



CPD4dentalnurses

YOUR FUTURE IN YOUR HANDS

Pregnancy and Oral Health

Aims: To discuss the physiologic changes that take place during pregnancy and how these can impact on the oral care management of the pregnant patient. To highlight the potential association between the presence of periodontitis and adverse pregnancy outcomes.

Objectives: On completion of this verifiable CPD article, the participant will be able to demonstrate, through completion of a questionnaire, the ability to:

- Demonstrate knowledge of the general physiological changes that occur in the various systems of the body during pregnancy.
- Identify the oral changes that can occur during pregnancy.
- Demonstrate knowledge of the preventive, diagnostic and therapeutic recommendations for the pregnant patient.
- Identify the potential association between the presence of periodontitis and adverse pregnancy outcomes.

Introduction

Pregnancy is not considered a medically compromised state, it is an extension of a healthy state.¹ Pregnancy can be a period of joy and anxiety for a woman and is characterised by various physiological changes in the body brought about by the circulating female sex hormones, particularly oestrogen and progesterone.^{1,2}

Physiologically, changes occur in the cardiovascular, hematologic, respiratory, gastrointestinal, genitourinary, endocrine, and oro-facial 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.³

Many studies have shown that the oral health of pregnant women can impact on the health of their baby. This affirms the importance of regular routine dental care during pregnancy. In some areas of social deprivation, pregnant patients may visit the dentist for the first time because of advice received during antenatal classes.⁴

Physiological Changes During Pregnancy

During pregnancy, the physiological changes of the various systems of the body can cause symptoms like nausea, vomiting, nasal congestion, heart burn, alteration in taste, food cravings, hyperventilation, shortness of breath and fatigue.¹ The systems of the body that are generally affected are the cardiovascular, endocrine and genitor-urinary systems.^{1,5}

Cardiovascular System

- There is peripheral vasodilation.
- Cardiac output increases by 20% by week 8, and then further up to 40% increase, maximal at week 20-28. In labour there is further increase in cardiac output and then a huge increase immediately after delivery, followed by return to normal within around an hour.
- Contributing to the increased cardiac output are increased stroke volume and an increase in heart rate of 10-20 beats per minute.
- Progesterone reduces systemic vascular resistance by about 20% early in pregnancy. Postural hypotension may result.
- Blood pressure is lower than normal in the first two trimesters but returns to normal in the third.
- Venous return in the inferior vena cava can be compromised in late pregnancy if a woman lies flat on her back. Reduced cardiac output can compromise fetal blood supply. Therefore, this needs to be taken into consideration when treating a pregnant woman in late pregnancy.
- Changes on examination and ECG below are caused by the physiological changes described above.⁶

Endocrine system

- Thyroid and parathyroid - A variety of changes can take place in the thyroid and parathyroid hormone levels due to increased oestrogen levels.⁶

Respiratory System

- Increased oxygen consumption by approximately 20%.
- Many women complain of feeling short of breath in pregnancy without explanatory pathology.
- Adrenal and Pancreas - Cortisol levels increase in pregnancy which favours lipogenesis and fat storage.

- Gestational diabetes can occur due to changes in insulin resistance over the course of pregnancy. However, obesity and a positive history of type 2 diabetes can predispose women to gestational diabetes.⁶

Metabolic Changes

- Changes in energy requirements in pregnancy remain controversial.
- The basal metabolic rate increases slowly over the course of pregnancy, by 15-20%.
- Active energy expenditure tends to fall over pregnancy.
- Normal weight gain is approximately 11.4 to 15.9kg for a woman of normal body mass index (BMI). Around 5 kg is the fetus, placenta, membranes and amniotic fluid and the rest is maternal stores of fat and protein and increased intra- and extra-vascular volume.⁶

Skin changes

- Hyperpigmentation of the umbilicus, nipples, abdominal midline (linea nigra) and face (melasma and chloasma) are common due to the hormonal changes of pregnancy.
- Hyperdynamic circulation and high levels of oestrogen may cause spider naevi and palmar erythema.
- Striae gravidarum ('stretch marks') are common.⁶

