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Management of the Pregnant Patient

Perinatal Oral Health and its Significance

It is increasingly recognized that oral health plays a vital role in overall health and well-being. However many women do not visit a dentist before, during, or after pregnancy, even when there are obvious signs of oral disease (D'Angelo et al. 2007, Gaffield et al. 2001). Many expectant mothers are unaware of the implications of poor oral health for themselves, their pregnancy, and/or their unborn child. (US DHHS 2000, Ramos-Gomez et al. 2002, Gaffield et al. 2001).

It is safe to deliver oral health services during the perinatal period, and delaying necessary treatment could result in harm to the mother and indirectly to the foetus (Michaowicz et al. 2008, Kumar and Samelson 2006). It is imperative that dental treatment be coordinated among perinatal and oral health care providers.

The key consensus statement developed by the expert panel and Advisory Committee participants is as follows:

Perinatal Oral Health Consensus Statement

Prevention, diagnosis and treatment of oral diseases, including necessary dental radiographs and use of local anaesthesia, are highly beneficial and can be undertaken during pregnancy with no additional foetal or maternal risk when compared to the risk of not providing care. Good oral health and control of oral disease protects a woman's health and quality of life and has the potential to reduce the transmission of pathogenic bacteria from mothers to their children.

DHSV recognizes that perinatal oral health, along with infant oral health, is one of the foundations upon which preventive education and dental care must be built to enhance the opportunity for a child to have a lifetime free from preventable oral disease. Recognizing that dentists, physicians, allied health professionals and community organizations must be involved as partners to achieve this goal, these recommendations include caries risk assessment, anticipatory guidance, preventive strategies, and therapeutic interventions, to be followed by the stakeholders in perinatal and paediatric oral health.

Oral Conditions Associated with Pregnancy

Physiologic changes during pregnancy may result in noticeable changes in the oral cavity. These changes include pregnancy gingivitis; benign oral gingival lesions, tooth mobility, tooth erosion, dental caries, and periodontitis (see Table 1). It is important to reassure women about the various changes to the gums and teeth during pregnancy and to reinforce good oral health habits to prevent or limit such presentations.

Table 1. Common Oral Health Conditions During Pregnancy	
Pregnancy gingivitis	An increased inflammatory response to dental plaque during pregnancy causes the gingivae to swell and bleed more easily in most women. Pregnancy gingivitis typically peaks during the third trimester. Women who have gingivitis before pregnancy are more prone to exacerbation during pregnancy. Generalized supra- and/or sub-gingival periodontal therapies should be initiated to eliminate plaque build-up along with intensive, effective oral hygiene education
Benign oral gingival lesions (known as pyogenic granuloma, granuloma Gravidarum or Epulis of pregnancy)	In approximately 5% of pregnancies, a highly vascularized, hyperplastic, and often pedunculated lesion up to 2 cm in diameter may appear, usually on the anterior gingiva. These lesions may result from a heightened inflammatory response to oral pathogens and usually regress after pregnancy. Excision is rarely necessary but may be needed if there is severe pain, bleeding, or interference with mastication.
Tooth mobility	Ligaments and bone that support the teeth may temporarily loosen during pregnancy, which results in increased tooth mobility. There is normally not any tooth loss unless other complications are present.
Tooth erosion	Erosion of tooth enamel may be more common because of increased exposure to gastric acid from vomiting secondary to morning sickness, hyperemesis gravidarum, or gastric reflux during late pregnancy. Measures to reduce the impact of nausea and vomiting on oral health include: • waiting for at least an hour before brushing teeth after vomiting or rinsing the mouth with a solution of bicarbonate of soda; • using fluoridated mouthwash and toothpaste; • eating small amounts of nutritious yet non-cariogenic foods (snacks rich in protein) throughout the day; and • chewing sugar-free gum (especially gums containing xylitol or casein phosphopeptide – amorphous calcium phosphate [CPP-ACP]) after meals or high sugar or acidic drinks.
Dental caries	Pregnancy may result in dental caries due to the increased acidity in the mouth, greater intake of sugary snacks and drinks secondary to pregnancy cravings, and decreased attention to prenatal oral health maintenance.
Periodontitis	Untreated gingivitis can progress to periodontitis, an inflammatory response in which a film of bacteria, known as plaque, adheres to teeth and releases bacterial toxins that create pockets of destructive infection in the gums and bones. The teeth may loosen, bone may be lost, and a bacteraemia may result.
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Oral Health Care during Pregnancy

Good oral health and control of oral disease protects a woman's health and quality of life and has the potential to reduce transmission of pathogenic bacteria from mothers to their children (CDAF 2010). Dental treatment can be safely provided at any time during pregnancy (ADA 1999) if the dentist is informed of the pregnancy.

