REPORTS OF THE COUNCIL ON SCIENCE AND PUBLIC HEALTH

The following reports, 1–9, were presented by Mary Anne McCaffree, MD, Chair.

1. THE CLINICAL UTILITY OF MEASURING BODY MASS INDEX AND WAIST CIRCUMFERENCE IN THE DIAGNOSIS AND MANAGEMENT OF ADULT OVERWEIGHT AND OBESITY

HOUSE ACTION: RECOMMENDATIONS ADOPTED AND REMAINDER OF REPORT FILED

Board of Trustees Report 9-A-07 recommended, in part, that our American Medical Association (AMA) ask the Council on Science and Public Health (CSAPH) to critically evaluate the clinical utility of measuring body mass index (BMI) and/or waist circumference in the diagnosis and management of overweight and obesity, with input from leading researchers and key stakeholder organizations.

This report reviews the reports, statements, and/or guidelines of several government and health professional organizations on the measurement of overweight and obesity. It also reviews selected research that supports or challenges these guidelines and recommendations. The report focuses on the use of BMI and waist circumference in adults only, as the AMA recently convened an expert committee to address this issue in children and adolescents.

CURRENT AMA POLICY ON MEASUREMENT OF OVERWEIGHT AND OBESITY

AMA policies related to measuring overweight and obesity include Policy D-440.971 (AMA Policy Database), which encourages physicians to routinely measure BMI and waist circumference in adults and BMI percentiles in children, while recognizing ethnic sensitivities and the relationship of BMI to stature, and Policy H-150.953, which urges physicians to assess their patients for overweight and obesity during routine medical examinations. See the Appendix for complete policy statements. In addition, recommendations emanating from our AMA's National Obesity Summit in 2004 encouraged routine measurement of BMI and waist circumference.

BACKGROUND

BMI is an estimate of body fatness expressed as weight in kilograms divided by height in meters squared (kg/m^2). BMI has been widely recommended by several government and health professional organizations, including our AMA, as a useful tool to screen for overweight and obesity in adults. Waist circumference is an estimate of abdominal adiposity that is also recommended by many of these organizations, although it is less widely used clinically. BMI and waist circumference are intended to identify individuals at high risk of adverse health outcomes, along with patient history and other clinical measurements.[1]

Obesity and overweight are currently defined by the National Heart Lung Blood Institute (NHLBI), World Health Organization (WHO), and most health professional and governmental organizations using BMI cut-points, despite evidence that BMI may not correspond to the same degree of body fatness or disease risk in all populations. Some attempts have been made to recommend alternative cut-points or alternate measures of body fatness and/or disease risk. In general, it remains unclear whether the current BMI cut-points have helped clinicians improve patient morbidity and mortality. However, few effective interventions are available to clinicians to reduce BMI in their patients compared with comorbid conditions such as hypertension and diabetes.

Recent estimates indicate that approximately two-thirds of Americans aged 20 to 74 years are classified as overweight or obese based on BMI categories established by the National Institutes of Health.[2] This compares to less than 50% of adults who were deemed overweight or obese before 1980 using the same measures.[2] The increasing trend in overweight in the last 25 years reflects primarily an increase in the obese category (BMI $\geq$ 30 kg/m^2) and a decrease in the percentage of adults in the normal (18.5-25 kg/m^2) range.[2] Similarly, abdominal adiposity, as measured by waist circumference, has significantly increased in adults over the last 20 years.[3] The prevalence of obesity is increasing in the United States and throughout the world using either indicator of adiposity.

Categories of body size have research, policy, and clinical applications. While these categories may not be equally applicable across populations for all obesity-related conditions, any revisions to these widely used definitions of overweight and obesity must be carefully considered.

METHODS

The web sites of government and health professional organizations were searched for reports, statements, and/or guidelines on the measurement of overweight and obesity. The Cochrane Database of Systematic Reviews and the web site of the Agency for Healthcare Research and Quality were searched for reviews related to this topic. PubMed was searched for English-language review articles published between July 1997 and December 2007 using the search terms "BMI," "body mass index," "waist circumference," "waist hip ratio," "overweight," "obesity," and "guidelines." Additional articles were identified by reviewing the reference lists of pertinent publications.

CURRENT CLASSIFICATIONS OF WEIGHT STATUS

In 1993, the WHO's Expert Committee on Physical Status recommended classifying overweight adults using BMI categories of 25.0 to 29.9 kg/m^2 for overweight grade 1, 30.0 to 39.9 kg/m^2 for overweight grade 2, and $\geq$ 40.0 kg/m^2 for overweight grade 3.[4] The panel acknowledged that BMI does not directly measure fat mass or fat percentages, but believed that the possibility of misclassification would have minimal impact as part of an overall health risk assessment that includes abdominal adiposity, smoking and dietary habits, physical activity, blood pressure, serum lipids and glucose, and family history.[4] In 1997, the WHO Consultation on Obesity recommended an additional cut-point at a BMI of 35 kg/m^2 as part of a three-tiered classification of obesity (Table 1).

In 1998, the NHLBI's Obesity Education Initiative Expert Panel defined overweight and obesity in adults 18 years of age and older using the same BMI cut-points as the WHO (Table 2). The NHLBI additionally recommended measuring waist circumference in individuals with BMIs below 35 kg/m^2, noting an increased relative risk of obesity-associated factors in women with waist circumference greater than 88 cm (35 inches) and in men with waist circumference greater than 102 cm (40 in). These guidelines have been endorsed by many government and professional organizations, including the National Cholesterol Education Program, the National High Blood Pressure Education Program, the North American Association for the Study of Obesity (NAASO), the Centers for Disease Control and Prevention (CDC), the American Heart Association, the American College of Physicians (ACP), the American College of Preventive Medicine (ACPM), and the US Preventive Services Task Force (USPSTF) (Table 3).

Both the WHO and NHLBI guidelines recognize that current BMI cut-points are not ideal indicators of body size. The WHO expert committees regarded BMI as a crude population-level indicator of obesity and associated risks that does not necessarily coincide with the same degree of adiposity across populations.[5] The 1997 WHO report recommended the development of sex-specific waist circumference cut-points for different populations to further aid in the classification of overweight and obesity,[5] which the NHLBI report did define for the general American population.[1] The WHO and NHLBI recommendations further recognized that BMI may misclassify some individuals on the basis of stature, such as those who are very muscular,[1] less than 5 feet tall,[1,4] or taller than 6 feet 3 inches.[4] In addition, their recommendations to prevent further weight gain or to lose weight at a given BMI are not intended for pregnant or lactating women, individuals with serious psychiatric illness, or anyone with an illness that may be aggravated by caloric restriction.[1] Moreover, adult BMI scores are not directly applicable to children or young teenagers.[6]

In 2003, a WHO expert consultation recommended retaining the current classifications of overweight and obesity based on BMI, but with additional BMI cut-points of 23, 27.5, 32.5, and 37.5 kg/m^2 for public health action in many Asian populations.[7] However, the committee failed to establish clear BMI cut-off points for overweight or obesity for all Asians, noting an onset of increased risk varying from 22 to 25 kg/m^2 across Asian populations, and of high risk varying from 26 to 31 kg/m^2.[7] In addition, the expert consultation recommended the measurement of waist circumference, particularly in populations predisposed to central adiposity, but did not recommend specific waist circumference cut-points.[7] The WHO has not recommended specific BMI or waist circumference cut-points for other populations, such as Africans or other populations not of European descent.

SCIENTIFIC EVIDENCE FOR INDICATORS OF OVERWEIGHT AND OBESITY

Although numerous governmental and health organizations, including our AMA, endorse the use of BMI and waist circumference to assess and monitor overweight and obesity, these measures, in fact, are screening tools, and are only qualified predictors of risk. BMI is significantly correlated with more accurate measures of body fatness, such as underwater weighing and dual-energy x-ray absorptiometry (DXA), but does not measure it directly.[1] In adults, waist circumference is a measure of central adiposity, but also is not a direct measure.[1] Waist circumference is most useful in further defining risk of overweight and obesity in individuals with a BMI below 35 kg/m^2; for BMIs above this value, waist measurement adds little clinical information.[1,8]

A large body of evidence supports the use of BMI and waist circumference in adults as indicators of underweight, overweight, and obesity.[1,4] BMI has been the most frequently studied indicator, and much of the scientific literature has found increased BMI to be associated with several diseases and conditions, including type 2 diabetes, coronary heart disease, high blood cholesterol, stroke, hypertension, gall bladder disease, osteoarthritis, sleep apnea, several cancers (notably endometrial, breast, prostate, and colon cancer), pregnancy complications, menstrual irregularities, stress incontinence, depression, and mortality.[1] The nature of the relationships between BMI and these conditions is generally similar across population groups, although the specific level of risk at a given BMI may differ by age, gender, race/ethnicity, and/or socioeconomic status.[1] These variations in specific risk are important to note, as they may reflect differences in body composition and fat distribution, as well as population-specific causes of overweight and genetic susceptibility to certain diseases.[4]

Waist circumference also has been shown to be an independent predictor of disease risk, particularly of cardiovascular disease (CVD) and CVD risk factors such as hypertension, dyslipidemia, and type 2 diabetes.[1,8-10] In fact, waist circumference is considered by some to be as good or better a predictor of CVD, type 2 diabetes, and mortality as BMI.[3,10,11] As with BMI, ethnicity, gender, and age may modify the specific level of risk associated with a given waist circumference.[1,5,12,13]

CONCERNS ABOUT USE OF BMI AND WAIST CIRCUMFERENCE

Despite the substantial literature supporting use of BMI and waist circumference in adults, some investigations have not observed direct associations between BMI and waist circumference and various health outcomes, particularly mortality. As noted above, even direct associations between BMI, waist circumference, and health outcomes may vary by ethnicity, stature, and age. These variations in absolute and relative risks have led some researchers and clinicians to question the clinical utility of using BMI, particularly the current BMI cut-points, as clear indicators of overweight and obesity. Concerns are greatest in the normal and overweight classifications; there is less disagreement about the utility of these cut-points in the moderate to severely underweight
(< 17 kg/m^2)[4] and obese categories.

Population-Specific Variations in BMI and Health Risk. Ethnicity, age, and athletic training may affect the relationship between BMI and various health outcomes. For example, some studies have found that risk of complications from overweight are not apparent in African Americans until they reach a BMI greater than 30 kg/m^2,[14,15] which may be due to reduced body fatness in African Americans at a given BMI compared to Caucasians.[16] However, other studies have not observed a different relationship between body fatness and BMI in African Americans as compared with Caucasians,[17,18] and risk of mortality from CVD remains higher in African Americans than in Caucasians, due in part to higher rates of other CVD risk factors in African Americans, such as hypertension and diabetes.[19,20] Waist circumference may be particularly helpful in clarifying disease risk in older African American women with BMIs in the normal and overweight ranges.[21]

In contrast, the risk of obesity-related disorders has been reported to begin at a lower BMI in some Asian populations than in Caucasian populations.[7,22] In general, many Asians have a higher percent body fatness than Caucasians of the same age, gender, and BMI.[7,23] Likewise, the prevalence of Asians with risk factors for type 2 diabetes and CVD is higher than seen in Caucasian populations with BMIs below 25 kg/m^2.[7] However, there is considerable variation in these associations between Asian populations. For example, a range of higher percentages of body fatness has been observed at low BMIs in Hong Kong Chinese, Singaporean Chinese, Malays, Indians, Indonesians, and Japanese, as compared with Caucasians, while Polynesians have a lower proportion of body fat compared to Caucasians. However, despite their lower proportion of body fat, Polynesians still have a higher prevalence of diabetes.[7] Similarly, the optimal BMI range for Australian Aboriginals appears to be 17 to 22 kg/m^2,

with adverse metabolic consequences seen at BMI values greater than 22 kg/m^2.[5] Nevertheless, there are no clear categories for overweight and obesity for all Asians. Research suggests that optimal cut-points for overweight range from 22 to 25 kg/m^2, and for obesity from 26 to 31 kg/m^2. Lower cut-points for populations in Hong Kong, Indonesia, and Singapore are not considered appropriate for those in northern China and Japan.[7] A WHO expert consultation on the appropriate BMI categories for Asian populations noted that BMI categories serve merely as a "convenience" for public health and clinical use, and that in reality, increased health risks exist on a continuum with increasing BMI.[7]

In older adults, changes in body composition (loss of fat-free mass, and gains in fat mass) and height alter the association between BMI and body fatness.[4,24] At any given BMI, body composition changes seen with aging underestimate body fatness and height losses overestimate fatness.[4,24] Despite these changes, risk of several conditions, including osteoarthritis, type 2 diabetes, sleep apnea, urinary incontinence, cataract, and some cancers are directly associated with BMI in older adults.[4,24] Mortality risk is also related to BMI in older adults, although the relationship is more nuanced than in younger and middle-aged adults. As age increases, the relative risk of mortality associated with BMI decreases, leading some to argue that obesity is not as harmful in older adults as in younger and middle-aged adults.[4,24] However, the absolute risk of mortality associated with BMI continues to increase with age, until approximately age 75 years; the apparent lack of association after age 75 years may be due to other competing risks or unique subgroup resistance to the adverse health effects of obesity.[4,24]

Current BMI cut-points do not reflect the same level of body fatness in highly trained athletes, such as those participating in college sports[25] or even former professional athletes.[26] However, this does not apply to all athletes; for example, football linemen tend to have significantly higher BMIs than their fellow football players and other athletes, with correspondingly higher percent body fatness[25,27] and greater risk for obesity-related conditions, such as high blood pressure and sleep apnea.[28]

Such variation in risk has led to arguments that a BMI cutoff of 25 kg/m^2 to classify individuals as overweight is too conservative in certain populations and may stigmatize some individuals unnecessarily.[29] In contrast, others argue that current cut-points result in lost opportunities to prevent or treat obesity-related conditions in some individuals currently classified as "normal" weight.[7] Therefore, based on the above considerations, the current cut points for BMI probably misclassify some individuals, but the extent of such misclassification is unknown, as is the real impact of any stigmatization that may be associated with being classified as overweight or obese based on BMI alone.

Concerns About Waist Circumference. Waist circumference is not universally accepted as an optimal measure of abdominal adiposity, as some studies have found waist-to-hip ratio or waist-to-height ratio to be better predictors of cardiovascular risk.[30,31] As noted above, ethnicity, age, and gender may modify the specific level of risk associated with a given waist circumference,[1,5,12,16] although ethnicity and age-specific cut-points are still lacking. Furthermore, a consensus panel convened in 2006 by NAASO--the Obesity Society; the American Diabetes Association; and Shaping America's Health: Association for Weight Management and Obesity Prevention-- concluded that a standardized approach for measuring waist circumference in research studies does not exist, as the optimal site at which waist circumference is most strongly correlated with abdominal adipose tissue is variable and the concomitant disease risk has not been established.[10] The panel concluded that there was not sufficient evidence that waist circumference provided enough additional information beyond BMI, blood pressure, and blood glucose and lipid levels to warrant its use clinically.[10] In addition, waist circumference has not as been as well-studied with many health outcomes other than CVD and its risk factors.

Reasons for Inconsistent Associations between BMI and Mortality. Perhaps the most controversy over the use of body size classifications has revolved around the association between BMI and mortality. Some concern focuses on the usefulness of BMI categories, as a number of studies have found that BMI values in the overweight range (25.0-29.9 kg/m^2) are not strongly associated with mortality as compared with BMI values in the normal range (18.5-24.9 kg/m^2).[32-35] Of even greater concern are observed differences in the shape of the relationship between BMI and mortality. While many studies have reported direct, linear associations between BMI and mortality,[36-40] other studies observed J- or U-shaped associations[1] between BMI and mortality.[33,41,42] However, the causes of death at low and

[1] J- and U-shaped associations reflect increased mortality at both lower and higher ranges of BMI values. Thus, the lowest risk of mortality is observed in the normal, overweight, and/or obesity class I categories of BMI.

high BMIs differ. At low BMIs, mortality is more likely due to digestive and pulmonary disease than at higher BMIs, where mortality is often due to CVD, diabetes, and gallbladder disease.[4]

It has been argued that J- or U-shaped associations between BMI and mortality reflect inadequate control of confounding variables.[1,4,37] A significant confounder is smoking, or inadequate measurement of smoking status. Early mortality due to pre-existing clinical or subclinical illness could also increase mortality risk at low BMIs. In addition, inappropriate adjustment for risk factors in the causal pathway, such as hypertension, hyperlipidemia, and diabetes, may result in underestimation of risks associated with overweight.[4]

While these potential confounders are widely known, they continue to be inadequately controlled for in study designs or analyses. For example, a recent study analyzed smoking status only as "current" or "not current,"[34] while another study did not include smoking at all in statistical models.[43] Some studies also fail to account for interactions between BMI and smoking.[41,42] Other studies have not accounted for pre-existing disease[34] or early deaths.[42] Some argue that excluding people with early deaths may not reduce bias and may have little impact on the association between BMI and mortality.[44] However, the lack of impact may be due, in part, to a loss of statistical power that comes from sample size reductions.[37] A recent analysis systematically demonstrated how estimates of J- or U-shaped associations between BMI and mortality may be observed when potential sources of bias are not carefully and comprehensively accounted for in study design and statistical analyses.[37] Unfortunately, it can be difficult to judge the thoroughness of statistical analyses from the limited information provided in the methods sections of many published articles; in other words, merely "adjusting for smoking" may not be sufficient to adequately address potential bias and confounding due to smoking.

J- or U-shaped associations may also reflect the possibility that people in the "normal" weight range are not as aggressively screened or treated for additional cardiovascular or other risk factors. A comparison of relative risks of mortality associated with different levels of BMI across National Health and Nutrition Examination Surveys (NHANES) I (1971-1975), II (1976-1980), and III (1988-1994) found that the impact of obesity on mortality appeared to decrease over time, possibly due to improved medical care, particularly for CVD.[33] Indeed, other analyses have found significantly greater decreases in total cholesterol levels and blood pressure in individuals classified as overweight and obese compared to those classified as normal weight.[45] These decreases paralleled significant increases in the use of cholesterol and blood pressure medications, with the most marked increases seen among overweight and obese adults.[45]

ADVANTAGES OF USING BMI AND WAIST CIRCUMFERENCE

Direct measures of body fatness, such as in vivo neutron inactivation analysis (IVNAA), are expensive and uncommon. Indirect methods, such as densitometry and DXA, are more accurate than the doubly indirect methods of BMI, waist circumference, and bioelectrical impedance, but are still relatively expensive and time consuming.[7] Because they are simple, rapid, and inexpensive, BMI and waist circumference are more practical for use in clinical settings than other measures of body fatness.[1]

Both BMI and waist circumference are believed to help both clinicians and patients monitor changes in body size over time, which may aid efforts to prevent and manage obesity-related diseases.[46] In obese adults with obesity-related diseases, modest weight loss of 5% to 10% of body weight may improve health.[46] In adults who are classified as overweight or obese without obesity-related comorbid conditions, lifestyle interventions may decrease the risk of developing these conditions and prevent further weight gain.[46] BMI can also help screen for conditions related to underweight, including anorexia nervosa.

Waist circumference provides an estimate of abdominal adiposity, which can predict risk of cardiometabolic disease above and beyond BMI.[10] Waist circumference may be easier for the public to understand than BMI,[3] and may be a useful gauge of healthy lifestyle interventions in patients whose BMI is unchanging.[10]

BMI in particular is an easy tool for monitoring obesity at the population level for public health and policy decisions. Cut-points inform policymakers of the percentage of the population at high risk of an adverse health outcome.[7] Changing the cut-points would change the proportion of individuals receiving treatment, as well as the nature and extent of prevention efforts; this could in turn have both short- and long-term financial effects on government, health insurers, and individuals.[7] BMI and waist circumference are also useful to assess the effect of interventions, as well as for estimating economic costs of obesity-related conditions.

DISADVANTAGES OF USING BMI AND WAIST CIRCUMFERENCE

BMI and waist circumference measures are not intended to be the sole indicators of an individual's disease risk.[1] For example, normal-weight obese syndrome has been described in which individuals have a normal weight and BMI (<25 kg/m^2), but have a fat mass > 30%.[47] These individuals do not have metabolic syndrome, but do have higher plasma levels of proinflammatory cytokines, which may raise their risk of later developing obesity, metabolic syndrome, and/or CVD. In addition, people with BMIs below 25 kg/m^2 may present with insulin resistance, hyperinsulinemia, and dyslipidemia, while some individuals with BMIs greater than 30 kg/m^2 and excess body fat may be metabolically healthy (ie, have high insulin sensitivity and normal blood pressure and lipid levels).[48,49] Furthermore, weight gain in adulthood has been associated with increased morbidity and mortality, independent of baseline weight.[4] Thus, monitoring changes in body weight throughout life, as well as monitoring other indicators of disease risk, such as hypertension and dyslipidemia, are necessary to assess an individual's health status.

Categories of overweight and obesity using current cut-points may misclassify the health status of some individuals. As noted above, cut-points for BMI and waist circumference as indicators of overweight or obesity do not apply equally well across all populations. However, multiple cut-points for multiple populations could be confusing, particularly in locations where residents are of mixed cultural, ethnic, and racial heritage.[7]

Specific to waist circumference, trained staff are needed to properly perform this measurement, making it less widely used.[3] Like BMI, waist circumference may not be useful in very short (under 5 feet) individuals, nor does it appear to add additional risk information in those with a BMI ≥ 35.0 kg/m^2. In addition, waist circumference has been correlated with fewer health outcomes than BMI. Also, there is currently no evidence that reducing either waist circumference or BMI through procedures such as liposuction will reduce risk of adverse health outcomes.[50]

In addition, concern exists that overemphasis on BMI or body size alone, without appropriate counseling on healthy lifestyle behaviors, may contribute to unhealthy behaviors or eating disorders, although dieting has not been associated with increased risk of eating disorders in adults.[51] Moreover, overattention to body size may detract from other modifiable risk factors, such as diet and physical activity, which are often independently associated with adverse health outcomes.[16,52,53]

Furthermore, there is little evidence that obesity screening programs improve mortality or morbidity. A 2003 report by the USPSTF did not find any randomized controlled trials that tested the efficacy of obesity screening programs in improving mortality, morbidity, or mental health. Likewise, the report found only limited evidence on the effectiveness of weight loss on clinical outcomes.[54] Another review also concluded that screening for obesity is unlikely to improve morbidity and mortality, due to misclassification of many individuals and lack of effective treatments for obesity.[16]

SCREENING AND PROMOTION OF HEALTHY DIETS AND PHYSICAL ACTIVITY

Since BMI is not the only modifiable risk factor for most conditions, it is also important to monitor other indicators of risk, including high blood pressure and blood cholesterol levels, weight change, and physical inactivity. Healthy diets and physical activity are already recommended for the management of overweight and obesity by the ACP.[55] Similarly, the USPSTF recommends high-intensity counseling about diet and/or physical activity, combined with other behavioral interventions, to promote sustained weight loss in obese adults.[54] The USPSTF also recommends moderate to high intensity behavioral dietary counseling for adults with hyperlipidemia and/or other known risk factors for cardiovascular and other diet-related chronic diseases.[56] However, the USPSTF found insufficient evidence to support moderate or low-intensity counseling and behavioral interventions in overweight and obese adults, as there is little direct evidence that these interventions lower mortality or morbidity related to obesity. Nevertheless, some organizations recommend healthy lifestyle counseling of varying degrees to individuals regardless of their BMI. For example, the American Academy of Family Physicians (AAFP) recommends that all patients aged 2 years and older be advised to "maintain caloric balance."[57] The AAFP also developed a program called "Americans in Motion" (AIM) to encourage physical activity, healthy nutrition, and emotional well-being in all individuals, families, and communities.[58] While healthy diets and physical activity have many health benefits beyond weight loss, and are recommended for healthy individuals of any size or body composition,[4,59,60] the efficacy of routine dietary counseling in all individuals in primary care settings has yet to be established.[56]

SUMMARY AND CONCLUSION

Overall, BMI and waist circumference are simple and affordable tools that help physicians identify changes in body size early, and that support efforts to maintain weight or achieve a modest weight reduction that will provide optimal health benefits to their patients. Both waist circumference and BMI are independent predictors of disease risk. Neither measure alone can predict a patient's absolute disease risk; rather, clinicians should consider these values in conjunction with other information, such as the presence of other diseases, other disease risk factors, and family history.[1] While BMI may inappropriately classify as overweight some individuals who are not at increased risk of disease, it is a useful tool that currently serves as a prompt to screen for other risk factors. However, individuals with normal BMIs should not be assumed to be risk-free, and should likewise be monitored for changes in body size and assessed for other disease risk factors.

The research, policy, and clinical effects of changing the current definitions for overweight and obesity must be carefully considered. BMI currently has wide acceptance as an indicator of overweight and obesity. The NHLBI and WHO reports are careful to point out that BMI is only one of several tools to use in assessing a patient's risk of adverse health conditions, and concern exists about stigmatizing people at relatively low disease risk as overweight or obese. The benefit of measuring waist circumference on a regular basis in clinical settings appears unclear, as it requires additional training of staff and increased office visit time. Of great concern to some physicians and researchers is the differential association between BMI and disease risk across some populations. However, disease risk is not homogeneous even within ethnic or cultural groups, such as "Europeans," "Asians," and "Africans." Multiple cut-points for multiple populations could be confusing, particularly in locations where people are of mixed cultural, ethnic, and racial heritage. Optimal BMI cut-points also may vary by health outcome.

At the present time, it appears more research is needed that specifically examines how health outcomes may vary across populations that are screened using different indicators of overweight and obesity. More research is also needed to address concerns such as patient stigma and utility of waist circumference vs. BMI in clinical settings. Research studies on mortality should carefully address confounding and bias, including the effect of treatment for comorbid conditions (such as medications for hypertension or high cholesterol) among overweight and obese individuals. Perhaps most important is the need for research on effective interventions, at both the individual- and population-level, to prevent and treat adverse health outcomes related to unhealthy body weight, regardless of how body weight is categorized.

In general, the relative risk of adverse health outcomes appears to increase with increasing body size. Thus, measurements of body size, however crude, should be done to monitor change in body size over time, as part of a comprehensive health examination. While more research is needed about the effectiveness of lifestyle counseling by physicians in all patients, there is evidence that high risk individuals may benefit from such counseling. Prevention of weight gain in adulthood should be encouraged in most patients, outside of pregnancy, intense athletic training, or necessary weight restoration following starvation or illness.

RECOMMENDATIONS

The Council on Science and Public Health recommends that the following be adopted and the remainder of this report be filed:

1. That our American Medical Association (AMA) reaffirm Policy D-440.971, "Recommendations for Physician and Community Collaboration on the Management of Obesity," which encourages physicians to incorporate body mass index (BMI) and waist circumference as a component measurement in the routine adult physical examination, recognizing ethnic sensitivities and its relationship to stature.

2. That our AMA support greater emphasis in physician educational programs on the risk differences among ethnic and age groups at varying levels of BMI and the importance of monitoring waist circumference in individuals with BMIs below 35 kg/m^2.

3. That our AMA support additional research on the efficacy of screening for overweight and obesity, using different indicators, in improving various clinical outcomes across populations, including morbidity, mortality, mental health, and prevention of further weight gain.

4. That our AMA support more research on the efficacy of screening and interventions by physicians to promote healthy lifestyle behaviors, including healthy diets and regular physical activity, in all of their patients to improve health and minimize disease risks.

REFERENCES

1. National Institutes of Health National Heart, Lung and Blood Institute. Clinical guidelines on the identification, evaluation, and treatment of overweight and obesity in adults: the evidence report. NIH publication No. 98-4083; 1998.
2. National Center for Health Statistics. Health, United States, 2006, with chartbook on trends in the health of Americans. Hyattsville, MD; 2006.
3. Ford ES, Mokdad AH, Giles WH. Trends in waist circumference among US adults. *Obesity Res.* 2003;11:1223-1231.
4. WHO Expert Committee on Physical Status. The use and interpretation of anthropometry. Report of a WHO Expert Committee. Geneva: World Health Organization; 1995.
5. WHO Consultation on Obesity. Obesity: preventing and managing the global epidemic: Report of a WHO Consultation. Geneva: World Health Organization; 2000.
6. Krebs NF, Himes JH, Jacobson D, Nicklas TA, Guilday P, Styne D. Assessment of child and adolescent overweight and obesity. *Pediatrics.* 2007;120:S193-S228.
7. Appropriate body-mass index for Asian populations and its implications for policy and intervention strategies. *Lancet.* 2004;363:157-163.
8. Janssen I, Katzmarzyk PT, Ross R. Body mass index, waist circumference, and health risk: evidence in support of current National Institutes of Health guidelines. *Arch Intern Med.* 2002;162:2074-2079.
9. Janssen I, Heymsfield SB, Allison DB, Kotler DP, Ross R. Body mass index and waist circumference independently contribute to the prediction of nonabdominal, abdominal subcutaneous, and visceral fat. *Am J Clin Nutr.* 2002;75:683-688.
10. Klein S, Allison DB, Heymsfield SB, et al. Waist circumference and cardiometabolic risk: a consensus statement from Shaping America's Health: Association for Weight Management and Obesity Prevention; NAASO, The Obesity Society; the American Society for Nutrition; and the American Diabetes Association. *Am J Clin Nutr.* 2007;85:1197-1202.
11. Janssen I, Katzmarzyk PT, Ross R. Waist circumference and not body mass index explains obesity-related health risk. *Am J Clin Nutr.* 2004;79:379-384.
12. Ardern CI, Katzmarzyk PT, Janssen I, Ross R. Discrimination of health risk by combined body mass index and waist circumference. *Obesity Res.* 2003;11:135-142.
13. Zhu S, Heshka S, Wang Z, et al. Combination of BMI and waist circumference for identifying cardiovascular risk factors in whites. *Obesity Res.* 2004;12:633-645.
14. Sanchez AM, Reed DR, Price RA. Reduced mortality associated with body mass index (BMI) in African Americans relative to Caucasians. *Ethn Dis.* 2000;10:24-30.
15. Fontaine KR, Redden DT, Wang C, Westfall AO, Allison DB. Years of life lost due to obesity. *JAMA.* 2003;289:187-193.
16. Wilson AR, McAlpine DD. The effectiveness of screening for obesity in primary care: weighing the evidence. *Med Care Res Rev.* 2006;63:570-598.
17. Fernandez JR, Heo M, Heymsfield SB, et al. Is percentage body fat differentially related to body mass index in Hispanic Americans, African Americans, and European Americans? *Am J Clin Nutr.* 2003;77:71-75.
18. Gallagher D, Visser M, Sepulveda D, Pierson RN, Harris T, Heymsfield SB. How useful is body mass index for comparison of body fatness across age, sex, and ethnic groups? *Am J Epidemiol.* 1996;143:228-239.
19. Henderson SO, Haiman CA, Wilkens LR, Kolonel LN, Wan P, Pike MC. Established risk factors account for most of the racial differences in cardiovascular disease mortality. *PLoS ONE.* 2007;2:e377.
20. Thomas AJ, Eberly LE, Davey Smith G, Neaton JD, Stamler J, for the Multiple Risk Factor Intervention Trial Research Group. Race/ethnicity, income, major risk factors, and cardiovascular disease mortality. *Am J Public Health.* 2005;95:1417-1423.
21. Patt MR, Yanek LR, Moy TF, Becker DM. Assessment of global coronary heart disease risk in overweight and obese African-American women. *Obes Res.* 2003;11:660-667.
22. Shiwaku K, Anuurad E, Enkhmaa B, et al. Overweight Japanese with body mass indexes of 23.0-24.9 have higher risks for obesity-associated disorders: a comparison of Japanese and Mongolians. *Int J Obes Relat Metab Disord.* 2004;28:152-158.

23. Rush EC, Goedecke JH, Jennings C, et al. BMI, fat and muscle differences in urban women of five ethnicities from two countries. *Int J Obes (Lond).* 2007;31:1232-1239.
24. Villareal DT, Apovian CM, Kushner RF, Klein S. Obesity in older adults: technical review and position statement of the American Society for Nutrition and NAASO, The Obesity Society. *Am J Clin Nutr.* 2005;82:923-934.
25. Ode JJ, Pivarnik JM, Reeves MJ, Knous JL. Body mass index as a predictor of percent fat in college athletes and nonathletes. *Med Sci Sports Exerc.* 2007;39:403-409.
26. Lynch NA, Ryan AS, Evans J, Katzel LI, Goldberg AP. Older elite football players have reduced cardiac and osteoporosis risk factors. *Med Sci Sports Exerc.* 2007;39:1124-1130.
27. Harp JB, Hecht L. Obesity in the National Football League. *JAMA.* 2005;293:1061-1062.
28. George CFP, Kab V, Levy AM. Increased prevalence of sleep-disordered breathing among professional football players. *N Engl J Med.* 2003;348:367-368.
29. Strawbridge WJ, Wallhagen MI, Shema SJ. New NHLBI clinical guidelines for obesity and overweight: will they promote health? *Am J Public Health.* 2000;90:340-343.
30. Schneider HJ, Glaesmer H, Klotsche J, et al. Accuracy of anthropometric indicators of obesity to predict cardiovascular risk. *J Clin Endocrinol Metab.* 2007;92:589-594.
31. See R, Abdullah SM, McGuire DK, et al. The association of differing measures of overweight and obesity with prevalent atherosclerosis: the Dallas Heart Study. *J Am Coll Cardiol.* 2007;50:752-759.
32. Allison DB, Fontaine KR, Manson JE, Stevens J, VanItallie TB. Annual deaths attributable to obesity in the United States. *JAMA.* 1999;282:1530-1538.
33. Flegal KM, Graubard BI, Williamson DF, Gail MH. Excess deaths associated with underweight, overweight, and obesity. *JAMA.* 2005;293:1861-1867.
34. Gronniger JT. A semiparametric analysis of the relationship of body mass index to mortality. *Am J Public Health.* 2006;96:173-178.
35. Romero-Corral A, Montori VM, Somers VK, et al. Association of bodyweight with total mortality and with cardiovascular events in coronary artery disease: a systematic review of cohort studies. *Lancet.* 2006;368:666-678.
36. Ajani UA, Lotufo PA, Gaziano JM, et al. Body mass index and mortality among US male physicians. *Ann Epidemiol.* 2004;14:731-739.
37. Gelber RP, Kurth T, Manson JE, Buring JE, Gaziano JM. Body mass index and mortality in men: evaluating the shape of the association. *Int J Obes (Lond).* 2007;31:1240-1247.
38. Manson JE, Willett WC, Stampfer MJ, et al. Body weight and mortality among women. *N Engl J Med.* 1995;333:677-685.
39. Lee IM, Manson JE, Hennekens CH, Paffenbarger RS Jr. Body weight and mortality: a 27-year follow-up of middle-aged men. *JAMA.* 1993;270:2823-2828.
40. Hu FB, Willett WC, Li T, Stampfer MJ, Colditz GA, Manson JE. Adiposity as compared with physical activity in predicting mortality among women. *N Engl J Med.* 2004;351:2694-2703.
41. Baik I, Ascherio A, Rimm EB, et al. Adiposity and mortality in men. *Am J Epidemiol.* 2000;152:264-271.
42. Calle EE, Thun MJ, Petrelli JM, Rodriguez C, Heath CW Jr. Body-mass index and mortality in a prospective cohort of US adults. *N Engl J Med.* 1999;341:1097-1105.
43. Bender R, Jockel KH, Trautner C, Spraul M, Berger M. Effect of age on excess mortality in obesity. *JAMA.* 1999;281:1498-1504.
44. Allison DB, Heo M, Flanders DW, Faith MS, Carpenter KM, Williamson DF. Simulation study of the effects of excluding early deaths on risk factor-mortality analyses in the presence of confounding due to occult disease: the example of body mass index. *Ann Epidemiol.* 1999;9:132-142.
45. Gregg EW, Cheng YJ, Cadwell BL, et al. Secular trends in cardiovascular disease risk factors according to body mass index in US adults. *JAMA.* 2005;293:1868-1874.
46. Douketis JD, Paradis G, Keller H, Martineau C. Canadian guidelines for body weight classification in adults: application in clinical practice to screen for overweight and obesity and to assess disease risk. *CMAJ.* 2005;172:995-998.
47. De Lorenzo A, Del G, V, Premrov MG, Bigioni M, Galvano F, Di Renzo L. Normal-weight obese syndrome: early inflammation? *Am J Clin Nutr.* 2007;85:40-45.
48. Karelis AD, St Pierre DH, Conus F, Rabasa-Lhoret R, Poehlman ET. Metabolic and body composition factors in subgroups of obesity: what do we know? *J Clin Endocrinol Metab.* 2004;89:2569-2575.
49. Karelis AD, Faraj M, Bastard JP, et al. The metabolically healthy but obese individual presents a favorable inflammation profile. *J Clin Endocrinol Metab.* 2005;90:4145-4150.

50. Klein S, Fontana L, Young VL, et al. Absence of an effect of liposuction on insulin action and risk factors for coronary heart disease. *N Engl J Med.* 2004;350:2549-2557.
51. National Task Force on the Prevention and Treatment of Obesity. Dieting and the development of eating disorders in overweight and obese adults. *Arch Intern Med.* 2000;160:2581-2589.
52. Sui X, LaMonte MJ, Laditka JN, et al. Cardiorespiratory fitness and adiposity as mortality predictors in older adults. *JAMA.* 2007;298:2507-2516.
53. Deckelbaum RJ, Fisher EA, Winston M, et al. Summary of a scientific conference on preventive nutrition: pediatrics to geriatrics. *Circulation.* 1999;100:450-456.
54. Screening for obesity in adults: recommendations and rationale. *Ann Intern Med.* 2003;139:930-932.
55. Snow V, Barry P, Fitterman N, Qaseem A, Weiss K. Pharmacologic and surgical management of obesity in primary care: a clinical practice guideline from the American College of Physicians. *Ann Intern Med.* 2005;142:525-531.
56. Behavioral counseling in primary care to promote a healthy diet: recommendations and rationale. *Am J Prev Med.* 2003;24:93-100.
57. American Academy of Family Physicians. Summary of Policy Recommendations for Periodic Health Examinations. Revision 5.4, August 2003. Leawood, KS: American Academy of Family Physicians; 2003.
58. American Academy of Family Physicians Initiative. AIM Americans In Motion. Available at: http://www.aafp.org/online/en/home/clinical/publichealth/aim/foryouroffice.html. Accessed 03/10/08.
59. US Department of Health and Human Services and US Department of Agriculture. Dietary Guidelines for Americans, 2005. 6th ed. Washington, DC: US Government Printing Office; 2005.
60. Haskell WL, Lee IM, Pate RR et al. Physical activity and public health: updated recommendation for adults from the American College of Sports Medicine and the American Heart Association. *Med Sci Sports Exerc.* 2007;39:1423-1434.

