

Oral Health Care During Pregnancy



Family Health Bureau
Ministry of Health
Sri Lanka
2009

PRACTICE GUIDELINES

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Expert panel

Programme Coordinator

Dr. Eshani Fernando, Consultant in Community Dentistry, Family Health Bureau

Universities

Prof. A.N.I. Ekanayaka
Senior Professor of Community Dentistry
Faculty of Dental Sciences
University of Peradeniya
Peradeniya

Prof. Lilani Ekanayake
Professor in Community Dentistry
Faculty of Dental Sciences
University of Peradeniya
Peradeniya

Prof. Sunethra Rajapaksa
Professor in Periodontology
Faculty of Dental Sciences
University of Peradeniya
Peradeniya

Prof. Harsha Seneviratne
Dean and Senior
Professor of Obstetrics &
Gynaecology
Faculty of Medicine
Colombo

Prof. Luxman
Wijeyeweera
Professor in Paediatric
Dentistry
Faculty of Dental
Sciences
University of Peradeniya
Peradeniya

Department of Health

Dr. J.M.W. Jayasundara Bandara
Deputy Director General/ Dental Services,
Ministry of Health
Sri Lanka

Dr. Deepthi Perera
Director/Maternal & Child Health
Ministry of Health
Sri Lanka

Dr. N. Karunaratna
Consultant Obstetrician & Gynaecologist
De Soysa Hospital for Women
National Hospital of Sri Lanka

Dr. Sudarshini Fernandopulle
Consultant Community Physician
Family Health Bureau

Dr. Loshan Moonasingha
Consultant Community Physician
Family Health Bureau

Dr. Dhammika Rowel
Consultant Community Physician
Family Health Bureau

Dr. R.R.M.L.R. Siyambalagoda
Deputy Director General/ Public Health
Services,
Ministry of Health
Sri Lanka

Dr. Sarath Wijemanna
Consultant Obstetrician & Gynaecologist
Family Health Bureau

Dr. Neil Thalagala
Consultant Community Physician
Family Health Bureau

Dr. Samudri Rodrigo
Consultant in Community Dentistry
Office of the Regional Director of Health
Services
Gampaha

Dr. Udaya Usgodarachchi
Consultant in Community Dentistry
Dental Institute

Professional bodies

Sri Lanka College of Obstetricians & Gynaecologists
College of Community Dentistry of Sri Lanka

**Message from Director General of Health Services,
Ministry of Healthcare & Nutrition**

I wish to congratulate Family Health Bureau, College of Obstetricians and Gynaecologists and College of Community Dentistry, Sri Lanka for producing this extremely useful manual which contains guidelines for Provision of Oral Healthcare during Pregnancy.

Proper implementation of this programme would contribute to improve the quality of life of the pregnant mother and that of the newborn.

Oral healthcare during pregnancy is already being provided in some districts but there is a wide variation in quality.

Therefore this manual will help in ensuring uniformity of oral healthcare services offered during pregnancy as well as improving quality.

I wish to assure my fullest support to all involved in producing this manual which would help the healthcare providers in their endeavour to provide quality oral healthcare services during pregnancy.

Dr. Ajith Mendis, Director General of Health Services,
Ministry of Healthcare & Nutrition

**Message from Deputy Director General (Dental Services) & Deputy
Director General (Public Health Services II),
Ministry of Healthcare & Nutrition**

Oral health promotion of mothers- A farsighted action with a vision

It is known that oral diseases, mainly dental caries starts very early in life and affects all age cohorts in the society. According to the National Oral Health Survey 2003, almost four deciduous teeth become carious at an age as early as five years of which approximately one tooth needs to be extracted. Among those children, while 65% have experienced dental caries, more than 23% needed extraction of one or more teeth.

Contrary to the common belief it is scientifically proven that dental caries is an infectious disease which could be transmitted to the newborn from those with closest contact typically the mother. Moreover it has been found that the risk of transmission and subsequent development of dental caries is proportionate to the count of caries causing bacteria in the mouth of an individual. Unless the oral diseases are intervened at a very early age, this travels through life events very fast and make the elderly age uncomfortable.

Oral healthcare programme for pregnant mothers is geared to provide comprehensive oral healthcare to pregnant mothers in order to improve the oral health of the mother and that of the newborn. It is evident that a motivated mother invariably promotes oral health in her off spring.

Hence this move to improve oral health during pregnancy and oral health promotion of the mother would be a golden milestone in the history of healthcare in this country. There is no doubt that if adopted properly and implemented with commitment our future Sri Lankan nation will definitely smile to the world with a full complement of healthy teeth.

Dr. J.M.W. Jayasundara Bandara, DDG (DS) & Dr. R.R.M.L.R.
Siyambalagoda, DDG (PHS II),
Ministry of Healthcare & Nutrition

**Message from Director (Maternal & Child Health),
Ministry of Healthcare & Nutrition**

Oral healthcare has recently been incorporated into the Maternal and Child Health Programme with the aim of promoting oral health among mothers and children as an important component in the improvement of quality of life.

Family Health Bureau produced this guideline with an expert panel consisting of members from the Faculty of Medicine, University of Colombo, Faculty of Dental Sciences, University of Peradeniya, experts from the Ministry of Health, Sri Lanka College of Obstetricians and Gynaecologists and the College of Community Dentistry of Sri Lanka. I wish to place on record my sincere appreciation to the members of the expert panel for making this a reality.

I appreciate the contribution and commitment of Dr. Eshani Fernando, Consultant Dental Surgeon, Family Health Bureau in preparing this guideline successfully.

I acknowledge the support rendered to us by the Secretary Health, Director General of Health Services, Deputy Director General/ Public Health Services and Deputy Director General/ Dental Services from the Ministry of Health in producing this manual.

This guideline was produced with the financial sponsorship of Health Sector Development Project and the World Health Organisation.

I sincerely hope that all care providers related to this programme make maximum use of this guideline in providing oral healthcare to pregnant mothers.

Dr. Deepthi Perera, Director (Maternal & Child Health),
Family Health Bureau,
Ministry of Healthcare & Nutrition

CHAPTER I

ORAL HEALTH CARE IN PREGNANCY AND EARLY CHILDHOOD

INTRODUCTION

In Sri Lanka, 65.5% of the 5 year-old children suffer from dental decay¹. On an average each child in this age group experience more than 3 decayed teeth ¹. Studies have shown that the prevalence of dental caries increases from 23% - 65% between the ages 1 and 2 years in Sri Lanka ². Pregnancy is an opportune time to motivate women about preventing dental caries in young children, the most common childhood problem in most if not all countries.

The National Oral Health Survey (2003) gives an indication about the oral healthcare needs of the females in the reproductive age group. It has been reported that 47.2% of the 15-year-old females and 78.4% of those in the 34-44 year-old age group have active dental caries. Accordingly 47 – 80% of pregnant mothers may need treatment for dental caries. The same survey also showed that 74.8% and 88.8% in the above age groups respectively required some form of periodontal care. This gives the magnitude of the problem regarding periodontal diseases of pregnant mothers.

Improving the oral health of pregnant mothers prevents complications of dental diseases during pregnancy, may reduce adverse pregnancy outcomes and has the potential to decrease early childhood caries in their babies. In adult life teeth are important for nutrition, speech and self esteem. In addition oral diseases impose a direct financial burden on the family. Health of teeth and other oral tissues should be considered along with general health and wellbeing.

The availability of guidelines for primary healthcare workers and dental surgeons in Sri Lanka providing oral health care during pregnancy and early childhood is a much felt need. Systems in some districts for the provision of oral healthcare are diverse in terms of prevailing practices. This document has been prepared by an expert panel which recorded that oral health of mothers and children should be incorporated into the existing National Maternal and Child Health Programme of the Ministry of Health coordinated by the Family Health Bureau.

