Perinatal Oral Health: 
Clinical Guidelines & Best Practices

Dental Care During Pregnancy

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Objectives

• Understand effect of maternal oral health on families
• Describe why pregnancy provides opportunity to provide oral health interventions for women
• Learn elements of clinical prevention and treatment guidelines for pregnant women
• Learn practical tips for making dental care more comfortable for patient AND provider
Impact of Maternal Oral Health on Families
Periodontal Disease
Etiology of Periodontitis

• Toxic products from bacteria in gingival crevice induce immune-system modulated processes that result in destruction of supporting bone
• Chronic disease process. Bone loss can occur in “episodes” throughout life
• Essentially an inflammatory process
Etiology of Periodontitis

• Multiple gram-negative species consistently associated with periodontitis
  – *Porphyromonas gingivalis*
  – *Actinobacillus actinomycetemcomitans*
Disease Response to Bacterial Plaque

- Fatty acids
- FMLP
- LPS
- IL-8

Low
- IL-10
- TGF-β
- IL-1ra
- TIMPs

High
- TNFα
- IL-6
- IL-1β
- IFN-γ
- PGE2
- MMPs
Periodontal Disease Definition

• **Moderate**- At least two teeth with interproximal attachment loss of $\geq 4$ mm or at least two teeth with $\geq 5$ mm of pocket depth at inter-proximal sites (*CDC, AAP*)
Moderate Periodontal Disease Prevalence
(1+ sites with Loss of Periodontal Attachment (LPA) 4+ mm)

Epi: Attachment loss > 6mm by race/ethnicity

Lack of Consistency

• Early studies were not consistent with clinical criteria
  – Impacts disease prevalence results
  – Makes it hard to compare studies
  – Definition of periodontitis may determine statistical significance of the association between periodontitis and adverse pregnancy outcomes (Kassab et al, 2011)
Periodontitis & Pregnancy

- **Case control** (Offenbacher et al 1996, Goepfert et al 2004)

- Both showed association between periodontitis and LBW, pre-term birth or preclampsia
- Known risk factors- smoking, race, alcohol, entry into care, maternal age etc. controlled
Definitions

• Preclampsia (ACOG)
  – Increased diastolic blood pressure
  – Proteinuria
  – HELLP syndrome (hemolysis, elevated liver enzymes, and low platelet counts)

• Prematurity (WHO)
  – 23rd to 37th weeks of gestation
Meta-Analysis of Associations
(Matevosyan, 2011)

- 125 studies between 1998-2010
- Maternal periodontal disease remains associated with perinatal adverse outcomes
  - Preclampsia
  - Prematurity
Periodontitis & Pregnancy Mechanisms

- Circulating periodontal bacteria induce activation of maternal immune responses-lead to cytokine production, release of prostaglandins *(Offenbacher 1998)*

- Periodontal bacteria & toxins cross the placental barrier colonize feto-placental unit, trigger inflammatory response and preterm birth *(Bobetsis 2006)*
  - *Studies find porphyromonas gingivalis in amniotic fluid*
Inflammation

- Pregnant women with periodontitis had higher C-reactive protein (C-RP) levels than periodontally healthy (Pitiphat et al, 2006)
- Plasma prostaglandin E(2), Interleukin (IL)-1 beta, Tumor necrosis factor-a
- PGE2 is a key mediator in labor/birth process
Randomized Clinical Trials

- Can prove or disprove causality
- Association vs. causality
- Control vs. Intervention
- Most intervention was in 2\textsuperscript{nd} tri-mester
- S & RP w/ anesthesia
OPT& Results

- Obstetrics and Periodontal Therapy (OPT) Study
  - Nov. 2006 NEJM
  - 410 control, 413 Tx group @ 4 US sites
  - No significant difference between Tx and control groups in number of pre-term births (<37 weeks)

