

# Healthier women, healthier reproductive outcomes: recommendations for the routine care of all women of reproductive age

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By addressing the reproductive intentions and contraceptive practices and needs of every patient, providers may be able to decrease women's chances of experiencing unintended pregnancies and support women in achieving planned and well-timed pregnancies. By addressing the health promotion needs of every patient and examining and addressing her health profile for reproductive risks, irrespective of her desires for pregnancy, it is likely that more women will enter pregnancy with high levels of preconception wellness and that healthier women and healthier pregnancies and infants will result. The importance of the integration of reproductive planning and health promotion into women's routine healthcare is further emphasized when the potentially far-reaching effects of reproductive outcomes (such as unintended pregnancies, adverse pregnancy outcomes, pregnancy complications, and sexually transmitted infections) on women's health, well-being, and life circumstances are considered.

**Key words:** health promotion, preconception, reproductive life plan

The Select Panel on Preconception Health has set as 1 of its goals that all women of reproductive age receive preconception care services (ie, evidence-based risk screening, health promotion and interventions) that will enable them to enter pregnancy in optimal health.<sup>1</sup> To achieve the Select Panel's goal, the content of routine preconception care must be demystified. Although a special preconception visit is appropriate for

women with complex medical and reproductive risks, it is not sufficient to recommend this strategy as a standard approach for disseminating clinical recommendations to all women.<sup>2</sup> Such an approach would miss many of the women who become pregnant each year, particularly those who become pregnant by chance rather than deliberate choice.

In 1990, Jack and Culpepper<sup>3</sup> recommended that preconception care be

made available to all women and their partners as an integral part of primary care. Others have echoed this recommendation, including the American College of Obstetricians and Gynecologists (ACOG), which underscores that optimizing a woman's health before and between pregnancies must be an ongoing process.<sup>4</sup>

Incorporating preconception health promotion into routine care is termed *opportunistic*<sup>2,5</sup> because every clinical encounter before pregnancy offers an opening to explore and reinforce health promotion by addressing such topics as weight management, dietary supplementation, exercise, immunization status, benefits of deliberate decisions regarding pregnancy and contraceptive options, protection against sexually transmitted infections (STIs), and avoidance of exposures that include tobacco, alcohol, and other drugs.

By emphasizing the promotion of women's wellness at every visit, we have the potential to impact the health and well-being of women themselves and, in so doing, achieve higher levels of preconception wellness for women who become pregnant and results in a better pregnancy outcome for women and their infants. Among the recommendations of the Center for Disease Control and Prevention's (CDC) Select Panel on Preconception Health is 1 which reads: "As part of primary care visits, provide risk assessment and educational and health promotion counseling to all women of reproductive age to reduce reproductive risks and improve pregnancy outcomes."<sup>1</sup> Risk assessment and targeted education and counseling are based on a thorough medical history that is updated annually. The history includes all of the elements that are taught in basic medical and nursing education: medical history;

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family and genetic history; reproductive history; prescription, over-the-counter, and alternative therapies; allergies; alcohol, tobacco and illicit drug use, social history that includes personal safety; psychosocial status, diet and immunization status. Positive findings in any of these areas may be important to the woman's health in the short and long term, and/or they may be significant for the health of any pregnancy that she might conceive or for any infant that she might bear. In the succeeding articles of this supplement, the evidence is reviewed and recommendations are offered regarding whether there are benefits to addressing positive findings in each of these areas in the preconception period. The reader is encouraged to review all of these articles.

This article outlines specific recommendations for the health promotion of all women of reproductive age, irrespective of their intent to become pregnant. As described in the article, "Clinical Content of Preconception Care: An Overview,"<sup>6</sup> each of the recommendations has been graded for strength, and the quality of the evidence that supports the recommendation has been assessed. In other articles in this series, the burden of suffering has been defined; for this article, which is about health promotion, we have substituted the term *burden of risk*.