Summary of Maternal Changes during Pregnancy¹

1st Trimester	2nd Trimester	3rd Trimester
Fatigue, backaches, mood swings	Gradually getting used to changes	Definite physical alterations
Nausea and vomiting/morning sickness	Stabilising of systemic changes	Significant increase in weight
Frequent urge to urinate Dizziness	Physical changes begin appearing	Difficulty in moving around
Snacking, binges	Uterus becomes more gravid	Danger of premature labour
Foetal organogenesis begins	Development of the foetal systems	Almost completion of foetal development

Oral Changes During Pregnancy

The main hormonal changes in a woman's life take place during pregnancy and the mouth is one of the main areas affected by such changes. Elevated hormone levels (oestrogen and progesterone) significantly increase vascular permeability in the gingival tissues and, in the presence of dental plaque, promote gingival inflammation. Pregnant women can be affected by pregnancy gingivitis, localised larger gum swelling - pregnancy epulis and periodontitis. Other oral changes can include salivary changes and increased facial pigmentation.³

In the cases of women who already have gingivitis or periodontitis it has been found that existing oral manifestations can be exacerbated during pregnancy. Therefore, the clinician should be aware of the changes occurring within the oral cavity of a pregnant woman so that they can be managed appropriately.⁷

Pregnancy Gingivitis

Pregnancy gingivitis is more likely to occur in patients who have poor oral hygiene or existing gingival inflammation. It can be uncomfortable and worrying to the patient and if left untreated it can cause damage to the supporting tissues and gingiva.⁴ The same health advice and educational measures and professional intervention should be applied. It should be emphasised that the same preventive, diagnostic and therapeutic oral procedures are safe throughout pregnancy and these measures are effective in improving and maintaining oral health. Professional intervention should be aimed at removing the dental biofilm and calculus from tooth surfaces.⁷

During pregnancy, the level of progesterone in the body can be 10 times higher than normal. This may enhance growth of certain bacteria that cause gingivitis. Also, the immune system may work differently during pregnancy. This could change the way the body reacts to the bacteria that cause gingivitis.⁸

The typical appearance of pregnancy gingivitis is that the gingiva is dark red, swollen, smooth and bleeds easily.¹ The patient may also experience bleeding on brushing/flossing, which can be profuse; spontaneous bleeding, blood on pillow or on eating crispy foods such as apples; a feeling of irritation or itching of the gums and halitosis.³ These changes can resolve within a few months of delivery but only if local irritants are removed such as smoothing overhanging fillings and if scrupulous plaque control is maintained.^{1,7}

The above changes that occur during pregnancy highlight the need to provide the patient with excellent oral hygiene instruction. This will involve demonstrating brushing and interdental cleaning and providing the patient with any required professional prophylaxis including scaling, root surface debridement and polishing. These measures will allow the pregnant woman to achieve an optimal level of dental health throughout her pregnancy.

Images of pregnancy gingivitis



Pregnancy and Periodontal Disease

NEW PERIODONTAL CLASSIFICATION QUICK REFERENCE GUIDE CORSODYL

The following 5 steps must be followed to create a patient 'Periodontal Diagnostic Statement'

STEP 1	TYPE: Periodontally healthy, gingivitis or periodontitis?	<ul style="list-style-type: none"> ●● Periodontal health – no obvious evidence of interdental recession ●● Gingivitis – no obvious evidence of interdental recession ●● Periodontitis – progress to step 2
STEP 2	EXTENT: What is the pattern of the disease, how many and what teeth are affected?	<ul style="list-style-type: none"> ●● Generalised – affects $\geq 30\%$ of teeth ●● Localised – $<30\%$ of teeth ●● Molar incisal pattern
STEP 3	CURRENT DISEASE STATE: Based on probing depths and BoP	<ul style="list-style-type: none"> ●● Stable – BoP $<10\%$, PPD $\leq 4\text{mm}$, No BoP at 4mm sites ●● In remission – BoP $\geq 10\%$, PPD $\leq 4\text{mm}$, No BoP at 4mm sites ●● Unstable – PPD $\geq 5\text{mm}$ or PPD at $\geq 4\text{mm}$ & BoP
STEP 4	STAGING: This tells us how severe the disease is. Look at radiographs for the site with the worst interproximal bone loss	<ul style="list-style-type: none"> ●● Stage I – $<15\%$ (or $<2\text{mm}$ attachment loss from CEJ) ●● Stage II – coronal third of root ●● Stage III – mid third of root ●● Stage IV – apical third of root
STEP 5	GRADING: This is about disease susceptibility and tells us how fast the disease is progressing. Look at radiographs for the site with the worst interproximal bone loss and divide the % bone loss by the patient's age	<ul style="list-style-type: none"> ●● Grade A (slow) – <0.5 ●● Grade B (moderate) – $0.5-1.0$ ●● Grade C (rapid) – >1.0