The oral health care programme for pregnant mothers aims to improve the oral health of mothers and young children by providing comprehensive care during the prenatal and antenatal periods. The objectives of the programme are to:

- ▶ Reduce complications of dental diseases during pregnancy
- ▶ Decrease early childhood caries by reducing the risk of transmission of causative bacteria to the newborn
- ▶ Prevent worsening of the existing oral diseases
- ▶ Reduce the possibility of adverse pregnancy outcomes
- ▶ Educate pregnant mothers on preventive measures for dental caries in young children

The panel developed separate recommendations for different categories of primary health care staff. The role of each member of the primary health care team and that of the Dental Surgeons in institutions have been identified and integrated. The barriers for provision of services in terms of inadequate number of Dental Surgeons in some MOH divisions and poor accessibility of dental clinics to the community have been noted by the panel. While these guidelines provide general protocols for change in the healthcare delivery systems and thereby improve the overall quality of care, specific treatment should be adopted in individual clinical situations.

SUMMARY OF GUIDELINES

General

- ▶ There is a need to provide dental care during pregnancy to improve the health of pregnant mother and that of the newborn.
- ▶ Dental treatment is safe and effective during pregnancy. Oral healthcare should be coordinated between antenatal and oral health care providers.
- ▶ Treatment required can be provided throughout pregnancy: however, the optimal period would be between the 14th and 20th week of pregnancy.
- ▶ Elective treatment which has the possibility of causing complications to the pregnancy can be deferred until the pregnancy is completed.
- ▶ Delay in necessary treatment could result in significant risk to the mother and indirectly to the fetus.

Strategy

To incorporate oral health into the existing care services

Role of public health care providers in the Oral Health Programme for pregnant mothers

1. Role of Regional Dental Surgeon (RDS) & Medical Officer/ Maternal and Child Health (MOMCH)

- ▶ Coordinate activities of the oral health programme for pregnant mothers in the district.
- ▶ Enable pregnant mothers to obtain priority oral health care from government dental clinics.
- ▶ Develop a list of oral health referral sources that will provide services to pregnant women.
- ▶ Allocate all Ante Natal Clinics (ANC) within a Medical Officer of Health (MOH) area to the closest government dental clinic.
- ▶ Allocate a specific time in all government dental clinics (e.g. one session per week) to screen and provide necessary care to the pregnant mothers with the concurrence of the Head of the Institution.
- ▶ Coordinate with the Dental Surgeons to decide on the number of pregnant mothers to be seen per session and the day to be referred.
- ▶ Consolidate the Monthly Returns sent by dental surgeons and prepare the Quarterly Return by RDS.
- ▶ Monitoring and evaluation of the programme in the district.

2. Role of the Medical Officer of Health (MOH)

- ▶ Ensure oral health is included in the screening during pre-pregnancy assessment.
- ▶ Organize oral health education sessions for pregnant mothers.
- ▶ Make appropriate referral to a dental surgeon on a previously agreed date in the first antenatal visit.
- ▶ Document in the Pregnancy Record.
- ▶ Encourage all women to adhere to the dental surgeons' recommendations regarding appropriate follow up.

3. Role of the Government Dental Surgeon

- ▶ Allocate a specific time in all hospital/ community and adolescent dental clinics (at least one session per week) for pregnant mothers with the concurrence of the RDS and the Head of the Institution.
- ▶ Record information regarding the chief complaint, other complaints, medical history, history of drugs and present medication. This information should be available to the MOH, VOG providing antenatal care.
- ▶ Perform clinical examination and plan treatment.
- ▶ Provide appropriate and adequate care to the pregnant mothers when referred by the MOH.
- ▶ Obtain the obstetrician's opinion if there is any underlying medical condition that may affect management of dental problems before carrying out treatment.

Role of the Government Dental Surgeon cont.

- ▶ List of procedures that may be carried out includes;
 - Screening for oral diseases
 - Uncomplicated restorations using amalgam, GIC, composite-chemical or light cured and zinc oxide and eugenol cement
 - Oral hygiene measures including scaling and polishing and root planning
 - Extractions when in the opinion of the Dental Surgeon there is a probability of an acute infection occurring during pregnancy
 - Any emergencies such as trauma to dental tissues Eg. Fracture of teeth, soft tissue lacerations
 - Follow the guidelines provided when prescribing drugs
- ▶ Avoid taking x-rays unless it is absolutely essential.
- ▶ Screen and treat at least 10 pregnant mothers per week by all Dental Surgeons in hospital/ adolescent/ community dental clinics.
- ▶ Provide oral health education to pregnant mothers to improve their oral and general health and that of the newborn.
- ▶ Record the relevant details of the pregnant mothers seen by the Dental Surgeons in the format provided and forward the returns to the RDS monthly.

4. Role of School Dental Therapist (SDT)

- ▶ Educate public health staff on oral health.
- ▶ Provide oral health education for pregnant mothers when requested.

5. Role of Public Health Midwife (PHM)

- ▶ Organize oral health education sessions/ provide oral health education for pregnant mothers and eligible couples.
- ▶ Encourage pregnant mothers to obtain oral health care.
- ▶ Follow up pregnant mothers to ensure compliance with Dental Surgeon's recommendations.

ORAL HEALTH AND PREGNANCY

Maternal oral health and early childhood dental caries

Dental caries is an infectious and transmissible disease ^{3, 4}. It is scientifically proven that children are born without *Streptococcus mutans*, the main bacteria responsible for dental decay.

Douglas and others reviewed 46 studies on the association of *Streptococcus mutans* between caregivers and their children and concluded that there is strong evidence that mothers are a primary source of MS colonization of their children. A few investigations showed other potential sources of children's MS colonization, notably fathers ⁵.

It is only during the first two to three years that these bacteria can be transmitted to the child by the persons in closest contact with it - typically the mother ⁶⁻⁸. Earlier studies demonstrated that infants acquire MS from their mothers only after the eruption of teeth. More recent studies indicate that MS can colonize the mouths of preterm infants and that horizontal, as well as vertical transmission does occur ⁴.

Prevalence of *Streptococcus mutans* and *sobrinus*, infection ranges from around 30 per cent in 3 month old preterm children to over 80 per cent in 24 month old children with primary teeth. The risk of transmission increases with high maternal salivary levels of MS and frequent inoculation. Factors that affect the colonization of MS may be divided into bacterial virulence, host-related and environmental factors ⁹. Complex interaction among these factors determines the success and timing of MS colonization in the child ⁹.

Earlier the children are infected with *Streptococcus mutans*, higher the caries prevalence ⁹. Thus transmission of streptococcus to the newborn should be delayed as long as possible. The efficacy of microbiological approaches on the caregivers to reduce caries risk in children still needs to be established through more rigorously designed clinical trials ⁵. Several methods are documented in the

literature for reducing the maternal reservoir of cariogenic bacteria. They include applying topical chlorhexidine or fluoride, chewing xylitol-containing gums, dietary counselling to reduce frequency of refined carbohydrate intake ¹⁰⁻¹³ and treatment of pregnant mothers to make them free of active dental decay ¹⁴. This is very important to reduce the prevalence of dental caries among young children.

Studies on parents and care givers indicate that many are unaware about the concept of transmissibility of dental caries and modes of spread. They reported the habit of blowing and tasting food, sharing utensils and kissing the children ¹⁵. In addition to reducing the risk of transmission of MS, providing oral health care during pregnancy, provides an opportunity to motivate the mothers about preventing dental caries in young children, one of the most prevalent chronic childhood illnesses.