### Family Planning Counseling and the Use of a Reproductive Life Plan

#### Burden of risk

Forty-nine percent of the pregnancies in the United States were identified as unintended (unwanted or mistimed) by women through the latest National Survey of Family Growth. Of these pregnancies, 44% ended in births; 42% ended in abortions, and 14% ended in fetal losses.<sup>7</sup> Unintended conceptions are represented in all sexually active subpopulations in the United States, with the probable exception of women who are being treated for infertility. The likelihood that a woman will experience an unintended pregnancy in her lifetime is significant. In 1994, 48% of women aged

15-44 years had experienced at least 1 unintended pregnancy sometime in their lives.<sup>8</sup> Forty-eight percent of unintended pregnancies occur in a month when contraception was used. In 1995, the Institute of Medicine detailed studies that examined the effects of unwanted and mistimed pregnancies on children, women, men, and families in a landmark publication, *The Best Intentions: Unintended Pregnancies and Well-being of Children and Families*, and found that such pregnancies were associated positively with elective abortions, late entry to prenatal care, low birthweight, child abuse and neglect, and behavioral problems in children.<sup>9</sup> Separating the impact of intendedness status from other social and environmental influences on these outcomes is, of course, difficult. The greatest impact may be additive rather than causal.<sup>10</sup> Unintended pregnancies, by definition, are unplanned, which means that the woman has not had an opportunity to take advantage of specific preconception health promotion and prevention activities beyond those they have undertaken for their own health, if any.

*How detectable is the risk?* Intendedness and unintendedness are self-reported and thus subject to reporting and recall bias. They are, by definition, only identifiable after the pregnancy has occurred.

*How effective are the current treatment/prevention strategies?* Contraception is highly effective; however, no method, including permanent sterilization, is perfect. Unintended pregnancies occur because of lack of contraception, imperfect use of contraception, and contraceptive failure. The latter 2 causes are significant because 49% of unintended pregnancies occur in women who used a method of contraception in the month they became pregnant.<sup>7</sup> Emergency contraception is available for women who determine themselves to be at risk for an unintended pregnancy. Studies indicate that women who use the levonorgestrel-only regimen for emergency contraception reduce the likelihood of pregnancy from 60%-94%.<sup>11</sup> Based on findings from 2 randomized controlled trials, levonorg-

estrel is significantly more effective than a combined estrogen and progestin approach.<sup>12</sup> Although the availability and quality of counseling are believed to influence decisions about the use of contraceptives, no standard definition of contraceptive counseling exists, and little research has addressed the relationship between counseling and contraceptive use, especially among adults.<sup>13</sup> Two recent systematic evidence reviews were unable to find research that could reliably answer whether counseling in the clinical setting can impact the successful use of hormonal contraception or successfully impact unintended pregnancies.<sup>14,15</sup>

*Impact of preconception care.* The only opportunity to prevent unintended pregnancy is before conception. The ideal reproductive planning tool would identify women who are planning to become pregnant within the next 12 months or at a later point in their lives and those women who are at risk of becoming pregnant (regardless of plans) because of lack of or inappropriate use of contraception. Existing tools or questions that facilitate women's reproductive planning include patient interview guides<sup>16</sup> and questions from the family planning module of the CDC's Behavioral Risk Factor Surveillance System Questionnaire. Examples of reproductive life plans have been put forth.<sup>10</sup> The receipt of preconception health promotion interventions that include an assessment of reproductive plans by low-income women who attend family planning clinics has been shown to increase subsequent pregnancy planning and intendedness.<sup>17</sup> Aside from this, reproductive planning tools have not been evaluated for feasibility or effectiveness (in terms of promoting planned pregnancies and timeliness of receipt of preconception care services) for women in the primary care or other settings. The CDC Select Panel Recommendations specify that the development, evaluation, and dissemination of reproductive life-planning tools and health education materials regarding preconception risk factors that are known to affect pregnancy outcomes is a high priority.<sup>1</sup>

**Recommendation.** Routine health promotion activities for all women of reproductive age should begin with screening women for their intentions to become or not become pregnant in the short and long term and their risk of conceiving (whether intended or not). Providers should encourage patients (women, men, and couples) to consider a reproductive life plan and educate patients about how their reproductive life plan impacts contraceptive and medical decision-making. Every woman of reproductive age should receive information and counseling about all forms of contraception from abstinence to permanent sterilization and the use of emergency contraception that are consistent with their reproductive life plan and risk of pregnancy. *Strength of recommendation:* A; *quality of evidence:* III.

