

Oral Health Care During Pregnancy

Recommendations for Oral Health Professionals

Jayanth Kumar, D.D.S., M.P.H.; Renee Samelson, M.D., M.P.H.

Abstract

Pregnancy is a unique time in a woman's life and is characterized by complex physiological changes. These changes can adversely affect oral health. Pregnancy is also an opportune time to educate women about preventing dental caries in young children, a common childhood problem. Although multiple studies have shown an association between periodontal infection and adverse pregnancy outcomes, such as premature delivery and low birth weight, recent randomized clinical trials conducted in the United States failed to show that treatment of periodontal disease during pregnancy improved birth outcomes. However, the studies confirmed the safety and effectiveness of providing oral health care during pregnancy.

Pregnancy by itself is not a reason to defer routine dental care and necessary treatment for oral health problems. Diagnosis and treatment, including needed dental X-rays, can be undertaken safely during the first trimester of pregnancy. Needed treatment can be provided throughout the remainder of the pregnancy; however, the time period between the 14th and 20th week is considered ideal.

HEALTH CARE PROFESSIONALS should recognize the importance of good oral health and make certain that the need for dental care during pregnancy and early childhood is met.¹ Pregnancy is a unique time in a woman's life and is characterized by complex physiological changes. These changes can adversely affect oral health. Pregnancy is also an opportune time to educate women about preventing dental caries in young children, a common childhood problem. Evidence suggests that most young children acquire caries-causing bacteria from their mothers. Improving the oral health of expectant and new mothers and providing oral health counseling may reduce the transmission of such bacteria from mothers to children, thereby delaying the onset of caries.

Although multiple studies have shown an association between periodontal infection and adverse pregnancy outcomes, such as premature delivery and low birth weight, two recent multi-center randomized trials in the United States failed to show that treatment of periodontal disease during pregnancy decreased the rate of premature delivery.² However, most importantly, the studies confirmed the safety and effectiveness of providing oral health care during pregnancy, including prophylaxis, restorations, extractions and periodontal treatment. It should be noted that these studies excluded women who had the most severe periodontal disease.

Pregnancy by itself is not a reason to defer routine dental care and necessary treatment for oral health problems. Diagnosis and treatment during the first trimester, including dental X-rays, can be undertaken safely. Needed treatment can be provided throughout the remainder of the pregnancy; however, the time period between the 14th and 20th week is ideal.

TABLE 1.

Role of Oral Health Professional

Oral health professionals should render all needed services to pregnant women because:

- Pregnancy by itself is not a reason to defer routine dental care and necessary treatment for oral health problems.
- Diagnosis, oral prophylaxis and treatment, including needed dental X-rays, can be undertaken safely during first trimester.
- Needed treatment can be provided throughout the remainder of the pregnancy; however, the time period between the 14th and 20th week is ideal.

What Should Happen at Oral Health Care Visit?

The oral health professional is encouraged to:

- Consider the following when planning definitive treatment:
 - Chief complaint and medical history.
 - History of tobacco, alcohol and other substance use.
 - Clinical evaluation.
 - Radiographs when needed.
- Develop and discuss a comprehensive treatment plan that includes preventive and maintenance care.
- Educate pregnant women about care that will improve their oral health:
 - Brush teeth twice daily with a fluoride toothpaste and floss daily.
 - Limit foods containing sugar to mealtimes only.
 - Choose water or low fat milk as a beverage. Avoid carbonated beverages during pregnancy.
 - Choose fruit rather than fruit juice to meet the recommended daily fruit intake.
 - Obtain necessary dental treatment before delivery.

