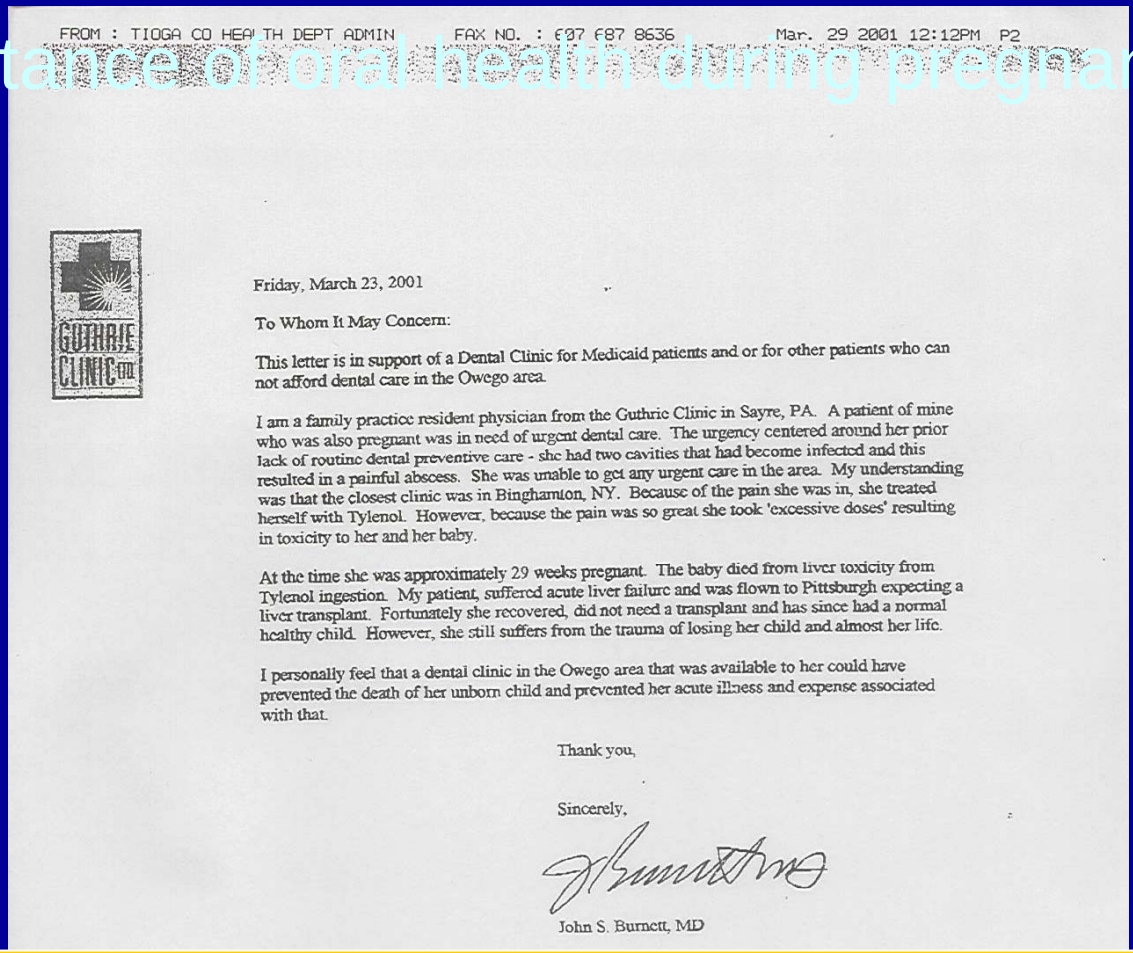
Development of Practice Guidelines for Oral Health during Pregnancy and Early Childhood

Renee Samelson MD MPH
New York State Department of Health
May 3, 2006

Objectives

- Why oral health care for pregnant women?
- What does the oral health professional need to know about obstetrics?
- What is the role of the oral health professional?
- What is the role of the prenatal care provider?

Importance of oral health during pregnancy



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."

Why should pregnant women receive oral health care?

- Oral health is part of overall health.
- Early childhood caries is a preventable infectious disease.
- Treatment of periodontal infection may decrease risk of premature/low birth weight deliveries.