### Physical activity

**Burden of risk.** According to the CDC,<sup>18</sup> regular physical activity substantially reduces the risk of dying of coronary heart disease, which is the nation's leading cause of death for women and men. Exercise also decreases the risk for stroke, breast cancer, colon cancer, diabetes mellitus, and high blood pressure. It helps to control weight; contributes to healthy bones, muscles, and joints; reduces falls among older adults; helps to relieve the pain of arthritis; reduces symptoms of anxiety and depression; and is associated with fewer hospitalizations, physician visits, and medications. Moreover, physical activity need not be strenuous to be beneficial; people of all ages benefit from participating in regular, moderate-intensity physical activity, such as 30 minutes of brisk walking  $\geq 5$  times a week. Despite the proven benefits of physical activity,  $> 50\%$  of American adults do not get enough physical activity to provide health benefits, and 25% of adults are not active at all in their leisure time. Activity decreases with age and is less common among women than men and among those with lower income and less education.<sup>18</sup> Studies have found lower levels of cortisol and adrenalin in response to stressful stimuli in individuals who exercise regularly and are fit. Exercise has been associated with reduced

allostatic loads and improved allostasis before pregnancy.<sup>19</sup>

**How detectable is the risk?** Detection is dependent on the provider asking and the woman honestly responding about her usual physical activity.

**How effective are the current treatment/prevention strategies?** There are no known direct benefits on pregnancy outcome of exercise before conception. Indirect benefits may include weight control and mood stability. Obesity is associated with numerous poor pregnancy outcomes, such as gestational diabetes mellitus, pregnancy-induced hypertension, preterm delivery, stillbirth, macrosomia, congenital anomalies.<sup>20</sup> Mood instability is associated with depression, which is often exacerbated in pregnancy and the postpartum period. A recent systematic review that was done under the auspices of the Agency for Health Research and Quality found several recent good- and fair-quality trials on the efficacy of counseling for physical activity in primary care; these studies found modest or no increases in physical activity, whereas previous reviews found interventions that target physical activity to be effective in the short term.<sup>21</sup> The National Institutes of Health recommends that all adults exercise at least 30 minutes a day on most, if not all, days of the week.<sup>22</sup>

**Recommendation.** All women should be assessed regarding weight-bearing and cardiovascular exercise and offered recommendations that are appropriate to their physical abilities. *Strength of recommendation:* C; *quality of evidence:* II-2.

### Nutritional status

A woman's nutritional status has a profound impact on her own health and can impact fertility and reproductive outcomes. Considerations include diet quality and body mass index (BMI). In their article in this supplement, Gardiner et al<sup>23</sup> explore at length the topics of diet, supplements, and vitamins as important foundations for a healthy pregnancy. To make a difference, these topics must be addressed routinely with all women as an avenue to higher levels of nutritional

health for themselves and for any pregnancies they may some day conceive.

### Weight status

**Burden of risk.** Approximately one-third of all women in the United States are obese, and obesity is identified as the fastest growing health problem in this country. *Obesity*, defined as a BMI of  $\geq 30$  kg/m<sup>2</sup>, is associated with elevated risks of type 2 diabetes mellitus, hypertension, infertility, heart disease, gallbladder disease, immobility, osteoarthritis, sleep apnea, respiratory impairment, social stigmatization, and a variety of cancers that include breast, uterine, and colon.<sup>24,25</sup> Mild-to-moderate overweight in young adults predicts subsequent obesity.<sup>25</sup> Weight retained from previous gestations is an important contributor to higher than optimal BMI in childbearing women.

Although most discussions of health risks that are associated with weight status focus on overweight and obesity, a 2005 analysis estimated the number of excess deaths that were associated with various BMI levels and found low BMI to be associated with excess deaths.<sup>26</sup> Computations revealed that 33,746 deaths were associated with BMI  $< 18.5$  kg/m<sup>2</sup>. The prevalence of low BMI was 1.9% in women ages 25-59 years and 2.4% in women beyond age 70 years, with most of the excess deaths occurring in the older women. The study did not include women  $< 25$  years old, an age group for which there is a significant risk of female athlete syndrome (disordered eating, menstrual irregularity, and low bone mass) and disordered eating such as bulimia, anorexia nervosa, and binge-eating disorder. A recent cross-sectional study of female athletes in California found that 18.2%, 23.5%, and 21.8% met the criteria for disordered eating, menstrual irregularity, and low bone mass, respectively.<sup>27</sup> According to the ACOG, 7 million women and girls have eating disorders.<sup>28</sup> Of note, defining low BMI as  $< 18.5$  kg/m<sup>2</sup> also fails to capture most of the women who enter pregnancy underweight, as defined by the Institute of Medicine, whose recommendations for optimal weight gain by prepregnancy

BMI identifies the cut point for low BMI as  $< 19.8 \text{ kg/m}^2$ .