Management of Oral Health Problems in Pregnant Women

The oral health professional is encouraged to:

- Implement best practices in the assessment of caries risk and management of caries in pregnant women.
- Perform a comprehensive gingival and periodontal examination, which includes a periodontal probing depth record.
- Consider the following as strategies to decrease maternal cariogenic bacterial load:
 - Suggest fluoride toothpaste, along with fluoride mouthrinses, depending on the fluoridation status of water.
 - Restore untreated caries.
 - Recommend chlorhexidine mouthrinses and fluoride varnish as appropriate.
 - Recommend the use of xylitol-containing chewing gum.
- Use the following when clinically indicated (See Table 2 for acceptable and unacceptable drugs):
 - Local anesthetic with epinephrine.
 - Analgesics, such as acetaminophen and/or codeine; antibiotics, including penicillins, erythromycin other than estolate form, cephalosporins and clindamycin.
 - Radiographs with thyroid collar and abdominal apron.
 - Non-steroidal anti-inflammatory drugs for 48 to 72 hours. Avoid aspirin, aspirin-containing products, erythromycin estolate and tetracycline.
- Discuss the benefits, risks and alternatives to treatments prior to 14 weeks gestation, including prophylaxis, root planing and scaling.
- Complete restorations with permanent materials, if possible, during pregnancy.
- Complete all necessary dental procedures prior to delivery.
- Consult with the prenatal care provider when considering:
 - Deferring treatment because of pregnancy.
 - Co-morbid conditions that may affect management of dental problems, such as diabetes, hypertension or heparin-treated thrombophilia.
 - Anesthesia other than a local block, such as intravenous sedation or general anesthesia to complete the dental procedure.

TABLE 2.
Acceptable and Unacceptable Drugs for Pregnant Women

	These drugs may be used during pregnancy.	FDA Category	These drugs should NOT be used during pregnancy.	FDA Category
ANTIBIOTICS	Penicillin Amoxicillin Cephalosporins Clindamycin Erythromycin (except for estolate form)	B B B B B	Tetracyclines Erythromycin in the estolate form Quinolones Clarithromycin	D B C C
ANALGESICS	Acetaminophen Acetaminophen with codeine Codeine Hydrocodone Meperidine Morphine <u>After 1st trimester and for 24-72 hrs. only</u> Ibuprofen Naprosyn	B C C C B B B B	Asprin	C

Approximately 15% of pregnancies are lost during the first trimester, most commonly because of karyotypic abnormalities. Organogenesis takes place during the first 12 weeks of gestation. In order for a treatment and/or environmental exposure to be considered teratogenic, this exposure must occur prior to the 12th week of pregnancy.

Malformations are present in 2% to 3% of live full-term newborn babies.^{1,4,5} Performing dental procedures during early pregnancy has never been reported to increase the rate of malformations or pregnancy loss. Many women suffer with morning sickness, which usually resolves after the first trimester. It is for these reasons that non-emergent treatments are deferred until the early second trimester.

The pregnant uterus is below the umbilicus until 20 weeks gestation and the woman is generally more comfortable than she will be as the pregnancy progresses. Therefore, oral health professionals should be aware of the gestational age of the pregnancy and certain physiological changes that occur during pregnancy. In the third trimester, particularly when the woman is supine, the uterus may obstruct the inferior vena cava and pelvic veins, which impedes venous return to the heart. This decrease in venous return can cause a decrease in the amount of oxygen delivered to the brain and uterus. Women who are supine may have nausea or vomiting when hypotension is present.

Oral health professionals play a significant role in counseling patients concerning the harmful effects of tobacco, alcohol and recreational drugs. Multiple studies have demonstrated a clear association between maternal smoking and perinatal morbidity and mortality.⁶⁻⁸ There is no known safe amount of alcohol consumption during pregnancy and, therefore, it is better to avoid all alcoholic beverages, including alcohol-containing mouthrinses.

Pregnancy and Treatment Considerations

Hypertensive Disorders

Oral health professionals should consult with the prenatal care provider before initiating dental procedures in women with uncontrolled severe hypertension. Blood pressure values of greater than or equal to 140/90 mmHg are considered mild hypertension; values greater than or equal to 180/110 mmHg are considered severe hypertension. Preeclampsia is a syndrome defined by hypertension and proteinuria during pregnancy. Eclampsia is defined as the new onset of grand mal seizures in a woman with preeclampsia.

