

PERINATAL ORAL HEALTH
FOR THE MEDICAL AND
DENTAL TEAM



Why oral health?

In 2000, the first Surgeon General's report on oral health identified:

- Dental and oral disease as a “silent epidemic”
- The mouth is the “mirror for general health”
- “To ignore oral health problems can lead to needless pain and suffering, complications that can devastate well-being, and financial and social costs that significantly diminish quality of life and burden American society,”

Oral Health in America: A Report of the Surgeon General



Department of Health and Human Services

Importance of perinatal and young child oral health

Pregnancy and early childhood are particularly important times to access oral health care services because the consequences of poor oral health can have a lifelong impact.



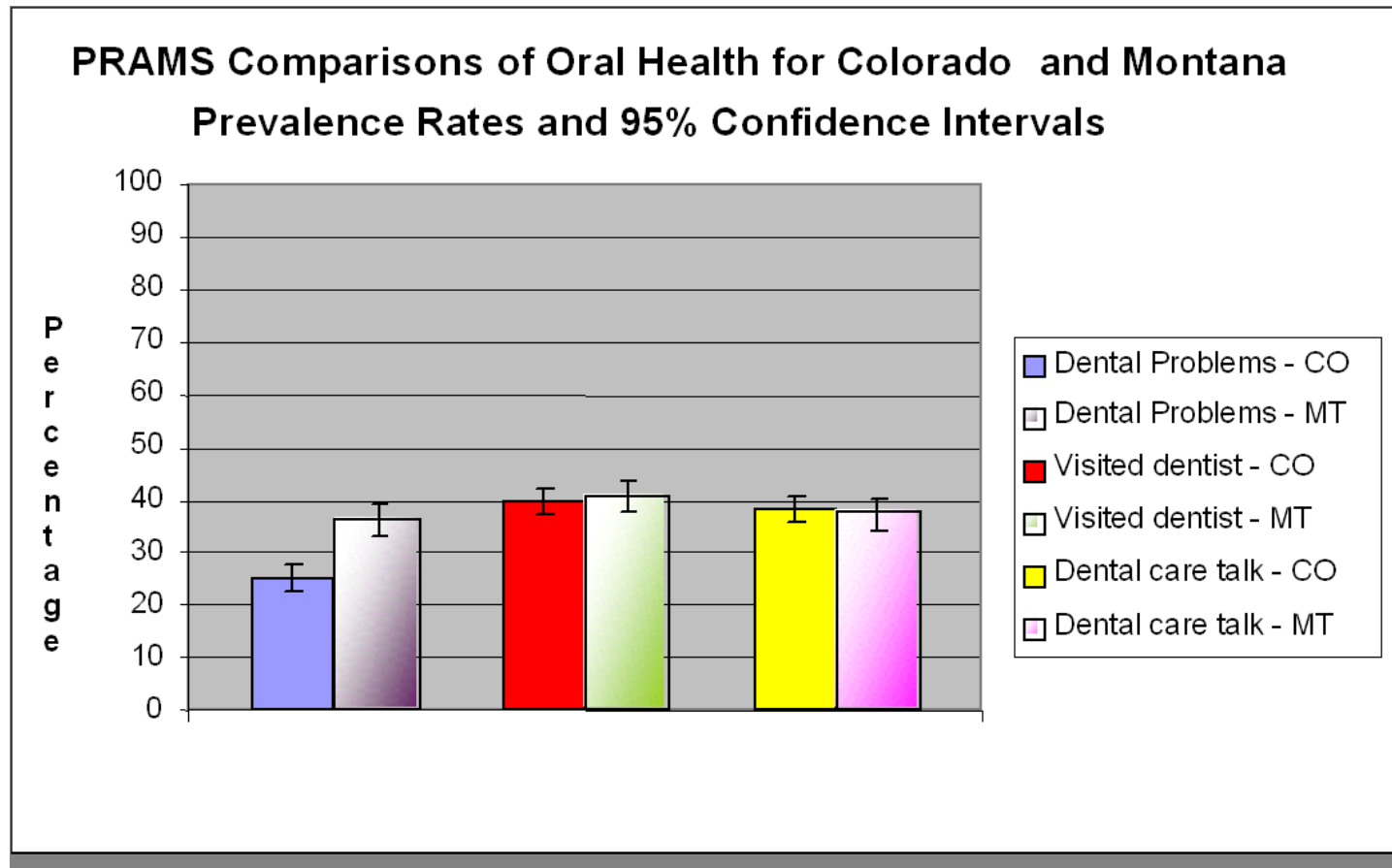
(Casassimo 1996, Lewit 1992, Gajendra 2004, Edelstein 2002)

Objectives

- Describe the importance of maintaining and improving oral health during pregnancy
- Describe the safety of dental treatment while pregnant
- Describe the etiology and disease process of caries
- Describe the risk factors and protective therapies related to caries
- Be able to complete perinatal oral health anticipatory guidance

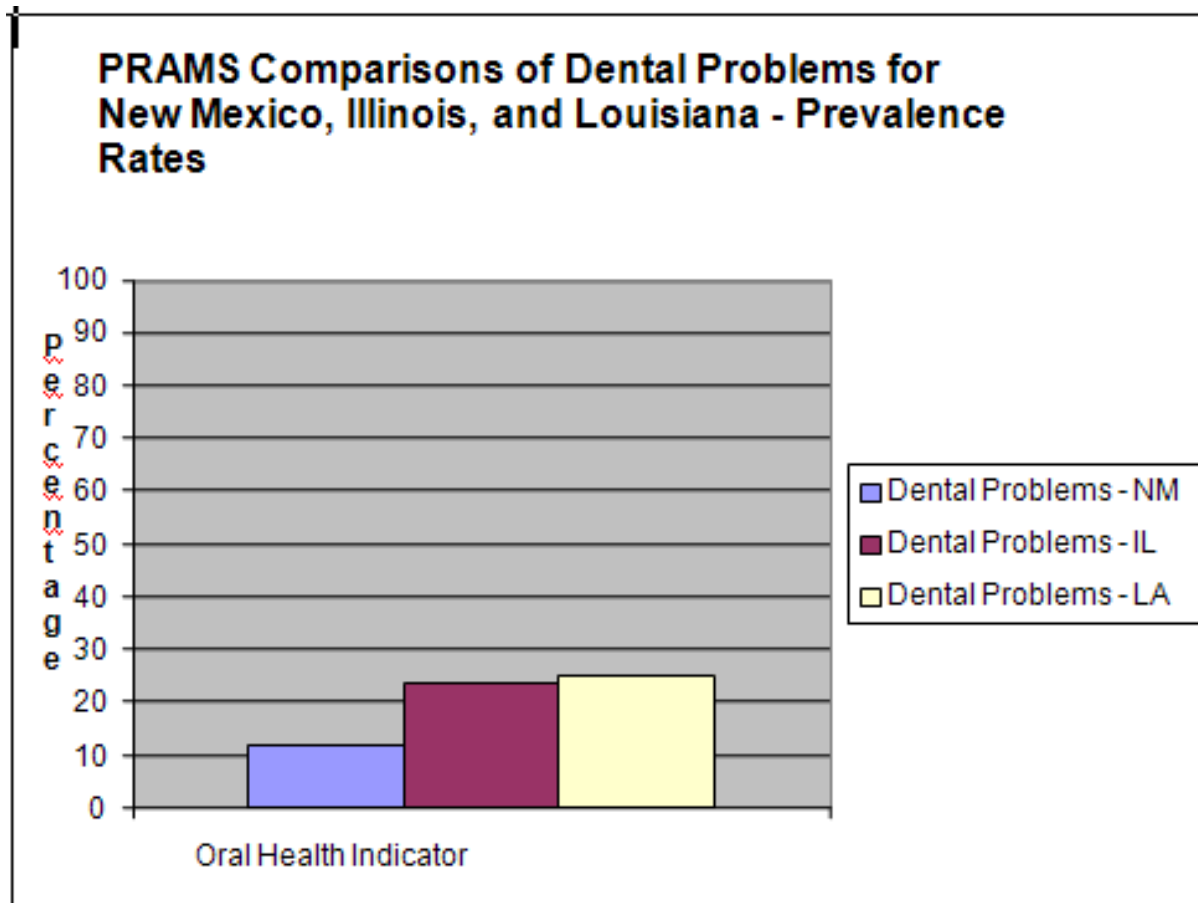
Status of prenatal oral health in Montana

