

Preconception Health Care

Recommendations From the CDC

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The initial days and weeks of pregnancy, before a woman knows she has conceived, are a time when her health and behavior can have great impact on the fetus. How can clinicians better prepare themselves—and every female patient of reproductive age—to promote optimal pregnancy outcomes?

State-of-the-art preconception health care has been shown to improve pregnancy planning¹—which, when combined with optimal prenatal care, leads to better outcomes for both women and infants. Unfortunately, about half of the four million pregnancies that occur in the United States each year are not planned,^{2,3} and it is during the earliest weeks of pregnancy (before a woman is even aware of her condition) that a fetus is most vulnerable to a variety of biopsychosocial influences and risk factors.

From 2001 to 2002, the US infant mortality rate rose for the first time in 40 years (from 6.8 to 7.0 infant deaths per 1,000 live births), attributable in part to the increased number of infants born weighing less than 750 g (1 lb 10.5 oz).⁴ In an effort to improve pregnancy outcomes, the CDC and more than 30 other health care organizations have identified promotion of preconception health as a critical public health priority.

Based on data from these organizations and from numerous published studies, the CDC, the Agency for Toxic Substances and Disease Registry, and a Select Panel on Preconception Care have made 10 recommendations* aimed at promoting preconception health and health care. By using these recommendations, clinicians and other concerned individuals and groups can help identify and modify a range of “medical conditions, personal behaviors, psychosocial risks, and environmental exposures” that might lead to an adverse pregnancy outcome for any of the 62 million US women of childbearing age.⁵

Ideally, as the document authors propose, every woman between menarche and menopause should

receive preconception care at every encounter with the health care system. This may be in the form of education, screening, or specific clinical interventions. To accomplish the document’s expressed goals, both clinicians and patients will need to be educated in order to raise their awareness and change their attitudes and behaviors.

Several of the CDC’s recommendations involve policy changes, eg, for agencies to modify their data collecting and for third-party payers to extend coverage and revise payment mechanisms. Of greatest importance to clinicians, the document also recommends numerous interventions for clinicians to implement during routine health care visits.

Although *Healthy People 2010*^{6,7} lists no preconception-specific objective (as was included, but not measured, in *Healthy People 2000*⁸), objectives in the 2010 initiative—“to improve maternal and child health outcomes”—encompass preconception health.

GOALS OF THE CDC INITIATIVE

In the new document, the CDC targets four goals:

- To increase knowledge and improve attitudes and behaviors regarding preconception health;
- To ensure provision of evidence-based risk screening, health promotion, and appropriate interventions to all US women of childbearing age (ie, 15 to 44 years) in order to optimize their health before each attempt to conceive;
- To provide interventions that will minimize or prevent health problems indicated by adverse outcomes of previous pregnancies; and

* This article is based on: Centers for Disease Control and Prevention. Recommendations to improve preconception health and health care—United States: a report of the CDC/ATSDR Preconception Care Work Group and the Select Panel on Preconception Care. MMWR Recomm Rep. 2006;55(RR-6):1-23. Most references were cited in this CDC report. This summary was prepared by R. Mimi Secor, who currently works as a nurse practitioner in a private Ob-Gyn office in Milford, Massachusetts. Ms. Secor is President Emerita and a Senior Advisor at Nurse Practitioner Associates for Continuing Education (NPACE), Natick, Massachusetts; a visiting scholar at Boston College; and a guest lecturer at numerous conferences and facilities, including the Massachusetts General Hospital Institute of Health Professions, Boston. A nationally known consultant and speaker, Ms. Secor serves as co-chair of the Clinician Reviews Editorial Board.

- To reduce the disparities that exist in adverse pregnancy outcomes.

The CDC and its partners have formulated 10 recommendations based on these goals. The document authors advise that the recommendations not be prioritized, but be implemented simultaneously.