- MOTOR
  - Sept. 2009 Obstet Gynecol
  - 1,800 subjects @ 3 US sites
  - No significant differences when the two groups were compared for obstetric or neonatal outcomes
Meta-Analysis of Clinical Intervention Trials

- Journal American Dental Association
  - 2010 Dec141(12): 1423-1434
- British Medical Journal
  - 2010 Dec 29;341:c7017
- Journal of Clinical Periodontology

- No effect on adverse birth outcomes
At the same time…

  - *F. nucleatum* isolated from placenta and stillborn fetus. Examination of microbial flora from mother identified the same clone in her subgingival plaque.
Underlying Molecular Mechanism Research Continues

- Periodontal pathogen Actinobacillus actinomycetemcomitans induces cell death in human placental trophoblasts (Li et al. Placenta 2011)
What we know…

- Association probably relates to inflammation in causal pathways
- Periodontitis in pregnancy is still a chronic disease/pathological state
- Periodontal health has a value in itself regardless whether there is a link with systemic disease
Routine Dental Treatment Safe

- Flip side is intervention studies showed routine dental treatment of periodontitis is safe during pregnancy

- Other routine dental care/procedures also safe (Michalowicz et al, 2008)
Dental Caries

- Dental caries, once acquired, is a chronic, ongoing disease PROCESS that must be managed throughout the life cycle
- Cavities are the RESULT or final disease endpoint of the dental caries process
- Multifactorial disease
- Primary cariogenic organisms
  - *Strep mutans & sobrinus*
  - *Lactobacilli*
Acquisition of Caries Causing Bacteria

- **Maternal transmission** of *strep mutans* during normal activities (feeding etc.) 

- Highest fidelity of transmission with mother

- DNA analysis shows same sequence in maternal and infant *strep mutans*
Strep Mutans Transmission
Epi: Prevalence of Coronal Caries Among Dentate Adults

NHANES 1999-2004
Early Childhood Caries

- Loss of function
- Failure to thrive \textit{(Elice and Fields 1990, Acs et al. 1999)}
- Unequal expenditure of resources for ER and hospital-based treatment \textit{(Ettelbrick, Webb and Seale 2000, Griffen et al. 2000)}
- Morbidity form treatment

- \textbf{Lifetime of caries} \textit{(Weinstein 1998)}
Early Childhood Caries Disparities

% 2-4 y/o Untreated Decay

Data Source: NHANES, 1999-2004, NCHS/CDC.
Influences on Children's Oral Health

Maternal Influence

• Diet
• Level of home care
• Importance of primary teeth & oral health
• Genetic & transmissibility components
Pregnancy Presents an Opportunity

- Introduce risk reduction & self management strategies for mom and child
- Stabilize maternal periodontal status
- Impact the cycle of *s. mutans* maternal transmission
Opportunity…

- At risk populations in contact with health care delivery system more frequently than usual
- Pregnant women may be interested in their oral health & open to health education messages
- May be only time have any type of dental insurance coverage
Dental Visits: 2002 PRAMS
Pregnancy Risk Monitoring System (CDC)
Dental Care Utilization

• Pregnant women receive dental care less frequently than the general female population (Jiang et al, 2008)

• Women with both private dental insurance and Medicaid coverage utilize dental care more frequently when they are not pregnant than when they are pregnant (Iida 2009, Thoele 2008)
Clinical Interventions
Guidelines

• Systematically developed statements to assist practitioner and patient decisions about appropriate health care for specific clinical circumstances \(\text{(IOM, 1990)}\)

• Recommendations based on evidence from rigorous systematic review and synthesis of published medical literature

• Define practices that meet the needs of most patients in most circumstances
2006 NY State Guidelines

Physician section:
Importance of oral health to pregnancy, responses to common concerns by dentists

