Perinatal Oral Health:
Clinical Guidelines & Best Practices

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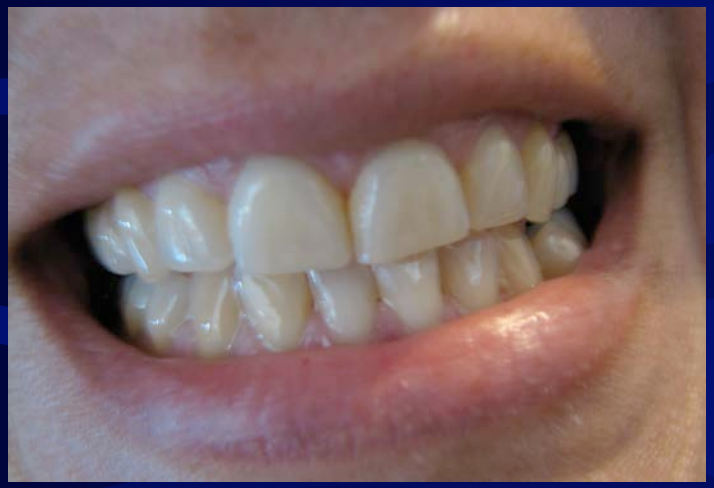
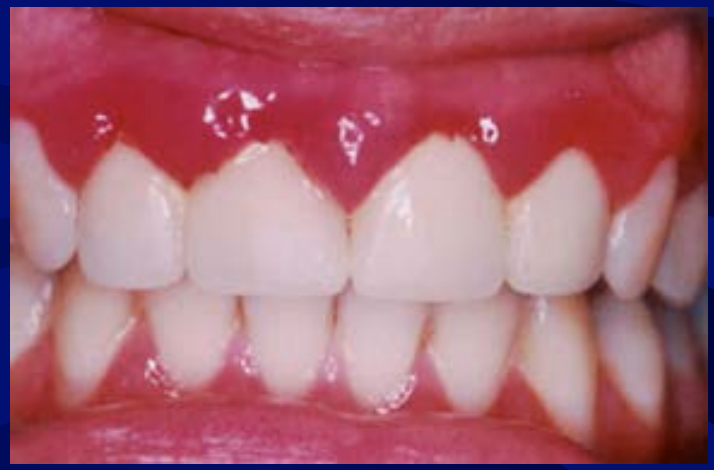
Objectives

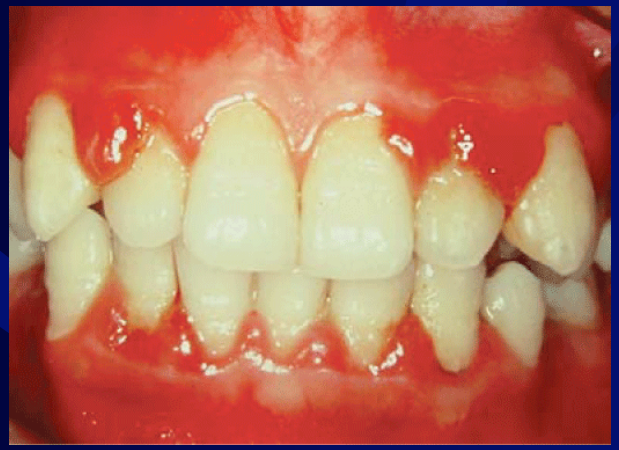
- Understand effect of maternal oral health on families
- Describe why pregnancy provides opportunity to provide oral health interventions for women
- Learn elements of clinical prevention and treatment guidelines for pregnant women
- Learn practical tips for making dental care more comfortable for patient AND provider

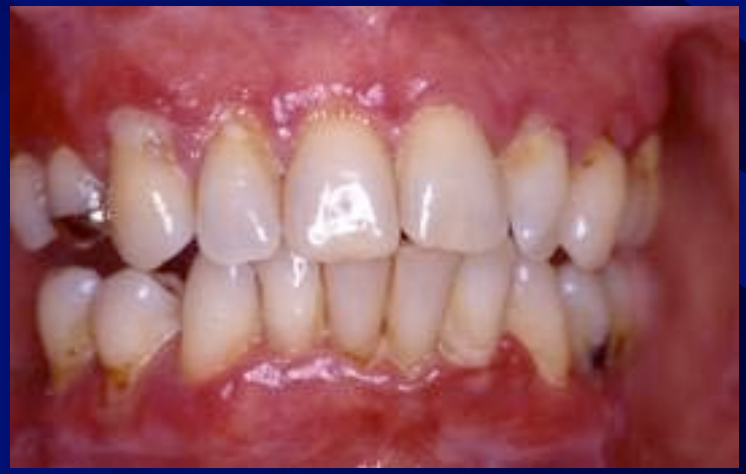
Impact of Maternal Oral Health on Families