9

Studies have shown there is a potential association between periodontal disease and three forms of adverse pregnancy outcome: low birth weight, preterm birth and pre-eclampsia (defined as high maternal blood pressure and significant proteinuria (presence of excess proteins in the urine), as well as with gestational diabetes. As yet there is no convincing scientific evidence that gum disease is a cause of adverse pregnancy outcomes, and that gum treatment will prevent this.¹⁰

Periodontal treatment should be performed without hesitation during pregnancy. Although non-surgical periodontal therapy during the second trimester of gestation does not seem to alter the risk of adverse pregnancy outcomes in most women, there does seem to be a reduction in the incidence of such outcomes in specific patient populations, such as pregnant women at high risk of pregnancy complications.⁷

Professor Madianos who, alongside Yiorgios Bobetsis produced the report – The importance of Periodontal Disease Treatment during Pregnancy for EFP/Oral B; recommends that dental professionals are aware of the following six key factors:

1. The importance of preserving and establishing periodontal and dental health during pregnancy, and should inform and educate their patients accordingly.
2. That non-surgical periodontal therapy and dental treatment, including restorations and extractions, are safe during pregnancy and especially during the second trimester of gestation.
3. That dental x-rays can be taken when needed, with the appropriate protection, and local anaesthesia can be delivered without additional risk for the foetus or the pregnant woman.
4. That the use of common painkillers and systemic antibiotics is generally safe, although tetracyclines should be avoided.
5. That, as a general rule, medication should be prescribed to the pregnant woman after communication with her obstetrician.
6. That all women should receive, at the start of pregnancy, a thorough evaluation of their dental and periodontal status. When gingivitis or periodontitis are diagnosed, periodontal treatment should be provided. Periodontal therapy will improve the periodontal condition and therefore the overall health of pregnant women.

Pregnancy Granuloma or Pregnancy Tumour

A pregnancy granuloma is a growth on the gums that occurs in 2% to 10% of pregnant women. It is also known as a pyogenic granuloma, pregnancy tumor or pregnancy epulis. Pregnancy granulomas usually develop in the first trimester and their incidence increases up to the seventh month of pregnancy.

Clinically, they present as red nodules, typically found near the upper gum line. However, they can also be found elsewhere in the mouth.^{1,8} They are a reactive lesion that can occur due to local irritation or trauma and they are not a true neoplasm or a true granuloma.¹ Pregnancy granulomas usually occur as a result of the changing hormones and increased vascular response, often developing at a site of a pre-existing gingivitis and plaque stagnation.⁷

After childbirth when the hormones return to normal, they often resolve without treatment. Although some may become more fibrous and may require surgical removal.¹

Improving oral hygiene by teaching the patient how to care for the area and thorough dental prophylaxis can decrease the size of the granuloma during pregnancy.

Images of Pregnancy Granuloma



Caries

The number of salivary cariogenic microorganisms can increase during pregnancy and changes in saliva composition may increase the risk of caries during pregnancy.¹ The major and the minor salivary glands may undergo changes in the pH and there may be a decrease in the level of sodium and an increase in the level of protein concentration. Salivary oestrogen levels may also rise. All of these factors can affect the susceptibility to caries.¹

In addition to these factors, a woman may experience an increased desire to snack frequently, which can also contribute towards the rate of decay. Again, this increases the need for good oral hygiene promotion, dietary advice and caries prevention advice.

Prescribing Drugs During Pregnancy

Drugs are absorbed more easily during pregnancy. Therefore, prescribing drugs during pregnancy should be avoided if possible, or the patient's doctor should be contacted prior to prescribing them. Lignocaine is safe to use during pregnancy providing the patient does not have any allergies to it. Low concentration vasoconstrictors have not been shown to cause any harm.⁷

The British National Formulary (BNF) states that "Drugs can have harmful effects on the embryo or fetus at any time during pregnancy. It is important to bear this in mind when prescribing for a woman of *childbearing age* or for men *trying to father* a child.