Health risks of being underweight include nutrient deficiencies, heart irregularities, osteoporosis, amenorrhea, and infertility. For women who become pregnant, low pregravid weight is associated with increased risks for preterm birth, low birthweight, and intrauterine growth restrictions, all of which are major contributors to poor pregnancy outcomes in this country. A low prepregnancy BMI may also increase the risk for birth defects, such as gastroschisis. A study by Lam et al<sup>29</sup> found that infants who were born to underweight mothers (pregnancy BMI,  $< 18.1 \text{ kg/m}^2$ ) were  $> 3$  times more likely to have gastroschisis, compared with infants of normal weight mothers (pregnancy BMI,  $18.1\text{--}28.3 \text{ kg/m}^2$ ). In this study, every unit increase in BMI was estimated to decrease the risk for gastroschisis by approximately 11%.

*How detectable is the risk?* The use of a BMI chart is an easy and rapid way to assess the weight category of all patients. ACOG recommends that providers calculate each woman's BMI and review medical, social, and family risks for weight-related conditions.<sup>24</sup>

*How effective are the current treatment/prevention strategies?* Counseling to support improvements in diet and physical activity are considered first-line interventions.<sup>24</sup> In a systematic review, the US Preventive Services Task Force (USPSTF) concluded that counseling alone or with pharmacotherapy can promote modest sustained weight loss.<sup>25</sup> The most successful nonsurgical approaches to weight loss were intensive, weight-focused counseling that consists of  $> 1$  session per month or multicomponent, intensive interventions that combine nutrition and exercise counseling with supportive, skill-building behavioral interventions. Evidence from randomized controlled trials of long-term benefits and improved health with weight loss was limited. The American Medical Association suggests that use of the stages of change model as adapted for overweight and obesity may help determine

patient motivation and interest in weight loss.<sup>30</sup> ACOG recommends setting an initial goal of losing 5-10% of total body weight over a 6-month period as realistic and achievable.<sup>24</sup> Data that evaluate the effectiveness of this approach were not found. Strategies to impact low BMIs, if they are symptomatic of eating disorders, will require partnering with specialists in the field.

*Recommendation.* All women should have their BMI calculated at least annually. All women with BMIs  $\geq 26 \text{ kg/m}^2$  should be counseled about the risks to their own health, the risks for exceeding the overweight category, and the risks to future pregnancies, including infertility. These women should be offered specific behavioral strategies to decrease caloric intake and increase physical activity and be encouraged to consider enrolling in structured weight loss programs. All women with a BMI  $\leq 19.8 \text{ kg/m}^2$  should be counseled about the short- and long-term risks to the own health and the risks to future pregnancies, including infertility. All women with a low BMI should be assessed for eating disorders and distortions of body image. Women who are unwilling to consider and achieve weight gain may require referral for further evaluation of eating disorders. *Strength of recommendation: A; quality of evidence: III.*

### Specific nutrient intake

*Burden of risk.* According to the National Nutrition Monitoring Survey, most women of reproductive age and older are not getting enough of the following nutrients through their diets: vitamins A, C, B6, and E; folate; calcium; iron; zinc; and magnesium. All of these nutrients are important for high levels of wellness. For instance, calcium supports and maintains optimal bone matrix; iron prevents some forms of anemia; zinc promotes healthy growth and an efficient immune system; vitamins A, C, and E are antioxidants that are important for the prevention of cardiovascular disease and cancers. In addition to being important for the health of a woman, these nutrients are important for the normal de-

velopment of the embryo and the progress of a healthy pregnancy.

*How detectable is the risk?* Nutrient deficiencies are difficult to detect before related diseases manifest.

*How effective are the current treatment/prevention strategies?* The efficacy of meeting the recommended daily allowances (RDA) for all nutrients that are listed is not known relative to disease prevention. It is believed that taking a multivitamin affords a level of protection beyond that achieved through the usual food choices of most women. Willett and Stampfer,<sup>31</sup> who are leading researchers in the field of nutrition, have concluded that there is greater benefit than harm in recommending a daily multivitamin that does not exceed the RDA of its component vitamins for most adults. Their recommendation is based on the substantial evidence that higher intakes of folic acid and vitamins B6, B12, and D are needed and beneficial. In their review, a multivitamin is especially important for women who might become pregnant, for persons who regularly consume 1 or 2 alcoholic drinks per day, the elderly, those who tend to absorb vitamin B12 poorly, vegans, and those with limited resources to afford adequate fruits and vegetables.