Periodontal Disease









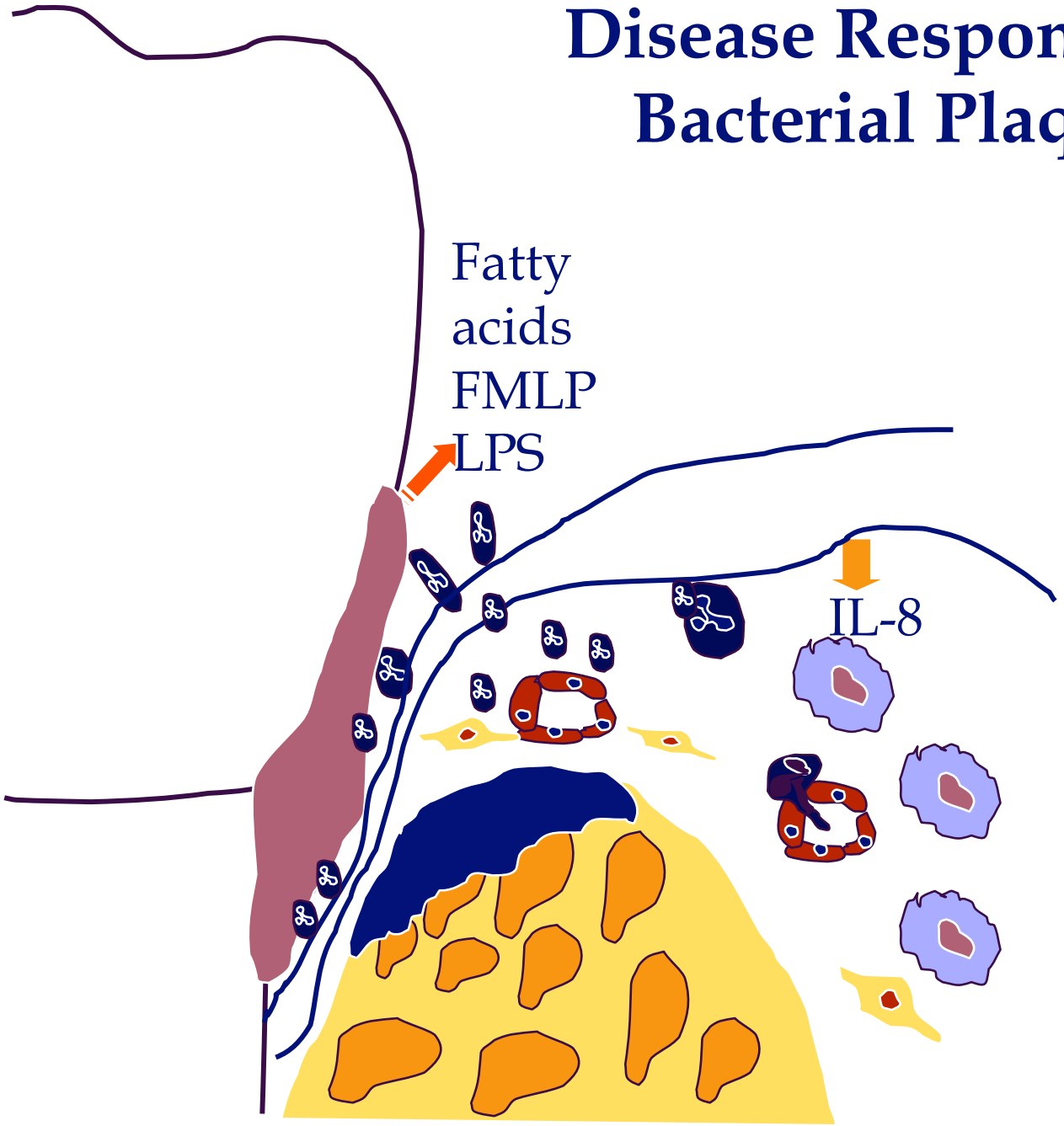
Etiology of Periodontitis

- 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



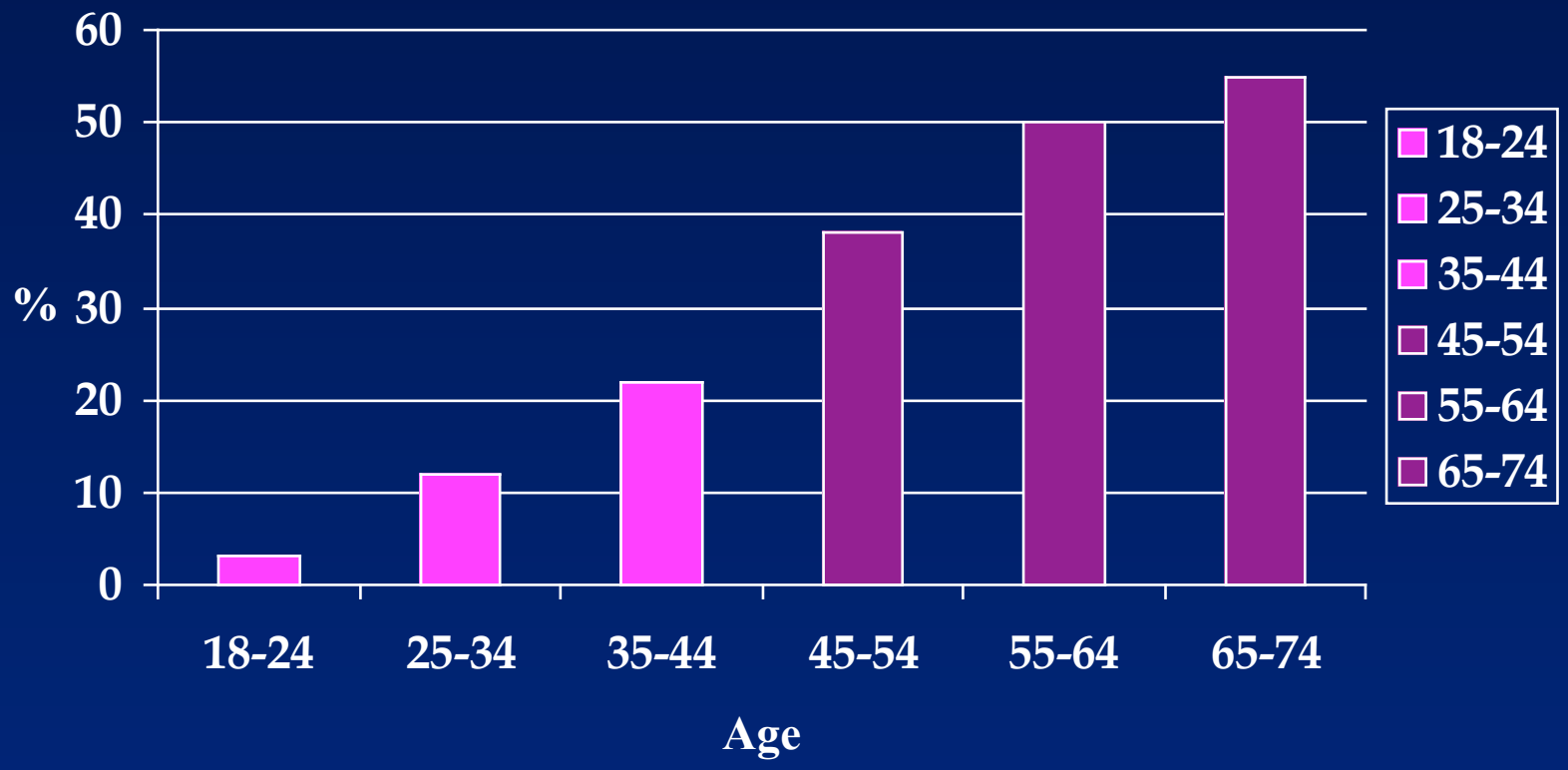
Low	High
IL-10	TNFα
TGF-b	IL-6
IL-1ra	IL-1β
TIMPs	IFN-g
	PGE2
	MMPs

Periodontal Disease Definition

- Moderate- At least two teeth with inter-proximal attachment loss of ≥ 4 mm or at least two teeth with ≥ 5 mm of pocket depth at inter-proximal sites *(CDC, AAP)*