Key Points

- Dental caries is an infectious and transmissible disease.
- Children are born without streptococci.
- Primary source of MS colonization is the mother.
- Other potential sources are fathers and other care givers.
- Colonization can take place even at the predentate state.
- Risk of transmission increases with high maternal salivary levels of MS and the frequency of inoculation.
- Earlier the children are infected with MS higher the prevalence of caries.
- Treating active caries in the mother to reduce the salivary levels of MS will delay the transmission to her child.
- Pregnancy is an opportune time to motivate mothers about preventing dental decay in children.

Effect of pregnancy on oral health

Pregnant mothers are more vulnerable for tooth erosion due to vomiting which is common in the early months of pregnancy. The contents of the stomach which can be very acidic can damage the tooth surface, softening the enamel ¹⁶.

Gingival changes during pregnancy have been well-documented ¹⁷⁻²⁰. Pregnancy is a time in which secretions of many hormones take place. The clinical manifestation of plaque-induced gingival inflammation is modulated by hormonal imbalances that occur during pregnancy ²¹. Increases in both the rate of oestrogen metabolism by the gingiva and the synthesis of prostaglandins contribute to the gingival changes observed ²¹. These gingival changes are pain, swelling and bleeding of a pregnant woman's gums.

Recent studies indicate that gingival changes during pregnancy are reversible and do not proceed to advanced periodontal disease. However during pregnancy the probing pocket depth of the gingiva and bleeding on probing of the gingiva increases ¹⁹. In non-controlled cases a development of pyogenic granuloma can be observed ²⁰. Therefore maintaining the health of the oral cavity is important during pregnancy.

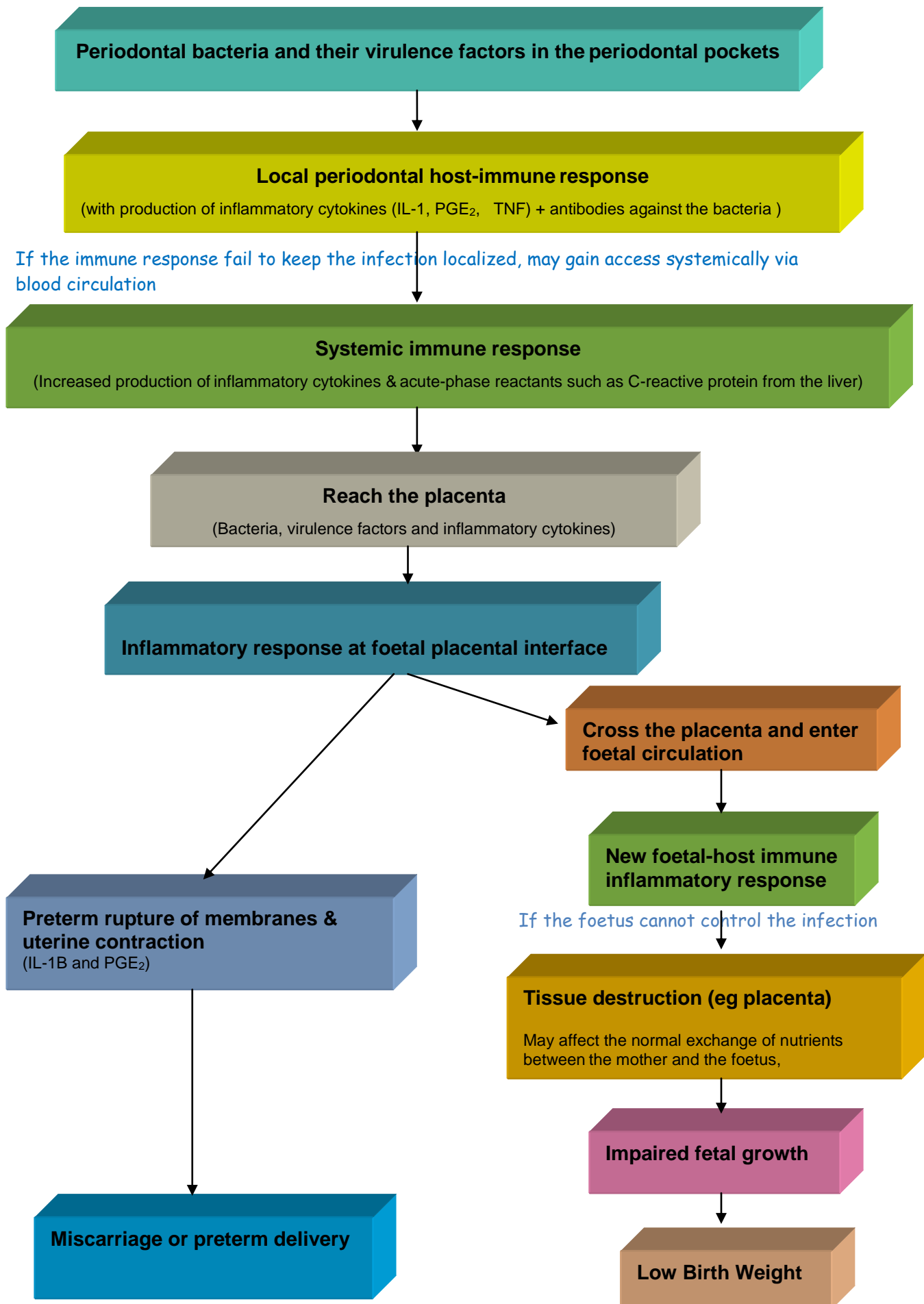
Effect of oral health on pregnancy

Periodontal disease is an infectious disease induced by gram-negative bacteria. It affects between 74-88% of the women of the reproductive age group in Sri Lanka¹. Periodontal disease causing bacteria accumulate in the gingival crevice of teeth in the absence of adequate oral hygiene forming a bacterial biofilm. Biofilms are a complex community of microorganisms characterized by the excretion of an adhesive and protective extracellular matrix, microbe-to-microbe attachment, structural heterogeneity, genetic diversity, and complex community interactions. Bacteria growing in dental biofilms display an increased tolerance to antibiotics and antimicrobial agents, including those used in dentifrices and mouth rinses ²¹.

In mature biofilms, the bacteria possess a plethora of virulence factors, including lipopolisaccaride (LPS) that may cause direct destruction to the periodontal tissues or stimulate the host to activate a local inflammatory response that although intended to eliminate the infection, also may lead to further loss of periodontal structures²². Moreover, bacteria and their shed virulence factors may enter the bloodstream, disseminate throughout the body and trigger the induction of systemic inflammatory responses²³.

Studies suggest that periodontal disease may cause adverse pregnancy outcomes such as preterm/low birth weight babies²³⁻³⁴. Xiong et al in 2007 carried out a meta-analysis of 44 studies to assess the relationship between periodontal disease and adverse pregnancy outcomes. Out of these 44 studies, 29 suggested an association between periodontal disease and increased risk of adverse pregnancy outcome and 15 found no evidence of an association.

The possible mechanism for development of periodontal disease induced adverse pregnancy outcomes has been suggested on the basis of current evidence.



There had been significant variations in the study type, sample size, criteria used to define periodontal disease and outcomes, inadequate control for confounding factors and possible effect modification. These variations make it difficult to base meaningful conclusions on published data. However there are indications for an association between periodontal disease and adverse pregnancy outcomes.

Many researchers are of the view that large multicenter randomized-controlled trials are needed to determine if prevention or treatment of periodontal disease, perhaps combined with other interventions, has an effect on adverse pregnancy outcome in these women ^{24,26,31}. Nevertheless providing periodontal treatment during pregnancy also has other benefits such as prevention of pregnancy induced inflammation of the gingiva and pyogenic granuloma.

