

## Dental Considerations in Pregnancy

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**Abstracts:** Pregnancy is a unique time in a woman's life and is characterized by complex physiological changes affecting general oral health. Pregnancy is also an opportune time to educate women about preventing dental caries in young children, a common childhood problem. This article reviews physiological changes associated with pregnancy and general considerations for the dental treatment of pregnant dental patients as well as for pregnant dental professionals. The limitations and uses of drugs are also discussed. [Thumar S NJIRM 2015; 6(1):93-97]

**Key Words:** pregnant patient, physiologic changes in pregnancy, dental treatment considerations.

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**Introduction:** Pregnancy causes many changes in the physiology of the female patient. These alterations are sometimes subtle but can lead to disastrous complications if proper precautions are not taken during dental treatment. Physiologically, changes occur in the cardiovascular, hematologic, respiratory, gastrointestinal, genitourinary, endocrine, and orofacial systems.

The changes that occur are the result of increasing maternal and fetal requirements for the growth of the fetus and the preparation of the mother for delivery. Increased hormonal secretion and fetal growth induce several systemic, as well as local physiologic and physical changes in a pregnant woman. Local physical changes occur in different parts of the body, including the oral cavity. These collective changes may pose various challenges in providing dental care for the pregnant patient.

### Physiological Changes during Pregnancy<sup>1</sup>:

#### Cardiovascular Changes:

- increased uterine mass causes compression of IVC leads to venous stasis and increased risk for deep venous thrombosis
- decreased amplitude of T-waves on electrocardiogram
- extra heart sounds / systolic s3 murmur

#### Hematologic Changes:

- hypercoagulable state leads to increased risk for thrombosis/ embolism, leukocytosis
- physiologic anemia due to increased circulating volume
- generalized immunosuppression

#### Respiratory Changes:

- Increased mucosal fragility / increased risk of airway edema, epistaxis with manipulation of nasal airway
- Decreased PaO<sub>2</sub> while supine leads to increased risk of hypoxia
- Decreased functional residual capacity
- Progesterone – induced hyperventilation

#### Gastrointestinal Changes:

- Loss of water esophageal sphincter tone leads to increased risk of reflux disease
- Decreased gastric motility
- Increased intragastric pressure

#### Genitourinary Changes:

- Loss of intravascular protein causes decreased oncotic pressure leads to peripheral edema
- Increased glomerular filtration rate, urinary stasis leads to increased risk of urinary tract infections

#### Endocrine Changes:

- Increase in Estrogen, Progesterone, Thyroxine, Steroids, Insulin levels

#### Oral Changes:

- pregnancy gingivitis
- pregnancy epulis
- increased tooth mobility
- dental caries
- erosion
- dental problems in relation to labour and delivery

#### Fetal Development during Pregnancy

Stages Of Pregnancy:First trimester [1-12 weeks]

- fetal organ formation
- most susceptible to adverse effects of teratogens

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#### Second trimester [13-24 weeks]

- fetal growth and maturation

#### Third trimester [25-40 weeks]

- fetal growth continues
- focus of concern is risk to upcoming birth process and safety and comfort of pregnant woman<sup>2</sup>

**Pregnancy Related Changes In Oral Cavity:** Oral changes include gingivitis, gingival hyperplasia, pyogenic granuloma, and salivary changes. Increased facial pigmentation is also seen. Elevated circulating estrogen, which causes increased capillary permeability, predisposes pregnant women to gingivitis and gingival hyperplasia. Pregnancy does not cause periodontal disease but does worsen an existing condition. Increased angiogenesis, due to sex hormones coupled with gingival irritation by local factors such as plaque, is believed to cause pyogenic granuloma in 1%-5% of patients, which occurs during the first and the second trimesters and may regress after the child's birth. The change in composition includes a decrease in sodium and pH, and an increase in potassium, protein, and estrogen levels. Due to increase in salivary estrogen the proliferation and desquamation of the oral mucosal cells provide a suitable environment for bacterial growth which predisposes the pregnant woman to dental caries. Good oral hygiene will help to prevent or reduce the severity of the hormone-mediated inflammatory oral changes.<sup>3</sup>