Pregnancy Risk Assessment Monitoring System (PRAMS) completed in Montana in 2002



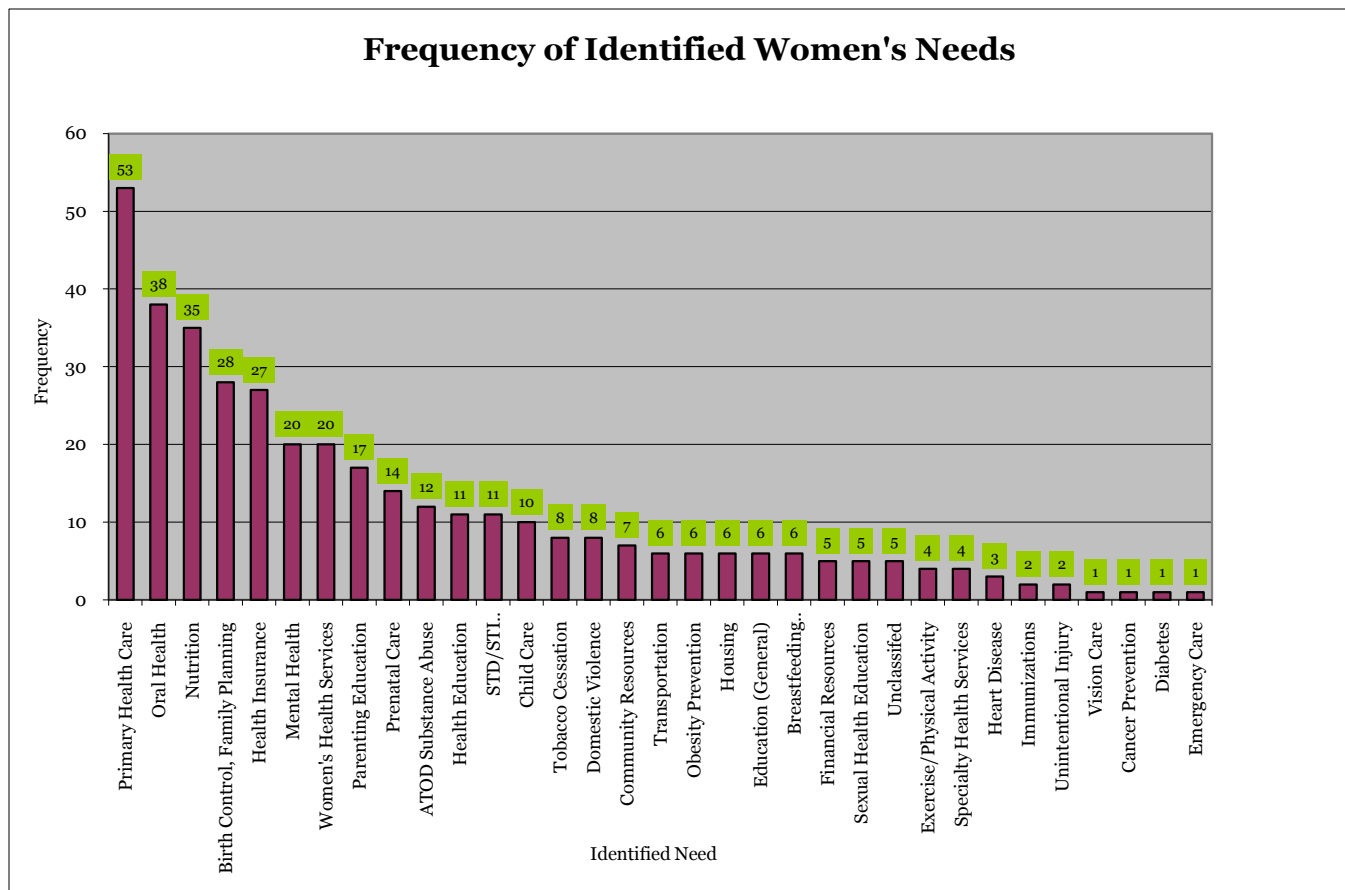
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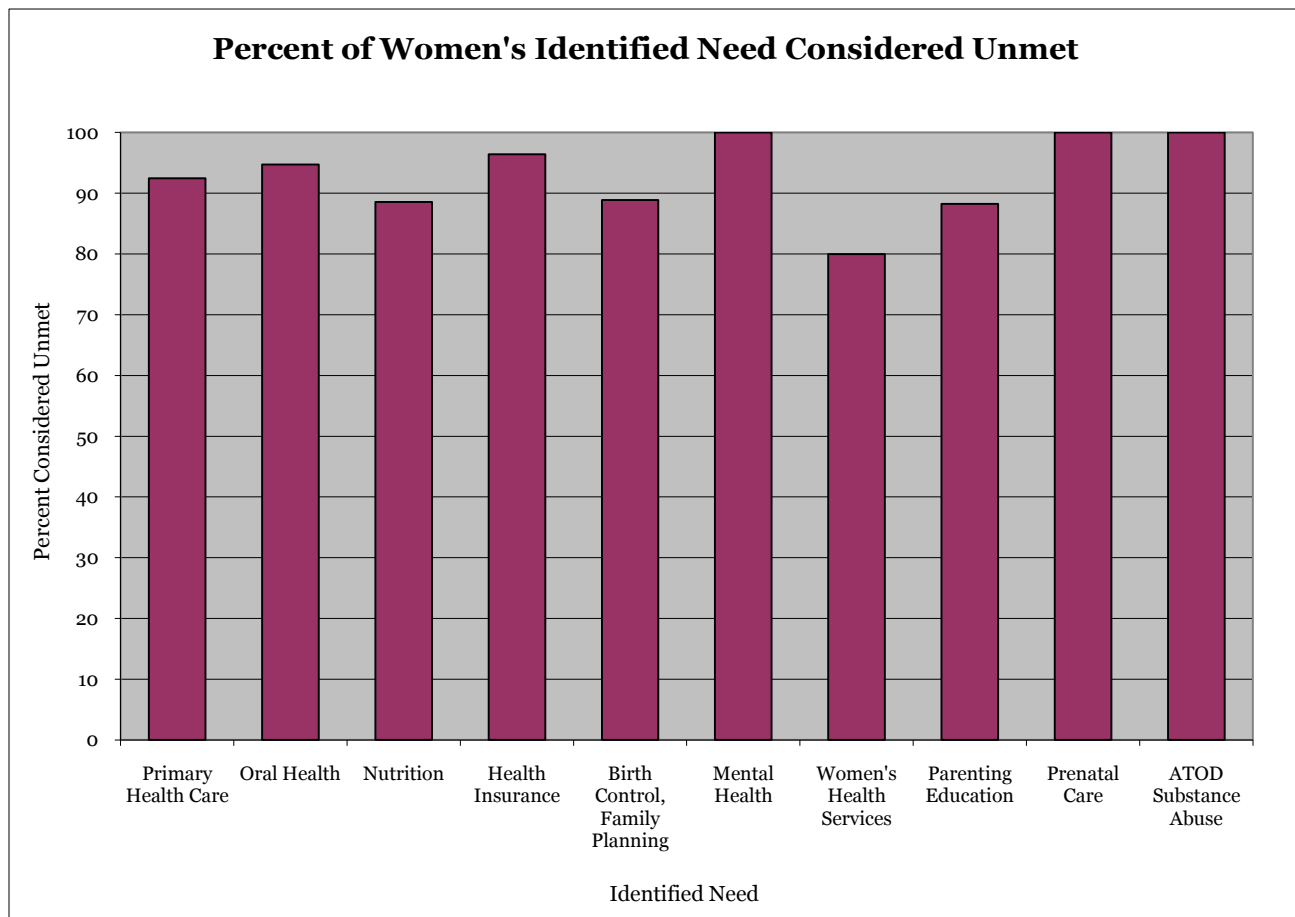
Status of perinatal oral health in Montana