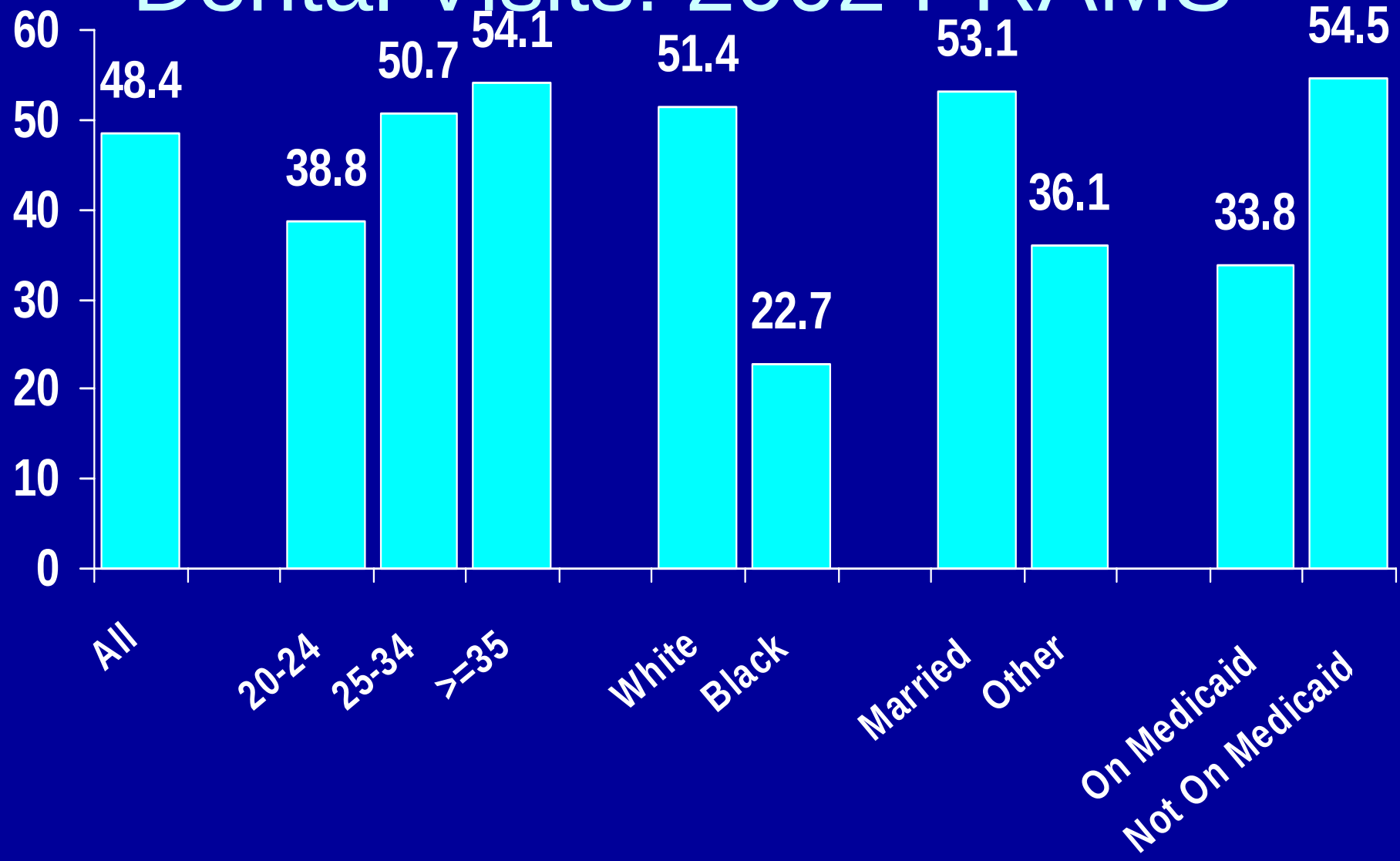
Burden of PLBW $5.5 billion

- 60-80% of all neonatal deaths(excluding congenital malformations)
- Rate of PTD increased over the last 20 years from 9% in 1980 to 12% in 2002
- Double in African Americans
- VLBW has increased from 1.15% -1.46 %
- 50% of PTD occur in women with no risk factors

Prevention and early dx of infection

- Appendicitis
- Cholecystitis
- Pneumonia
- Pyelonephritis
- Asymptomatic bacteriuria
- Genital tract
- Periodontal disease