Diabetes

Gestational diabetes, or Type III diabetes, occurs in 2% to 5% of pregnant women in the United States.⁹ Ongoing control of diabetes during pregnancy further decreases the risk of adverse pregnancy outcomes, such as preeclampsia and large-for-gestational age (macrosomic) newborns.¹

Heparin

A small number of pregnant women with a diagnosis of thrombophilia may be given one or two injections of heparin daily to improve pregnancy outcome. Heparin increases the risk for bleeding complications during dental procedures.¹⁰ Many pregnant women can stop the use of heparin 24 hours prior to any dental procedures. However, consultation with the prenatal provider is recommended.

Risk of Aspiration

Pregnant women have delayed gastric emptying due to hormonal changes and an incompetent esophageal valve. As a result, pregnant women are considered to always have a “full stomach” and, thus, are at increased risk for aspiration.^{1,11}

FDA Use-in-Pregnancy Ratings for Drugs

Although a few agents have been shown to be teratogenic in humans, the teratogenic potential of many of these agents is not known.^{1,12} Most medications prescribed for common diseases can be used with relative safety because there have been few adverse drug reports. Moreover, the untreated disease or condition itself may pose more serious risks to both mother and fetus than any unsubstantiated risks from the medications.

Please note that a new FDA drug classification is available for public comment and can be accessed at www.fda.gov/Drugs/DevelopmentApprovalProcess/DevelopmentResources/labeling/ucm093307.htm.

Nitrous Oxide Use in Dental Office

The use of nitrous oxide should be limited to cases where topical and local anesthetics are inadequate. In such situations, consultation with the prenatal care provider would be prudent. Adequate precautions must be taken to prevent hypoxia, hypotension and aspiration.¹¹ Maintaining a semi-seated position and avoiding excessive sedation are required to prevent aspiration. Conscious sedation should be the last possible alternative in the third trimester. These women may be best treated with general anesthesia in a hospital setting.

Diagnostic X-rays

According to the American College of Radiology, no single diagnostic procedure results in a radiation dose significant enough to

threaten the well-being of the developing embryo and fetus.¹³ Current evidence suggests that there is no increased risk to the fetus with regard to congenital malformation, growth retardation, or abortion from ionizing radiation at a dose of less than five rad.^{14,15} The goal is to minimize X-ray exposure to the fetus.

FDA guidelines recommend the use of health history and clinical judgment to determine the need for and type of radiographic images for diagnosis.¹⁶ Every precaution should be taken to minimize radiation exposure—using protective thyroid collars and aprons whenever possible. While dental X-rays necessary for optimal treatment are recommended during pregnancy, full-mouth series, panoramic and cephalograms may be postponed until the postpartum period.

Mercury Fillings and Human Health Problems

At present, there is no evidence that exposure of the fetus to mercury released from the mother's existing amalgam fillings causes any adverse effect.^{17,22} There is international agreement that the scientific data do not confirm the presence of a significant health hazard from use of dental amalgam. Nevertheless, Germany, Austria and Canada have restricted the use of amalgams in certain populations, including pregnant women. In addition, Sweden and Denmark are phasing out all mercury-containing materials because of environmental concerns.¹⁷

Mercury vapor (elemental mercury, a form of inorganic mercury) is released during amalgam removal or placement and may be inhaled and absorbed into the bloodstream, through which it crosses the placental barrier. This procedure may temporarily increase the mercury level in blood. However, use of a rubber dam and high-speed evacuation (suction) can markedly reduce such vapor inhalation.

According to a recent systematic review, there is insufficient evidence to support or refute the hypothesis that mercury exposure from dental amalgam restorations contributes to adverse pregnancy outcomes.¹⁷ A study conducted by Hujuel et al. found that placement of dental amalgams during pregnancy did not increase the risk for low birth weight babies.¹⁹

The elemental mercury found in dental amalgams is different from methylmercury, a form of organic mercury. The consumption of fish and seafood is the major source of organic mercury.^{17,20} The ingestion of methylmercury during pregnancy is a major public health concern, while evidence of the adverse effect of mercury released from dental amalgams during pregnancy is lacking.