An Australian survey of women who had recently given birth found knowledge about oral and dental health was strongly linked to lower educational achievement and lower socioeconomic background. Over half of respondents had not attended a dentist in the previous 12 months, and only 30% attended during their most recent pregnancy (Thomas et al. 2008).

Referral for a comprehensive oral examination and treatment during pregnancy is especially important for the mother. Women should be reassured that pregnancy does not cause dental problems but may make them more likely.

Anticipatory Guidance

Women are particularly receptive to health promotion messages during pregnancy compared to when they are not pregnant and are more motivated to refrain from or reduce risky behaviours such as smoking and alcohol consumption to improve their health and prevent harm to the developing foetus. Research has also shown a reduction in the incidence of caries among children whose mothers received oral health advice during pregnancy (Plutzer & Spencer 2008). Receiving information about perinatal oral health significantly improves the uptake of dental services among pregnant women (Boggess and Edelstein 2006).

Diet: A healthy diet is necessary to provide adequate amounts of nutrients for the mother-to-be and unborn child. Food cravings may lead to the consumption of foods that increase the mother's caries risk. Dietary education for the parents includes the carcinogenicity of certain foods and beverages, role of frequency of consumption of these substances, and the demineralization/remineralisation process.

Fluoride: Using fluoridated toothpaste and rinsing with an alcohol-free, over-the-counter mouth rinse containing 0.05 percent sodium fluoride once a day or 0.02 percent sodium

fluoride rinse twice a day have been suggested to help reduce plaque levels and help promote enamel remineralization (AAPD 2003)

Oral hygiene: Brushing with fluoridated toothpaste and flossing by the parent are important to help dislodge food and reduce bacterial plaque levels

Xylitol chewing gum: Evidence suggests that the use of xylitol chewing gum (four to five times a day by the mother) has a significant impact on mother-child transmission of MS (caries causing bacteria) and decreasing the child's caries rate. Thus, management of prevention in the child can integrate the parents. The use of Xylitol chewing gum has also demonstrated a reduction of the probability of vertical transmission of MS at two years of age (Isokangas and Soderling 2000)

Prevention of Early Childhood Caries*

The term vertical transmission referrers to the transmission of caries causing bacteria from the caregiver to the child. The major reservoir from which infants acquire caries causing bacteria (MS) is their mothers' saliva (Grinderfjord et al 1995). Thus, management of prevention in the child can integrate the parents. This includes suppressing *Streptococcus mutans* reservoirs in mothers by treating active caries and using topical antimicrobial chlorhexidine gels and fluoride preparations to reduce the chance of transmission (Kohler et al 1984). The Dental Bureau of the New York State Department of Health has also recommended altering saliva sharing activities such as tasting food before feeding babies and the sharing of toothbrushes by children and parents.

Consider the following as strategies to decrease maternal cariogenic bacterial load:

- Recommend brushing teeth twice daily with fluoridated toothpaste along with fluoride mouth rinses, especially before bedtime, and flossing daily.
- Restore untreated caries.
- Recommend Chlorhexidene mouth rinses and fluoride varnish as appropriate.
- Recommend the use four to five times a day of xylitol-containing chewing gum or other xylitol products.
- Encourage drinking optimally fluoridated tap or bottled water.

Dental caries is the single most common chronic disease of childhood and a public health problem that continues to affect infants and preschool children worldwide. Infant oral health care begins ideally with prenatal oral health counselling for parents, a service that should be provided by all health professionals.