Periodontal disease is a chronic disease in its own right irrespective of whether or not it is associated with adverse general health outcomes. It is not desirable for a pregnant woman to have significant amounts of oral disease whatever form this may take. Consequently there is a need to control periodontal disease in pregnant women.

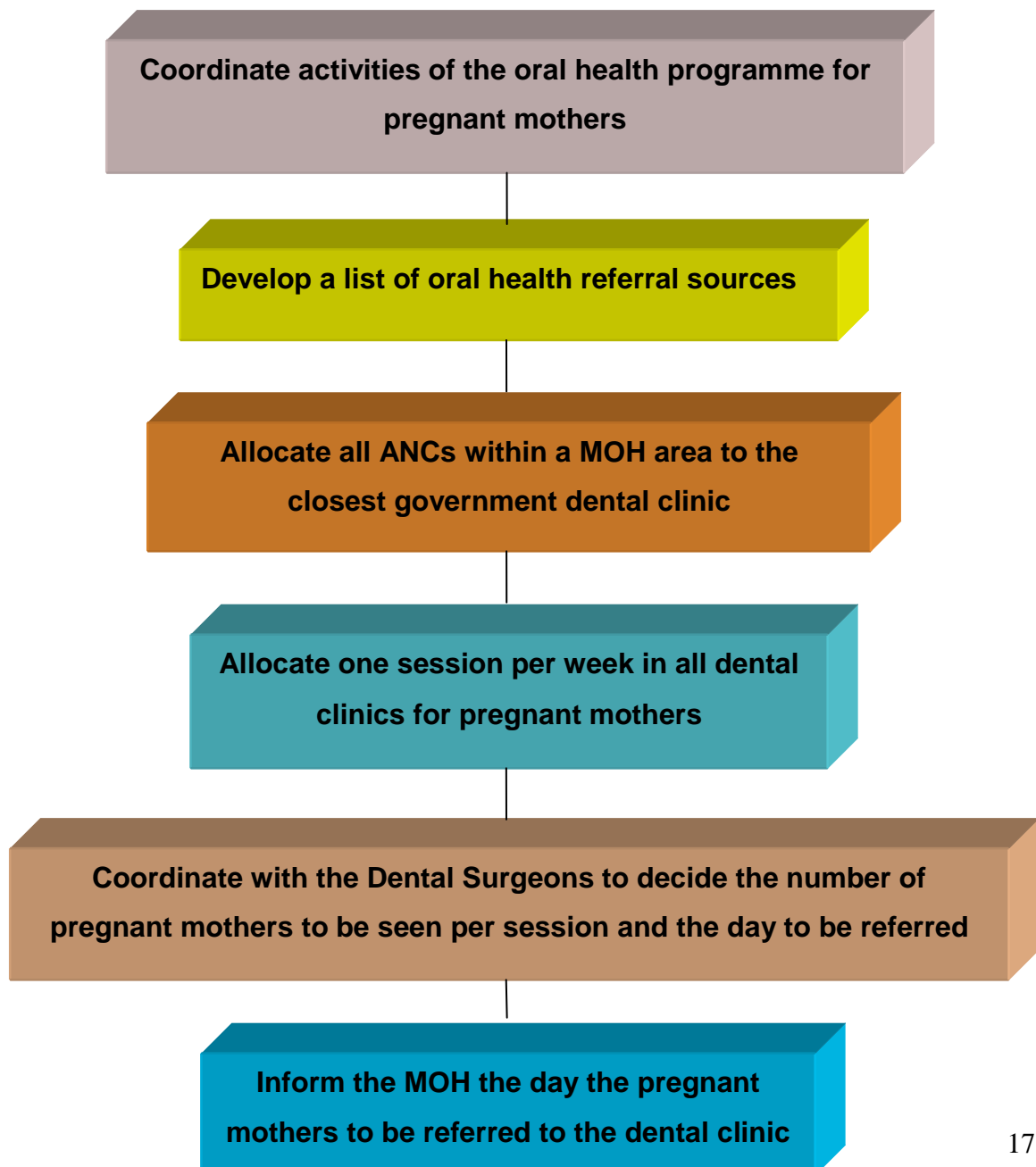
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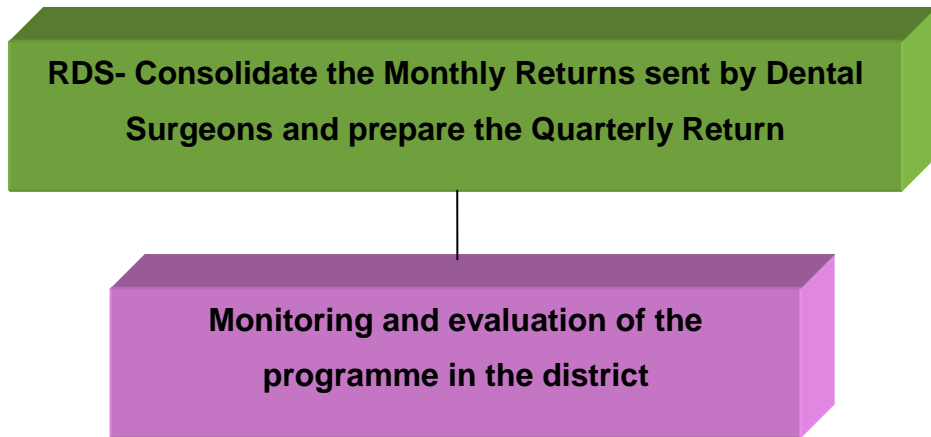
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ROLE OF RDS & MOMCH IN THE ORAL HEALTH PROGRAMME FOR PREGNANT MOTHERS

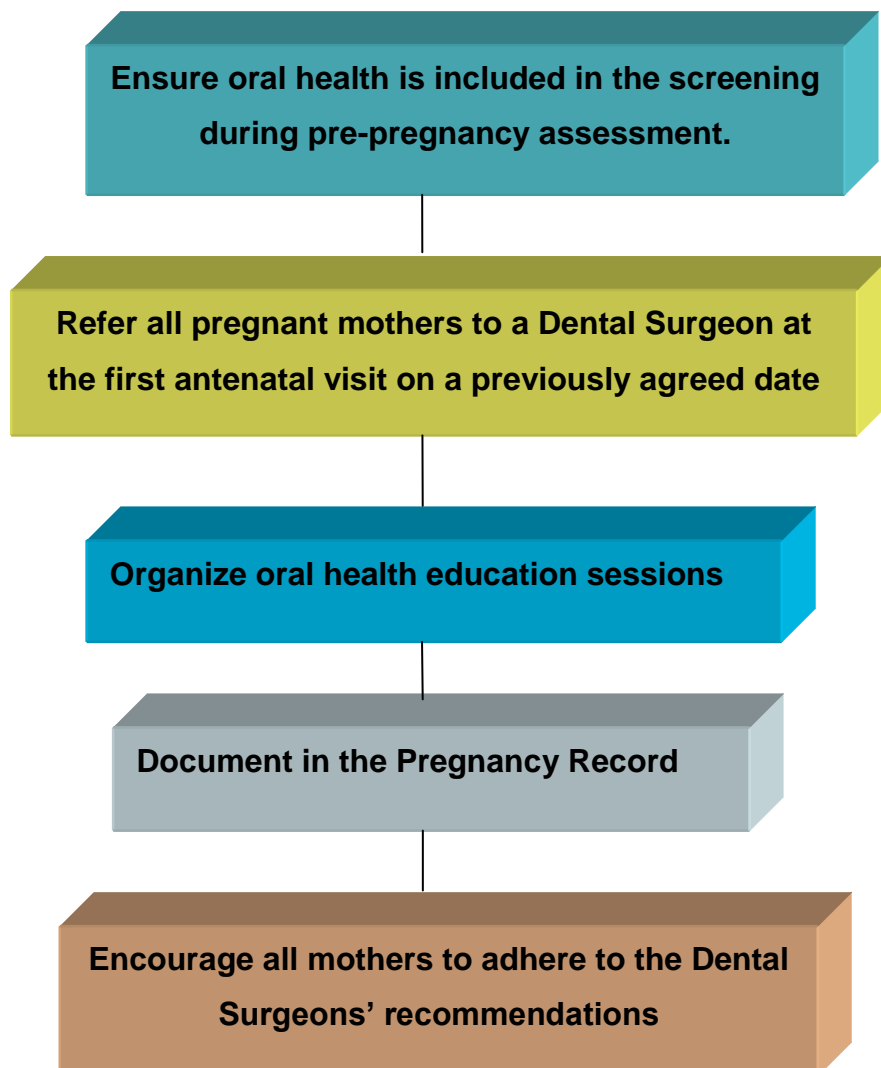
It is recommended that oral health should be an integral part of antenatal care. During pregnancy, a woman has at least 5 contacts with the primary health care team. Pregnant mothers are more amenable for receiving health messages and behaviour change during this period especially when they are made aware that oral health can affect the health of the child. The MOMCH being the district level manager for provision of MCH care and the RDS for oral healthcare, the panel recommended the following activities to be carried out by them.