Each recommendation includes specific *health action steps* to be implemented by patients, clinicians in both public and private health care, communities, government on several levels, researchers, and/or policy makers. This article will focus on health action steps that clinicians can implement in their practices. To review the complete CDC document, go to www.cdc.gov/mmwr/preview/mmwrhtml/rr5506a1.htm.

1. Individual Responsibility

According to a report from the American College of Obstetricians and Gynecologists (ACOG), most women experience fertility for an average of 40 years.² Thus, a *reproductive life plan* (ie, whether or when to have children, how to optimize reproductive health) is encouraged for every woman, man, and couple.

In the same way that patients can modify specific risk factors to avoid chronic disease, taking a “life span approach” to reproductive health, with increased awareness of risk factors, can help them reduce unintended pregnancies, age-associated infertility, and fetal exposure to teratogenic substances. Optimizing each woman’s health preconceptually is key to ensuring positive pregnancy outcomes.⁹ The reproductive life plan should be individualized according to the patient’s age, life stage, and priorities; she should be encouraged to modify the plan as her biopsychosocial needs change.

Until age-appropriate reproductive life-planning tools are developed (and these must take literacy, health literacy, culture, and language into account), the primary care provider should raise relevant questions at routine visits: *Do you plan to have children? How many? When do you think you might conceive a child [or your next child]? Have you thought about how your health issues [eg, diabetes, polycystic ovary syndrome] may impact at what age you might best conceive? What can you do to best prepare your body for a healthy pregnancy?*

2. Consumer Awareness

In a 2002 study of women ages 18 to 44, 50% were overweight or obese, 9% had diabetes, 6% had asthma, 3% each had hypertension and cardiac disease, and 1% had a thyroid disorder.¹⁰ In another study involving pregnant women, 38% of those who said they had planned their pregnancies had risk factors, ie, “indications for preconception counseling” (including smoking, alco-

hol use, weight concerns, and delayed prenatal care).¹¹

Clearly, the public must be made more aware—through school health education programs, the media, and clinicians—of the impact that untreated illnesses and adverse health behaviors can have on pregnancies. Does your patient know that smoking during pregnancy can lead to low birth weight? Or that she should not use alcohol at all once she conceives? Is she aware of health care services that are available and recommended before she considers becoming pregnant?

Public education has brought about changes in public attitudes regarding smoking and infant sleep position; similar efforts, including those made by clinicians, could have an important impact on delaying sexual behavior, avoiding unprotected intercourse, minimizing drug and alcohol use, and addressing many other preconceptional risk factors.

3. Preventive Visits

In 2004, almost 85% of reproductive-aged women had received health care services in the preceding year, and more than half received preventive health services.¹² Well-woman examinations and other routine visits offer clinicians an important opportunity to incorporate preconception health care services. These include routine assessment for preconception risk factors (see Table 1,^{2,13-16} page 48) and appropriate interventions, patient education to promote healthful behaviors (eg, healthy diet, weight management, adequate folic acid intake), and relevant counseling (eg, family planning and prevention of unintended pregnancy, up-to-date immunizations, early prenatal care, social and financial support). Screening for new health problems and appropriate management of current health conditions should be ongoing.

Also contained in the report’s health action steps are recommendations for primary care providers and advanced practice clinicians to improve their awareness, knowledge, attitudes, and practice regarding preconception health care. Relevant curricula (possibly in the form of “preconception care modules”) should be introduced in clinical education programs at all levels of health education. Currently, models for preconception care and relevant links are already available from Bright Futures for Women’s Health and Wellness¹⁷ (a program cosponsored by the Maternal and Child Health Bureau and the American Academy of Pediatrics; see brightfutures.aap.org).

4. Interventions for Identified Risks

Childbearing-related care should not be provided in isolation from management of chronic and infectious

illnesses; compartmentalizing care, the CDC report says, can jeopardize women, their potential pregnancies, and their future children. Interventions that have been demonstrated as most effective, for conditions with the potential for causing the greatest harm, should receive high priority. These measures are often overlooked in primary care, the authors note.