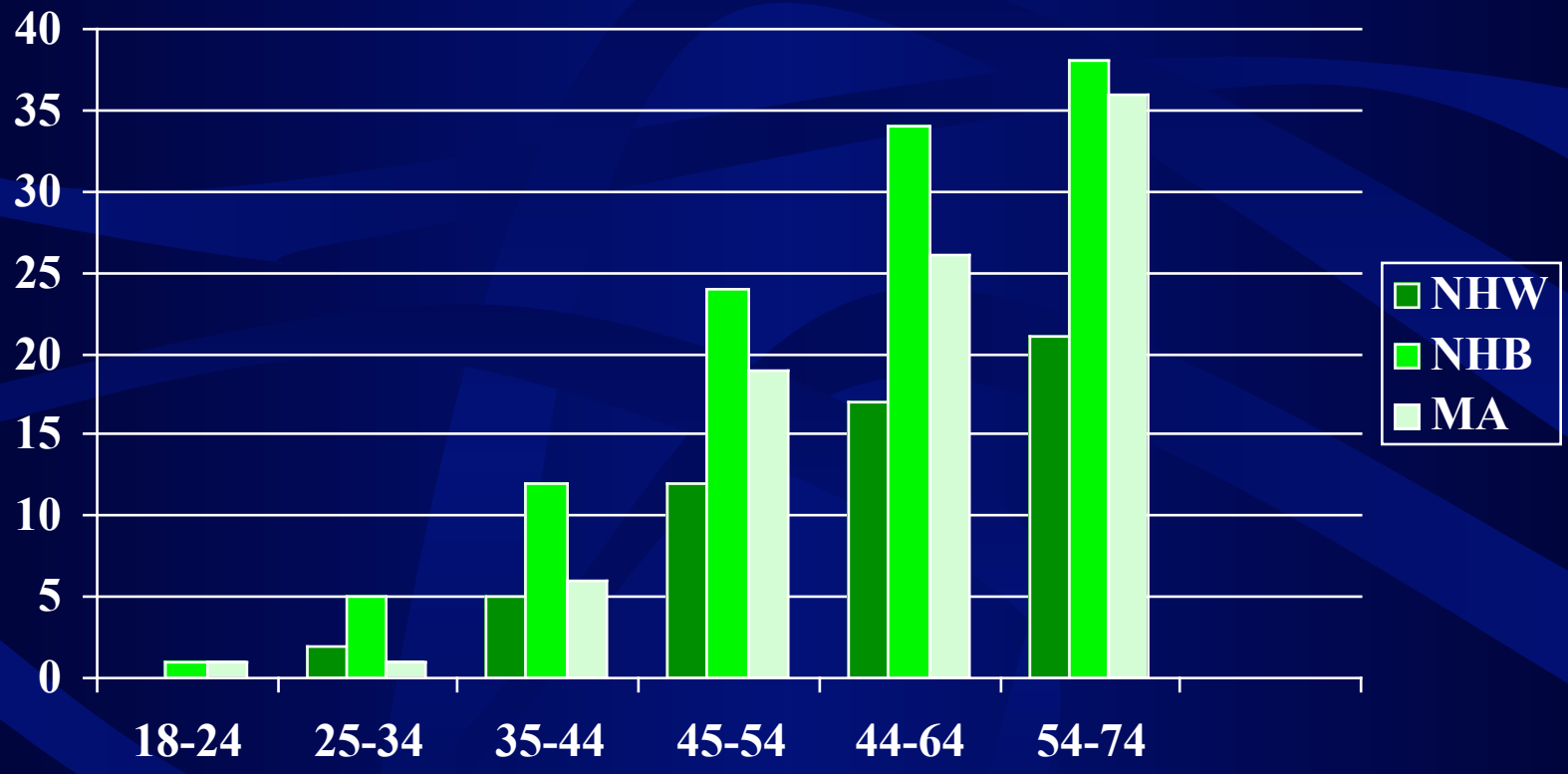
Moderate Periodontal Disease Prevalence

(1+ sites with Loss of Periodontal Attachment (LPA) 4+ mm)



Source: NHANES 3 (1989-94), US Population

Epi: Attachment loss > 6mm by race/ ethnicity



Source: NHANES III (1989-94), US Population

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)*
- Prospective *(Jeffcoat 2001, Lopez 2002, Offenbacher 2006, Pitiphat et al 2007, Saddki et al 2007)*
- 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

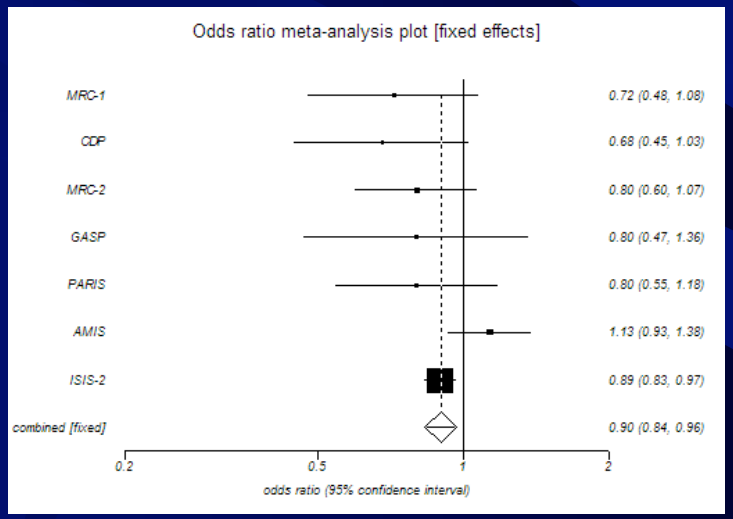
Definitions

- 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 2nd tri-mester
- S & RP w/ anesthesia

OPT& MOTOR Results

Maternal Oral Therapy to Reduce Obstetric Risk

- 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
  - 2011 Oct;38(10):902-14.

- No effect on adverse birth outcomes

At the same time…

- Han et al. Term Stillbirth Caused by Oral *Fusobacterium nucleatum.* Obstet Gynecol 2010;115:442–5.
  - *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)*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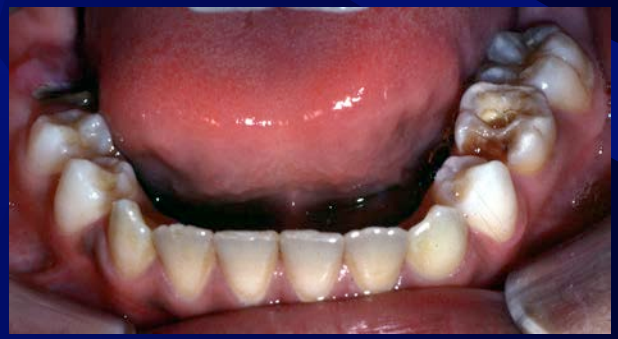
Dental Caries

- 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*

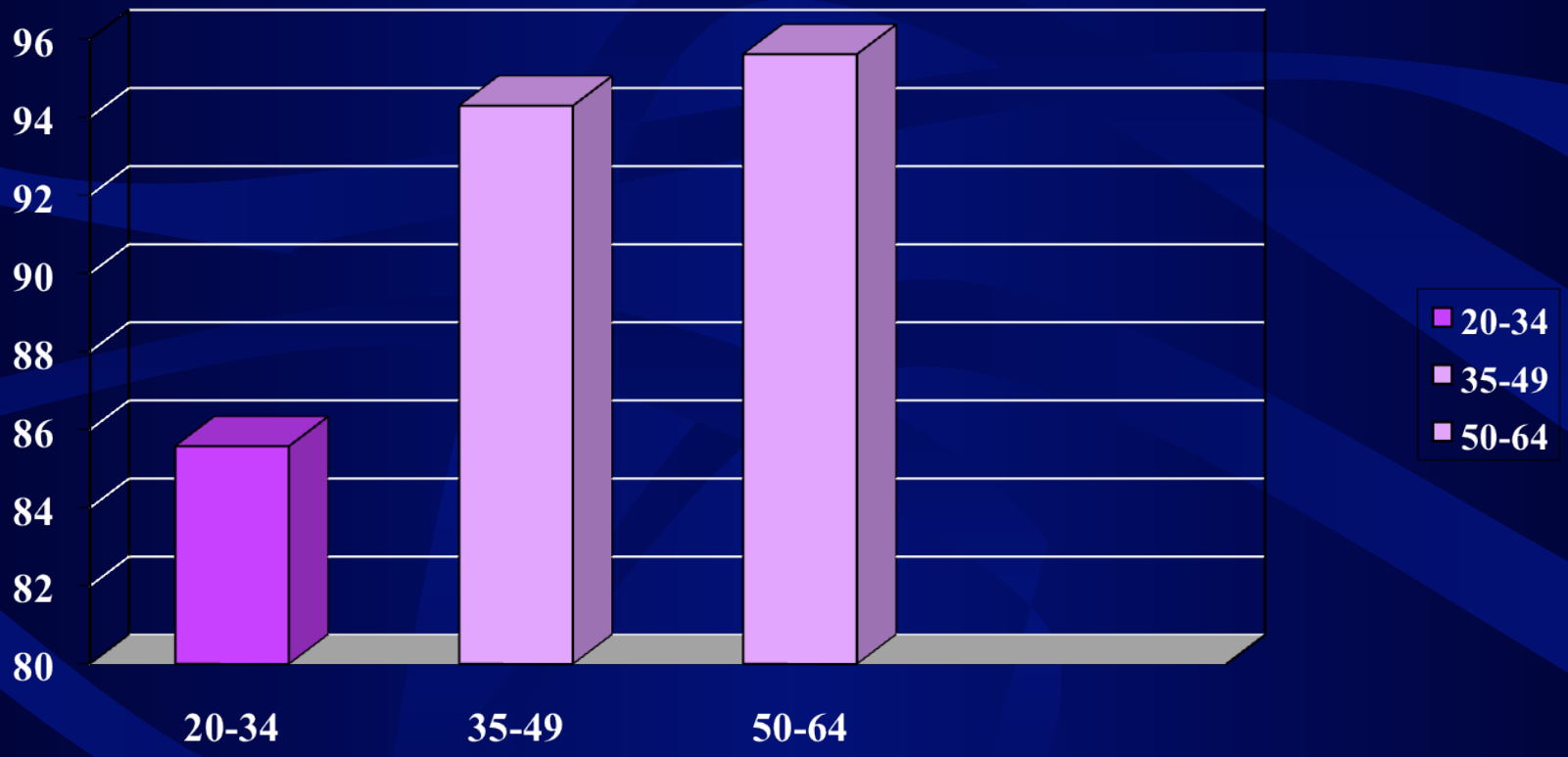


Acquisition of Caries Causing Bacteria

- Maternal transmission of *strep mutans* during normal activities (feeding etc.)
  (Berkowitz et al 1981, 1985, 2003, 2006. Caufield et al 1993, 1995, 2000, 2003, 2005)
- 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