*Recommendation.* All women of reproductive age should be assessed for nutritional adequacy and receive a recommendation to take a multivitamin supplement if any question of ability to meet the RDAs through food sources is uncovered. Care must be taken to counsel against ingesting supplements in excess of the RDAs. *Strength of recommendation: A; quality of evidence: III.*

### Folate levels

*Burden of risk.* The specific nutrient, folate, has gained particular attention over the last 15 years because of the epidemiologic evidence that women who do not receive some form of folate supplementation have an increased likelihood of having a pregnancy that is complicated by neural tube defects (NTDs) and other birth defects.<sup>32-40</sup> Increasingly, low folate levels have been associated with the

occurrence of coronary artery disease, breast and colon cancers, and the development of some forms of dementia.<sup>41-50</sup>

Folate levels can be altered by consuming folate-rich foods or by ingesting folic acid, a synthetic compound that is available through dietary supplements and through fortified foods. Folic acid is approximately 50% more bioavailable than folate and therefore has a greater efficiency in protecting against disease states influenced by folate levels.<sup>51</sup>

*How detectable is the risk?* Nutrient deficiencies are difficult to detect before related diseases are manifested; NTDs that are present within 28 days after conception usually are diagnosed through fetal testing, such as alpha-fetoprotein blood assays and ultrasound evaluations that are done early in the second trimester of gestation.

*How effective are the current treatment/prevention strategies?* Compelling evidence about the benefits of folic acid in the prevention of NTDs resulted in the 1992 US Public Health Service recommendation that "all women of reproductive age in the United States who are capable of becoming pregnant should consume 0.4 mg of folic acid (400  $\mu$ g) per day for the purpose of reducing their risk of having an affected pregnancy."<sup>52</sup> Subsequently, the US Food and Drug Administration approved a population-based strategy to fortify all enriched grain products with folic acid, effective January 1998. The fortification levels were set relatively low but have resulted in the average woman, who eats a standard diet, ingesting an extra 190-240  $\mu$ g of folic acid daily.<sup>53,54</sup> In 1998, the Institute of Medicine affirmed the US Public Health Service recommendation and added that women of childbearing years should take 400  $\mu$ g of synthetic folic acid daily that is obtained from fortified foods and/or supplements and consume a balanced, healthy diet of folate-rich food.<sup>55</sup> The Institute of Medicine recommendation combines the 3 approaches that are available to individual women to increase their exposure to folic acid: supplementation, ingestion of fortified foods, and ingestion of foods that are

naturally rich in folate, all of which are dependent on knowledge, behaviors, and access to the protective choices.

Supplementation is the strategy that has been promoted the longest. Two reports on trends that are related to the use of folic acid before conception indicate that, at most, daily supplementation has been adopted by  $\leq 40\%$  of nonpregnant women of reproductive age.<sup>56,57</sup>

The National Health and Nutrition Examination Surveys (NHANES) are conducted periodically by the CDC to assess the health, dietary practices, and nutritional status of noninstitutionalized civilians in the United States. In 2002, the CDC analyzed the NHANES from 2 time frames and found that the median serum and erythrocyte folate concentrations had increased significantly for women ages 15-44 years after fortification.<sup>58</sup> Subsequently, Dietrich et al<sup>59</sup> undertook further analysis of NHANES data and found that  $< 10\%$  of women of reproductive age reached the erythrocyte folate concentration that is associated with protection against NTDs. They excluded all survey participants in their analysis who had used any nutritional supplement in the 30 days before their laboratory testing. The researchers concluded that fortification at the presently mandated level was probably not sufficient to prevent NTDs. In the most recent analysis of NHANES data, the CDC<sup>60</sup> reported a 16% decline in serum folate concentrations among women aged 15-44 years from 1999-2000 to 2003-2004; red blood cell folate concentrations decreased 8% over the same time periods. Both of these findings were statistically significant.

The spina bifida rate per 100,000 live births declined 25% from 1995-2000 and 13% from 2000-2005. The anencephaly rate declined 35% from 1991-1995 and was unchanged from 1995-2005.<sup>61</sup> What portion of these reductions are related to the trio of prevention strategies, supplementation, fortification, and food choices and what portion is related to ascertainment biases that are related to early prenatal diagnosis and elective terminations is unknown. However, that a primary prevention opportunity exists that is inexpensive has potential health

benefits beyond the prevention of congenital anomalies and which is underused suggests that more emphasis must be placed on reaching women with this simple strategy. Reinforcement of public awareness campaigns by clinicians has been demonstrated to increase the use of folic acid supplementation markedly.<sup>62,63</sup>

*Recommendation.* All women of reproductive age should be advised to ingest 0.4 mg (400  $\mu$ g) of synthetic folic acid daily from fortified foods and/or supplements and to consume a balanced, healthy diet of folate-rich food.<sup>55</sup>  
*Strength of recommendation: A; quality of evidence: I-a.*

### Immunizations

The routine care of all women should consider her risks and susceptibility to infections that are preventable through vaccination. In this supplement, Coonrod et al<sup>6</sup> provide a thorough review of the evidence for immunizations as part of a comprehensive preconception health and healthcare program.