Dental Visits: 2002 PRAMS



IOM Criteria: When practice guidelines are Needed

- Problem is common or expensive
- Great variation exists in practice patterns
- Enough scientific evidence to determine appropriate/optimal practice

Goals of developing practice guidelines for pregnant women and early childhood

- To improve the oral health
- To help receive appropriate oral health services
- To decrease incidence of ECC
- To facilitate productive communication among professionals
- To help train professionals
- To indicate where more research is needed
- To possibly impact incidence of low birth weight/premature delivery

Obstetrics for dentists

- Time line of pregnancy
- Harmful maternal behaviors
- Medical conditions of pregnancy
- Drugs that are contraindicated

Timeline

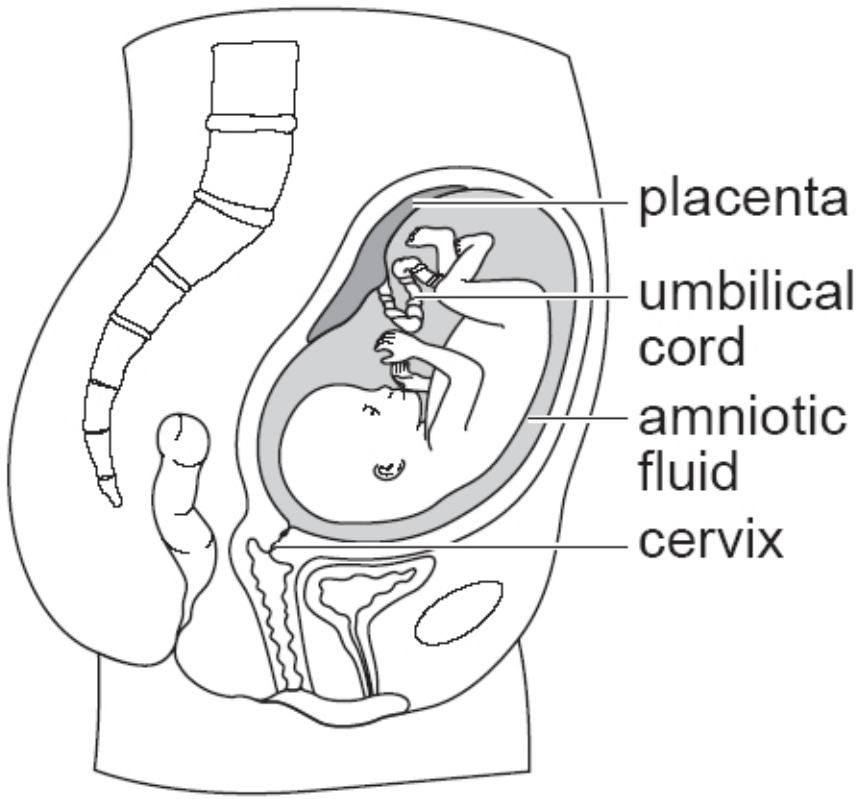
- **Trimesters are 14 weeks each based on 42 week pregnancy**
- **Embryonic period 2 thru 8 weeks**
- **Fetal period 8 weeks till delivery**

First Trimester

- Embryo up to 9 weeks
- Teratogenecity up to 10 weeks
- Malformations 3-4%
- Loss 10-15%

