Kahn RS. Prevalence, Correlates, and Trajectory of Television Viewing Among Infants and Toddlers. *Pediatrics* 2002; 109:634-642.

[10]Anderson RE, Crespo CJ, Bartlett SJ, Cheskin, LJ, Pratt M. Relationship of physical activity and television watching with body weight and level of fatness among children: results from the Third National Health and Nutrition Survey. *JAMA* 1998; 279:938-942.

[11]American Dietetic Association, Position of the American Dietetic Association. Dietary Guidance for Healthy Children aged 2 to 11 years. Am Diet Assoc 2004;104:660-677.

[12]Lobstein T, Baur L, Uauy R. Obesity in children and young people: a crisis in public health. Obesity Reviews 2004;5(Suppl 1):4-85.

[13]Rudolph CD, Rudolph AM, editors. Rudolph's Pediatrics, 21st ed. New York: McGraw-Hill; 2003.

[14]McGill HC Jr, McMahan CA, Malcom GT, Oalmann MC, Strong J, and the Pathobiological Determinants of Atherosclerosis in Youth (PDAY) Research Group. Relation of Glycohemoglobin and Adiposity to Atherosclerosis in Youth. *Arteriosclerosis, Thrombosis, and Vascular Biology* 1995;15:431-440.

[15]Berenson GS, Srinivasan SR, Bao W, Newman WP III, Tracy RE, Wattigney WA. Association between Multiple Cardiovascular Risk Factors And Atherosclerosis in Children and Young Adults. *NEJM* 1998;338:1650-1656.

[16]Gidding SS, Bao **W,** Srinivasan SR, Berenson GS. Effects of Secular Trends in Obesity on Coronary Risk Factors in Children: The Bogalusa Heart Study. *Journal of Pediatrics* 1995;127:868-874.

[17]Freemark M. Pharmacologic Approaches to the Prevention of Type 2 Diabetes in High Risk Pediatric Patients. *Journal of Clinical Endocrinology and Metabolism* 2003; 88:3-13.

[18] Steinberger J, Daniels SR. Obesity, Insulin Resistance, Diabetes, and Cardiovascular Risk in Children: An American Heart Association Scientific Statement From the Atherosclerosis, Hypertension, and Obesity in the Young Committee (Council on

Cardiovascular Disease in the Young) and the Diabetes Committee (Council on Nutrition, Physical Activity, and Metabolism). *Circulation* 2003;107:1448-1453.

[19]NHLBI Expert Panel on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults. Clinical Guidelines on the Identification, Evaluation and Treatment of Overweight and Obesity in Adults: The Evidence Report. National Institutes of Health, National Heart Lung and Blood Institute. Sept. 1998. Available at: http://www.nhlbi.nih.gov/guidelines/obesity/ob_gdlns.pdf Accessed 15 February 2006.

[20]Serdula MK, Ivery D, Coates RJ, Freedman DS, Williamson DF, Byers T. Do Obese Children Become Obese Adults? A Review of the Literature. *PrevMed* 1993; 22:167-77.

[21]Finkelstein EA, Fiebelkorn 1C, Wang G. National Medical Spending Attributable to Overweight and Obesity: How Much, and Who's Paying. *Health Affairs* 2003;W3-219-W3-226.

[22]Thorpe KE, Florence CS, Howard DH, Joski P. The Impact of Obesity on Rising Medical Spending. Health Affairs 2004;23:480-486.

[23]Wang G, Dietz WH. Economic Burden of Obesity in Youths Aged 6 to 17 Years: 1979-1999. Pediatrics 2002;109(5): E81-1.

[24]U.S. Department of Health and Human Services. Healthy People 2010: Understanding and Improving Health. 2nd ed. Washington DC: U.S. Government Printing Office,

November 2000. Available at: http://www.healthypeople.gov/Publications. Accessed 15 February 2006.

[25]Institute of Medicine. Preventing Childhood Obesity: Health in the Balance. Koplan JP, Liverman CT, Kraak VA, eds. Committee on Prevention of Obesity in Children and Youth. Washington, DC: The National Academies Press, September 2004. Available at: http://books.nap.edu/books/0309091969/html/R3.htmltfpagetop. Accessed 15 February 2006.

