

**Public and Private-Sector Efforts to Improve the
Oral Health of Pregnant Women:**

Policies, Programs, and Practices

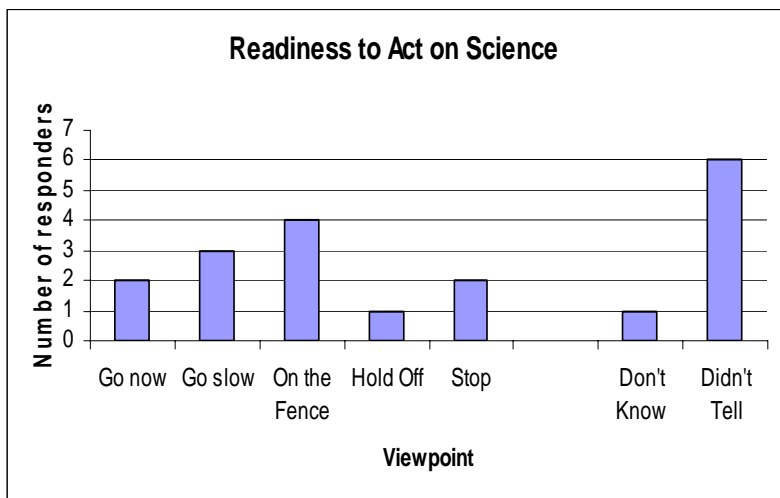
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Background, Context, and Charge

One hundred and five years after the debunked “focal infection” theory first claimed an oral-systemic health connection,¹ the mouth was dramatically reconnected to the body with the oft-cited 1996 publication of Offenbacher’s paper entitled “Periodontal infection as a possible risk factor for preterm low birth weight.”² Excitement within the dental and public health professions was palpable. Epidemiologists were venerated. Clinicians were pleased with the implications of this “perio-preterm relationship” for their stature among other medical specialists. Within a few years of the paper’s release, consumer oral health product manufacturers began mounting advertising campaigns including one by a toothbrush manufacturer that featured a young woman holding an infant over the caption, “This dental professional helps deliver healthy babies.”³ Public health activists in government, policy shops, and advocacy organizations recognized the potential to address the mounting problem of preterm birth and its associated costs. Public and private dental insurers began to extend enhanced dental coverage to pregnant women. Harkening back to the “focal infection” theory that had led to wholesale extraction of teeth and had set restorative dentistry back by decades,⁴ dental educators and professional societies struggled with how and when to adopt the new findings into clinical practice.⁵

By 2003, leaders of the Department of Health and Human Services (DHHS) oral health endeavors appropriately asked, ‘What new policies and programs that depend on this science should the federal government support?’ On April 24, 2004, 21 planners from a variety of public and private groups met to plan a “Research into Policies and Program



(RIPP)” Forum on “periodontal health and pregnancy outcomes” in order to answer this question. Of 19 attendees who responded to a pre-meeting opinion survey, there was an array of opinion on whether the science was then yet ready for policy and programmatic support (figure at left). There was wider consensus that the

“implications are important” (9 respondents considered the implications “of very importance,” 3 “of medium importance”, 1 agreed with “don’t know” and 6 didn’t respond).⁶

How policymakers should respond to science in general is an issue that has received a great deal of attention in recent years over issues ranging from genomics and stem cell research to evolution and theology. RIPP planners voiced acceptance of a statement from a respected policy publication that:

“Scientists generally agree that the most reliable research is based on good data, conducted by experts in their fields, reviewed by scientific peers and capable of being replicated by others. Many scientists also argue that policy decisions should usually, though not always, be based on the overwhelming scientific consensus, rather than fringe views. All say science should not be driven by the desire to arrive at desired policy outcomes.”⁷

This quote describes both the tension that exists in the early adoption of any new information and the need for government to act in ways that balance the public’s welfare with the need for reliable information.