All health professionals should educate women about the potential harm that can accrue from untreated caries during pregnancy. The oral health professional and the pregnant woman should determine the best treatment options based on an evaluation of the benefits, risks and alternatives of using dental amalgams.

Prophylactic Antibiotics During Pregnancy

Pregnancy in and of itself is not an indication for prophylactic antibiotics during dental procedures, although bacteremia can occur as a result of dental procedures. Transient bacteremia is well documented following such procedures as tooth extractions, gingivectomy, supra- and subgingival scaling, ultrasonic scaling and subgingival irrigation.²³ The recommendations for preventing subacute bacterial endocarditis should be followed when such patients are encountered.

Xylitol-containing Chewing Gum

The role of sucrose and other fermentable carbohydrates in the causation of dental caries is well known.²⁴⁻²⁶ Xylitol, a naturally occurring sweetener, has been added to chewing gums, candy, toothpastes and chewable fluoride tablets because of its potential to reduce dental caries. A National Institutes of Health consensus development conference on the diagnosis and management of dental caries identified xylitol-containing products as effective caries-preventive agents.²⁶

Position in Dental Chair

When a pregnant woman lies flat on her back in the third trimester, the uterus may press on the inferior vena cava and impede venous return to the heart. This decrease in venous return can cause decreased oxygen to the brain and uterus. The pregnant woman may complain of dizziness and/or nausea. Placing a small pillow under the woman's right hip, so called left uterine displacement, or having the woman lean on her left side moves the uterus off the vena cava.¹ This intervention can easily be done in the dental chair. In addition, it is recommended that a pregnant woman's head not be lower than her feet while performing dental procedures.

A summary of the recommendations developed by the expert panel is provided in Table 1 and Table 2. ■

Queries about this article can be sent to Dr. Kumar at jvk01@health.state.ny.us.

ACKNOWLEDGEMENT

This manuscript is adapted from a document titled "Oral Health Care during Pregnancy and Early Childhood: Practice Guidelines." An expert panel appointed by the New York State Department of Health developed the guidelines. The other panel members were Ronald Burakoff, D.M.D., M.P.H.; Howard Minkoff, M.D.; Robert Berkowitz, D.D.S.; Ronald Billings, D.D.S., M.S.D.; David Clark, M.D.; Gustavo Cruz, D.M.D., M.P.H.; Mary D'Alton, M.D.; Burton Edelstein, D.D.S., M.P.H.; Robert Genco, D.D.S., Ph.D.; David M. Krol, M.D., M.P.H.; J. Gerald Quirk, M.D., Ph.D.; and J. C. Veille, M.D.

REFERENCES

1. New York State Department of Health. Oral Health Care During Pregnancy and Early Childhood. Practice Guidelines. NYSDOH 2006. Albany, NY.
2. Offenbacher S et al. Effects of periodontal therapy on rate of preterm delivery. *Obstet Gynecol* 2009;114:551-9.
3. Michalowicz BS, Hodges JS, DiAngelis AJ, et al. Treatment of periodontal disease and the risk of preterm birth. *NEJM* 2006;18(2):355:1885-1894.
4. Cunningham FG, Gant NF, Leveno KJ, Gilstrap III LC, Hauth JC, Wenstrom KD. Williams Obstetrics. 21st ed. McGraw-Hill Medical Publishing Division, 2001.
5. ACOG practice bulletin. Management of recurrent pregnancy loss. Number 24, February 2001. (Replaces Technical Bulletin Number 212, September 1995). American College of Obstetricians and Gynecologists. *Int J Gynaecol Obstet* 2002; 78(2):179-190.
6. ACOG educational bulletin. Teratology. American College of Obstetricians and Gynecologists. *Int J Gynaecol Obstet* 1997; 57:319-326.
7. March of Dimes. Illicit Drug Use During Pregnancy. http://www.marchofdimes.com/professionals/14332_1169.asp. Accessed on March 22, 2006.
8. March of Dimes. Smoking During Pregnancy. http://www.marchofdimes.com/professionals/14332_1171.asp. Accessed on March 22, 2006.
9. March of Dimes. Drinking Alcohol During Pregnancy. http://www.marchofdimes.com/professionals/14332_1170.asp. Accessed on March 22, 2006.
10. ACOG Practice Bulletin. Clinical management guidelines for obstetrician-gynecologists. Number 30, September 2001 (replaces Technical Bulletin Number 200, December 1994). Gestational diabetes. *Obstet Gynecol* 2001; 98(3):525-538.
11. Lockwood CJ. Inherited thrombophilias in pregnant patients: detection and treatment paradigm. *Obstet Gynecol* 2002; 99(2):333-341.