Table 1. World Health Organization classification of adult weight by BMI[5,7]

Classification	BMI (kg/m^2)	Risk of comorbidities
Underweight	< 18.5	Low (but risk of other clinical problems increased)
Normal range	18.50-24.99	Average
Overweight	≥ 25.00	
Preobese	25.00-29.99	Increased
Obesity	≥ 30.00	
Obese class I	30.00-34.99	Moderate
Obese class II	35.00-39.99	Severe
Obese class III	≥ 40.00	Very severe

Table 2. National Heart Lung and Blood Institute classifications of overweight and obesity by BMI and waist circumference in adults [1]

		Risk of type 2 diabetes, hypertension, and CVD *relative* to normal weight and waist circumference*	
	BMI (kg/m^2)	Men ≤ 40 in Women ≤ 35 in	Men ≥40 in Women ≥ 35 in
Underweight	< 18.5	---	---
Normal weight	18.5 – 24.9	---	---
Overweight	25.0 – 29.9	Increased	High
Obesity (Class I)	30.0 – 34.9	High	Very High
Obesity (Class II)	35.0 – 39.9	Very High	Very High
Extreme obesity (Class III)	≥ 40	Extremely High	Extremely High

*NHLBI guidelines note that increased waist circumference can indicate increased disease risk even in individuals considered normal weight.

Table 3. Guidelines on screening for overweight and obesity in adults

Organization	Policy, recommendation, and/or guidelines
AMA	Encourages physicians to properly screen for overweight and obesity using BMI and waist circumference in adults, while recognizing ethnic sensitivities and their relationship to stature (also see Appendix). National Obesity Summit recommendations encourage routine measurement of BMI and waist circumference.
American Academy of Family Physicians (AAFP)	Recommends measuring height and weight periodically in all patients and uses CDC definitions of overweight and obesity. The AAFP has educational toolkits to help physicians measure BMI.
American Association of Clinical Endocrinologists (AACE) and American College of Endocrinology (ACE)	Recommend assessing body fat via weight-for-height, BMI, waist-to-hip ratio, waist circumference, and "any other valid methods" as part of a comprehensive medical examination.
American College of Preventive Medicine (ACPM)	Recommends periodic measurement of BMI in all adults and endorses the NIH practical guidelines in advising overweight and obese patients.
American Heart Association and the American College of Cardiology Foundation	Recommend screening for both BMI and waist circumference, but note that some obese people classified as obese may have normal amounts of body fat and a large muscle mass and are not at increased risk of coronary heart disease (CHD), while some people with a normal BMI have high body fat and small muscle mass and are at increased risk of CHD.
Health Canada Guidelines for Body Weight Classification in Adults	Classify body weight using same BMI and waist circumference categories as WHO and NHLBI as part of overall health risk assessment.
Centers for Disease Control and Prevention (CDC)	Classify body weight by NHLBI BMI categories. Recommends assessing additional risk using waist circumference and other risk factors.
The Endocrine Society and the Hormone Foundation	Overweight and obesity classified using NHLBI definitions.
National Heart, Lung, and Blood Institute (NHLBI) and the North American Association for the Study of Obesity(NAASO)	Body weight classified using categories of BMI (kg/m^2) as defined in Table 2. Recommends measuring waist circumference in individuals with a BMI of 25-34.9 kg/m^2
US Preventive Services Task Force (USPSTF)	Recommends screening for overweight and obesity using BMI[54]
World Health Organization (WHO)	Body weight classified using categories of BMI (kg/m^2) as defined in Table 1. Additional cut-points of 23, 27.5, 32.5, and 37.5 kg/m^2 are recommended for public health action in many Asian populations. Recommends measuring waist circumference but has not defined cut-points.

APPENDIX - Relevant AMA policy related to obesity

Policy D-440.971 Recommendations for Physician and Community Collaboration on the Management of Obesity
Our AMA will: (1) work with the Centers for Disease Control and Prevention to convene relevant stakeholders to evaluate the issue of obesity as a disease, using a systematic, evidence-based approach; (2) continue to actively pursue measures to treat obesity as an urgent chronic condition, raise the public's awareness of the significance of obesity and its related disorders, and encourage health industries to make appropriate care available for the prevention and treatment of obese patients, as well as those who have co-morbid disorders; (3) encourage physicians to incorporate body mass index (BMI) and waist circumference as a component measurement in the routine adult

physical examination, and BMI percentiles in children recognizing ethnic sensitivities and its relationship to stature, and the need to implement appropriate treatment or preventive measures; (4) promote use of our Roadmaps for Clinical Practice: Assessment and Management of Adult Obesity primer in physician education and the clinical management of adult obesity; (5) develop a school health advocacy agenda that includes funding for school health programs, physical education and physical activity with limits on declining participation, alternative policies for vending machines that promote healthier diets, and standards for healthy a la carte meal offerings. Our AMA will work with a broad partnership to implement this agenda; and (6) collaborate with the CDC, the Department of Education, and other appropriate agencies and organizations to consider the feasibility of convening school health education, nutrition, and exercise representatives, parents, teachers and education organizations, as well as other national experts to review existing frameworks for school health, identify basic tenets for promoting school nutrition and physical activity (using a coordinated school health model), and create recommendations for a certificate program to recognize schools that meet a minimum of the tenants. (CSA Rep. 4, A-05)

H-150.953 Obesity as a Major Public Health Program
Our AMA will: (1) urge physicians as well as managed care organizations and other third party payers to recognize obesity as a complex disorder involving appetite regulation and energy metabolism that is associated with a variety of comorbid conditions; (2) work with appropriate federal agencies, medical specialty societies, and public health organizations to educate physicians about the prevention and management of overweight and obesity in children and adults, including education in basic principles and practices of physical activity and nutrition counseling; such training should be included in undergraduate and graduate medical education and through accredited continuing medical education programs; (3) urge federal support of research to determine: (a) the causes and mechanisms of overweight and obesity, including biological, social, and epidemiological influences on weight gain, weight loss, and weight maintenance; (b) the long-term safety and efficacy of voluntary weight maintenance and weight loss practices and therapies, including surgery; (c) effective interventions to prevent obesity in children and adults; and (d) the effectiveness of weight loss counseling by physicians; (4) encourage national efforts to educate the public about the health risks of being overweight and obese and provide information about how to achieve and maintain a preferred healthy weight; (5) urge physicians to assess their patients for overweight and obesity during routine medical examinations and discuss with at-risk patients the health consequences of further weight gain; if treatment is indicated, physicians should encourage and facilitate weight maintenance or reduction efforts in their patients or refer them to a physician with special interest and expertise in the clinical management of obesity; (6) urge all physicians and patients to maintain a desired weight and prevent inappropriate weight gain; (7) encourage physicians to become knowledgeable of community resources and referral services that can assist with the management of overweight and obese patients; and (8) urge the appropriate federal agencies to work with organized medicine and the health insurance industry to develop coding and payment mechanisms for the evaluation and management of obesity. (CSA Rep. 6, A-99)

2. CSAPH'S SUNSET REVIEW OF 1998 HOUSE DIRECTIVES AND POLICIES

HOUSE ACTION: RECOMMENDATION ADOPTED AS FOLLOWS AND REMAINDER OF REPORT FILED

At its 1984 Interim Meeting, the House of Delegates established a sunset mechanism for House policies (Policy G-600.110, AMA Policy Database). Under this mechanism, a policy established by the House ceases to be viable after 10 years unless action is taken by the House to retain it.

The objective of the sunset mechanism is to help ensure that the AMA Policy Database is current, coherent, and relevant. By eliminating outmoded, duplicative, and inconsistent policies, the sunset mechanism contributes to the ability of the AMA to communicate and promote its policy positions. It also contributes to the efficiency and effectiveness of House of Delegates deliberations.

At its 2002 Annual Meeting, the House modified Policy G-600.110 to change the process through which the policy sunset review is conducted. The process now includes the following steps:

- In the spring of each year, the House policies that are subject to review under the policy sunset mechanism are identified.
- Using the areas of expertise of the AMA Councils as a guide, the staffs of the AMA Councils determine which policies should be reviewed by which Councils.

- For the Annual Meeting of the House, each Council develops a separate policy sunset report that recommends how each policy assigned to it should be handled. For each policy it reviews, a Council may recommend one of the following actions: (a) retain the policy; (b) rescind the policy; or (c) retain part of the policy. A justification must be provided for the recommended action on each policy.
- The Speakers assign the policy sunset reports for consideration by the appropriate Reference Committees.

Although the policy sunset review mechanism may not be used to change the meaning of AMA policies, minor editorial changes can be accomplished through the sunset review process.

In this report, the Council on Science and Public Health presents its recommendations on the disposition of the House directives and policies from 1998 that were assigned to it. The CSAPH's recommendations on policies are presented in the Appendix to this report.

RECOMMENDATION

The Council on Science and Public Health recommends that the House of Delegates directives and policies that are listed in the Appendix to this report be acted upon in the manner indicated in the Appendix and the remainder of this report be filed.

APPENDIX - Recommended Actions on 1998 House Policies and Directives

Policy Number	Title	Recommended Action and Rationale
D-10.999	Prevention of Injuries to Children from Recreational Trampoline Use	Rescind. AMA contacted the Consumer Product Safety Commission, American College of Sports Medicine, American Academy of Pediatrics, and the Centers for Disease Control and Prevention on this issue. The AAP does not recommend the use of home trampolines; the American Academy of Orthopaedic Surgeons has developed safety recommendations and information.
D-15.998	School Bus Safety	Rescind. AMA contacted the US Department of Transportation and the National Transportation Safety Board requesting such a study and action.
D-15.999	Options for Improving Motorcycle Safety	Retain in part. Eliminate sections (2) and (4) as these are not strategic priorities, and the Motorcycle Safety Booklet was published by NHSA in 1999.
D-20.998	Bloodborne Pathogen Transmission to and from Health Care Workers	Retain. Still relevant.
D-45.999	Air Travel Safety	Rescind. Directive was accomplished.
D-55.999	Colorectal Cancer Screening and Surveillance in People at Average and at Increased Risk	Rescind. The Physicians Consortium for Performance Improvement has developed measures on colorectal cancer screening, to be reviewed every 3 years.
D-60.999	Health Care for Young Adults	Rescind. Discussions were held with the National Institute of Child Health and Human Development, Society of Adolescent Medicine, and AAP. The AMA, through our own national initiative on adolescent preventive services, worked with these and other groups to promote healthcare for young adults.
D-150.999	Truth in Nutrition Labeling Related to Trans Fatty Acids	Rescind. The FDA has required the declaration of trans fatty acids in nutrition labeling since January 2006 (Final Rule published July 11, 2003)

Policy Number	Title	Recommended Action and Rationale
D-165.997	Physician Education of Their Patients About Prescription Medicines	Retain. Continue to support and disseminate Guidelines for Counseling Patients About Prescription Medications in the Ambulatory Setting.
D-220.999	Update on AMA Activities with other Accreditation Organizations	Rescind. The goal of the directive has been accomplished. The Joint Commission maintains a Sentinel Event Advisory Group.
D-280.998	Economic Impact of PASARR on Hospitals, Physicians, and Patients	Rescind. This is part of contemporary general practice.
D-425.998	Priorities in Clinical Prevention Services	Rescind. Accomplished. The Partnership for Prevention has continued to study priorities for clinical preventive services and has published additional reports.
D-425.999	Public and Private Funding of Prevention Research	Retain. Still relevant given the large increase in bottled water consumption.
D-440.998	Potential Accreditation Process for Public Health Departments	Rescind. Accreditation process is being developed through NACCHO, APHA, and others.
D-440.999	Chemical Analysis Report of Public and Commercial Water	Retain. Still relevant given the large increase in bottled water consumption.
D-450.999	American Medical Accreditation Program (AMAP)	Rescind. AMAP is no longer in existence.
D-490.998	Tobacco Control and Settlement	Retain in part. Still relevant. Delete (3). Accomplished.
D-490.999	Coding for Health Problems Related to Tobacco Use	Rescind. Accomplished.
D-515.999	Research on Violence in School Settings	Rescind. Accomplished. The AMA convened a National Commission that published a report on the prevention of school violence.
H-10.970	Use of Protective Eyewear by Athletes	Retain. AAP and AAO updated their policy statement in 2004.
H-10.971	Safety of Off-Road Motorized Vehicles	Rescind. Several groups have worked to accomplish this task.
H-10.977	Helmets and Preventing Motorcycle- and Bicycle-Related Injuries	Retain. Still relevant.
H-10.989	Better Fire Prevention in Public Buildings	Retain in part. Minor editorial change deleting the words “more stringent” to read as follows: The AMA urges state public authorities to consider enactment of ~~more stringent~~ uniform fire protection codes in public buildings, for the risks such furnishings hold for the emission of toxic gases as well as intense heat, and (2) at least in the case of new construction, the introduction of expanded sprinkler systems and fully automatic smoke detectors.
H-15.956	Options for Improving Motorcycle Safety	Retain. Still relevant.
H-15.971	Receipt of Federal Highway Funds and Motorcycle Helmet Laws	Retain. Some states still lack mandatory helmet laws.
H-15.980	Motorcycle Safety	Retain. Still relevant.

Policy Number	Title	Recommended Action and Rationale
H-15.994	State Motorcycle Helmet Laws	Retain. Still valid approach to public health safety. A few states lack any helmet laws, and many have laws that do not apply to all riders.
H-15.997	Elderly's Eligibility for Automobile Insurance and Licensure	Retain. Still relevant.
H-15.998	Driver Education in Secondary Schools	Retain. Still relevant.
H-25.996	Retirement and Hiring Practices	Retain. Still relevant with the aging of the American population.
H-25.998	Policy Recommendations in the Field of Aging	Retain. Still relevant.
H-25.999	Health Care for Older Patients	Retain. Still relevant.
H-30.999	Admission of Alcoholics to General Hospitals	Retain. Still very relevant.
H-35.999	Medicine and Pharmacy Relations	Retain. Still valid.
H-45.980	Airborne Infections on Commercial Flights	Retain as recommended by the Aerospace Medical Association.
H-45.989	Child Safety Restraint Use in Aircraft	Retain as recommended by the Aerospace Medical Association.
H-45.990	Programs Which Reduce Drug and Alcohol Use in All Facets of Aviation	Retain. Most, but not all, personnel are covered by Federal Aviation Administration testing requirements.
H-45.992	Airplane Safety	Retain as recommended by the Aerospace Medical Association.
H-45.999	Implied Consent for Alcohol Level Tests in Pilots	Retain as recommended by the Aerospace Medical Association.
H-50.986	Blood Donations by Donors over 65 Years of Age	Retain. The AMA continues to support the donation of blood by healthy donors over age 65 years.
H-50.987	Autologous Transfusions for Elective Surgery	Retain. AMA continues to advocate for patient education regarding autologous transfusion.
H-50.998	Definition of Blood as a Medical Service	Retain. AMA continues to endorse the concept that the procurement, processing, distribution, or use of human blood and other human tissues is the rendering of medical services by all who participate and not the selling of a commodity.
H-50.999	Blood Banks	Retain. AMA continues to support the concept that the medical profession has primary responsibility for the care and treatment of patients; and, therefore, has a paramount interest in evaluating facilities and procedures for blood procurement, storage, and use.
H-55.980	Skin Cancer Self-Examination	Retain. Still relevant as recommended by the American Academy of Dermatology.
H-55.981	Carcinoma of the Colon and Rectum	Retain. Policy conforms to US Preventive Services Task Force Guidelines on screening for colorectal cancer.

Policy Number	Title	Recommended Action and Rationale
H-55.988	Uniform Cancer Staging	Retain with editorial changes on (1) to reflect current terminology to read as follows: The AMA (1) endorses the tumor, node involvement, metastasis (TNM) system accepted by the American Joint Committee and the International Union Against Cancer ~~Staging System~~ for staging of ~~C~~cancer;
H-60.947	Guns in School Settings	Retain. Still Relevant.
H-60.987	Health Care Needs of Homeless and Runaway Youths	Rescind. Although the issue is still relevant, the strategy is no longer current.
H-60.989	Sexually Oriented Advertising to Youth	Retain. Still relevant.
H-60.990	Child Pornography	Retain in part (2, 4, 5, and 6), deleting sections 1, 3, and 7. While the issue of child pornography is relevant, the activities referred to in 1, 3 and 7 are not addressed in current AMA strategic objectives.
H-90.991	Handicapped Parking Spaces	Retain. Still relevant.
H-95.951	Role of Self-Help in Addiction Treatment	Retain. Still relevant.
H-95.980	Increased Funding for Drug-Related Programs	Retain. Still a major health need.
H-95.981	Drug Abuse in the United States – A Policy Report	Retain. While these strategies are being acted upon, they need to be maintained.
H-95.999	Disposable Syringes	Retain. AMA continues to request manufacturers of disposable needles and syringes to adopt designs to prevent reuse and provide clear direction for correct disposal.
H-100.970	Informational Campaign on Diethylstilbestrol	Retain. CDC continues to maintain educational resources for consumers and physicians on this subject.
H-100.987	Insufficient Testing of Pharmaceutical Agents in Children	Retain. Still relevant.
H-120.967	Dispensing of Computer Generated Drug Information	Retain in part. Delete from “through” to “drug-related therapy, and” in (1) to read: The AMA continues to cooperate with the National Council on Patient Information and Education (NCPIE), USP, the FDA and others to establish standards for patient information.
H-120.987	American Pharmacists Association	Retain with edit. American Pharmacists Association acronym is APhA, not APA.
H-120.999	Refilling of Prescriptions	Retain. Still relevant.
H-125.995	Therapeutic and Pharmaceutical Alternatives by Pharmacists	Retain. Still valid.
H-135.952	Manganese in Gasoline	Retain. Still relevant, as MMT is still being studied by the EPA.
H-135.956	Human and Environmental Health Impacts of Chlorinated Chemicals	Retain. Still relevant.

Policy Number	Title	Recommended Action and Rationale
H-135.980	A Permanent United States-Mexico Border Environmental Health Commission	Rescind. Already accomplished.
H-135.981	Medical Perspective on Nuclear Power	Retain in part with the following minor edits in (6) and (7) to read as follows: (6) Radiation exposures of workers – Exposures of workers to ionizing radiation in US nuclear power plants have diminished ~~during the past decade~~ and are extremely low. (7) Disposal of radioactive wastes – The nation should continue ~~strenuous~~ efforts to reach ~~the~~ a national goal ~~set by Congress~~, ~~that~~ for all states ~~by January 1, 1993, should~~ to make arrangements for the disposal of low-level radioactive wastes generated within their borders. All methods of generating electricity involve the production of wastes requiring disposal.
H-135.982	Low Level Radioactive Wastes	Retain. Still relevant.
H-135.983	Infectious Medical Waste	Rescind. Accomplished. The Joint Commission hospital accreditation Standard E.C.3.10 states: "The hospital manages its hazardous materials and waste risks."
H-150.965	Eating Disorders	Retain in part. Direct comparisons of the different consequences of under- and overweight are unwarranted. In addition, there is currently insufficient evidence supporting the efficacy of many educational and counseling materials related to unhealthy eating and weight restrictive behaviors, and concerns remain regarding the potential harmfulness of untested programs. In (4) delete the word "available" and insert "appropriate" as follows: (4) participate in this effort by consulting with appropriate specialty societies and by assisting in the dissemination of ~~available~~ appropriate educational and counseling materials pertaining to unhealthy eating, dieting, and weight restrictive behaviors.
H-150.975	Dangerous Health and Diet Books	Retain. Still relevant.
H-160.932	Asthma Control	Retain in part, with editorial changes to reflect relevant updates from ERP-3 to read as follows: The AMA: (1) encourages physicians to make appropriate use of evidence-based guidelines, including those contained in Expert Panel Report III: Guidelines for the Diagnosis and Management of Asthma released by the National Heart, Lung and Blood Institute; ~~Furthermore, the AMA believes practice guidelines should be evidence-based and urges that all future guidelines for the diagnosis and management of chronic diseases such as asthma be evidence-based;~~ (2) encourages physicians to provide self-management education, tailored to the literacy level of the patient by teaching and reinforcing appropriate self-monitoring, the use of a written asthma action plan, taking medication correctly, and avoiding environmental factors that worsen asthma; and ~~to patients about asthma and the principles of asthma self-management as follows: (a) The AMA insists that patient education be based on evaluated models using appropriate effective self-management; (b) The AMA encourages physicians to participate in training based on evaluated physician education models that can enhance their teaching and communication skills enabling them to provide patient education that engenders positive change in patients; (c) The AMA encourages physicians to~~

Policy Number	Title	Recommended Action and Rationale
		~~augment their own patient education whenever possible by referring patients to comprehensive asthma education programs based on evaluated models; and~~ (3) encourages physicians to incorporate the four components of care (assessment and monitoring; education; control of environmental factors and comorbid conditions; and appropriate medication selection and use. ~~monitor outcomes of their asthma treatment through instruments such as the Asthma Outcomes Monitoring System (AOMS) developed by the Joint Council of Allergy, Asthma, and Immunology.~~
H-160.938	Disease-Specific Self-Management Programs	Retain. Still relevant.
H-160.942	Evidence-Based Principles of Discharge and Discharge Criteria	Retain. Still relevant.
H-170.985	Science Education	Retain in part to read as follows: The AMA supports working with other concerned organizations and agencies to identify ways to improve science education and science literacy in the nation, and to increase interest in science and education on the part of the nation's youth. ~~(2) urges coordination with other agencies in the implementation of an action plan; and (3) encourages efforts to obtain grants from industry and other organizations in partial support of this effort.~~
H-215.991	Medicare Hospital Inspection and Certification Process	Retain. Still relevant.
H-220.933	Critical Relevancy of Medical Staff in JCAHO Standards	Retain. The Joint Commission accreditation standards MS.1.20 and MS.4.50 provide for fair hearing and appeal processes. However, because there continue to be hospital-physician conflicts, the relevance of this policy is critical for AMA monitoring and advocacy on behalf of medical staffs.
H-220.934	Conflicting Accreditation Standards among Various Accreditors	Retain. This policy supports the AMA's need to continuously monitor and make recommendations to accrediting organizations to ensure that problems and conflicts are resolved.
H-220.935	JCAHO Policy on Sentinel Events	Rescind. The Joint Commission's Sentinel Event is no longer "new" and is currently in place. Accomplished.
H-220.966	Future Directions of the JCAHO	Retain. The relevance of this policy is enduring. *Note: Consideration should be given to amending the title as it does not reflect the intent of the policy.*
H-220.994	Assuring Cost-Effective Procedures	Rescind. Accomplished. The Joint Commission launched its nationwide Cooperative Accreditation Initiative in 1995 to reduce the cost and duplication of survey and inspection activity experienced by hospitals and other health care organizations.
H-260.985	Policy for Physician Office Laboratory	Rescind. Prototype policies already exist. Physician office laboratories are required to comply with CLIA. Although there is no similar mandatory quality program adopted for office radiology, the American College of Radiology recommends a number of measures to ensure the highest quality imaging services.
H-260.986	Quality Control in Cervical Cytology – the Papanicolau Smear	Rescind per recommendation of College of American Pathologists.

Policy Number	Title	Recommended Action and Rationale
H-260.987	Laboratory Testing	Rescind. Currently there is no requirement that all commercial laboratories servicing Medicare patients be operated by physicians or by scientists with doctoral degrees. Only labs performing high-complexity tests (including microscopy) must be operated by a physician or scientist with a doctoral degree. Directors of labs performing only waived or moderate-complexity tests are not required to hold a doctoral degree. All clinical laboratories, whether or not they are servicing Medicare patients, are bound by these CLIA regulations.
H-260.999	Ocular Tissue Examination	Rescind. Not a relevant topic for AMA policy statement.
H-275.939	Internet Gambling	Retain. Still relevant.
H-280.958	Pain Control in Long-Term Care	Retain. Still a relevant issue.
H-280.963	Drug Regimen Review in Long Term Care Settings	Retain. Still relevant.
H-295.902	Alternative Medicine	Retain. Still relevant.
H-345.990	Electroconvulsive Therapy	Retain. Some still view this as an archaic and outmoded approach.
H-360.998	Cardiac Resuscitation by Nurses	Retain. Still relevant.
H-410.968	Criteria and Process to Evaluate Clinical Practice Guidelines	Rescind. The AMA no longer has a Recognition Program for practice parameters.
H-410.973	AMA Role in Practice Parameters	Rescind. The AMA no longer has the Practice Parameters Partnership and Forum and we no longer use the term “practice parameters.”
H-420.977	Posting of Warnings Against Use of Alcohol During Pregnancy	Retain. Only 22 states have mandatory signage; federal legislation covers only alcohol containers.
H-425.990	Prevention of Coronary Artery Disease	Retain. Still relevant.
H-425.996	Health Screening Programs	Retain. Still relevant.
H-440.900	Treatment of Chlamydia Trachomatis	Retain. AMA continues to support strategies used to control sexually transmitted diseases and control of chlamydia trachomatis and encourages physicians to participate in these strategies.
H-440.901	Achieving National Adolescent Immunization Goals by the Year 2002	Retain in part. AMA should retain this concept, but delete “for the Years 2000 and 2002.”
H-440.965	The Future of Public Health	Retain. Still relevant and aligned with AMA strategic priorities.
H-440.966	Elimination of Tuberculosis as a Public Health Problem	Retain in part. AMA should continue to endorse the plan but should delete “below 3.5 cases per 100,000 Americans per year by the year 2000, and”
H-440.997	Research and Control of Gonorrhea	Retain. AMA continues to reaffirm its concern and urge additional support of research and control of gonorrhea.
H-440.998	US Public Health Service	Retain. Still relevant.

Policy Number	Title	Recommended Action and Rationale
H-440.999	Increase in Venereal Disease	Retain. AMA recognizes the resurgence of syphilis and gonorrhea to the proportions of a national health problem and supports AMA's inquiry of the causative factors for the sharp increase in diseases for which a simple cure is available.
H-450.953	Preoperative Diagnostic Laboratory Panels	Rescind. Already accomplished.
H-450.985	Necessary Limitations in Use of Quality Screening Systems	Rescind. Local institutions determine common practice..
H-460.923	Melanoma Registry	Retain. Melanoma is on the rise and registry, which could assist in research, does not exist.
H-460.973	Protection of Scientific Freedom from Special Interest Groups	Retain. Still relevant.
H-460.974	Animal Research/Rights	Retain. Still relevant.
H-460.991	Use of Animals in Research	Rescind. Covered by H-460.979, Use of Animals in Research
H-470.976	Abuse of Anabolic Steroids	Retain. Still relevant.
H-470.983	Boxing as a Health Hazard	Legislative approach is not feasible. Retain in part, delete (3) as follows: The AMA (1) supports publicizing the deleterious effects of boxing on the health of participants; and (2) encourages the elimination of boxing from amateur scholastic, intercollegiate and governmental athletic programs as detrimental to the health of participants. ~~(3) supports model legislation seeking to curtail the utilization of boxing as a public spectacle to the extent feasible.~~
H-470.993	Weight Loss in Amateur Wresting	Retain in part to read as follows: Our AMA : (1) supports ~~reaffirms~~ the position of the ~~AMA Committee on the Medical Aspects of Sports and the~~ American College of Sports Medicine that rapid and significant weight loss or unrealistic weight maintenance over protracted periods in amateur wrestlers are practices detrimental to good health and can induce potentially serious illness in younger athletes; (2) opposes dangerous weight loss techniques used by amateur athletes to achieve competitive weight; and (3) strongly urges amateur athletic associations to institute a mandatory ban on weight loss techniques including, but not limited to, fluid deprivation and the use of diuretics, hot rooms and impermeable suits.
H-470.995	Athletic (Sports) Medicine	Retain. Still relevant.

Policy Number	Title	Recommended Action and Rationale
H-470.997	Exercise and Physical Fitness	Remains a major public health issue. Retain in part to read as follows: The AMA encourages all physicians to utilize the health potentialities of exercise for their patients as a most important part of health promotion and rehabilitation, and urges state and local medical societies to emphasize through all available channels the need for physical activity for all age groups and both sexes. ~~Other organizations and agencies concerned with the health of the public should be informed of the interest,~~ ~~support and activities of~~ The AMA ~~in this area and should be~~ encourage~~s~~~~d~~ other organizations and agencies to join with the Association in promoting physical fitness through all appropriate means.
H-470.998	Youth Physical Fitness	School fitness programs should be promoted. Retain in part to read as follows: The AMA and its state and local components should reemphasize their support of local school and college youth fitness programs~~;~~. ~~and the AMA believes that the health services phases of fitness programs should be carried out under medical supervision conducted in a manner determined by school authorities after medical consultation.~~
H-475.987	Freedom of Speech in Medical Information	Retain. Still relevant.
H-480.962	Patient Access to Devices Pending Approval	Retain. Still relevant.
H-515.974	Mass Media Violence and Film Ratings	A rating system for violence has already been established, but the issue of media violence is still relevant and is aligned with AMA strategic objectives. Retain in part, rescind 2–4, and 7; retain 1, 5, 6 and 8, to read as follows: Redressing shortcomings in the Current System: The AMA: (1) will speak out against the excessive portrayal of violence in the news and entertainment media, including newscasts, movies, videos, computer games, music and print outlets, and encourage the depiction of the medical, social and legal consequences of violence by the media; (2) ~~urges the entertainment industry to make fundamental changes in the rating system, which will give consumers more precise information about violent and sexual content of motion pictures, television and cable television programs, and other forms of video and audio entertainment, thereby enabling consumers to make more meaningful decisions for themselves and their children about what they view or hear; (3) works with the entertainment industry and other groups interested in reducing violent content of media programming, to incorporate age classifications into the ratings system that reflect scientifically demonstrated developmental periods during childhood and adolescence such as ages 3- to 7-year-olds, 8- to 12-year-olds, and 13- to 17-year-olds. The AMA will expand its national campaign against violence to include media violence; and promotes campaigns similar to the Minnesota Medical Association's campaign throughout the entire federation; (4) urges the entertainment industry to develop a uniform ratings system that is easy for consumers to understand and which can be applied across existing and future entertainment technologies (5);~~ advises physicians to counsel parents about the known effects of media violence on children's behavior and encourage them to reduce the amount of violent programming viewed by their children; ~~(6)~~ (3) monitors changes in the current ratings system and working through state medical societies to inform physicians and their patients about these changes; ~~(7) urges~~

Policy Number	Title	Recommended Action and Rationale
		~~consideration be given to the potential development of a Television Violence Code with input from the government, the television industry, and the public, including the medical profession, to address issues relating to all television violence, including news reports and entertainment;~~ and ~~(8)~~ (4) supports all other appropriate measures to address and reduce television, cable television, and motion picture violence.
H-520.994	Nuclear Test Ban	Retain. Still relevant.
H-520.999	Opposition to Nuclear War	Retain. Still relevant.

3. THE HEALTH EFFECTS OF HIGH FRUCTOSE SYRUP (RESOLUTION 407, A-07)

HOUSE ACTION: RECOMMENDATIONS ADOPTED AND REMAINDER OF REPORT FILED

Resolution 407 (A-07), introduced by the International Medical Graduates Section at the 2007 American Medical Association (AMA) Annual Meeting and referred to the Board of Trustees, asks:

> That our AMA urge the US Food and Drug Administration (FDA) and the US Department of Agriculture (USDA) to require the food industry to use non-fructose sweeteners and limit the use of high fructose syrups in their products; and
>
> That our AMA urge the FDA and USDA to require the food industry to clearly label products containing high fructose syrups with an indication that "this product contains high fructose syrup; excessive intake of high fructose syrup may lead to obesity."

This report reviews the chemical properties and health effects of high fructose corn syrup (HFCS) in comparison to other added caloric sweeteners and evaluates the potential impact of restricting the use of fructose-containing sweeteners, including the use of warning labels on foods that contain high fructose syrups.

CURRENT AMA POLICY ON FOOD AND NUTRITION LABELING AND POOR NUTRITIONAL VALUE OF ADDED SUGARS

AMA Policy H-150.971 (AMA Policy Database) on food labeling and advertising states that "warning statements on food labels are not appropriate for ingredients that have been established as safe for the general population." This policy further states that the FDA has not defined descriptors for foods that are relatively higher in sugar than other foods because there are no established scientific data indicating the level at which sugars would become harmful in an individual food.

Other AMA policies encourage restaurants and schools to limit their use of added sugars. Policy H-150.945 urges restaurants to improve the nutritional quality of menu items by using less added sugars and sweeteners. Policies H-150.960 and D-150.987 support the replacement of sugar-added products in schools with healthier alternatives. (See Appendix for complete policy statements.)

METHODS

Literature searches for articles published though December 2007 were conducted in the PubMed database and the Cochrane Database of Systematic Reviews using the search terms "high fructose corn syrup" and "high fructose syrup." Web sites managed by federal and world health agencies, and applicable professional and advocacy organizations, were also reviewed for relevant information, including the World Health Association, the USDA, and

the Corn Refiners Association. Additional articles were identified by reviewing the reference lists of pertinent publications.

BACKGROUND

High fructose syrups (HFS) are sweeteners produced from starches such as corn, rice, tapioca, wheat, potato, and cassava.[1,2] Corn is the primary starch used to produce HFS in the United States, which manufactures more HFS than any other country;[2] thus, HFCS is the most prevalent HFS.

HFCS is pervasive in the US food supply, found in many breakfast cereals, beverages, breads, sauces, spreads, salad dressings, canned fruits, snack foods, desserts, meat and fish products, condiments, dairy products, frozen dinners, soups, and other products.[3] Rising rates of obesity since the early 1980s, shortly after HFCS was widely introduced into the US food supply, have fueled concerns about its potential adverse health effects. The adverse metabolic effects of fructose have likewise raised concerns about excessive amounts of fructose in the American diet.

Generally Recognized as Safe Status of HFCS

The FDA has affirmed (1983) and reaffirmed (1996)[4,5] the generally recognized as safe (GRAS) status of HFCS. There is no limitation on its use beyond good manufacturing process.[5]

Sweeteners in the Food Supply

Caloric sweeteners include sugar (sucrose), HFCS, honey, molasses, crystalline fructose, and fruit juice concentrates. As described below, most caloric sweeteners contain fructose and all provide 4 kcal per gram. The most commonly used sweeteners are refined sugars and HFCS, which account for 45% and 42%, respectively, of added caloric sweeteners in the US food supply.[6] Corn-derived glucose (dextrose) and glucose syrups comprise an additional 12% of the added sweetener market, with honey and edible syrups (maple syrup, molasses, etc.) comprising the remaining 1%.[6] The per capita availability of crystalline fructose and fruit juice as sweeteners is not tracked by the USDA's Economic Research Service.

Low-calorie and non-nutritive sweeteners are increasingly used in food products,[7] although the per capita use of these sweeteners is not available from the Economic Research Service. Sugar alcohols, also known as polyols, are not fully absorbed from the gastrointestinal tract, and provide an average of 2 kcal per gram (range: 0.2–3.0 kcal/g).[8,9] These low-calorie sweeteners include sorbitol, mannitol, xylitol, erythritol, isomalt, lactitol, maltitol, and hydrogenated starch hydrolysates.[8,9] Tagatose and trehalose are sugars that are similar to the sugar alcohols in function and provide 2 kcal and 4 kcal per gram, respectively.[8] Non-nutritive sweeteners include sucralose, neotame, aspartame, acesulfame potassium, and saccharin. The non-nutritive sweeteners do not contain any calories, except for aspartame, which has 4 kcal per gram. Due to their intense sweetness, very small quantities of these non-nutritive sweeteners are needed, making the amount of energy actually consumed even from aspartame negligible.[8]

Since 1966, the amount of added caloric sweeteners in the US food supply increased 27%, from 113 pounds per person per year to 143 pounds per person per year in 2005.[6] Increased consumption of soft drinks and fruit drinks contributed to more than half of this increase in added sugar intake.[10] The availability of HFCS in the food supply grew more than 100-fold since its introduction in 1967.[10] Meanwhile, availability of sucrose (from refined cane and beet sugars) decreased 33%. HFCS, at a cost of 14 cents per pound, is half the price of sugar (sucrose), which cost 30 cents per pound in 2005. However, use of HFCS appears to have leveled off, after peaking in 1999 at 64 pounds per person, with 59 pounds per person in 2005. This appears to be due to the increased use of non-caloric sweeteners, as reflected by the increased availability of diet soft drinks and bottled water, and declines in consumption of regular soft drinks.[7] Increased corn prices in response to ethanol production are expected to have little impact on the price of HFCS, raising the price of soft drinks by an expected 1%.[11]

Chemical Properties of HFCS Compared with Sugar

The term "high fructose corn syrup" implies that the syrup is primarily comprised of fructose. However, the types of HFCS used in most food products are only high in fructose as compared with regular corn syrup, which does not contain any fructose. Regular corn syrup is mainly used as a non-sweet thickener and consists of pure glucose and glucose polymers. HFCS was developed in 1967 through the partial enzymatic isomerization of glucose to fructose,

resulting in HFCS-42,[10] which contains 42% fructose, 53% glucose, and 5% higher saccharides (Table).[12] In the 1970s, HFCS-90 was developed (90% fructose) and combined with HFCS-42 to create HFCS-55 (55% fructose).[12]

The monosaccharide content of HFCS-42 and HFCS-55 is similar to sucrose (table sugar), which is a disaccharide composed of 50% fructose and 50% glucose.[12] In contrast to sucrose, the monosaccharides fructose and glucose exist free in solution in HFCS. In addition, HFCS-42 and HFCS-55 have significantly higher moisture contents than sucrose (29% and 23% versus 5%, respectively).

Other caloric sweeteners (with the exception of pure glucose) contain similar or even higher amounts of fructose. Honey has a molecular composition similar to sucrose and HFCS,[13] as does molasses, which is the least refined form of sugar (Table).[8] Fruit juices also contain similar amounts of fructose, although the exact composition varies by type. For example, orange and grape juices have equal amounts of fructose and glucose, while apple juice has about twice as much fructose as glucose (Table).[3,14] Crystalline fructose, which can be made from HFCS as well as from sucrose, contains 98% to 100% fructose.[1,4] Crystalline fructose is the sweetest monosaccharide, with a sweetness of 173 relative to crystalline sucrose, which as the standard has a reference value of 100 (glucose has a relative sweetness score of 74).[12]

The different types of HFCS have distinct uses in food production. HFCS-55 was formulated to have the same level of sweetness as sucrose and is used primarily in carbonated soft drinks, other sweetened beverages, ice cream, and frozen desserts.[12] HFCS-42 has less fructose than sucrose and is therefore slightly less sweet. HFCS-42 is used in baked goods, canned fruits, condiments, dairy products, and other products.[3,12] HFCS-90 is used to produce HFCS-55, as well as in "light" foods, where only a small amount is needed due to its more intense sweetness.