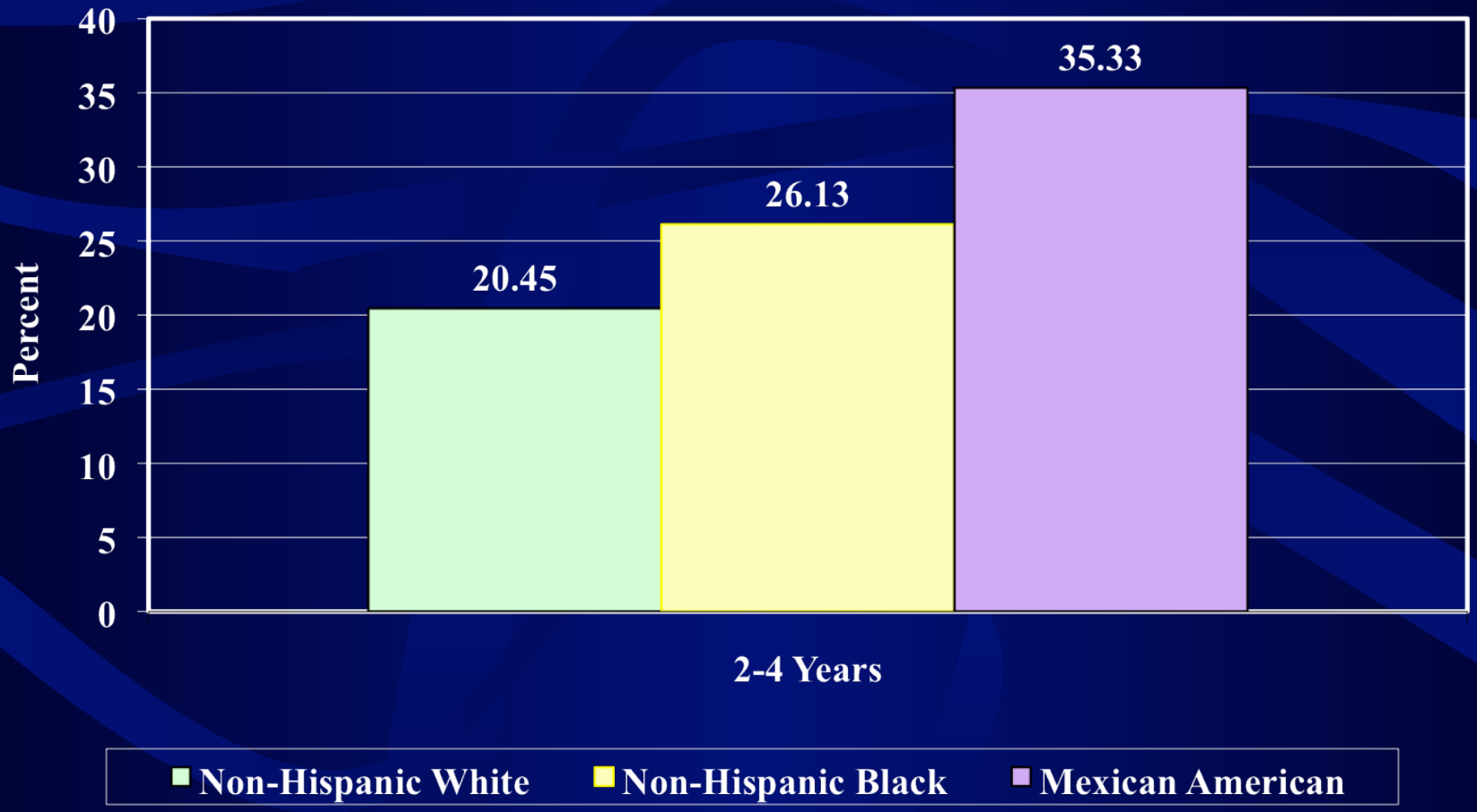
Early Childhood Caries

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

- Lifetime of caries *(Weinstein 1998)*

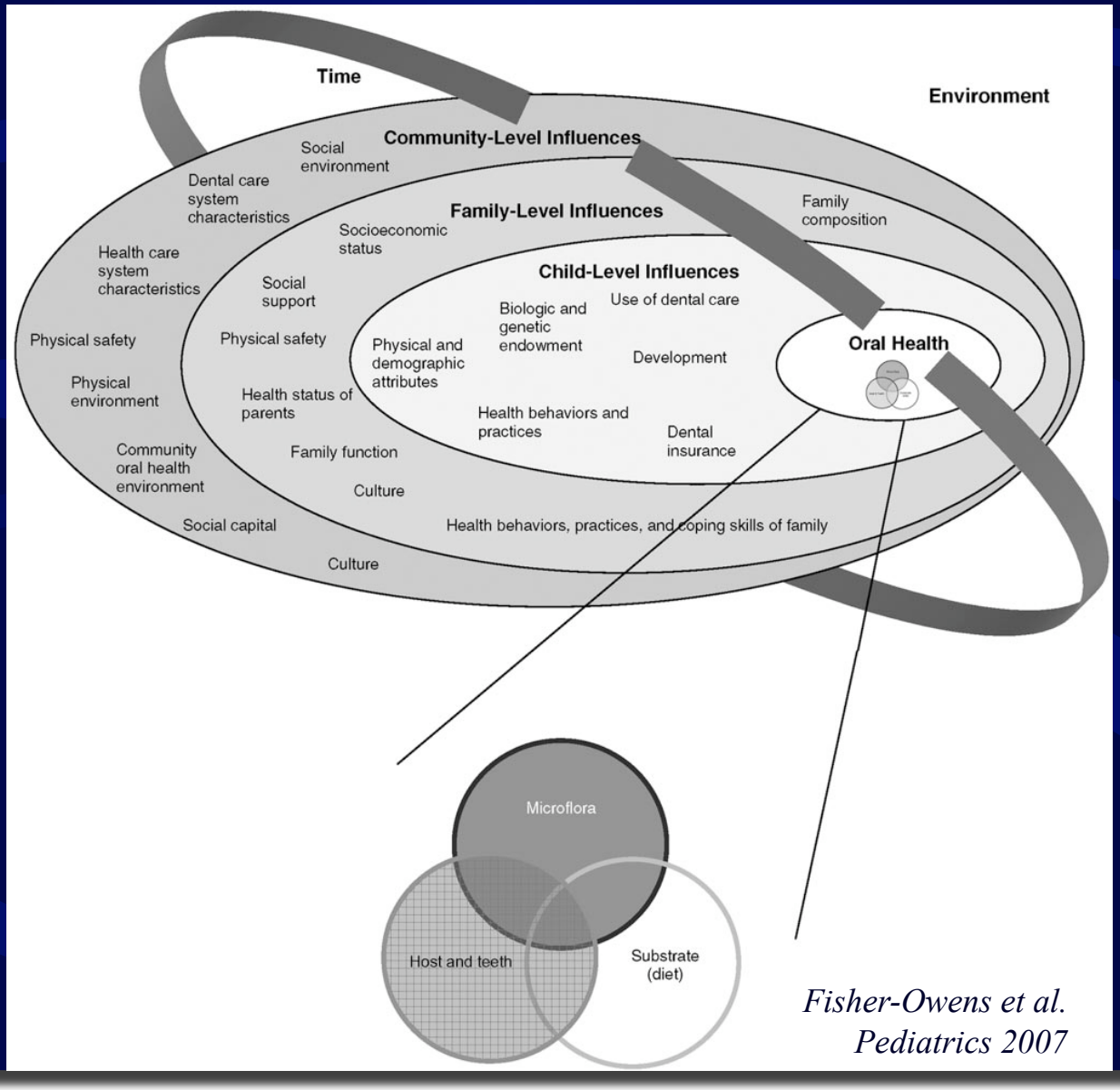
Early Childhood Caries Disparities

% 2-4 y/o Untreated Decay



Data Source: NHANES, 1999-2004, NCHS/CDC.