#### **Pharmacological Consideration during Pregnancy:**

Higher volume of drug distribution, lower maximum plasma concentration, lower plasma half-life, higher lipid solubility, and a higher clearance of the drugs is seen in pregnancy. Certain drugs are known to cause miscarriage, teratogenicity, and low birth weight of the fetus. Most drugs are excreted in breast milk, exposing the newborn to the drugs. Toxicity to new born depends on the chemical properties, dose, frequency, duration of exposure to the drugs, and amount of milk consumed. Understanding the

safety aspects of commonly used and prescribed medications minimizes adverse outcomes.<sup>1</sup>

**Table 1:**

Drugs	Use In Pregnancy	Use In Lactation	Remarks
<b>ANTIBIOTICS</b>			
Amoxicillin Metronidazole Erythromycin Penicillin Cephalosporins	Yes	Yes	Fetal ototoxicity with gentamycin. Discoloration of teeth with tetracycline.
Gentamycin Clindamycin	Yes	Yes	Maternal toxicity/fetal death with chloramphenicol
Tetracycline Chloramphenicol	No	No	
<b>ANALGESICS</b>			
Acetaminophen Morphine Meperidine	Yes	Yes	Postpartum hemorrhage associated with aspirin.
Oxycodone Hydrocodone Propoxyphene Pentazocine	With caution	With caution	Respiratory depression with morphine.
Aspirin Ibuprofen Naproxen	Not in 3rd trimester	No	
<b>ANTIFUNGAL</b>			
Clotrimazole Nystatin	Yes	Yes	Fetal toxicity with ketoconazole.
Fluconazole Ketoconazole	With caution	With caution	
<b>LOCAL ANESTHETICS</b>			
Lidocaine Prilocaine Etidocaine	Yes	Yes	Fetal bradycardia with Mepivacaine & Bupivacaine
Mepivacaine Bupivacaine	With caution	Yes	
<b>CORTICOSTEROIDS</b>			
Prednisolone	Yes	Yes	
<b>SEDATIVES / HYPNOTICS</b>			
Nitrous oxide	Not in 1st trimester	Yes	Spontaneous abortions with Nitrous oxide.
Barbiturate Benzodiazepines	No	No	Cleft lip/palate with Benzodiazepines

Most antibiotics do cross the placenta and thus have the potential to affect the fetus. erythromycin, azithromycin, and clarithromycin, do not cross the placenta to any significant extent. They do not cause fetal anomalies. The tetracyclines are to be avoided in the pregnant patient and in children up to 12 years of age because of permanent dental staining. Use of metronidazole justified for significant oral and maxillofacial infections in the pregnant patient because of its less effects.

There is a small number but a wide variety of drugs that are teratogens (ie, drugs that can cause either structural or functional birth defects).<sup>1</sup>

**Table 2:**

Known Teratogens And Their Fetal Effects	
Teratogens	Effect on fetus
Ethyl alcohol	Fetalalcohol syndrome
Tobacco	Low birth rate, cleft lip and palate
Cocaine	Cognitive delay, placental abruption
Thalidomide	Micromelia
Methyl mercury	Microcephaly, brain damage
Anticonvulsants (all) Carbamazepine Valproicacid Lamotrigine Phenobarbital Topiramate	Orofacialclefts, cardiac malformations, Spinabifida Neural tube defects Neural tube defects Urinary malformations Abnormalities in all subjects
Warfarin (eg, coumadin)	Warfarin embryopathy (midface and long bone deficiency) spontaneous abortion.
Angiotensin-converting enzyme inhibitors	Oliguria, renal dysgenesis, lung and limb abnormalities
Retinoids	Spontaneous abortion Multiple malformations

**Routine Dental Treatments during Pregnancy:**

**Ideal Timing For Dental Treatment:** Although pregnancy is not a contraindication to dental treatments, the clinician should consult with the

patient's physician to clarify individual treatment issues, especially when dental emergencies arise during the first trimester. It is advisable to defer elective treatment during the first trimester because of the potential vulnerability of the fetus.