Chronic health conditions and sometimes, the medications they require can be harmful to mother and/or fetus during pregnancy (see Table 2,^{18,19} page 49).

For example, in women who take valproic acid for epilepsy (an agent that may be teratogenic or may interfere with folate metabolism), dosing should be reduced before they consider conception.^{20,21} Those who need anticoagulants should use only agents that are known to be nonteratogenic; gestational use of warfarin, for example, has been linked to fetal bone abnormalities.²² Effective contraception should be used by women who take isotretinoin for acne, and this agent should be discontinued before conception to prevent miscarriage and birth defects.²³

Clinicians should review and evaluate the benefits and risks of medications for thromboembolism, depres-

sion, and anxiety.¹⁶ Clinical practice guidelines have been developed to provide preconception care for women with diabetes and hypothyroidism.^{24,25}

Treatment with antiretroviral agents has been shown to reduce mother-to-infant transmission of HIV.²⁶ Vaccination programs to prevent rubella, influenza, and hepatitis B in women who might become pregnant have been very successful.^{27,28}

Other important interventions include folic acid supplementation beginning at least three months before conception to prevent neural tube defects,²⁹ hyperglycemia management to prevent congenital defects associated with diabetes,²⁴ and a low-phenylalanine diet for women born with phenylketonuria (who are at increased risk for delivering infants with mental retardation).³⁰

Appropriate preconception dental care can reduce a woman's risk for delivering a preterm and/or low-birth-weight infant.³¹ For women with poor oral health (and at least 80% of women in the 20-to-39-year age-group have dental caries or related conditions¹⁰), providers should recommend dietary measures and fluoride use to reduce mother-to-infant transmission of cariogenic bacteria.³²

Patients from families known to have genetic disorders should be referred for special counseling.

TABLE 1

Components of Preconception Risk Screening^{2,13-16}

Physical assessment, risk screening, vaccinations, and counseling, according to the American Academy of Pediatrics and the American College of Obstetricians and Gynecologists, provide the framework for appropriate preconception interventions. The following issues are specified in various guidelines for risk screening:

- Reproductive history
- Environmental hazards and toxins
- Medications known to be teratogenic
- Nutrition, including folic acid supplementation and weight management
- Genetic conditions, family history
- Substance use, including alcohol and tobacco
- Chronic medical conditions (eg, diabetes, hypertension, poor oral health)
- Infectious diseases and vaccinations
- Family planning
- Psychosocial concerns (eg, depression, domestic violence, housing, social support)

Sources: Centers for Disease Control and Prevention. Recommendations to improve preconception health and health care. *MMWR Recomm Rep*. 2006; ACOG. *Obstet Gynecol*. 2005²; Weisman. *Matern Child Health J*. 1997¹³; AAP/ACOG Guidelines for perinatal care. 2002¹⁴; Jack and Culpepper. *JAMA*. 1990¹⁵; Brundage. *Am Fam Physician*. 2002.¹⁶

5. Interconception Care

Women who have experienced an adverse pregnancy outcome (infant death, fetal loss, birth defects, low birth weight, or preterm birth) are at increased risk for future adverse outcomes. Interconception care (ie, systematic follow-up and intervention between pregnancies), most appropriately initiated during postpartum checkups, is crucial. However, it is a matter of great concern that only 80% of women with private health insurance and 55% of women covered by Medicaid have a postpartum visit.³³

According to the CDC, 28,000 infants die during the first year of life in the US each year; 12% of all births occur before 37 weeks' gestation, and 3% of all newborns have one or more of 45 birth defects (which, in turn, are the leading cause of infant mortality in the US).^{4,34,35} Even though women's regular clinicians are likely to be aware that these adverse outcomes have occurred, systematic follow-up and relevant interventions (ie, to address medical, dental, and psychosocial risks that may have contributed to the adverse event) are not yet specified in any professional medical guidelines.