HFCS has several advantages over sucrose in food manufacturing:

- Enhances other flavors because its sweetness is detected quickly and early by the taste buds, but does not linger, resulting in a clearer and crisper perception of other flavors.
- Maintains freshness and prolongs shelf life through improved moisture control and less microbial spoilage, resulting in firmer canned fruits and less freezer burn in frozen fruits.
- Maintains the soft texture of baked goods by retaining moisture and resisting crystallization.
- Provides better browning and flavor in baked goods, and better color retention in products such as ketchup and strawberry preserves.
- Maintains its structural stability over a range of temperatures and acidity levels.
- Maintains the pourability of frozen products due to its lower freezing point.
- Increases fermentability, which makes it more economical in producing breads.[3,4]

Many of the above noted advantages of HFCS are due to the colligative properties of the free fructose and glucose molecules, which depend on the concentration of the solute, not on their identity.[1] For example, the smaller monosaccharides generate higher osmotic pressures and lower freezing points than the disaccharide sucrose. Likewise, free fructose and glucose in HFCS are "reducing sugars," while sucrose is non-reducing; this provides better browning of baked goods and better retention of red colors.[1] The properties of free fructose are particularly significant in enhancing the versatility of HFCS, such as its greater ability to adsorb and retain moisture compared with sucrose.[1]

In products sweetened with sucrose, the covalent bond between the fructose and glucose molecules breaks down in low acid environments, such as those found in soft drinks, as well as at high temperatures, such as during storage in hot climates.[1,15] A recent study reported that the sucrose content of a cola beverage decreased from 36% of total sugars to only 10% of sugars three months after manufacture, and the free fructose content increased from 32% to 44% of total sugars.[15] This creates variability in the taste profile of the product. In contrast, HFCS maintains its structural stability over a range of temperatures and acidic conditions.[1]

FRUCTOSE AND GLUCOSE IN THE BODY

Since the hydrolysis of sucrose under low pH or high temperatures results in free fructose and glucose, as found in HFCS, beverages containing either sweetener should be absorbed similarly by the body. Even if sucrose is not hydrolyzed before consumption, the covalent bond between the fructose and glucose molecules in sucrose is easily cleaved by the enzyme sucrase in the brush-border cells of the small intestine.[10,12,16] Thus, the body is absorbing free

fructose and glucose molecules regardless of whether they originated as part of HFCS or sucrose. The only difference is the greater osmotic pressure generated by the smaller monosaccharides compared with the disaccharide sucrose, which affects the amount of fluid secreted in the stomach.[16,17]

Many of the concerns about HFCS are, in fact, concerns about the role of fructose in appetite and metabolism. Fructose is more quickly emptied from the stomach compared with other sugars, and is absorbed in the intestines more slowly and less completely than glucose.[18,19] Unlike glucose, fructose intake does not stimulate insulin secretion, which is likely due to the lack of fructose transporters (Glut-5) in the β cells of the pancreas.[10,20] Insulin is believed to directly and indirectly (though effects on leptin secretion) inhibit food intake.[10] The brain and central nervous system also lack Glut-5 transporters, further inhibiting the ability of fructose to provide satiety signals.[10,20] In addition, fructose can more easily be incorporated into phospholipids and triacylglycerols than glucose, as fructose metabolism bypasses the key rate limiting step in the liver that slows glucose metabolism.[20] Thus, consumption of excess amounts of fructose, but not the same amount of glucose, have been found to significantly increase rates of lipogenesis.[20] In addition, fructose consumption does not increase leptin or decrease ghrelin levels, in contrast to the hormonal response after glucose ingestion.[21] (Leptin generally inhibits food intake and increases energy expenditure,[20] while ghrelin appears to increase hunger and appetite.[21])

The chemical-reducing properties of free fructose allow it to form stable complexes with iron that promote both iron and zinc absorption.[22] Fructose and sucrose both reduce the bioavailability of copper in animals at high intakes, but not in humans at intakes of 20% of total energy,[22] which is higher than most people consume.[10,23] Because HFCS contains free fructose, it is possible that HFCS could affect the balance of certain minerals in the body. HFCS and sucrose did not affect the balance of iron, magnesium, calcium, and zinc over 2 weeks in one study that examined this issue,[24] although another study found HFCS-sweetened beverages to adversely affect magnesium, calcium, and phosphorous homeostasis over 6 weeks.[25]

Fructose and Adverse Health Outcomes

Human and animal studies have found direct associations between high intakes of fructose and adverse health outcomes, including obesity and the metabolic syndrome. In most animal models, diets high in fructose increase total energy intake, insulin resistance, weight gain, dyslipidemia, and hypertension.[20,26] In humans, fructose has been associated with increased total energy intake, body weight, hepatic and adipose tissue insulin resistance, and dyslipidemia.[20,26] Individuals with diabetes and hyperinsulinemia may be particularly sensitive to these adverse effects of excessive fructose intake.[27] However, fructose in both sucrose and HFCS appears equally detrimental, although the adverse effects appear limited to high intakes and not to the small amount of naturally occurring fructose in fruits and vegetables (approximately 15 g/d; for comparison, a 12 oz serving of a soft drink may contain 25 g of fructose,[26] and average fructose intakes are about 97 g/d).[20]

More immediate adverse consequences of excessive fructose intake include diarrhea, flatulence, borborygmus, abdominal distention, and abdominal pain.[18,19] More than half of healthy individuals report symptoms of gastrointestinal distress after consuming 25 g or more of crystalline (pure) fructose.[18] However, when fructose is consumed with glucose, as it is usually found in citrus juices, sucrose, and HFCS, absorption of fructose is improved and malabsorption and its associated symptoms are less likely to occur.[18,19] In addition, frequent consumers of fructose may have greater tolerance or threshold for these potential side effects.[18]

Calorically Sweetened Beverages and Adverse Health Outcomes

Calorically sweetened beverages are a significant source of HFCS in the American diet.[10] They have been associated with overconsumption of calories and with weight gain in animals and humans,[10] as well as with other adverse health outcomes. The body does not appear to compensate for extra calories from beverages as well as those from soups or solid foods.[10,28] A recent review and meta-analysis found that soft drinks, whether sweetened with HFCS or sucrose, were strongly and consistently associated with higher total calorie consumption in cross-sectional, longitudinal, and long-term experimental studies, with the strongest associations seen in the experimental studies.[28] Several studies have found higher energy intakes than could be explained by consumption of the soft drinks alone, suggesting that soft drinks may reduce feelings of satiety, increase hunger, or acclimate individuals to prefer sweeter and generally more calorie-dense foods.[28] In addition, soft drink consumption has been positively associated with body mass index (BMI), particularly in experimental studies.[28] A much smaller body of literature reports soft drink consumption to be inversely associated with consumption of milk, calcium, fruit, and dietary fiber, and with overall

dietary quality, and directly associated with dental caries, kidney stones, diabetes, and systolic and diastolic blood pressure.[28] In general, industry-funded studies reported significantly smaller effect sizes, particularly those examining the relationship between soft drinks and energy intake.[28]

HFCS AND OBESITY

At present, insufficient evidence exists that HFCS consumption has contributed to obesity more than sucrose, increased consumption of total calories (from any source), or decreased physical activity.[12] Recent studies have not found statistically significant differences between HFCS and sucrose on total energy intake, macronutrient intake, taste, hunger, thirst, overall satiety, or concentrations of insulin, glucose, glucagon-like peptide 1 (GLP-1), uric acid, leptin, and/or ghrelin.[15,16,29,30] Both beverages sweetened with HFCS and those sweetened with sucrose contribute to the overconsumption of calories at meals served 50 to 120 minutes later compared with a diet beverage or no beverage.[15,16] In addition, men and women may respond to the sweeteners differently, as one study found that men experienced significantly less hunger after consuming HFCS than sucrose, while women experienced less hunger after consuming sucrose-sweetened beverages.[16] However, another study found increased hunger in women the day after consuming 30% of calories from sucrose as compared with HFCS.[29]

Unfortunately, these small experimental studies examined only the short-term effects of sucrose and HFCS and may have been underpowered. At least two of the studies (which provided details on their statistical power) were only powered to detect 120 to 150 kcal differences in response,[15,30] even though smaller differences in energy intake may contribute long-term to obesity or other health outcomes. In one study, the authors expressed concern about their lack of statistical power to detect a difference between sucrose and HFCS and repeated the experiment comparing sucrose to solutions of free glucose and free fructose, but not to HFCS.[30] However, this second experiment was only powered to detect a 120 kcal difference in response between 20% glucose:80% fructose and 80% glucose:20% fructose solutions, not to detect differences between the more similarly composed sucrose and HFCS beverages.[30] In fact, intake was 192 kcal greater at the test meal after consumption of the 50:50 solution of free glucose/free fructose compared with the sucrose solution, but this difference was not statistically significant.[30] Moreover, all four of these recent studies received financial support from the sweetener industry or involved investigators who have consulted with the sweetener industry.

It has been hypothesized that the extra 5% fructose in HFCS-55 compared to sucrose has acclimated individuals to a sweeter diet,[10] although the sweetness intensity of HFCS-55 is similar to that of sucrose.[3,12] Food use data show that between 1909 and 1997, there was an 86% increase in per capita use of added caloric sweeteners in the United States,[23] with added caloric sweeteners now comprising about 16% of total calories,[10] and HFCS comprising 7% to 10% of total calories.[10,23] Among the 20% of Americans consuming the most HFCS (conservatively estimated at 11% of total calories), half of their carbohydrate intake comes from caloric sweeteners.[10] The affordability and versatility of HFCS compared to sucrose may have contributed to the sweetening of the American diet. However, the replacement of some sucrose with HFCS has not altered the ratio of fructose to glucose in the food supply. In 1966, before the use of HFCS, the ratio of fructose to glucose was 0.78, compared with 0.79 in 2002.[12]

Epidemiologic studies have yet to directly measure total HFCS intake in individuals, because food databases do not contain data on the HFCS content of foods. The increase in HFCS in the food supply has been highly correlated with the increased prevalence of obesity and type 2 diabetes, but because there are no individual-level data on HFCS consumption,[23] only ecological associations are available for consideration. It is possible that other aspects of diet and physical activity that occurred simultaneously with increases in HFCS consumption may play a larger role in the rising rates of obesity and diabetes seen in recent years. For example, calorie intake increased by 523 kcal/d between 1970 and 2003.[31] Additionally, obesity rates are rising even in those countries where trade barriers have limited the use of HFCS.[32]

GUIDELINES ON CALORIC SWEETENERS

Dietary guidelines generally recommend limiting intake of added caloric sweeteners of any type. In order to meet required nutrient needs and limit weight gain, sample diets in the Dietary Guidelines for Americans recommend limiting discretionary calories, including those from added sugar, to no more than 32 g (8 tsp or 128 kcal) per day on a 2,000 calorie diet, which is less than that found in most calorically sweetened soft drinks.[33] While the sample diets are just suggestions, current average intakes, estimated at 318 kcal/d, far exceed these limits.[10] Additionally, an Expert Consultation for the World Health Organization and the Food and Agriculture Organization of the United

Nations recommended limiting intake of "free sugars" to < 10% of total calories to improve overall diet quality and prevent overweight and dental caries. In this recommendation, "free sugars" includes all monosaccharides and disaccharides added to foods by manufacturers, food preparers, and consumers, as well as sugars naturally found in honey, syrups, and fruit juices.[34]

POTENTIAL IMPACT OF LIMITING FRUCTOSE-CONTAINING SWEETENERS

Regarding the first resolve of Resolution 407 (A-07), a ban on the use of fructose-containing sweeteners would include not just pure fructose and high fructose syrups, but also naturally occurring sweeteners such as honey, cane and beet sugars, and fruit juices. Regulation to limit the use of HFS, including HFCS, will likely result in the replacement of HFS with sucrose and other caloric sweeteners in food products, not in a reduction in the use of added sugars by food manufacturers. This replacement would not change the calorie content of sweetened foods and beverages, and would likely not change the ratio of fructose to glucose in the food supply.

Regarding the second resolve of Resolution 407, HFCS is generally recognized as safe (GRAS) by the FDA; thus, in accordance with AMA policy (H-150.971), warning labels on products containing HFCS would be unwarranted. At the present time, there is insufficient evidence that HFCS is more likely to contribute to adverse health outcomes than sucrose or any other caloric sweetener. The GRAS status of HFCS is unlikely to be revoked unless such evidence is found.

AREAS REQUIRING FURTHER RESEARCH OR ATTENTION

More information is needed to clarify the impact of HFCS and other sweeteners on health. While a few studies have examined the metabolism of HFCS compared to sucrose, more research is needed on the long-term effects of high consumption of these sweeteners to confirm their similarities. In addition, research is needed on the possible effects of different sweeteners in various subpopulations, including overweight and obese individuals, or those at risk of obesity due to family history or other conditions.[12] It is important that the research be free of potential bias, as most previous studies were conducted by researchers who had received funds from the sweetener industry. While this does not necessarily bias the results, the bias found in the soft drink studies discussed above suggests the need for more independent research.

Information on HFCS should be added to the USDA food composition and nutrient databases to allow for epidemiological research on intakes of HFCS in individuals and its relationship with health outcomes.[12] While the USDA has constructed a database containing the added sugar content of selected foods,[35] it does not distinguish between types of added sweeteners. There is currently no analytical method for differentiating between naturally occurring sugars of any type and added sugars[12,35]; thus, the values in the database were calculated by the USDA from the ingredients listed on product labels.[35] Improved databases on the amount of added sweeteners in all foods are still needed.

SUMMARY AND CONCLUSION

HFCS is a common food ingredient in the United States. The most commonly used types of HFCS (HFCS-42 and HFCS-55) are similar in composition to sucrose, consisting of roughly equal amounts of fructose and glucose. The primary difference between HFCS and sucrose is that these monosaccharides exist free in solution in HFCS, but in disaccharide form in sucrose. The free monosaccharides in HFCS provide better flavor enhancement, stability, freshness, texture, color, pourability, and consistency to foods in comparison with sucrose. As use of HFCS increased over the last 30 years, so did rates of obesity and diabetes. Human and animal studies have found direct associations between fructose and adverse health outcomes, including obesity. However, the adverse health effects of HFCS, beyond those of other caloric sweeteners, most of which contain fructose, are not well established. Consumption of added caloric sweeteners in general increased over the same period, as did total calories. Likewise, rates of obesity have risen even in countries where little HFCS is consumed.

The literature on HFCS consists mostly of ecological or small, short-term experimental studies, many of which have been industry-supported. Because the composition of HFCS and sucrose are so similar, particularly on absorption by the body, it appears unlikely that HFCS contributes more to obesity or other conditions than sucrose. Nevertheless, it is difficult to thoroughly examine the potentially differential effect of various sweeteners, particularly as they relate to health conditions such as obesity, which develop over relatively long periods of time. Improved nutrient databases

are needed to analyze food consumption in epidemiological studies, as are more strongly designed experimental studies. At the present time, there is insufficient evidence to restrict use of HFCS or other fructose-containing sweeteners in the food supply or to require the use of warning labels on products containing HFCS.

RECOMMENDATIONS

The Council on Science and Public Health recommends that the following statements be adopted in lieu of Resolution 407 (A-07) and the remainder of this report be filed:

1. That our American Medical Association (AMA) recognize that at the present time, insufficient evidence exists to specifically restrict use of high fructose corn syrup (HFCS) or other fructose-containing sweeteners in the food supply or to require the use of warning labels on products containing HFCS.

2. That our AMA encourage independent research (including epidemiological studies) on the health effects of HFCS and other sweeteners, and evaluation of the mechanism of action and relationship between fructose dose and response.

3. That our AMA, in concert with the Dietary Guidelines for Americans, recommend that consumers limit the amount of added caloric sweeteners in their diet.

REFERENCES

1. Hanover LM, White JS. Manufacturing, composition, and applications of fructose. *Am J Clin Nutr.* 1993;58:724S-732S.
2. Vuilleumier S. Worldwide production of high-fructose syrup and crystalline fructose. *Am J Clin Nutr.* 1993;58:733S-736S.
3. Corn Refiners Association. Questions and answers about high fructose corn syrup. Available at: http://www.corn.org/HFCSBrochure.pdf . Accessed 02/29/08.
4. Fructose Information Center. Facts about fructose. Available at: http://www.fructose.org/facts.asp. Accessed 02/29/08.
5. Food and Drug Administration. High fructose corn syrup. Code of Federal Regulations. Washington, DC; US Government Printing Office. *Federal Register.* 1996; 61(165): 43447-43450 (21CFR184.1866).
6. US Department of Agriculture, Economic Research Service. US per capita caloric sweeteners estimated deliveries for domestic food and beverage use by calendar year: 1966-2006. Table 50. Available at: http://www.ers.usda.gov/Briefing/Sugar/Data.htm. Accessed 02/29/08.
7. US Department of Agriculture, Economic Research Service. High-fructose corn syrup usage may be leveling off. *Amber Waves*. 2008; 6(1):4.
8. Position of the American Dietetic Association: use of nutritive and nonnutritive sweeteners. *J Am Diet Assoc.* 2004;104:255-275.
9. Kroger M, Meister K, Kava R. Low-calorie sweeteners and other sugar substitutes: a review of the safety issues. *Compr Rev Food Science Food Safety.* 2006;5:35-47.
10. Bray GA, Nielsen SJ, Popkin BM. Consumption of high-fructose corn syrup in beverages may play a role in the epidemic of obesity. *Am J Clin Nutr.* 2004;79:537-543.
11. Leibtag, Ephraim. Corn prices near record high, but what about food costs? *Amber Waves*. 2008; 6(1):10-15.
12. Forshee RA, Storey ML, Allison DB, et al. A critical examination of the evidence relating high fructose corn syrup and weight gain. *Crit Rev Food Sci Nutr.* 2007;47:561-582.
13. Hein GL, Storey ML, White JS, Lineback DR. Highs and lows of high fructose corn syrup: a report from the Center for Food and Nutrition Policy and its Ceres Workshop. *Nutr Today.* 2005;40:253-256.
14. US Department of Agriculture, Agricultural Research Service. 2007. USDA National Nutrient Database for Standard Reference, Release 20. Available at: http://www.ars.usda.gov/nutrientdata. Accessed 02/29/08.
15. Monsivais P, Perrigue MM, Drewnowski A. Sugars and satiety: does the type of sweetener make a difference? *Am J Clin Nutr.* 2007;86:116-123.
16. Soenen S, Westerterp-Plantenga MS. No differences in satiety or energy intake after high-fructose corn syrup, sucrose, or milk preloads. *Am J Clin Nutr.* 2007;86:1586-1594.
17. Bray GA, Nielsen SJ, Popkin BM. Reply to MF Jacobson. *Am J Clin Nutr.* 2004;80:1081-1082.
18. Beyer PL, Caviar EM, McCallum RW. Fructose intake at current levels in the United States may cause gastrointestinal distress in normal adults. *J Am Diet Assoc.* 2005;105:1559-1566.

19. Riby JE, Fujisawa T, Kretchmer N. Fructose absorption. *Am J Clin Nutr.* 1993;58:748S-753S.
20. Elliott SS, Keim NL, Stern JS, Teff K, Havel PJ. Fructose, weight gain, and the insulin resistance syndrome. *Am J Clin Nutr.* 2002;76:911-922.
21. Wylie-Rosett J, Segal-Isaacson CJ, Segal-Isaacson A. Carbohydrates and increases in obesity: does the type of carbohydrate make a difference? *Obes Res.* 2004;12(Suppl 2):124S-129S.
22. O'Dell BL. Fructose and mineral metabolism. *Am J Clin Nutr.* 1993;58:771S-778S.
23. Gross LS, Li L, Ford ES, Liu S. Increased consumption of refined carbohydrates and the epidemic of type 2 diabetes in the United States: an ecologic assessment. *Am J Clin Nutr.* 2004;79:774-779.
24. Ivaturi R, Kies C. Mineral balances in humans as affected by fructose, high fructose corn syrup and sucrose. *Plant Foods Hum Nutr.* 1992;42:143-151.
25. Milne DB, Nielsen FH. The interaction between dietary fructose and magnesium adversely affects macromineral homeostasis in men. *J Am Coll Nutr.* 2000;19:31-37.
26. Rutledge AC, Adeli K. Fructose and the metabolic syndrome: pathophysiology and molecular mechanisms. *Nutr Rev.* 2007;65:S13-S23.
27. Glinsmann WH, Bowman BA. The public health significance of dietary fructose. *Am J Clin Nutr.* 1993;58:820S-823S.
28. Vartanian LR, Schwartz MB, Brownell KD. Effects of soft drink consumption on nutrition and health: a systematic review and meta-analysis. *Am J Public Health.* 2007;97:667-675.
29. Melanson KJ, Zukley L, Lowndes J, Nguyen V, Angelopoulos TJ, Rippe JM. Effects of high-fructose corn syrup and sucrose consumption on circulating glucose, insulin, leptin, and ghrelin and on appetite in normal-weight women. *Nutrition.* 2007;23:103-112.
30. Akhavan T, Anderson GH. Effects of glucose-to-fructose ratios in solutions on subjective satiety, food intake, and satiety hormones in young men. *Am J Clin Nutr.* 2007;86:1354-1363.
31. US Department of Agriculture, Economic Research Service. US food consumption up 16 percent since 1970. *Amber Waves*. 2005; 3(5):5.
32. Anderson GH. Much ado about high-fructose corn syrup in beverages: the meat of the matter. *Am J Clin Nutr.* 2007;86:1577-1578.
33. US Department of Health and Human Services and US Department of Agriculture. Dietary Guidelines for Americans, 2005. 6th ed. Washington, DC: US Government Printing Office; 2005.
34. Diet, nutrition and the prevention of chronic diseases. *World Health Organ Tech Rep Ser.* 2003;916:i-149.
35. US Department of Agriculture, Agricultural Research Service, Beltsville Human Nutrition Research Center, Nutrient Data Laboratory. USDA Database for the added sugars content of selected foods, release 1. Available at: http://www.nal.usda.gov/fnic/foodcomp/Data/add_sug/addsug01.pdf. Accessed 02/29/08.

Table. Estimated molecular composition of common caloric sweeteners (%)[3,4,12-14]

	Fructose	Glucose	Higher saccharides
HFCS-42	42	53	5
HFCS-55	55	42	3
HFCS-90	90	9	1
Sucrose	50	50	0
Honey	49	43	8
Molasses	50	48	3
Apple juice	59	31	10
Orange juice	51	49	0
Crystalline fructose	100	0	0

APPENDIX - Current AMA Policy on Food Labeling and Poor Nutritional Value of Added Sugars

H-150.971 Food Labeling and Advertising
Our AMA believes that there is a need for clear, concise and uniform labeling on food products and supports the following aspects of food labeling: (1) Required nutrition labeling for all food products that includes a declaration of carbohydrates, protein, total fat, total saturated and polyunsaturated fatty acids, cholesterol, sodium and potassium content, and number of calories per serving. (2) Use of and/or ingredient labeling to declare the source of fats and oils. Knowledge of the degree of saturation is more important than knowing the source of oils in food products. It is not uncommon for manufacturers to use blends of different oils or to hydrogenate oils to achieve specific functional

effects in foods. For example, vegetable oils that are primarily unsaturated may be modified by hydrogenation to more saturated forms that bring about desired taste, texture, or baking characteristics. This recommendation is therefore contingent upon nutrition labeling with saturated fat content. (3) The FDA's proposed rule on food labeling that requires quantitative information be provided on both fatty acid and cholesterol content if either one is declared on the label, as an interim step. (4) Warning statements on food labels are not appropriate for ingredients that have been established as safe for the general population. Moreover, the FDA has not defined descriptors for foods that are relatively higher in calories, sodium, fat, cholesterol, or sugar than other foods because there are no established scientific data indicating the level at which any of these substances or calories would become harmful in an individual food. (5) Our AMA commends the FTC for its past and current efforts and encourages the Commission to monitor misleading food advertising claims more closely, particularly those related to low sodium or cholesterol, and health claims. (6) Our AMA supports the timely approval of the Food and Drug Administration's proposed amendment of its regulations on nutrition labeling to require that the amount of trans fatty acids present in a food be included in the amount and percent daily value, and that definitions for "trans fat free" and "reduced trans fat" be set. (BOT Rep. C, A-90; Reaffirmed: Sunset Report, I-00; Appended: Res. 501, A-02; Reaffirmation A-04; Reaffirmed: in lieu of Res. 407, A-04)

Policy H-150.945 Nutrition Labeling and Nutritionally Improved Menu Offerings in Fast-Food and Other Chain Restaurants
Our AMA: (1) supports federal, state, and local policies to require fast-food and other chain restaurants with 10 or more units (smaller, neighborhood restaurants could be exempt) to provide consumers with nutrition information on menus and menu boards; (2) recommends that nutrition information in fast-food and other chain restaurants include calorie, fat, saturated fat and trans fat, and sodium labeling on printed menus, and, at a minimum, calories on menu boards, since they have limited space, and that all nutrition information be conspicuous and easily legible; (3) urges federal, state, and local health agencies, health organizations, and physicians and other health professionals to educate people how to use the nutrition information provided in restaurants to make healthier food choices for themselves and their families; and (4) urges restaurants to improve the nutritional quality of their menu offerings--for example, by reducing caloric content; offering smaller portions; offering more fruits, vegetables, and whole-grain items; using less sodium; using cooking fats lower in saturated and trans fats; and using less added sugars/sweeteners. (Res. 419, A-07)

Policy H-150.960 Improving Nutritional Value of Snack Foods Available in Primary and Secondary Schools
The AMA supports the position that primary and secondary schools should replace foods in vending machines and snack bars, which are of low nutritional value and are high in fat, salt and/or sugar, with healthier food choices which contribute to the nutritional needs of the students. (Res. 405, A-94; Reaffirmation A-04; Reaffirmed: in lieu of Res. 407, A-04; Reaffirmed: CSA Rep. 6, A-04)

D-150.987 Addition of Alternatives to Soft Drinks in Schools
Our AMA will seek to promote the consumption and availability of nutritious beverages as a healthy alternative to high-calorie, low nutritional-content beverages (such as carbonated sodas and sugar-added juices) in schools. (Res. 413, A-05)

4. ENSURING THE BEST IN-SCHOOL CARE FOR CHILDREN WITH DIABETES (RESOLUTION 404, A-07)

HOUSE ACTION: RECOMMENDATIONS ADOPTED IN LIEU OF RESOLUTION 404 (A-07) AND REMAINDER OF REPORT FILED

INTRODUCTION

Resolution 404 (A-07), introduced by the Medical Student Section and referred by the House of Delegates, asked:

> That our American Medical Association (AMA) support the implementation of rigorous training programs under physician oversight, including frequent refresher courses, for selected school staff members to dose and administer injectable medications in emergency situations and to aid the child in his or her self-administration of insulin in the case that a licensed medical professional is not available.

Several federal and some state laws provide protection for children with disabilities, including diabetes. This report provides an overview of such protections and the recommended approaches to ensuring that children with diabetes are educated in a medically safe environment and have access to the same educational opportunities as their peers in public schools. Resolution 404 (A-07) is evaluated in light of these findings.

METHODS

English-language reports on studies using human subjects were selected from a PubMed search of the literature from 2000 to March 2008 using the terms "pediatric" and "diabetes," in combination with "epidemiology," "treatment," and "schools." Additional articles were identified by manual review of the references cited in these publications. Web sites of the American Academy of Pediatrics, American Academy of Clinical Endocrinologists, The Endocrine Society, American Diabetes Association, National Diabetes Education Program, and National Association of School Nurses were searched for relevant articles. Additionally, a Google search for information on treatment of diabetes in schools was conducted.

EPIDEMIOLOGY

The incidence of developing diabetes before age 20 years is approximately 24.3/100,000 per year, with higher risks (>25/100,000 per year) for non-Hispanic white, non-Hispanic black, and American Indian youth compared with Hispanics and Asian ethnicities, whose risk is less than 20/100,000 per year.[1] Although most of these patients (78%) have type 1 diabetes, the rates of apparent type 2 diabetes mellitus increase with age and occur more frequently among non-Hispanic black, Asian, and American Indian individuals.[1] Thus, approximately 1/400 school-aged children have diabetes, and it is estimated that each year an additional 13,000 to 15,000 pediatric patients are diagnosed with type 1 diabetes requiring daily insulin injections to maintain glycemic control.[2,3]

PROTECTIONS FOR SCHOOL-AGED CHILDREN WITH DIABETES─EDUCATION LAWS.

Three federal laws provide protection for children with diabetes and require school districts to ensure access to educational opportunities in a medically safe environment without discrimination. These federal laws are: Section 504 of the Rehabilitation Act of 1973, the American with Disabilities Act (ADA), and the Individuals with Disability Education Act (IDEA).[4-6]

The ADA is a federal civil rights law enacted in 1990 that prohibits discrimination by public entities against people with disabilities. In this context, the ADA applies broadly to public, but not religious private institutions. Similarly, Section 504 of the Rehabilitation Act (a federal law passed by Congress in 1973) is an antidiscrimination law that prohibits recipients of federal funds from discriminating against individuals on the basis of disability. As they relate to schools, both are geared toward students with physical or mental impairments (disability) that "substantially limits one or more major life activities" by requiring schools to provide students with "reasonable accommodations" and educational services to ensure they have an equal opportunity to participate in academic, nonacademic, and extracurricular activities.

Most parents and students with diabetes rely on Section 504 and/or the ADA to support their right to a disability assessment. Implementation of Section 504 is accomplished by developing a Section 504 plan, which is prepared by the school, generally in consultation with parents (who have a right to participate). The plan describes the accommodations, special education, and/or related services that will be provided in order for the student to stay healthy at school and have equal access to education. Generally, the plan should be informed by a Diabetes Medical Management Plan developed by the child's physician. Deciding who will provide diabetes care in the school setting is an important part of the accommodation plan.

The IDEA is a federal law that provides funds to states to support special education and related services for children with disabilities, and is administered by the Office of Special Education Programs in the U.S. Department of Education. Unlike Section 504 and the ADA, IDEA's protections only apply to certain categories of students whose disability impairs the student's ability to learn to the extent that he or she requires special education and related services. Implementation is accomplished through an individualized education program (IEP).

When requests and/or negotiations for developing an adequate Section 504 plan or IEP fail, parents or guardians typically engage internal school or district grievance procedures. Additional measures include filing an

administrative complaint with the State Board of Education or filing a lawsuit in court, depending on whether the claim is based on IDEA, Section 504, or the ADA. Treating physicians should function as advocates in this process.[7]

The *Legal Rights of Students with Diabetes* is an authoritative and comprehensive resource designed to assist advocates throughout the process of working with schools to secure appropriate care, learning environment, and access to activities for these students.[8] In addition, several states have adopted statutes that specifically relate to school-based diabetes care. Links to these specific state laws can be accessed from the American Diabetes Association web site.[9]

RESPONSIBILITIES OF SCHOOLS

Schools must designate an employee to coordinate and implement compliance with Section 504 and the ADA.[8] It is also the school's legal responsibility to provide appropriate training to school staff on diabetes-related tasks and in the treatment of diabetes emergencies.[8] This training should be provided by health care professionals with expertise in diabetes unless the student's health care provider determines that the parent or guardian is able to provide school personnel with sufficient oral and written information to allow the school to establish a safe and appropriate environment for the child.

WHAT HEALTH SERVICES SHOULD BE PROVIDED AND WHO SHOULD PROVIDE THEM?

The ideal situation is for a school nurse to provide diabetes care-related health services. However, even if a full-time nurse is present (and many schools lack sufficient nursing staff), additional personnel must be trained to provide routine and emergency diabetes care, including checking blood glucose levels and administering glucagon or insulin, if needed, during the school day and during extracurricular activities and field trips when a nurse is unavailable.

The National Diabetes Education Program (NDEP) and the American Diabetes Association both hold the view that diabetes care tasks may be safely and appropriately delegated to nonmedical and non-nursing personnel in the school setting, including field trips and other extracurricular activities.[10,11] State laws typically regulate who may perform diabetes care tasks and whether a given task must be delegated by a nurse or other health care professional before a nonlicensed person may perform it.[8] The delegated tasks that are permitted vary from state to state, but delegation is acceptable in most states. Where delegation is not permitted, the school must provide appropriately licensed personnel to provide services.[8]

Most students with diabetes should have two planning documents, one that describes the treatment plan (or Diabetes Medical Management Plan), and another that outlines how the needed diabetes care will be provided at school (Section 504 plan or something comparable). Children covered by IDEA are required to have a written IEP. Also recommended are a "quick reference emergency plan," which describes how to recognize hypoglycemia and hyperglycemia and what to do as soon as signs or symptoms of these conditions are observed. Some school nurses also may generate an "individual care plan" that provides instructions to faculty and staff who are in contact with the student.[10]

The Diabetes Medical Management Plan should be completed by the student's personal health care team and parents/guardians, and reviewed with relevant school staff, with copies easily accessible by the school nurse and trained diabetes personnel, and other authorized persons. These plans typically include contact information and instructions for blood glucose monitoring and insulin dosing and administration, including specific instructions on students' abilities if they have an insulin pump. Additionally, information on meals and snacks to be eaten at school and on exercise and sports may be provided, along with the usual symptoms and treatment for both hypoglycemia and hyperglycemia, supplies to be kept at school, and approval signatures. Sample Medical Management Plans and Quick Reference Emergency Plans (see Appendix) are available as part of the Guide for School Personnel developed by the NDEP.[11]

The trained diabetes personnel assist with diabetes care tasks such as blood glucose monitoring, insulin and glucagon administration, and urine ketone testing in the school setting. As noted above, the extent to which care may be provided by non-health care professionals varies based on state law. As Resolution 404 alludes to, these school staff members should be trained and monitored, taking the relevant state laws into account. The care plan developed as part of the necessary accommodations should identify school employees assigned to provide care to an individual

student. The NDEP (which is endorsed by our AMA) advises this should be done under the direction of the school nurse, when allowed by state nurse practice acts.[11] The school nurse is responsible for training, monitoring, and supervising these school personnel. The NDEP further notes that "a team approach to developing the care plan, involving the student, parent, health care provider, key school personnel, and school nurse, is the most effective way to ensure safe and effective diabetes management during the school day."[11]

The American Diabetes Association Position Statement on Diabetes Care in the School and Day Care Setting and the Association's "Safe at School Campaign" also emphasize the need to assess the requirements of each child individually and to provide appropriate care in the school based on the student's Diabetes Medical Management Plan or other health care plan.[10,12] The Association has developed "Diabetes Care Tasks at School: What Key Personnel Need to Know," a series of training modules that can be used to train school personnel and which are available online.

The basic principles behind the Safe at School campaign are:[13]

- All school staff members who have responsibility for a student with diabetes should receive training that provides a basic understanding of the disease and the student's needs, how to identify medical emergencies, and which school staff members to contact with questions or in case of an emergency.

- The school nurse holds a primary role of coordinating, monitoring, and supervising the care of a student with diabetes. However, in addition to any full- or part-time school nurse, a small group of school staff members should receive training from a qualified health care professional in routine and emergency diabetes care so that a staff member is always available for younger or less-experienced students who require assistance with their diabetes management (e.g., administering insulin, checking their blood glucose, choosing appropriate food) and for all students with diabetes in case of an emergency (including administration of glucagon). These staff members should be school personnel who have volunteered to do these tasks and do not need to be health care professionals.

The American Academy of Pediatrics recommends that the "leadership in developing safe guidelines lies with the certified school nurse, the physician, and the parent. When school nurses delegate care to nonmedical staff members, a system should be devised through which the school nurse, parent, and physicians are comfortable with the protocol."[14,15] The American Nursing Association also notes that individualized health care planning is a nursing responsibility that is regulated by state nurse practice acts and cannot be delegated to unlicensed individuals.[16]

The limited survey data that are available indicate that improvements are needed in the way schools address the health care needs of their students with diabetes.[17,18]

OTHER POLICY STATEMENTS

The Juvenile Diabetes Research Foundation position statement on diabetes management in schools states that "students with type 1 diabetes must be allowed to manage their diabetes in a school setting by monitoring their blood sugar, eating appropriate foods, and administering insulin," fostered by appropriate school policies and a supportive network of teachers, parents, school administrators and health care providers.[19,20]

The Parent Teacher Association urges that at least two staff members per school undergo specific training on diabetes care and emergency procedures, and on identification and treatment of symptoms of hyperglycemia and hypoglycemia, as allowed by state laws and practice acts.

SUMMARY AND CONCLUSION

Federal laws, and in many cases, state laws provide protection for school-aged children with type 1 diabetes, and a general framework is in place to address the health care and education needs of students with diabetes. Parents, the health care team, and school personnel should work together to allow children with diabetes to participate fully and safely in the school experience.

Physicians should assist in developing individualized Diabetes Medical Management Plans for students. The school nurse has the primary responsibility for integrating this information into the development of in-school plans for

providing the necessary health care services for students with diabetes, as well as training of nonmedical school personnel to provide needed services, which is particularly important to the process. The extent to which individual physicians are engaged will vary from school to school based on state practice regulations and local school district practices; however, physicians should function as advocates throughout the planning process. Deficiencies in caring for school-aged children with diabetes are the result of local policies and school-level system and training issues, and will not be solved by our AMA advocating for more rigorous physician-directed training programs for nonmedical school personnel.

RECOMMENDATION

The Council on Science and Public Health recommends that the following statement be adopted in lieu of Resolution 404 (A-07) and the remainder of this report be filed:

> That our American Medical Association establish policy that physicians, physicians-in-training, and medical students should serve as advocates for pediatric patients with diabetes to ensure that they receive the best in-school care, and are not discriminated against, based on current federal and state protections.

REFERENCES

1. The Writing Group for the SEARCH for Diabetes in Youth Study Group. Incidence of diabetes in youth in the United States. *JAMA.* 2007;297:2716-2724.
2. Centers for Disease Control and Prevention. *National diabetes fact sheet: General information and national estimates on diabetes in the United States*. Atlanta, GA: U.S. Department of Health and Human Services; 2005.
3. National Diabetes Education Program. Helping the student with diabetes succeed: a guide for school personnel. U.S. Department of Health and Human Services; 2003 Available at: http://ndep.nih.gov/diabetes/pubs/Youth_SchoolGuide.pdf. Accessed March 4, 2008.
4. U.S Department of Education, Office of Civil Rights. Section 504 of the Rehabilitation Act of 1973, 29 USC § 794, implementing regulations at 34 CFR Part 104. Available at: www.ed.gov/ocr/disability.html. Accessed March 4, 2008.
5. Title II of the Americans with Disabilities Act of 1990, 42 USC § 12134 et seq., implementing regulations at 28 CFR Part 35. Available at www.ed.gov/ocr/disability.html. Accessed March 4, 2008.
6. Individuals With Disabilities Education Act, 20 USC § 111 et seq., implementing regulations at 34 CFR Part 300. Available at: www.ed.gov/offices/OSERS/OSEP. Accessed March 4, 2008.
7. The role of health care professional in diabetes discrimination issues at work and school. *Diabetes Educator.* 2002;28:1021-1027.
8. Rapp JA, Arent S, Dimmick BL, Jackson C. *Legal Rights of Students with Diabetes*. American Diabetes Association; 2007. Available at: http://www.diabetes.org/advocacy-and-legalresources/attorneymaterials/legalrights.jsp. Accessed March 4, 2008.
9. American Diabetes Association. School legislation. Available at: http://www.diabetes.org/advocacy-and-legalresources/discrimination/school/legislation.jsp. Accessed March 4, 2008.
10. American Diabetes Association. Care of children with diabetes in the school and day care setting. *Diabetes Care.* 2003;26(Suppl 1):S131-S135.
11. National Diabetes Education Program. Helping the Student with Diabetes Succeed. A Guide for School Personnel. US Department of Health and Human Services. Available at: http://ndep.nih.gov/diabetes/pubs/Youth_NDEPSchoolGuide.pdf. Accessed March 4, 2008.
12. American Diabetes Association. Safe at School Campaign. Available at: http://www.diabetes.org/advocacy-and-legalresources/discrimination/school/safeschool.jsp. Accessed March 4, 2008.
13. American Diabetes Association. Diabetes care tasks at school. What key personnel need to know. Available at: http://diabetes.org/advocacy-and-legalresources/discrimination/school/schooltraining.jsp. Accessed March 4, 2008.
14. American Academy of Pediatrics, Committee on School Health. Guidelines for emergency medical care in school. *Pediatrics.* 2001;107:435–436.
15. American Academy of Pediatrics, Committee on School Health. The role of the school nurse in providing school health services. *Pediatrics.*2001;108:1231–1232.
16. National Association of School Nurses. Position Statement. School nurse role in care and management of the child with diabetes in the school setting. 2005. Available at: http://www.nasn.org/Default.aspx?tabid=216. Accessed March 4, 2008.