Second Trimester

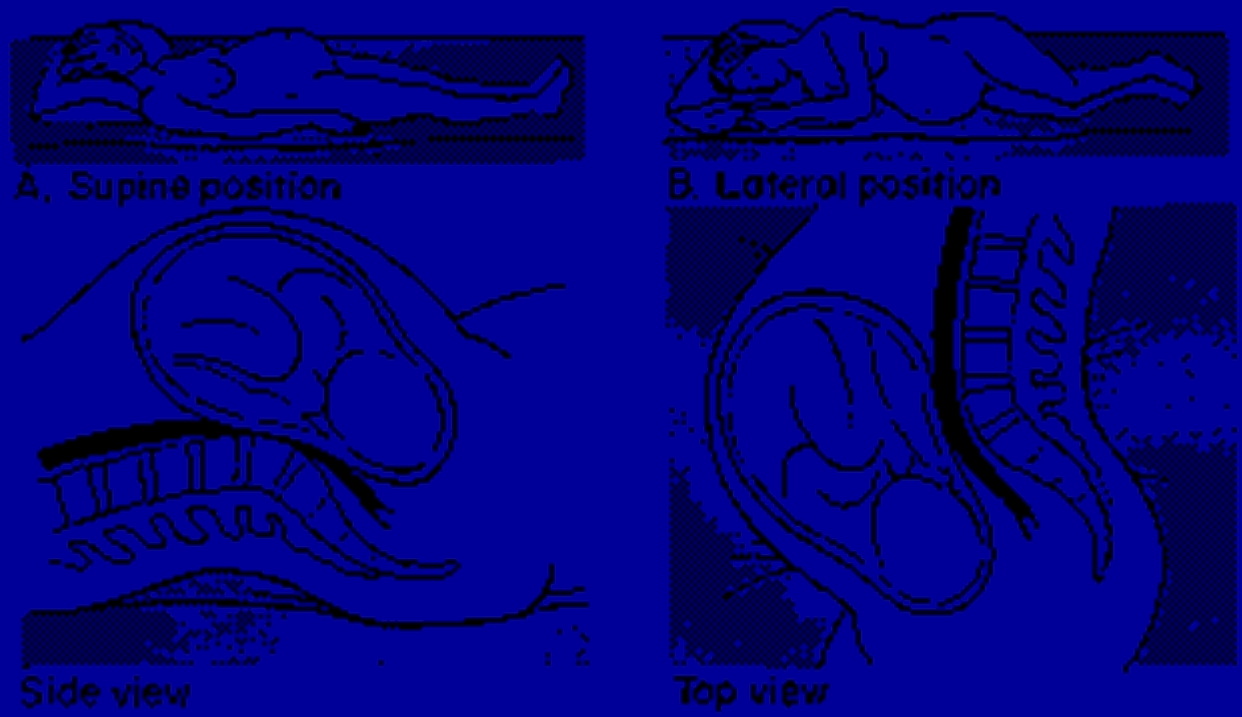
- Safest time to perform procedures 14 to 20 weeks
- Pregnancy below umbilicus