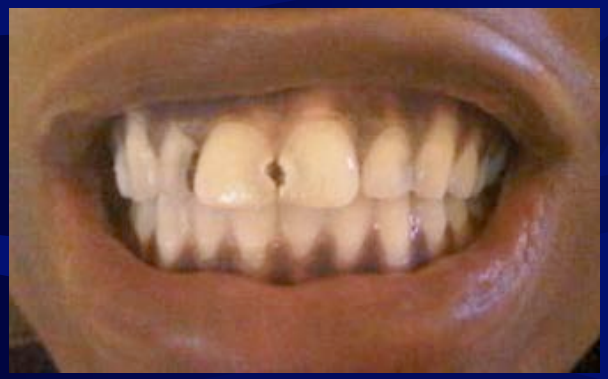
Influences on Children's Oral Health

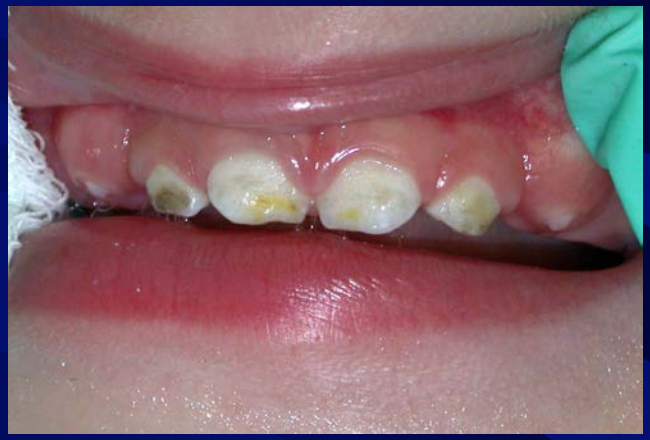


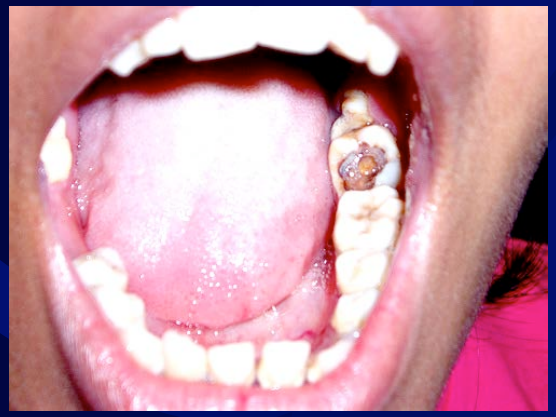
Fisher-Owens et al. Pediatrics 2007

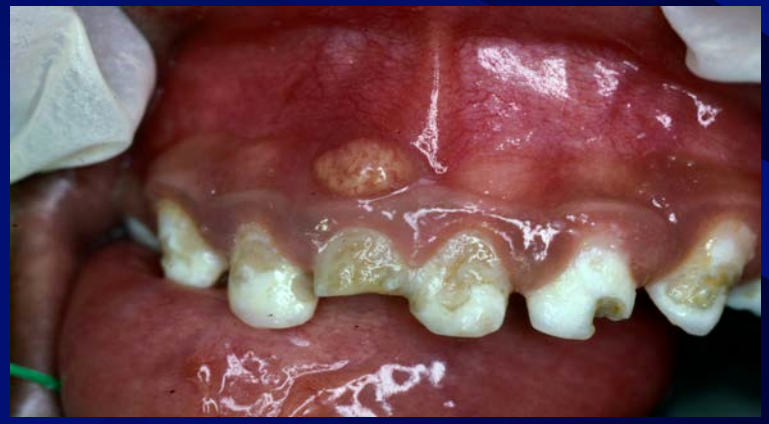
Mom

Child









Maternal Influence

- Diet
- Level of home care
- Importance of primary teeth & oral health

- Genetic & transmissibility components

Pregnancy Presents an Opportunity

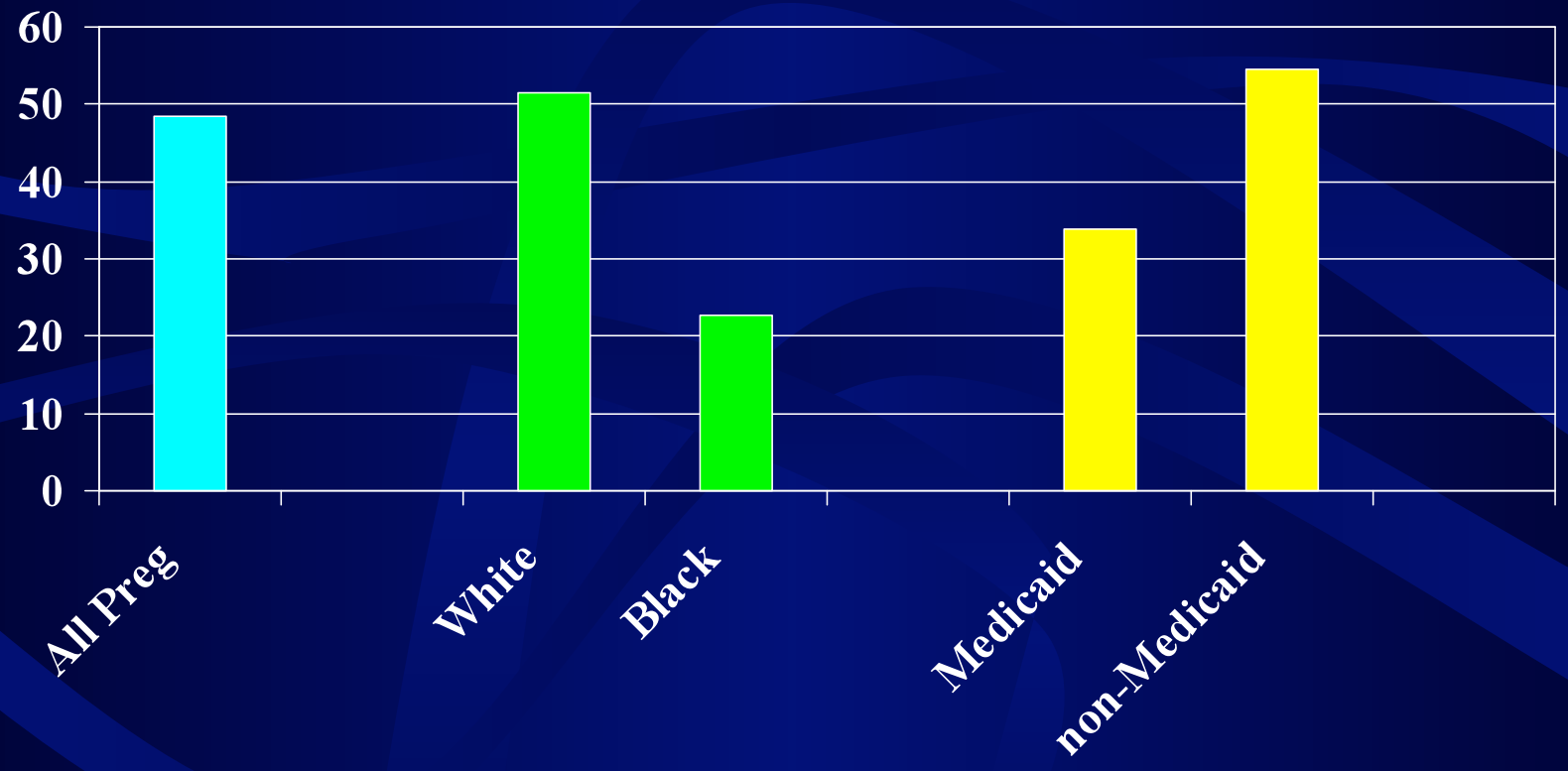
- Introduce risk reduction & self management strategies for mom and child
- Stabilize maternal periodontal status
- Impact the cycle of *s. mutans* maternal transmission