The second trimester is the safest time to perform routine dental care. In this period, treatment planning should include elimination of potential problems that could arise later in pregnancy or during the immediate postpartum period.

The early part of the third trimester is still a relatively good time to provide routine dental care. However, no elective dental treatment is advisable late in the third trimester. Extensive reconstructive procedures such as crowns and partial dentures should preferably not be performed at any time during pregnancy.<sup>4</sup>

**Dental Radiographs:** As a result of modern features such as high-speed film, filtration, collimation and use of lead aprons, dental radiography has been safer. When taking a radiograph of a pregnant patient is inevitable, the dose of radiation to be given and the time of gestation are two important factors to consider. Studies showed that no increase in gross congenital anomalies occurs as a result of exposures totalling less than 0.05 to 0.1 Gy during pregnancy. The amount of radiation used in dental radiographs is well below the threshold dose. 18 intraoral dental radiographs and a lead apron result in an estimated fetal embryonic dose of 0.0000001 Gy. Dental radiographs are optimally taken in the second trimester and with the use of a lead apron.<sup>4</sup>

**Amalgam Restorations:**The use of dental amalgam in pregnant women is controversial because it is recognized that amalgam restorations release mercury and mercury is known to cause congenital malformations.

However, recent data have confirmed that the amount of mercury vapour released from amalgam restorations- about 1 to 3 microgram per day- is well below the toxic level. This amount is not high enough to produce any teratogenic effect. Although there is no evidence linking amalgam use

and birth defects or stillbirths, clinicians are advised to approach the removal or placement of amalgam with precautions.

Pregnant dental clinicians and dental assistants are chronically exposed to mercury vapour in the workplace. It has been confirmed that pregnant dental staff who work in clinics with proper hygiene and disposal practices do not have an increased risk of mercury exposure to their fetuses. Besides, with improved handling and hygiene procedures and increased use of precautionary measures, such as rubber dam, mercury exposure of both dental personnel and patients decreases dramatically.<sup>4,5</sup>

**Root Canal Therapy:** In the event of root canal infection during pregnancy, root canal therapy should be performed. Root canal infection can spread and should be taken care of as soon as possible to avoid posing any undue risk to the mother's and baby's health.

Root canal treatment may be performed during the first, second, or third trimester of pregnancy, however, the second trimester is generally preferred. Though treatment may be done during the third trimester, many pregnant women find sitting reclined in a dental chair difficult and uncomfortable. Because of this, it is preferable to perform root canal therapy before the third trimester. The root canal treatment itself is safe to undergo while pregnant and is best done after the first trimester. Though root canal therapy itself is safe during pregnancy, the X-rays and use of antibiotics are the main causes for concern.

Root canal treatment generally requires X-rays to determine the extent of infection. The dose of radiation received from a single X-ray is very minimal and to date no adverse effects have been seen from teeth X-rays on fetal development. However, it is best to limit any undue risks during pregnancy, which is why root canal treatment should wait until the second trimester.

Root Canal Therapy: May require the use of antibiotics to eliminate root canal infection. Antibiotics like penicillin and amoxicillin are still considered safe for use in pregnant women.

Other possible sources of risk associated with root canal treatment are: anesthesia. Dentists often use small amount of anesthesia to pregnant women. But if the dose is not sufficient to alleviate the pain of the patient, the dose may be increased gradually. As the tension of the dental procedure has a detrimental effect on the baby, additional anesthesia is preferable to allow the stress affects the baby.<sup>4,6</sup>

**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. 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.<sup>5</sup>

**Conclusion:** After consulting the patient's physician and assessing the potential risks of undergoing dental treatment during pregnancy, necessary treatment and drugs should not be withheld from the patient who requires them. Proper assessment, intervention and patient education about dental problems during pregnancy can help to enhance pregnancy outcomes. Clinicians and oral hygienists can assume vital roles in maintaining oral health during pregnancy by prenatal oral health counselling.

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