17. Lewis DW, Powers PA, Goodenough MF, Poth MA. Inadequacy of in-school support for diabetic children. *Diabetes Technol Ther.* 2003;5:45-56.
18. Melton D, Henderson J. Do public schools provide optimal support for children with diabetes? *Prev Chronic Dis.* 4(3):1-3. Available at: www.cdc.gov/pcd/issue/2007/jul/06_0124.htm. Accessed March 4, 2008.
19. Juvenile Diabetes Research Foundation. Position Statement on Diabetes Management in Schools. 2001. Available at: http://www.jdrf.org/index.cfm?fuseaction=home.viewPage&page_id=B0F27252-2A5E-7B6E-1BEA8F58C0863902. Accessed March 4, 2008.
20. Parent Teachers Association. Resolution. Recognition and care of school-age children with diabetes. 2006. Available at: www.pta.org/archive_article_details_1152136026718.html. Accessed March 10, 2008.

APPENDIX

See the "Quick Reference Emergency Plan" charts for hypoglycemia and hyperglycemia in *Helping the Student with Diabetes Succeed. A Guide for School Personnel.*[11] These charts are not reproduced in this Appendix.

5. REVISION OF THE LIFETIME DEFERRAL FOR BLOOD DONATION OF THE MEN WHO HAVE SEX WITH MEN (MSM) POPULATION (RESOLUTION 515, A-07)

HOUSE ACTION: RECOMMENDATIONS ADOPTED AS FOLLOWS IN LIEU OF RESOLUTION 515 (A-07) AND REMAINDER OF REPORT FILED

Resolution 515 (A-07), introduced by the New York Delegation and referred to the Board of Trustees, asked:

> That our American Medical Association (AMA) advocate to the Food and Drug Administration (FDA) that its guidance is discriminatory to large populations of potential blood donors and that this policy has not kept pace with screening technology and with the spread of specific diseases; and
>
> That our AMA advocate to the FDA that a uniform screening of donors be put in place for all populations and that the lifetime restriction for men who have had sex with men since 1977 be eliminated.

This Council report reviews data on the prevalence of human immunodeficiency virus (HIV) in the men who have sex with men (MSM) population, examines the potential increase in the blood supply that would result from increased donations by the MSM population, and discusses any increased risk to the safety of the blood supply should the lifetime deferral from blood donation be removed. The report does not discuss social and ethical issues that surround the current FDA guidance on this issue.

DATA SOURCES

- Literature searches conducted in the PubMed database for English-language articles published between 1998 and 2008 using the search terms "men who have sex with men blood donation" or "men who have sex with men blood deferral" yielded a total of 95 references; 45 articles/reviews directly relevant to the risk management of blood donations were selected for further review. An additional 11 references were culled from the articles selected for further review.
- The World Wide Web was searched, using the "Google" search engine, using the search term "men who have sex with men blood donation deferral." Relevant Web references were examined for accuracy and appropriateness. Electronic references cited in this report were revisited to verify availability as of March 5, 2008.

INTRODUCTION

Over the past few years, interest has been expressed in changing the current FDA blood donor deferral criteria for the MSM population. Men who have had sex with men even once since 1977 are permanently deferred from blood donation. It has been proposed that permanent deferral be changed to a specific time of abstinence from MSM

behavior, after which the individual should be allowed to donate blood. Several time lengths have been proposed for the deferral period; however, a 1-year deferral has received the most interest. The primary reasons why this policy change is being considered are the view that the current policy is discriminatory toward the gay population and that the volatility of the US blood supply would be eased by relaxation of the current policy.

This matter is difficult to address based purely on scientific data. Clearly, this is a risk management decision where the best available scientific evidence must be balanced against the needs of society, both in terms of the blood supply itself (i.e., safety and quantity) and in terms of cultural and ethical norms.

This report presents the current scientific data on blood donation deferral and the MSM population. It recommends that an analysis of the societal and ethical implications of revising the lifetime deferral policy for MSM populations be undertaken by the Council on Ethical and Judicial Affairs in order that the risk management equation be balanced. Indeed, the FDA suggests that this risk management decision is constantly changing based on new scientific data and has committed to convening expert panels to review the evidence regularly. It is also reasonable to expect that changing societal norms will play a major role in public acceptance of any such policy change. The FDA states that should future information support a change in the current policy for the MSM population, it will be seriously considered. Additionally, the FDA has stated that it is working with the Centers for Disease Control and Prevention (CDC) and the National Institutes of Health to reach consensus on this issue. Of note, both Canada and the European Union have a similar lifetime blood donation deferral policy for the MSM population and following recent review have chosen to maintain the status quo.

BLOOD DONATION IN THE UNITED STATES

The current US blood supply is remarkably safe. However, the potential for new, as yet unidentified, bloodborne pathogens for which no tests exist, analogous to hepatitis C in the late 1980s and West Nile virus in this decade, requires that stringent donor selection criteria remain firmly in place. While the ultimate responsibility for keeping the US blood supply safe lies with the individual establishments that collect the blood, the FDA is tasked with keeping blood donations as safe as possible. To accomplish this, the FDA has issued guidance that recommends multi-layered protections for donated blood to ensure its safety.[1] There are five levels:

Donor Screening: Donors are first informed about potential risks that may compromise the blood supply, and then through a detailed questionnaire are required to answer questions about factors that may bear on the safety of their blood.[2] For example, donors with a history of intravenous (IV) drug abuse are permanently deferred. Studies indicate that donor screening is effective; for example, one study indicates that donors deferred via standard blood donor questions regarding risk of viral hepatitis as well as those with a history of IV drug use were more likely to have higher hepatitis marker rates than those who were not deferred.[2] Of note, prior to the availability of tests for HIV and hepatitis C, the risks of post-transfusion hepatitis C and HIV infection were managed via donor selection criteria, such as the use of voluntary donors and deferral of those with known risk conditions.[3]

Blood Testing: After donation, every unit of donated blood undergoes a series of tests for hepatitis B and C viruses (HBV and HCV), HIV 1 and 2, human T-lymphotropic virus (HTLV types I and II), West Nile virus, and syphilis. These tests have become more and more sophisticated, and the current use of nucleic acid testing (NAT) has dramatically reduced the risk of contracting HIV and HCV from the blood supply.[4,5] However, despite the improved bloodborne pathogen testing, there still remains a "window" period for several of these pathogens during which the tests will *not* detect recent infection of the donor. For HIV, this window is now about 11 days and for HCV 10 days (although a range of 10 to 30 days is possible).[4]

Donor Lists: All blood collection establishments are required to keep a current list of deferred donors and use it to ensure they do not collect blood from anyone on the list.

Quarantine: Donated blood must be quarantined and not used for transfusion until it is tested and shown to be free of known infectious agents.

Problems and Deficiencies: Should manufacturing problems occur, blood collection establishments are required to investigate immediately and correct all deficiencies. The FDA must be notified when product deviations occur in distributed products.

Current Lifetime Blood Donation Deferral Criteria

Current FDA guidance is followed in an FDA-approved AABB- (formerly known as the American Association of Blood Banks) developed Donor History Questionnaire, which is used by blood collection agencies, such as AABB members, America's Blood Centers, and the American Red Cross. This recommends that any person fitting the following conditions be permanently deferred for blood donation;[6]

- Is repeatedly reactive to screening tests for HBV, HCV, HIV, HTLV-I/II (on two independent donations), and has antibodies to core antigen of HBV (on two independent donations);
- Has a history of hepatitis since age 11 years;
- Has a history of hemophilia or other inherited bleeding disease;
- Has a history of IV drug use;
- Has a history of Chagas' disease;
- Has a blood relative with Creutzfeldt-Jakob disease;
- Has received growth hormone of human pituitary origin or dura mater graft;
- Has lived in the United Kingdom for 3 months or more between 1980 and 1996, or in Europe for 5 years overall or more since 1980;
- Has received a transfusion in the United Kingdom or France since 1980;
- Has a history of hematologic cancer;
- Is a male who had sex with a male even once since 1977; or
- Has received money or drugs for sex.

In addition to these permanent deferrals, there are also deferrals for specific time periods, which are determined by the risk factor and may be implemented at the medical director's discretion. Thus, if someone self-identifies as having had acupuncture, electrolysis, or a body piercing, they are deferred from donating blood for 1 year. Even ear piercings, if not performed in a physician's office, may necessitate a 1-year deferral. Dental work may require a 1-day deferral while a root canal procedure may call for a 3-day deferral.[6]

Residual Risk of Contracting a Bloodborne Pathogen from a Blood Transfusion

Despite these efforts, certain challenges to efficacy of the donor screening process remain. First, the potential donor must be able to fully understand the screening questions in order to answer them accurately. For example, it has been shown that donors have a varying range of definitions of sex that may be due to different concepts of risk activities.[7] Second, there will always be some underlying level of unreported deferrable risk, with younger donors more likely to not report deferrable risk.[8,9] Third, there is the risk of quarantine release errors, in which a unit of blood waiting for testing is accidentally released. Finally, despite donor screening, rare testing errors will occur, although some experts believe these to be so low in frequency as to be inconsequential.[10]

When all factors are considered, the risk that an infectious unit of blood will be undetected and enter the blood supply is called the residual risk. In the United States, this residual risk is currently estimated to be about 1 in 1,935,000 donations for HCV and 1 in 2,135,000 donations for HIV, with the combined use of NAT and serologic screening of donations.[11,12] Hepatitis B virus residual risk, using a combination of anti-hepatitis B core and hepatitis B surface antigen testing, is about 1 unit in 200,000 to 500,00 donations.[12] NAT is available for HBV but is not required as a routine screen due to the marginal added benefit of its use with pooled donor samples. However, it is being performed under an investigational new drug (IND) application in selected blood centers. It is important to note that incidence rates for all these pathogens and for HTLV are twice as high in first-time donors, which emphasizes the importance of the testing process, even after donor deferral.[11]

At this time, the residual risk of West Nile virus is estimated to 1 in 350,000 donation.[13] While six cases of transfusion-associated transmission of West Nile virus have been identified since 2003 (when minipool NAT was introduced), there have been no cases since individual donation NAT in endemic regions was implemented.[12,14]

Prevalence of the MSM Population in the United States

Although few definitive reports exist on the prevalence of MSM in the US population, one carefully performed and frequently cited survey from 1994 reported that 2.8% of males aged 18 years or older self-identified as being

homosexual or gay.[15] Data from the General Social Surveys conducted between 1996 and 2000 indicate the rate of MSM to be in the range of 3.1% to 3.7%.[16]

Prevalence of HIV and Other Bloodborne Pathogens in the MSM Population

Surveillance data from the CDC indicate that three decades into the HIV epidemic, the MSM population comprised more than two-thirds (68%) of all men living with HIV in 2005, even though only about 5% to 7% of US men have reported having sex with other men.[17] Additionally, data from the National HIV Behavioral Surveillance system suggest that HIV prevalence ranges from about 18% to 40%, with a median of 25% in this population.[18] This translates to about 500,000 to 800,000 MSM who are infected with HIV. Significantly, 48% of the MSM who were HIV-positive were unaware of their infection,[18] and more than half of those who were unaware had not had an HIV test in the previous year.[18] Other reports suggest a lower HIV prevalence (about 8%) in the MSM population, perhaps reflecting differences in the sample populations studied,[19,20] with 25% of HIV-infected MSM unaware of their infection.[21] However, the incidence of HIV in the MSM population remains fairly stable, ranging between 2% to 3% per year for those with high risk behaviors and 1% for those with low risk behaviors.[22,23]

With respect to HBV and HCV prevalence, while levels have declined over the last 20 years, the primary risk factors for infection have not. Thus, about 18% to 40% of MSM have markers of previous HBV infection, while about 4% have markers of HCV infection.[23-25] Incidence of HBV infection in the MSM population averages about 13%.[26] Notably, HCV prevalence in the MSM population is no more than twice that of the general population, and with the high sensitivity of anti-HCV enzyme immunoassay and the redundancy of HCV NAT, deferral of blood donations from the MSM population plays at best a marginal role in preventing HCV transmission.

With respect to HBV, it is important to recognize that 95% of HBV infections resolve, with an average window period of about 80 days. Thus, with any deferral policy that is greater than 1 year following the high risk activity, the primary risk to the blood supply lies in those who are chronically infected. The prevalence of chronic HBV infection in the MSM population is about 1%. Even then, these donors would test positive with the two HBV antibody tests and thus the primary risk defaults to donation during the window period following infection.[27]

Of more recent relevance to the MSM population is human herpesvirus 8 (HHV-8), the causative agent for Kaposi's sarcoma. At the May 2006 meeting of the Department of Health and Human Services (HHS) Advisory Committee on Blood Safety and Availability, it was reported that the prevalence of HHV-8 in HIV-negative MSM was about 12% to 16%. However, it appears that while HHV-8 may be transmitted via blood transfusions, the rate is about 2% to 3% of seropositive units.[28,29] Finally, the prevalence of HHV-8 among the general population of donors is quite high (at least 3.5%) and there are no reports of increased Kaposi's sarcoma incidence, even when many of these units are transfused into immunosuppressed patients.[30]

Risk Assessment of the Donor Deferral Criteria for the MSM Population

Several factors must be considered in any decision to change the current lifetime deferral criteria for blood donation for the MSM population. The first is whether a deferral standard can be created that would result in no significant increase in risk over the current lifetime deferral criteria. This makes the assumption that the US public would not accept any situation that would result in a blood supply that is not as safe as reasonably possible. The second is whether any change in the deferral criteria would increase donor numbers sufficiently to make a significant impact on the current blood supply. In this regard, the 2005 Nationwide Blood Collection and Utilization Report indicates that while blood shortages were less frequent, when they did occur they were more acute,[31] and some studies indicate that any change in deferral standards may only marginally improve recruitment of MSM donors.[32] Third, ethical and societal issues must be considered and these include the perception of discrimination against the MSM population should deferral criteria not be supported by scientific data. Indeed, lawsuits are beginning to be filed against blood collection agencies for refusing to accept blood donations from the MSM population.[33]

Several studies (some unpublished, but presented at the FDA's March 2006 Behavior-Based Donor Deferrals in the NAT Era meeting) have examined these issues.[23] Leiss and colleagues examined different deferral criteria that included: (1) No MSM deferral; (2) change to a 1-year deferral period; (3) change to a 5-year deferral period; and (4) change to a 10-year deferral period.[10] Their analysis concluded that with the current prevalence rates of HIV in the MSM population and the residual risk with the current deferral policy, there would be an unacceptable increase in risk should the MSM population no longer be deferred, thereby making the safety of the blood supply rely solely

on blood testing. This finding is supported by a 2007 study in Australia, which reported that those potential donors most likely to become infected with HIV and donate blood during the testing window period were MSM.[34] The Leiss study also concluded that targeting blood donation deferral to a set of high-risk behaviors is not practical. In particular, such a practice would require the screening process to ask questions that focus "directly and in detail" on very sensitive and intimate sexual behavior, questions that many donors would find awkward to answer truthfully. Furthermore, behaviors change over time and this strategy would create many challenges for administrators of blood collection agencies. The example used by the authors is an individual who has previously donated but now declares a sexual behavior risk.[10]

A 1-Year Deferral Policy

Germain and co-workers have examined the impact on the US blood supply of a 1-year deferral policy.[35] They calculate an 8% increase in HIV risk or 1 additional HIV-contaminated unit for every 136,000 additional donations and estimate that the number of donations would increase by 1.3%. The authors conclude that while the increased risk with a 1-year abstinence from blood donation from the last MSM contact would be very small, it is not zero.

A study by Soldan and Sinka estimated that in the United Kingdom the risk of an HIV-infected unit being released to the public would increase by 60% with a policy change from lifetime deferral to a 1-year deferral from last MSM contact, reflecting an increase from the current risk of 0.45 per year to 0.75 per year.[36] These authors also state that the increase in non-infected donations with such a policy shift would be small (perhaps 2% of current donations), and they favor maintaining permanent de-selection of MSM, irrespective of the risk of HIV-infectious donations.

Finally, in 2006, Andrew Dayton summarized to the HHS Advisory Committee on Blood Safety and Availability the findings from a March 2006 FDA workshop on deferral of the MSM population.[23,28] His mathematical modeling using data from the FDA's Biological Product Deviation Report suggested that a 1-year deferral policy would increase HIV risk by 2.5% of the current risk. However, the same model using older data from New York state yielded an increased HIV risk of 40% of the current risk, which translates to an increase of about 5 infectious units transfused (in this model, Dr. Dayton assumed a background residual risk of 12 infected units). Analysis of such a policy change in 2000 indicates that the pool of blood donors could be increased by 112,000.[27]

Leiss and colleagues suggest that similar to changing to a no-deferral policy, this small but scientifically real increase in risk is a clear violation of ethical principles and therefore not acceptable.[10] However, testimony from Celso Bianco representing the AABB at the May 2006 Advisory Committee on Blood Safety and Availability meeting argued that assumptions made in these studies have been too conservative; the AABB's analysis suggests that moving to a 1-year deferral policy would increase the number of HIV-infected donations being transfused by 1 in 46 million donations, or 1 case every 32.8 years.[28]

A 5-Year Deferral Policy

If a 5- or 10-year deferral policy is considered, risk management calculations would yield risks at a level that many might consider acceptable. A study by Sanchez and colleagues found that compared to blood donors who did not report MSM contact, the prevalence of reactive screening test results was fivefold higher among those who reported the behavior within the past 5 years.[37] However, in those who last practiced male-to-male sex more than 5 years ago, no significant difference was found. The authors suggest that a 5-year deferral following MSM contact may be a good starting point for consideration in changing blood donation deferral policy.

At the March 2006 FDA workshop, Andrew Dayton presented data indicating that a 5-year deferral policy would increase HIV risk by 1.7% of the current risk. This is using the newer data from the FDA's Biological Product Deviation Report. Using the older New York state data yielded an estimate of increased HIV risk of 25% over the current residual risk (allowing 3 more infectious components to be transfused).[23] With respect to HHV-8, the FDA estimates that changing the MSM deferral to 1 to 5 years would increase blood recipient exposure to HHV-8 by 2% to 5%.[28] Michael Busch presented information indicating that with abstinence of less than 12 months or for 1 to 5 years, the presence of positive infectious disease markers was 3 to 4 times that of the general donor population.[28] However, with abstinence for 5 years or longer, the marker rate was similar to that of the general donor population.[28]

Thus, data suggest that men who have abstained from sex with other men for more than 5 years essentially present no greater risk than the general population.[10,23,28] Additionally, at the May 2006 Advisory Committee on Blood

Safety and Availability meeting, data were presented indicating that a 5-year deferral period would provide a temporal safety net that would allow unidentified pathogens that may emerge to be recognized before they enter the blood supply.[28] A policy change consistent with these data was examined by the FDA in 2000 and it was estimated that about 62,300 new donors would be added to the donor pool.[27] In their risk management analysis, Leiss and co-workers suggest that while it is a matter of judgment as to whether a 5-year deferral period would pass the risk hurdle, it may be "within the ballpark " for discussion.[10] They also suggest potential societal and ethical benefits from considering this policy change. These include the utilitarian benefit of potentially increasing the pool of blood donors, and the social benefit of reducing the perceived stigma associated with the MSM population. However, it must be noted that this remains controversial. Many argue that the rights of blood transfusion recipients outweigh any asserted rights of blood donors,[38] that the right to receive safe blood is the overriding responsibility of blood collection agencies,[39] and that there is no direct discrimination in the current lifetime deferral policy since the purpose of selection is to prevent virus infections, including HIV, with which the MSM population are disproportionately affected.[28]

A Perspective on Risk Assessment

Any mathematical model for risk management can only provide an estimate of the potential risk. To put this into perspective, the residual risk that an HIV-infected unit of blood will enter the blood supply is estimated at about 1 infected donation for every 2.1 million donations, which translates to a residual risk of about 7 infected units every year – there are about 14.5 million blood donations annually.[31] However, it is clear that 7 HIV-infected units do not enter the US blood supply annually undetected. In fact, since the implementation of NAT in 1999, there have been four incidences where HIV has been transmitted via a blood transfusion, with the last in 2002 (C. Bianco, America's Blood Centers, personal communication, April 2008). In all four of these transmissions, the donors denied any risk factors at screening, rendering the length of donor deferral moot (J. MacPherson, America's Blood Centers, personal communication, April 2008). In the eight years since the implementation of NAT, more than 14 million units of whole blood/red blood cells, and about 28 million total blood components, have been transfused annually. A rudimentary analysis would suggest that out of more than 112 million whole blood units transfused, only 4 resulted in HIV transmission. Clearly, this is far lower than is predicted by the risk models. Whether this is due to the lifetime deferral or to the fact that there is short, finite 11-day window period during which the risk of an infected donor's blood cannot be adequately tested, cannot be determined. In the absence of actual data to supplement the risk assessments, these risk assessments will only be as good as the assumptions used in the modeling. Indeed, this is a position echoed by the blood collection agencies.

The Position of Blood Collection Agencies

Blood collection agencies do not support the current lifetime deferral recommendation for men who have had sex with men even once since 1977. In a statement submitted to the March 2006 FDA Workshop on Behavior-Based Donor Deferrals in the NAT Era, the American Red Cross, America's Blood Centers, and the AABB stated that they "believe that the current lifetime deferral for men who have had sex with other men is medically and scientifically unwarranted and recommend that deferral criteria be modified and made comparable with criteria for other groups at increased risk for sexual transmission of transfusion-transmitted infection."[40] These three organizations, which represent virtually all the blood collection agencies in the United States, also specify that they "acknowledge the concern that relaxation of deferral criteria may increase the number of presenting donors who are marker positive." They go on to state, "[h]owever, this impact has not been measured directly; it has only been modeled using what may be incomplete assumptions. The blood collectors are willing to assist in collecting data regarding the actual impact of changes in the deferral, in order to allow for informed decision-making, and/or for the development of additional, appropriate interventions to ameliorate the impact."

CONCLUSIONS

Men who have had sex with men since 1977 are currently permanently deferred from blood donation. This FDA policy recommendation has generated controversy due concerns that it may be discriminatory and that it stigmatizes the MSM population. It is clear that a policy change with respect to blood donation deferral is a risk management decision wherein the risks of introducing additional infected units for transfusion over the current residual risk must be balanced against the benefits of increasing the pool of blood donors. Also important are ethical and societal factors, which this report does not address. Any policy decision on blood donation deferral of the MSM population must be governed by the best available scientific evidence but there are inherent weaknesses in mathemathical

models used in the risk assessments on this issue that continue to generate some uncertainty. With respect to the MSM population, it appears that a policy change from a permanent lifetime deferral to a 5-year deferral following the last MSM contact may be supportable, but societal and ethical consequences must be analyzed should this decision be advanced. Such an analysis should include discussion of what society would consider acceptable risk with respect to safety of the blood supply, as that will determine to what extent a precautionary principle must be factored into any policy decision. Finally, should such a policy change occur, blood collection agencies must be marshaled to collect data that will provide actual data for future risk assessments to improve decision-making on this issue.

RECOMMENDATION

The Council on Science and Public Health recommends that the following statement be adopted in lieu of Resolution 515 (A-07), and that the remainder of this report be filed:

> That our American Medical Association (AMA) recognize that based on existing scientific evidence and risk assessment models, a shift to a 5-year deferral policy for blood donation from men who have sex with men is supportable.

REFERENCES

1. Food and Drug Administration. Keeping Blood Transfusions Safe: FDA's Multi-layered Protections for Donated Blood. Available at: http://www.fda.gov/opacom/factsheets/justthefacts/15blood.html. Accessed: 3-5-2008.
2. Zou S, Fujii K, Johnson S, et al. Prevalence of selected viral infections among blood donors deferred for potential risk to blood safety. *Transfusion.* 2006;46:1997-2003.
3. Tan L, Khan MK, Hawk JC, III. Use of blood therapeutically drawn from hemochromatosis patients. Council on Scientific Affairs, American Medical Association. *Transfusion.* 1999;39:1018-1026.
4. Stramer SL, Glynn SA, Kleinman SH, et al. Detection of HIV-1 and HCV infections among antibody-negative blood donors by nucleic acid-amplification testing. *N Engl J Med.* 2004;351:760-768.
5. Goodman JL. The safety and availability of blood and tissues--progress and challenges. *N Engl J Med.* 2004;351:819-822.
6. American Association of Blood Banks. Blood Donor History Questionnaire. Available at: http://www.aabb.org/Content/Donate_Blood/Donor_History_Questionnaires/AABB_Blood_Donor_History_Questionnaire. Accessed: 3-5-2008.
7. O'Brien SF, Ram SS, Yi QL, Goldman M. Donor's understanding of the definition of sex as applied to predonation screening questions. *Vox Sang.* 2008;
8. Damesyn MA, Glynn SA, Schreiber GB, et al. Behavioral and infectious disease risks in young blood donors: implications for recruitment. *Transfusion.* 2003;43:1596-1603.
9. Van der Bij AK, Coutinho RA, Van der Poel CL. Surveillance of risk profiles among new and repeat blood donors with transfusion-transmissible infections from 1995 through 2003 in the Netherlands. *Transfusion.* 2006;46:1729-1736.
10. Leiss W, Tyshenko M, Krewski D. Men having sex with men donor deferral risk assessment: an analysis using risk management principles. *Transfus Med Rev.* 2008;22:35-57.
11. Dodd RY, Notari EP, Stramer SL. Current prevalence and incidence of infectious disease markers and estimated window-period risk in the American Red Cross blood donor population. *Transfusion.* 2002;42:975-979.
12. Stramer SL. Current risks of transfusion-transmitted agents: a review. *Arch Pathol Lab Med.* 2007;131:702-707.
13. Bihl F, Castelli D, Marincola F, Dodd RY, Brander C. Transfusion-transmitted infections. *J Transl Med.* 2007;5:25
14. West Nile virus transmission through blood transfusion--South Dakota, 2006. *MMWR Morb Mortal Wkly Rep.* 2007;56:76-79.
15. Laumann EO, Gagnon JH, Michael RT, Michaels S. *The Social Organization of Sexuality in the United States*. Chicago: University of Chicago Press; 1994.
16. Anderson JE, Stall R. Increased reporting of male-to-male sexual activity in a national survey. *Sex Transm Dis.* 2002;29:643-646.
17. Centers for Disease Control and Prevention. Cases of HIV infection and AIDS in the United States and Dependent Areas, 2005. Available at: http://www.cdc.gov/hiv/topics/surveillance/resources/reports/2005report/default.htm. Accessed: 3-5-2008.

18. Sifakis F, Flynn CP, Metsch LR, et al. HIV Prevalence, Unrecognized Infection, and HIV Testing Among Men Who Have Sex with Men --- Five U.S. Cities, June 2004--April 2005. *MMWR.* 2005;54:597-601.
19. Pollack LM, Osmond DH, Paul JP, Catania JA. Evaluation of the Center for Disease Control and Prevention's HIV behavioral surveillance of men who have sex with men: sampling issues. *Sex Transm Dis.* 2005;32:581-589.
20. McQuillan GM, Kruszon-Moran D, Kottiri BJ, et al. Prevalence of HIV in the US household population: the National Health and Nutrition Examination Surveys, 1988 to 2002. *J Acquir Immune Defic Syndr.* 2006;41:651-656.
21. Unrecognized HIV infection, risk behaviors, and perceptions of risk among young black men who have sex with men--six U.S. cities, 1994-1998. *MMWR Morb Mortal Wkly Rep.* 2002;51:733-736.
22. McFarland W, Stoyanoff SR, Shehan D, et al. HIV Incidence Among Young Men Who Have Sex With Men -- Seven U.S. Cities, 1994-2000. *MMWR. Morb Mortal Wkly Rep.* 2001;50:440-444.
23. Food and Drug Administration. Behavior-Based Donor Deferrals in the NAT Era. Available at: http://www.fda.gov/cber/minutes/nat030806t.htm. Accessed: 3-5-2008.
24. Rhodes SD, DiClemente RJ, Yee LJ, Hergenrather KC. Hepatitis B vaccination in a high risk MSM population: the need for vaccine education. *Sex Transm Infect.* 2000;76:408-409.
25. Remis RS, Dufour A, Alary M, et al. Association of hepatitis B virus infection with other sexually transmitted infections in homosexual men. Omega Study Group. *Am J Public Health.* 2000;90:1570-1574.
26. Wasley A, Miller JT, Finelli L. Surveillance for acute viral hepatitis--United States, 2005. *MMWR Surveill Summ.* 2007;56:1-24.
27. Dayton, A. I. Deferral of MSM: Policy Analysis. Available at: http://www.fda.gov/OHRMS/DOCKETS/AC/00/backgrd/3649b1t/index.htm. Accessed: 3-5-2008.
28. Department of Health and Human Services. Blood Safety and Availability Advisory Committee May 2006 meeting transcript. Available at: http://www.hhs.gov/bloodsafety/transcripts/ACBSA20060509.pdf. Accessed: 3-5-2008.
29. Hladik W, Dollard SC, Mermin J, et al. Transmission of human herpesvirus 8 by blood transfusion. *N Engl J Med.* 2006;355:1331-1338.
30. America's Blood Centers. Study Finds Evidence of Transmission of HHV-8 by Transfusion. *ABC Newsletter.* 2006;37:1-2.
31. Department of Health and Human Services. 2005 Nationwide Blood Collection and Utilization Survey. Available at: http://www.hhs.gov/bloodsafety/2005NBCUS.pdf. Accessed: 3-3-2008.
32. Spencer B, Rios J, Cable R. Marginal recruitment impact of potential alterations to FDA deferral criteria for men who have sex with men. *Transfusion.* 2006;46:869-870.
33. Garmaise D. Gay man launches suit over refusal to accept blood donation. *HIV AIDS Policy Law Rev.* 2006;11:20-21.
34. Musto JA, Seed CR, Law M, Keller AJ, Kaldor JM. Estimating the risk of blood donation associated with HIV risk behaviours. *Transfus Med.* 2008;18:49-54.
35. Germain M, Remis RS, Delage G. The risks and benefits of accepting men who have had sex with men as blood donors. *Transfusion.* 2003;43:25-33.
36. Soldan K, Sinka K. Evaluation of the de-selection of men who have had sex with men from blood donation in England. *Vox Sang.* 2003;84:265-273.
37. Sanchez AM, Schreiber GB, Nass CC, et al. The impact of male-to-male sexual experience on risk profiles of blood donors. *Transfusion.* 2005;45:404-413.
38. Brooks JP. The rights of blood recipients should supersede any asserted rights of blood donors. *Vox Sang.* 2004;87:280-286.
39. Franklin IM. Is there a right to donate blood? Patient rights; donor responsibilities. *Transfus Med.* 2007;17:161-168.
40. Kleinman S: *Behavior-Based Blood Donors Deferrals in the Era of Nucleic Acid Testing (NAT): AABB Statement presented at the FDA Behavior-Based Blood Donors Deferrals in the Era of Nucleic Acid Testing (NAT) meeting*, 2006.

6. PORTABLE LISTENING DEVICES AND NOISE-INDUCED HEARING LOSS (RESOLUTION 425, A-07)

HOUSE ACTION: RECOMMENDATION ADOPTED IN LIEU OF RESOLUTION 425 (A-07) AND REMAINDER OF REPORT FILED

INTRODUCTION

Resolution 425, introduced by the Michigan Delegation at the 2007 Annual Meeting and referred to the Board of Trustees, asks:

> That our American Medical Association (AMA) support limiting the maximum output of portable musical devices to acceptable Occupational Safety & Health Administration (OSHA) guidelines; and
>
> That our AMA lobby the federal government and/or appropriate federal agencies for the establishment of regulations or rules that would limit the output of portable musical devices sold in the United States to limits within OSHA guidelines.

Our AMA has long recognized the problem of noise-induced hearing loss. In 1990, a Board of Trustees report reviewed scientific data and concluded "…the misuse of personal headphones can pose a threat to the listener's hearing. Such potential for harm depends upon a number of variables, including the station signal strength, battery strength, accuracy of volume settings, etc." This report encouraged physicians to counsel patients about the potential loss of hearing associated with the misuse of personal listening devices; urged that research be directed at more specific definition of the relationship between acute and chronic use of personal listening devices and the occurrence of short-term and long-term noise-induced hearing loss; and directed the AMA to work with key stakeholders to enhance awareness, knowledge, and remediation of causes of noise-induced hearing loss (Policy H-440.957, AMA Policy Database).

Responding to continued concern about noise-induced hearing loss, the House of Delegates adopted Resolution 407 (I-00), which called on our AMA to encourage public education about the dangers of noise-induced hearing loss especially from toys and electronic devices, and encourage the Consumer Product Safety Commission and other federal agencies to study the impact of toys and electronic devices on noise-induced hearing loss among children and adolescents (Policy H-440.897).

Portable music players have continued to increase in popularity, and these listening devices have become smaller and more sophisticated. This report reviews the use of personal listening devices; the epidemiology of recreational, noise-induced hearing loss; current national guidelines for the maximum output of portable musical devices; and data on the decibel levels of in-ear headphones.

METHODOLOGY

Published studies from 1985 through February 2008 were identified by a MEDLINE search of English-language articles, using the search terms "noise induced hearing loss," "acquired hearing loss," "headphones," "in-ear headphones," and "portable listening devices." A total of 14 articles were identified; additional articles were identified by review of references cited in these publications. In addition, web sites of OSHA, the National Institute of Occupational Safety and Health (NIOSH), and the National Institute on Deafness and Other Communication Disorders were searched for information relevant to noise-induced hearing loss. Reports from the National Institutes of Health Consensus Development Conference on Noise and Hearing Loss and from the American Speech-Language-Hearing Association also were consulted. Consultation with national experts and key stakeholder organizations provided additional perspective.

USE OF PERSONAL LISTENING DEVICES

Rapid technological advances have revolutionized personal listening devices, leading to an electronics market dominated by Walkman, iPod, and other brands of MP3 players. A 2006 national study of 1000 individuals aged 18 to 70 years conducted on behalf of the American Speech-Language-Hearing Association provides information on

the contemporary listening habits of youth and adults.[1] This study found that approximately 36% of adults and 62% of students used Walkman personal electronic listening devices, 11% and 36% respectively used iPod devices, and 11% and 25% respectively used other brands of MP3 players (Table). Hispanic and African Americans were more likely than Caucasians to report using each of the listening devices. Use rose with family income, and declined with age. Regardless of the type of portable musical device, the typical listening session lasted from 1 to 4 hours for approximately 40% of adults and 25% to 30% of youth. In addition, approximately 35% of adults and 40% to 59% of teens reported listening at loud volumes.

Table: Listening Practices with Portable Musical Devices[1]

	Usage of Devices		Length of Typical Session: 1-4 hrs		Usual Volume: Loud	
	Adult	Student	Adult	Student	Adult	Student
Walkman*	36%	62%	37%	--	34%	--
Apple iPod	11%	36%	38%	30%	38%	41%
Other MP3 player	11%	25%	43%	24%	34%	59%

*portable CD player

THE RELATIONSHIP BETWEEN PERSONAL LISTENING DEVICES AND HEARING LOSS

The intensity, frequency, and duration of noise exposure affect hearing loss.[2] OSHA regulations, promulgated in 1983, set the industrial standard for permissible noise exposure levels at 4 hours for 95 decibels, 2 hours for 100 decibels, and 1 hour for 105 decibels.[3] When employees are subjected to sound exceeding these levels, feasible administrative or engineering controls should be utilized. If such controls fail to reduce sound levels within OSHA limits, personal protective equipment must be provided and used to reduce sound levels within the noise exposure standards. When information indicates that any employee's exposure may equal or exceed an 8-hour time-weighted average of 85 decibels, employers should develop and implement a monitoring program as part of a "hearing conservation program," and make audiometric testing available to all employees whose exposures equal or exceed such limits.

In 1998, NIOSH updated its previous 1972 recommendations on permissible sound level in order to focus on preventing hearing loss, not merely conserving hearing. Similar to OSHA, NIOSH recommends a "hearing loss prevention program" for workers whose noise exposures equal or exceed 85 decibels for 8 hours, that includes exposure assessment, engineering and administrative controls, proper use of hearing protectors, audiometric evaluation, education and motivation, recordkeeping, and program audits and evaluations. Additionally, NIOSH recommends that occupational noise exposure be controlled at certain levels based on the combination of exposure level (L) and duration (T), according a formula that is more stringent based on the requirement that noise exposure time be halved for each 3-decibel increase in noise level. Consequently, the most recent NIOSH recommendations are more stringent than OSHA's as the noise level increases.[4] It should be noted, however, that occupational noise levels average the intensity and reflect a steady-state of continuous high level noise; when daily noise exposure consists of periods of different noise levels, these can also be converted to a time-weighted average In contrast to industrial noise, music has wide ranges of frequency as well as intensity and does not reflect a continuous state.

Although individual preferences for music loudness are subjective, portable music devices are capable of producing decibel levels that exceed occupational safety limits. According to the American Speech-Language-Hearing Association, at maximum volume, Apple iPods produce sound at 120 to 125 decibels, the Sony Walkman MP3 player at 108 to 115 decibels, and the Bratz-Liptunes MP3 player at 115 to 120 decibels.[5] Portnuff and Fligor studied the loudness produced at different volume settings.[6] Averaging the results from different types of earphones, a volume control of 50% produced sound at approximately 70 decibels, of 70% at approximately 80 decibels, and of 100% at approximately 100 decibels. On average, the output level of in-ear headphones was 5.5 decibels higher than over-the-ear headphones.