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)*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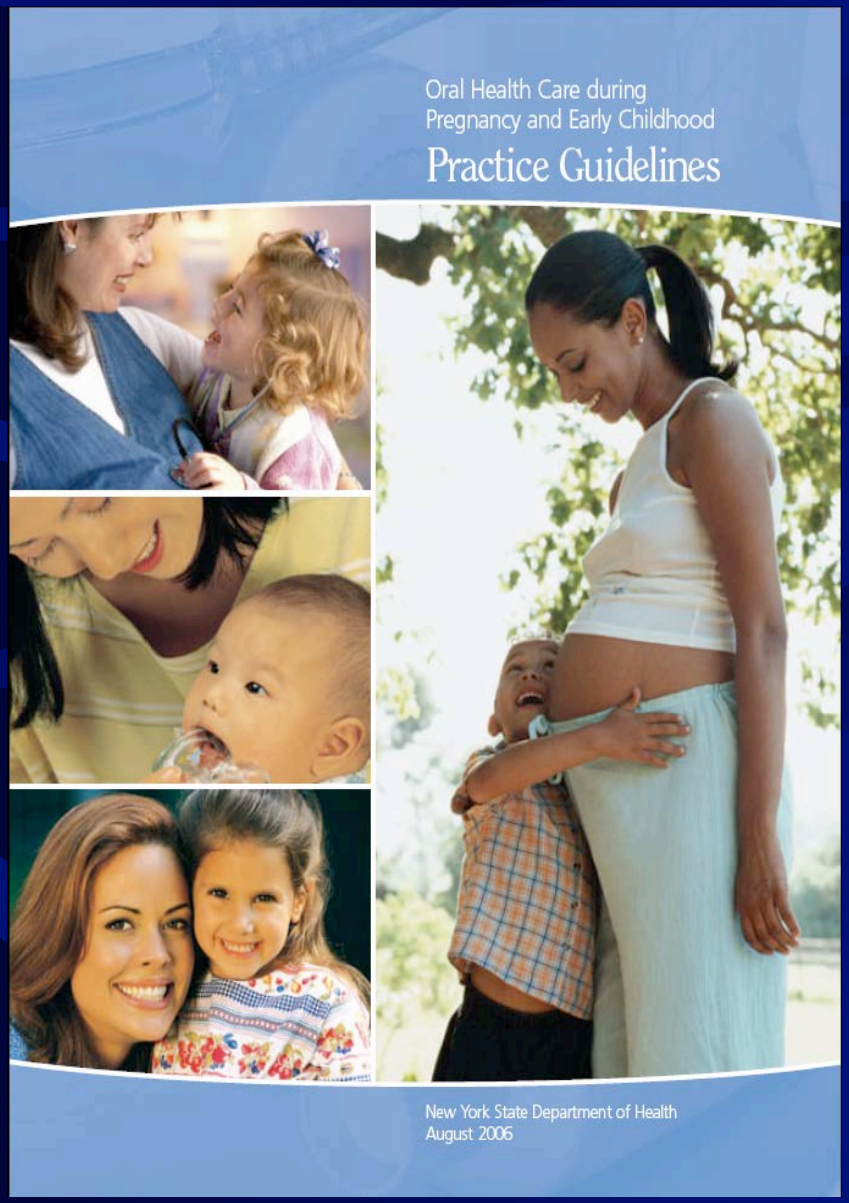
Clinical Interventions

Guidelines

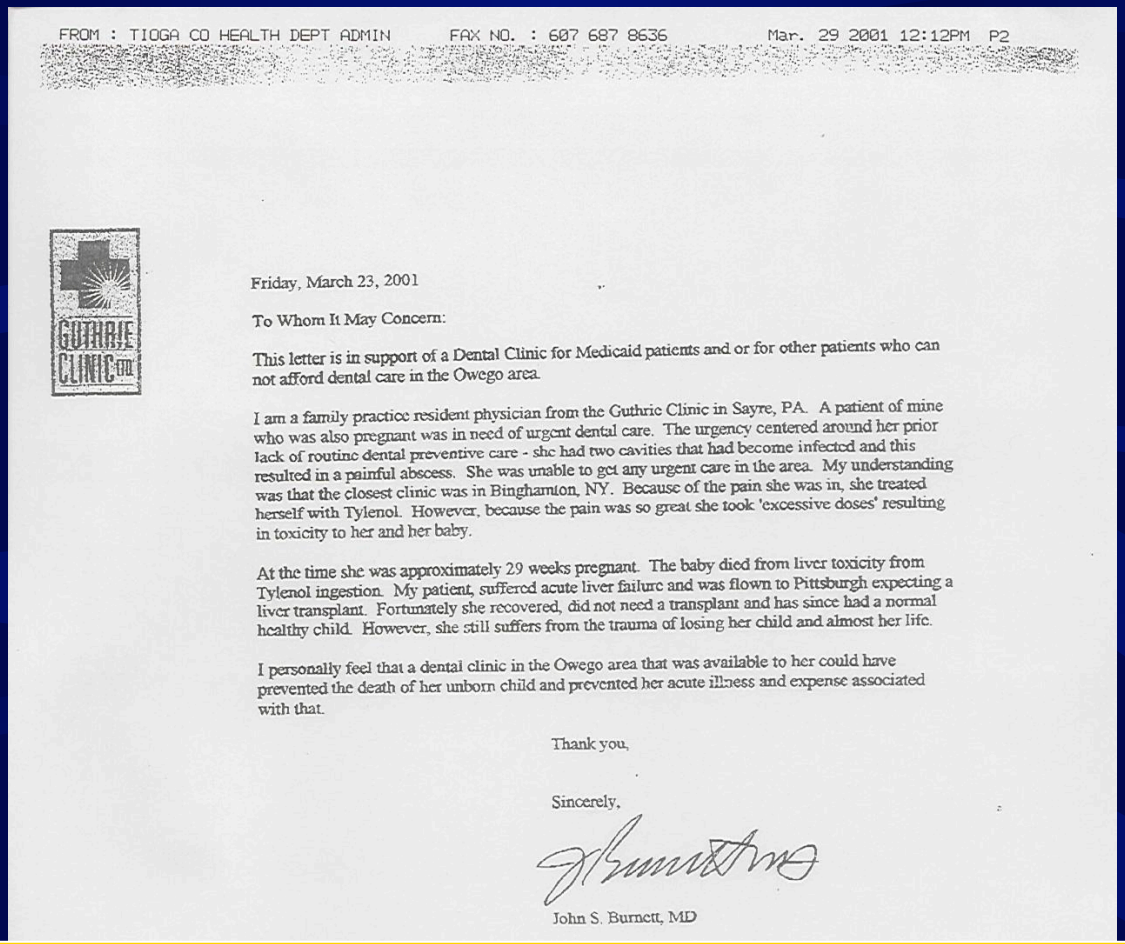
- Systematically developed statements to assist practitioner and patient decisions about appropriate health care for specific clinical circumstances *(IOM, 1990)*
- Recommendations based on evidence from rigorous systematic review and synthesis of published medical literature
- Define practices that 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



FROM : TIOGA CO HEALTH DEPT ADMIN FAX NO. : 607 687 8636 Mar. 29 2001 12:12PM P2

GUTHRIE CLINIC

Friday, March 23, 2001

To Whom It May Concern:

This letter is in support of a Dental Clinic for Medicaid patients and or for other patients who can not afford dental care in the Owego area.