12. Rosen MA. Management of anesthesia for the pregnant surgical patient. *Anesthesiology* 1999; 91(4):1159-1163.
13. Food and Drug Administration. Use-in-Pregnancy Ratings for Drugs. www.updodate.com. Accessed on Dec. 15, 2005.
14. ACOG Committee Opinion. Number 299, September 2004 (replaces No. 158, September 1995). Guidelines for diagnostic imaging during pregnancy. *Obstet Gynecol* 2004; 104(3):647-651.
15. National Council on Radiation Protection and Measurement. Report No. 54: Medical radiation exposure of pregnant and potentially pregnant women. National Council on Radiation Protection and Measurement. 1977.
16. Toppenberg KS, Hill DA, Miller DP. Safety of radiographic imaging during pregnancy. *Am Fam Physician* 1999; 59(7):1813-8, 1820.
17. ADA. The selection of patients for dental radiographic examinations. http://www.ada.org/prof/resources/topics/topics_radiography_examinations.pdf. Accessed on March 1, 2009.
18. Life Sciences Research Office. Review and analysis of the literature on the potential adverse health effects of dental amalgam. Bethesda, MD. 2004.
19. United States Food and Drug Administration Center for Devices and Radiological Health Consumer Information. Consumer Update: Dental Amalgam. [updated 2002 Dec 31; cited 2005 Aug, 30]. <http://www.fda.gov/cdrh/consumer/amalgams.html>. Accessed on March 22, 2006.
20. Hujuel PP, Lydon-Rochelle M, Bollen AM, Woods JS, Geurtsen W, del Aguila MA. Mercury exposure from dental filling placement during pregnancy and low birth weight risk. *Am J Epidemiol* 2005; 161(8):734-740.
21. March of Dimes. During your pregnancy. Mercury. <http://www.marchofdimes.com/pnhec/159-15759.asp>. Accessed on Nov 29, 2005.
22. Wasylko L, Matsui D, Dykxhoorn SM, Rieder MJ, Weinberg S. A review of common dental treatments during pregnancy: implications for patients and dental personnel. *J Can Dent Assoc* 1998; 64(6):434-439.
23. Whittle KW, Whittle JG, Sarll DW. Amalgam fillings during pregnancy. *Br Dent J* 1998; 185(10):500.
24. Li X, Kolltveit KM, Tronstad L, Olsen I. Systemic diseases caused by oral infection. *Clin Microbiol Rev* 2000; 13(4):547-558.
25. Burt BA. The use of sorbitol- and xylitol-sweetened chewing gum in caries control. *J Am Dent Assoc* 2006; 137(2):190-196.
26. Milgrom P, Ly KA, Roberts MC, Rothen M, Mueller G, Yamaguchi DK. Mutans streptococci dose response to xylitol chewing gum. *J Dent Res* 2006; 85(2):177-181.
27. NIH. Diagnosis and Management of Dental Caries Throughout Life. NIH Consensus Statement. <http://consensus.nih.gov/2001/2001DentalCaries115PDF.pdf> 18(1), 1-24. Accessed on March 26, 2006.