In one example of a working model of interconception health care, the Interpregnancy Care Program at Grady Memorial Hospital, Atlanta, risk factors are being identified and minimized in women who have

given birth to infants weighing less than 1,500 g (about 3.5 lb). As they help these patients reevaluate their reproductive goals, clinicians should encourage them to extend the interval between births (eg, to at least 18 to 20 months³⁶)—allowing more time to address and manage medical concerns.

Grantees in the federal Healthy Start program are required to provide women and their children with two years' postpartum follow-up, including interconception care; women with adverse pregnancy outcomes receive even more intensive postpartum care (as provided by Florida's Magnolia Project, for example). The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) is also charged with identifying and referring women at risk.

6. Prepregnancy Checkup

As an important aspect of optimal maternity care, one prepregnancy visit should be added to the recommended regimen of prenatal and postpartum visits. In addition

to the benefits of risk assessment, health promotion, and appropriate interventions for women who are attempting to conceive, instituting such a visit underscores the importance of pregnancy planning ("intend- edness") and preparedness.¹ The periodic well-woman exam, when conducted by an appropriately educated clinician, can serve this purpose.

The authors of the CDC document recommend adjustment of third-party payer rules to cover one prepregnancy visit per pregnancy; they also call for the development of clinical guidelines for such visits.

7. Health Insurance Coverage for Women of Limited Income

Access to affordable care, including preconception care, is considered essential to the successful implementation of this initiative. Low socioeconomic status has been linked to lack of health care access, exposure to environmental hazards, inappropriate health behaviors, and poor physical and emotional health—with a potentially

TABLE 2
What Drugs Should or Should Not Be Used During Pregnancy?^{18,19}

Clinical trials of medications are not ordinarily conducted in pregnant women because of the potential risk to the fetus. However, the FDA ranks medications in one of five categories, according to what is known about their safe use or contraindications for women who are pregnant.

Category	Description	Examples (not a comprehensive list)
A	No increase in the risk of fetal abnormalities shown in well-controlled studies of pregnant women	Folic acid, vitamin B ₆ , thyroid medication in prescribed/moderate doses
B	No evidence of fetal harm shown in animal studies, but no studies conducted in pregnant women (or fetal abnormalities shown in animal studies have been refuted by high-quality studies in pregnant women)	Acetaminophen, acyclovir, amoxicillin, amoxicillin/clavulanate, ampicillin, azithromycin, cephalosporins, clozapine, diphenhydramine, erythromycin, famotidine, hydrochlorothiazide, ibuprofen (first/second trimesters only), insulin, metformin, metronidazole, prednisone
C	Adverse effects demonstrated in animal studies; no studies of sufficient quality in pregnant women	ACE inhibitors (first trimester), albuterol, antipsychotic agents, aspirin, ciprofloxacin, clarithromycin, codeine, oral fluconazole, furosemide, levofloxacin, omeprazole, paroxetine, prochlorperazine, sumatriptan, theophylline, trimethoprim/sulfamethoxazole, vaginal azoles
D	Well-controlled or observational studies of pregnant women have shown a risk to the fetus, but therapeutic benefits may outweigh the risks	ACE inhibitors (second/third trimesters), alcohol, full-dose aspirin, doxycycline, ibuprofen (third trimester), lithium, phenytoin, rifampicin, tetracycline, valproic acid, most cancer chemotherapy agents
X	Use is contraindicated in women who are or who may become pregnant; positive evidence of fetal abnormalities in human or animal studies	Acitretin, etretinate, isotretinoin; diethylstilbestrol, statins, thalidomide, warfarin

Sources: CDC. Recommendations to improve preconception health and health care. *MMWR Recomm Rep*. 2006; National Women's Health Information Center. 2002¹⁸; Briggs et al. *Drugs in Pregnancy and Lactation*. 2005.¹⁹

detrimental impact on pregnancy outcomes (particularly the risk for preterm birth).^{37,38} Racial disparities in access to appropriate health care are also associated with adverse pregnancy outcomes.³⁹

Further, women with no health insurance (an estimated 17 million⁴⁰) are most likely to delay health care or do without it. Additionally, lack of insurance is more common among women of childbearing age than among older women. According to the report, in states where qualification for Medicaid coverage is being expanded, priority should be given to younger women.