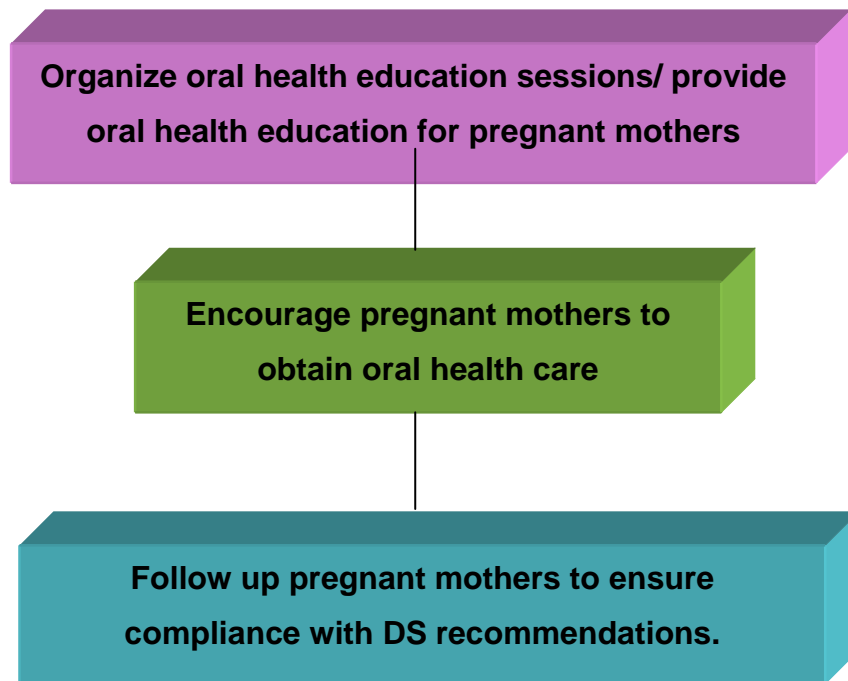
ROLE OF MOH IN THE ORAL HEALTH PROGRAMME FOR PREGNANT MOTHERS

MOH being the leader of the primary health care team should take the leading role in the implementation of the programme. The MOH can be very influential in encouraging pregnant mothers to maintain a high level of oral hygiene, to visit a dental surgeon and obtain all treatment recommended by the dental surgeon. The panel recommended the following activities to be carried out by the MOHs.



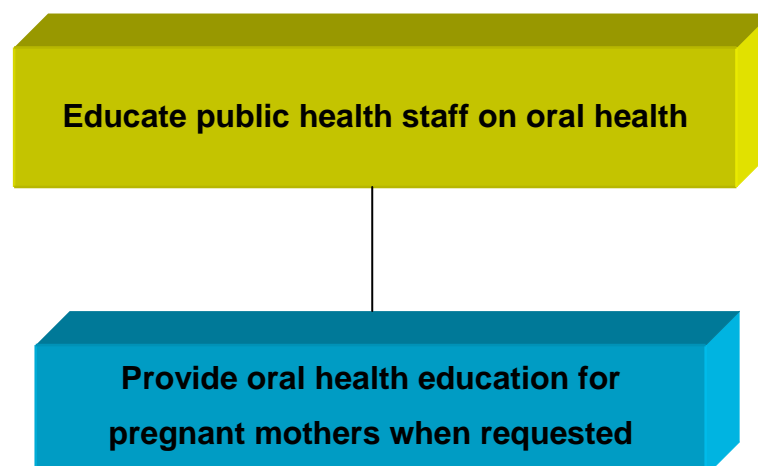
ROLE OF PHM IN THE ORAL HEALTH PROGRAMME FOR PREGNANT MOTHERS

PHM being the grass root level healthcare provider responsible for delivery of maternal and child health, the panel identified the following activities to be carried out by her.



ROLE OF SDT IN THE ORAL HEALTH PROGRAMME FOR PREGNANT MOTHERS

The main target group of SDTs is children between 3-13 years of age but they are responsible for creating oral health awareness among all members of the community. Therefore the panel recommended the following role for SDTs in this programme.



ROLE OF DS IN THE ORAL HEALTH PROGRAMME FOR PREGNANT MOTHERS

The role of dental surgeon includes providing preventive and curative care and anticipatory guidance for pregnant mothers. Dental surgeons should render all needed services to pregnant mothers because:

- Pregnancy by itself is not a reason to defer routine dental care and necessary treatment for oral health problems;
- During the first trimester diagnosis and treatment can be carried out safely;
- Needed treatment can be provided throughout pregnancy; however, the optimal period would be between the 14th and 20th week of pregnancy.

Pregnant mothers would be referred from antenatal clinics to the closest government dental health institutions. These are government hospitals, community dental clinics and adolescent dental clinics.

During the visit to the dental clinic, patients are examined for dental caries, periodontal disease, impacted, unerupted or fractured teeth and other problems. Some patients may require extensive treatment, such as root planning to control periodontal disease, root-canal therapy or extractions of teeth. Dental procedures such as bridgework and cosmetic dentistry should be deferred until the pregnancy is completed.

The government dental surgeons are advised to develop a mechanism for pregnant mothers to obtain oral healthcare in government dental clinics on a priority basis without having to wait in queues.

All hospital/ community and adolescent dental clinics should allocate a specific time (one session per week) for pregnant mothers. Dental surgeons in government dental clinics are required to provide appropriate and adequate care to the pregnant mothers when referred by the MOH.

PROCEDURE TO BE FOLLOWED BY DENTAL SURGEONS AT THE FIRST VISIT TO THE DENTAL CLINIC

- ▶ Enable pregnant mothers to obtain priority oral health care from government dental clinics.
- ▶ Screen and treat at least 10 pregnant mothers per week by all Dental Surgeons in hospital dental clinics.
- ▶ Record information regarding the chief complaint, other complaints, medical history, history of drugs and present medication. This information should be available to the MOH, VOG providing antenatal care.
- ▶ Perform clinical examination.
- ▶ Develop a comprehensive treatment plan that includes preventive and maintenance care and discuss the plan with the patient.
- ▶ Provide oral health education to pregnant mothers to improve their oral and general health and that of the newborn.
 - ▶ Brush teeth twice daily with a fluoridated toothpaste.
 - ▶ If there is hyperemesis brush at a convenient time when nausea is minimal.
 - ▶ Rinse the mouth thoroughly after vomiting to prevent the acidic contents of vomit damaging the enamel.
 - ▶ Limit food containing sugar to mealtimes.
 - ▶ Choose fruit rather than fruit juice to meet the recommended daily fruit intake.
 - ▶ Avoid carbonated beverages during pregnancy.
 - ▶ Obtain necessary dental treatment before delivery.
- ▶ Record the relevant details of the pregnant mothers seen by the Hospital DSS in the format provided and forward the returns to the RDS monthly.