By assessing every woman's immunization status routinely, irrespective of her pregnancy intentions, more women will be protected against preventable diseases and will enter pregnancy with fewer infectious disease risks. The Advisory Committee on Immunization Practices of ACOG and the American Academy of Family Physicians have identified that assessment of immunity and appropriate protection should be provided to all adults ages 19-49 years for the following diseases: tetanus, diphtheria, pertussis; varicella; and measles, mumps, and rubella. The Advisory Committee on Immunization Practices also endorses human papillomavirus vaccination for all women  $\leq 26$  years. The need for other immunizations is recommended based on specific risk factors.<sup>64</sup>

*Recommendation.* All women of reproductive age should have their immunization status for tetanus, diphtheria, pertussis; measles, mumps, and rubella; and varicella reviewed annually and updated as indicated. All women should be assessed annually for health, lifestyle, and occupational risks for other infections and offered indicated immunizations.

*Strength of recommendation: A; quality of evidence: III.*

### Substance use

In their article in this supplement, Floyd et al<sup>65</sup> detail the importance and impact of substance exposure on pregnancy outcomes. Because the prevalence of alcohol and tobacco use by women of reproductive age is significant and has the potential to impact their own health as well as the health of any pregnancies they may conceive, these topics have been included in this article as appropriate areas for inclusion in the routine care of all women.

### Tobacco

**Burden of risk.** According to the USPSTF, tobacco use is the leading preventable cause of death in the United States and results in 440,000 deaths annually. Over 155,000 deaths annually from neoplasms, 80,000 deaths from ischemic heart disease, and 17,000 deaths from cerebrovascular disease are attributed to smoking.<sup>66</sup> For women, specifically, cigarette smoking is the largest preventable cause of death and disability in this country.<sup>67</sup> Women who smoke have higher likelihood of dysmenorrhea, secondary amenorrhea, and menstrual irregularities. They also enter into menopause at an earlier age and are at increased risk for hip fractures. Smoking also affects health outcomes of people other than the smokers; smoking during pregnancy results in the deaths of approximately 1000 infants annually. Significant risks that are associated with smoking during pregnancy include premature births, spontaneous abortions, stillbirths, and intrauterine growth retardation. A metaanalysis found a 90% increased risk of placenta abruption in smokers<sup>68</sup>; smokers also have an increased risk for placenta previa.

**How detectable is the risk?** Screening for tobacco use usually is achieved through a verbal history that is associated with underreporting of exposure. Urinary cotinine levels can be used to screen for and monitor smoking, but this approach is not usual in clinical practices.

**How effective are the current treatments/prevention strategies?** Brief tobacco cessation counseling interventions that include screening, brief counseling ( $\leq 3$  minutes), and/or pharmacotherapy have proved to increase tobacco abstinence rate. The "5 As" behavioral counseling framework provides a useful strategy for engaging patients in smoking cessation discussions. The 5 As are assess, advise, agree, assist, and arrange; this approach, which has been demonstrated through clinical trials to be effective, has been endorsed by the USPSTF as an effective strategy for use in the primary care setting.<sup>69</sup> Clinics that implement screening systems that are designed regularly to identify and document a patient's tobacco use increase their rates of clinician intervention, although there is limited evidence for the impact of screening systems on tobacco cessation rates.<sup>70</sup> The USPSTF found good evidence that brief smoking cessation interventions that include screening, brief behavioral counseling ( $< 3$  minutes), and pharmacotherapy can be offered effectively in primary care settings to increase the proportion of smokers who successfully quit smoking and remain abstinent after 1 year.<sup>71</sup>

**Recommendation.** All women should be assessed for the use of tobacco at each encounter with the healthcare system, and those who smoke should be counseled, using the 5 As, to limit exposure. *Strength of recommendation: A; quality of evidence: II-2.*