12 weeks (84 days)
100mm

Third trimester

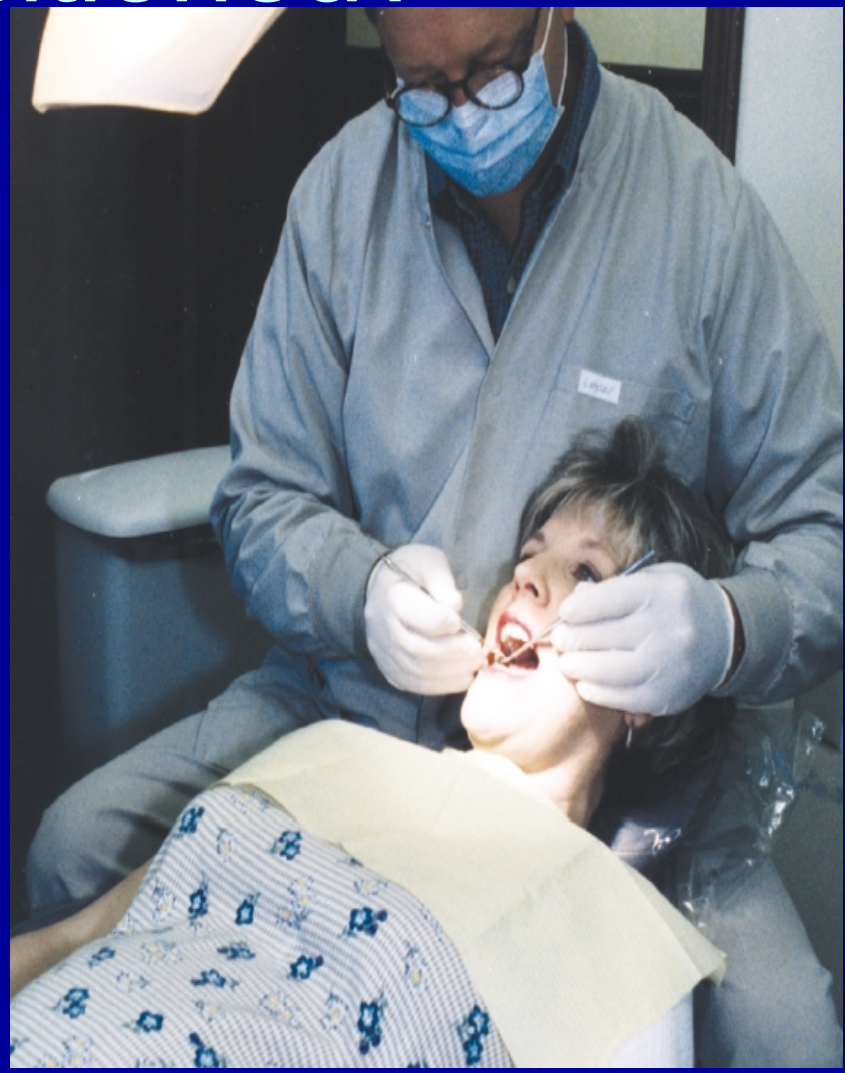
- Hypotension



Aspiration - delayed gastric emptying
incompetent esophageal valve

How should the pregnant woman be positioned?

- Flat position may cause hypotension and hypoxia
- Place a small pillow under right hip - left lateral displacement
- Head above feet



Medical Conditions of Pregnancy

- Hypertension
- Preeclampsia
- Diabetes
- Heparin use
- Aspiration

Oral health professionals should render all needed services

- Pregnancy is not a reason to defer routine dental care and necessary RX for oral health problems.
- 1st trimester DX and RX can be undertaken safely.
- Needed Rx can be provided throughout pregnancy; ideal time 14 to 20 weeks.

Actions for oral health professionals

- Plan definitive RX based on
  - chief complaint,
  - hx of tobacco, alcohol and other substance use,
  - clinical evaluation,
  - radiographs when needed
- Develop and discuss RX plan - preventive, restorative, and maintenance care
- Provide emergency care at any time
- Provide dental prophy and RX during pregnancy

Questions dentist may ask:

- Can I take x-rays?
- Can I inject local anesthesia with epinephrine?
- Can I administer 30% nitrous oxide for analgesia?
- What medications can I prescribe?
- Are topical agents safe?
- When should restorations and other necessary procedures be performed?
- Can I use mercury restorations?

What is the role of PNC provider?

- Ask
- Assess
- Advise
- Arrange
- Assist

What is the role of the prenatal care provider?

- Assess problems with oral cavity.
- Encourage all women to schedule oral health visit.
- Encourage patients to adhere to the recommendations regarding appropriate follow-up.
- Document in the prenatal care plan.
- Facilitate treatment - written medical clearance.
- Develop a list of oral health referral services
- Respond to questions from oral health professional.

Do you have bleeding gums, toothache, cavities, loose teeth or other problems in your mouth?

YES

-Refer to a dentist
-Stress the importance of timely visit
-Inquire if the pregnant woman needs help in accessing dental care

Do you have bleeding gums, toothache, cavities, loose teeth or other problems in your mouth?

NO

-Ask the next question:
Have you had a dental visit in the last 6 months?

YES

- Encourage the pregnant woman to keep the next appointment
- Reassure that dental care during pregnancy is effective and safe