Although portable music devices and attendant headphones have the potential to cause hearing damage, actual effects are probably short-lived. After exposure to a loud noise of either long duration and low intensity or high intensity and short duration, a person may have a temporary threshold shift in hearing, which is an immediate hearing loss sometimes accompanied by ringing in the ears (tinnitus). Usually, the cochlea will recover over a period of a few days. If the duration and intensity are too great, however, permanent hearing loss might occur. The results of a number of studies suggest that 5% to 20% of people who use portable music devices with over-the-ear

headphones experience either tinnitus or dull hearing.[7-12] It is difficult, however, to extrapolate these results to current patterns of use, because these studies were conducted before the most recent advances in earphone technology. The results of epidemiological studies from both the United States and Argentina suggest, in fact, that no correlation exists between the use of portable music devices and hearing deficits.[9,13] Furthermore, there are no studies on the long-term effects of portable music devices, regardless of the type of earphones used.

At least six factors complicate the design and interpretation of studies on portable music devices and noise-induced hearing loss: (1) OSHA standards are based on using occupational noise in calculating hearing loss; however, compared with occupational noise, music varies in acoustic spectrum and intensity; (2) musical sounds reaching the inner ear are discontinuous, thus providing the hair cells an opportunity for some recovery; (3) listening devices vary in their output capacity; (4) headphones vary in terms of the distance at which they deliver sound to the ear canal; (5) users vary the actual listening volume according to environmental noise and the noise reduction capability of the headphone; and (6) individuals vary in their sensitivity to damage and recovery from noise.[9,12,14,15] More research is needed to increase basic understanding of the physiology of hearing loss from in-ear headphones, the relationship of noise-induced hearing loss to age, and recovery expectations.

Technological advances in headphones have created smaller and more efficient devices for delivering music. More efficient blocking of ambient noise translates to a lower volume used when listening to music.[14] Whereas 20 years ago headphones were relatively bulky, most MP3 players today are sold with in-ear headphones.[14] These devices do not block as much ambient noise as over-the-ear devices, and they also deliver sound more directly to the ear canal. Thus, independent of the type of portable music device, in-ear headphones produce noise levels in the ear canal that are substantially greater than noise levels of over-the-ear headphones at the same volume control setting.[15] For example, in a laboratory study on 100 young adults, Fligor and Ives demonstrated that the preferred listening level of most subjects using different in-ear headphones was around 65 decibels in low background noise (range 63 to 67), and 83 decibels with high background noise (range 77 to 89).[16] Two earphones used in this study had built-in ambient noise isolation. When using earphones with this technology, the preferred listening decibel level was lower than with the use of non-dampened earphones (77 and 84 decibels vs. 89 decibels).

SUMMARY AND DISCUSSION

Theoretically, current portable music devices produce maximum sound levels that can damage hearing and lead to hearing loss. In addition, in-ear headphones produce sound at substantially greater levels than do over-the-ear models. It is not clear, however, if the combination of high-output portable music devices and in-ear headphones causes long-term hearing loss. Although some laboratory and epidemiological data suggest a link between temporary noise-induced hearing loss and listening devices, this relationship is not as well established for in-ear headphones. The rising popularity of portable music devices and in-ear headphones, however, raises the question of how to address the potential public health risk of noise-induced hearing loss. Three potential approaches are:

1. Promote a health education message to alert users that listening to music at high volume and for long durations may damage hearing. Various public and private organizations could work to educate the public on the potential hazard of listening to loud music. Although national guidelines do not exist, a set of recommendations based on scientific information for maximum listening times per day for in-ear headphones to prevent noise-induced hearing loss risk criteria has been proposed.[6] Thus, when the volume control on the music device is $\leq 60\%$, there is no limitation for the length of an individual listening session. However, with the volume at 70%, a person should not listen for more than 6 hours, at 80% not more than 1.5 hours, at 90% not more than 22 minutes, and at 100% not more than 5 minutes.

2. Advocate for expansion and use of technology to reduce earphone-delivered sound. At least four technologies reduce the potential damage. Noise isolation devices work like earplugs to block background noise, thus enabling a person to listen comfortably at lower volumes even in loud environments. Noise cancellation headphones, by comparison, are bulkier and employ an active technology that is run by batteries. The sound isolation devices are relatively expensive ($40 to $100). Finally, automatic volume limiter systems are built into some portable listening devices and permit the user to set a maximum volume control. Two companies currently produce products with this technology.

3. Advocate for health protection legislation. This option raises the issue of whether or not the government should mandate that manufacturers of portable music devices should limit the maximum sound their

devices can emit. When deciding if government intervention to reduce public health risks is warranted, it is important to consider the scientific evidence on the nature of the problem, as well as the feasibility and cost of potential solutions.[17] Although there is no doubt that portable music devices produce sound that can damage hearing, epidemiological data on the extent of noise-induced hearing loss caused by in-ear headphones are lacking. Furthermore, as discussed above, companies are already producing earphones and music devices that permit a person to voluntarily limit the sound output.

Given all of these considerations, invoking a mandate to limit sound emission from portable music devices appears unwarranted and unnecessary at this time, and the most expedient approach is to promote a health education message. Therefore, the Council believes that existing AMA policy is adequate.

RECOMMENDATION

The Council on Science and Public Health recommends that the following statement be adopted in lieu of Resolution 425 (A-07) and the remainder of the report be filed:

That our American Medical Association reaffirm Policies H-440.897 and H-440.957.

REFERENCES

1. Zogby International: Survey of Teens and Adult about the Use of Personal Electronic Devices and Head Phones. March, 2006. Available at: http://www.asha.org/NR/rdonlyres/10B67FA1-002C-4c7b-ba0B-1C0A3AF98A63/0/zogby_survey2006.pdf. Accessed November 9, 2007.
2. Noise and Hearing Loss. National Institutes of Health Consensus Statement. January 22-24, 1990;8:1-24. Available at: http://consensus.nih.gov/1990/1990NoiseHearingLoss076html.htm. Accessed October, 17, 2007.
3. Occupational Noise Exposure. Regulations Standards 29 CFR, 1910 Subpart G. U.S. Department of Labor, Occupational Safety & Health Administration. Available at: www.osha.gov/pls/oshaweb/ owadisp.show_document?p_table=STANDARDS&p_id=9735. Accessed October 2007.
4. Criteria for a recommended standard: occupational noise exposure, 1998. Public Health Service, Centers for Disease and Prevention, National Institute for Occupational Safety and Health. Available at: www.nonoise.org/hearing/criteria/criteria.htm. Accessed October 2007.
5. American-Speech-Language-Hearing Association. Popular technology unpopular with ear's hair cells; 2006. Available at: www.asha.org/about/news/2006/techdamage.htm? Accessed November 19, 2007.
6. Portnuff CDF, Fligor BJ. Sound output levels of the iPod and other MP3 players: is there potential risk to hearing? Paper presented at the NIHL in Children Meeting, Cincinnati, Ohio, October 19, 2006. Available at: www.hearingconservation.org/docs/virtualPressRoom/portnuff.htm. Accessed October 17, 2007.
7. Smith PA, Davis A, Ferguson M, Lutman ME. The prevalence and type of social noise exposure in young adults in England. *Noise Health.* 2000;2:41-56. Available at noiseandhealth.org/article.asp?2000/ 2/6/41/32650. Accessed November 19, 2007.
8. Rice CG, Bresin M, Roper RG. Sound levels from personal cassette players. *Br J Audio.* 1987;21:273-278.
9. Biassoni EC, Serra MR, Richter U, Joekes S, et al. Recreational noise exposure and its effects on the hearing of adolescents. Part II: development of hearing disorders. *Int J Audiology*. 2005;44:74-85.
10. Bradley R, Fortnum H, Coles R. Research note: patterns of exposure of school children to amplified music. *Br J Audio.* 1987;21:119-125.
11. Lee PC, Senders CW, Gantz BJ, Otto SR. Transient sensorineural hearing loss after overuse of portable headphone cassette radios. *Otolaryngol Head Neck Surg*. 1985;93:622-625.
12. Mostafapour SP, Lahargoue K, Gates GA. Noise-induced hearing loss in young adults: the role of personal listening devices and other sources of leisure noise. *Laryngoscope.* 1998;108:1832-1839.
13. Niskar AS, Kieszak SM, Holmes A, Esteban E, et al. Prevalence of hearing loss among children 6 to 19 years of age: the Third National Health and Nutrition Examination Survey. *JAMA.* 1998;279:1071-1075.
14. Hodgetts WE, Rieger JM, Szarko RA. The effects of listening environmental and earphone style on preferred listening levels of normal hearing adults using an MP3 player. *Ear & Hearing.* 2007;28:290-297.
15. Fligor BJ, Cox LC. Output levels of commercially available portable compact disc players and the potential risk to hearing. *Ear & Hearing*. 2004;25:513-527.
16. Fligor BJ, Ives TE. Does earphone type affect risk for recreational noise-induced hearing loss? Available at: www.hearingconservation.org/docs/virtualPressRoom/FligorIves.pdf. Accessed October 20, 2007.

17. Gostin LO. Public health law in a new century, Part III: public health regulation: a systematic evaluation. *JAMA*. 2000;283:3118-3122.

7. ELDER MISTREATMENT (RESOLUTION 429, A-07)

HOUSE ACTION: RECOMMENDATIONS ADOPTED IN LIEU OF RESOLUTION 429 (A-07) AND REMAINDER OF REPORT FILED

INTRODUCTION

Resolution 429 (A-07), introduced by the Illinois Delegation, asked:

> That our American Medical Association (AMA) adopt policy that recognizes elder abuse and maltreatment in nursing homes as a continuing problem, and that further supports comprehensive steps to reduce its incidence; and
>
> That our AMA support passage of appropriate legislation that would help prevent elder abuse in nursing homes and give consumers more information to guide nursing home placement.

After discussion, Reference Committee D recommended to the House of Delegates that this issue be referred to the Board of Trustees with a broader mandate, to provide a more comprehensive overview of elder abuse and mistreatment in the community as well as in institutions; it was referred.

Elder mistreatment cuts across class, race, and gender lines and occurs in both urban and rural areas, making it a pervasive, but often neglected public health problem. With coming demographic shifts in the US population, and corresponding increases in the occurrence of degenerative diseases, opportunities for elder mistreatment are increasing. The lack of clear definitions, population-based surveys, and outcome measures have prevented accurate studies of this phenomenon.

Almost every physician has encountered older patients whom they suspect may be mistreated, yet there is little guidance to help them in their care of these individuals. Policies are needed that call for increased awareness, education, research, and medical care for this sector of the population. This report describes the state of the field, including definitions, epidemiology, the role of physicians, and implications for medical education and research. It concludes with nine policy recommendations for better clinical care and increased education and research. The few existing methodologically sound studies are cited to support these recommendations.

METHODS

An extensive search of the literature was conducted on the topics of elder abuse, elder neglect, elder mistreatment, and elder self-neglect. References from the 2003 National Academy of Science publication, "Elder Mistreatment: Abuse, Neglect, and Exploitation in an Aging America," were included based on the rigor of each research report, the accuracy and sources of statistics cited, the expertise of the authors, and the frequency with which a particular citation has been cited in peer-reviewed publications. Many of the articles chosen were featured at national meetings on elder mistreatment hosted by the Department of Justice, the National Institute of Justice, the Federal Bureau of Investigation, the American Geriatrics Society, and the Gerontological Society of America.

BACKGROUND

History: Physicians began writing about elder mistreatment in the late 1950s.[1,2,3,4] In a 1975 letter to the *British Medical Journal*, Burston was the first to describe physical abuse of an elder, which he referred to as "granny battering."[5] Despite such reports, elder mistreatment was thought to be largely a social problem. In 1974, the passage of Title XX of the Social Security Act mandated that states develop protective service agencies for senior citizens.[6] By 1981, every state had an agency whose role was to protect vulnerable older people. Many if not most of these agencies were housed in state or county social service entities.

In the 1990s, physicians and nurses began to systematically study the phenomenon of elder mistreatment. There have been two National Research Council reports, one in 2002 ("Confronting Chronic Neglect: The Education and Training of Health Professionals on Family Violence") and one in 2003 ("Elder Mistreatment: Abuse, Neglect, and Exploitation in an Aging America").[7,8] The National Institute on Aging is currently funding several grants on the subject; however, prior to 2004, there were fewer than 15 funded national grants that addressed elder mistreatment.[8] The literature on this problem is scant and includes mostly case series and reviews, although more primary data is starting to emerge.

Definitions: The specific definitions of the types of elder mistreatment vary from state to state, as defined by state laws. The lack of widely accepted definitions precludes comparisons as well as assessment of the extent of the problem. The National Center on Elder Abuse uses specific definitions, which are listed in Figure 1 (see Appendix). Often referred to generally as "elder abuse," the term "elder mistreatment" is used by those in the field to encompass, broadly, physical abuse, neglect, and financial exploitation, and often includes self-neglect. The establishment of standard definitions would facilitate research, especially population-based studies.

Although sometimes subdivided, there are generally considered to be three broad types of elder mistreatment: abuse, neglect, and exploitation. Elder abuse is defined as the infliction of physical harm on a senior and includes sexual assault. Neglect is the failure to provide the goods or services needed to meet basic needs (food, shelter, medical care) and can be perpetrated by a caregiver or by the vulnerable individual on him- or herself (self-neglect). Exploitation is use of an older adult's money or resources by caregivers for their own purposes.[9] Common examples of community abuse (see below) are noted in Figure 2 (see Appendix).

The unifying feature of elder mistreatment is that those who suffer mistreatment are vulnerable and unable to protect themselves.[8] Moreover, when elder mistreatment is committed by others, the perpetrator is known to the elder. As opposed to frank crimes against the elderly, in elder mistreatment, a trust relationship exists between the elder and family members or paid caregivers. In these ways, elder mistreatment is similar to child mistreatment. Children are vulnerable because their brains are developing and they cannot act autonomously; elders lose the ability to act autonomously because they develop cognitive and functional impairments.

The Special Case of Self-neglect: Although recognized by 35 states as a reportable form of elder mistreatment, self-neglect (which can be voluntarily reported) is the most common type of case received by state and county APS agencies.[10,11] Seniors who neglect themselves often live in squalor and dangerous environments such as homes with gas leaks, vermin, and animal and human feces.[12] Self-neglect almost always involves medical issues, such as comorbid diseases that affect cognition and function.[13] Perhaps the most obvious role for physicians and the greatest need for medical care lie in identifying and intervening in cases of elder self-neglect.

Self-neglect is often viewed as a benign condition that is the result of poor choices by cognitively intact elders. However, in a study of persons with self-neglecting behaviors, Tierney and colleagues measured harm in 131 persons.[14] They defined harm as physical injury, property loss or damage, or an incident requiring emergency community intervention. The risk for experiencing harm was 21%. Dyer and colleagues reported on serious consequences of self-neglect, which included the absence of utilities, the presence of spoiled or rotting food, living with untreated advanced medical disease, or laying in excrement.[13]

EPIDEMIOLOGY

The National Association of Protective Service Administrators conducted two national surveys, funded by the Administration on Aging, on the number of reports of elder mistreatment received by states in 2000 and 2004. All 50 states and the District of Columbia and Guam responded. Although the best of its kind, this data set is incomplete because of the definitional variations from state to state and the variation in the ways that states organize their protective service agencies. Some states (e.g., California) organize protective service agencies by county, while in Texas there is central organization through the state office. As a result very few states could provide answers to all 21 questions; for many of the questions only 50% or less of the states could respond to specific questions.

More than 560,000 cases of mistreatment in community dwellers were reported to state agencies in 2004, which represented nearly a 20% increase from the earlier survey.[15] In the second survey the types of mistreatment as reported by 19 states were: self-neglect 37.2%, caregiver neglect 20.4%, financial exploitation 14.7%, emotional abuse 14.8%, and physical abuse 0.7%. The most common sources of reports were family members (17%), social

services workers (10.6%), and friends and neighbors (8%) – these data were derived from only 11 states. Sixty-six percent of the elder mistreatment victims were white, 18.7% were African American, and 10.4% were Hispanic. The fact that so many states did not collect the data and could not respond to the survey questions is a strong example of why better research, uniform language and definitions, and data collection are so essential. The state agencies are funded to provide services and are not equipped to conduct valid research.

Despite the incomplete nature of the studies, these data on total numbers of reports are felt to represent only one-fifth of the cases that actually occur, and the true number is likely from two to five million cases per year.[16] In an in-home survey in Israel, 18% of seniors reported physical abuse or neglect.[17] Fear, cognitive impairment, and unwillingness to implicate family members may prevent seniors from reporting the majority of cases.

Facility versus Community Mistreatment

Elder mistreatment can occur in nursing facilities. In the United States, some 1.6 million people live in approximately 17,000 licensed nursing homes, and another 1 million in an estimated 45,000 residential care facilities, such as personal care homes, adult congregate living facilities, domiciliary care homes, adult care homes, homes for the aged, and assisted living facilities.[18,19,20] In California an estimated 20% to 30% of institutions have been cited annually for abusive events that resulted in actual harm.[21] In 2003, state long-term care ombudsman programs nationally investigated 20,673 complaints of abuse, neglect, and exploitation. Physical abuse was the most common type reported.[22] Individuals in these settings are felt to be at much higher risk for abuse and neglect than older persons who live at home, since they are often more cognitively and functionally impaired and less able to protect themselves. Furthermore, nursing home patients and others in long-term care facilities are often too impaired to report or prevent acts of mistreatment. In fact, most adult protective services (APS) agencies receive reports of mistreatment in community dwellers, and do not always receive reports on nursing home residents; separate agencies undertake the investigation of mistreatment in facilities. Depending on the state, these may include departments of health and human services, departments of aging, and ombudsmen programs, which are present in every state. The investigations vary widely depending on funding and training of those involved.

Outcomes

Very few studies have examined outcomes for self-neglect and the types of elder mistreatment that involve perpetrators. There have been no longitudinal studies on elder mistreatment to determine trajectory, recurrence rate, effects of interventions, and health outcomes. In a landmark study, Lachs and colleagues crossed the Established Populations for Epidemiologic Studies in the Elderly (EPESE) database with the Connecticut Ombudsmen program. This New Haven EPESE was one of four studies on cohorts of aging individuals funded by the National Institutes of Health (NIH). This study demonstrated that physical abuse and caregiver neglect increased the risk of death threefold, while self-neglect increased it twofold.[23] None of the subjects in either group died from injury and the authors posited that death was due to malnutrition, multiple comorbidities, or frailty.

THE ROLE OF PHYSICIANS IN ELDER MISTREATMENT

Recognition

Elder mistreatment is a complex issue involving medical disease complicated by social issues. The difficulty is rooted in the inability to consistently arrive at a firm diagnosis of elder mistreatment. How does one distinguish among physiological changes associated with aging, degenerative and other diseases, and elder mistreatment? In the case of bruising, for example, are ecchymoses due to thinning, aged skin, a blood dyscrasia, or physical abuse? The same is true of many other "red flags" of mistreatment such as weight loss, fractures, pressure ulcers, and over-medication. Common red flags of elder mistreatment are described in Figure 3 (see Appendix). Distinguishing among the effects of aging versus disease versus mistreatment requires a clear understanding of the living situation and environment, as well as medical judgment.

Joint Commission standard PC.2.05.0 requires that "the [organization] have criteria to identify [patients] who may be victims of … elder or child abuse and neglect."[24] This policy also requires reporting to the appropriate agency. Identification and assessment of elder mistreatment is a sophisticated evaluation and requires time, medical knowledge, and an appropriate level of suspicion. There is a need to sensitize physicians to look for elder mistreatment earlier so that intervention is possible.

Risk Factors

There are a number of recognized risk factors for elder mistreatment. Dementia and depression, alcohol use or other substance abuse, and dependence on others are recognized risk factors for mistreatment.[10,25,26] Vitamin D deficiency has been demonstrated to be a likely risk factor for self-neglect.[27] In an NIH-funded pilot study when compared to frail public hospital patients, self-neglecting elders had a higher prevalence of vitamin D deficiency (37% vs. 13% [$p < .012$]).[27] Like vitamin D deficiency, any disorder that leads to executive dysfunction and the inability to plan, sequence, and carry out tasks can render elders vulnerable and unable to care for and protect themselves.[26,28] Although poverty and ethnic or racial background are associated with an increased incidence of reports to protective service agencies, elder mistreatment is observed in all sectors of society.[10]

Screening

APS agencies do not use reliable and validated screening tools; most state or county agencies do not have the resources to develop, test, and study instruments for the identification of elder mistreatment. Researchers have developed and studied a few tools, but few have undergone the rigorous repeated studies that are necessary for validation (i.e., multiple settings, multiple administrators).[17] One exception is the Elder Assessment Instrument, developed by Fulmer and colleagues, which has been utilized to detect caregiver neglect in emergency center patients.[29,30] This tool requires 20 minutes to administer and training prior to administration and thus is not suitable for the physician in practice. The Brief Abuse Screen of the Elderly is five-item instrument suitable in a clinical setting, but this tool requires training, does not screen for self-neglect, and has not been widely used.[31] Some recommend that physicians can probe using three questions: Do you feel safe at home? Who prepares your meals? Who handles your finances? Insufficient answers to any of these questions should prompt further investigation.[32]

A widely accepted, validated, and reliable screening tool, which is also practical and can be applied quickly, is needed to enable physicians to detect mistreatment. The ideal tool would help physicians and other health care and social service professionals in every setting quickly apply a standardized screen for mistreatment and recommend the appropriate medical and social interventions. It would also create a common language for communication to agencies, such as APS; other disciplines; and even across state lines. Since elder mistreatment is known to be an independent risk factor for death, data on the risk factors and markers for death could identify those at greatest risk of dying as a result of elder mistreatment. A tool based on these data could help physicians and others to triage the more critical cases, as well as help medical examiners determine if death was due to elder mistreatment or natural causes.

Reporting

In 44 states physicians are considered mandated reporters to the state or local protective service agencies. In a national survey by the National Association of Protective Service Administrators, physicians were noted to report fewer than 3% of cases.[33] Nurses and social service agency personnel are also mandated reporters in other states and report at much higher rates than physicians. There must be a suspicion of mistreatment and iron-clad evidence is not required. Physicians and other reporters are often granted immunity from civil and criminal liability if the report is made in good faith. The decision to report is easy in obvious cases; however, in more subtle cases it may take several visits and discussions with collateral sources before a physician is convinced that there is a suspicion of mistreatment. Failure to report in most states is a punishable offense; incarceration and or fines can be imposed, although few cases are ever prosecuted. Published reports have identified the major barriers to physician reporting. These include time pressures and lack of awareness of the extent of the problem. Sometimes, other medical professionals, such as nurses or hospital social workers, report the cases referred by physicians or the medical team. Many physicians fear that they will endanger the patient-physician relationship, lose control of case outcomes, be drawn into court, and decrease quality of life for the patient.[34,35] Some others do not believe that state agencies will help, are not aware of the specific laws in their states, or cannot recognize the key risk factors for elder mistreatment.[36]

APS agencies are known by a variety of names across the United States, but they are most commonly social service agencies that perform investigations and provide social interventions. These include:

- Home clean up;
- Arranging for provider services; transportation services;
- Linking patients with health care providers and services;

- Paying utility bills; food and other basic needs; and
- Obtaining legal services – such as representative payees and guardians.

The National Association of Protective Service Administrators survey determined that from 2000 to 2004 expenditures by protective service agencies increased 20%.[15] There are high recidivism rates among reported cases; i.e., cases that were reported multiple times. Recidivism can be explained by the reluctance of victims to accept services, or inappropriate reporting by family members or others (examples of such inappropriate reports might be those seeking social services or responding to conflicts among family members). In some cases, recidivism can be explained by undiagnosed and untreated medical disease and the need for sophisticated medical judgment that APS workers cannot provide. Many physicians are frustrated by the inability of APS agencies to resolve more cases of elder mistreatment;[37] however, there are likely multiple reasons for this. APS interventions may not be accepted by clients and since these workers are representatives of the state they cannot force interventions on unwilling elders with adequate mental capacity. Furthermore, although APS workers may have social work training, few have any medical training.[38] As an example, APS workers may not recognize the more subtle cases of mental incapacity and can leave their clients in dangerous situations, believing that the elder is making a lifestyle choice. Self-determination is a major tenet of APS casework. Due to their lack of medical training, APS workers may not always recognize occult or undiagnosed or even life-threatening diseases. This underscores the need to apply medical judgment to complicated cases. No study of the effectiveness of APS intervention has been conducted since the passage of Title XX, despite the nearly half billion dollars spent annually on these agencies nationally.

MEDICAL CARE IN CASES REPORTED TO APS

Primary Care Physician Role

Once a case is reported to APS, an investigation ensues. In some states feedback is provided to the physician; in other instances the investigation continues without any notification to the reporter. Physicians may be asked to provide medical records to APS workers, but this differs by state. The physician is often tasked with providing ongoing care to the patient. Occasionally, a physician may be called on to testify on behalf of the patient; however, excellent documentation of the findings and explicitly identifying the suspected mistreatment in the medical record can often preclude the need for a court appearance. Once APS has completed its intervention (for example, placing a provider in the home, and closing the case), it is the ethical duty of the primary care physician to provide ongoing monitoring of the patient. This may be particularly important for elderly patients with early neurodegenerative diseases that may worsen over time.

The Physician as Member of the Care Management Team

Some physicians are opting for involvement with APS clients beyond traditional office care, and are participating in medical case management teams. Indeed, numerous disciplines and agencies are often simultaneously involved in elder mistreatment cases. Often efforts are duplicated, incurring more costs and not achieving resolution. Medical case management teams, such as the Texas Elder Abuse and Mistreatment Institute and the Vulnerable Adult Specialist teams, have been formed to increase the efficiency and effectiveness of public and private groups that treat vulnerable mistreated elders.[13,39,40,41,42] Since APS agencies do not employ physicians or other health care personnel, they must refer clients for medical care. Physicians may work directly with APS on case management teams and participate directly in investigations and interventions. They generally provide comprehensive geriatric assessment, which includes evaluation of cognition, mood, medications, and function in addition to history and physical examination.

Physicians who serve on medical case management teams often make home visits with APS workers. A major role for the physician is the diagnosis of unrecognized diseases, such as vitamin B12 deficiency or depression, and evaluating unusual physical signs and presentations. Physicians can adjust or simplify medication regimens and order home health and other services to curtail neglect; at times they serve as consultants to the primary care physician or assume the care of the patient. They advise APS workers about the severity and prognosis of the condition as well as the time course so that APS agencies can plan and carry out the appropriate interventions. Often the most pressing need is a capacity assessment of the patient, which determines if a social-legal intervention is needed or if the APS worker can intervene at all against patient wishes. Physicians provide the needed medical interventions that complement the social service interventions of APS agencies.

Work on a case management team is very different from traditional medical practice. Unlike patients who come willingly to a medical clinic or emergency center, medical examinations of APS clients may be compelled by the state and patients often undergo them begrudgingly.[43] The type of capacity assessment is different from that with which most physicians are familiar. Unlike capacity assessments performed in the clinic or hospital setting where the physician is assessing the person's ability to consent to a medical procedure, APS clients require an assessment of their decision-making and executive capacities to perform self-care and self-protection.[44] Those deemed incapacitated often require guardians or conservators to remain safe in the community.

A book entitled *Elder Abuse Detection and Intervention: A Collaborative Approach*, co-authored by individuals from medicine, social work, protective services, criminal and civil law, and law enforcement, details best practices for interdisciplinary teams across the United States and the processes for elder mistreatment team development.[45] Although generally felt to be very useful by health care and other professionals, outcomes of these teams have not been formally evaluated. There is no agreed upon methodology for evaluation, generally accepted definitions, or outcomes or other measures by which to study the effectiveness of APS services. There has also been little to no funding for demonstration projects or program evaluation.

Expert Witness and Other Physician Roles

A handful of physicians across the United States have the necessary experience and interest to serve as expert witnesses in elder mistreatment cases. Prosecutors often lack enthusiasm for trying elder mistreatment cases due to the dearth of suitable expert witnesses. Attorneys often ask forensic nurses to assist with these cases because they have the necessary forensic training.[46,47]

Physicians in approximately eight states participate in elder abuse fatality review teams. Like child fatality review teams, these teams are forming in numerous sites across the United States to explore ways to improve state agency, law enforcement, criminal justice, and medical care processes. Some child protective service agencies have medical directors who advise the staff on care of children. A similar position for physicians or perhaps a medical advisory board may also be appropriate for APS agencies.

EDUCATIONAL ISSUES

In the 2002 National Academy of Science report "Confronting Chronic Neglect: The Education and Training of Health Professionals on Family Violence"7 the authors equate family violence, including elder mistreatment, with the most serious public health issues such as cancer and heart disease, and call for better education of physicians and other health professionals in this area. Specific recommendations are summarized below:

1. Creation of family violence centers to conduct research on the impact of family violence on the health care system and evaluate and test training and education programs for health professionals. The centers should be established by the Department of Health and Human Services and modeled after similar multidisciplinary centers in fields such as injury control, Alzheimer's disease, and geriatric education.
2. Health professional organizations and educators--including academic health center faculty—should address the essential skills to be included in health professional curricula on family violence; effective teaching strategies; and approaches to overcoming barriers and promoting and sustaining behavior changes by health professionals in dealing with family violence.
3. Health care delivery systems and training settings, particularly academic health care centers and federally qualified health clinics and community health centers, should assume greater responsibility for developing, testing, and evaluating innovative training models or programs.
4. Federal agencies and other funders of education programs should create expectations and provide support and incentives for evaluating curricula on family violence for health professionals. Evaluations should focus on the impact of training on the practices of health professionals and the effects on family violence victims.

The report asserted that health professionals alone cannot solve this complex problem and encouraged society to pay greater attention to the tragedy of family violence.

Medical Students: Almost all medical students in the United States are trained to recognize child abuse, but in an Association of American Medical Colleges survey published in 1998, only 38% recalled receiving training on elder mistreatment.[48] In a study in Virginia, only 19% of medical school and residency programs included curricular

content on elder mistreatment.[49] This may reflect a low priority accorded geriatric medicine in most curricula. Medical school faculty should train students to recognize and intervene in cases of elder mistreatment. Several medical schools where faculty are interested in this topic have worked with APS agencies in their specific states to organize "ride-alongs" with APS workers.[50] Students report that these sessions are enlightening and informative and are likely to make a lifelong impact on these trainees.

Residents: Residents, especially in internal medicine, emergency medicine, psychiatry, and family medicine, will likely begin to care for mistreated elders during residency training. They must be able to recognize, diagnose, properly document, and intervene in these cases. Residency is an ideal time for trainees to begin to form relationships with state agencies and realize the public health responsibilities of physicians. Teaching the multifaceted aspects of elder mistreatment addresses each of the core competencies, especially patient care, professionalism, and systems-based practice. Residents practicing in the hospital also come under The Joint Commission umbrella and are expected to recognize and report elder mistreatment.

Continuing Medical Education: In some states, such as Texas, physicians are required to have one hour of ethics or family violence training each year in order to maintain their licenses. Practicing physicians in the community may see many cases of elder mistreatment in their practices, but without training to recognize, intervene, and report, they may miss cases and leave elders in jeopardy. Training physicians to identify older patients who are at high risk of elder mistreatment could lead to broader use of preventive measures to reduce this risk. In the early 1990s, our AMA convened an expert panel to develop a consensus document entitled "Diagnostic and Treatment Guidelines on Elder Abuse and Neglect," which described a practical approach for physicians in elder mistreatment cases.[51]

RESEARCH ISSUES

State of the Science

A 2002 *JAMA* editorial described the lack of research in elder mistreatment and called elder abuse and neglect a "new research topic."[52] Only a limited number of small or state-based studies on elder mistreatment have been conducted, and the full breadth and depth of the issue is unknown. These studies were retrospective and used inconsistent definitions as noted above. What is needed are data derived from prospective cross-sectional studies that are population based. Only a small number of federally funded studies of elder mistreatment have been conducted. Recently, the Department of Justice (Office on Violence Against Women and the National Institute of Justice) has funded seed grants for researchers in elder mistreatment. In 2004, the National Center for Research Resources funded an exploratory center called the Consortium for Research in Self-Neglect of Texas. In 2006, the National Institute on Aging began funding epidemiological studies to quantify the prevalence and incidence of elder mistreatment through methodologically rigorous research.

Challenges in Elder Mistreatment Research

Lack of funding has hampered research, but there are also significant methodological challenges to the study of this phenomenon. The major barriers to research on elder mistreatment are the varying definitions, difficulties associated with studying vulnerable populations, the lack of a "gold standard" or definitive diagnostic test, and selection of appropriate outcome measures.

Problems with Studying a Vulnerable Population

Mistreated elders are by definition a vulnerable population and are thus protected under the code of conduct for investigations. Many institutions with faculty who want to study elder mistreatment have faced difficulty in obtaining institutional review board (IRB) approval for elder mistreatment studies, even when the studies involved only interviews. Mistreated individuals may shun research studies, as they do medical care, wanting no involvement from others because of fear of being removed from the home or that perpetrators, known to the victims, may be prosecuted. Vulnerable groups can be studied by obtaining consent by proxy; however, in a given mistreatment case the available proxy may be the one who is exploiting or neglecting the elder and may not consent for fear of being exposed. IRB processes and protocols for studying this special population are needed, including guidelines on research subject surrogates.

Lack of a Gold Standard

Rigorous investigation of any public health problem is more easily achieved with a gold standard--a widely accepted method to distinguish cases from non-cases--but there is no biopsy or imaging study that can detect elder mistreatment. Elder mistreatment is a complex medical diagnosis that may touch the core values of the examiner. APS agency evaluation may be the closest to a standard, but untested screening tools and variations in worker training and experience make APS assessment unreliable. Although there may never be a true gold standard for a problem as complex as elder mistreatment, researchers must develop rigorous measurements to reliably evaluate interventions by APS agencies and medical or legal professionals.

LEGISLATION

The Elder Justice Act (S. 1070 and H.R. 1783): This comprehensive act, first introduced in 2003 and reintroduced to both houses of Congress in March 2007, seeks to accomplish many things. To elevate elder justice issues to the national level the act proposes creation of: (1) Offices of Elder Justice at the departments of Health and Human Services and Justice to serve programmatic, grant-making, policy, and technical assistance functions relating to elder justice; (2) a public-private partnership and a Coordinating Council to coordinate activities of all relevant federal agencies, states, communities, and private and not-for-profit entities; and (3) a consistent funding stream and national coordination for APS.

Under this proposed legislation, an Elder Justice Resource Center and library would provide information for consumers, advocates, researchers, policy makers, health providers, clinicians, regulators, and law enforcement personnel. The center and library would both increase knowledge and support/fund promising projects. Centers of excellence would be funded to develop forensic capacity. Victim assistance, “safe havens,” and support for at-risk elders are to be provided. The bill also describes measures for enhancing prosecution. Technical, investigative, coordination, and victim assistance resources would be made available, as well as increased training for medical, legal, and social service professionals. The bill calls for special programs to support underserved populations, including rural, minority, and Native American seniors. Lastly, model state laws and practices would be studied, along with ways to increase security and improve consumer information on long-term care.

A concerted national effort is needed to bring together all of the interested parties (from federal and state governments, medical societies, medical schools, and research institutions) to address the serious public health problem of elder mistreatment in the fastest growing segment of society.

CONCLUSIONS

Elder mistreatment occurs in every US jurisdiction and our AMA should adopt policy on the clinical, educational, and research issues surrounding this public health problem. Our AMA should advocate to federal and state governments, the NIH and other funders, medical schools, and the public that abuse, neglect, and exploitation are major threats to safety and well being in old age. Physicians have the responsibility to help maintain patient safety in medical and community settings. Advocating for these most vulnerable persons in American society is the professional responsibility of physicians to our patients and society.

RECOMMENDATIONS

The Council on Science and Public Health recommends that the following statements be adopted in lieu of Resolution 429 (A-07) and that the remainder of this report be filed:

That our American Medical Association:

1. Recognize elder mistreatment as a serious and pervasive public health problem that requires an organized effort from physicians and all medical professionals to improve the timely recognition and provision of clinical care in vulnerable elders who experience mistreatment.

2. Recognize the importance of an interdisciplinary and collaborative approach to this issue, and encourage states to bring together teams with representatives from medicine, nursing, social work, adult protective

services (APS), criminal and civil law, and law enforcement to develop appropriate interventions and evaluate their effectiveness.

3. Encourage all physicians caring for the elderly to become more proactive in recognizing and treating vulnerable elders who may be victims of mistreatment through prevention and early identification of risk factors in all care settings. Encourage physicians to participate in medical case management and APS teams and assume greater roles as medical advisors to APS services.

4. Promote collaboration with the Liaison Committee on Medical Education and the Association of American Medical Colleges, as well as the Commission on Osteopathic College Accreditation and American Association of Colleges of Osteopathic Medicine in establishing training in elder mistreatment for all medical students; such training could be accomplished by local arrangements with the state APS teams to provide student rotations on their teams. Physician responsibility in cases of elder mistreatment could be part of the educational curriculum on professionalism and incorporated into questions on the US Medical Licensing Examination and Comprehensive Osteopathic Medical Licensing Examination.

5. Encourage the development of curricula at the residency level and collaboration with residency review committees, the Accreditation Council for Graduate Medical Education, specialty boards, and Maintenance of Certification programs on the recognition of elder mistreatment and appropriate referrals and treatment.

6. Encourage substantially more research in the area of elder mistreatment.

7. Encourage the US Department of Health and Human Services, Office of Human Research Protections, which provides oversight for institutional review boards, and the Association for the Accreditation of Human Research Protection Programs to collaborate on establishing guidelines and protocols to address the issue of vulnerable subjects and research subject surrogates, so that research in the area of elder mistreatment can proceed.

8. Encourage a national effort to reach consensus on elder mistreatment definitions and rigorous objective measurements so that interventions and outcomes of treatment can be evaluated.

9. Encourage adoption of legislation, such as the Elder Justice Act, that promotes clinical, research, and educational programs in the prevention, detection, treatment, and intervention of elder abuse, neglect, and exploitation.

REFERENCES

1. Macmillan D, Shaw P. Senile breakdown in standards of personal and environmental cleanliness. *BMJ.* 1966;2:1032-1037.
2. Macmillan D. Psychiatric aspects of social breakdown in the elderly. *R Soc Health J*. 1957;77(11):830-836.
3. Clark ANG, Mankikar GD, Gray I. Diogenes syndrome: a clinical study of gross neglect in old age. *Lancet.* 1975:1(7903):366-368.
4. Drummond LM, Turner T, Reid S. Diogenes' syndrome--a load of old rubbish? *J Psych Med*. 1997;14(3):99-102.
5. Burston GR. Granny battering. *BMJ.* 1975;3(5983):592.
6. US Congress, Select Committee on Aging. A Report: Elder Abuse (an examination of a hidden problem). Washington, DC: US Government Printing Office; 1981.
7. Cohn F, Salmon ME, Stobo JD. *Confronting Chronic Neglect: The Education and Training of Health Professionals on Family Violence*. Washington: The National Academies Press; 2002.
8. Bonnie RJ. *Elder Mistreatment: Abuse, Neglect, and Exploitation in an Aging America*. Washington: The National Academies Press; 2003.
9. NCEA. The basics. National Center on Elder Abuse Website. Available at: www.elderabusecenter.org/pdf/research/apsreport030703.pdf. Accessed February 20, 2007.
10. Lachs MS, O'Brien S, Hurst L, et al. Risk factors for reported elder abuse and neglect: a nine-year observational cohort study. *Gerontologist*. 1997;37(4):469-474.
11. Pavlik VN, Festa NA, Hyman DJ, Dyer CB. Quantifying the problem of abuse and neglect in adults: analysis of a statewide database. *J Am Geriatr Soc*. 2001;49:45-48.