Dental Treatment

Diagnostic Radiation

Diagnostic radiographs are an important tool in the diagnosis and treatment of dental problems and are considered safe during pregnancy (Toppenberg 1999, Matteson et al. 1991)

The Australian government's Australian Radiation Protection and Nuclear Safety Agency published a Code of Practice and Safety Guide outlining Radiation Practice in Dentistry in 2005.

Radiation Protection Series Publication No. 1 (ARPANSA 2002) recommends:

• When taking a radiograph of an area distant from the foetus, such as dental radiography, this can be taken at any time with insignificant dose to the foetus any time during pregnancy. Use of a lead protective drape is recommended when the radiation beam is directed towards the patient's body, for example when taking occlusal views of the maxilla. (Radiation Health Committee 2005).

Should the patient require consecutive radiation exposure, such as when having endodontic treatment, the foetus should be afforded the same level of protection as a member of the public, which is set at the rate of 1 mSv per year (Radiation Health Committee, 2005) (American Academy of Paediatric Dentistry 2007).

- There is no need to defer dental radiography during pregnancy on the grounds of radiation protection.

Positioning the Pregnant Patient

During treatment of a pregnant patient, place the patient in a semi-reclining position as tolerated. Encourage frequent position changes, and/or place a small pillow under her hip to prevent postural hypotensive syndrome*.

Restorative Materials:

When handling dental amalgam appropriately, amalgam restorations are considered safe for pregnant patients and their baby (Daniels et al, 2007) (Luglie et al. 2005) (DHSV, Amalgam Policy, 2009). During both placement and removal, use of a rubber dam and high-speed suction can markedly reduce vapor inhalation during procedures. It is advisable to delay removal until after pregnancy or weaning if a rubber dam and high-speed suction cannot be used. However, even during placement and removal, studies do not show any adverse reproductive effects if safe amalgam practices are used (ADA 2008).

While BPA may not be a direct ingredient in composite resin materials, it can be a by-product of the degradation by salivary enzymes of other monomers used in these materials. The placement of resin-based composite restorations has been associated with detectable increases in saliva and urine of BPA within 1 h after placement (Kingman et al. 2012). To reduce the potential risk (if any) it has been suggested that dental providers use a mild abrasive, such as pumice, either on a cotton applicator or in a prophy cup; or wash the restoration/sealant surface for 30 seconds with an air-water syringe while suctioning fluids and debris from the mouth (Azarpazhooh and Main 2008)

- Utilize a rubber dam during restorative procedures and endodontic procedures.
- Use safe amalgam and safe composite practices when placing restorative materials.

Periodontal Disease* and Management

The prevalence of periodontal disease is reportedly around 50% during pregnancy (Macones et al 2010). The incidence of periodontal disease has been associated with lower levels of education and socioeconomic status (Machuca et al. 1990; Gaffield et al. 2001; Taanni et al 2003).

Associations between periodontal disease and preterm birth and low birth weight (Jeffcoat et al 2003; Lopez et al 2005; Offenbacher et al. 2006; Polyzos et al 2009; Lopez et al. 2005; Sadatmansouri et al. 2006; Tarannum and Faizuddin 2007) have been suggested. However, recent studies have found no association between periodontal disease and adverse pregnancy outcomes (Srinivas et al 2009) , preterm birth (Khadar and Ta'ani 2005; Offenbacher et al. 2009; Macones et al. 2010) , low birth weight or fetal growth restriction (Michalowicz et al. 2006; Novak et al 2008; Michalowicz et al. 2009).

However periodontitis can erode the bone and other supporting structures of teeth and ultimately result in tooth loss (Laine 2002). Pregnant women who develop Gestational Diabetes are also at greater risk for periodontal disease than women who do not develop Gestational Diabetes. Once periodontal disease occurs, it makes control of diabetes more difficult. Appropriate detection and active management and treatment of periodontal disease can improve glycaemic control of the diabetic patient (Simpson et al 2015). Additionally evidence demonstrates no significant differences between women receiving periodontal treatment during or after pregnancy in terms of preterm birth, birth weight or pre-eclampsia* (Newnham et al. 2009).