[26]American Medical Association. Guidelines for Adolescent Preventive Services (GAPS): Recommendations and Rationale. Eds. Elster AB, Kuznets NJ. Chicago: Williams & Wilkins; 1994.

[27]American Academy of Pediatrics Committee on Nutrition. Prevention of Pediatric Overweight and Obesity. Policy Statement, *Pediatrics* 2003;12:424-430.

[28]American Academy of Pediatrics. Bright Futures in Practice: Nutrition 2nd edition. Chicago; 2001.

[29]American Dietetic Association, Position of the American Dietetic Association. Dietary Guidance for Healthy Children aged 2 to 11 years. *3 Am DietAssoc* 1999:99:93-101.

[30]Sallis JF, Patrick K. Physical Activity Guidelines for Adolescents: Consensus Statement. *Pediatric Exercise Science* 1994;6:302-314.

[31]National Association for Sport and Physical Education. Active Start: A Statement of Physical Activity Guidelines for Children Birth to Five Years. Reston, VA: National Association for Sport and Physical Education;2002.

[32]National Association for Sport and Physical Education. Physical Activity for Children: A Statement of Guidelines, 2nd ed. Reston, VA: National Association for Sport and Physical Education;2004.

[33]USDA and HHS. Dietary Guidelines for Americans 2005. Washington, DC: USDA and HHS; 2005. http://www.health.gov/dietaryguidelines/dga2005/document. Accessed 14 February 2006.

[34]US Preventive Services Task Force. Counseling to Promote a Healthy Diet. *In* Guide to Clinical Preventive Services, Second Edition. Williams and Wilkins, 1996 pp 625-642.

[35]US Preventive Services Task Force. Behavioral Counseling in Primary Care to Promote a Healthy Diet. *In* Guide to Clinical Preventive Services, Periodic Updates. Third Edition. 2003 Available at: http://ahrq.gov/clinic/gcpspu.htm. Accessed 13 June 2004.

[36]US Preventive Services Task Force. Counseling to Promote Physical Activity. *In* Guide to Clinical Preventive Services, Second Edition. Williams and Wilkens, 1996. pp 611-624.

[37] Calonge N, Allan JD, Berg AO, Frame PS, et al. Screening and Interventions for Overweight in Children and Adolescents: Recommendation Statement. Pediatrics 2005;116:205-210.

[38]Campbell K, Waters E, O'Meara S, Kelly S, Summerbell CD. Interventions for preventing obesity in children (Cochrane Review). In: *The Cochrane Library*, Issue 3, 2003. Oxford: Update Software.

[39]Summerbell CD, Waters E, Edmunds LD, Kelly S, Brown T, Campbell KJ. Interventions for preventing obesity in children. The Cochrane Database of Systematic Reviews 2005, Issue 3. Art. No.: CD001871. DOI: 10.1002/14651858.CD001871.pub2.

[40]Summerbell CD, Ashton V, Campbell KJ, Edmunds L, Kelly S, Waters E. Interventions for treating obesity in children (Cochrane Review). The Cochrane Database of Systematic Reviews 2003, Issue 3. Art. No.: CD001872. DOI: 10. 1002/14651858.CD001872.

[41]Harvey EL, Glenny AM, Kirk SF, Summerbell CD .An updated systematic review of interventions to improve health professional's management of obesity. Obes Rev 2002 Feb:3(l):45-55.

[42]Mullen PD, Simons-Morton DG, Ramirez G, Frankowski RF, Green LW, Mains DA. A meta-analysis of trials evaluating patient education and counseling for three groups of preventive health behaviors. *Patient Educ Couns* 1997;32(3): 157-173.

[43]Hillsdon M, Foster C, Thorogood M. Interventions for promoting physical activity. The Cochrane Database of Systematic Reviews 2005, Issue 1. Art. No.: CD003180.pub2. DOI: 10.1002/14651858.CD003180.pub2.

[44]Calfas KJ, Long BJ, Sallis JF, Wooten WJ, Pratt M, Patrick K. A Controlled Trial of Physician Counseling to Promote the Adoption of Physical Activity. *Prev Med* 1996;25:225-233.

[45]Brunner EJ, Thorogood M, Rees K, Hewitt G. Dietary advice for reducing cardiovascular risk. The Cochrane Database of Systematic Reviews 2005, Issue 4. Art. No.: CD002128.pub2. DOI: 10.1002/14651858.CD002128.pub2.