12. Dyer CB, Pickens S, Burnett J. Vulnerable elders: when it is no longer safe to live alone. *JAMA*. 2007; 298(12):1448-1450.
13. Dyer CB, Goodwin JS, Pickens-Pace S, et al. Characterizing self-neglect: a report of 538 cases seen by a geriatric medical team. *Am J Public Health.* 2007;97(9):1671-1676.
14. Tierney MC, Charles J, Naglie G, Jaglal S, Kiss A, Fisher RH. Risk factors for harm in cognitively impaired seniors who live alone: a prospective study. *J Am Geriatr Soc*. 2004;52(9):1435-1441.
15. The 2004 Survey of State Adult Protective Services: Abuse of Adults 60 Years of Age and Older. Washington, DC: National Center on Elder Abuse; 2006. Available at: http://www.apsnetwork.org/Resources/docs/AbuseAdults60.pdf. Accessed July 24, 2006.
16. Department of Justice. Extent of Victimization. Available at: http://www.ojp.usdoj.gov/ovc/publications/infores/clergy/general.htm. Accessed February 20, 2008.
17. Cohen M, Levin SH, Gagin R, Friedman G. Elder abuse: disparities between older people's disclosure of abuse, evident signs of abuse, and high risk of abuse. *J Am Geriatr Soc*. 2007;55:1224–1230.
18. Strahan GW. *An Overview of Nursing Homes and Their Current Residents: Data from the 1995 National Nursing Home Survey, Advance Data from Vital and Health Statistics (No. 280).* Hyattsville, MD: National Center for Health Statistics; 1997.
19. Hawes C, Mor V, Wildfire J, Lux L, Green R, Iannacchione V, Phillips C. *Executive Summary: Analysis of the Effects of Regulation on the Quality of Care in Board and Care Homes.* Report to the U.S. Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation. Washington, DC; Research Triangle Park, NC: Research Triangle Institute; 1995.
20. Hawes C, Rose M, Phillips C. *A National Study of Assisted Living for the Frail Elderly: Results of a National Telephone Survey of Facilities.* Washington, DC: U.S. Department of Health and Human Services, Office of the Assistant Secretary for Planning and Long-Term Care; 1999. Available at: http://aspe.hhs.gov/daltcp/home.htm. Accessed February 20, 2008.
21. Liang B. Elder abuse detection in nursing facilities: using paid clinical competence to address the nation's shame. *J Health Law*. 2006;39(4):527-550.
22. National Ombudsman Reporting System Data Tables 2003. Washington, DC: U.S. Administration on Aging; 2005. Available at: http://www.ncea.aoa.gov/ncearoot/Main_Site/pdf/publication/FinalStatistics050331.pdf. Accessed March 11, 2008.
23. Lachs MA, Williams CS, O'Brian S, et al. Mortality of elder mistreatment. *JAMA*. 1998;280(5):428-432.
24. Joint Commission. Available at: www.jointcommission.org/NR/rdonlyres/64B54001-9DCB-4B1D-7EAEAD242711/0/ahc_sii_pc_revised_chapter.pdf. Accessed February 18, 2008.
25. Dyer CB, Pavlik VN, Murphy KP, Hyman DJ. The high prevalence of depression and dementia in elder neglect. *J Am Geriatr Soc*. 2000;48(2):205-208.
26. Tierney MC, Snow WG, Charles J, Moineddin R, Kiss A. Neuropsychological predictors of self-neglect in cognitively impaired older people who live alone. *Am J Geriatr Psychiatry*. 2007;15(2):140-148.
27. Aung K, Burnett J, Smith SM, Dyer CB. Vitamin D deficiency associated with self-neglect in the elderly. *J Elder Abuse Negl*. 2006;18(4):63-78.
28. Royall DR, Palmer R, Chiodo LK, Polk MJ. Declining executive control in normal aging predicts change in functional status: the Freedom House study. *J Am Geriatr Soc*. 2004;52(3):346-352.
29. Fulmer T, Paveza G, Abraham II, Fairchild S. Elder neglect assessment in the emergency department. *J Emerg Nursing.* 2000;26:436-443.
30. Fulmer T, Paveza G, Vanderweerd C, Guadango L, Fairchild S, Norman R, Abraham I, Bolton- Blatt M. Neglect assessment in urban emergency departments and confirmation by an expert clinical team. *J Gerontol A Biol Sci Med Sci*. 2005;60(8):1002-1006.
31. Reis M, Nahmiash D, Schrier R. The Brief Abuse Screen for the Elderly. Presented at the 22nd Annual Scientific and Educational Meeting of the Canadian Association on Gerontology; Montreal, Quebec, Canada; 1993.
32. Fulmer T, Dyer CB, Connolly MT, Guadango L. Progress in elder abuse assessment instruments. *J Am Geriatr Soc*. 2004;52(2):297-304.
33. Teaster PB. A response to the abuse of vulnerable adults: the 2000 survey of state adult protective services; 2002. Available at: www.elderabusecenter.org/pdf/research/apsreport030703.pdf. Accessed November 8, 2005.
34. Wei GS, Herbers JE. Reporting elder abuse: a medical, legal, and ethical overview. *J Am Med Womens Assoc*. 2004;59(4):248.
35. Rodriguez MA, Wallace SP, Woolf MH, Mangione CM. Mandatory reporting of elder abuse: between a rock and a hard place. *Ann Fam Med*. 2006;4(5):403-409.

36. Taylor DK, Bachuwa G, Evans J, Jackson-Johnson V. Assessing barriers to the identification of elder abuse and neglect: a communitywide survey of primary care physicians. *J Natl Med Assoc*. 2006;98(3):403-404.
37. Rodriguez MA, Wallace SP, Woolf NH, Mangione CM. Mandatory reporting of elder abuse: between a rock and a hard place. *Ann Fam Med*. 2006;4(5):403-409.
38. Dyer CB, Heisler CJ, Hill CA, Kim LC: Community approaches to elder abuse. *Clin Geriatr Med*. 2005; 21(2):429-447.
39. Dyer CB, Hyman DJ, Pavlik V, Murphy KP, Gleason MS. Elder neglect: a collaboration between a geriatrics assessment team and adult protective services. *South Med J*. 1999;92(2):242-244.
40. Mosqueda L, Burnight K, Lia S, Kemp B. Advancing the field of elder mistreatment: a new model for integration of social and medical services. *Gerontologist*. 2004;44(5):703-708.
41. Dyer CB, Goin A. The value of interdisciplinary teams in the management of elder abuse and neglect. *Generations*. 2000;24(2):23-27.
42. Health JM, Kobylarz FA, Brown M, Castano S. Interventions from home-based geriatric assessments of adult protective service clients suffering elder mistreatment. *J Am Geriatr Soc*. 2005;53(9):1538-1542.
43. Dyer CB, Silverman E, Nguyen T, McCullough L. Ethical patient care. In: Mezey MD, Cassell K, Botrell MM, Hyer K, Howe JL, Fulmer TT(eds). *A Casebook for Geriatric Health Care Teams*. Baltimore: Johns Hopkins University Press; 2002.
44. Naik AD, Pickens S, Burnett J, Lai JM, Dyer CB. Assessing capacity in the setting of self-neglect: development of a novel screening tool for decision making capacity. *J Elder Abuse Negl.* 2006;18(4):79-91.
45. Brandl B, Dyer CB, Heisler CJ, Otto J, Stiegel L, Thomas R. *Elder Abuse Detection and Intervention: A Collaborative Approach*. New York: Springer; 2006.
46. Campbell R, Long SM, Townsend SM, et al. Sexual assault: nurse examiners' experiences providing expert witness court testimony. *J Forensic Nurs*. 2007;3(1):7-14.
47. Baker MW, Heitkemper MM. The roles of nurses on interprofessional teams to combat elder mistreatment. *Nurs Outlook*. 2005;53(5):253-259.
48. Alpert EJ, Tonkin AE, Seeherman AM, Holtz HA. Family violence curricula in US medical Schools. *Am J Prevent Med*. 1998; 14(4): 273-282.
49. Hendricks-Matther MK. A survey of family-violence curricula in Virginia medical school and residencies at university medical centers. *Acad Med*. 1997;72(1):54-56.
50. Heath JM, Dyer CB, Kerzner LJ, Mosqueda L, Murphy C. Four models of medical education about elder mistreatment. *Acad Med*. 2002;77(11):1101-1106.
51. American Medical Association. Diagnostic and Treatment Guidelines on Elder Abuse and Neglect, 1996.
52. Voelker R. Elder abuse and neglect: a new research topic. *JAMA*. 2002;288:2254-2256.53. Goodyear-Smith FA. Medical evaluation of sexual assault findings in the Auckland region. *NZ Med J.* 1989;102(876):493-495.
53. Goodyear-Smith FA. Medical evaluation of sexual assault findings in the Auckland region. *NZ Med J*. 1989;102(876):493-495
54. Mosqueda LM, Burnight K, Liao S. The life cycle of bruises in older adults. *J Am Geriatr Soc*. 2005;53(8):1339-1343.
55. Dyer CB, Connolly MT, McFeeley P. The medical forensics of elder abuse and neglect in elder mistreatment: abuse, neglect and exploitation in an aging America. Washington, DC: National Academic Press; 2002; pp 339-381.

APPENDIX

Figure 1: National Center on Elder Abuse Definitions of Elder Mistreatment

Physical abuse is defined as any act of violence that causes pain, injury, impairment, or disease, including striking, pushing, force-feeding, and improper use of physical restraints or medication.

Psychological or emotional abuse is conduct that causes mental anguish. Examples include threats, verbal or nonverbal insults, isolation, and humiliation. Some legal definitions require identification of at least 10 episodes of this type of behavior within a single year to constitute abuse.

Financial abuse is misuse of an elderly person's money or assets for personal gain. Acts such as stealing (eg, money, social security checks, possessions) or coercion (eg, changing a will, assuming power of attorney) constitute financial abuse.

Neglect is the failure of a caretaker to provide for the patient's basic needs. As in the previous examples of abuse, neglect can be physical, emotional, or financial. Physical neglect is failure to provide eyeglasses or dentures, preventive health care, safety precautions, or hygiene. Emotional neglect includes failure to provide social stimulation (eg, leaving an older person alone for extended periods). Financial neglect involves failure to use the resources available to restore or maintain the well-being of the aging adult.

Sexual abuse is defined as nonconsensual intimate contact or exposure or any similar activity when the patient is incapable of giving consent. Family members, friends, institutional employees, and fellow patients can commit sexual abuse.

Self-neglect is behavior in which seniors compromise their own health and safety, as when an aging adult refuses needed help with various daily activities. When the patient is deemed competent, many ethical questions arise regarding the patient's right of autonomy and the physician's oath of beneficence.

The miscellaneous category includes all other types of abuse, including violation of personal rights (eg, failing to respect the aging person's dignity and autonomy), medical abuse, and abandonment.

Figure 2: Examples of Elder Mistreatment

- *Physical abuse.* A 72-year-old woman with deforming rheumatoid arthritis is pinched and beaten by her schizophrenic daughter because the elder can no longer help clean the house.
- *Caregiver neglect.* A 77-year-old woman status post multiple strokes, is found dead at a nursing facility due to undiagnosed sepsis from multiple deep pressure ulcers on her back, vagina and scalp.
- *Financial exploitation.* A 68-year-old former CIA agent with early Alzheimer's disease is threatened by his paid caregiver who steals $100,000 of his retirement funds. With markedly diminished funds he now presents to the public hospital with pneumonia and an albumin of 1.5 g/dL.
- *Self-Neglect.* A 80 year old man with diabetes and severe depression that blunts his judgment, fails to accept care for his gangrenous foot, becomes immobile and burns to death in a house fire.

Figure 3: Red Flags in Elder Mistreatment

General: medical noncompliance in vulnerable elders; dysfunctional family relationships; history inconsistent with physical examination
Physical abuse: bruising - especially trunk, neck, head, genitalia [53,54]; fractures – especially in areas not usually affected by osteoporosis; lacerations, skin tears on trunk, neck, head, genitalia
Neglect (caregiver or self): malnutrition; contractures; over- or under-medicated; pressure ulcers[55], contractures; lice or scabies; multiple ill-cared for pets
Financial exploitation: failure to obtain medications; multiple evictions; patient unaware of their income, costs
For more complete descriptions see National Academy of Science report on the medical forensics of elder mistreatment.[55]

8. SUBSTANCE USE AND SUBSTANCE USE DISORDERS

HOUSE ACTION: RECOMMENDATIONS ADOPTED AND REMAINDER OF REPORT FILED

INTRODUCTION

Resolution 421, introduced by the Texas Delegation and adopted by the House of Delegates at the 2007 American Medical Association (AMA) Annual Meeting, asked that our AMA study ways in which it can be supportive in communicating the fact that substance use disorder is: (1) a potentially lethal but treatable disease; and (2) one that may be preventable with early education and intervention. The resolution further asked that such efforts be directed at youth to help them understand these diseases and their treatments and to stave off peer pressure to experiment with potentially addictive substances.

To provide some clarity, and to substantiate the need to better address substance use disorders, this report focuses on the current terminology and clinical definitions relevant to substance use, the epidemiology of substance-use disorders and their public health impact, and the neurobiology of addiction. A general overview is provided, but a detailed discussion about the evaluation and treatment of patients with substance use disorders, or efforts directed to preventing substance use in youth, is beyond the scope of this report. The recommendations address, in part, the need for our AMA to continue activities and/or partnerships designed to reduce the public health impact of substance use disorders.

METHODS

English-language reports on studies using human subjects were selected from a MEDLINE search of the literature from 1995 to March 2008 using the terms "addiction," "substance" and/or "drug" in combination with "use," "abuse," "dependence," "disorder," "epidemiology," and "treatment." Additional articles were identified by manual review of the references cited in these publications. Web sites of the National Institute on Drug Abuse, National Institute on Alcohol Abuse and Alcoholism, Substance Abuse and Mental Health Services Administration, Centers for Disease Control and Prevention, American Society of Addiction Medicine, American Academy of Child and Adolescent Psychiatry, American Academy of Pediatrics, American Academy of Family Physicians, and the American College of Physicians were searched for relevant publications.

THE PUBLIC HEALTH IMPACT OF SUBSTANCE USE

Virtually every physician encounters patients or family members affected by substance-related conditions. A number of national studies and published reports indicate that substance use, including the nonmedical use of controlled substances, is a continuing concern and represents a significant public health problem, particularly among teens and young adults. Nonmedical use is defined as the use of prescription medications without a prescription, or use that is directed primarily toward the subjective experiences caused by the substance.

Prevalence Data

The annual National Survey on Drug Use and Health (NSDUH), sponsored by the Substance Abuse and Mental Health Services Administration (SAMHSA), is the primary source of information on the use of illicit drugs, alcohol, and tobacco in the civilian population, aged 12 years and older, in the United States.[1] According to the 2006 survey, more than 20 million Americans were current (i.e., within the last 30 days) illicit drug users, including 7 million individuals who reported past month nonmedical use of prescription drugs.

In 2006, ~73 million Americans aged 12 years or older were current users of a tobacco product.[1] Among high school youth, current use of cigarettes decreased significantly from the late 1990s to 2003 but rates have since leveled off. Young adults aged 18 to 25 years have the highest rate of current tobacco use (~44%).[1] This represents a small decrease from the 2002 rate of 45.3%, although the rate of current use of smokeless tobacco in youths aged 12 to 17 years and young adult current use of cigars increased during this period. In 2006, the prevalence of current use of a tobacco product was highest in American Indians or Alaska Natives, and lowest among Asians.

With regard to alcohol, underage (illegal) use rates rise from 4% among 12- or 13-year-olds to 52% for those aged 18 to 20 years.[1] Legal adult use rates peak at 69% among 21- to 25-year-olds and decrease with age, eventually decreasing to ~38% among people aged 65 years and older. Overall, the alcohol use rate of those 18 years and older is ~65%. Among youth, whites in 2006 were more likely than other racial/ethnic groups to report current use of alcohol, while Asians were least likely. The recent Surgeon General's *Call to Action to Prevent and Reduce Underage Drinking* provides additional information on the scope of the problem in youth.[2]

The National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) conducted by the National Institute on Alcohol Abuse and Alcoholism (NIAAA) defines high risk drinking as no more than 4 standard drinks a day for men and no more than 3 a day for women and/or weekly limits of no more than 14 standards drinks for men and 7 for women (similar to NSDUH).[3] Nearly 30% of the population over 18 years of age exceeded *either* the daily or weekly limits for alcohol consumption in 2002, and the prevalence of those exceeding the weekly limits increased from 9.4% to 10.3% between 1992 and 2002.[3]

Binge drinking (≥5 drinks on at least one occasion in the past month) affects at least 57 million individuals annually. Rates of binge drinking episodes among minors peak at 36% (18- to 20-year-olds), and among adults at 46% (aged 21 to 25 years), decreasing to 18.4% of persons aged 35 years or older.[1,4] Importantly, nearly half of binge-drinking episodes occur among otherwise moderate (non-heavy) drinkers, and nearly three-quarters of all binge drinkers are otherwise moderate drinkers.[5] Compared with non-binge drinkers, binge drinkers are 14 times more likely to drive while impaired by alcohol.

Except for the underage illicit use of alcohol and tobacco, marijuana continues to be the most commonly used illicit drug (14.8 million past month users). Nonmedical use of prescription drugs is the next most common, followed by cocaine, heroin, hallucinogens, and methamphetamine. Current illicit drug use varied by race/ethnicity in 2006. Among persons aged 12 years or older, the rate was lowest among Asians (3.6%) and highest (13.7%) among American Indians or Alaska Natives.

Combined data from the 2002-2004 NSDUH surveys indicate that nonmedical use of prescription pain relievers was second only to marijuana use as the most prevalent drug misuse behavior, with the highest rates occurring in young adults aged 18 to 25 years.[1] Although illicit drug use rates declined modestly overall in teens and young adults between 2002 and 2006, the proportion of young adults reporting current nonmedical use of prescription drugs in the NSDUH increased from 5.4% to 6.4%. Similarly, the 2007 Monitoring the Future survey continued to show encouraging trends reflecting overall lower use of illicit drugs and alcohol in America's youth, except for the nonmedical use of prescription pain relievers, which maintained an elevated rate of use.[6]

Patients Meeting Criteria for Substance Abuse and Dependence

Nearly 5% of the population aged 18 years and older met *Diagnostic and Statistical Manual of Mental Disorders* (DSM)-IV criteria (see below) for alcohol abuse, and 3.8% met the criteria for alcohol dependence. (DSM-IV did not use the term "addiction," although many clinicians and educators use "addiction" synonymously with the term "substance dependence." This may change in the forthcoming revision [DSM V].) Highest rates were in 18- to 29-year-olds. Among people who had developed alcohol dependence in the year prior to the survey and sought treatment, 25% were still dependent, 27% were in partial remission, 12% were in remission but drinking at levels that put them at risk for relapse, 18% were low risk drinkers, and a comparable number were totally abstinent.[7] However, 75% of this population never received treatment. Approximately 36 million cigarette smokers (14.4% of the total population) currently meet the criteria for nicotine dependence.

According to NSDUH, an estimated 22.6 million persons (9.2% of the population ≥12 years of age) were classified with substance dependence (excluding nicotine) or substance abuse in 2006 based on DSM, 4th edition, text revision (DSM IV-TR) criteria.[1] Of these, 3.2 million were classified with dependence on or abuse of both alcohol and illicit drugs, 3.8 million were dependent on or abused illicit drugs but not alcohol, and 15.6 million were dependent on or abused alcohol but not illicit drugs.

Emergency Room Visits

The Drug Abuse Warning Network (DAWN) covering 21 metropolitan areas (with samples from the rest of the country) receives reports of emergency department (ED) episodes related to recent drug use including illegal drugs,

prescription and over-the-counter (OTC) drugs, dietary supplements, and alcohol in minors or in combination with other drugs in adults (data are not collected if alcohol is the only substance involved in patients aged 21 years or older).[8] In 2005, 1.45 million ED visits were associated with drug misuse or abuse. Approximately 56% involved an illicit drug; 34% involved alcohol; and 41% involved the nonmedical use of prescription drugs, OTC pharmaceuticals, or dietary supplements; the latter represented a 21% increase from 2004. ED-related visits increased 33% for stimulants, 24% for opioid analgesics, and 19% for benzodiazepines. DAWN data cannot be used to identify whether the drugs were obtained from a legitimate prescription, as opposed to other sources.

Treatment Facilities

Additional data on problems with substance use disorders emanate from the Treatment Episode Data Set (TEDS) report, which provides information on the demographic and substance use characteristics of the annual admissions to treatment for alcohol and drug use disorders in facilities that are licensed or certified by the state substance abuse agency.[9] Five substances accounted for 95% of all TEDS admissions in 2005: alcohol (39%), opiates (17%), marijuana (16%), cocaine (14%), and stimulants (9%; primarily methamphetamine). TEDS admissions for primary abuse of opiates other than heroin increased from 1% of all admissions in 1995 to ~4% in 2005. The proportion of admissions for primary marijuana abuse increased from 10% in 1995 to 16% in 2005, and for methamphetamine or amphetamine from 4% to 9% between 1995 and 2005. Sixty-two percent of TEDS admissions in 2005 entered ambulatory treatment, 21% entered detoxification, and 17% entered residential/rehabilitation treatment.

In summary, nearly 1 in 7 Americans meets the criteria for alcohol abuse or dependence during their lifetime, another 1 in 7 is currently dependent on nicotine, and about half this number meets the criteria for illicit drug abuse or dependence. A substantial number of other Americans engage in patterns of substance use that are harmful to themselves and/or others. Overall, these survey data confirm the current magnitude of substance use and addiction in the United States.

COSTS AND COMORBIDITIES

Substance use disorders seldom occur in isolation. According to the most recent NESARC data, 18% to 20% of the U.S. population with a substance use disorder have a co-occurring independent anxiety or mood disorder.[3] Among those seeking treatment for a drug-use disorder, 60% had at least one independent mood disorder, 43% at least one independent anxiety disorder, and 55% a comorbid alcohol use disorder. The risk relationship is reciprocal, with psychiatric disorders predicting increased risk of substance use and vice versa.[10] Similarly, drug use disorders are far more common among persons with alcohol use disorders, and alcohol use disorders are far more common among persons with drug use disorders than among those in the general population. Individuals with substance use disorders also have an increased prevalence of chronic medical conditions and are at greater risk for human immunodeficiency virus (HIV) and other sexually transmitted diseases.

Combined, substance use disorders are the leading cause of death and disability in this country. Annually, the single leading actual cause of death in the United States is tobacco use (435,000 deaths;16.6%), almost always among persons suffering from nicotine addiction; alcohol consumption is third (85,000; 3.5%) and illicit use of drugs is ninth (17,000; 0.7%).[11] These substances also are factors in other leading causes of death including infectious diseases (including HIV, hepatitis B virus, and hepatitis C virus infections), toxic exposures, motor vehicle crashes, and incidents involving firearms. More persons die in America from alcohol-induced injuries (trauma) than from alcohol-induced illnesses.

Contributors to the economic costs of substance misuse and addiction are health care expenditures for substance use services and the medical consequences of use, lost earnings due to impaired job performance, social welfare administrative costs, and increased demands on the juvenile and criminal justice system, as well as other impacts on society from violence, crime, and accidents. The attributable costs related to substance use disorders exceed $500 billion annually.[12] However, more than 95% of the health care dollars devoted to substance use and addiction is spent on treatment of the medical consequences of addiction, versus less than 5% on treatment of addiction itself. Less than one-half of 1% of U.S. health care expenditures goes to treatment for substance use disorders themselves.

TERMINOLOGY AND DEFINITIONS

The terminology used in this field continues to cause some confusion. Most drug or alcohol users do not meet the criteria for substance abuse or dependence. Rather, there are patterns of use that include "substance use," "misuse or risky use," "harmful use" or "abuse," as well as "dependence" or "addiction," each with different implications.

Diagnostic Criteria

DSM IV-TR uses an umbrella category "substance-related disorders," which is further subdivided into two groups: the substance use disorders (substance dependence and substance abuse), and the substance-induced disorders (i.e., intoxication, withdrawal, other medical or psychiatric disorders, or health problems attributable to substance use).[13] Descriptive criteria for substance dependence and abuse (see Appendix) are intended to be applicable across most classes of substances.

Most notably, substance dependence is defined as "a maladaptive pattern of substance use, leading to clinically significant impairment or distress," manifested by at least 3 of 7 criteria within a 12-month period, including: (1) tolerance; (2) withdrawal symptoms; (3) increased dosage or length of use; (4) persistent desire or unsuccessful efforts to cut down or control use; (5) inordinate amount of time devoted to substance retrieval, use, or recovery from use; (6) important activities are affected because of use; and (7) use is continued despite knowledge of harm.

Substance abuse is defined as "a maladaptive pattern of substance use leading to clinically significant impairment or distress, manifested by at least 1 of 4 criteria within a 12-month period. These criteria are: (1) recurrent use causing failure to fulfill major role obligations; (2) recurrent use in hazardous situations; (3) recurrent use causing substance-related legal problems; and (4) continued use despite persistent or recurrent social or interpersonal problems caused or exacerbated by the substance.

The DSM IV-TR criteria for substance dependence and substance abuse are generally applicable to alcohol, opioids, sedative-hypnotics/anxiolytics, amphetamine, cocaine, and cannabis. Some dependence criteria may not apply to hallucinogens, phencyclidine, and inhalants. For nicotine, dependence, but not abuse, is a diagnostic entity (although, ironically, the International Classification of Diseases [ICD]-9 code for "tobacco use disorder" falls numerically among the other forms of "substance abuse"—the 305.xx series--rather than among other forms of "substance dependence"—the 304.xx series).

Accordingly, addiction is one of the substance-use disorders. Addiction is defined as:[14]

> …a primary, chronic, neurobiological disease, with genetic, psychosocial, and environmental factors influencing its development and manifestations. It is characterized by behaviors that include one or more of the following: impaired control over drug use, compulsive use, continued use despite harm, and craving.

It is now generally accepted that addiction is a brain disease (see below), often progressive, and with a chronic relapsing/remitting course in which compulsive drug-seeking and drug-taking behavior persist, even in the face of harmful health, social, and in some cases, legal consequences.[12] Addiction is distinct from tolerance and physical dependence. That is, tolerance and physical dependence can develop to substances in the absence of behaviors that constitute addiction.[15]

Still other terms were used in the 2006 Institute of Medicine (IOM) Report entitled "Improving the Quality of Health Care for Mental and Substance-Use Conditions." This report discussed the epidemiology of substance-use "conditions" or "illnesses" and their treatment, documenting discrepancies between substance use care that is known to be effective, and care that is actually delivered.[16]

With regard to alcohol, various terms associated with patterns of misuse have been used. A 1990 report by the IOM broadened the base by referring to alcohol problems consistent with the concept that a continuum exists for the pattern of use and potential harms.[17] The NIAAA uses substance dependence or abuse per DSM IV-TR, and at-risk drinking.[3] The limits above which risks increase are more than 2 drinks daily for men, and more than 1 drink daily for women or those over 65 years of age. Risky drinkers are those who exceed daily or weekly limits; harmful drinkers experience harm associated with their alcohol use, but do not meet the DSM IV-TR criteria for substance abuse or dependence.

In concert with the definition of addiction, alcoholism is defined as:[18,19]

> …a primary, chronic disease with genetic, psychosocial, and environmental factors influencing its development and manifestations. The disease is often progressive and fatal. It is characterized by continuous or periodic: impaired control over drinking, preoccupation with the drug alcohol, use of alcohol despite adverse consequences, and distortions in thinking, most notably denial.

NEUROPATHOLOGICAL BASIS OF ADDICTION

Most people who experiment with illicit drugs or alcohol or who are exposed to opioids, stimulants, or sedative-hypnotics during medical treatment do not develop a substance use disorder. Addictive substances can induce pleasant states or euphoria in the initiation phase and/or relieve distress from anxiety, depression, fear, feelings of hopelessness, and so forth. Continued use of some substances triggers adaptive changes in the central nervous system leading to tolerance and physical dependence. In some individuals, ongoing substance use gives rise to a condition in which environmental stimuli (cues) associated with substance use itself induce conditioned responses (craving; drug-seeking behavior) in the absence of the drug.[20] The motivational hierarchy of persons with addiction differs from that of persons without addiction or from that which they manifested prior to the onset of addiction: substance use or procuring drug supplies takes a salient position as a positive reinforcer, displacing other rewards such as pro-social reinforcements derivable from work, educational achievement, family, intimate relationships, recreational pursuits, and community involvement. Relapse and vulnerability to relapse are key elements to maintaining substance use. Vulnerability to developing a substance use disorder is based on interplay of the characteristics of the substance; substance availability and cost; genes; environmental influences; social interactions; developmental history and experiences;[21] and other host factors, including the presence of other psychiatric disorders.[22-24]

Specific neurologic substrates have been identified on the basis of neuroimaging studies in humans and gene targeting in animals, assisted by the availability of specific receptor agonists and antagonists.[20] Neuroimaging techniques have measured neural effects as they occur or following drug exposures, how they change and persist in the brains of individuals with substance use disorders, and how they remit after periods of abstinence. Substances that are neurotoxic with chronic use (e.g., alcohol, methamphetamine, cocaine) induce changes that are evident at a gross structural level.

Alcohol and other substances that are misused enhance specific brain neurochemical pathways in a fashion similar to other natural rewards (e.g., food, sex), only in a more intense and prolonged manner. Dopamine-containing projections from the ventral tegmental area to the nucleus accumbens are a key component in brain reward circuitry. Activity in this dopamine pathway plays a pivotal role in coding reward (and its saliency), predicting reward, and the motivation to pursue it. The pathway also is involved in priming cortical regions that exert inhibitory control and executive function (choice), and in conditioned or learned responses.[20] By mimicking the brain effects of natural rewards that serve biological needs, addictive drugs exert their capacity to shape behavior.[25]

Although the initial activation of this pathway is critical for drugs to reinforce behavior and promote substance misuse, addiction is associated with long-term changes in brain circuitry in higher cortical pathways and associative loops. Repeated administration of the substance triggers (long-term) synaptic changes in higher brain regions and excitatory neuropathways as learned associations with drug-related events are formed.[26] Ultimately, these changes modify (diminish) how the brain perceives the value of natural rewards, and dampens the capacity of the prefrontal cortex to exert cognitive control over drug seeking, while at the same time enhancing responsiveness to cues and drug-associated stimuli.[20,27] On a behavioral level, the individual transitions from experiencing the acute drug effects to patterns of recreational use, and then the pathological states of abuse or addiction. This pattern typically occurs with high frequency and often with great rapidity among nicotine users. The persistence of addiction is based on the remodeling of synapses and brain circuits similar to the process of long-term associative memory, wherein drug-associated environmental stimuli or cues have inordinate power in directing behavior.[28] The persistence of changes in brain activity of persons with addiction explains the persistence of behaviors, altered motivational hierarchies, cue responses, and craving, that can persist for long periods after the cessation of substance use (e.g., for years after a nicotine addict's last cigarette).[29] These changes have obvious implications for the required course and effectiveness of treatment in individuals with addiction.

TREATMENTS ARE EFFECTIVE

To be effective, treatment must address the individual's substance use; use behaviors; and any associated medical, psychiatric, social, vocational, and legal problems.[30] For individuals with risky use, harmful use, or substance abuse, treatment is directed toward detoxification and/or resolution of withdrawal symptoms as needed, motivation to change, moderation in use or use patterns, minimization of problems from use, and harm reduction. For individuals with addiction, treatment (with abstinence as a goal) is focused on detoxification and resolution of withdrawal symptoms, fostering behavioral changes to eliminate drug use behaviors, and bolstering personal responsibility for wellness, in order to decrease the frequency and severity of relapses, increase the duration of remission, and optimize functioning.[31] To accomplish rehabilitation, cognitive, affective, and social changes are necessary in addition to behavior change.[30]

Organizing care to address concurrent conditions, such as by integrating alcohol and drug treatment with other medical care, and combining treatment for substance use and mental health problems also optimizes outcomes.[32,33] Treatment can be hampered by the stigma associated with substance use as well as by patient variables including impaired self-management capabilities; in some cases, treatment entry may have been coerced. Additionally, the mode of clinical practice; features of certain state medical practice acts; the varied composition of the health care workforce delivering care for patients with substance use disorders; failure to screen, identify, or intervene; and discriminatory insurance coverage impede the delivery of patient-centered care.

Treatment for substance use disorders is delivered in different settings, using a variety of approaches. Because addiction is a chronic disease, management and recovery from it (restored functioning and, ideally, sustained abstinence), may, as with other chronic diseases, be a long-term process requiring repeated treatment interventions.

Psychosocial interventions typically are delivered as:

- Outpatient treatments ranging from primarily education and counseling for individuals and families, to programs that also treat comorbid mental health or medical problems, to intensive day treatment.
- Short-term residential programs with inpatient treatment followed by extended outpatient therapy, often supplemented by participation in a self-help group.
- Long-term residential or therapeutic community treatment programs.

In adults, general approaches include cognitive behavioral therapy for relapse prevention, supportive-expressive psychotherapy or individualized drug counseling, motivational enhancement to encourage treatment acceptance and adherence and discontinue drug use, and contingency management.[33,34] Individual, group, and family approaches all have utility. Brief advice and office-based counseling interventions (see below) have been used in patients with alcohol use disorders and nicotine dependence, but have not been shown to be helpful in other substance use disorders. Also effective are 12-step mutual support groups as an adjunct to treatment and as a long-term component of sustaining remission. More specialized community-based programs exist,[35] including community counseling plus vouchers (positive reinforcement) that reward drug-free periods, and day treatment with abstinence contingencies and vouchers. Behavior or multidimensional family therapies are particularly useful for adolescents. A clinical practice guideline on the assessment and treatment of children and adolescents with substance use disorders is available from the American Academy of Child and Adolescent Psychiatry.[36] Specific services for affected family members are also offered by many addiction treatment agencies.

For patients with substance dependence or addiction, pharmacologic treatments are used according to the following paradigms:

- To manage withdrawal symptoms and facilitate cessation of substance use.
- In some cases, agonist replacement therapy is used during the cessation process (e.g., for nicotine), or as maintenance treatment (e.g., for opioids) with counseling and needed medical, psychological, and social services.
- To block drug effects that are reinforcing (partial agonists or antagonists working at nicotinic or mu-opioid receptors).
- To diminish cravings and prevent relapse (alcohol, nicotine, opioids; possibly cocaine).
- To induce aversive responses to assist in promoting abstinence (alcohol; possibly cocaine).

Brief Interventions

The essential features of office-based brief interventions are based on the 5 "A's": *ask* about use at every opportunity; *advise* patients to stop; *assess* their willingness to stop; *assist* the patient to stop; and *arrange* follow-up care.[37] Brief advice and multi-contact office-based counseling interventions by primary care physicians reduce risky and harmful alcohol use, and enhance tobacco cessation efforts.[38-40] Very brief or brief single-contact interventions are less effective or ineffective in reducing alcohol and nicotine consumption in these groups. Data on whether women or youth may be less responsive than adult males to these types of interventions for problem drinking are somewhat controversial.[38,39]

Instructive and helpful manuals or guidelines are available for primary care physicians to assist in providing effective screening and treatment via brief intervention.[41,42] Toll-free smoking cessation "QuitLines" are available for patient assistance in every state.[43] Overall, these types of efforts to reduce alcohol and tobacco use need to be improved.[44] Applied treatments also reduce consumption and substance use behaviors in individuals affected by opioids, cannabis, and cocaine who seek treatment.[45]

PREVENTION EFFORTS

Most prevention efforts focus on substance use-related issues, and not addiction *per se*. The National Institute on Drug Abuse (NIDA) has developed a research-based guide for parents, educators, and community leaders on preventing illicit substance use (other than alcohol) among children and adolescents.[46] The guide includes several prevention principles addressing risk and protective factors; prevention planning for family, school, and community programs; and program delivery. Prevention programs are usually designed to reach target audiences in their primary setting; they also can be classified based on the audience as *universal* (designed for a general audience); *selective* (designed for groups at risk), or *indicated* (designed for individuals already using substances). A number of such evidence-based programs under each classification have been catalogued by NIDA, and the American Academy of Pediatrics has published a policy statement on the role of schools in combating illicit substance use.[47,48]

The Center for Substance Abuse and Prevention (CSAP) within SAMHSA provides an online "Prevention Platform" with tools and resources to help organizations undertake assessment efforts, build capacity by mobilizing resources and via training and education to promote readiness, and create a comprehensive plan with goals, objectives, and strategies aimed at meeting the substance abuse prevention needs of the community, implement various components of the prevention plan, and evaluate the impact of programs and practices.[49] The CSAP has also designed and implemented several public education programs that range from raising awareness about the harms of underage drinking to helping families live a healthy, drug-free lifestyle.[50] Links to a number of other prevention resources are available on the CSAP's web site. Another effective national prevention organization is the Community Anti-Drug Coalitions of America.[51]

AMA PREVENTION AND OTHER ACTIVITIES

Our AMA has a long-standing commitment to the prevention and treatment of alcohol, tobacco, and illicit drug use and addiction. In 1956 our Council on Mental Health and its Committee on Alcoholism recognized alcoholism as a disease that could be treated medically.[52] In 1979 our AMA adopted a policy statement entitled "Guidelines for Physician Involvement in the Care of Substance-Abusing Patients." The guidelines articulated the principle that every physician must assume clinical responsibility for the diagnosis and referral of patients with substance use disorders, and broadly defined the competencies required to meet that responsibility. These activities represented some of the first efforts by a major medical organization to address addiction as a disease, and to highlight the need for all physicians to have competence in addressing substance use disorders. Almost 30 years later, the targets set for health education and health care delivery on substance use disorders have not been substantially approached.

The AMA Office of Alcohol, Tobacco and Other Drug Abuse Prevention, located in the Division of Healthy Lifestyles, raises awareness of alcohol-, tobacco-, and illicit drug abuse-related problems and solutions among physicians and the general public. The Office serves physicians and the public as an information source for advocacy, public policy change, leadership, and education. It also serves as liaison to federal and international drug abuse prevention and treatment agencies and collaborates in disseminating resources for physicians. It helps physicians help their patients through the dissemination of screening and brief intervention resources for management of patient alcohol problems and of smoking cessation resources.