MANAGEMENT OF ORAL HEALTH PROBLEMS IN PREGNANT MOTHERS

- ▶ Consult the obstetrician 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
 - ▶ Anaesthesia other than infiltration or local block (intravenous sedation or general anaesthesia) to complete the dental procedure.
- ▶ Implement best practices in the assessment of caries and management of caries in pregnant mothers.
- ▶ Avoid taking x-rays unless it is absolutely essential.
- ▶ Perform a basic gingival and periodontal examination.
- ▶ Consider the following strategies to decrease maternal cariogenic bacterial load:
 - ▶ Suggest using fluoride toothpaste.
 - ▶ Restore untreated caries.
 - ▶ Recommend chlorhexidine mouth rinses and fluoride varnishes as appropriate.
- ▶ List of procedures that may be carried out includes;
 - ▶ Uncomplicated restorations using amalgam, GIC, composite-chemical or light cured and zinc oxide - eugenol cement
 - ▶ scaling, polishing and root planning

- ▶ Extractions when in the opinion of the Dental Surgeon there is a probability of an acute infection occurring during pregnancy
- ▶ Any emergencies such as trauma to dental tissues Eg. Fracture of teeth, soft tissue lacerations
- ▶ Follow the guidelines provided when prescribing drugs.
- ▶ Complete restorations with permanent materials if possible during pregnancy.
- ▶ Mothers with symptomatic caries or deep decay should be treated promptly at any time during pregnancy.
- ▶ Complete all necessary dental procedures prior to delivery.

Record keeping

- ▶ Maintain a separate register (Pregnant Mothers' Register) in the format provided to enter the details of pregnant mothers.
- ▶ Record the necessary details of the pregnant mothers seen by the dental surgeons;
 - ▶ in the Pregnant Mothers' Register and
 - ▶ in the 'Oral Health Record of Pregnant Mothers'.
- ▶ Oral Health Record of Pregnant Mothers should be handed over to the patient.
- ▶ Send a Monthly Return to the RDS.

Prescribing commonly used drugs in dentistry

Given below is the list of commonly used drugs in dentistry which are safe to use during pregnancy. Dental surgeons are advised to use caution in prescribing drugs to pregnant mothers.

Safe drugs during pregnancy

Category	Drug
Antibiotics	Penicillins Ampicillin Amoxycillin
	Clavulanic acid
	Cefalexin
	Cefuroxime
	Clindamycin
	Erythromycin- except esolate form
Anti fungals	Econazole
Analgesics	Paracetamol

Other commonly used drugs in dentistry with possible unwanted effects with the comment given in the British National Formulary 2008 are in Annexure II.

Taking x-rays

Diagnostic x-rays can be used during pregnancy. Literature suggests that diagnostic x-rays are safe during pregnancy¹⁻⁴ provided there is shielding for the pregnant woman's abdomen and neck from x-ray exposure in the dental clinic. Although the safety of radiation exposure during pregnancy is a common concern, a missed or delayed diagnosis can pose a greater risk to the woman and her pregnancy than any hazard associated with ionizing radiation.

The usual x-rays taken in a dental clinic are bitewing or periapical views with the x-ray film in the mouth. The number and the type of x-rays will depend on the clinical procedure. The mean skin exposure from a typical dental x-ray is approximately 0.1mrad. A full mouth series of 22 dental x-rays will result in a total exposure of 2.2mrad¹.

Most diagnostic procedures expose the embryo to less than 5 rad or 50 mSv. This level of radiation exposure will not increase reproductive risks (either birth defects or miscarriage) ^{2,3}. According to published information, the reported dose of radiation to result in an increase incidence of birth defects or miscarriage is above 20 rad or 200 mSv ³.

This shows that even if a full set of 22 dental x-rays were taken the exposure level remains well below the safety standard. According to the American College of Radiology and Health Physics Society no single diagnostic procedure results in a radiation dose significant enough to threaten the well being of the developing embryo and foetus ⁴.

However, the panel after giving due consideration to all these facts, common perceptions among people and health care providers and the standard of maintenance of the x-ray equipment in institutions, recommended that dental x-rays should be taken only if absolutely essential with adequate protection to the pregnant mothers abdomen and the neck.

Use of local anaesthesia

Lidocaine/ lignocaine with epinephrine is considered safe during pregnancy ⁵. Lidocaine with epinephrine prolongs the length of anaesthesia because the drug is absorbed slowly. There is a theoretical concern about the effect of epinephrine on uterine muscle. No scientific studies however could be found to confirm this effect in pregnant women.

Reproduction studies have been performed in rats at doses up to 6.6 times the human dose and have revealed no evidence of harm to the foetus caused by lidocaine. There are, however, no adequate and well-controlled studies in pregnant women. Animal reproduction studies are not always predictive of human response. General consideration should be given to this fact before administering lidocaine to women of childbearing potential, especially during early pregnancy when maximum organogenesis takes place ⁶. The frequency of malformations was not increased among reviews of almost 300 children whose mothers were given Lidocaine during early pregnancy ^{7,8}.

Positioning of pregnant mother in the dental chair

When the pregnant woman lies flat on her back, the uterus in the third trimester can 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 the 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 side moves the uterus off the vena cava⁹. This intervention can easily be done in the dental chair. *In addition, it is recommended that a pregnant woman's head should not be lower than her feet while performing dental procedures.*

Timing of dental treatment

Needed oral health treatment could be provided anytime during the pregnancy⁷. Traditionally all non-emergency treatments are postponed by antenatal care providers until the first trimester has passed. This practice has been based on theoretical concerns for potential harm to the foetus during the period of organogenesis. There is no compelling evidence that precludes dental treatment anytime during pregnancy including the first trimester. The early second trimester is the ideal time to perform all dental procedures. At this stage in gestation, the threat for teratogenicity has passed, nausea and vomiting are less common and the uterus is not large enough to cause discomfort. Another reason for completing treatment is that some pregnant women may require general anaesthesia with intubation at delivery. Because pre-anaesthesia evaluation usually occurs at the time of labour, problem such as loose teeth and temporary restorations should be remedied prior to the estimated date of delivery.

Co-morbid conditions that may affect management of dental problems

Hypertensive Disorders of Pregnancy

Dental surgeons should be aware of hypertensive disorders because of increased risk of bleeding during procedures and should consult with the antenatal care provider before initiating dental procedures in mothers with

uncontrolled severe hypertension. Blood pressure values of greater than or equal to 140/90 mmHg are considered mild hypertension and values greater than or equal to 160/110mmHg are considered severe hypertension ¹⁰. Hypertensive disorders of pregnancy, including chronic or pre-existing hypertension and the development of hypertension during pregnancy, occur in 12-22% of pregnancies. Up to 5% of pregnant mothers have chronic hypertension ¹¹. By definition chronic hypertension is diagnosed prior to pregnancy or during the first 20 weeks of gestation.

Pre-eclampsia 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 pre-eclampsia. The diagnostic criteria for superimposed pre-eclampsia include new onset proteinuria in a woman with diagnosed chronic hypertension. Pre-eclampsia occurs in 5-8% of pregnancies ¹⁰.