I am a family practice resident physician from the Guthrie Clinic in Sayre, PA. A patient of mine who was also pregnant was in need of urgent dental care. The urgency centered around her prior lack of routine dental preventive care - she had two cavities that had become infected and this resulted in a painful abscess. She was unable to get any urgent care in the area. My understanding was that the closest clinic was in Binghamton, NY. Because of the pain she was in, she treated herself with Tylenol. However, because the pain was so great she took 'excessive doses' resulting in toxicity to her and her baby.

At the time she was approximately 29 weeks pregnant. The baby died from liver toxicity from Tylenol ingestion. My patient, suffered acute liver failure and was flown to Pittsburgh expecting a liver transplant. Fortunately she recovered, did not need a transplant and has since had a normal healthy child. However, she still suffers from the trauma of losing her child and almost her life.

I personally feel that a dental clinic in the Owego area that was available to her could have prevented the death of her unborn child and prevented her acute illness and expense associated with that.

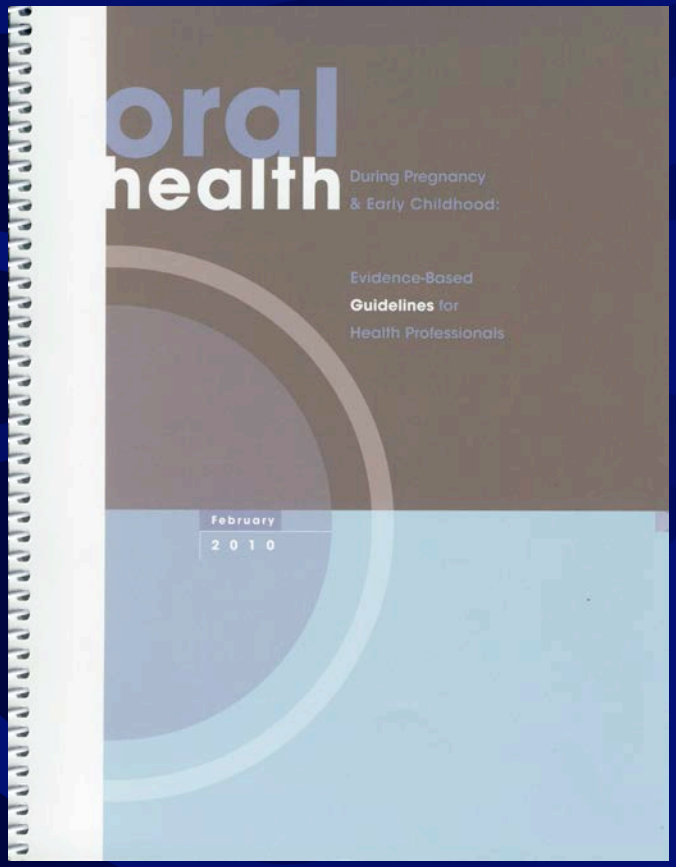
Thank you,

Sincerely,

John S. Burnett, MD

"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

NAME

DOB

MRN

PCP

Patient ID / Addressograph

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
- Extraction
- 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-not estolate form *(Cipro and Tetracycline are <u>not recommended</u> 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 **Dentist/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	**550-1639**	**FAX**	(648-7609 phone)	**Southeast**	**822-3620**	**FAX**	(671-7066 phone)
SMHC	**863-0900**	**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/ Oral Surgery

Comments: _____

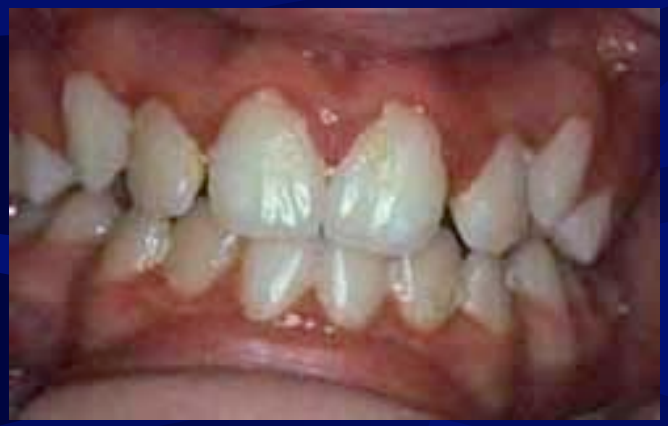
_____

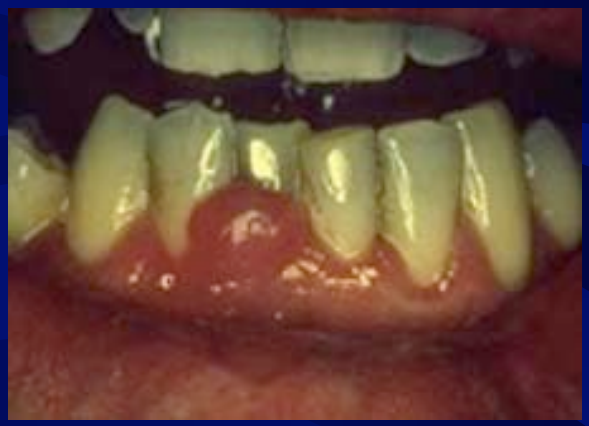
_____

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 teratogenecity- 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

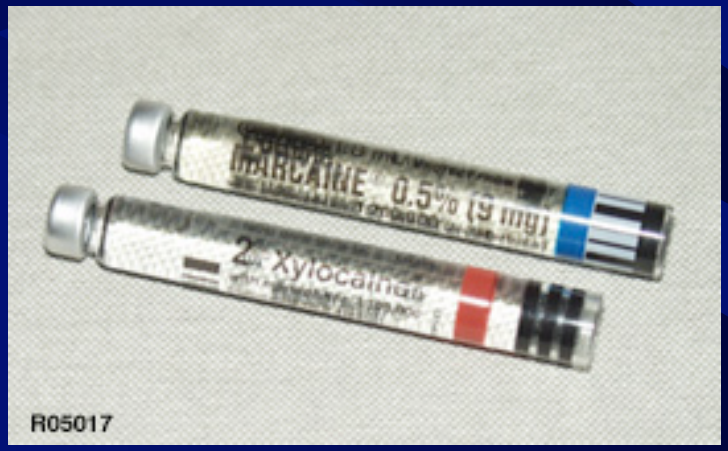
- Provide emergency/acute care at any time during pregnancy as indicated by oral condition

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

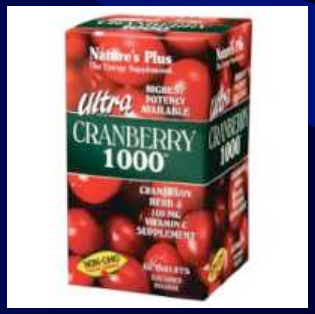
- Amalgam
  - No evidence of harmful effect in population based studies and reviews *(FDA 2009, CDC, NCI)*
  - No additional risk if standard safe amalgam practices are used
- Resins
  - Short-term exposure associated with placement has not been shown to have health risk; data lacking on the effects 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