Dentist section:
Evidence based recommendations and protocols for clinical treatment of pregnant women
“Because pain was so great she took ‘excessive doses’ (Tylenol) resulting in toxicity to her and her baby. At the time she was approximately 29 weeks pregnant. The baby died from liver toxicity. My patient suffered acute liver failure and was flown to Pittsburgh expecting a liver transplant.”
2010 California Guidelines

- California Dental Association Foundation
- American College of Obstetricians and Gynecologists, District IX
Need For Guidelines

• 2006 California Maternal and Infant Health Assessment (MIHA) data showed 35.1% pregnant women had a dental visit
• 53.8% stated they had an oral health problem during pregnancy, but of those 62.3% did not visit the dentist while pregnant
• Desire among both dentists and ObGyn’s for professional guidelines and education
Need For Guidelines- Patient

- Attitude towards dental treatment while pregnant
- Concerns regarding dental care not verbalized to perinatal providers
- Belief poor oral health status during pregnancy is normal
- Low awareness of importance of maternal oral health and relationship to infant’s long-term oral health
Need For Guidelines - Perinatal Providers

- Lack knowledge about the importance of oral health status
- Not performing routine assessment and referral of pregnant women into dental care
- Not enough information to provide rationale why attending dental visits is important & respond to concerns
Need For Guidelines - Dental Providers

• Insufficient training combined with lack of experience treating pregnant women in dental school
• Fear of malpractice suit if something goes wrong with a patient’s pregnancy
• Concerns about the safety of procedures
• Addressing patient perceptions of risk
Malpractice Myth

- TDIC - ten states & 17,000 insured dentists
- Reports one claim in the past 15 years blaming adverse birth outcome on dental treatment
  - No evidence for claim
Guidelines Development Process

• Advisory committee
• Nationally recognized experts
  – Periodontology, medicine (FM/Ob-Gyn/Radiology), ethics, environmental & occupational health, public health, cariology
• Experts write guidelines- best available evidence- 250 references!
• Guidelines reviewed & disseminated
Role of Perinatal Provider

• Ask about and assess oral health
• Facilitate oral health examination by identifying dental provider
• Facilitate treatment by providing written medical clearance
• Ask if any concerns & address. Inform dental care is safe and effective
San Francisco General Hospital and Trauma Center
Community Health Network

PRE/PERINATAL ORAL HEALTH REFERRAL

Date: ____________________________ Referral to Dental Clinic: ☐ Silver ☐ Chinatown ☐ Potrero ☐ S.E. SMHC ☐ Native American ☐ UOP

Reason for referral: ☐ Routine ☐ Bleeding gums ☐ Pain ☐ Other: ____________________________

Weeks gestation (at time of referral): ____________________________ Estimated delivery date: ____________________________ Patient Phone #: ____________________________

☐ This patient is cleared for routine evaluation and dental care, which may include but not be limited to:
  - Dental x-rays as needed for diagnosis (with abdominal and neck lead shield)
  - Oral health examination
  - Dental prophylaxis
  - Scaling and root planing
  - Restoration of untreated caries
  - Extractions
  - Standard local anesthetic (lidocaine with or without epinephrine)
  - Analgesics (if needed): Acetaminophen and/or Acetaminophen with codeine
    (Nonsteroidal anti-inflammatory drugs are not recommended during pregnancy)
  - Antibiotics (if needed and no known allergies): Penicillin, Amoxicillin, Cephalosporin, Clindamycin, Erythromycin-estolate form (Cipro and Tetracycline are not recommended during pregnancy)

Significant Medical Conditions: ☐ NONE ☐ YES (e.g., heart condition, liver disease, kidney disease, etc.)