NO

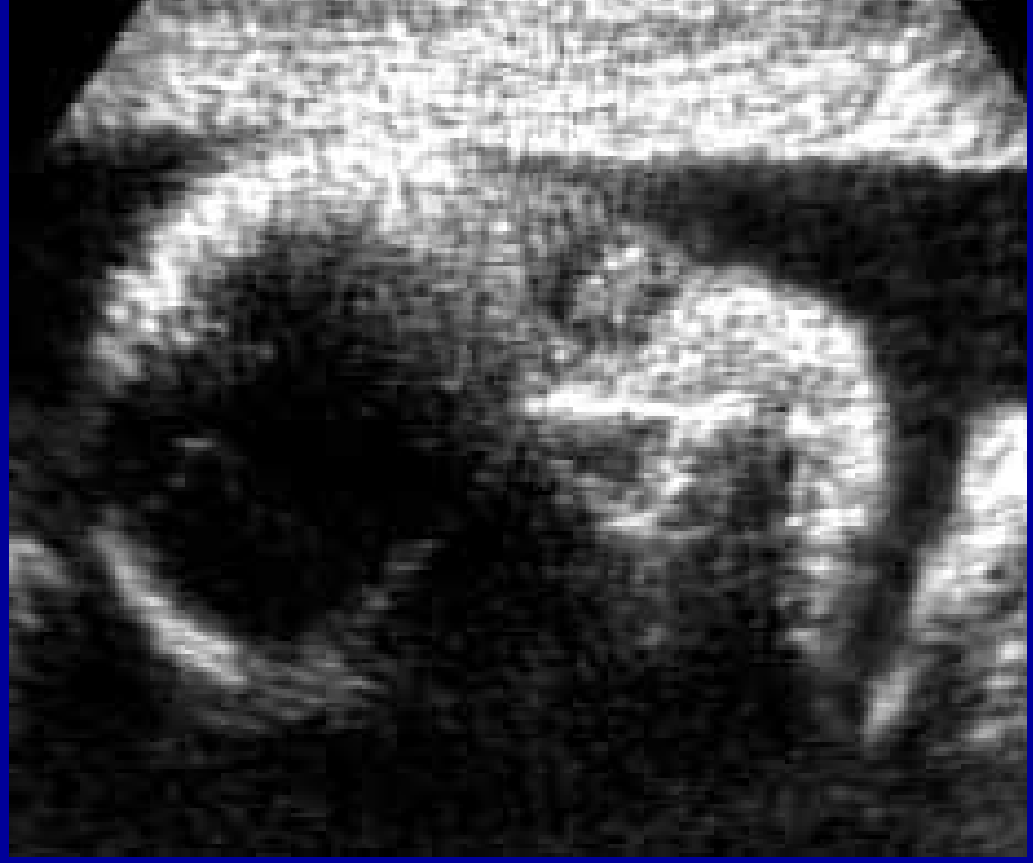
-Encourage the pregnant woman to make a dental appointment as soon as possible

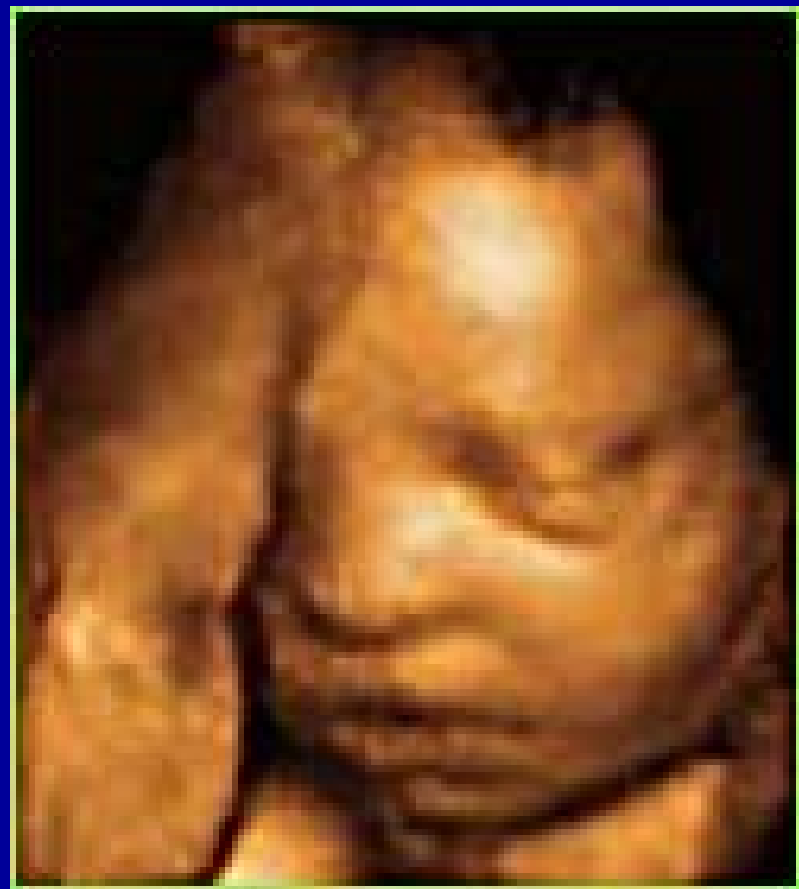
Message for PNC providers

- Educate patients (and other providers):
  - Oral health is part of overall health
  - Dental care is safe and effective
  - Delay in treatment could result in adverse effects
  - Dispel myths and misconceptions
  - Incorporate oral health care into routine prenatal care
- Partner with dental professionals