- While research is ongoing, the best available evidence to date shows that periodontal treatment has no effect on birth outcomes of preterm labor and low preterm birth weight and is safe for the mother and foetus.
- Best practice suggests that because it has been shown to be safe and effective in reducing periodontal disease and periodontal pathogens, periodontal care should be provided during pregnancy.

Use of Nitrous Oxide

Higher anxiety levels associated with pregnancy are not uncommon and may intensify the stress of a dental appointment for a pregnant woman (Moore 1998). Where a patient's anxiety may prevent cooperation with essential treatment, and behavioural management strategies are insufficient to manage her fear and anxiety, nitrous oxide may be regarded as the sedation agent of choice (Becker and Rosenberg 2008). It has been suggested that its use should be avoided during the first trimester of pregnancy (Rowland et al. 1995)

Because pregnancy is associated with decreased anaesthetic requirements, lower concentrations of nitrous oxide may be adequate for sedation and patient comfort. Prolonged dental treatments and nitrous oxide exposure should be avoided if possible.

Prior to planned use of nitrous oxide/oxygen during dental treatment, consultation with the patients' obstetrician or maternal-foetal medicine subspecialist is recommended to check for any pulmonary concerns, in addition to standard nitrous oxide protocols in dentistry.

- Nitrous oxide should be avoided in the first trimester and, when used, administered for less than 30 minutes and with at least 50% oxygen.

Pharmacological Considerations

Pharmacologic treatment during pregnancy is of concern as the maternal metabolism of drugs is altered by the normal physiologic changes of pregnancy, and certain medications can reach the foetus and cause harm. Some commonly used dental agents are listed below. For further medications please refer to the Therapeutic Guidelines - Oral and Dental (2012).

Pharmacological Agent	Indications, Contraindications and Special Considerations
Analgaesics	
Paracetamol	May be used during pregnancy
Codeine	
Ibuprofen	May be used in short duration during pregnancy (48 to 72 hours) Avoid in the 1st and 3rd trimesters
Aspirin	
Antibiotics	
Amoxicillin	May be used during pregnancy
Clindamycin	
Metronidazole	
Penicillin	
Tetracycline	Never use during pregnancy
Anaesthetics	
Lignocaine, Bupivicaine, Mepivicaine with Adrenaline	May be used during pregnancy
Nitrous Oxide	May be used during pregnancy when topical or local anaesthetics inadequate. Pregnant women require lower levels of nitrous oxide to achieve sedation; consult with prenatal care health professional.
Antimicrobials	
Chlorhexidine	May be used during pregnancy
Xylitol	
Fluoride	

Recommendation

Pregnancy is not a reason to defer routine dental care or treatment of oral health problems. Prevention and treatment of gingivitis periodontal disease and dental caries before, during, and after pregnancy are the best way to improve the perinatal health of individuals and the community. It is integral to advise the pregnant woman that prevention, diagnosis and treatment of oral diseases, including needed dental X-rays and use of local anaesthesia, are highly beneficial and can be undertaken with no additional foetal or maternal risk when compared to not providing care.

Definitions

Early childhood caries; Also known as "baby bottle caries" or "baby bottle tooth decay," early childhood caries (ECC) is a common bacterial infection characterized by decay in the teeth of infants or young children. It is defined as: one or more decayed, missing (due to caries), or filled tooth surfaces in any primary tooth in a child <71 months (i.e., age 6).

Postural Hypotensive Syndrome; An abnormal decrease in blood pressure when a person stands up that may lead to fainting. A slight fall in systolic blood pressure is normal upon rising. Abnormal postural hypotension involves a decrease in both systolic and diastolic pressures with changes in heart rate.

Periodontal disease; Also known as gum disease, periodontal disease is caused by infection and inflammation of the gingiva (gum), the periodontal connective tissues and the alveolar bone, which can lead to tooth loss**.**

Pre-eclampsia; High blood pressure and protein in the urine that develops after the 20th week of pregnancy. Some women develop high blood pressure without the proteinuria (protein in urine); this is called pregnancy-induced hypertension (PIH) or gestational hypertension. Both pre-eclampsia and PIH are regarded as very serious conditions and require careful monitoring of mother and baby.

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