2008 Montana Preliminary Needs Assessment



Status of perinatal oral health in Montana

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Importance of perinatal dental interventions

- Teachable moment: women are more receptive to make changes that improve the health of their child
- For some women this may be the only time they have medical and dental insurance (Timothe 2005)
- Some women may have trouble accessing dental care after pregnancy due to loss of insurance or preoccupation with child rearing (Gaffield 2001 & Allston 2001)

National organizations who recommend to improve oral health during pregnancy

- National Center for Maternal and Child Health
- American Dental Association
- American Academy of Pediatric Dentistry
- American Academy of Periodontology
- American Academy of Pediatrics

Importance of maintaining and improving oral health during pregnancy

- Improves general health (Crall 2005 & Allston 2001)
- Deferring treatment can cause harm to the mother and the fetus
 - ▣ Self medication for pain
 - ▣ Systemic health impact of untreated dental infections
 - ▣ Untreated caries in mom = increases caries in child
- Improves the general and oral health of children (Gunay 1998)

Self medication

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



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,

A black rectangular redaction box covering the signature of the author.

“Because the pain was so great she took ‘excessive doses’ (Tylenol) resulting in toxicity to 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.”

Oral health problems are common in pregnant women

- Pregnancy gingivitis common
- 30% of pregnant women have periodontal disease
- 25% of women reproduction age have caries

(Allston 2001, Oral Health US 2002 & Crall 2005)



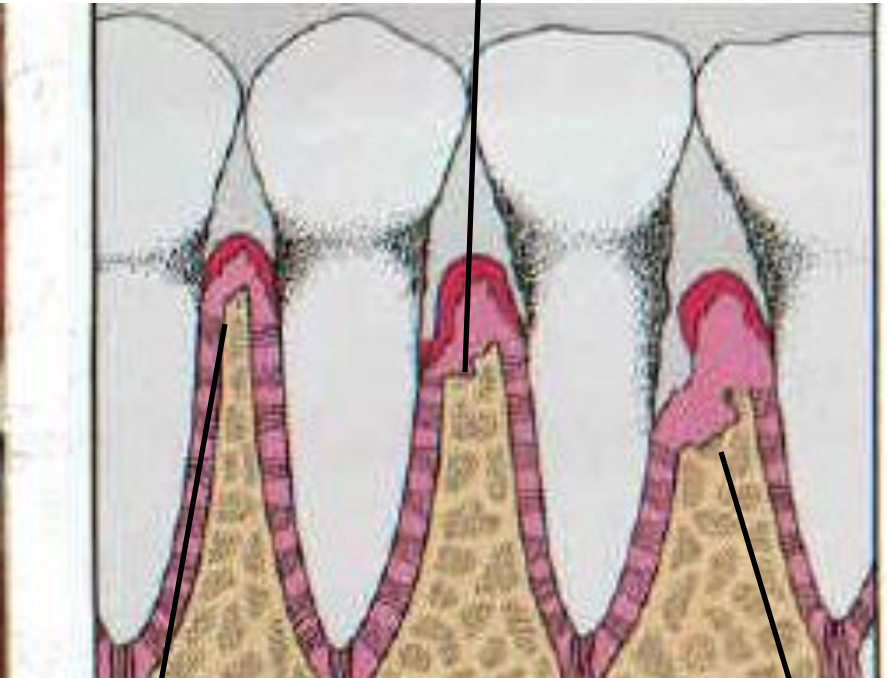
Periodontal disease and prenatal patients

- Periodontal: peri = around & odont = teeth
- Two main disease categories with different causative bacterial agents
 - **Gingivitis**
 - Reversible, no bone loss, aerobic
 - **Periodontitis**
 - Irreversible, loss of supporting bone, anaerobic

Etiology of periodontitis

- Caused by anaerobic gram-negative bacteria
- Toxic products from bacteria in the gingival crevice induce immune-system modulated processes that result in destruction of supporting bone
- Genetic component
- Chronic disease process, that is bone loss, can occur in “episodes” throughout life
- The infection is not normally associated with pain, but patients may have symptoms such as bleeding gums or bad breath. They do not seek care because they do not have pain and believe that bleeding gums and bad breath are “normal”.