Effective prevention of alcohol and tobacco use have been found to involve combinations of environmental change strategies consisting of public education and counter-marketing, reduction and control of availability and promotion, minimum use and purchase age, increase in cost through taxation and other means (e.g., license fees; bans on discounted sales), clean indoor air regulations (for smoking), and beverage service training and regulations (for alcohol), supported by law enforcement entities. These strategies were applied effectively by our AMA, in partnership with the Robert Wood Johnson Foundation, through funding and management of three national, state, and local coalition policy advocacy programs:

- SmokeLess States (1993-2004; in 41 states);
- Reducing Underage Drinking through Coalitions (1996-2005; in 10 states, District of Columbia and Puerto Rico); and
- A Matter of Degree–the National Effort to Reduce Binge Drinking among College Students (1996-2007; 10 university-city projects).

Currently, NIDA supports its Primary Care Physician Outreach Project at the AMA to familiarize physicians with resources to address patient drug abuse and to research ways to increase physician involvement in addressing patient substance use disorders. As part of this effort, NIDA has funded 6 Centers of Excellence in Substance Abuse Information through medical education development grants to 6 medical school participants in the AMA Ethics Division's Innovative Strategies for the Education of Physicians (iSTEP) initiative. The Environmental Protection Agency supports an AMA project, "Developing A System to Educate Low Income Patients About Health Risks of Secondhand Smoke," to increase physicians' and their staffs' knowledge about secondhand smoke as a major asthma trigger and source of respiratory distress in children and adults, and to assist physicians to educate, especially, low income patients about the health effects of secondhand smoke exposure and how to reduce their family's exposure, especially through smoking cessation.

Our AMA has also collaborated with the Partnership for a Drug Free America on several of its universal programs designed to foster family communication and understanding that harm is associated with substance use. Currently, our AMA partners with the Office of National Drug Control Policy to reinforce messages designed to minimize the diversion of prescription drugs subject to misuse, and with the AMA Alliance in a national collaboration to reduce the depiction of smoking in motion pictures.

AMA POLICY

Our AMA already recognizes that "drug dependencies, including alcoholism, tobacco dependence, and substance abuse" are diseases (Policies H-95.983, H-95.976, and H-30.977, AMA Policy Database). Furthermore, AMA policy also recognizes that "drug addiction in any of its manifestations," is a treatable disease (Policy H-30.958) and promotes "medical approaches to substance use disorders" (Policy H-95.950).

However, the terminology used throughout AMA policy on what are now generally termed substance use disorders is variable. Examples include use of the terms "chemically dependent," "drug abuse," "substance abuse," "alcohol and other drug abuse," "alcoholism and other chemical dependencies," "alcohol use disorders," and "alcohol dependency." Certain policies that characterize conditions and/or diseases introduce further ambiguity. For example, AMA policy on health promotion and disease prevention refers to the "health hazards of tobacco, alcohol, accidental injuries, unhealthy lifestyles, and all *forms of preventable illness*" [emphasis added] (Policy H-425.993). AMA policy on "substance abuse among physicians" defines physician impairment as any physical, mental, or behavioral *disorder* (Policy H-95.955). Other policies refer to alcoholism as a *disability* or *chronic illness* (H-30.995; H-30.999).

SUMMARY AND CONCLUSION

Substance use disorders are common in the United States, affecting a disproportionate share of adolescents and young adults, and are associated with substantial morbidity and mortality. More attention should be devoted to screening for alcohol and drug use and to effective professional treatment, including office-based brief interventions with behavioral components, and/or referral for appropriate treatment of substance use disorders, especially when addictive disease is suspected. Future research efforts should focus on implementation strategies to facilitate adoption of these practices into routine health care. Additionally, research using neurobiologic approaches to identify why some individuals are more susceptible to developing substance use disorders may be informative.

RECOMMENDATIONS

The Council on Science and Public Health recommends that the following recommendations be adopted and that the remainder of this report be filed:

1. That our American Medical Association (AMA) continue to seek and participate in partnerships designed to foster awareness and to promote screening, diagnosis, and appropriate treatment of substance misuse and substance use disorders.

2. That our AMA renew its efforts to: (a) have substance use disorders addressed across the continuum of medical education; (b) provide tools to assist physicians in screening, diagnosing, intervening, and/or referring patients with substance use disorders so that they have access to treatment; (c) develop partnerships with other organizations to promote national policies to prevent and treat these illnesses, particularly in adolescents and young adults; and (d) assist physicians in becoming valuable resources for the general public, in order to reduce the stigma and enhance knowledge about substance use disorders and to communicate the fact that substance use disorder is a treatable disease.

3. That our AMA support appropriate federal and state legislation that would enhance the prevention, diagnosis, and treatment of substance use disorders.

REFERENCES

1. Substance Abuse and Mental Health Administration─Office of Applied Studies. Results from the 2006 National Survey on Drug Use and Health: national findings. Available at: http://oas.samhsa.gov/nsduh/2k6nsduh/2k6Results.pdf. Accessed March 4, 2008.
2. US Department of Health and Human Services. The Surgeon General's Call to Action To Prevent and Reduce Underage Drinking. US Department of Health and Human Services, Office of the Surgeon General; 2007. Available at: http://www.surgeongeneral.gov and at http://www.hhs.gov/od. Accessed April 8, 2008.
3. National Institute on Alcohol Abuse and Alcoholism. *Alcohol Alert No 70*. National Epidemiologic Survey on Alcohol and Related Conditions. Available at: http://pubs.niaaa.nih.gov/publications/AA70/AA70.pdf. Accessed March 7, 2008.
4. National Center for Chronic Disease Prevention & Health Promotion. Behavioral Risk Factor Surveillance System. Trends Data. Alcohol Use: Binge Drinking. Available at: http://apps.nccd.cdc.gov/brfss/Trends/trendchart.asp?qkey=10100&state=US. Accessed March 4, 2008.
5. Naimi TS, Brewer RD, Mokdad A, Denny C, Serdula MK, Marks JS. Binge drinking among US adults. *JAMA.* 2003;289:70-75.
6. Johnston LD, O'Malley PM, Bachman JG, Schulenberg JE. Overall, illicit drug use by American teens continues gradual decline in 2007. December 11, 2007. Ann Arbor, MI: University of Michigan News Service. Available at: www.monitoringthefuture.org. Accessed March 4, 2008.
7. Dawson DA, Grant BF, Stinson FS, et al. Recovery from DSM-IV alcohol dependence: United States 2001-2002. *Addiction.* 2005;100:281-292.
8. Substance Abuse and Mental Health Services Administration, Office of Applied Studies. *Drug Abuse Warning Network, 2005: National Estimates of Drug-Related Emergency Department Visits.* DAWN Series D-29, DHHS Publication No. (SMA) 07-4256, Rockville, MD; 2007. Available at: http://dawninfo.samhsa.gov/files/DAWN-ED-2005-Web.pdf. Accessed March 8, 2008.
9. Substance Abuse and Mental Health Services Administration, Office of Applied Studies. *Treatment Episode Data Set (TEDS).* Highlights – 2005. National Admission to Substance Abuse Treatment Services, DASIS Series: S-36, DHHS Publication No. (SMA) 07-4229, Rockville, MD; 2006. Available at: http://wwwdasis.samhsa.gov/teds05/tedshi2k5_web.pdf. Accessed March 8, 2008.
10. Brady KT, Sinha R. Co-occurring mental and substance use disorder: the neurobiological effects of chronic stress. *Am J Psychiatry.* 2005;162:1483-1493.
11. Mokdad AH, Marks JS, Stroup DF, Gerberding JL. Actual causes of death in the United States, 2000. *JAMA.*. 2004;291:1238-1245.
12. National Institute on Drug Abuse. Addiction: It's a Brain Disease Beyond a Reasonable Doubt. NIH Pub. No. 07-5605. April 2007.
13. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*, 4th edition, Text Revision. Washington, DC: American Psychiatric Association; 2000.

14. The American Academy of Pain Medicine, the American Pain Society, and the American Society of Addiction Medicine. Consensus Statement: Definitions Related to the Use of Opioids for the Treatment of Pain. Available at: http://161.58.165.114/ppol/Opoid%20Definition%20C%2002.htm. Accessed April 16, 2008.
15. Heit HA. Addiction, physical dependence, and tolerance: precise definitions to help clinicians evaluate and treat chronic pain patients. *J Pain Palliat Care Pharmacother*. 2003;17:15-29.
16. Institute of Medicine, Committee on Crossing the Quality Chasm. Adaptation to Mental Health and Addictive Disorders. Board of Health Care Services. *Improving the Quality of Health Care for Mental and Substance-use Conditions.* Washington, DC: National Academies Press; 2006.
17. Institute of Medicine, Committee for the Study of Treatment and Rehabilitation Services for Alcoholism and Alcohol Abuse. *Broadening the Base of Treatment of Alcohol Problems*. Washington, DC: National Academy of Sciences; 1990.
18. American Society of Addiction Medicine. Policy Statement on the Definition of Alcoholism. Available at: http://161.58.165.114/ppol/Definition%20of%20Alcoholism.htm. Accessed April 2, 2008.
19. Morse RM, Flavin DK. The definition of alcoholism: The Joint Committee of the National Council on Alcoholism and Drug Dependence and the American Society of Addiction Medicine to sudy the definition and criteria for the diagnosis of alcoholism. *JAMA.* 1992;268:1012-1014.
20. Kalivas P, Volkkow N. The neural basis of addiction: a pathology of motivation and choice. *Am J Psychiatry*. 2005;162:1403-1413.
21. Shedler J, Block J. Adolescent drug use and psychological health: a longitudinal inquiry. *Am Psychol.* 1990;45:612-630.
22. Merikangas KR, Stolar M, Stevens DE, Goulet J, Preisig MA, Fenton B, Zhang H, O'Malley SS, Rounsaville BJ. Familial transmission of substance use disorders. *Arch Gen Psychiatry.* 1998; 55:973–979.
23. Kendler KS, Prescott CA, Myers J, Neale MC. The structure of genetic and environmental risk factors for common psychiatric and substance use disorders in men and women. *Arch Gen Psychiatry.* 2003;60:929–937.
24. Rhee SH, Hewitt JK, Young SE, Corley RP, Crowley TJ, Stallings MC. Genetic and environmental influences on substance initiation, use, and problem use in adolescents. *Arch Gen Psychiatry.* 2003;60:1256–1264.
25. Kelley AE, Berridge KC. The neuroscience of natural rewards: relevance to addictive drugs. *J Neurosci.* 2002;22:3306–3311.
26. Nestler EJ. Common molecular and cellular substrates of addiction and memory. *Neurobiol Learn Mem.* 2002;78:637–647.
27. Goldstein RZ, Volkow ND. Drug addiction and its underlying neurobiological basis: neuroimaging evidence for the involvement of the frontal cortex. *Am J Psychiatry.* 2002; 159:1642–1652.
28. Kauer JA. Learning mechanisms in addiction: synaptic plasticity in the ventral tegmental area as a result of exposure to drugs of abuse. *Annu Rev Physiol.* 2004;66:447-475.
29. Nestler EJ. Is there a common molecular pathway for addiction? *Nat Neurosci.* 2005;8:1445-1449.
30. Miller MM. Traditional approaches to the treatment of addiction. In: Graham AW, Schultz TK, eds. *Principles of Addiction Medicine.* 2nd edition. Chevy Chase, MD: American Society of Addiction Medicine; 1998.
31. Betty Ford Institute Consensus Panel. What is recovery? a working definition from the Betty Ford Institute. *J Subst Abuse Treat.* 2007;33:221-228.
32. Weisner C, Mertens J, Parthasarathy S, Moore C, Lu Y. Integrating primary medical care with addiction treatment: a randomized controlled trial. *JAMA.* 2001;286:1715-1723.
33. Parthasarathy S, Mertens J, Moore C, Weisner C. Utilization and cost impact of integrating substance abuse treatment and primary care. *Med Care.* 2003;41:357-367.
34. National Institute on Drug Abuse. Principles of drug addiction treatment. NIH Publication No. 99-4180. Bethesda, MD; 1999. Available at: http://www.nida.nih.gov/PODAT/PODATIndex.html. Accessed March 8, 2008.
35. Meyers RJ, Smith JE, Villanueva M: The community reinforcement approach: history and empirical validation. *J Cognitive Psychotherapy.* 2005;19:12-25.
36. American Academy of Child and Adolescent Psychiatry. Practice parameter for the assessment and treatment of children and adolescents with substance use disorders. Available at: http://www.aacap.org/galleries/PracticeParameters/substanceUseDisorder.pdf. Accessed March 10, 2008.
37. Fiore MC, Bailey WC, Cohen SJ, et al. *Smoking Cessation.* Rockville, MD: Agency for Health Care Policy and Research, US Department of Health and Human Services; 1996. (Clinical practice guideline No 18. Publication No 96-0692.)
38. Institute of Medicine, Committee on Crossing the Quality Chasm. Improving the quality of health care for mental and substance-use conditions. Washington, DC: National Academies Press; 2006.

39. Kaner EF, Beyer F, Dickinson HO, et al. Effectiveness of brief alcohol interventions in primary care populations. *Cochrane Database Syst Rev.* 2007;(2):CD004148.
40. Whitlock EP, Polen MR. Behavioral counseling interventions in primary care to reduce risky/harmful alcohol use by adults: a summary of the evidence for the US Preventive Services Task Force. *Ann Intern Med.* 2004;140:557-568.
41. Wu P, Wilson K, Dimoulas P, Mills EJ. Effectiveness of smoking cessation therapies: a systematic review and meta-analysis. *BMC Public Health*. 2006;6:300-323.
42. US Department of Health and Human Services Public Health Service; National Institutes of Health; National Institute on Alcohol Abuse and Alcoholism. *Assessing Alcohol Problems. A Guide for Clinicians and Researchers.* 2nd Edition. NIH Publication No. 03–3745. Bethesda, MD; 2003.
43. National Conference of State Legislatures. Tobacco Use Cessation: The Effectiveness of Quit Lines. Available at: http://www.ncsl.org/programs/health/tobaccostop.htm. Accessed April 16, 2008.
44. The Tobacco Use and Dependence Clinical Practice Guideline Panel, Staff, and Consortium Representatives. A clinical practice guideline for treating tobacco use and dependence: a US Public Health Service report. *JAMA.* 2000;283:3244-3254.
45. Keuhn BM. Despite benefit, physicians slow to offer brief advice on harmful alcohol use. *JAMA.* 2007;299:751-752.
46. Polen M, Whitlock E, Wisdom J, Nygren P, Bougatsos C. Screening in primary care settings for illicit drug use: staged systematic review for the United States Preventive Services Task Force. Evidence Synthesis No. 58, Part 1. AHRQ Publication no. 08-05108-EF-1. Rockville. MD; January 2008.
47. National Institute on Drug Abuse. Preventing drug use among children and adolescents: a research-based guide. 2nd edition. NIH Publication no. 04-4212(B). Bethesda, MD; 2003.
48. American Academy of Pediatrics, Council on School Health and Committee on Substance Abuse. The role of schools in combating illicit substance abuse. *Pediatrics.* 2007;120:1379-1384.
49. Center for Substance Abuse and Treatment. Prevention Platform. Available at: http://prevention.samhsa.gov/about/spf.aspx. Accessed March 8, 2008.
50. Center for Substance Abuse and Treatment. Prevention Education Tools. Available at: http://prevention.samhsa.gov/capacity/prevedutools.aspx. Accessed March 8, 2008.
51. Community Anti-Drug Coalitions of American. Resources available at: http:/cadca.org/. Accessed April 15, 2008.
52. Block MA, Chairman, Committee on Alcoholism—Council on Mental Health. Medical treatment of alcoholism. *JAMA*. 1956;162:1610-1619.

APPENDIX - DSM IV-TR Criteria for Substance Dependence and Substance Abuse

A maladaptive pattern of substance use, leading to clinically significant impairment or distress, as manifested by three (or more) of the following, occurring at any time in the same 12-month period:

(1) tolerance, as defined by either of the following:
  (a) a need for markedly increased amounts of the substance to achieve intoxication or desired effect
  (b) markedly diminished effect with continued use of the same amount of the substance

(2) withdrawal, as manifested by either of the following:
  (a) the characteristic withdrawal syndrome for the substance (refer to Criteria A and B of the criteria sets for withdrawal from the specific substances)
  (b) the same (or a closely related) substance is taken to relieve or avoid withdrawal symptoms

(3) the substance is often taken in larger amounts or over a longer period than was intended

(4) there is a persistent desire or unsuccessful efforts to cut down or control substance use

(5) a great deal of time is spent in activities necessary to obtain the substance (e.g., visiting multiple doctors or driving long distances), use the substance (e.g., chain-smoking), or recover from its effects

(6) important social, occupational, or recreational activities are given up or reduced because of substance use

(7) the substance use is continued despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by the substance (e.g., current cocaine use despite recognition of cocaine-induced depression, or continued drinking despite recognition that an ulcer was made worse by alcohol consumption)
Specify if:
With Physiological Dependence: evidence of tolerance or withdrawal (i.e., either Item 1 or 2 is present)
Without Physiological Dependence: no evidence of tolerance or withdrawal (i.e., neither Item 1 nor 2 is present)

DSM IV-TR Criteria for Substance Abuse

A. A maladaptive pattern of substance use leading to clinically significant impairment or distress, as manifested by one (or more) of the following, occurring within a 12-month period:

(1) recurrent substance use resulting in a failure to fulfill major role obligations at work, school, or home (e.g., repeated absences or poor work performance related to substance use; substance-related absences, suspensions, or expulsions from school; neglect of children or household)
(2) recurrent substance use in situations in which it is physically hazardous (e.g., driving an automobile or operating a machine when impaired by substance use)
(3) recurrent substance-related legal problems (e.g., arrests for substance-related disorderly conduct)
(4) continued substance use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of the substance (e.g., arguments with spouse about consequences of intoxication, physical fights)

B. The symptoms have never met the criteria for Substance Dependence for this class of substance.

9. OPTIMIZING CARE FOR GAY MEN AND LESBIANS

HOUSE ACTION: RECOMMENDATIONS ADOPTED AND REMAINDER OF REPORT FILED

INTRODUCTION

This Council has previously addressed the health care needs of the homosexual community; first in 1981 as the human immunodeficiency virus (HIV) epidemic was unfolding, and again in 1994 when effective treatments for HIV were available, but disparities in providing quality care to gay men and lesbians became more widely recognized.[1,2]

Recently, the American Medical Association (AMA) Advisory Committee on Gay, Lesbian, Bisexual and Transgender (GLBT) Issues requested that the Council again consider this topic. The Committee supported its request by identifying topic areas that needed updating, based on new findings and published data. The recognition that many lesbian, gay, bisexual, and transgender health issues were not fully understood led the Institute of Medicine to issue a report in 1999 on the status of lesbians' health.[3] *Healthy People 2010* identifies gay men and lesbians as 1 of the 6 most underserved groups subject to health disparities.[4]

The Council agreed to the request and this report represents a collaborative effort between the Council and the GLBT Advisory Committee. The report focuses on the health care needs of gay men and lesbians in the United States, including specific discussion and/or advice, for physicians on how to optimize the care of these individuals.

The report does not examine the issue of same sex marriage nor specifically examine the physiological and psychological well-being of children raised by same sex couples. However, the Council notes that current AMA policy supports: (1) allowing the adoption of a child by the same sex partner, or opposite sex nonmarried partner, who functions as a second parent or co-parent to that child; and (2) equality in laws affecting health care of members (including dependent children) in same sex partner households (Policies H-60.940 and D-65.995, AMA Policy Database). The American Academy of Pediatrics also has concluded that "there is no relationship between parents' sexual orientation and any measure of a child's emotional, psychosocial, and behavioral adjustment" and that

"greater stability and nurturance within a family system [regardless of parents' sexual orientation] predicts greater security and fewer behavioral problems among children."[5] Similarly, the American Academy of Family Physicians supports promoting a safe and nurturing environment, including psychological and legal security, for all children, including those of adoptive or foster parents, regardless of the parent's sexual orientation.[6] Nationally, 33% of female-partnered and 22% of male-partnered households live with their children under the age of 18 years.[7]

This report also does not specifically address gender identity except to differentiate it from sexual orientation (see below). Many gay men and lesbians have gender identities concordant with their biological sex. However, transgender persons have a gender identity discordant from their biological sex with psychological and social attributes that do not correspond to their physical bodies. Transsexuals, a subset of transgender, are people who have a strong and persistent cross-gender identification, discomfort with their biological self (gender dysphoria), and desire to acquire the characteristics of the other sex, which may lead them to seek sexual reassignment surgery. Sexual orientation and gender identity are independent attributes and it is possible for a transgender individual to have either opposite sex or same sex desires.

METHODS

To supplement the literature search from the 1994 Council report, English-language reports on studies using human subjects were selected from a PubMed search of the literature from 1995 to April 2008 using the MeSh terms "homosexuality, male or female," in combination with "statistics & numerical data," "sexual behavior," "risk-taking," "epidemiology," "sexually-transmitted diseases," "ethnic groups," "medical history taking," "genetics, behavioral," "health services/utilization," "cancer," "substance-related disorders," "mental disorders/diagnosis," "preventive health services," and "prejudice or violence." In addition, Web sites of the Gay and Lesbian Medical Association, American Academy of Pediatrics, National Institutes of Mental Health, Centers for Disease Control and Prevention (CDC), American Academy of Child and Adolescent Psychiatry, American Psychiatric Association, American Academy of Family Physicians, and the American College of Physicians also were searched for relevant documents. Additional articles were identified by manual review of the references cited in these publications.

DEFINITION OF TERMS

In order for physicians to better understand their gay and lesbian patients, the terminology and demographics of homosexuality are briefly reviewed. Gay refers to a male who is emotionally, romantically, sexually, and relationally attracted to other males. Popular usage also employs gay to refer to men and women with same sex attractions. Lesbian refers to women who are emotionally, romantically, sexually, and relationally attracted to other women.

Sexual Orientation vs Sexual Behavior. The distinction between sexual orientation (identity) and sexual behavior is important when considering the medical care of gay men and lesbians. Sexual orientation consists of 3 attributes: desire or attraction, behavior, and identity. These attributes frequently do not co-exist. Individuals may identify with one sexual orientation, yet their sexual behavior, either in the past or present, may not correspond. One widely quoted study found that for men, 7.7% have same sex desires, 7.1% participated in same sex behaviors, and 2.8% self-identified as being gay.[8] This study found that for women, 7.5% express same sex desires, 3.8% participated in same sex behaviors, and 1.4% self-identified as being lesbian.[8] Thus, more individuals have homosexual feelings than engage in homosexual behavior, and more engage in homosexual behavior than develop lasting homosexual identification.[8] Furthermore, an individual's sexual behaviors may vary over time. For example, some gay men, lesbians, and bisexuals are or were married, and some have children either from their own heterosexual relationships or by adoption.[9] Self-identified lesbians who want to have their own children may choose to be artificially inseminated, after which the birth mother and her lesbian partner may seek to legally adopt the child.[10]

Prevalence of Gay Men and Lesbians. Differences regarding personal perception and accepted definition of sexual orientation versus behavior contribute to the uncertainty about the prevalence of gay men, lesbians and bisexuals. In addition, given the sensitive nature of the subject and the societal stigmatization of homosexuality, underreporting may occur. An analysis of 5 surveys conducted between 1970 and 1990 estimated that at least 5% to 7% of U.S. males report same-gender sexual contact during adulthood.[11] When the largest metropolitan areas are surveyed, more than 9% of men self-identify as gay.[8] Surveys conducted from 1996 to 2000 indicate that the rate of men who have sex with men (MSM) is in the range of 3.1% to 3.7%.[12] Per the definition of terms provided above, some of these surveys blurred the lines among sexual behavior and sexual identity. The 2002 National Survey of Family

Growth (NSFG) report found that among males 15 to 44 years of age, 6% have had oral or anal sex with another male.[13] The proportion of men who had a male sexual partner in the last 12 months was 2.9%, or approximately 1.77 million men. The proportion of men who had only male sexual partners in the last 12 months was 1.6%.

The NSFG also found that among women 15 to 44 years of age, 11% answered yes when asked, "Have you ever had any sexual experience of any kind with another female?" The proportion of women who had a female sexual partner in the last 12 months was 4.4%, or approximately 2.71 million women, and the proportion who had only female sexual partners in the last 12 months was 1.3%. In the Women's Health Study of American Physicians, 2.6% of respondents self-identified as lesbian.[14] Information derived from exit polling and longitudinal health care studies reveals that lesbian self-identification is somewhat higher in younger, compared with older individuals.[15,16]

Thus, self-reports of sexual orientation vary across age groups, and also differ by geographical locations. Gay men and lesbians are found in all communities, and therefore, comprise a portion of the patient pool for health care services throughout the country.

Non-disclosure of sexual identity. Religious background, culture, and race affect and often complicate how people self-identify (or misidentify) themselves. Gay-identified MSM face stigma in various aspects of their lives. Shame and hostility surrounding lesbians and particularly gay men are more prevalent in certain racial/ethnic communities. African-American and Latino MSM face racial discrimination from society at large and homophobia from their own ethnic groups, often feel unaccepted in the mainstream gay community, and are more likely to identify as heterosexual than white MSM.[17] When faced with fear of alienation and lack of community support, such individuals may characterize their actions as sexual behavior as opposed to a sexual orientation,[18] which prevents MSM in both groups from identifying as gay and, thus, limits exposure and response to prevention messages.

Internalized homophobia and nondisclosure are maladaptive methods of trying to reconcile the shame and guilt that occur when the beliefs of an individual's religion, culture, or race differ from his or her desires and behaviors. Internalization of these experiences influences health care utilization, HIV testing, communication, and adherence behaviors among members of this population. This may lead to seclusion and risk-taking behaviors. Thus, how men and women choose to self-identify is important and should be considered by physicians and their staff when shaping communication and prevention strategies in order to foster appropriate disclosure of sexual behaviors and identity; nondisclosure can be harmful to the patient and his or her partners.[6]

GENERAL ISSUES CONFRONTING GAY MEN AND LESBIANS THAT AFFECT WELL BEING AND MEDICAL CARE

Mental Health. The 1994 Council report highlighted an undercurrent of emotional concerns affecting gay men and lesbians.[2] All patients, regardless of their sexual orientation, have a right to respect and concern for their lives and values. However, as noted above, gay men and lesbians face ostracism and discrimination from many elements of society, including some health care professionals.

Societal reactions force some gay men and lesbians to feel stigmatized and hide their true identity from their co-workers, friends, family, and physicians. Societal and internalized homophobia may affect access to appropriate care and directly impact mental health and well-being. Adolescents who are ambivalent about their sexuality or who are aware of their homosexual orientation but isolated from emotional support are especially vulnerable to societal reactions. As a result, gay men and lesbians have a greater vulnerability to certain psychiatric disorders; the 12-month prevalence of panic disorder, major depression, and generalized anxiety disorder is higher in gay men and lesbians.[19] Additionally, gay men and lesbians use mental health care services at a significantly higher rate compared with heterosexual men and women.[19]

Psychiatric disorders develop (in part) as a result of leading marginalized lives; enduring the stress of hiding one's sexuality; or facing sexual prejudice that manifests as verbal, emotional, or physical abuse/violence from intolerant family members and communities.[20-22] According to 2004 Federal Bureau of Investigation statistics, hate crimes based on sexual orientation constituted the third highest category reported and made up 15.5% of all reported hate crimes; only race- and religion-based prejudice crimes were more prevalent.[23] The prevalence of domestic violence among gay and lesbian couples is as common as it is in heterosexual relationships.[24] While same sex battering mirrors heterosexual battering both in type and prevalence, gay and lesbian victims may receive fewer protections.[25]

Additionally, many older gay men in particular, who lived through the acquired immunodeficiency syndrome (AIDS) crisis, often continue to feel guilt for many years and sometimes throughout the remainder of their lives. This guilt is due to the fact that they lost many friends and loved ones but are still alive, even though they engaged in the same behaviors as those lost. While this may have negative psychological implications, these individuals often have a greater understanding of HIV/AIDS.

Substance Use. Substance use and substance use disorders are prevalent in all segments of American society (see CSAPH Report 8, A-08). Counseling gay men and lesbians about smoking cessation is important because they have significantly higher smoking rates than the general population.[26] Accurately establishing the epidemiology of substance use in gay men and lesbians is complicated by sampling techniques and definitions used. Nevertheless, the reported rates of substance use and substance use disorders, including alcohol, tobacco, and other drugs (eg, marijuana, cocaine, methamphetamine), appear to be somewhat higher among gay men and lesbians, particularly in urban areas, compared with their heterosexual counterparts.[27-32]

Patterns of substance use are in part influenced by the fact that bars are common meeting venues for gay men and lesbians. So-called "club drugs" (3,4-methylenedioxymethamphetamine [MDMA; Ecstasy]; gammahydroxybutryate [GHB]) along with methamphetamine are popular among young adults and urban MSM. Substance use can camouflage or exacerbate other underlying mental health problems, and increases the probability of engaging in high-risk sexual behavior.[33,34] In particular, increased sexual risk behavior has been associated with the use of methamphetamine and inhaled nitrites ("poppers").[35-39]

Access to Care. Access to health care is another important issue.[3,4] Optimal health care requires access to both knowledgeable physicians and appropriate prevention services. Impaired access to health care and the resultant underservice can be caused by economic, geographic, cultural, linguistic, or attitudinal barriers. Gay men and lesbians encounter barriers to accessing care, clustering around 4 main issues:[40] (1) reluctance of some gay men and lesbians to disclose sexual identity, in part because of fear of negative reactions; (2) insufficient numbers of physicians who feel competent to provide care; (3) barriers emanating from lack of financial resources, lack of insurance, or impediments that limit visiting and medical decision-making rights (see below) for gay men and lesbians and their partners; and (4) lack of culturally appropriate prevention services.

Surrogates and Medical Decision-Making. In regard to medical decision-making, particularly concerning patient preferences for life-sustaining treatment, physicians need to consider the special needs of gay men and lesbians who have significant partner relationships. Although biological relatives are usually consulted in surrogate decision-making, many gay men and lesbians have not informed their families of their homosexual relationships and many would prefer their partners to be involved in proxy medical decisions. In 2006, our AMA adopted policy that encourages all hospitals to add to their rules and regulations, and to their patient's Bill of Rights, language permitting same sex couples and their dependent children the same hospital visitation privileges offered to married couples. Whenever possible, physicians should explore surrogate decision-making preferences of their homosexual patients before the need arises. To do this effectively, physicians and patients must know their state and local laws on surrogate decision-making.

Response of the Medical Profession

The 1994 Council report chronicled relevant information about the views of physicians toward gay men and lesbians. In 1973 the American Psychiatric Association (APA) officially removed homosexuality from the list of diagnoses of mental disorders. In 1986 the APA deleted a diagnostic category of "ego-dystonic homosexuality" for individuals diagnosed as overly concerned about their homosexuality, but in succeeding years, the attitudes and beliefs of certain physicians have continued to reflect the often negative or at best ambivalent views of the larger society toward homosexuality, and a majority of physicians surveyed expressed discomfort regarding the care of gay men and lesbians.[41] Reparative therapy, or conversion therapy, is aimed at changing a person's sexual orientation from homosexuality to heterosexuality. Many organizations, including both the AMA and the APA warn that such attempts may be harmful to the patient (AMA Policy H-160.991).

More recent surveys suggest a substantial reduction in homophobia among physicians, but reflect lingering uncertainties and discomfort in their abilities to provide optimal care, especially among pediatricians treating adolescent gay males or lesbians.[42,43] These and other barriers may lead to delays in seeking care or an avoidance of preventive and treatment services. The Gay and Lesbian Medical Association (GLMA) with assistance from our

AMA is conducting a national survey to study physicians' attitudes, knowledge, and beliefs about LGBT patients' unique health care needs in order to improve knowledge and practices in this area.

Understanding Homosexuality. Better understanding about the origins of homosexuality could improve attitudes and practices. Twins studies demonstrate that familial factors, a portion of which are genetic, have a substantial impact on sexual orientation. Concordance rates of 48% to 60% were found in studies of male and female pairs of monozygotic twins, in which at least one twin was homosexual; one monozygotic triplet set has been identified with all 3 concordant for homosexual orientation.[44-46] In fraternal male twins, if one is gay, there is a 22% chance the second twin will also be gay. Additionally, among those raised in the same household, 11% of the non-twin brothers are gay, 9% if adopted. In fraternal female twins, there is a 16% chance the second twin will be lesbian. Adopted sisters of lesbians have a 6% chance of being lesbian. These studies relied on recruitment of subjects through publications targeting gay men and lesbians, potentially biasing the sample. Studies that relied on self-report questionnaires in national twin samples and sibling pairs, or that were based on volunteer twin registries also have demonstrated significant familial aggregation, but with a lower concordance rate for homosexual orientation of approximately 30%.[47,48] Heritability reflects the degree to which a given trait is associated with genetic factors, but nothing about the specific genetic factors involved or about the mechanisms through which they exert influence (i.e., direct or permissive effects).

A consistent biodemographic correlate of sexual orientation in men is birth order, originally observed in a Canadian sample in the 1990s, and since confirmed by others.[49, 50] Younger brothers are more likely to be gay; older sisters neither enhance this effect nor negate it. Another correlate of sexual orientation in men is handedness. If no older brothers exist, 12% of heterosexual males and 16% of homosexual males are left-handed, respectively. However, fraternal birth order and handedness may interact in influencing sexual orientation.[51] Both childhood social/rearing and prenatal mechanisms have been advanced to account for the "fraternal birth order" effect in men. A recent analysis of four samples of gay and heterosexual men, including individuals reared in nonbiological and blended families (i.e., raised with step-siblings or as adoptees) supports a prenatal origin to the fraternal birth order effect since only biological older brothers, including those not reared with the participant, increased the probability of homosexuality in men.[52]

Other findings point to discernible differences in neurodevelopment and neurophysiologic function between homosexual and heterosexual individuals, including variations in the size or volume of a putative sexually dimorphic area in the human brain (interstitial nucleus of the anterior hypothalamus), cochlear function and tone discrimination, and central nervous system processing and response to human pheromone-like substances.[53-58]

Optimizing Primary Care of Gay Men and Lesbians

As noted above, creating a welcoming environment and engaging in nonjudgmental discussion are initially important to optimize the patient-physician relationship, and thus the care delivered for gay men and lesbians. A patient's experience in a health care setting is influenced by all of the individuals encountered during the visit. Cogent advice on creating a safe health care environment for gay men and lesbians is available from the GLMA.[59] To educate a new generation of clinicians, the American College of Physicians also has published the first comprehensive text on the care of sexual and gender minority patients.[60] This text provides an extensive list of resources based on topic, as well as sample intake (and sexual history) forms for new patients that are available free online (www.acponline.org/acp_press/fenway/).

Taking a Patient Sexual History. A major reason why physicians may not offer appropriate guidance for gay men and lesbians is a failure to identify such patients. Physicians begin their relationship with patients by taking a medical and pertinent social/family history; a sexual history is an important and often overlooked component of the medical history. Previous surveys indicated that communication between gay men and lesbians and their primary care physician may be limited on several levels, and that a minority of primary care physicians routinely conducted a sexual history of new adult patients.[2] These findings were duplicated in a recent survey, which found that although approximately 60% of primary care physicians asked about sexual activity at a routine visit, only 12% to 34% conducted a sexual history.[61] Another survey found that less than 20% of obstetricians and family practitioners routinely assessed their patient's sexual orientation.[62] The goal of open communication is complicated by the fact that a significant percentage of gay men and lesbians do not routinely reveal their sexual orientation to their primary care physician because of fear of discrimination or ostracism.[63,64] Less than 20% of gay men patients routinely

discuss their risk of sexually transmitted diseases (STDs) with their physician, and of these, only 1 in 5 are prompted to do so by their physician.[65]

Thus, many physicians continue to experience awkwardness around issues of sexual health and HIV/AIDS, leading to incomplete discussions of these topics, despite interest from their patients. Patients usually feel comfortable talking with their physician about sexual practices and believe it is appropriate for physicians to question them in this area. When physicians do not ascertain sexual orientation and sexual behavior and assume patients are heterosexual, gay men and lesbians may not acknowledge or share these facts, which can contribute to the physician overlooking risk factors. Sample recommended questions for intake forms are available in the *Guidelines for Care of Lesbian, Gay, Bisexual, and Transgender Patients.*[59] Taking an inclusive and nonjudgmental history and being aware of the range of health-related behaviors and medicolegal issues pertinent to gay men and lesbians enables physicians to perform relevant screening tests and to make appropriate referrals. Indeed, the very act of taking a sexual history in a nonjudgmental and attentive manner with open-ended questions can help the patient feel comfortable and willing to share information.

For the sexual history, general questions raising the topic of sexual activity without probing into specific behaviors should be asked first (for example, lead-in questions might be, "Are you sexually active or do you abstain from sex?" "When did you first engage in sexual activity?" or "Do you have sex with men, women, both or neither?"). Questions that could confuse behavior with orientation (for example, "Are you gay?") should be avoided, as many patients may have had sexual contact with others of their own sex and yet would not consider themselves gay or lesbian by their understanding of the term. These can be followed by more specific questions (which differ for men and women) relating to actual activity and behavior to assist in risk assessment for STDs, including HIV. Guidance for conducting a sexual risk assessment in MSM is available from the GLMA.[66] For women, the CDC recommends asking about the "five P's": partners, practices, prevention of STDs, past history of STDs, and prevention of pregnancy. Previous pregnancy, induced abortion, and hormonal contraceptive use are common among women who report sex with women, regardless of self-identification as lesbian.[67]

Patient history-taking and evaluation is also an appropriate time to screen for sexual abuse, domestic violence, and other life stressors among gay men, lesbians, and bisexuals that have implications for mental health and well being (as noted above).

Diagnostic and Therapeutic Considerations

There is no disease that can be ruled in or out solely on the basis of a patient's sexual orientation or sexual behavior. Generally, men and women who engage in same sex behavior suffer from the same health afflictions as individuals who engage in opposite sex behavior. Physicians should be vigilant for tobacco, alcohol, and other substance use, and allow for discussion of stress and other life events that may affect well being, or increase the occurrence of mood and/or anxiety disorders in their gay and lesbian patients. Some disease entities, however, are of particular concern to men and women who engage in same sex behavior and care must be taken to consider them in the development of a differential diagnosis and treatment plan.

Lesbians: Additional Considerations for Clinicians

Most major health issues confronting lesbians are similar to those of heterosexual women, but issues that may require more attention include: fostering increased routine screening for breast and cervical cancer and certain STDs; evaluating risk for cardiovascular disease; assessing substance use and substance use disorders; assessing mental health and assisting patients in coping with sexual stigma and sexual prejudice; and screening for domestic violence, hate crimes, and other sources of significant ongoing stress.