Diabetes and pregnancy

Gestational diabetes (type III diabetes) is most commonly diagnosed after 24 weeks of gestation. Pre-existing type II diabetes, characterized by insulin resistance, is more likely to continue after delivery especially if the woman is obese. Type I diabetes with underlying autoimmune pathogenesis may also be initially diagnosed during pregnancy.

There is growing acceptance that diabetes is associated with increased occurrence and progression of periodontitis—so much so that periodontitis has been called the “sixth complication of diabetes” ¹². The risk is independent of whether the diabetes is type 1 or type 2.

Some investigators have reported a two-way connection between diabetes and periodontal diseases, proposing that not only are diabetic patients more susceptible to periodontal disease, but the presence of periodontal disease affects glycaemic control ¹³.

Experimental studies suggest that hyperglycaemia is the major teratogen in diabetic pregnancies, but other diabetes-related factors may also affect foetal

outcomes. Teratogenicity is associated with pre-existing and gestational diabetes¹⁴.

Women with diabetes should be offered pre-conception counselling with a multidisciplinary team to optimize general health and glycaemic control and to review the risks of congenital anomalies.

Risk of aspiration

Pregnant women have delayed gastric emptying due to hormonal changes and incompetent oesophageal valve⁸. Thus pregnant mothers are at increased risk for aspiration. Therefore prophylactic measures to prevent aspiration should be used particularly during the third trimester. A woman with multiple gestations is at increased risk of aspiration in the mid second trimester because of large uterus. Maintaining a semi seated position and avoiding excessive sedation are required to prevent aspiration.

Mercury fillings and human health problems

At present there is no evidence that the exposure of the foetus to mercury released from the mother's existing fillings causes any adverse effect¹⁵⁻¹⁸. There is international agreement that the scientific data do not confirm the presence of a significant health hazard from the use of dental amalgam.

Dental amalgam is the most common material used for repairing a posterior tooth. Resins (Composites), glass-ionomer cement, gold or porcelain restorations are alternative material. Dental amalgams are often more durable than resin or glass-ionomer fillings and less costly than gold or porcelain restorations. But little is known about any of these materials in relation to pregnancy¹.

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 outcomes¹⁵. One concern raised by several studies is that mercury exposure during pregnancy may lead to decreased birth weight. A population-based, case-control study found no evidence that mercury-

containing dental fillings placed during pregnancy increased low-birth-weight risk¹⁶ or other adverse outcomes¹⁷.

The elemental mercury found in dental amalgams is different from methyl mercury, a form of organic mercury. The consumption of fish and sea food is the major source of organic mercury. The ingestion of methyl mercury during pregnancy is more of a concern than mercury released from dental amalgams¹. All health professionals should educate women about the potential harm that can accrue from untreated caries during pregnancy. Mothers with symptomatic caries or deep decay should be treated promptly at any time during pregnancy.

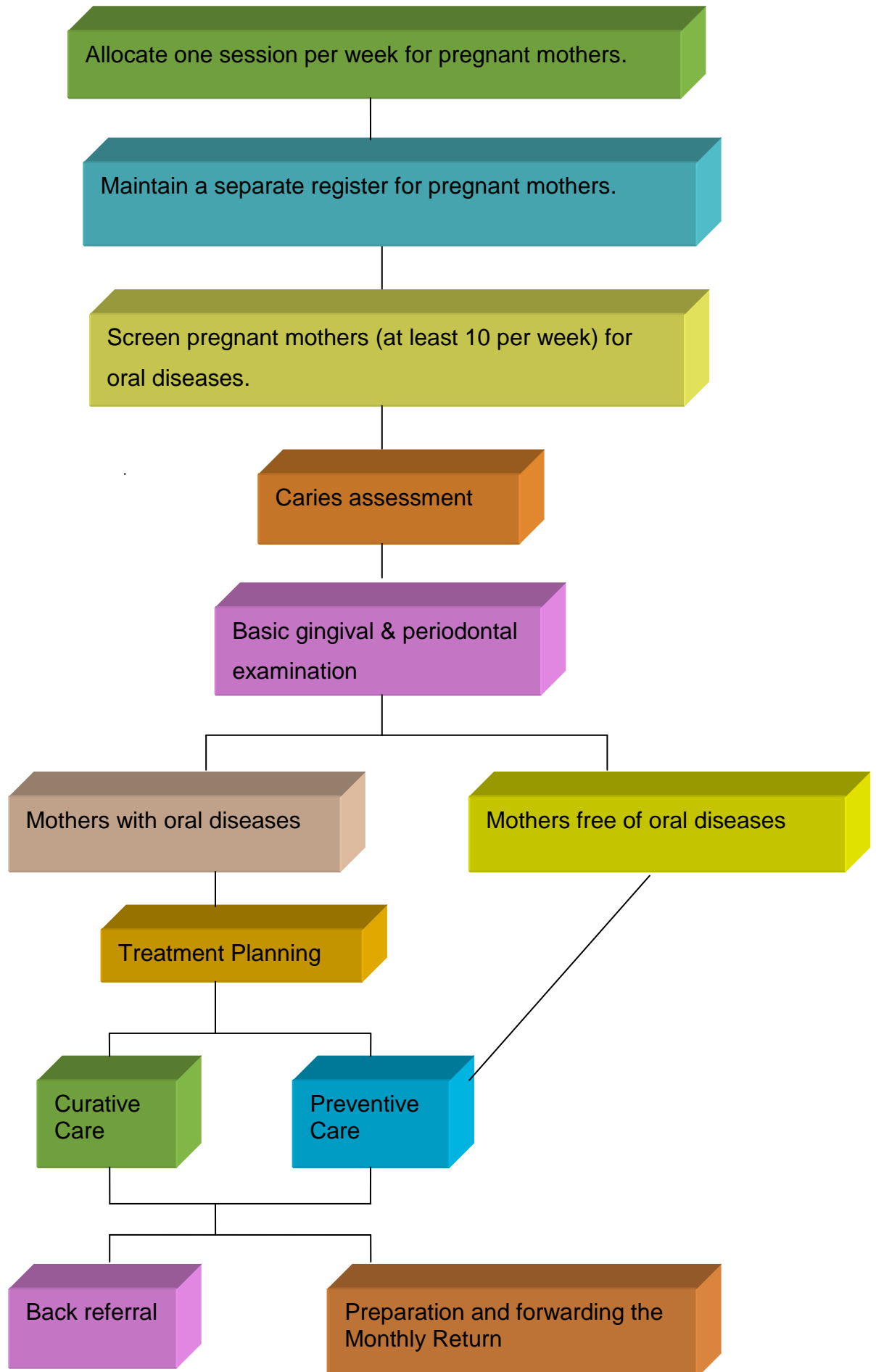
Prophylactic Antibiotics During Pregnancy

Pregnancy in and of itself is not an indication for prophylactic antibiotics during dental procedures, although bacteraemia can occur as a result of dental procedures. Transient bacteraemia is well documented following such procedures as tooth extractions, gingivectomy, supra-and subgingival scaling, ultrasonic scaling and subgingival irrigation¹⁹⁻²¹.

However some studies suggest that the impact of bacteraemia resulting from a single-tooth extraction may be less than the effect of tooth brushing, given the greater frequency for oral hygiene, for individuals at risk for infective endocarditis^{22,23}. While the occurrence of bacteraemia is common following dental procedures, clinical trials have not reported any adverse effects of dental interventions on pregnant mothers¹.

Criteria for prescribing antibiotics to prevent sub acute bacterial endocarditis are the same for pregnant mothers as they are for all individuals. Antibiotics are used prophylactically to prevent sub acute bacterial endocarditis in all patients at increased risk.

Dental surgeons are advised to obtain guidance from the VOG and cardiologist before commencing any treatment on a pregnant mother with a risk of developing sub acute bacterial endocarditis.