Periodontitis and bone loss



mild bone loss

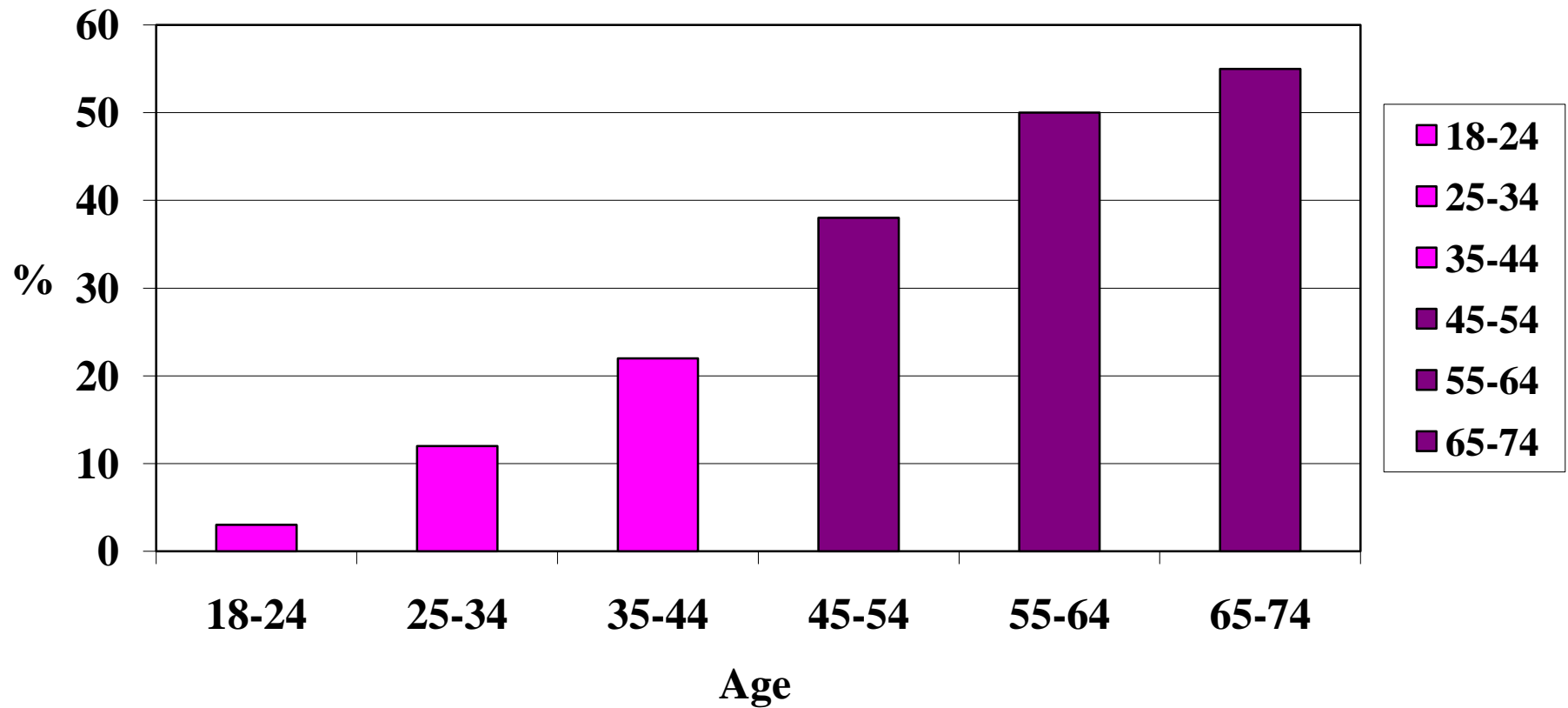
severe bone loss

Consequences of periodontitis



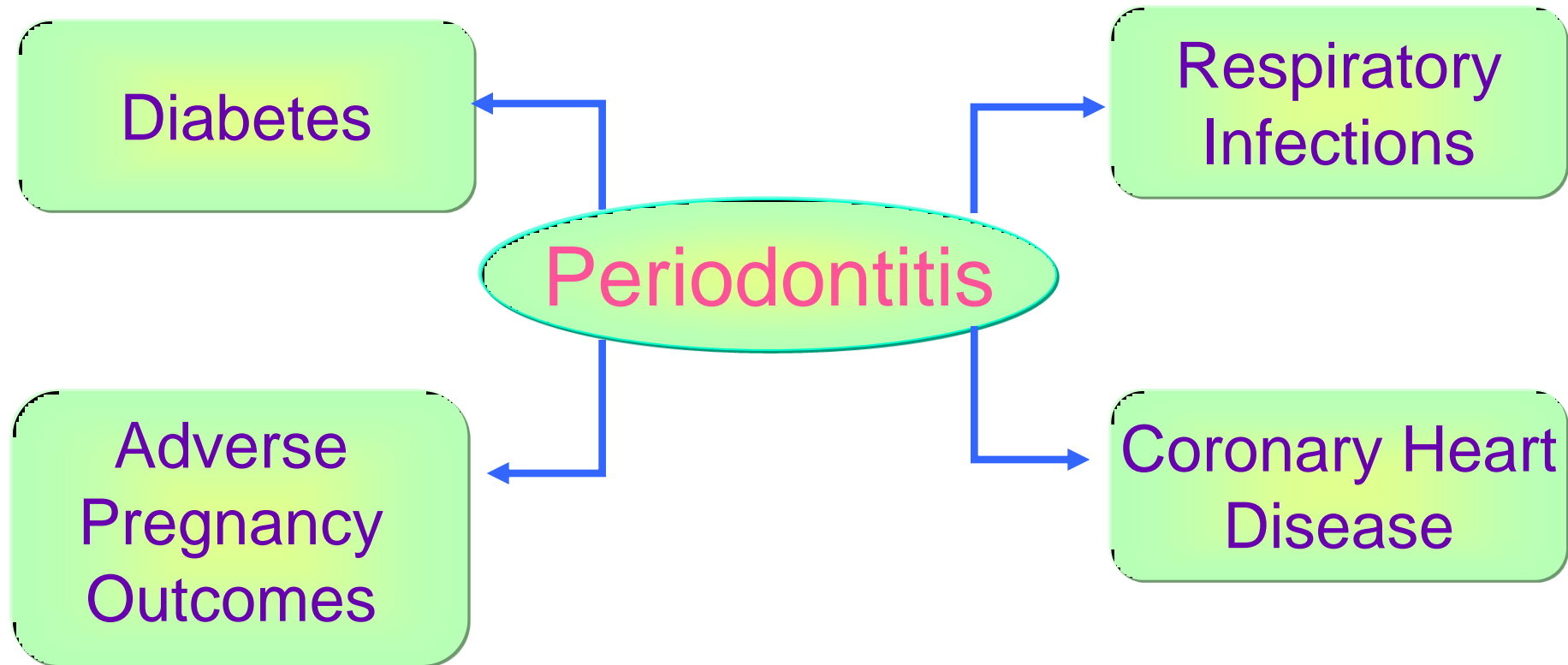
Tooth Loss!

Prevalence of moderate periodontitis



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

Periodontitis associations



Periodontitis and adverse pregnancy outcomes

Current research supports an association between **periodontitis** and the risk of a woman delivering a **low-birth weight** and/or **preterm baby** (Offenbacher et al 1996, 1998, Goepfert et al 2004, Jeffcoat 2001, Lopez 2002, Offenbacher 2006, Pitiphat et al 2007, Saddki et al 2007)

An estimated 30% of pregnant women have **periodontitis** (Crall 2005)

Treatment of periodontitis during pregnancy

- Some research suggests treating pregnant women with periodontitis improves birth outcomes (Jeffcoat 2002, Lopez 2003)
- Other research does not support this finding, but *does conclude* that treatment is safe for pregnant women (Michalowicz 2006)

Treatment of periodontitis during pregnancy

- The MOTOR trial:
 - ▣ 1800 subjects
 - ▣ Periodontal therapy did not reduce low-birth weight and/or preterm delivery
 - ▣ Participants did not respond as well to traditional therapy
 - ▣ It maybe that a more rigorous therapeutic approach is needed during pregnancy



Poor birth outcomes and dental need in Montana

Exposure Variables		Sample Distribution (%) ⁷	Low Birth Weight				Infant Admitted To ICU			
			% yes	p-value	Prevalence Ratio (PR)	95% CI	% yes	p-value	PR	95% CI
<i>Needed to Visit the Dentist</i> (n=10,376)	Yes	36.19	52.11	0.0245	1.99	1.09-3.63	50.47	0.0098	1.90	1.17-3.08
	No	63.81	47.89	Reference Group		49.53	Reference Group			
<i>Visited the Dentist</i> (n=10,421)	No	59.23								
	Yes	40.77								
<i>Talked with the Dentist</i> (n=10,256)	No	62.49								
	Yes	37.51								

Reported *Needing to Visit the Dentist* was correlated with both low birth weight (<2500 grams) and NICU admission outcomes

The association suggests women who perceived a dental problem during pregnancy had 99% more occurrences of low birth weight outcomes and 90% more occurrences of NICU admissions than those women not reporting a dental problem during pregnancy

Last comments....

- There is a clear association
- We don't know if it's causal
 - ▣ The mechanism is not clear
- Periodontitis is still a disease/pathological state
- Treatment of periodontitis is safe during pregnancy

Mom's mouth matters!

Moms and babies share 70% identical bacteria!