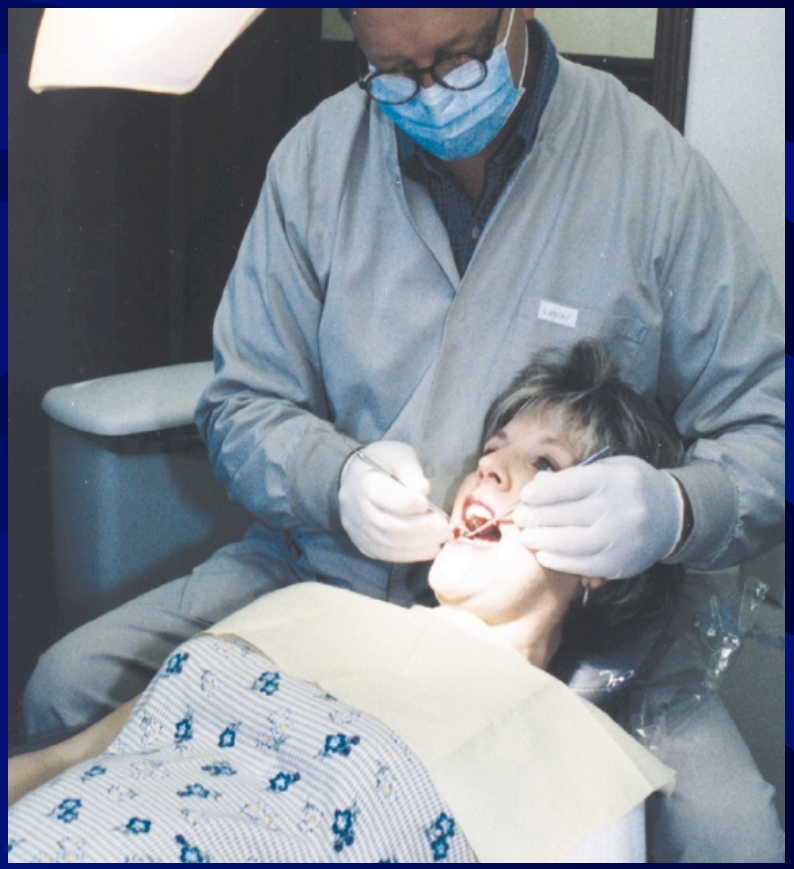
- Most are Category B (no adequate studies animals or women)
  - Lidocaine
  - Acetaminophen
  - Penicillin, amoxicillin, clindamycin
  - Nystatin
- Category C (effects on animals & no studies on women)
  - Chlorhexidine rinse
  - Codeine

Drugs in Pregnancy- Avoid

- NSAIDS (1st & 3rd)
- Erythromycin estolate
- Tetracycline

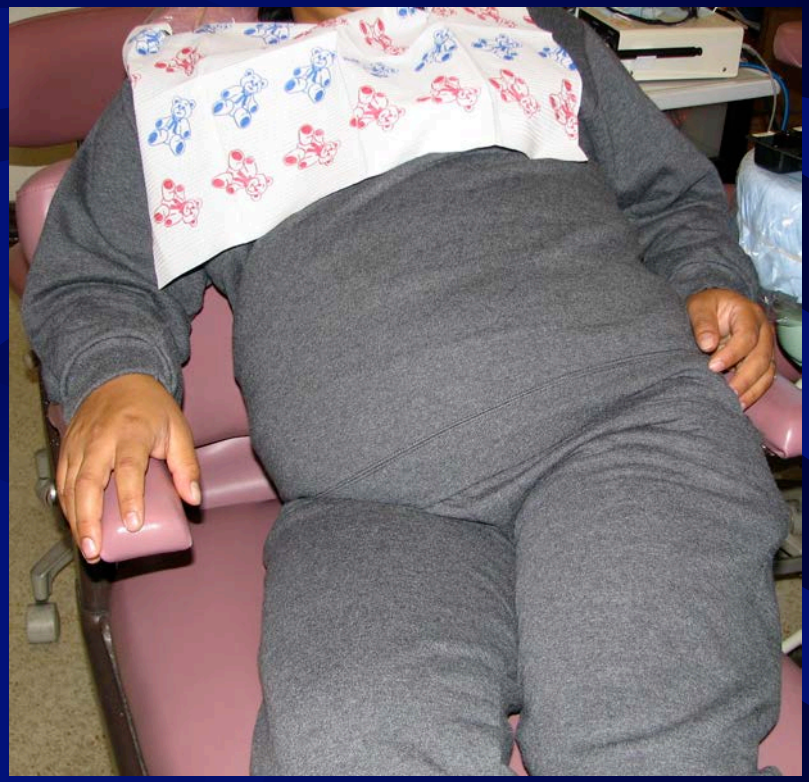
Patient Comfort

- 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

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Chemotherapeutics

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

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

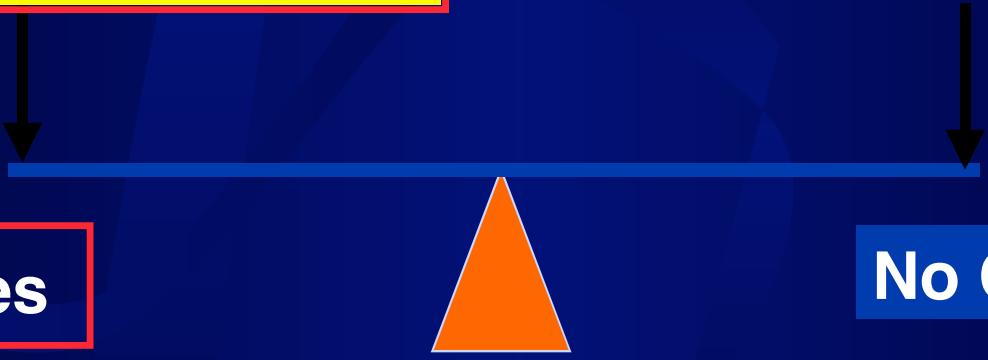
The Caries Balance

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 FI 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


BERRY
Spry
MINTS
Xylitol
240 pieces
4.63 OZ. (144 g)


100% Good For You
COOL FRUIT
FRESH BREATH
zellies
HEALTHY TEETH
Sweetened with 100% Xylitol

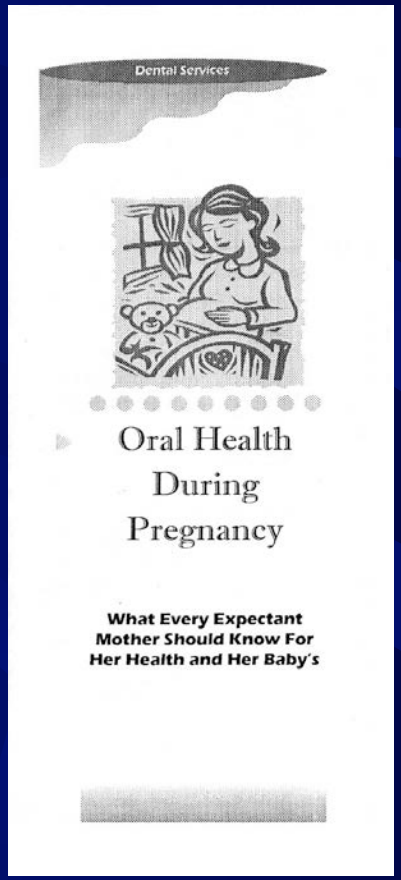

AMAZINGLY EFFECTIVE
B FRESH
BREATH FRESHENING GUM
SUGAR FREE!
Patented
BUBBLE GUM

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

COMMUNITY HEALTH NETWORK

SILVER AVENUE
FAMILY HEALTH CENTER

PERINATAL ORAL HEALTH

ACTION PLAN/ SELF MANAGEMENT GOALS

NAME

DOB

MRN

PCP

Patient ID / Addressograph

SELECT TWO GOALS

Quit bad habits

Brush twice a day with fluoride toothpaste

No soda

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

- http://www.cdafoundation.org/library/docs/news_030110a.htm
- http://cda.org/publications/journal_of_the_california_dental_association/archive_&_search
  - 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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