RIPP Forum planners noted that the perio-preterm relationship had not yet reached “scientific consensus.” They focused attention on the clinical trials funded by the National Institutes of Health (NIH), National Institute of Dental and Craniofacial Research (NIDCR) of periodontal therapy interventions during pregnancy that were then underway. Findings, which were subsequently published in November 2006,⁸ validate the safety of periodontal therapy during pregnancy but note no significant reduction in rates of preterm birth (defined as birth before 37 weeks), low birth weight, or fetal growth restriction resulting from periodontal treatment during pregnancy. A companion editorial,⁹ however, calls for additional studies that monitor different birth outcomes and/or focus on the value of interventions before and between pregnancies as potentially more timely and effective. Additional critiques of the study’s methodology and its implications are reflected in a November 7th statement by the American Academy of Periodontology stating that:

“Research presented in a recent paper...is at variance with findings of other studies, which have suggested that periodontal treatment positively affects birth outcomes. There may be several explanations for the differences in research findings to date including timing of the treatment intervention, as well as the pregnancy outcomes studied. For example, the Michalowicz research did not study the effect of periodontal treatment on early adverse outcomes, such as late miscarriage, stillbirth, and early spontaneous preterm birth, which previous observational studies have linked with periodontal disease.... The intriguing findings of the study...support the need for additional research to clarify the potential effect of periodontal disease on adverse pregnancy outcomes, given the potential impact of the increasing problem of prematurity. Other trials are underway that should provide additional insight on this important topic.”

Findings of the RIPP Forum planning meeting reflect tensions related to best applications of science for policy and programs. They noted that:

- Neither the obstetric nor dental communities had yet developed definitive guidelines on the care of pregnant women, and clinicians require further evidence-based guidance.

- The science was still emerging on both the safety of periodontal treatment during pregnancy and the impact of such treatment on birth outcomes.
- A responsible approach to the public would feature conditional and cautious statements that encourage attention to pregnant women’s oral health for its own sake if not for the potential to reduce unfavorable birth outcomes.
- The potential for the perio-preterm relationship to substantially explain prevalent and increasing levels of preterm low birth weight is substantial.
- No action by the federal government can significantly influence what state governments or the private sector will do with the information or how far they will go in promoting their interests. But the federal government should await further science before supporting policies and programs that depend upon it.
- There is little need for concern about a “downside” risk of addressing pregnant women’s oral health as doing so is inherently valuable whether or not the perio-preterm relationship is found to be authentic.

Ultimately, the proposed RIPP Forum was scheduled for December 2006 to reconsider the same question of scientific readiness to proceed with governmental policies and programs that are based on the perio-preterm relationship.

This paper was commissioned in support of the upcoming meeting which will be convened by the Maternal and Child Health Bureau (MCHB) of the Health Resources and Services Administration (HRSA). It describes a sampling of policies, programs, and practices in the public and private sectors that typify how agencies have built upon the putative relationship between periodontal disease during pregnancy and unfavorable birth outcomes since the RIPP planning meeting. This non-systematic web-based review provides information on how academics, insurers, state governments, policy organizations, professional societies, practitioners, manufacturers, and others have featured this oral-systemic connection in their efforts to address the oral health of pregnant women.

As evidenced by the following examples, the perio-preterm relationship has, in general, been subsumed under the oral-systemic health rubric which also addresses evidence of an association between periodontal disease and diabetes management, risk for cardiovascular disease/stroke, risk for coronary artery disease, and risk for bacterial pneumonia.

Methodology

State Government

Initial information on state health agencies with possible oral health policy and/or programmatic efforts targeted to pregnant women was identified through several sources. First, researchers conducted a review of the MCHB Title V Information System to identify any states with relevant State Title V Performance Measures. Second, the Association of Maternal and Child Health Programs—the national association representing the directors of the state Title V Maternal and Child Health (MCH) Services

Block Grant Program—issued a call for state information in an “Ask the Expert” feature of its electronic membership newsletter. Third, researchers conducted an analysis of the Children’s Dental Health Project *Summary and Analysis of State Oral Health Plans* for states with oral health objectives targeted to pregnant women. This summary includes an analysis of oral health objectives, organized by population and focus area, in state oral health plans. Finally, some states were identified based on information included in an unpublished draft evaluation report of the State Oral Health Collaborative Systems grants evaluation. Based on this initial analysis, researchers identified at least 14 states (AR, AL, CA, CO, GA, ID, IL, LA, NV, NH, NY, SC, UT, and WV) that appeared to have some type of oral health activity targeted to pregnant women in state public programs (i.e., Oral Health, Title V MCH, Medicaid).