Vertical transmission of caries

- Cariogenic bacteria is transmitted from caregiver to child via sharing spoons during eating, cleaning dropped pacifiers or wiping babies mouth with caregiver's saliva (Berkowitz 2003 & Caulfield 1982)
- Colonization occurs any time after birth, but most common after teeth have appeared 6-36 months (Caulfield 1982 & Caulfield 2005)
- **The earlier that cariogenic bacteria occupy ecological niches in the child's mouth the greater the percentage of the child's plaque will be comprised of these bacteria.**(Caulfield 1982 & Caulfield 2005)
- As the child grows, cariogenic bacteria become less able to colonize within the child's mouth, as the available ecological niches are already colonized with other bacteria (Caulfield 1982 & Caulfield 2005)
- Reducing the vertical transmission of caries can be accomplished by 1) reducing maternal reservoirs 2) avoiding vectors 3) and increasing child's resistance to colonization (Kohler 1994, Brambilla 1998, Gunay 1998, Isokangas 2000, Soderling 2001)

Caries and children

Though caries is nearly completely preventable:



- It is the single most common childhood chronic disease affecting 58% of children
- It is 5-8 times more common than asthma
- It is the most prevalent unmet health care need in US children

(NIH 2000)

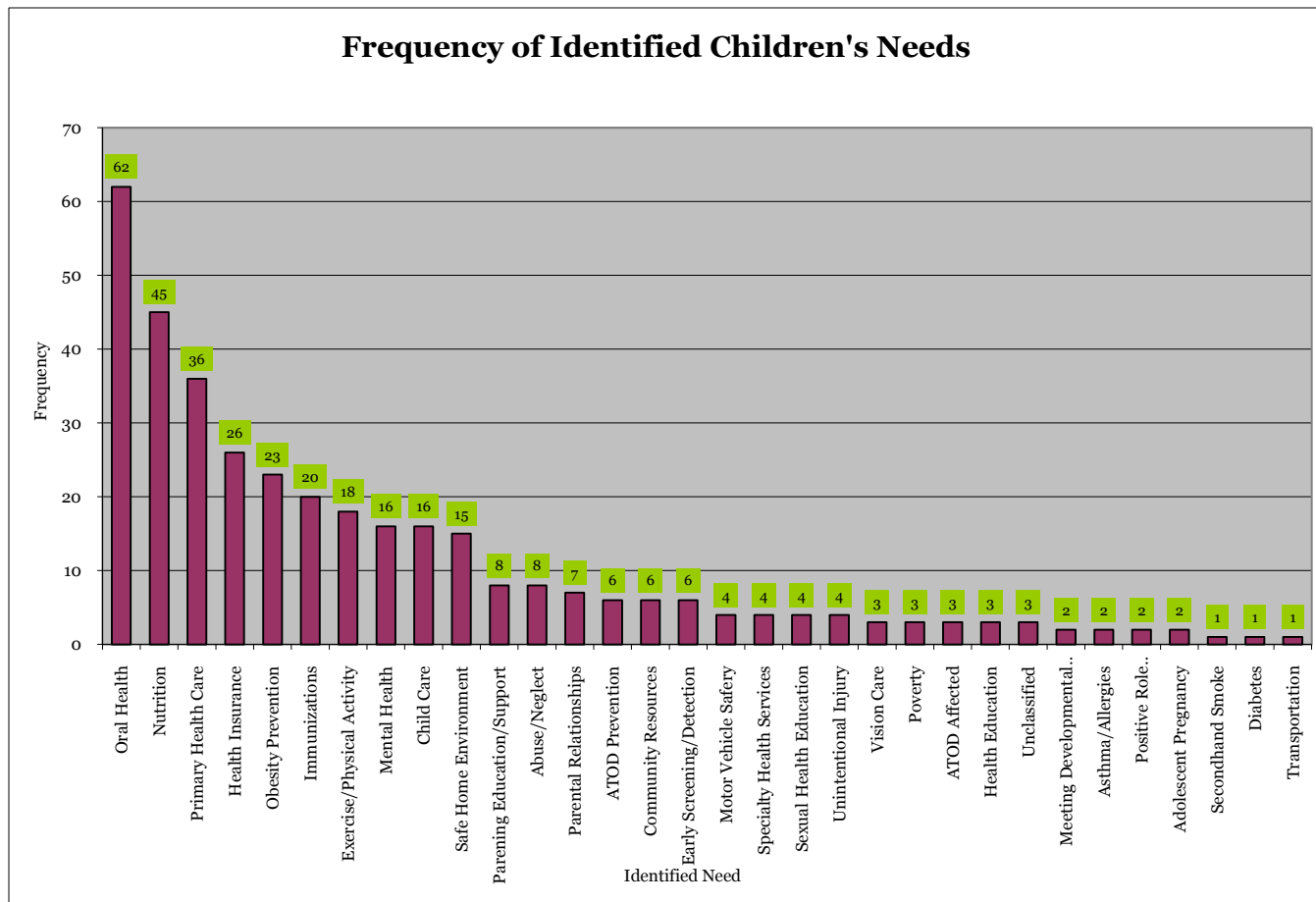
Early Childhood Caries

- Virulent form of caries that impacts very young children
- Infection is established as an infant



Status of children's oral health in Montana

2008 Montana Preliminary Needs Assessment





“What’s the big deal? Aren’t they just baby teeth?”