During the *first trimester* drugs can produce congenital malformations (teratogenesis), and the period of greatest risk is from the third to the eleventh week of pregnancy.

During the *second* and *third trimesters* drugs can affect the growth or functional development of the fetus, or they can have toxic effects on fetal tissues.

Drugs given shortly before term or during labour can have adverse effects on labour or on the neonate after delivery."¹⁴ This reinforces the need to discuss with the patient's General Practitioner before prescribing medications.

Medications During Pregnancy and Breast-feeding¹⁵

Key medication considerations during pregnancy and breast-feeding.

AGENT	FDA PR* CATEGORY	SAFE DURING PREGNANCY?	SAFE DURING BREAST-FEEDING?
Analgesics and Anti-inflammatories[†]			
Acetaminophen	B	Yes	Yes
Aspirin	C/D	Avoid	Avoid
Codeine	C	Use with caution	Yes
Glucocorticoids (dexamethasone, prednisone)	C	Avoid [‡]	Yes
Hydrocodone	C	Use with caution	Use with caution
Ibuprofen [§]	C/D	Avoid use in third trimester	Yes
Oxycodone	B	Use with caution	Use with caution
Antibiotics^{¶#}			
Amoxicillin	B	Yes	Yes
Azithromycin	B	Yes	Yes
Cephalexin	B	Yes	Yes
Chlorhexidine (topical)	B	Yes	Yes
Clarithromycin	C	Use with caution	Use with caution
Clindamycin	B	Yes	Yes
Clotrimazole (topical)	B	Yes	Yes
Doxycycline	D	Avoid	Avoid
Erythromycin	B	Yes	Use with caution
Fluconazole	C/D	Yes (single-dose regimens)	Yes
Metronidazole	B	Yes	Avoid; may give breast milk an unpleasant taste
Nystatin	C	Yes	Yes
Penicillin	B	Yes	Yes
Terconazole (topical)	B	Yes	Yes
Tetracycline	D	Avoid	Avoid
Local Anesthetics			
Articaine	C	Use with caution	Use with caution
Bupivacaine	C	Use with caution	Yes
Lidocaine (with or without epinephrine)	B	Yes	Yes
Mepivacaine (with or without levonordefrin)	C	Use with caution	Yes
Prilocaine	B	Yes	Yes
Benzocaine (topical)	C	Use with caution	Use with caution
Dyclonine (topical)	C	Yes	Yes
Lidocaine (topical)	B	Yes	Yes
Tetracaine (topical)	C	Use with caution	Use with caution
Sedatives			
Benzodiazepines	D/X	Avoid	Avoid
Zaleplon	C	Use with caution	Use with caution
Zolpidem	C	Use with caution	Yes
Emergency Medications			
Albuterol	C	Steroid and β_2 -agonist inhalers are safe	Yes
Diphenhydramine	B	Yes	Avoid
Epinephrine	C	Use with caution	Yes
Flumazenil	C	Use with caution	Use with caution
Naloxone	C	Use with caution	Use with caution
Nitroglycerin	C	Use with caution	Use with caution

* FDA PR: U.S. Food and Drug Administration Pregnancy Risk. See Table 1 for FDA PR category definitions.

† In the case of combination products (such as oxycodone with acetaminophen), the safety with respect to either pregnancy or breast-feeding is dependent on the highest-risk moiety. In the example of oxycodone with acetaminophen, the combination of these two drugs should be used with caution, because the oxycodone moiety carries a higher risk than the acetaminophen moiety.

‡ Oral steroids should not be withheld from patients with acute severe asthma.

§ Ibuprofen is representative of all nonsteroidal anti-inflammatory drugs. In breast-feeding patients, avoid cyclooxygenase selective inhibitors such as celecoxib, as few data regarding their safe use in this population are available, and avoid doses of aspirin higher than 100 milligrams because of risk of platelet dysfunction and Reye syndrome.

¶ Antibiotic use during pregnancy: The patient should receive the full adult dose and for the usual length of treatment. Serious infections should be treated aggressively. Penicillins and cephalosporins are considered safe. Use higher-dose regimens (such as cephalexin 500 mg three times per day rather than 250 mg three times per day), as they are cleared from the system more quickly because of the increase in glomerular filtration rate in pregnancy.

Antibiotic use during breast-feeding: These agents may cause altered bowel flora and, thus, diarrhea in the baby. If the infant develops a fever, the clinician should take into account maternal antibiotic treatment.