Researchers then conducted phone interviews in October and early November 2006 with oral health program directors, staff in state Medicaid agencies, and/or other program staff in a selected sub-sample of seven states (AR, AL, ID, IL, LA, UT, and WV) to determine the scope, focus, and overall goals of state government activities. These seven states were selected based on several factors including: geographic distribution, scope of activities and efforts, and length of existing efforts (i.e., efforts had been in place since or prior to 2004). Using a guided interview process that included a brief questionnaire, researchers obtained information on these states’ activities, including: 1) overall description of state policy and/or programmatic efforts to address periodontal disease in pregnant women; 2) the predominant focus and target audience for such efforts; 3) the impact, if any, of the early perio-preterm research on states’ policy and/or programmatic directions; 4) proposed and/or anticipated future directions and next steps, particularly in light of the recent NIDCR clinical trials published in November 2006; and 5) relevant materials produced by the state (e.g., public service announcements, brochures, anticipatory guidance for physicians). It is important to note that this methodological approach may not have captured all of the states with current or proposed activities in this area.

Other Entities

For all other entities, two independent researchers (Burton Edelstein and Satvir Kaur of Columbia University College of Dental Medicine) conducted non-comprehensive web searches using Google and Firstgov search engines on terms including “periodontal disease,” “preterm,” “pregnancy,” “low birth weight,” and combinations of these terms. Secondary searches were conducted based on first-level findings. Some additional non-web information was obtained by direct observation and inquiry of oral health experts.

Findings

1. Employer sponsored health insurers (“ESI”) and dental plans

In response to both the emerging science supporting oral-systemic health associations and market conditions, dental insurers have acted with particular gusto on the perio-preterm relationship.

Motive for promoting perio-preterm relationship

As the costs of commercial ESI have climbed, employers have increasingly shifted expenses to beneficiaries, curtailed dependent coverage, negotiated with carriers for larger provider networks at lower costs and – to the concern of dental carriers – looked to constraining benefits, including dental coverage. To restrain dental coverage costs and thereby retain employer commitment to dental benefits, dental plans have remained static for many years. Annual and lifetime benefit caps have generally not increased in two decades while plans have developed PPO and dental HMO networks or imposed fixed-fee payment schedules to hold down employer costs. Employers, seeking even greater discounts, have put dental plans in a squeeze between lowering costs to employers, maintaining beneficiary satisfaction, and retaining a sufficient number of participating dentists in an era of declining dentist supply. As dental plans seek to enhance their value proposition, they have found the oral-systemic health connection—and particularly the perio-preterm relationship—to be particularly fruitful by claiming that substantial medical cost savings may be attainable from investing in dental care.

Insurance industry response to the perio-preterm relationship

Dental plans are available to employers from three types of vendors: (1) dedicated companies that provide only dental coverage (e.g., the multi-state Delta Dental network), (2) companies that provide both dental and health coverage (e.g., Aetna, Met Life, Guardian, Cigna), and (3) carriers that also provide direct dental care (e.g., Willamette Dental, Health Partners, and some plans offered by Kaiser Permanente). The business structure, economics, and associated financial and marketing incentives differ amongst these three. They will be distinguished further in the following assessment of how commercial carriers have responded to the perio-preterm relationship.

1. Generalization to other health conditions

As evidence has mounted that diabetes, cardiovascular disease, and coronary artery disease/stroke were also linked to periodontal health status,¹⁰ carriers have developed oral-systemic disease benefits that extend beyond pregnancy. According to a September 19, 2006 Wall Street Journal article,¹¹ a number of carriers have expanded preventive dental coverage “for some patients amid evidence it improves overall health.” As noted in the following table, published in the aforementioned Wall Street Journal article, pregnancy has become subsumed as one of a number of conditions amenable to oral health consideration:

Ounce of Prevention

Some insurance plans that are covering more preventive dental services for some patients, amid evidence it improves overall health:

INSURERS	COVERED MEMBERS	ENHANCED BENEFITS
Aetna Inc.	13.4 million dental members in all states. Employers include Costco Wholesale.	Starting next year a free additional regular deep-cleaning and periodontal maintenance for diabetes and heart disease-management patients, as well as pregnant women. Implants available under some plans.
Blue Cross Blue Shield of Michigan	1.1 million dental members in Michigan area. Employers include Ford Motor Co. and Kellogg Co.	Pilot program covers an additional regular cleaning annually (over the usual limit of 2) for pregnant women, diabetics and heart patients, through year-end. Implants covered at 50% if employees pay for plan that includes them.
Cigna Corp.	5.5 million members with joint medical and dental coverage. Employers include Avnet Inc.	100% coverage for scaling and root planing and periodontal maintenance for pregnant members or those in a disease-management program for diabetes or heart disease. All pregnant women can receive an extra regular cleaning. Implants covered if employer pays for benefit.
Guardian Life Insurance Co. of America	7 million plans in all 50 states.	Implants covered since June 2005 in PPO and indemnity plans for employers who pay for this benefit. Enhanced coverage for adult fluoride treatments expected in 2007.
MetLife Inc.	20 million covered for group dental and self-insured employer plans.	Implants covered if employer decides to provide for them. Adding fluoride varnish for adults as well as children (used to limit to age 19) in plans where employers decide to provide it reducing routine X-rays.
Principal Financial Group Inc.	1.93 million dental members.	In 2007, will introduce additional periodontal and regular cleanings for pregnant women and those in disease-management programs. Also, will introduce rider for employers that want it that covers cosmetic dentistry and implants.
Washington Dental Service	2 million members; employers include KCTS Public Television, and Pacific Research Laboratories.	Expanded tooth-sealant coverage for children and adults; antimicrobial mouth rinse for pregnant women; and prescription-strength toothpaste. But routine X-rays now covered annually instead of every 6 months.

Source: the companies

2. Risk/reward calculation

The same logic that led to the NIH clinical trial also led health and dental insurers to provide an enhanced dental benefit during pregnancy.

In calculating the risk and reward for this intervention, insurers needed to determine whether dental care during pregnancy is safe so that they would not promote an intervention that had potential liability risk of inducing rather than preventing birth-related problems. Neither the American Dental Association (ADA) nor the American College of Obstetricians and Gynecologists (ACOG) has promulgated guidelines on dental care for pregnant women. The consensus of

dental academics and of widely accepted practice was that dental care was safe within limits. In general, timing was considered ideal during the second trimester—after the potential for mutagenesis was reduced and before the physical comfort of the mother in the dental chair became a concern. Preventive care including “cleanings” (prophylaxis, scaling, and root planning) was considered acceptable. Radiographs were considered acceptable only when essential for immediate treatment of a dental problem and with proper patient protection. And elective dental treatments were considered inadvisable until after birth. None of these precluded the provision of one or more cleanings during pregnancy. Thus, the “downside” risk was considered minimal and acceptable even before the NIH study was published in November 2006.

Insurers also needed to estimate the cost of adding an expanded benefit and determine whether the benefit could be offered as a no-cost add-on to existing plans. Since the related interventions—an additional cleaning during pregnancy with or without provision of antimicrobial mouth rinses—were relatively low cost and easily implemented, a number of carriers elected to add supplemental pregnancy benefits at no cost to employers.

The “upside benefit” was also considered and found to be positive. In case the perio-preterm relationship was not found valid, the intervention would nonetheless be beneficial to the woman’s own oral health and therefore be of value. This is the same conclusion earlier reached by the RIPP Forum planners.

In all, the physical risk was assessed as minimal and the financial and marketing reward substantial if able to reduce unfavorable birth outcomes and, at a minimum, positive for improving women’s oral health status. An additional benefit to the carriers was its welcome by dental and dental hygiene professionals who were independently acting on the science to vaunt their professions as relevant to both oral and systemic health.

3. *Marketing approach of carriers that offer both health and dental plans*

Combined health-dental plans promoted the concept that dual coverage was more advantageous to employers because (1) the “health coverage side” could identify pregnant women based on medical claims and target them for additional dental supervision and (2) the carrier could offer blended premiums across health and dental coverage built on the assumption that dental interventions would be cost-savings on the “health side.” Examples include:

- AETNA¹²: Starting January 1, 2007, Aetna will offer “educational outreach about dental care and enhanced dental benefits to members who are pregnant” including one additional cleaning visit and follow up visits “that include spot removal of plaque or tarter.” The company states, “There is a significant body of research that indicates pregnant women...benefit from early periodontal care. The member outreach program, in conjunction with enhancements to our dental offerings, is designed to motivate these individuals to seek care.”