### Alcohol

**Burden of risk.** According to the USPSTF, alcohol misuse is associated with  $> 100,000$  deaths per year.<sup>72</sup> Alcohol misuse includes numerous patterns of alcohol ingestion: Risky drinkers are those who consume above the recommended daily, weekly, or per-occasion amounts; harmful drinkers experience harms that are associated with their alcohol intake but do not meet the criteria for alcohol abuse and dependence that are associated with repeated negative physical, psychological, and social effects from alcohol. Maximum recommended consumption is  $\leq 1$  standard drink per day

for adult women and for anyone older than 65 years of age, and  $\leq 2$  standard drinks per day for adult men.<sup>72</sup> No alcohol consumption is considered safe in pregnancy. Prenatal alcohol exposure is associated with significant maternal and fetal health risks that include miscarriage, growth retardation, and fetal alcohol spectrum disorders, which includes fetal alcohol syndrome. Prenatal alcohol use is considered a leading preventable cause of birth defects and developmental disabilities in the United States.<sup>73,74</sup> In the 2006 *National Survey on Drug Use and Health*,<sup>75</sup> 53% of women ages 15-44 years reported current alcohol use, and 23.6% reported binge drinking. National estimates that used the 2002 Behavioral Risk Factor Surveillance System report that more than one-half of women who do not use contraception reported alcohol use and that 12.4% of the women reported binge drinking in the 30 days preceding the survey.<sup>76</sup> Many women who are at risk for pregnancy will conceive and continue alcohol use during the earliest weeks of pregnancy when the greatest prenatal damage from alcohol exposure will occur. An estimated 11% of women who drink 1-2 oz of absolute alcohol a day during the first trimester have babies with features consistent with fetal alcohol syndrome,<sup>77</sup> which includes growth retardation, physical anomalies, neurodevelopmental abnormalities, and mental retardation. There is no established safe level of alcohol consumption during pregnancy.<sup>78</sup>

**How detectable is the risk?** Determining alcohol use patterns is dependent on the provider asking and the patient providing reliable answers. There are no known validated questionnaires for the assessment of alcohol use, but there are a number of validated screening instruments to assess alcohol abuse in childbearing-aged women (such as the TWEAK [Tolerance, Worried, Eye-opener, Amnesia, K/Cut down], T-ACE [Tolerance, Annoyed, Cut down, Eye-opener], Audit, and Audit-C).<sup>79,80</sup> The National Institute on Alcohol Abuse and Alcoholism produced a guidance document for clinicians (*Helping Patients Who Drink Too Much: A Clinician's Guide*)<sup>81</sup> that uses

quantity, frequency, and maximum amounts of alcohol consumed as a guide for advising and treating individuals who exceed recommended limits.

*How effective are the current treatments/prevention strategies?* A systematic evidence review that was undertaken by the USPSTF found that good quality brief multicontact behavioral counseling interventions that are delivered by primary care providers reduces risky and harmful alcohol use.<sup>69</sup> Very brief or brief single contact interventions were less effective or ineffective.<sup>69</sup> The elements in effective interventions were generally consistent with the 5 As approach to behavioral counseling interventions that have been endorsed by the USPSTF as appropriate to the primary care setting.<sup>69</sup> The 5 As are assess, advise, agree, assist, arrange. Evidence-based guidelines have been developed for identifying and intervening with reproductive aged women who are engaging in risky drinking. Currently, screening and brief interventions are the recommended standard of care for alcohol abuse problems in adults and pregnant women.<sup>82</sup> A recent randomized controlled trial found that motivational interventions that are aimed at alcohol and effective contraception in the pre-conception period significantly reduced the risk of alcohol-exposed pregnancies in high-risk women.<sup>83</sup>

*Recommendation.* All women should be assessed at least annually for alcohol use patterns and risky drinking behaviors and provided with appropriate counseling; all women should be advised of the risks to the embryo/fetus of alcohol exposure in pregnancy and that no safe level of consumption has been established. *Strength of recommendation:* A; *quality of evidence:* III.

## STIs

*Burden of risk.* The CDC estimates that approximately 19 million new STIs occur annually in the United States, almost one-half of which are among young adults ages 15-24 years.<sup>84</sup> Although STIs are common among all ages, races, and ethnic groups, racial and ethnic minorities are affected disproportionately. In a companion article in this supplement,

Coonrod et al<sup>85</sup> provide a detailed overview of the prevalence, screening, and treatment of STIs and review the evidence to support recommendations for women who may become pregnant. Given the prevalence of STIs and their serious health consequences, the primary care of all women, whether pregnancy is intended or not, should include assessment of STI risk, counseling, and other strategies for prevention and provision of indicated testing and treatment.