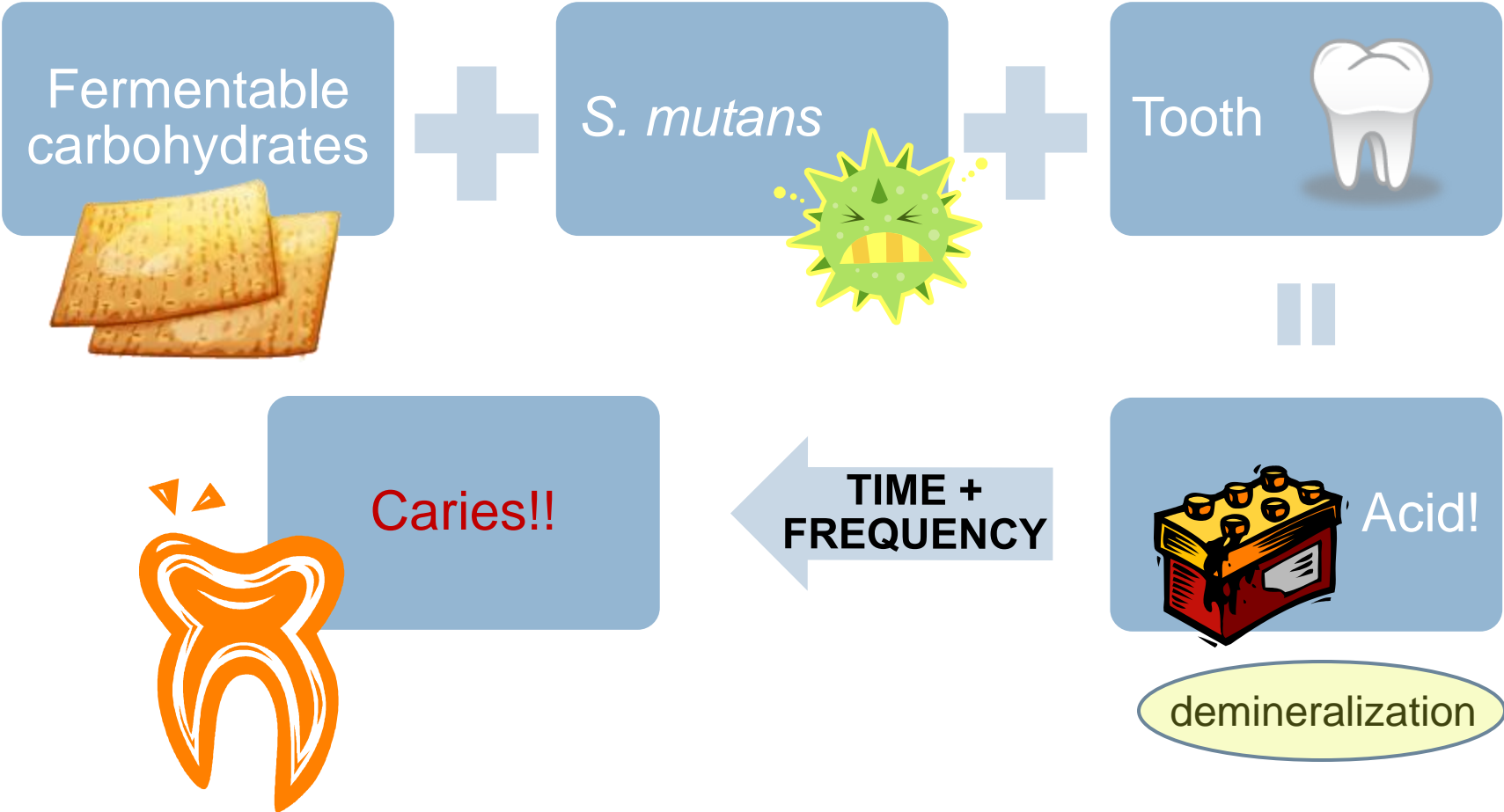
The painful truth

- Primary (baby) teeth are important for eating, smiling, speaking, good self esteem, healthy adult teeth and good general health (NIH 2000)
- Know one knows the true impact living in constant pain can have on the growth and development of a child
- Approximately 51,679,100 million school hours are missed annually by school-aged children due to a dental problem or visits, with 117 hours missed per 100 children (Giff 1992)
- Pain and infection due to caries can lead to
 - Failure to thrive
 - Poor self esteem
 - Lost school hours
 - Spread of the infection to other organs
 - Death

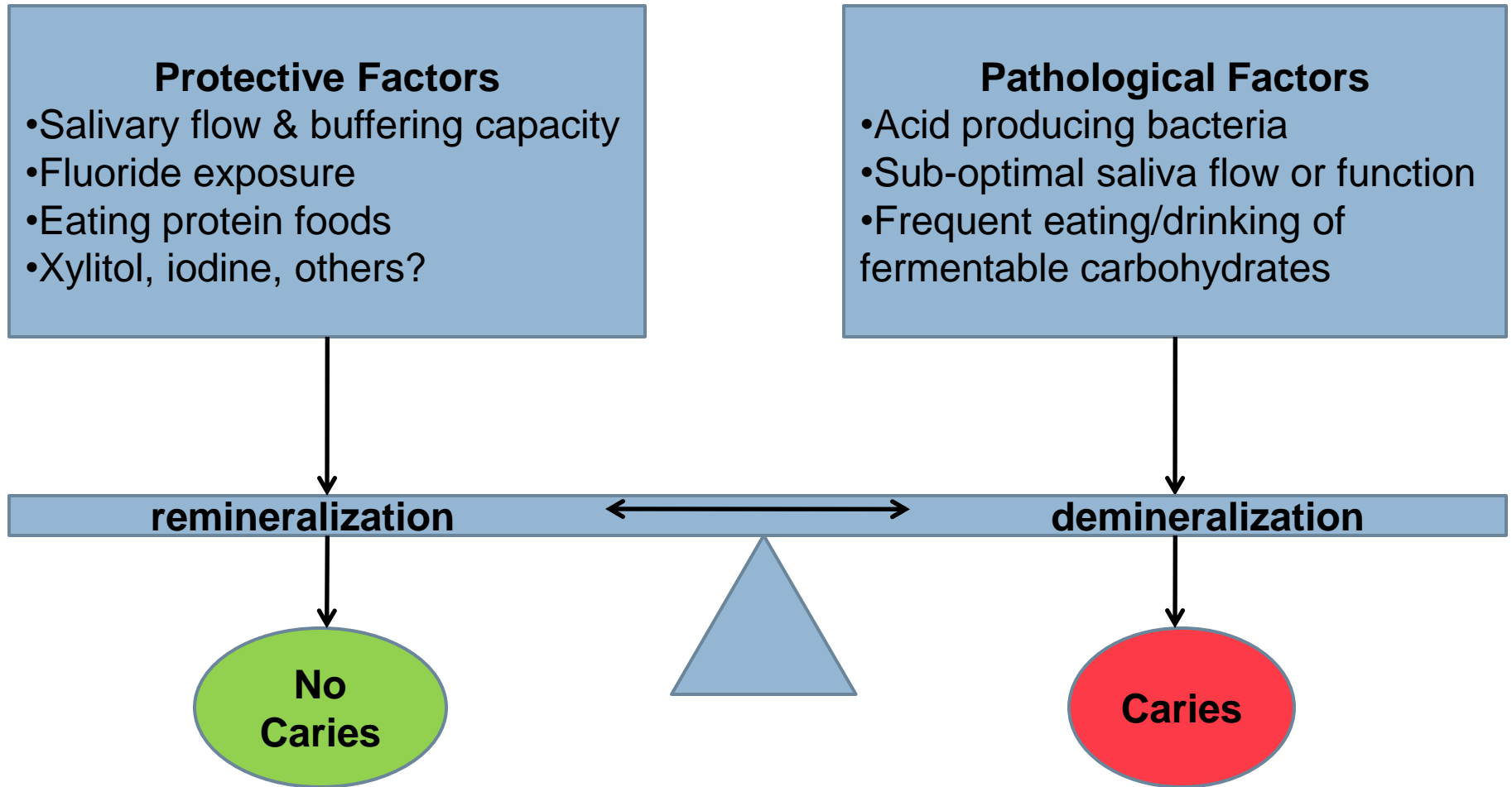
(Acs 1992, 1999, 2002, Ayhan 1996)



Formation of caries



The caries balance



How to identify women at high risk for caries

- Do your gums bleed or are they red or tender?
- Have you had nausea and/or vomiting?
- Do you frequently eat and/or drink carbohydrates?
- Do you have a history of cavities or do you have cavities now?
- Do your other children have a history of cavities?
- Has it been over a year since you have seen the dentist?
- Do you use fluoridated toothpaste?
- How frequently do you brush your teeth?

- Is your patient of a low socioeconomic status?
- Does your patient have plaque on their teeth?

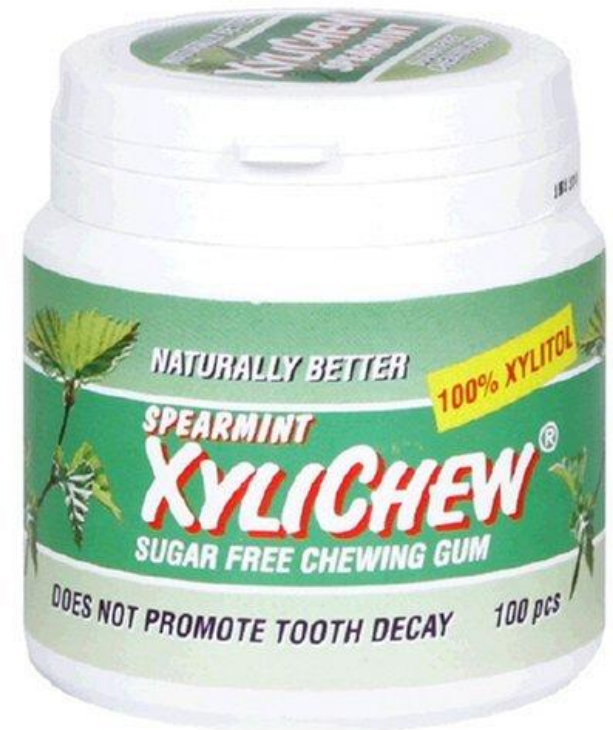
Caries prevention strategies for pregnant patients