Known Allergies: ☐ NONE ☐ YES Drug(s)/Reactions(s): ____________________________

Current Medications: ☐ NONE ☐ Prenatal Vitamins ☐ Iron ☐ Calcium ☐ OTHERS (PCP to attach updated list of active Rx with referral)

Any Precautions: ☐ NONE ☐ SPECIFY (List if any comments or instructions): ____________________________

Perinatal Care Provider (PCP)/print name: ____________________________ CHN #: ____________________________

Phone/ pager: ____________________________ PCP Fax #: ____________________________

PCP Clinic: ____________________________

Perinatal Care Provider:
1. Clerk or patient to call Dental Clinic for appointment. 2. Fax referral form to Dentists/Dental Clinic. 3. Give copy of referral form to patient to bring to dentist. 4. Place one copy in patient’s chart.

Dental Clinics:
Silver Ave 657-1785 FAX (657-1730 phone) Chinatown 291-8794 FAX (364-7636 phone)
Potrero Hill 855-1639 FAX (648-7609 phone) Southeast 822-3620 FAX (671-7066 phone)
SMHC 863-9900 FAX (626-2380 phone) Native American 621-1429 FAX (621-8056 phone)
UOP 351-7187 FAX (929-6501 phone - initial visit is a “first come/first served” drop-in, at 8 am & 1pm)

Dentist: Please fax back information (to PCP Fax # above) after initial dental visit:

Exam Date: ☐ Normal exam/recall ☐ Missed Appt.

☐ Needs additional treatment visits for: ☐ Caries ☐ Periodontitis ☐ Referral to OMFS/O Oral Surgery

Comments: ____________________________
Role of Dental Provider

- Same as any comprehensive care patient
- Exam & risk assessment
- Surgical intervention/treatment appropriate disease level
- Preventive activities including risk reduction self-management strategies
- Recall
Oral Conditions Unique to Pregnancy

- Pregnancy Gingivitis
- Pregnancy Epulis
- Erosion from morning sickness
Guidelines Consensus Statement

Prevention, diagnosis and treatment of oral diseases, including needed dental radiographs and use of local anesthesia, are highly beneficial and can be undertaken during pregnancy with no additional fetal or maternal risk when compared to the risk of not providing care.

*Pregnancy is not a reason to defer routine dental care or treatment of oral health problems.*
Key Findings

- No evidence relating early spontaneous abortion to first trimester oral health care or dental procedures.
- Not necessary to have approval from the prenatal care provider for routine dental care of healthy patient.
- Control of oral diseases in pregnant women has potential to reduce transmission of oral bacteria from mothers to their children.
Consult Indicated

- Co-morbidities that may affect management - diabetes, pulmonary issues, heart or valvular disease, hypertension, bleeding disorders, or heparin-treated thrombophilia
- Nitrous oxide needed for dental treatment
- Intravenous sedation or general anesthesia needed
Dentist’s Concerns for Surgical Intervention/treatment

• X-rays
• Emergency care
• Nitrous oxide
• Local anesthesia
• Restorative materials
• Medications
• Perception of patient discomfort
Adverse Pregnancy Outcomes

- Risk of pregnancy loss before 20 weeks: 15 - 25%. Most are not preventable.

- Risk of teratogenesis: up to 10 weeks
  - Rate of malformations: 3 to 4%
X-rays

• Radiographic imaging not contraindicated
  – Very low levels of radiation
  – Thyroid collar and abdominal apron
• Should be utilized as required to complete full examination, diagnosis and treatment plan
• Standard of care
Emergency Care

• Provide emergency/acute care at any time during pregnancy as indicated by oral condition
Nitrous Oxide

- Should be limited to situations where topical and local anesthetics are inadequate & care is essential
- Cost-benefit analysis
- Pregnant women require lower levels of nitrous oxide to achieve sedation
Local Anesthesia

• Local anesthetic with epinephrine when clinically indicated
Restorative Materials

• Amalgam
  – No evidence of harmful effect in population based studies and reviews (FDA 2009, CDC, NCI)
  – No additional risk if standard safe amalgam practices are used

• Resins
  – Short-term exposure associated with placement has not been shown to have health risk; data lacking on the effects of long-term exposures
Drugs in Pregnancy- Physiological Considerations