Family-planning-waiver projects, used by a number of states to permit Medicaid coverage for low-income, uninsured women who do not ordinarily qualify, can lead to substantial savings, better preconception wellness, health, and prevention of adverse outcomes.⁴¹ Coverage should be extended (and reimbursement levels improved for preconception care providers) to include more comprehensive risk screening, health promotion, and needed interventions.

8. Public Health Programs and Strategies

Features of preconception health should be introduced into already-existing public health programs (eg, Title X, the WIC program, Title V, Healthy Start), with an emphasis on interconception-related interventions for women who have had adverse gestational outcomes. These programs, which serve millions of women, provide an appropriate setting to deliver more comprehensive preconception health care, referral of high-risk women to clinicians, and possibly the testing of new awareness strategies (similar to those that have successfully been implemented for childhood vaccinations, prevention of adolescent pregnancies, and other issues).

9. Research

Few studies have been conducted regarding the effectiveness of preconception screening, intervention, and counseling in primary care, where clinicians' time and other resources may be limited. In one study of women visiting a hospital's primary care clinic for a pregnancy test, those with a negative result had, on average, nine preconception risk factors. Clinicians, though informed of these findings, did not address these concerns with specific interventions.⁴² Similarly, algorithms and educational programs have been shown to prompt risk factor screenings but not follow-up interventions; nor do provider attitudes improve as a result.⁴³

More research is needed, including studies to document the cost-effectiveness of preconception care—particularly for women at high risk for adverse pregnancy outcomes. When ethical considerations permit, interventions should be tested in randomized clinical trials.

10. Monitoring Improvements

Public health agencies' surveillance and data collection must be modified to include preconception health initiatives and their outcomes. Examples mentioned in the document include the Pregnancy Risk Assessment Monitoring System and the National Survey of Family Growth. Currently, only 23 states have identified preconception care as a "priority need" through the Maternal and Child Health Bureau (Title V).⁴⁴

The CDC and its partner organizations recommend that preconception care be included in the objectives for *Healthy People 2020*.

CONCLUSION

According to the CDC report on preconception health and health care, progress to improve pregnancy outcomes in the US during the past 10 years has been slow. Interventions to address harmful behaviors, adverse health conditions, and other risk factors before women become pregnant have been inconsistent. Millions of women, couples, and families stand to benefit from implementation of the CDC recommendations; primary care clinicians are urged to recognize and implement opportunities to engage in this worthwhile effort. ■

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POSTTEST QUESTIONS*

1. A 2001-2002 increase in the US infant mortality rate may be explained in part by:
 - a. Reporting errors
 - b. The continuing rise in the cesarean delivery rate
 - c. An increase in births to females younger than 15
 - d. The increased numbers of infants born weighing less than 750 g
2. In the CDC report, preconception health care is recommended for:
 - a. All women of reproductive age
 - b. All women ages 15 to 44 who have never conceived
 - c. All women who have experienced an adverse pregnancy outcome
 - d. All women in a committed heterosexual relationship
3. Gestational use of which of the following agents has been linked to fetal bone abnormalities?
 - a. Thyroid medications
 - b. Insulin
 - c. Erythromycin
 - d. Warfarin
4. To prevent neural tube defects, the CDC report advises, a woman should begin to take folic acid supplements:
 - a. As soon as she knows she is pregnant
 - b. At least three months before conception
 - c. When she starts trying to conceive
 - d. At menarche
5. Women born with phenylketonuria:
 - a. Should follow a high-phenylalanine diet
 - b. Are at risk for delivering infants with structural birth defects
 - c. Are at risk for delivering infants with mental retardation
 - d. Should be advised against having children
6. Dental caries and other oral diseases:
 - a. Should not be treated with fluoride shortly before conception
 - b. Place women at risk for delivering infants with structural birth defects
 - c. Place women at risk for delivering a preterm or low-birth-weight infant
 - d. Have been reported in 55% of women ages 20 to 39
7. Interconception care, according to the CDC report, is particularly important for women who:
 - a. Have given birth to an unusually large infant
 - b. Have experienced an adverse pregnancy outcome
 - c. Have given birth to more than one infant
 - d. Have a family history of genetic disease
8. Only 80% of women with private insurance and 55% of those with Medicaid:
 - a. Have a postpartum visit
 - b. Have annual preventive care visits
 - c. Have a preconception health care visit
 - d. Have monthly prenatal care visits
9. Overall, the leading cause of infant mortality in the US is:
 - a. Birth defects
 - b. Birth weight below 1,500 g
 - c. Birth weight below 750 g
 - d. Insufficient prenatal care
10. Providers of an interconception care program for mothers of low-birth-weight infants recommend an interval between pregnancies of at least:
 - a. One year
 - b. Fifteen to 16 months
 - c. Eighteen to 20 months
 - d. Two years

* The CE Posttest Examination Answer Sheet can be found on next page.

Examination Answer Sheet

Issue Date: July 2006

Expiration Date: July 31, 2007

This exam can be taken online at www.CliniciansCME.com. Upon passing the exam, you can print out your certificate immediately. You can also view your test history at any time and print out duplicate certificates from the Web site.

Preconception Health Care Recommendations From the CDC

Directions: Select one answer for each question in the exam and evaluation by completely darkening the appropriate circle. An identifier is required to process your exam.

The primary objective of this educational initiative is to provide clinicians in primary care with the most up-to-date information regarding CDC recommendations for the management of women who are of childbearing age, with a focus on reproductive health awareness and modifiable risk factors.

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Examination				
1.	A	B	C	D
2.	A	B	C	D
3.	A	B	C	D
4.	A	B	C	D
5.	A	B	C	D
6.	A	B	C	D
7.	A	B	C	D
8.	A	B	C	D
9.	A	B	C	D
10.	A	B	C	D

1 = Very well 2 = Well 3 = Fair 4 = Poorly 5 = Very poorly

How well was each course objective met?

11. Summarize four goals on which the CDC's 10 preconception care-related recommendations are based. ① ② ③ ④ ⑤

12. List the biomedical, behavioral, and social risks of chief concern to the health of women of reproductive age and their potential pregnancy outcomes. ① ② ③ ④ ⑤

13. Discuss at least three preconception-associated interventions that the clinician can perform during a routine health care visit with a woman of childbearing age. ① ② ③ ④ ⑤

14. Explain the importance of interconception care for women who have experienced adverse pregnancy outcomes. ① ② ③ ④ ⑤

1 = Very well 2 = Well 3 = Fair 4 = Poorly 5 = Very poorly

Rate the effectiveness of how well the activity:

15. Related to your practice needs. ① ② ③ ④ ⑤

16. Will help you improve patient care. ① ② ③ ④ ⑤

17. Avoided commercial bias/influence. ① ② ③ ④ ⑤

18. How would you rate the overall quality of the material presented? ① ② ③ ④ ⑤

19. Your knowledge of the subject was increased: Greatly Somewhat Hardly

20. The difficulty of the course was: Complex Appropriate Basic

How long did it take to complete this course? _____

Suggested topics for future CE articles: _____

Comments on this course: _____

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You must choose and complete one of the following three identifier types:

① SS # _____

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The following is your: Home Address Business Address

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Address _____

City _____ State _____ ZIP _____

Telephone # _____ Fax # _____

Profession: MD PA NP Other

Credit Requested (check one): 0.75 Hours Category 1 AMA PRA
 1.2 Contact Hours by The NPA

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Signature _____

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Lesson 105295

CLR0607