- Floss and brush twice daily with fluoridated toothpaste
 - ▣ Rx toothpaste: PreviDent 5000 Plus – brush 2 mins – do not rinse or eat or drink for 1/2hour



Caries prevention strategies for pregnant patients

- Xylitol gum - natural sugar
- Reduces *S. mutans* (Hildebrandt 2000)
- Reduces transmission of caries to children (Soderling 2001)
- 6 grams 4/day (Milgrom 2006)
- Chew 5 mins qid



Caries prevention strategies for pregnant patients

- Reduce snacking of fermentable carbohydrates including: crackers, soda, juice, cereal and granola bars

**100%
natural or
organic**



**Non-cavity
causing**

- Increase snacking of protein snacks including: cheese, meat, nuts and yogurt
- Increase water intake
- After vomiting or acid reflux “swish and spit” with a teaspoon of baking soda in a cup of water

Dental treatment and pregnant women

- All pregnant women should obtain a dental exam while pregnant and seek to improve or maintain good oral health (ADA)
- The New York State Department of Public Health developed an advisory panel consisting of 30 nationally recognized expert OB/GYN's, dentists and researchers
- After careful review of all of the most current and rigorous research to date they concluded:



Dental treatment and pregnant women

- Dental care is safe and effective during pregnancy. Oral health care should be coordinated among prenatal and oral health care providers.
- First trimester diagnosis and treatment, including needed dental radiographs, can be undertaken safely to diagnose disease processes that need immediate treatment.
- Needed treatment can be provided throughout pregnancy; however, the time period between the 14th and 20th week is ideal.
- Elective treatment can be deferred until after delivery.
- Delay in necessary treatment could result in significant risk to the mother and indirectly to the fetus.

Common gaps in knowledge for providers

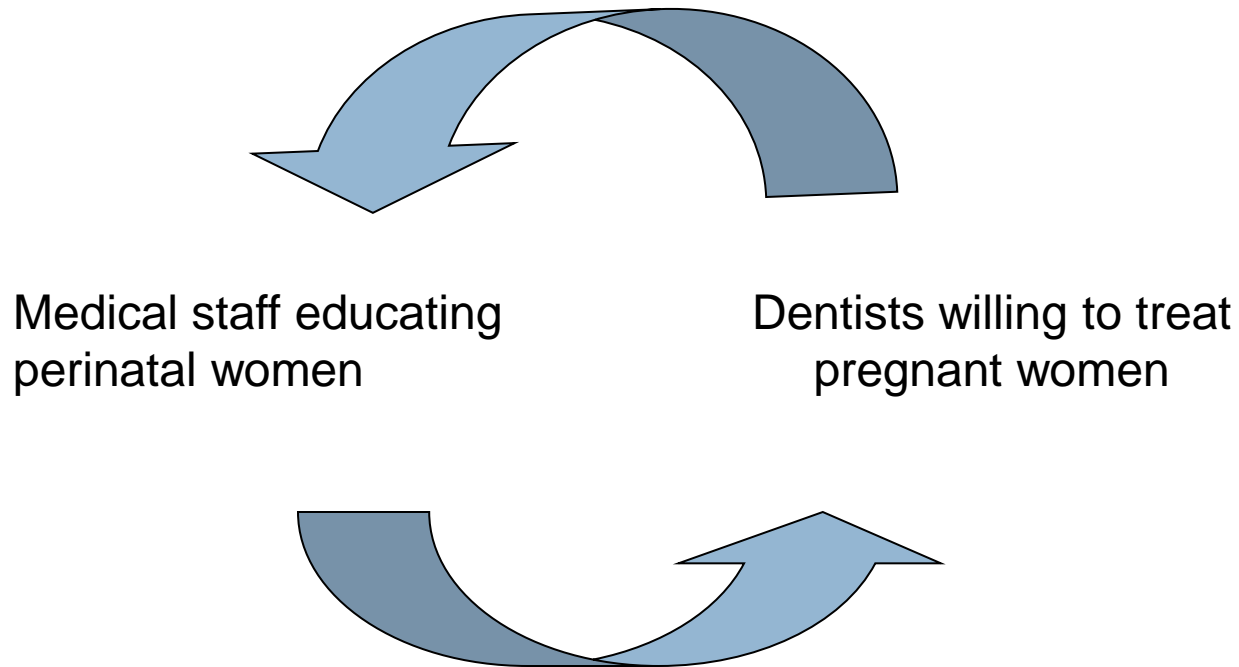
- Effect of radiographs on the fetus
- Effect of medications on the fetus and mother
 - ▣ Anesthetics
 - ▣ Antibiotics
 - ▣ Analgesics
- Effect of restorative materials on the fetus
- How to handle disorders related to pregnancy



Patient misconceptions surrounding oral health and pregnancy

- ❑ Bleeding gums are “normal” during pregnancy
- ❑ “have a baby = lose a tooth”
- ❑ Having a baby robs calcium from the mothers teeth and results in more caries
- ❑ Pain during dental procedures is unavoidable
- ❑ Dental radiographs during pregnancy are harmful to the fetus
- ❑ Postponing dental treatment until after pregnancy is safer for the fetus and mother

Medical – Dental integration is KEY!



Time line of pregnancy

- 40 weeks for LMP
- Trimesters based on 42 weeks



Dental care is safe and effective any time during pregnancy!

There is no need to delay non-elective care until after delivery.

(Cunningham 2001 & Kumar 2006)

Time line of pregnancy: first trimester

- 10-15% spontaneous abortions in 1st trimester: mostly karyotypic abnormalities
- Organogenesis occurs in 1st 10 weeks
- Environmental teratogens occur with in this time
- Malformations are present in 2-3% of all newborns
- Dental treatment during early pregnancy has *never* been reported with an increased rate of malformations

Time line of pregnancy: second trimester

- 14 – 20 weeks is best time to complete treatment
- Risk of pregnancy loss is lower
- Organogenesis is complete
- Care is most comfortable during this time

Time line of pregnancy: third trimester

- Uterus can press against vena cava and pelvic veins
- Decrease venous return
- May increase nausea and vomiting

Dental treatment guidelines for the dentist

Consider the following when planning definitive treatment:

- Chief complaint and medical history
- History of tobacco, alcohol and other substance use
- Clinical evaluation
- Radiographs when needed

Develop and discuss a comprehensive treatment plan that includes preventive and maintenance care

Educate pregnant women about care that will improve their oral health:

- Brush teeth twice daily with a fluoride toothpaste and floss daily
- Limit foods containing sugar to mealtimes only
- Choose water or low-fat milk as a beverage. Avoid carbonated beverages during pregnancy.
- Choose fruit rather than fruit juice to meet the recommended daily fruit intake.
- Obtain necessary dental treatment before delivery

Dental treatment guidelines for the dentist

Dentists are encouraged to:

- Implement best practices in the assessment of caries risk and management of caries in pregnant women
- Perform a comprehensive gingival and periodontal examination, which includes a periodontal probing depth record
- Consider the following as strategies to decrease maternal cariogenic bacterial load:
 - Suggest fluoride toothpaste along with fluoride mouth rinses depending on the fluoridation status of water
 - Restore untreated caries
 - Recommend chlorhexidene mouth rinses and fluoride varnish as appropriate
 - Recommend the use of xylitol-containing chewing gum