- Changes in pulmonary, gastrointestinal and peripheral blood flow can alter drug absorption

- Hepatic changes can alter biotransformation of drugs by the liver and clearance
Drugs in Pregnancy

- Study of W. VA pregnant women (Glover et al. 2003)
  - Average 1.14 prescription drugs, excluding vitamins and iron
  - Average of 2.95 over-the-counter drugs
    - Tylenol, Tums, cough drops
  - Nearly half (45%) used herbal agents
    - Peppermint, cranberry
Drugs in Pregnancy - Not to Exceed Daily Doses

• Most are Category B (no adequate studies on animals or women)
  – Lidocaine
  – Acetaminophen
  – Penicillin, amoxicillin, clindamycin
  – Nystatin

• Category C (effects on animals & no studies on women)
  – Chlorhexidine rinse
  – Codeine
Drugs in Pregnancy- Avoid

- NSAIDS (1\textsuperscript{st} & 3\textsuperscript{rd})
- Erythromycin estolate
- Tetracycline
Patient Comfort

- Head higher than feet
- Upper arch treatment early in pregnancy before lower arch
- Morning or afternoon appointment preference
- Breaks
Postural Considerations

- 3rd trimester - Postural hypotensive syndrome
- IVC impingement by weight of fetus
- Turn on side to restore circulation
Chemotherapeutics

- Fluoride
- Chlorhexidine (CHX)- non-alcoholic version available
- Xylitol

- No over the counter mouth rinses with alcohol (Listerine 20% alcohol)
The Caries Balance

**Pathological Factors**
- Acid-producing bacteria
- Sub-normal saliva flow and/or function
- Frequent eating/drinking of fermentable carbohydrate

**Protective Factors**
- Saliva flow and components
- Fluoride, calcium, phosphate
- Antibacterials: - chlorhexidine, iodine?, xylitol, new?

Caries  
No Caries
Fluoride

- OTC & Rx options
Chlorhexidine

- Suppress *s. mutans* & periodontal pathogens
- Italian 30 month study- delayed *s. mutans* colonization in children after intervention with mother during last 3 months of pregnancy (*Brambilla et al. JADA 1998*)
- Patients rinse prior to appointment
- After birth- 1 week of CHX followed by 3 weeks of OTC Fl rinse (*Spolsky et al. CDA Journal 2007*)
- Cost/insurance coverage
Xylitol

• Naturally occurring sugar derived from bark of birch tree
• Suppresses *s. mutans* (Hildebrandt 2000)
• Studies show decreases transmission *s. mutans* (Soderling *et al*, 2000)
• Only way to insure therapeutic dose is dispense
Self Management Goals Based on Risk Assessment

- Increasing & maintaining protective factors
- Reducing risk factors
Patient Education Materials

- Review for reading level and cultural appropriateness
- Keep materials brief
- Include larger print
- Focus on how Mother’s oral health affects baby
- DVD’s
Motivational Interviewing

• Get mothers to talk…you listen
• Give choices (key, key, key)
• Acceptance facilitates change
• Pressure to change facilitates resistance
• Sensitivity to culture, SES
• Small steps
SELECT TWO GOALS

- Quit bad habits
- Brush twice a day with fluoride toothpaste
- Rinse after morning sickness
- Less/no candy & junk food
- Floss nightly
- Complete dental treatment
- Chew Xylitol Gum/mints
- Use fluoride rinse/gel regularly
- Take Pre-Natal Vitamins daily
- Eat better
- Drink tap water
Resources Perinatal Oral Health

  – September 2010 issue
What now?

• Engage perinatal providers in your community

• Private vs. Public insurance
  – Limited scope
  – Ends two months after birth
Conclusion

- Pregnant women are experiencing a normal biological state and ethically deserve the same level of care as any other patient
- Lack of knowledge and anecdotal concerns influenced dental practice
- Evidence base shows appropriate dental care is necessary and safe
Our Goal