- CIGNA¹³: Starting January 1, 2007, Cigna will inaugurate its “Healthy Pregnancies, Healthy Babies” risk-stratified maternity management program “to help prevent complications during pregnancy and birth.” The overall program includes risk identification for pregnancy complications, patient education, wellness promotion, targeted support from nurse case managers, an expanded dental benefit, and financial incentives for participation. CIGNA’s July 20, 2006, statement of benefits enhancements to its dental coverage lists “a [dental] benefit enhancement [for women covered by both CIGNA health and dental plans] created in response to mounting research indicating an increased probability of preterm birth for those with gum disease.”
- Blue Cross Blue Shield of MI¹⁴: Citing research that “suggests that hormonal changes in pregnant women place them at increased risk of gum disease which can lead to premature or low birth weight babies and increase the chance of toxemia in expectant mothers,” this carrier instituted free cleanings for pregnant women. This new service is accessed through coupons distributed through obstetricians, family practitioners, and nurse midwives.

4. *Marketing approach of dental-only plans*

In general, dental-only plans were regarded to be at a market disadvantage compared with dual product vendors because they had less opportunity to identify pregnant women and promote integration across their plans. Dental-only plans promoted the concept that they were sufficiently specialized in their market niche that they could better engage dentists in acting on the perio-preterm relationship and that they were more attuned to disease management approaches.

- Health Net of Oregon:¹⁵ Typical of the approaches now under consideration, this regional dental-only plan is considering one additional cleaning for pregnant women payable at 100% of allowable charges not subject to deductibles for both in- and out-of-network dental providers.
- Washington Dental Service (WDS): WDS capitalized on its efforts to promote evidence-based care and disease management by introducing plan-paid antimicrobial mouth rinses for pregnant women.

5. *Marketing and management considerations by direct service plans*

Direct service plans are configured variously but tend to deliver dental services under a fixed annual budget through mechanisms such as capitation and salaried employees. They market their niche by featuring cost control, oral wellness promotion, and risk-based care. Whether stand-alone dental providers (e.g., Willamette Dental) or combined with medical services (e.g., HealthPartners of MN), there is internal incentive to reduce expensive consequences of poor periodontal health.

6. *Research*

National carriers that provide both health and dental coverage have unique opportunities to conduct large-population studies on the impact of dental care on

medical costs. One such systemic-oral health study¹⁶ received national attention when featured by the American Association for Dental Research in its 2006 annual meeting press kit and in the Wall Street Journal. The newspaper reported, “A two year study of 144,000 insured patients by Aetna and the Columbia University College of Dental Medicine released in March found that earlier periodontal treatment reduced overall medical care costs by 9% for diabetes, 16% for coronary artery disease, and 11% for cerebrovascular disease or stroke.”

2. **Health Professional Associations**

National dental hygienists’, dentists’, and perinatal care providers’ organizations have acted upon the perio-preterm relationship with web-based information for consumers, public information campaigns, and professional publications. Searches of the official websites of national dental hygiene, dental, and obstetrical service providers on the terms “periodontal,” “dental,” “oral” and “preterm” revealed the following:

- American Dental Hygienists Association: “Premature Births: Know the Facts and Stats. Note: recent studies have shown that women with periodontal disease are at three to five times greater risk of preterm birth than those who are periodontally healthy.”¹⁷
- American Dental Association: The consumer section of the ADA site makes no claim regarding the perio-preterm association beyond the very generic statement, “Your oral health is an important part of your overall health, and good oral health habits not only help prevent oral problems during pregnancy, they also affect the health of your unborn child.” However, the professional section of the site features a Listerine-sponsored entry on oral-systemic health that includes a section on pregnancy which lists (1) a press release and power point presentation from a February 2006 joint ADA-American Medical Association briefing entitled “Progressing periodontal disease during pregnancy causes greater risk of preterm delivery”; (2) an overview of a 2003 systematic review¹⁸ of the association; and (3) the 2001 Jeffcoat article,¹⁹ which was featured on the journal’s cover. Additionally the ADA’s journal issued a special supplement in October 2006 entitled, “The oral-systemic disease connection: an update for the practicing dentist,” which featured contributions on pregnancy complications²⁰ as well as articles on cardiovascular disease, pneumonia, and diabetes—all of which were enrolled as articles within the journal’s continuing dental education program for dentists. The pregnancy article concluded that there is biologic plausibility to the association but that insufficient evidence exists to recommend periodontal treatment during pregnancy to reduce the risk of adverse outcomes.
- Academy of General Dentistry: This second-largest national association of dentists delivers extensive continuing education to dentists and actively engages federal government in promoting the importance of oral health. Examples related to oral-systemic health include a fact sheet on pregnancy and gingivitis that

references the Offenbacher paper²¹ and a US Senate proclamation sponsored by Sen. Thad Cochran on the general importance of oral health to general health.