Message for oral health professionals

- Educate providers and patients
  - Oral health is part of overall health
  - Dispel myths and misconceptions
  - Incorporate oral health care into routine prenatal care
- Partner with prenatal providers
- Provide treatment when needed





Thank you

Up to 50% of PTD deliveries occur without risk factors

* Previous preterm birth
- Age, race
- Poverty - low SES
- Poor nutrition/BMI <20
- Cervical injury or anomaly
- Uterine anomaly or fibroid
- Premature cervical dilation or effacement
- Multiple gestation
- Vaginal bleeding

Infection-induced preterm birth

- Sub-clinical
- Caused by anaerobes and genital mycoplasmas
- Ascending or hematogenous
- Account for up to 50% of preterm births
- Greater percent of VLBW

Klein L & Gibbs R(2004)Use of microbial cultures and antibiotics…" AJOG. 190,1493-502.

Possibly effective interventions

- Progesterone
- Smoking cessation
- Avoidance of illicit drugs and alcohol
- Decrease rate of multiples
- Cervical cerclage in subgroup
- Reduced occupational fatigue
- Appropriate nutrition – DHA
- Cervical length and biochemical tests
- Prevention and early diagnosis of infection

Is it safe to take x-rays?

- “No single diagnostic procedure results in a radiation dose significant enough to threaten the well-being of the developing embryo and fetus.” American College of Radiology
- “Undergoing a single…X-ray…does not result in radiation exposure adequate to threaten the well-being of the developing preembryo, embryo or fetus and is not an indication for an abortion.” American College of Ob-Gyn

Precautions

- Use abdominal and thyroid shields
  - Use health history and clinical judgment
  - Limit the number of x-rays

Antepartum Dental Radiography and Infant Low Birth Weight

Philippe P. Hujoel, PhD
Anne-Marie Bollen, PhD
Carolyn J. Noonan, MS
Michael A. del Aguila, PhD

Context Both high- and low-dose radiation exposures in women have been associated with low-birth-weight offspring. It is unclear if radiation affects the hypothalamus-pituitary-thyroid axis and thereby indirectly birth weight, or if the radiation directly affects the reproductive organs.

Objective To investigate whether antepartum dental radiography is associated with low-birth-weight offspring.

Design A population-based case-control study.

Participants and Setting Enrollees of a dental insurance plan with live singleton births in Washington State between January 1993 and December 2000. Cases were 1117 women with low-birth-weight infants (<2500 g), of whom 336 were term low-birth-weight infants (1501-2499 g and gestation ≥37 weeks). Four control pregnancies resulting in normal-birth-weight infants (≥2500 g) were randomly selected for each case (n=4468).

Main Outcome Measures Odds of low birth weight and term low birth weight by dental radiographic dose during gestation.

Results An exposure higher than 0.4 milligray (mGy) during gestation occurred in 21 (1.9%) mothers of low-birth-weight infants and, when compared with women who had no known dental radiography, was associated with an adjusted odds ratio (OR) for a low-birth-weight infant of 2.27 (95% confidence interval [CI], 1.11-4.66, *P*=.03). Exposure higher than 0.4 mGy occurred in 10 (3%) term low-birth-weight pregnancies and was associated with an adjusted OR for a term low-birth-weight infant of 3.61 (95% CI, 1.46-8.92, *P*=.005).

Conclusion Dental radiography during pregnancy is associated with low birth weight, specifically with term low birth weight.

JAMA. 2004;291:1987-1993 www.jama.com

PREPUBERTAL, ADOLESCENT, AND pregnant females exposed to ionizing radiation may be at an increased risk for delivering a low-birth-weight (LBW) infant (<2500 g). In prepubertal girls, high-dose therapeutic radiation for childhood cancers has been associated with an increased risk for future LBW offspring, and a direct relationship has been reported between the radiation dose and LBW risk.[1-3] In adolescents, diagnostic radiation for idiopathic scoliosis was also associated with a dose-dependent increased LBW risk.[4] In pregnant women, medical x-ray radiation, not dental x-ray radiation, has been associated with an increased LBW risk,[3] and exposure to the atomic bomb explosion in Hiro-

Odds Ratios and 95% Confidence Intervals for LBW and TLBW associated with Ionizing Radiation during gestation and the Impact of controlling over the risk factors.