*How detectable is the risk?* The CDC clinical prevention guidelines for STIs (a component of the STI treatment guidelines)<sup>86</sup> specify that healthcare providers should routinely and regularly obtain sexual histories from their patients and address risk reduction strategies based on identified risk practices. The "5 Ps," which focus on partners, prevention of pregnancy, protection from STIs, sexual practices, and past history of STIs, is an identified approach for eliciting a complete sexual history.<sup>86</sup>

*How effective are the current treatments/prevention strategies?* The prevention of STIs is based on patient education and counseling about avoidance of STIs through changes in sexual behaviors and the preexposure vaccination of persons at risk for vaccine-preventable STIs. The CDC STI prevention guidelines advise that healthcare providers use a client-centered, interactive approach to provide counseling and education that are directed at a patient's personal risk, the situations in which risk occurs, and the use of goal-setting strategies around specific actions that can reduce the risk for STI transmission.<sup>86</sup> A randomized controlled trial of a client-centered approach, Project RESPECT, demonstrated that a brief counseling intervention is associated with a reduced frequency of STI risk-related behaviors and with a lowered acquisition of STIs.<sup>87</sup> Practice models that are based on Project RESPECT have been implemented successfully in clinical settings.<sup>88</sup>

Although it is known that abstaining from sexual activity or being part of a long-term, mutually monogamous relationship with an uninfected partner is

the most reliable way to avoid the transmission of STIs, it is unknown whether counseling about abstinence or monogamy is effective in promoting these behaviors.

Male latex condoms, when used consistently and correctly, are effective in preventing the transmission of HIV and some other STIs, which include chlamydia, gonorrhea, and trichomoniasis. Male latex condom use is also associated with a 70% reduction in the risk for transmission of human papillomavirus. Male latex condom use might reduce the risk for transmission of herpes simplex virus-2, although data are limited. The failure of condoms to protect against STI transmission usually results from inconsistent or incorrect condom usage rather than from condom breakage. Male condoms that are made from materials other than latex have higher breakage and slippage rates when compared with latex condoms, but condoms made from polyurethane or other synthetic material should be substituted for latex condoms for those with latex allergy. Male condoms that are made from natural membrane condoms (eg, lamb cecum) have pores that do not allow the passage of sperm but that do allow the transmission of many STIs, which includes HIV and hepatitis B. Therefore, the use of natural membrane condoms for protection against STIs is not recommended.<sup>86</sup> Laboratory studies demonstrate that the female condom is an effective mechanical barrier to viruses, which includes HIV, and to semen. If used consistently and correctly, the female condom has been shown to reduce the risk of STIs in a limited number of clinical studies.<sup>86</sup> Female condoms are substantially more costly than male condoms.

The use of spermicides that contain nonoxynol-9 has been associated with disruption of the genital epithelium, which might be associated with an increased risk for HIV transmission. As such, spermicides that contain nonoxynol-9 (including condoms that are lubricated with nonoxynol-9) are not recommended for STI prevention.<sup>86</sup>

Preexposure vaccination is 1 of the most effective methods for the prevention of transmission of specific STIs,

which include hepatitis B, hepatitis A, and human papillomavirus. Hepatitis B vaccination is recommended for all unvaccinated, uninfected persons being evaluated for an STI. Hepatitis A vaccine is licensed and is recommended for men who have sex with men and illicit drug injecting and noninjecting drug users. A vaccine against human papillomavirus types 6, 11, 16, and 18 is available and recommended for women and girls aged 9-26 years. Vaccination strategies are discussed more fully elsewhere in this supplement.<sup>6</sup>

**Recommendation.** Healthcare providers should assess STI risks regularly and routinely, provide counseling and other strategies that include immunizations to prevent the acquisition of STIs, and provide indicated STI testing and treatment for all women of childbearing age. *Strength of recommendation: A; quality of evidence: III.*

### Comment

By addressing the reproductive intentions and contraceptive practices and needs of every woman who seeks care, providers may be able to decrease women's chances of experiencing unintended pregnancies and support women in achieving planned and well-timed pregnancies. By addressing the health promotion needs of every woman who seeks care and examining and addressing her health profile for reproductive risks, irrespective of her desires for pregnancy, it is likely that more women will enter pregnancy with high levels of preconception wellness and that healthier women and healthier pregnancies and infants will be the result. The importance of integrating reproductive planning and health promotion into women's routine healthcare is further emphasized when the potentially far-reaching effects of reproductive outcomes (such as unintended pregnancies, adverse pregnancy outcomes, pregnancy complications, and STIs) on women's health, well-being, and life circumstances are considered. Because the reproductive capacity for most women spans nearly 4 decades, during which time her reproductive intentions and risks are likely to change, the importance of viewing

women's reproductive health promotion as an on-going process is underscored. ■

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