- American Academy of Periodontology: This specialty organization of periodontists maintains a robust consumer website on the perio-preterm association under a campaign entitled “Baby Steps to a Healthy Pregnancy and On-Time Delivery.”²² Specific to the perio-preterm relationship, the site states, “Studies have shown a relationship between periodontal disease and preterm, low birthweight babies. In fact, pregnant women with periodontal disease may be seven times more likely to have a baby that's born too early and too small. The likely culprit is a labor-inducing chemical found in oral bacteria called prostaglandin. Very high levels of prostaglandin are found in women with severe cases of periodontal disease.” The professional portion of the site includes a Trustee-endorsed 2004 “statement regarding periodontal management of the pregnant patient,” which concludes with the claim, “For pregnant women, proper periodontal examination and treatment, if indicated, can have a beneficial effect on the health of their babies.”
- American College of Obstetrics and Gynecology: This specialty organization of obstetricians provides only six entries under the public-domain search on “periodontal disease.” All predate the 2004 RIPP Forum planning meeting. A search of 2004, 2005 and 2006 ACOG statements—including a 2006 statement entitled “ACOG Statement in Support of IOM Report, *Preterm Birth: Causes, Consequences, and Prevention*” —does not reveal any statement related to oral health.
- American Academy of Family Physicians: As family physicians provide obstetric care, the AAFP website was searched without results for 2004-2006 statements on periodontal disease and pregnancy.
- American College of Nurse Midwives: The College published an updated “Quick Info” guide on oral health in September 2005 that states, “Early findings suggest that treatment [for periodontal disease] early in pregnancy may prove beneficial for improved [birth] outcomes.”

With support from Blue Cross Blue Shield of Michigan, the Michigan Dental Association has developed and aired two 30-second TV commercials that cite the perio-preterm relationship among other oral-systemic health considerations. These clever and humorous advertisements can be accessed at <http://public.smilemichigan.com/site/406/Default.aspx>.

Both ads are designed to stimulate consumers to schedule dental appointments based on the potential to protect their overall health. The campaign theme is, “Want a healthy body? Start with a healthy mouth.”

3. Consumer Oral Health Product Companies

Manufacturers of oral health products (toothpastes, toothbrushes, mouth rinses, floss) have engaged the perio-preterm relationship through both corporate sponsorship of other organizations' efforts and directly with consumers.

Examples of corporate partnership with non-profit organizations include corporate sponsorship of the following:

- Two campaigns mounted through the National Healthy Mothers Healthy Babies Coalition by Sunstar Butler and Philips Sonicare (described below).
- The American Dental Associations' national campaign to educate the public about the link between oral health and overall health with Colgate Palmolive. Through this partnership, Colgate provides its "Healthy Mouth Healthy Body" campaign materials to dentists and web-based information to consumers that is linked to the ADA site. Campaign materials include office posters, a question-and-answer sheet on the oral-systemic connection, and a tube of Total toothpaste.
- March of Dimes (MOD) Prematurity Campaign which receives support from a variety of oral health care, dental insurance, and related businesses including GlaxoSmithKline and CIGNA.

Direct-to-consumer campaigns:

- Butler Sunstar "Living Younger" campaign features a brochure entitled "Healthy Gums – Healthy Life," which cites oral systemic connections to prematurity, pneumonia, and diabetes and touts "Brush away the years" and "Floss for your health."
- Pfizer Listerine "Do It For Your Mouth. Do It For Life" campaign features a widely placed print advertisement showing a stethoscope draped over a bottle of Listerine over the caption, "If you think it's just for your mouth, think bigger." According to an MSNBC web article,²³ the ad—which is carefully worded to suggest possible oral-systemic connections—was widely vetted with professional associations. A companion website called the "mind-body connection"²⁴ specifies the conditions of interest as pregnancy, stroke, and heart disease.
- Toms of Maine co-sponsors the PBS television show "Healthy Body Healthy Mind," which featured a segment on oral health aired nationally on November 20, 2006. The segment²⁵ states that periodontal disease can cause premature birth as well as fetal and placental infection – claims also stated on the company's website.²⁶

Other oral health product companies have taken a more low-key approach to addressing the pregnancy-preterm relationship. For example:

- In contrast to Colgate's "Healthy Mouth Healthy Body" campaign that actively promotes the oral-systemic connection, Procter and Gamble's Crest Pro-Health "Healthy Mouth and Body"²⁷ website is more restrained and does not mention prematurity in its article on pregnancy.
- Oral B's "Learning Center" web page on pregnancy²⁸ promotes a more general approach to oral health, stating, "When you're pregnant, what you do to take care

of your own health, including your oral health, affects the health of your developing baby.... So while you are pregnant, it is especially important to practice good oral hygiene, which means brushing and flossing every day, eating a healthy, balanced diet and continuing to make regular dental visits.