Dental treatment guidelines for the dentist

Use the following when clinically indicated:

- Local anesthetic with epinephrine
- Analgesics such as acetaminophen and/or codeine, antibiotics including penicillins, cephalosporins and erythromycins, excluding erythromycin estolate
- Radiographs with thyroid collar and abdominal apron
- Non-steroidal anti-inflammatory drugs for 48 to 72 hours

Complete restorations with permanent materials, if possible, during pregnancy

Complete all necessary dental procedures prior to delivery

Consult with the prenatal care provider 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
- An anesthesia other than a local block such as intravenous sedation or general anesthesia to complete the dental procedure

Safety of dental radiographs

- "Women should be counseled that x-ray exposure from a single diagnostic procedure does not result in harmful fetal effects. Specifically, exposure to less than 5 rad has not been associated with an increase in fetal anomalies or pregnancy loss." (ACOG 1995)
- Current evidence supports that there is no increased risk to the fetus with regard to congenital malformation, growth retardation, or abortion from ionizing radiation at a dose of less than 5 rad (Toppenberg 1999)
- 1 conventional dental x-ray = .0001 rad exposure to the fetus (Toppenberg 1999)
- 1 digital dental x-ray = .00005 rad exposure to the fetus

Safety of dental radiographs

- Standard of care is as needed for proper diagnosis and treatment (ADA)
- Radiation exposure is less of an issue due to digital imaging (40-90% less radiation than conventional x-rays)
- Hujoel et al. recently reported an association with 1st trimester dental radiographs and low birth weight babies (Hujoel 2004)
- Several weaknesses in study (Boice 2004, Moore 2004, Reiman 2004)



FDA use-in-pregnancy ratings for drugs

FDA Use-in-Pregnancy Ratings for Drugs

- **Category A** – Controlled studies show no risk – Adequate, well-controlled studies in pregnant women have failed to demonstrate risk to the fetus.
- **Category B** – No evidence of risk in humans – Either animal studies show risk (but human findings do not) or, if no adequate human studies have been done, animal findings are negative.
- **Category C** – Human studies are lacking and animal studies are either positive for fetal risk or lacking as well. However, potential benefits may justify the potential risk.
- **Category D** – Positive evidence of risk – Investigational or post marketing data show risk to the fetus. Nevertheless, potential benefits may outweigh the risk, such as some anticonvulsive medications.
- **Category X** – Contraindicated in pregnancy – Studies in animals or humans, or investigational or post marketing reports have shown fetal risk, which clearly outweighs any possible benefit to the patient, such as isotretinoin and thalidomide.

Acceptable medications in pregnancy

Medication	Pregnancy rating
Lidocaine with epinephrine	B
Prilocaine with epinephrine	B
Acetaminophen	B
Acetaminophen with codeine	C
Acetaminophen with hydrocodone	C
Ibuprofen (after 1 st trimester for 24-72 hours)	B
Naprosyn (after 1 st trimester for 24-72 hours)	B
Nitrous oxide (infrequent use at 30% or less for 30 mins or less)	B
Penicillin	B
Clindamycin	B
Amoxicillin	B
Cephalosporin's	B
Erythromycin (excepts estolate forms)	B
Meperidine	B
Morphine	B

Unacceptable medications in pregnancy

Medication	Pregnancy rating
Tetracycline	D
Erythromycin in estolate forms	B
Quinolones	C
Clarithromycin	C
Aspirin	C
Benzodiazepines	C-D

Amalgam restorations and pregnancy

- Amalgam fillings are just one of many restorative materials dentists and patients can choose from
- At present, there is no evidence that exposure of the fetus to Hg released from the mother's existing amalgams causes any adverse effects (CDC, Bethesda/NIH 2004, FDA 2006, Hujoel 2005, March of Dimes 2006, Whittle 1998)
- There is international agreement that scientific data does not confirm the presence of any health hazard from use of dental amalgam (Bethesda/NIH 2004)
- Regardless, certain countries have restrictions of amalgam use in certain populations including pregnant women. Additionally, Sweden and Denmark are phasing out *all* Hg containing materials because of *environmental concerns*.

Amalgam in pregnant women

- Organic Hg = found in fish and seafood is a major source of Hg = is a health concern
- Inorganic Hg = elemental Hg = Hg vapor = not related to adverse health effects
- Hg vapor can be produced during both placement and removal of amalgam
 - ▣ Rubber dam and high suction dramatically reduce vapor (Whittle 1998)
 - ▣ A recent systematic review, there was insufficient evidence to support or refute the hypothesis that Hg exposure from dental amalgam contributes to adverse outcomes
 - ▣ Recent research did not increase risk of low-birth weight (Hujoel 2005)

Choice of restorative materials during pregnancy

- “Women with symptomatic caries or deep decay should be treated promptly, including in the first trimester” (Kumar 2006)
- Composite “tooth colored” fillings are made of **resin** (plastic)
- Bisphenol-A a chemical found in **resin** has been shown to be an endocrine disrupter in animal studies (Olea 1996)

Nitrous oxide use in dental offices

- Class B
- Use precautions to avoid hypotension, hypoxia and aspiration
- Use in short 30 min or less doses
- Not to be used at each appointment
- Use pulse oximeter if possible = 95% or higher is goal

Disorders of pregnancy

- **Hypertensive disorder:** 140/90 – 160/110 mmHg; 12-22% PG women
- **Preclampsia:** hypertension and proteinuria; 5-8% PG women
- **Eclampsia:** preclampsia & grand mal seizures
- **Diabetes:** Dx & Tx of oral disease very important as infection can make diabetes difficult to control; 2-5% PG women
- **Heparin:** Tx for Thrombophilia; small # of women
- **Normal for PG women to have decreased blood pressure:** lowest at 16-18 weeks, due to changes in renin-angiotensin system and development of anemia

Disorders of pregnancy

□ Risk of aspiration

- PG women always considered to have a “full stomach”
- Higher with multiple gestations
- Avoid excessive sedation

(Creasy 2004)

□ Pressure for the vena cava

- Position patient with a small pillow under right hip and do not use trendelenburg (Wasylko 1998)

□ Vomiting

- Treatment: 1 teaspoon baking soda in 1 cup of water and rinse after vomiting



Prenatal anticipatory guidance

- Cavities are preventable!
- Your baby's teeth are important for eating, smiling, speaking, good self esteem, healthy grown-up teeth and good general health
- Cavity causing germs can be passed from parents to their babies. Avoid sharing with your baby anything that has been in your mouth.
- Your oral health directly affects your baby's oral health
- Obtain a dental exam and any needed dental treatment **before** your baby is born
- Dental treatment including dental radiographs are safe for pregnant women
- Floss and brush your teeth daily with fluoridated toothpaste
- Choose your baby's dentist and schedule a dental exam by **AGE ONE**

Role of prenatal providers

- Assess problems with teeth & gums and make appropriate referral to DDS
- Encourage all women to visit the DDS if they have not done so with in the past 6 months, or if a new condition has occurred
- Encourage all women to adhere to the DDS's recommendation regarding follow-up care
- Share appropriate clinical information with DDS
- Educate pregnant (PG) women about care that will improve their oral health
- Assist PG women with nausea and vomiting
- Advise women about practices that will reduce the risk of caries in children

Conclusion

- **Dental care is safe and effective any time during pregnancy**
- **Delaying dental treatment until after pregnancy may cause unforeseen harm to mom and/or baby**
- **Follow establish practice guidelines when treating pregnant women**



Thank you!

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