[46]US Preventive Services Task Force. Screening for Obesity in Adults: Recommendations and Rationale. Ann Intern Med 2003;139(11):930-32.

[47]Kahan M, Wilson L, Becker L. Effectiveness of Physician-based Interventions with Problem Drinkers: A Review. CMAJ 1995;152:851-859.

[48]Nawaz H, Adams ML, Katz DL. Physician-Patient Interactions Regarding Diet, Exercise, and Smoking. Preventive Medicine 2000;31:65 2-657.

[49]Silagy C, Stead LF. Physician Advice for Smoking Cessation (Cochrane Review). In:The Cochrane Library, Issue 3, 2004. Chichester, UK: John Wiley & Sons, Ltd.

[50]Rice VH, Stead LF. Nursing Interventions for Smoking Cessation (Cochrane Review). In: The Cochrane Library, Issue 3,2004. Chichester, UK: John Wiley & Sons, Ltd.

[51]Whitlock EP, Orleans TC, Pender N, Allan J. Evaluating Primary Care Behavioural Counseling Interventions: An Evidence-based Approach. AJPM 2002;22:267-84.

[52]Kahn EB, Ramsey LT, Brownson RC, Heath GW, Howze EH, Powell KE, Stone EJ, Rajab MW, Corso P, Task Force on Community Preventive Services. The Effectiveness of Interventions to Increase Physical Activity: A Systematic Review. *AJPM* 2002;22(4S):73-107.

[53]Elford RW, MacMillan HL, Wathen CN with the Canadian Task force on Preventive Health Care. Counseling For Risky Health Habits: A Conceptual Framework for Primary Care Practitioners. CTFPHC Technical Report #01-7. November, 2001. London, ON: Canadian Task Force.

[54]Clamp M, Kendrick D. A Randomised Controlled Trial of General Practitioner Safety Advice for Families with Children Under 5 Years. May 23 *BMJ* 1998;316:1576-1579.

[55]DiGuiseppi C, Higgins JPT. Inteventions for promoting smoke alarm ownership and function. The Cochrane Library. 2004:2.

[56]Lu MC, Lange L, Slusser W, Hamilton J, Halfon N. Provider Encouragement of Breast-feeding: Evidence From a National Survey. Obstetrics & Gynecology 2001-97:290-295.

[57]Epstein LH, Wing RR, Koeske R etc. Long-term effects of family-based treatment of childhood obesity. *J Consult din Psychol* 1987;55:91-95.

[58]Epstein LH, Valoski A, Wing RR, McCurley J. Ten-year Follow-up of Behavioral, Family-Based Treatment of Obese Children. *JAMA* 1990;264: 2519-2524.

[59]Dennison BA,Erb TA, Jenkins PL. Television viewing and television in bedroom associated with overweight risk. Pediatrics 2002;109:1028-1035.

[60]Feldman W, Beagan BL with the Canadian Task Force on Preventive Health Care. Screening for Childhood Obesity. 1994. Available at : http://www.ctfphc.org/. Accessed 12 February 2006.

[61]American Academy of Pediatrics. Committee on Public Education. Children, Adolescents, and Television. *Pediatrics* 2001:107: 423-426.

[62]Berkey CS, Rocklett RH, Field AE, Gillman MW, Frazier AL, Camargo CA, Colditz GA. Activity, dietary intake, and weight changes in a longitudinal study of preadolescent and adolescent boys and girls. *Pediatrics* 2000;105:E56.

[63]The American Medical Association. Assessment and Management of Adult Obesity: A Primer for Physicians. Assessing Readiness and Making Treatment Decisions. 2003.

[64]National Heart, Lung, and Blood Institute (NHLBI) and North American Association for the Study of Obesity (NAASO). The practical guide to the identification, evaluation, and treatment of overweight and obesity in adults. Bethesda, MD: National Institutes of Health; 2000. Publication No. 00-4084. Available at: http://www.nhlbi.nih.gov/guidelines/obesity/practgde.htm Accessed 12 February 2006.

[65]Sackett DL, Strauss SE, Richardson WS, Rosenberg W, Haynes RB. Evidence-based Medicine: How to Practice and Teach EBM. Second edition, Churchill Livingstone 2000. Edinburgh.