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Annexure 1

Important facts that should be mentioned during health education for pregnant mothers

- Oral health is important for general health
- Dental treatment is safe and effective during pregnancy.
- Needed treatment can be provided throughout pregnancy: however, the time period between the 14th and 20th week is ideal
- Delay in necessary treatment could result in significant risk to the mother and indirectly to the fetus.
- Commonest disease in childhood is dental decay.
- Three things are required for dental caries activity to become established and progress:
 - one or more susceptible tooth surfaces,
 - cariogenic bacteria, and
 - fermentable carbohydrates (particularly sugar).
- These caries causing bacteria are transmitted to the newborn from those who are in closest contact typically the mother.
- Treatment of oral diseases in pregnant mothers significantly reduces the rate of transmission
- Calcium is not removed from teeth for the development of the foetus
- Existing oral diseases could be aggravated during pregnancy
- Studies suggest that periodontal disease may cause adverse pregnancy outcomes

Oral health messages to be given to pregnant mothers regarding their oral health

- Brush teeth twice daily with a fluoridated toothpaste
- Limit food containing sugar to mealtimes
- Choose fresh fruits, lightly cooked vegetables or whole grain foods for snacks
- Those who are experiencing frequent nausea and vomiting
 - Brush teeth at a convenient time when nausea is minimal
 - Rinse the mouth thoroughly after vomiting to remove the residual acid that may damage the enamel
- Obtain necessary dental treatment during pregnancy

Oral health messages to be given to mothers regarding oral health of children

- Caries can start when teeth erupt.
- Avoid bottle feeding.
- Avoid constant use of sippy cups.
- Avoid saliva sharing behaviors such as sharing a spoon when tasting baby food.
- Start brushing from the day the first tooth appears in the mouth with cloth or soft brush.
- Wipe an infant's teeth after feeding, especially along the gum line with a soft cloth or soft bristled toothbrush.
- Supervise children's brushing and use a small amount of fluoridated toothpaste.
- Children should be encouraged to spit out the excess toothpaste after brushing to prevent ingestion of large doses of fluoride.
- Excess toothpaste should not be swallowed.
- Children should not rinse after brushing as the very small amount of toothpaste left in the mouth, after spitting, continues to protect against tooth decay.
- Delay introducing sugar as long as possible.
- Reduce the frequency and amount of sugar intake to a minimum so that the child does not develop a craving for sugar.
- Limit sweets to mealtimes.
- Avoid frequent snacking of sugary foods.
- Avoid excessive intake of juices and fizzy drinks .
- Avoid saliva sharing behaviors between children via their toys pacifier etc.
- Lift the lip and check for decay- white or brown spots along the gum margin mainly in front teeth.
- Visit a dental surgeon between 6-12 months of age.

Annexure II

Other commonly used drugs in dentistry with possible unwanted effects during pregnancy

Category	Drug	Comment
Antibiotics	Azithromycin-	Manufacturer advises use only if adequate alternatives not available
	Metronidazole-	Manufacturer advises avoidance of high-dose regimes
	Co-trimoxazole-	Teratogenic risk. Neonatal haemolysis and methhaemoglobinaemia
	Tetracycline Doxycycline	Effects on skeletal development in animal studies Dental discolouration, maternal hepatotoxicity with large parental doses
	Chloramphenicol	Neonatal grey syndrome
	Ciprofloxacin Ofloxacin	Avoid. Arthropathy in animal studies. Safer alternatives available
Anti fungals	Nystatin	No information available, but absorption from gastro-intestinal tract negligible
	Miconazole	Manufacturer advises avoid if possible-toxicity at high doses in animal studies
	Ketoconazole	Manufacturer advises avoid unless potential benefit outweighs risk. (teratogenicity in animal studies)
Analgesics	NSAIDs Diclofenac sodium Ibuprofen Mefenamic acid Indomethacine	Most manufacturers' advice avoid (or avoid unless potential benefit outweighs risks): ketorolac contraindicated during pregnancy. With regular use closure of foetal ductus arterioses in utero and possibly persistent pulmonary hypertension of the newborn. Delayed onset and increased duration of labour.
	Opioid analgesics Pethidine, Codeine Diamorphine	Depress neonatal respiration; withdrawal effects in neonates of dependent mothers; gastricstasis and risk of inhalation pneumonia in mother during labour.

	Aspirin	Impaired platelet function and risk of haemorrhage: delayed onset and increased duration of labour with increased blood loss; Avoid analgesics doses if possible in last few weeks. (Low doses probably not harmful.) With high doses, closure of foetal ductus arteriosus in utero and possibly persistent pulmonary hypertension of newborn: kernicterus in jaundiced neonates.
Other	Benzodiazepines Diazepam	Avoid regular use: (risk of neonatal withdrawal symptoms)
	Lignocaine	With large doses, neonatal respiratory depression, hypotonia, and bradycardia after paracervical or epidural block
	Corticosteroids Hydrocortisone Dexamethasone Triamcinolone Prednisolone	Risk of intrauterine growth restriction on prolonged or repeated systemic treatment
	Anti histamines Chlorpheniramine	No evidence of teratogenicity; embryo toxicity in animal studies with high doses of hydroxyzine and loratadine: Manufacturers of cetirizine, cinnarizine, desloratadine, dimenhydrinate, hydroxyzine, ketotifen, loratadine and mizolastine advise avoid.
	Tranexamic acid	No evidence of teratogenicity in animal studies. Manufacturer advises use only if potential benefit outweighs risks- crosses the placenta

Annexure III
ORAL HEALTH RECORD OF PREGNANT MOTHERS

Referred to: Date:

Patient Name: Age:

EDD: Week of Gestation today:

MEDICAL HISTORY

Known allergies	<input type="text"/>	Diabetes	<input type="text"/>
Asthma	<input type="text"/>	Epilepsy	<input type="text"/>
Bleeding Disorders	<input type="text"/>	Hypertension	<input type="text"/>
Cardiac disease	<input type="text"/>	Rheumatic fever	<input type="text"/>

High risk/ Normal Pregnancy: Special precautions if any:

.....

Referred by: Signature:

This section is to be filled by the MOH

DENTAL HISTORY

Complications related to past dental treatment:

.....

This section is to be filled by the DS

EXAMINATION

Extra Oral: Normal/ Abnormal (Specify)

Intra Oral:

BASIC PERIODONTAL EXAMINATION				Index		
	8-4	3-3	4-8		=	
3 rd examination	<input type="text"/>	<input type="text"/>	<input type="text"/>	No bleeding or pocketing detected	=	0
2 nd examination	<input type="text"/>	<input type="text"/>	<input type="text"/>	Bleeding on probing - no pocketing > 3.5mm	=	1
1 st examination	<input type="text"/>	<input type="text"/>	<input type="text"/>	Plaque retentive factors present - no pocketing > 3.5mm	=	2
1 st examination	<input type="text"/>	<input type="text"/>	<input type="text"/>	Pockets > 3.5mm but <5.5mm in depth	=	3
2 nd examination	<input type="text"/>	<input type="text"/>	<input type="text"/>	Pockets > 5.5 mm in depth	=	4
3 rd examination	<input type="text"/>	<input type="text"/>	<input type="text"/>			

Record the highest score for the sextant.

CARIES STATUS

<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Index		
No caries	=	<input type="text"/>
Caries	=	X

SPECIAL INVESTIGATIONS

TREATMENT PLAN

Dental Caries

Index

8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8	

Healthy/ Restored/Missing	=	
Needs Simple Restoration	=	S
Needs Advanced Restoration	=	A
Needs Extraction	=	E

TREATMENT

Referred to Consultant:

Reason for referral:

Referred by: DS/.....

Signature:

Date:

Consultants Observations and Remarks:

