



Preconception Care

A guide
for optimizing
pregnancy
outcomes

**The American College of Obstetricians
and Gynecologists, District II/NY**

The American College of Obstetricians and Gynecologists recommend that **all** health encounters during a woman's reproductive years, particularly those that are a part of preconception care, should include counseling on appropriate health behaviors to optimize pregnancy outcomes and prevent maternal mortality.

CHECKLIST OF PRECONCEPTION CARE TOPICS:

Education:

- Smoking, alcohol abuse and other drug use
- Folic acid supplementation, 400 mcg daily as a standard of care

Counseling:

- Sexually transmitted infections including HIV
- Family planning and pregnancy spacing
- Healthy body weight and diet
- Importance of oral health
- Increased risk of hepatitis C in those with tattoos and/or body piercings
- Lead and other environmental and/or occupational exposures
- Genetic disorders (including cystic fibrosis and sickle cell genotypes)

Assessment:

- Physical assessment including **physical examination and medical and family history**
- Carrier screening (racial/ethnic background/family history)
- Immunization record including rubella, hepatitis B, and varicella
- Complications with past pregnancies (postpartum hemorrhage, thrombotic event, preeclampsia/eclampsia, PIH, gestational diabetes, Rh incompatibility, etc.)
- Identification and assistance for victims of domestic violence
- Psychosocial screening for parent readiness

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Preconception care is defined as a set of interventions that aim to identify and modify biomedical, behavioral and social risks to the woman's health or pregnancy outcome through prevention and management. Certain steps should be taken before conception or early in pregnancy to maximize health outcomes. Consider the following clinical issues.²

A. BEHAVIORAL

1. **Alcohol Misuse:** Women who are heavy drinkers (five or more drinks on one occasion on five or more days in the past 30 days) have a higher risk of cardiac and hepatic complications. Any amount of alcohol drinking among pregnant women also puts the fetus at risk for fetal alcohol syndrome (FAS). Patients should be informed that prenatal alcohol abuse is a preventable cause of birth defects, including mental retardation and neurodevelopmental defects. It is recommended that women are counseled preconceptionally about these effects.^{3,4}
2. **Domestic Violence:** Trauma, either accidental or intentional is the leading cause of death in women of reproductive age.⁵ Violence often begins during pregnancy and if it is already present it may escalate and continue through the postpartum period. Screening women at least once in each trimester is recommended whenever bruising, improbable injury, or depressed mood is noted.⁶
3. **Drug Abuse:** The use of illicit drugs and alcohol during pregnancy has adverse effects on the neonate, and these children are at risk for altered neurodevelopmental outcome and poor health status. Detection and treatment of drugs and alcohol are essential precursors to appropriate therapeutic interventions in the preconception period.⁴
4. **Folic Acid:** Neural tube defects (NTDs), such as anencephaly and spina bifida, have multifactorial origins but their etiology often may involve abnormalities in homocysteine metabolism that are potentially remediable by folic acid dietary supplementations. The first occurrence of NTDs may be reduced if women of reproductive age take 0.4mg of folic acid daily both before conception and during the first trimester of pregnancy.¹
5. **Over-the Counter Medications:** Talk to your patient about her use of over-the-counter medications, herbal products, vitamins, or nutritional supplements. Certain vitamins in excess are harmful. For example, vitamin A in doses greater than 10,000 international units has been shown to cause severe birth defects when taken during pregnancy.⁷

6. **Prior Pregnancy Loss:** Preconceptional counseling is recommended in women who experienced a prior pregnancy loss. During the preconception period, investigate the factors that may have contributed to the previous negative outcome and attempt to assuage guilt and help patients resolve any grief from a previous loss. Provide recommendations to the patient that may reduce the chances of pregnancy loss. Also, inform patients realistically about the likelihood of successful future childbearing.
7. **Psychosocial Concerns:** Psychosocial issues are nonbiomedical factors that affect mental and physical well being. Screening for risk factors may help predict a woman's attentiveness to personal health matters, her use of prenatal services, and the health status of her offspring. Psychosocial screening should include assessment of risk factors, such as: barriers to care, unstable housing, unintended pregnancy, communication barriers, nutrition, tobacco use, substance use, depression, safety, intimate partner violence, and stress.
8. **Smoking:** Health risks associated with smoking during pregnancy include intrauterine growth restriction, placenta previa, and abruption placetae. Additionally, adverse pregnancy outcomes may occur including premature rupture of membranes, low birth weight, and perinatal mortality. Smokers of reproductive age should be counseled about the associated risks of smoking and the negative outcomes associated with pregnancy.

Both cessation of tobacco use and prevention of smoking relapse are key clinical intervention strategies during preconception and pregnancy. A 5-15 minute counseling session performed by appropriately trained health care providers is most effective with pregnant women who smoke fewer than 20 cigarettes per day. This intervention, known as the 5 A's, is appropriate for use during routine prenatal office visits and includes the following five steps: Ask, Advise, Assess, Assist, and Arrange.⁸

B. CHRONIC DISEASES:

1. **Asthma:** Asthma during pregnancy requires special attention and comprehensive treatment. Alterations of doses for certain medications such as corticosteroids may change. Educating patients preconceptionally would be beneficial to the patients' pregnancy outcome. Additionally, environmental factors such as allergens (animal dander, house-dust mites, cockroaches, pollens, and indoor molds), tobacco smoke, and indoor/outdoor pollutants (wood-burning stoves of fireplaces, unvented stoves, perfumes, cleaning agents) could exacerbate asthma attacks and should be discussed during preconception to limit exposures.⁹

2. **Diabetes:** Preconceptional counseling for women with pregestational diabetes mellitus is beneficial and cost-effective. Preconceptional counseling should focus on the importance of euglycemic control before pregnancy, as well as the adverse obstetric and maternal outcomes that can result from poorly controlled diabetes. An evaluation for underlying vasculopathy is advisable and, in selected patients, may include a retinal examination by an ophthalmologist, a 24-hour urine collection for protein excretion and creatinine clearance, and electrocardiography. Daily multivitamins containing at least 0.4 mg of folic acid are particularly important in women with diabetes given their increased risk of neural tube defects. Higher doses of folic acid may be beneficial in some cases, especially in the presence of other risk factors for neural tube defects.¹⁰
3. **Heart Disease:** Women of reproductive age living with heart disease should be counseled about the potential risks associated with pregnancy. Hypertension in pregnancy, specifically preeclampsia and transient hypertension of pregnancy, is associated with increased rates of hypertension and coronary heart disease later in life.¹¹
4. **Hypothyroidism:** Women should be counseled preconceptionally about treatment during pregnancy. Treatment of hypothyroidism in pregnant women is the same as for non-pregnant women and involves administering levothyroxine at sufficient dosages to normalize thyroid-stimulating hormone (TSH) levels. Levothyroxine therapy should be adjusted at four-week intervals until TSH levels are stable. Pregnancy increases maternal thyroid hormone requirements in women with hypothyroidism diagnosed before pregnancy.¹²
5. **Obesity:** Obesity may be defined as a body mass index (BMI) of 30 kg/m² or greater.¹³ Obstetricians should provide preconception counseling and education about the possible complications and should encourage obese patients to undertake a weight reduction program before attempting pregnancy.¹⁴ Even modest reductions in weight may have a beneficial effect on perinatal outcome. During pregnancy, weight reduction is not advised but counseling concerning appropriate weight gain is advisable. The goal should be towards development of lasting diet and exercise habits which will help the woman sustain a healthy weight throughout her lifetime.¹⁵
6. **Oral Health:** Dental care is encouraged as appropriate before and during pregnancy. Some studies have found an association between periodontal disease and poor pregnancy outcomes of premature delivery, low birth weight and preeclampsia. Additional research is needed in this area.¹⁶

C. GENETICS:

- 1. Cystic Fibrosis (CF):** Preconception carrier screening for CF allows carrier couples to consider all reproductive options. The decision to have CF carrier screening should be with the patient's informed consent. The following are recommendations for CF screening:
 - Information about CF screening should be accessible to all couples.
 - CF carrier screening should be offered before conception or early in pregnancy when both partners are Caucasian, European, or of Ashkenazi Jewish ethnicity.
 - In individuals with a family history of CF, medical records of the affected family members should be obtained.
 - Reproductive partners with CF or congenital bilateral absence of vas deferens may benefit from an expanded panel of mutations, or a complete analysis of the CFTR gene by sequencing.
 - When both partners are CF carriers, genetic counseling is recommended to review reproductive options.
 - CF carrier screening may identify individuals with two CF mutations who have not been previously diagnosed with CF.¹⁷
- 2. Maternal Phenylketonurea (PKU):** Routine screening for PKU in newborns and early dietary therapy with a phenylalanine-restricted diet have markedly reduced mental retardation in affected individuals. It has been suggested that dietary control should be implemented at least three months prior to conception to help prevent fetal structural defects, cardiac defects, low birth weight, microcephaly, and mental retardation.¹⁸
- 3. Sickle Cell Anemia:** Pregnancy in women with sickle cell disease is associated with an increased risk of morbidity and mortality because of the combination of underlying hemolytic anemia and multiorgan dysfunction associated with this disorder. Pregnant patients with sickle cell disease need increased prenatal folic acid supplementation. A recommended 4 mg per day of folic acid should be prescribed due to the continual turnover of red blood cells.¹⁹

ACOG recommendations on hemoglobinopathies in pregnancy based on good and consistent scientific evidence. (Level A):¹⁹

- Individuals of African, Southeast Asian, and Mediterranean descent are at increased risk for being carriers of hemoglobinopathies and should be offered carrier screening, and if both parents are determined to be carriers, genetic counseling is recommended.
- A complete blood count and hemoglobin electrophoresis are the appropriate laboratory tests for screening for hemoglobinopathies. Solubility tests alone are inadequate for screening because they fail to identify important transmissible hemoglobin gene abnormalities affecting fetal outcome.
- Couples at risk for having a child with sickle cell disease or thalassemia should be offered genetic counseling to review prenatal testing and reproduction options. Prenatal diagnosis of hemoglobinopathies is best accomplished by DNA analysis of cultured amniocytes or chorionic villi.

4. Genetic Disorders-European Jewish Descent:

*Seven Recommendations from ACOG Committee on Genetics:*²⁰

- The family history of individuals considering pregnancy, or who are already pregnant, should determine whether either member of the couple is of Eastern European (Ashkenazi) Jewish ancestry or has a relative with one or more of the genetic conditions.
- Carrier screening for TSD, Canavan disease, cystic fibrosis, and familial dysautonomia should be offered to Ashkenazi Jewish individuals before conception or during early pregnancy so diagnostic testing options may be considered.
- Carrier screening is also available for mucopolidosis IV, Niemann-Pick disease type A, Fanconi anemia group C, Bloom syndrome, and Gaucher's disease.
- When only one partner is of Ashkenazi Jewish descent, that individual should be screened first. If it is determined that this individual is a carrier, the other partner should be offered screening.
- Individuals with positive family history of one of the disorders should be offered carrier screening for the specific disorder and may benefit from genetic counseling.

- When both partners are carriers of one of the disorders, they should be referred for genetic counseling and offered prenatal diagnosis. Carrier couples should be informed of the disease manifestations, range of severity, and available treatment options.
- When an individual is found to be a carrier, his or her relatives are at risk for carrying the same mutation. The patient should be encouraged to inform his or her relatives of the risk and the availability of carrier screening. The provider does not need to contact these relatives because there is no provider patient relationship with relatives and confidentiality must be maintained.

NOTE: The Wadsworth Laboratory, New York State's most comprehensive state laboratory, is currently conducting newborn testing on 40 different inherited metabolic conditions.

D. MEDICATIONS:

Medication use should be continued to control disease in women during the preconception period. Switching medication may be appropriate during the preconception period if suitable alternatives exist with less risk to the pregnant woman or fetus.

General statements may be made about the teratogenic potential of prescription drugs, however, maternal condition and treatment needs should be considered, weighing the benefit to the mother with the risk to the fetus. The U.S. Food and Drug Administration has defined five risk categories (A, B, C, D, X) that are used by manufacturers to rate their products for use during pregnancy.²¹

Certain drugs taken preconceptionally may be a risk factor for negative pregnancy outcomes. Some examples of drugs which should be managed carefully during the preconception period are:

- **Isotretinoin:** If used in pregnancy to treat acne, it can result in miscarriage and birth defects. Pregnancy prevention should be practiced in women of reproductive age taking these drugs.²
- **Anti-Epileptic Drugs:** Certain types of these drugs are teratogens (e.g. valproic acid).²
- **Oral Anticoagulants:** Drugs for management of blood clotting such as Warafin have shown to be teratogenic. Early exposure during pregnancy could be avoided preconceptionally by switching drugs.²

E. SEXUALLY TRANSMITTED INFECTIONS (STIs):

STIs can have harmful effects on pregnant women, their partners, and their fetuses. All women of reproductive age and their sex partners should be asked about STIs, counseled about the possibility of perinatal infections during pregnancy, and given access to treatment if needed preconceptionally and during pregnancy.

CDC Treatment Guidelines, 2006 ²²

1. **Bacterial Vaginosis (BV):** Evaluation for BV might be conducted during the first prenatal visit for asymptomatic patients who are at high risk for preterm labor (e.g., those who have a history of a previous preterm delivery).
2. **Chlamydia:** All pregnant women should be routinely tested for *Chlamydia trachomatis* at the first prenatal visit.
3. **Gonorrhea:** All pregnant women at risk for gonorrhea or living in an area in which the prevalence of *Neisseria gonorrhoeae* is high should be tested at the first prenatal visit for *N. gonorrhoeae*. A repeat test should be performed during the third trimester for those at continued risk.
4. **Hepatitis B:** All pregnant women should be routinely tested for hepatitis B surface antigen (HBsAg) during an early prenatal visit (e.g. first trimester) in each pregnancy even if previously vaccinated or tested. All laboratories that conduct HBsAg tests should use an HBsAg test that is FDA-cleared and should perform testing according to the manufacturer's labeling, including testing of initially reactive specimens with a licensed neutralizing confirmatory test.
5. **Hepatitis C:** All pregnant women at high risk for hepatitis C infection should be tested for hepatitis C antibodies at the first prenatal visit. Women at high risk include those with a history of injection drug use and those with a history of blood transfusion or organ transplantation before 1992.
6. **HIV:** All pregnant women in the United States should be tested for HIV infection as early in pregnancy as possible.
7. **Cervical Cytology:** Cervical cytology testing should be obtained at the first prenatal visit if none has been documented during the preceding year.
8. **Syphilis:** A serologic test should be performed on all pregnant women during the first prenatal visit.

F. VACCINATION

- 1. Human Papillomavirus:** The U.S. Food and Drug Administration has approved a quadrivalent human papillomavirus (HPV) vaccine for females aged 9–26 years. ACOG recommends the vaccination of females in this age group. The quadrivalent HPV vaccine has been classified by the FDA as pregnancy category B. Thus, vaccination use during pregnancy is not recommended at this time.²³
- 2. Influenza:** Women who will be pregnant during the influenza season (October through mid May) should be vaccinated with the influenza vaccine. The ideal time to administer the vaccine is October and November; however, it is appropriate to vaccinate patients throughout the influenza season as long as the vaccine supply lasts. This intramuscular, inactivated vaccine may be used in all three trimesters. Any theoretical risk of the vaccination is outweighed by its benefits. Likewise, the benefits of the vaccine outweigh any unproven potential concerns about traces of thimerosal preservative, which exist only in the multidose vials. It should be noted that the intranasal vaccine spray contains a live, attenuated virus and should not be used during pregnancy.²⁴
- 3. Rubella Seronegativity:** The rubella vaccine is a live attenuated virus and is highly effective with few side effects in rubella susceptible women of reproductive age. Rubella vaccination is not recommended during pregnancy and women should be advised to avoid conception for one month following immunization. Additionally, this vaccine should be administered to all susceptible women preconceptionally.²⁴
- 4. Varicella:** Preconceptional immunization of women to prevent disease in the offspring, when practical, is preferred to vaccination of pregnant women with certain vaccines. The risks involved for pregnant women who contract varicella include an increased chance of developing severe pneumonia. Risks for the fetus includes congenital varicella (occurs in 2% of fetuses infected during the second trimester). Live virus vaccine during pregnancy is contraindicated for varicella vaccination, but no adverse outcomes have been reported when given during pregnancy. However, specific immune globulin immunization should be considered for healthy pregnant women exposed to varicella to protect against maternal, not congenital infection. One dose intramuscularly within 96 hours of varicella exposure should be given to the mother.²⁵

Endnotes:

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APPENDIX I

PRECONCEPTION CARE RESOURCES

American College of Obstetricians and Gynecologists
www.acog.org

American Academy of Family Physicians
www.aafp.org

American Academy of Pediatrics
www.aap.org

American College of Nurse-Midwives
www.acnm.org

American Diabetes Association
www.diabetes.org/home.jsp

American Society for Reproductive Medicine
www.asrm.org

Antiepileptic drug registry
www.massgeneral.org/aed

Association of Women's Health, Obstetric and Neonatal Nurses
www.awhonn.org

The Centers for Disease Control and Prevention
www.cdc.gov/ncbddd/preconception/default.htm

March of Dimes
www.marchofdimes.com/professionals/preconception.asp

National Birth Defects Prevention Network
www.nbdpn.org

The New York State Pregnancy Risk Network
www.pregnancyrisknetwork.org

Practice Guidelines for Oral Health Care During Pregnancy and Early Childhood
nyhealth.gov/prevention/dental/weblinks_oral_health.htm

PRECONCEPTION HEALTH CARE SYNOPSIS

Ask about reproductive intentions at every visit and ascertain risk of an unplanned pregnancy.

For women not actively seeking to become pregnant, discuss current contraceptive methods and any concerns or problems with that method.³

Preconception checklist^{1,2,3}

Genetic

- Folic acid supplement (400 mcg routine, 4 mg previous neural tube defect)
- Carrier screening (racial/ethnic background/family history):
 - Sickle cell anemia
 - Cystic fibrosis
 - Thalassemia
 - Tay-Sachs disease

Screen for Infectious Diseases, Treat, Immunize, Counsel

- HIV
- Syphilis
- Gonorrhea/Chlamydia
- Hepatitis C in those with tattoos and/or body piercings
- Immunizations:
 - Rubella, varicella, hepatitis B
 - Influenza vaccine if woman will be pregnant during influenza season
- Toxoplasmosis- avoid raw meat, cat litter, garden soil
- Cytomegalovirus, parvovirus B19 (fifth disease):
 - Frequent hand washing
 - Universal precautions for child health care

Environmental Toxins

- Smoking cessation
- Screen for alcoholism and use of illegal drugs
- Occupational exposures- Material Safety Data Sheets from employer
- Household chemicals- avoid paint thinners/strippers, other solvents, pesticides
- Radiation exposure in early pregnancy

¹ Freda MC, Moos MK, Curtis M. The history of preconception care: evolving guidelines and standards. *Maternal and Child Health Journal* 2006;10(5S): S43-S52.

² Brundage SC. Preconception health care. *Am Fam Physician* 2002; 65:2507-14.

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Medical Assessment

- Evaluate overall health and opportunities for improving health
- Determine if woman suffers from any undiagnosed or uncontrolled medical problems (e.g. diabetes, thyroid disease, dental caries or gum disease, heart disease, asthma)
- Diabetes – optimize control
- Hypertension – avoid ACE inhibitors, angiotensin II receptor antagonists
- Epilepsy – consider increased dose of folic acid
- DVT – switch from warfarin (Coumadin) to heparin
- Acne – stop isotretinoin (e.g. Accutane)
- Depression/anxiety and other mental health issues – discuss current benefit/risk medication data

Lifestyle

- Recommend regular moderate exercise
- Avoid hyperthermia (hot tubs)
- Caution against obesity and being underweight
- Assess risk of nutritional deficiencies:
 - Vegan
 - Pica
 - Milk intolerance
 - Calcium or iron deficiency
- Avoid overuse of:
 - Vitamin A (limit to 3,000 IU per day)
 - Vitamin D (limit to 400 IU per day)
 - Caffeine (limit to two cups of coffee or six glasses of soda per day)
- Screen for domestic violence
- Screen for social issues (e.g. place to live, child care, transportation)
- Counsel on the use of over-the-counter medications, nutritional supplements and naturopathic substances

Assess Any Complications From Previous Pregnancies

- Cesarean section
- Premature delivery
- Hypertensive disorder of pregnancy
- Diabetes
- Rh incompatibility
- Postpartum hemorrhage
- Thrombotic event (DVT/PE)

This booklet has been produced by the Safe Motherhood Initiative (SMI), a collaborative project of the American College of Obstetricians and Gynecologists, District II/New York and the New York State Department of Health. Established in 2001, the mission of the Initiative is to help prevent pregnancy-related deaths through improved understanding of the causes and risk factors for maternal mortality.

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