Sexually Transmitted Diseases. Attempts to use national or local surveillance data to estimate the risk of STD transmission between women are limited because many risk classification schemes have either excluded same-gender sex among women or subsumed it under a hierarchy of other behaviors viewed as higher risk.[68] This issue also is complicated by the fact that often times, women who have sex with women (WSW) have had sex (or continue to have sex) with men.[69] Among such individuals, acquisition of chronic virally transmitted diseases, including human papillomavirus (HPV) genital herpes, and HIV from male partners, presumably occurs at a rate per contact similar to that in heterosexual populations. Additionally, compared with heterosexual women, lesbians have

higher rates of sex with bisexual women and injection drug users.[70] These facts reinforce the need for physicians to be aware of their patient's sexual history, regardless of their reported sexual orientation.

Although women who do not have sexual contact with men are at substantially reduced risk for contracting syphilis, gonorrhea, and chlamydia, these cannot be eliminated from consideration on the basis of sexual history alone. If symptoms or signs are present, these infections should be ruled out with appropriate testing. Sexual transmission of HPV, herpes simplex (particularly HSV-1), *Treponema pallidum*, *Trichomonas vaginalis, Chlamydia trachomatis,* and even gonorrhea and hepatitis between women has been reported.[71-74] The prevalence of bacterial vaginosis among lesbians is high; vaginitis in lesbians is caused by the same organisms as in heterosexual women and is treated similarly.[75,76]

Human papillomavirus (HPV) DNA has been detected in 13% to 30% of WSW. Self-identified lesbians and women who have never had sex with men are less likely to undergo pelvic examinations and Pap tests.[77-79] However, squamous intraepithelial lesions are common among women who are sexually active with women, and also occur among those who have never had sex with men.[79] Thus, Pap test screening should not differ for WSW regardless of their sexual history, and current recommendations on HPV vaccination should be followed.[80,81] Vaccination is not a substitute for routine cervical cancer screening, and vaccinated females should have cervical cancer screening as recommended.

Women now comprise about 25% of newly diagnosed HIV/AIDS cases, with black women representing the fastest growing segment, but female-to-female transmission of HIV has not been conclusively demonstrated, despite various case reports. The well documented risk of female-to-male transmission of HIV shows that vaginal secretions and menstrual blood contain the virus and that mucous membrane exposure (e.g., oral, vaginal) to these secretions has the potential to cause HIV infection.

Through December 2004, a total of 246,461 women in the United States were reported as HIV-infected. Of these, 7,381 were reported to have had sex with women; however, most had other risk factors, such as injection drug use; sex with men who are infected or who have risk factors for infection; or, more rarely, receipt of blood or blood products.[82] Among women who reported that they have had sex only with women (n=534), 91% also had another risk factor—typically, injection drug use. The CDC gives high priority for follow-up investigation to HIV-infected women whose only initially reported risk factor is sex with women. As of December 2004, none of these investigations had confirmed female-to-female HIV transmission, either because other risk factors were later identified or because some women declined to be interviewed. A study of more than 1 million female blood donors found no HIV-infected women whose only risk factor was sex with women. Despite the absence of confirmed cases of female-to-female transmission of HIV, currents findings do not negate the possibility.

Cancer. Based on survey data, self-identified lesbians as a group have more risk factors for certain cancers compared with their heterosexual counterparts, including higher rates of smoking and alcohol use; higher rates of overweight, central adiposity, and obesity; lower lifetime use of oral contraceptives; fewer pregnancies (lower or nulliparity); and lower consumption of fruits and vegetables.[15,16,83] When addressed by standard risk assessment models, lesbians (as a group) have higher 5-year and lifetime risks for developing breast cancer, and would appear to have higher risks for ovarian cancer as well.[84] Additionally, lesbians are less likely to have had a mammogram in the past 2 years than other women.[85] Because lesbians usually do not need contraceptives, they tend to wait longer between Pap smears and general gynecological examinations. As noted above, lesbians are less likely to undergo pelvic examinations and screening for cervical cancer. By not presenting for regular Pap tests or screening mammograms, individuals miss the opportunity to receive other preventive care.

Despite these findings and behaviors, there is no prospective population-based study of the comparative incidence of cancers in lesbians, and no outcome data confirming that lesbians have higher cancer rates. This lack of research is problematic because general epidemiological studies of cancer in women have identified specific risk factors that are distributed differently in the lesbian population. The only population-based cohort study that examined the subject found no evidence for an increased rate of cancer in lesbians.[86] Physicians should screen lesbians for breast and cervical cancer according to established guidelines for the general population. Further clinical decisions should be based on evaluation of individual risk factors as determined by social and sexual history and physical examination.

Cardiovascular Disease. As noted above, lesbians have more risk factors for heart disease than the general population. One recent population-based study confirmed that lesbian women are more likely to be overweight and

obese.[87] Population-based data also suggest that lesbians are more likely to report a diagnosis of heart disease than heterosexual women.[88] Increased attention to screening and prevention of cardiovascular disease in these individuals is warranted.

Gay Men: Additional Considerations for Clinicians

Most major health issues confronting gay men are similar to those of heterosexual men, but several unique issues exist including routine screening for HIV and other STDs, screening for and immunizing against hepatitis viruses, and screening for HPV-related neoplasia. As noted above, physicians also should be prepared to assess substance use and substance use disorders and mental health status in patients who are coping with sexual stigma and sexual prejudice, or who may be victims of domestic violence or hate crimes, and who are subject to other ongoing sources of significant stress, such as discrimination or harassment in the workplace. Intimate partner violence occurs at the same rate in same sex as in opposite sex relationships.[89]

Sexually Transmitted Diseases. MSM may present with various syndromes typical of STDs.[59] HIV infection remains a predominant health concern of the gay community; HPV and herpes simplex virus infection also are common (see below). In 2006, 73% of HIV/AIDS diagnoses among adolescents and adults were for males. Male-to-male sexual contact remains the primary transmission category for new diagnoses, followed by injection drug use and high risk heterosexual contact.[90] MSM currently account for ~70% of all HIV infections among male adults and adolescents; blacks are substantially overrepresented, accounting for nearly half of new diagnoses.[91]

After declining during the 1980s and 1990s, the number of HIV diagnoses for MSM and the occurrence of unsafe sex practices appear to be increasing.[92] Individual, sociocultural, and biomedical factors affect HIV risk behavior among MSM.[93] Sexual risk factors and apparent increases in unprotected anal intercourse may be responsible, exacerbated in some cases by substance use; additionally, advances in treatment for HIV infection have led to an increase in the number of persons who are living with HIV infection. The availability of highly active antiretroviral therapy may lead to the belief that improved treatment reduces infectiousness or makes HIV a less serious disease (therapeutic optimism), causing some MSM to underestimate the risks associated with HIV infection.[92,94-96] Additionally, 1 in 4 persons in the United States who are infected with HIV are unaware of their infection.[91] Young MSM, particularly blacks, are even more likely to be unaware they are HIV-positive and may lack perspective on the toll AIDS has taken on gay men.[97] HIV prevention efforts can improve behavior and reduce sexual risk factors;[98,99] such efforts include making HIV testing a routine part of medical care, implementing new models for diagnosing HIV infections outside of medical settings, and preventing new infections by working with HIV-infected persons and their partners to reduce risky behaviors.

The rates of other STDs, including syphilis, gonorrhea, and chlamydia, have increased in some urban areas, also affecting blacks and Hispanic disproportionately.[92,100-102] Urethritis is the most common presentation of chlamydia, but proctitis also may manifest. Other bacterial, protozoa, and viruses also have been implicated in non-gonococcal urethritis in MSM.[103] Therefore, clinicians should routinely assess the risks of STDs for all male patients. MSM should routinely undergo nonjudgmental STD/HIV risk assessment and client-centered prevention counseling to reduce the likelihood of acquiring, or for those who already infected, of transmitting HIV or other STDs. Current CDC guidelines recommend that the following studies be performed at least annually for sexually active MSM: HIV serology, if HIV-negative or not previously tested; syphilis serology; urethral culture or urine nucleic acid amplification test for gonorrhea; urethral or urine test (nucleic acid amplification) for chlamydia; pharyngeal specimen collection to test for gonorrhea in men with oral-genital exposure; and rectal gonorrhea and chlamydia screening in men having receptive anal intercourse.[104]

Hepatitis. All forms of hepatitis can be encountered in gay men. Hepatitis B disproportionately affects MSM, accounting for 15% to 20% of new infections annually in the United States; however, few adolescent and young adult MSM are vaccinated against HBV.[105,106] The Advisory Committee on Immunization Practices (ACIP) recommends universal hepatitis B vaccination for all unvaccinated adults in settings in which a high proportion of adults have risks for HBV infection, such as health care settings targeting services to MSM, STD/HIV testing and treatment facilities, and drug abuse treatment and prevention settings. Hepatitis A also disproportionately affects MSM, accounting for approximately 10% of all new HAV infection in this country; hepatitis A infection is generally based on fecal-oral routes of transmission.[107] Therefore, vaccination against hepatitis A and B is recommended for all MSM in whom previous infection or immunization cannot be documented.

Cancer. Anogential HPV types are divided into low risk types, which are associated predominately with anogenital warts and mild dysplasia, and high risk types (e.g., 16, 18, 31, and 45), which are associated with high grade dysplasia and anogenital cancers. HPV infection is prevalent in gay men.[108] The same strains of HPV that are associated with cervical cancer (usually 16 and 18) can also develop into anal carcinoma. Anal cancer is a rare tumor in the general population (age adjusted incidence of 1.5/100,000), but the incidence has risen over the last 25 years. Anal cancer is much more common in HIV-positive MSM, with an estimated incidence of 35/100,000, a rate that exceeds that of cervical cancer.[109-110] Another study estimated that the incidence of anal cancer is 80 times higher in gay and bisexual men.[111]Anal cancer and its precursor lesion, anal high grade squamous intraepithelial lesions (HSILs), are associated with HPV infection, anoreceptive intercourse, cigarette smoking, and immunosuppression, as well as HIV infection; a high proportion of tumors have detectable HPV.[112,113]Anal HPV infection and anal SILs are most common in HIV-positive MSM (perhaps because of persistent HPV infection), but sexually active HIV-negative MSM in all age groups also have a high prevalence of SILs, as do HIV-positive heterosexual men.[114]

Similar to the cervical Pap smear, anal swabs for cytology are a possible screening method for anal SILs and anal cancer and may be cost effective when administered every 2 to 3 years in HIV-negative men 40 years of age and older; some experts recommend annually screening in HIV-positive MSM.[115-117] More studies are needed to confirm the utility of this screening approach, as well as the potential value of HPV vaccination in men; the latter approach is currently being studied in clinical trials.

Adolescents: Additional Considerations for Clinicians

When dealing with their sexual identity, adolescents face a major milestone in their development. Heterosexual adolescents who conform to the norms of society have their own set of concerns, but adolescents who think they may be homosexual confront an enormous psychosocial challenge. Gay and lesbian youth face unique developmental challenges to managing their emerging identity within the constraints of a heterosexual family, society, and tradition.[118]

Adolescents access to care is influenced by the balance between their minor status, their emerging sexuality, and the need for confidential, culturally competent care.[59] Often alienated from their families, schools, and communities, these youth are hindered by societal stigmatization and prejudice, limited knowledge of human sexuality, a need for secrecy, a lack of opportunities for open socialization, and limited communication with healthy role models. They may seek, but not find, understanding and acceptance by parents and others; such rejection may lead to isolation, runaway behavior, homelessness, depression, suicide, substance abuse, and school or job failure. A substantial number of gay and lesbian youth experience violence related to their sexual orientation and suffer harmful psychological and psychosocial consequences.[59]

The psychosocial difficulties encountered by homosexual adolescents put them at risk for depression and suicide. According to the Secretary's Task Force on Youth Suicide issued nearly 20 years ago, gay male adolescents were 2 to 3 times more likely than their peers to attempt suicide.[119] More recent analysis suggests that suicide attempts in gay and lesbian youth are significantly associated with gender nonconformity, early awareness of homosexuality, stress, violence, lack of support, family problems, school drop-out, and substance use or other psychiatric disorders.[120] The combination of substance use and unprotected sex is particularly problematic for gay and lesbian youth. Alcohol and substance use are significantly related to high risk sexual behavior.[59,121] A significant number of gay youth engage in high risk sexual activity and unprotected anal intercourse, and are unaware of their HIV status.[122,59]

Today, an increased number of resources are available to assist GLBT youth as well as their families and friends. Organizations such as Parents and Friends of Lesbians and Gays (PFLAG) and the Gay and Lesbian Straight Education Network (GLSEN) have become increasingly visible in communities across the country. These organizations work to educate both heterosexual and GLBT populations on the need for acceptance and understanding of individual differences, sexual orientations, and/or gender identities. Over the past 10 years, the GLSEN in particular has been very successful in bringing Gay/Straight Alliance student groups to schools across the country. Information about these organizations may be found at www.pflag.org and www.glsen.org.

CONCLUSION

Improvements are still needed to address disparities in health care for gay men and lesbians. Gay men and lesbians are disproportionately at risk for societal discrimination and violent hate crimes, STDs, a variety of mental health conditions, substance use, and certain cancers. Problems are encountered with access to quality care and counseling pertinent to actual lifestyle behaviors.[59] Physicians can assist by providing a welcoming practice environment, relevant educational materials, and inclusive patient intake and other forms, and by becoming familiar with the issues facing gay men and lesbians. When physicians and practices cannot accomplish these tasks, referral of the patient to another physician who can provide such care is imperative. With appropriate education and training, physicians can play a vital role in ensuring access to quality care for gay men and lesbians, and in helping them lead healthier lives.

RECOMMENDATION

The Council on Science and Public Health recommends that Policy H-160.991, Health Care Needs of the Homosexual Population, be amended by insertion to read as follows:

H-160.991 Health Care Needs of the Homosexual Population

1. Our AMA: (a) believes that the physician's nonjudgmental recognition of sexual orientation and behavior enhances the ability to render optimal patient care in health as well as in illness. In the case of the homosexual patient this is especially true, since unrecognized homosexuality by the physician or the patient's reluctance to report his or her sexual orientation and behavior can lead to failure to screen, diagnose, or treat important medical problems. With the help of the gay and lesbian community and through a cooperative effort between physician and the homosexual patient effective progress can be made in treating the medical needs of this particular segment of the population; (b) is committed to taking a leadership role in: (i) educating physicians on the current state of research in and knowledge of homosexuality and the need to take an adequate sexual history; these efforts should start in medical school, but must also be a part of continuing medical education; (ii) educating physicians to recognize the physical and psychological needs of their homosexual patients; (iii) encouraging the development of educational programs for homosexuals to acquaint them with the diseases for which they are at risk; (iv) encouraging physicians to seek out local or national experts in the health care needs of gay men and lesbians so that all physicians will achieve a better understanding of the medical needs of this population; and (v) working with the gay and lesbian community to offer physicians the opportunity to better understand the medical needs of homosexual and bisexual patients; and (c) opposes, the use of "reparative" or "conversion" therapy that is based upon the assumption that homosexuality per se is a mental disorder or based upon the a priori assumption that the patient should change his/her homosexual orientation.

2. Our AMA will (a) educate physicians regarding: (i) the need for women who have sex exclusively with women to undergo regular cancer and sexually transmitted infection screenings due to their comparable or elevated risk for these conditions; and (ii) the need for comprehensive screening for sexually transmitted diseases in men who have sex with men; and (b) support our partner medical organizations in educating women who have sex exclusively with women on the need for regular cancer screening exams, the risk for sexually transmitted infections, and the appropriate safe sex techniques to avoid that risk.

3. Our AMA will use the results of the survey being conducted in collaboration with the Gay and Lesbian Medical Association to serve as a needs assessment in developing such tools and online continuing medical education (CME) programs with the goal of increasing physician competency on gay, lesbian, bisexual, and transgender health issues.

4. Our AMA will continue to explore opportunities to collaborate with other organizations, focusing on issues of mutual concern in order to provide the most comprehensive and up-to-date education and information to physicians to enable the provision of high quality and culturally competent care to gay men and lesbians.

REFERENCES

1. Council on Scientific Affairs. Healthcare needs of the homosexual population. *JAMA.* 1982;248:736-739.

2. Council on Scientific Affairs. Healthcare needs of gay men and lesbians in the United States. *JAMA.* 1996;275:1354-1359.
3. Committee on Lesbian Health Research Priorities, Solarz AL, ed. Lesbian Health: Current Assessment and Direction for the Future. Washington, DC: National Academy of Sciences; 1999.
4. *Healthy People 2010*. Office of Disease Prevention and Health Promotion, US Dept of Health and Human Services. Available at: http://www.health.gov/healthypeople/. Accessed May 2, 2008.
5. Perrin EC, for the Committee on Psychosocial Aspects of Child and Family Health Technical Report: Coparent or second-parent adoption by same-sex parents. *Pediatrics* 2002;109;341-344
6. American Academy of Family Physicians. Policy on Child's Health. Available at: http://www.aafp.org/online/en/home/policy/policies/c/children.html. Accessed May 2, 2008.
7. Simmons T, O'Connell M. Married-couple and unmarried-partner households: 2000. US Department of Commerce Economics and Statistics Administration. US Census Bureau; 2003. Census 2000 Special Reports.
8. Laumann EO, Gagnon JH, Michael RT, Michaels S. *The Social Organization of Sexuality: Sexual Practices in the United States.* Chicago, Ill: University of Chicago Press; 1994.
9. Stevens PE. Lesbians and HIV: clinical, research, and policy issues. *Am J Orthopsychiatry*. 1993;63:289-294.
10. White J, Levinson W. Primary care of lesbian patients. *J Gen Intern Med*. 1993;8:41-47.
11. Rogers SM, Turner CF. Male-male sexual contact in the U.S.A.: findings from five sample surveys, 1970-1990. *J Sex Research*. 1991;28:491-519.
12. Anderson JE, Stall R. Increased reporting of male-to-male sexual activity in a national survey. *Sex Transmi Dis.* 2002;29:643-646.
13. Mosher WD, Chandra A, Jones J. Sexual behavior and selected health measures: men and women 15-44 years of age, United States 2002. *Adv Data.* 2005;362.
14. Brogan DJ, O'Hanlan KA, Elon L, Frank E. Health and professional characteristics of lesbian and heterosexual women physicians. *J Am Med Womens Assoc.* 2003;58:10-19.
15. Case P, Austin SB, Hunter DJ, et al. Sexual orientation, health risk factors, and physical functioning in the Nurses Health Study II. *J Womens Health.* 2004;13:1033-1047.
16. Valanis BG, Bowen DJ, Bassford T, Whitlock E, Charney P, Carter RA. Sexual orientation and health: comparisons in the women's health initiative sample. *Arch Fam Med.* 2000;9:843-853.
17. Malebranche D. Race and sexual identity: perceptions about medical culture and healthcare among black men who have sex with men *J National Med Assoc.* 2004;96:97-107.
18. Lever J, Kanouse DE, Rogers WH, et al. Behavior patterns and sexual identity of bisexual males. *J Sex Research*. 1992;29:141-167.
19. Cochran SD, Mays VM, Sullivan JG. Prevalence of mental disorders, psychological distress, and mental health services use among lesbian, gay, and bisexual adults in the United States. *J Consult Clin Psychol.*2003;71:53-61.
20. Meyer IH. Prejudice, social stress, and mental health in lesbian, gay and bisexual populations: conceptual issues and research evidence. *Psychol Bull.*2003;129:674–697.
21. Safren SA, Heimberg RG. Depression, hopelessness, suicidality, and related factors in sexual minority and heterosexual adolescents. *J Consult Clin Psychol.* 1999;67:859–866.
22. Mills TC, Paul J, Stall R, et al. Distress and depression in men who have sex with men: the Urban Men's Health Study [published correction appears in *Am J Psychiatry*. 2004;161(4):776]. *Am J Psychiatry.* 2004;161:278-285.
23. Federal Bureau of Investigation. Crime in the United States 2004─Hate Crime. Available at: http://www.fbi.gov/ucr/cius_04/offenses_reported/hate_crime/index.html. Accessed May 4, 2008.
24. Barnes E. It's just a quarrel. *Am Bar Assoc J.* 1998;February:24-25.
25. Murphy B. Queer justice: equal protection for victims of same-sex domestic violence. *U L Rev*. 1995;335.
26. Tang H, Greenwood GL, Cowling DW, et al. Cigarette smoking among lesbians, gays, and bisexuals.: how serious a problem? *Cancer Causes Control*. 2004;15:797-803.
27. Cochran SD, Mays VM, Bowen D, et al. Cancer-related risk indicators and preventive screening behaviors among lesbians and bisexual women. *Am J Public Health.* 2001;91:591-597.
28. Stall RD, Greenwood GL, Acree M, Paul J, Coates TJ. Cigarette smoking among gay and bisexual men. *Am J Public Health.* 1999;89:1875-1878.
29. Dean L, Meyer IH, Robinson K, et al. Lesbian, gay, bisexual, and transgender health: findings and concerns. *J Gay Lesbian Med Assoc.* 2000;4:102-151.
30. Cabaj RP. Substance abuse in the gay and lesbian community. In: Lowinson JH, Ruiz P, Millman R, eds. *Substance Abuse: A Comprehensive Textbook*. Baltimore: Williams and Wilkins; 1992:852-860.
31. Cochran SD, Ackerman D, Mays V, et al. Prevalence of non-medical drug use and dependence among homosexually active men and women in the US population. *Soc Study Addiction.* 2004;99:989-998.

32. Stall R, Paul JP, Greenwood G, et al. Alcohol use, drug use and alcohol-related problems among men who have sex with men: the Urban Men's Health Study. *Addiction.* 2001;96:1589-1601.
33. Colfax G, Coates TJ, Husnik MJ, et al. Longitudinal patterns of methamphetamine, popper (amyl nitrite), and cocaine use and high risk sexual behavior among a cohort of San Francisco men who have sex with men. *J Urban Health.* 2005;82:i62-i70.
34. Hughes TL, Elaison M. Substance use and abuse in lesbian, gay, bisexual, and transgender populations. *J Primary Prevention.* 202;22:263-298.
35. Woody GE, Donnell D, Seage GR, et al. Non-injection substance use correlates with risky sex among men having sex with men: data from HIVNET. *Drug Alcohol Dependence.* 1999;53:197-205.
36. Wong W, Chaw JK, Kent CK, et al. Risk factors for early syphilis among gay and bisexual men seen in an STD clinic: San Francisco, 2002-2003. *Sex Transm Dis.* 2005;32:458-463.
37. Molitor F, Truax SR, Ruiz JD, et al. Association of methamphetamine use during sex with risky sexual behaviors and HIV infection among non-injection drug users. *West J Med.* 1998;168:93-97.
38. Shoptaw S. Methamphetamine use in urban gay and bisexual populations. *Topics HIV Med.* 2006;14:84-87.
39. Mayer KH, Bradford JB, Makadon HJ, Stall R, Goldhammer H, Landers S. Sexual and gender minority health: what we know and what needs to be done. *Am J Public Health.* 2008;98:989–995.
40. Koblin BA, Husnik MJ, Colfax G, et al. Risk factors for HIV infection among men who have sex with men. *AIDS.* 2006;20:731-739.
41. Stein TS. Overview of new developments in understanding homosexuality. In: Oldhan JM, Riba MB, Tasman A, eds. *Review of Psychiatry*: Volume 12. Washington, DC: American Psychiatric Press; 1993:9-40.
42. Smith DM, Mathews WC. Physicians' attitudes toward homosexuality and HIV: a survey of a California Medical Society revisited (PATHH-II). *J Homosex.* 2007;52:1-9.
43. Lena SM, Wiebe T, Ingram S, Jabbour M. Pediatricians' knowledge, perceptions, and attitudes towards providing health care for lesbian, gay, and bisexual adolescents. *Ann R Coll Physicians Surg Can.* 2002;35:406-410.
44. Bailey J, Pillard R. A genetic study of male sexual orientation. *Arch Gen Psychiatry.* 1991;48:1089-1096.
45. Bailey JM, Pillard RC, Neale MC, Agyei Y. Heritable factors influence sexual orientation in women. *Arch Gen Psychiatry.* 1993;50:217-223.
46. Whitman FL, Diamond M, Martin J. Homosexual orientation in twins: a report on 61 pairs and three triplet sets. *Arch Sex Behav*. 1993;22:187-206.
47. Kendle KS, Thornton LM, Gilman SE, Kessler RC. Sexual orientation in a U.S. national sample of twin and nontwin pairs. *Am J Psychiatry*. 2000;157:1843-1846.
48. Bailey JM, Dunne MP, Martin NG. Genetic and environmental influences on sexual orientation and its correlates in an Australian twin sample. *J Person Soc Psychol.* 78:524-536.
49. Blanchard R, Bogaeert AF. Homosexuality in men and number of older brothers. *Am J Psychiatry*. 1996;153:27-31.
50. Camperio-Ciani A, Corna F, Capiluppi C. Evidence for maternally inherited factors favouring male homosexuality and promoting female fecundity. *Proc Biol Sci.* 2004; 271:2217-2221.
51. Blanchard R, Cantor JM, Bogaert AF, Breedlove SM, Ellis L. Interaction of fraternal birth order and handedness in the development of male homosexuality. *Horm Behav.* 2006;49:405-414.
52. Bogaert AF. Biological versus nonbiological older brothers and men's sexual orientation. *Proc Natl Acad Sci*. 2006;103:10771-10774.
53. LeVay S. A difference in hypothalamic structure between heterosexual and homosexual men. *Science.* 1991;254:1034-1037.
54. Byne W, Tobet S, Mattiace LA, et al. The interstitial nuclei of the human anterior hypothalamus: an investigation of variation with sex, sexual orientation, and HIV status. *Horm Behav.*. 2001;40:86-92.
55. McFadden D, Pasanen E. Comparison of the auditory systems of heterosexuals and homosexuals: click-evoked otoacoustic emission. *Proc Natl Acad Sci*. 1998;95:2709-2713.
56. Loehlin JC, McFadden D. Otacoustic emissions, auditory evoked potentials, and traits relating sex and sexual orientation. *Arch Sexual Behavior.* 2003;32:115-127.
57. Savic I, Berglund H, Lindstorm P. Brain response to putative pheromones in homosexual men. *Proc Natl Acad Sci*. 2005;102:7356-7361.
58. Berglund H, Lindstorm P, Savic I. Brain response to putative pheromones in lesbian women. *Proc Natl Acad Sci*. 2006;103:8269-8274.
59. Gay and Lesbian Medical Association. Guidelines for care of lesbian, gay, bisexual, and transgender patients. Available at: http://ce54.citysoft.com/_data/n_0001/resources/live/
60. GLMA%20guidelines%202006%20FINAL.pdf. Accessed May 3, 2008.

61. Makadon HJ, Mayer KH, Potter J, Goldhammer H, eds. *The Fenway Guide to Lesbian, Gay, Bisexual, and Transgender Health.* Philadelphia: American College of Physicians; 2008.
62. Wimberly YH, Hogben M, Moore-Ruffine J, Moore SE, Fry-Johnson Y. Sexual-history taking among primary care physicians. *J Natl Med Assoc.* 2006;98:1924-1929.
63. Maheux B, Haley N, Rivard M, Gervais A. Do physicians assess lifestyle risks during general medical examinations? a survey of general practitioners and obstetrician-gynecologists in Quebec. *Can Med Assoc J.* 1999;160:1830-1834.
64. Marwick C. Survey says patients expect little physician help on sex. *JAMA.* 1999;281:2173-2174.
65. Eliason MJ, Schop R. Does "Don't ask, don't tell apply to health care? lesbian, gay, and bisexual people's disclosure to health care providers. *J Gay Lesbian Med Assoc.* 2001;5:125-134.
66. Elford J, Bolding G, Maguire M, Sherr L. Do gay men discuss HIV risk reduction with their GP? *AIDS Care.* 2000;12:287-290.
67. Gay and Lesbian Medical Association. MSM: Clinician's Guide to Incorporating Sexual Risk Assessment in Routine Visits. Available at: www.glma.org.
67. Centers for Disease Control and Prevention. Taking a sexual history. Available at: www.cdc.gov/std/see/HealthCareProviders/SexualHistroy-H.pdf. Accessed May 5, 2008.
68. Marrazzo JM, Stine K. Reproductive health history of lesbians: implications for care. *Am J Obstet Gynecol.* 2004;190:1298-1304.
69. Diamant AL, Schuster MA, McGuigan K, Lever J. Lesbians' sexual history with men: implications for taking a sexual history. *Arch Intern Med*. 1999;159:2730-2736.
70. Koh AS, Gomez CA, Shade S, Rowley E. Sexual risk factors among self-identified lesbians, bisexual women, and heterosexual women accessing primary care settings. *Sex Transm Dis.* 2005;32:563-569.
71. Kwakwa HA, Ghobrial MW. Female-to-female transmission of human immunodeficiency virus. *Clin Infect Dis.* 2003;36:e40–41.
72. Kellock D, O'Mahony CP. Sexually acquired metronidazole-resistant trichomoniasis in a lesbian couple. *Genitourin Med.* 1996;72:60-61.
73. Gage S. Preliminary findings: the national lesbian and bisexual women's health survey. In: *National Lesbian and Gay Health Conference*. New York: Gay and Lesbian Medical Association; 1994.
74. Marrazzo JM, Stine K, Wald A. Prevalence and risk factors for infection with herpes simplex virus type-1 and -2 among lesbians. *Sex Transm Dis*. 2003;30:890-895.
75. Fethers K, Marks C, Mindel A, Estcourt CS. Sexually transmitted infections and risk behaviours in women who have sex with women. *Sex Transm Infect.* 2000;76:345-349.
76. Marrazzo JM, Koutsky LA, Eschenbach DA, Agnew K, Stine K, Hillier SL. Characterization of vaginal flora and bacterial vaginosis in women who have sex with women. *J Infect Dis*. 2002;185:1307-1313.
77. Diamant AL, Schuster MA, Lever J. Receipt of preventive health care services by lesbians. *Am J Prev Med.* 2000;19:141-148.
78. Marrazzo JM, Koutsky LA, Stine KL, et al. Genital human papillomavirus infection in women who have sex with women. *J Infect Dis*. 1998;178:1604-1609.
79. O'Hanlan KA, Crum CP. Human papillomavirus-associated cervical intraepithelial neoplasia following lesbian sex. *Obstet Gynecol*. 1996;88:702-703.
80. Marrazzo JM, Coffey P, Elliott MN. Sexual practices, risk perception and knowledge of sexually transmitted disease risk among lesbian and bisexual women. *Perspect Sex Reprod Health*. 2005;37:6-12.
81. Bailey JV, Kavanagh J, Owen C, McLean KA, Skinner CJ. Lesbians and cervical screening. *British J Gen Pract.* 2000;50:481-482.
82. CDC Fact Sheet. HIV/AIDS among women who have sex with women. Available at: http://www.cdc.gov/hiv/topics/women/resources/factsheets/pdf/wsw.pdf. Accessed May 2, 2008.
83. Koh AS. Use of preventive health behaviors by lesbian, bisexual, and heterosexual women: questionnaire survey. *West J Med.* 2000;172:379-384.
84. Dibble SL, Roberts SA, Nussey B. Comparing breast cancer risk between lesbians and their heterosexual sisters. *Women's Health Issues*. 2004;14:60-68.
85. Kerker BD, Mostashari F, Thorpe L. Health care access and utilization among women who have sex with women: sexual behavior and identity. *J Urban Health.* 2006;83:970-979.
86. Frisch M, Else S, Grulich A, Johansen C. Cancer in a population-based cohort of men and women in registered homosexual partnerships. *Am J Epidemiol.* 2003;157: 966-972.
87. Boehmer U, Bowen DJ, Bauer GR. Overweight and obesity in sexual-minority women: evidence from population-based data. *Am J Public Health.* 2007;97:1134-1140.

88. Diamant AL, Wold C. Sexual orientation and variation in physical and mental health status among women. *J Womens Health.* 2003;12:41-49.
89. McClennen JC. Domestic violence between same gender partners: recent findings and future research. *J Interpers Violence*. 2005;20:149-154.
90. CDC Fact Sheet. HIV/AIDS in the United States. March 2008. Available at: http://www.cdc.gov/hiv/resources/factsheets/PDF/us.pdf. Accessed May 2, 2008.
91. CDC Fact Sheet. HIV/AIDS among men who have sex with men. Available at: http://www.cdc.gov/hiv/topics/msm/resources/factsheets/msm.htm. Accessed May 2, 2008.
92. Special focus profiles: men who have sex with men. In: *Sexually Transmitted Disease Surveillance, 2005*. Atlanta: US Department of Health and Human Services, CDC; November 2006. Available at http://www.cdc.gov/std/stats/msm.htm. Accessed May 3, 2008.
93. Fenton KA, Imrie J. Increasing rates of sexually transmitted diseases in homosexual men in Western Europe and the United States: why? *Infect Dis Clin North Am.* 2005;19:311-331.
94. Wolitski R. The emergence of barebacking among gay men in the United States: a public health perspective. *J Gay Lesbian Psychotherapy.* 2005;9:13-38.
95. Mansergh G, Colfax GN, Marks G, et al. The Circuit Party Men's Health Survey: findings and implications for gay and bisexual men. *Am J Public Health.* 2001;91:953-958.
96. Purcell DW, Parsons JT, Halkitis PN, Mizuno Y, Woods WJ. Substance use and sexual transmission risk behavior of HIV-positive men who have sex with men. *J Substance Abuse.* 2001;13:185-200.
97. MacKellar DA, Valleroy L, Secura G, et al. Unrecognized HIV infection, risk behaviors, and perceptions of risk among young men who have sex with men: opportunities for advancing HIV prevention in the third decade of HIV/AIDS. *J Acquir Immune Defic Syndrom.*. 2005;38:603–614.
98. Johnson WD, Hedges LV, Ramirez G, et al. HIV prevention research for men who have sex with men: a systematic review and meta-analysis. *J Acquir Immune Defic Syndrome.* 2002;30(suppl 1):S118–S129.
99. Sanchez T, Finlayson T, Drake A, et al. Human immunodeficiency virus (HIV) risk, prevention, and testing behaviors--United States, National HIV Behavioral Surveillance System: men who have sex with men, November 2003-April 2005. *MMWR Surveill Summ.* 2006;55:1-16.
100. Centers for Disease Control and Prevention. Primary and secondary syphilis among men who have sex with men—New York City, 2001. *MMWR.* 2002;51:853–856.
101. Centers for Disease Control and Prevention. Primary and secondary syphilis—United States, 1999. *MMWR.* 2001;50:113–117.
102. Centers for Disease Control and Prevention. Transmission of primary and secondary syphilis by oral sex—Chicago, Illinois, 1998–2002. *MMWR*. 2004;53:966–968.
103. Centers for Disease Control and Prevention. Treatment guidelines on sexually transmitted disease. *MMWR.* 2006;55(RR-11):1-100.
104. MacKellar DA, Valleroy LA, Secura G, et al. Two decades after vaccine licensure: hepatitis B immunization and infection among young men who have sex with men. *Am J Public Health.* 2001;91:965-971.
105. Bradshaw CS, Tabrizi SN, Read TR, et al. Etiologies of nongonococcal urethritis: bacteria, viruses, and the association with orogenital exposure. *J Infect Dis.* 2006;193:336-345.
106. Weinbaum CM, Lyerla R, MacKellar DA, et al. The Young Men's Survey phase II: hepatitis B immunization and infection among young men who have sex with men. *Am J Public Health.* 2008;98:839-845.
107. Mast EE, Weinbaum CM, Fiore AE, et al. Advisory Committee on Immunization Practices (ACIP) Centers for Disease Control and Prevention (CDC). A comprehensive immunization strategy to eliminate transmission of hepatitis B virus infection in the United States: recommendations of the Advisory Committee on Immunization Practices (ACIP) Part II: immunization of adults. *MMWR Recomm Rep.* 2006;55(RR-16):1-33.
108. Dunne EF, Nielson CM, Stone KM, Markowitz LE, Giuliano AR. Prevalence of HPV infections among men: a systemic review of the literature. *J Infect Dis.* 2006;194:1044-1057.
109. Daling JR, Weiss NS, Hislop TG, Maden C, Coates RJ, Sherman KJ, et al. Sexual practices, sexually transmitted diseases, and the incidence of anal cancer. *N Engl J Med*. 1987;317:973-7.
110. Qualters JR, Lee NC, Smith RA, Aubert RE. Breast and cervical cancer surveillance, United States, 1973-1987. *MMWR CDC Surveill Summ*. 1992;41:1-7.
111. Chin-Hong PV, Vittinghoff E, Cranston RD, et al. Age-related prevalence of anal cancer precursors in homosexual men: the EXPLORE study. *J Natl Cancer Institute.* 2005;97:896- 905.
112. Daling JR, Madeleine MM, Johnson LG, et al. Human papillomavirus, smoking, and sexual practices in the etiology of anal cancer. *Cancer.* 2004;101:270-280.
113. Uronis HE, Bendell JC. Anal cancer: an overview. *Oncologist.* 2007;12:524-534.

114. Piketty C, Darragh TM, DaCosta M, et al. High prevalence of anal human papillomavirus infection and anal cancer precursors among HIV-infected persons in the absence of anal intercourse. *Ann Intern Med.* 2003;136:453-459.
115. Goldie SJ, Kuntz KM, Weinstein MC, et al. The clinical effectiveness and cost-effectiveness of screening for anal squamous intraepithelial lesions in homosexual and bisexual HIV-positive men. *JAMA* 1999;281:1822–1829.
116. 116. Goldie SJ, Kuntz KM, Weinstein MC, et al. Cost-effectiveness of screening for anal squamous intraepithelial lesions and anal cancer in human immunodeficiency virus-negative homosexual and bisexual men. *Am J Med.* 2000;108:634-641.
117. Mathews WC. Screening for anal dysplasia associated with human papillomavirus. *Top HIV Med.* 2003;11(2):45-49.
118. Ryan C, Futterman D. Lesbian and gay youth: care and counseling. state of the art reviews. *Adolescent Med.* 1997;:207-374.
119. Davidson L, Linnoila M, eds. *Report of the Secretary's Task Force on Youth Suicide: Volume 2: Risk F*actors for Youth Suicide. Washington, DC: US Dept. of Health and Human Services, Public Health Service, Alcohol, Drug Abuse, and Mental Health Administration publication (ADM). 1989:89-162.
120. Remafedi G. Sexual orientation and youth suicide. *JAMA.* 1999;282:1291-1292.
121. Remafedi G. Predictors of unprotected intercourse among gay and bisexual youth: knowledge, beliefs, and behavior. *Pediatrics.* 1994;94:163-168.
122. Sumartojo E, Lyles C, Choi K, et al. Prevalence and correlates of HIV testing in a multi-site sample of young men who have sex with men. *AIDS Care.* 2008;20:1-14.