Conclusion

An accurate medical history is essential when the pregnant patient attends dental practice including details of any past pregnancies and any complications that may have occurred.

Pregnancy provides a “teachable moment” in self-care and future child-care when the patient attends dental practice. Home care maintenance should be enquired into and the necessary reinforcements provided including appropriate nutrition advice. The power of prevention can be utilised, as both periodontal disease and caries are overwhelmingly preventable through well recognised strategies.

© 2023 Sue Bagnall BSc (hons) RDH

Personal Development Plan and Reflective Learning

This CPD is linked to the following GDC Enhanced CPD Development Outcome:

A. Effective communication with patients, the dental team and others across dentistry, including when obtaining consent, dealing with complaints, and raising concerns when patients are at risk.

C. Maintenance and development of knowledge and skill within your field of practice.

Reflective learning is now a requirement of the GDC Enhanced Professional Development Scheme. As such, you will now need to answer some reflective learning questions, before your certificate is generated. These will be:

- 1) What did you learn (or confirm) from the activity that was helpful or relevant to your daily work and patients?
- 2) Comment on any changes/updates needed in your daily work
- 3) How has completion of this CPD article benefitted your work as a DCP?

Examples will be provided. Please remember that you need to fill this in on completion of the exam but you can also update this at any time from your CPD log. If you take a few moments to write your reflection on completion, you will have fulfilled the Enhanced CPD requirements.

Further Reading

[Women’s Oral Health During Pregnancy](#)

References

1. Nayak, A. (2012) Oral Healthcare Considerations for the Pregnant Woman. *Dental Update*. 39 pp.51-54.
2. Boggess, K. and Edelstein, B. (2006) Oral Health in Women During Preconception and Pregnancy: Implications for Birth Outcomes and Infant Oral Health. *Maternal and Child Health Journal*.
3. Kurien, S., Kattimani, V.S., Sriram, R., Sriram, S.K., Rao, P., Bhupathi, A., Bodduru, R., and Patil, N. (2013) Management of Pregnant Patient in Dentistry. *J Int Oral Health*. Feb 5(1) pg.88-87.
4. Chapman, A. and Felton, S. (2009) *Basic guide to Oral Health Education and Promotion*. Oxford. Blackwell Publishing.
5. Hunter, S. and Robson, C. (1992) Adaption of the Maternal Heart in Pregnancy. *British Heart Journal*. 68. Pp. 540-543.
6. Patient.co.uk (2022) Available from: <http://www.patient.co.uk/doctor/physiological-changes-in-pregnancy> (Accessed 17/02/2023).
7. EFP. (2022) Available from: https://www.efp.org/fileadmin/uploads/efp/Documents/Campaigns/Oral_Health_and_Pregnancy/Guidelines/guidelines-dental-2.pdf (Accessed 17/02/2023).
8. Soory, M. (2000) Hormonal Factors in Periodontal Disease. *Dental Update*. 27. pp.380 - 383.
9. GSK (2022) Available from: <https://www.gskhealthpartner.com/en-gb/patient-care-resources/> (Accessed 20/01/2021).
10. British Dental Health Foundation (2014) Healthy Gums and Health Body. Available at: <http://www.dentalhealth.org/tell-me-about/topic/mouth-and-body/healthy-gums-and-healthy-body> (accessed 17/02/2023).
11. Madianos, P. (2022) Available from: <https://www.efp.org/gum-disease-general-health/oral-health-pregnancy/resources/periodontal-treatment-during-pregnancy-is-safe-and-effective-but-does-not-seem-to-reduce-risk-of-adverse-pregnancy-outcomes-phoebus-madianos-29051/> (accessed 17/02/2023).
12. Han, Y. (2011) "Oral health and adverse pregnancy outcomes- what next?" *Journal of Dental Research*, 90 (3), pp289-293.
13. Darby, M.L., Walsh, M.M (2011) *Dental Hygiene Theory and Practice*. pp348-353. Elsevier: Canada
14. NICE (2022) Available from: <https://bnf.nice.org.uk/guidance/prescribing-in-pregnancy.html> (accessed 17/02/2023).
15. Toothgood (2022) Available from: <https://toothgood.com/pregnancy-drugs-list-cheatsheet/> (accessed 17/02/2023).