	> 0.4 mGy		0.1 – 0.4 mGy	
	Unadjusted	Adjusted	Unadjusted	Adjusted
LBW	1.80 (1.09 – 2.97)	2.27 (1.11 – 4.66) *	1.09 (0.87 – 1.36)	1.20 (0.88 – 1.63) *
		2.54 (1.23 – 5.21) **		1.29 (0.95 – 1.76) **
TLBW	3.05 (1.53 – 6.08)	3.61 (1.46 – 8.92) *	1.30 (0.92 – 1.85)	1.66 (1.09 – 2.53) *
		3.54 (1.40 – 8.96) **		1.66 (1.08 – 2.56) **

* Adjusted for Smoking, chronic hypertension, preeclampsia, alcohol use, marital status,diabetes: Indicator variables. Duration of dental insurance eligibility, weight gain, pre-pregnancy weight: Continuous var.

** Adjusted for above variables + dental procedures (preventive, restorative, endodontic, periodontal, fixed and removable prosthodontic, oral surgery and orthodontic).

Editorial comments

- JAMA - Reiman, Duke; Lockhart, Dickson Institute for Health Studies, Charlotte
- JADA - Moore and Preece, University of Texas at San Antonio
- Journal of Radiological Protection - Boice, Vanderbilt and International Epidemiology Institute, Stovall, MD Anderson, Green, Roswell Park Cancer Institute

Guidelines For Prescribing Dental Radiographs

Patient Category *(Adult)*	Dentulous
New Patient	- Post. bite-wings & selected periapicals - Full mouth intraorals (if clinical evidence of generalized disease/extensive ℞)
Recall Patient	- Post. bite-wings, 12-18 month interval
No clinical caries/ High risk factors for caries	- Post. bite-wings, 24-36 month interval
Periodontal Disease/ History of periodontal treatment	- Selected periapical &/ bite-wings for areas where periodontal disease is clinically demonstrated

Originating Committee: Ad Hoc committee on Pedodontic Radiology, Review Council: Council of Clinical Affairs, Revised 1992, 1995, 2001.

Is it safe to inject local anesthetic?

- Yes.
  - Lidocaine 2% category B
  - Mepivicaine 3% category C
  - Epinephrine

Is it safe to administer nitrous oxide?

- Should be used only when local anesthesia is not adequate
- Concerns
  - Occupational hazard
  - Aspiration
  - Hypoxia
  - Hypotension
  - Second trimester procedures

Antibiotics

Recommended	Not recommended
Penicillin Amoxicillin Cephalosporins Clindamycin Erythromycin (except estolate form)	Tetracycline Erythromycin estolate Quinolones Clarithromycin

Analgesics

Recommended	Not recommended
•Acetaminophen •Codeine •After 1st trimester •NSAID –Ibuprofen –Naprosyn (for 24 to 72 hours only)	Aspirin

Are topical agents safe?

- Fluoride
  - Toothpaste & mouthrinse
- Xylitol chewing gum
- Chlorhexidine (11% alcohol)
- No over the counter mouthrinses with alcohol (Listerine 20% alcohol)

When should restorations/ necessary work be performed?

- Needed treatment should be provided any time
- Second trimester - early 14 to 20 weeks is preferred
- Pre-anesthesia evaluation may require addressing loose teeth and restorations prior to time of delivery

Is it safe to use mercury restorations?

- No evidence of harmful effect (FDA 1997; LSRO 2004)
- Benefits outweigh risks
- Canada, Germany, and New Zealand have some restrictions

Neuropsychological and renal effects of dental amalgam in children - JAMA April 2006

- 5 community health dental clinics in Boston and one in Farmington, ME
- 534 children randomized to receive amalgam or resin composite
- 5 year evaluation
- No difference in IQ scores, memory index, urinary albumin

Neurobehavioral effects of dental amalgam in children

- 507 children Lisbon, Portugal
- randomized to amalgam or resin composite - 7 year follow-up
- No difference in memory, attention, visuomotor function or nerve conduction velocity
- Starting at 5 years, additional restorative treatment 50% higher in composite group

Editorial caution - Herbert Needleman MD, Pittsburgh

- Time interval may not be long enough - effect of toxic exposure later in life
- May not have enough power for detecting smaller effect - 3 point difference in IQ
- Effect of amalgam on vulnerable group not considered (genetic predisposition - CPOX4 gene) to Hg toxicity)