4. Academic and Scholarly Efforts

Institute of Medicine Preterm Birth Study

The National Academy of Sciences Institute of Medicine recently completed a 2006 report entitled *Preterm Birth: Causes, Consequences, and Prevention*²⁹ which includes (1) a brief review of the perio-preterm relationship in a discussion of distant sources of inflammation, (2) relates the biology of periodontal disease to bacterial vaginosis, and (3) concludes that “periodontal disease and other causes of systemic inflammation and their relation to preterm birth are ... promising areas of research that merit funding for interdisciplinary investigations.” The 45 page executive summary, however, contains no mention of the perio-preterm relationship.

Centers for Disease Control and Prevention Preconception Campaign

CDC released an April 2006 *Mortality and Morbidity Weekly* article entitled “Recommendations to Improve Preconception Health and Health Care,³⁰” which reported, with notable idiosyncrasy, “Because of the direct links between a mother's oral health and her offspring's risk for dental caries, dental interventions can reduce the risk for prematurity and low birthweight. Evidence supporting interventions to reduce mother-to-child transmission of cariogenic bacteria supports recommendations for the appropriate use of fluorides and dietary control to reduce maternal salivary reservoirs of cariogenic bacteria, particularly for women who have experienced high rates of dental caries.” While this article established a goal of “[a]ssur[ing] that all women of childbearing age in the United States receive preconception care services ... that will enable them to enter pregnancy in optimal health,” no specific recommendation for dental care was provided. However, under a recommendation on “interventions for identified risk,” dental disease was mentioned parenthetically in the statement, “Women with medical conditions associated with increased risks for morbidity and mortality to mother and fetus (e.g., diabetes, hypertension, heart disease, rubella sero-negativity, thrombophilias, dental disease, or obesity) need to control these conditions.”

An additional component of the CDC preconception campaign was the commissioning of papers including one that provides a more conventional explanation of the perio-preterm relationship.³¹ The paper, published in a special preconception edition of the *Maternal and Child Health Journal* recommends maternal preventive dental care for the mother's own health, for the oral health of her children, and potentially for her pregnancy outcomes.

New York State Department of Health Guidelines Project

Recognizing the lack of professional guidelines for the oral health care of pregnant women, the New York State Department of Health sponsored development of the 72-

page 2006 “Oral Health Care During Pregnancy and Early Childhood: Practice Guidelines.”³² This publication, the first effort to develop evidence-based practice guidelines, engaged a group of academic pediatric dentists, periodontists, obstetricians, and public health professionals to develop recommendations for medical and dental prenatal care, oral health, and child health professionals. Specifically regarding the perio-preterm relationship final recommendations include a statement that “delay in necessary [dental] treatment could result in significant risk to the mother and indirectly to the fetus.” The publication further promotes first trimester oral health care, states the safety of dental care during pregnancy, suggests deferral of elective care, and targets the 14th to 20th week as ideal for routine care.

Aetna Monograph for Dentists

Through its affiliation with Columbia University College of Dental Medicine, Aetna sponsors development and dissemination to its network dentists of monographs that are topical and evidence based. A 2006 example entitled “Periodontal Disease and Pre-Term Low Birth Weight” describes the potential biological mechanisms, reviews published studies, describes active clinical trials, and makes specific recommendations to dentists regarding care of pregnant women. Recommendations include provision of routine preventive care, delay of elective care, and counseling about pregnancy risk factors including smoking, drinking, and poor diet.

5. Consumer Advocates and Oral Health Policy Agencies

Some advocacy organizations, by example the National Healthy Mothers Healthy Babies Coalition, have actively and aggressively promoted public information on the perio-preterm relationship while others, notably the MOD, has been more reserved in its approach.

National Healthy Mothers Healthy Babies Coalition (HMHB)

The mission of this 179 organizational member coalition is “To improve the health and safety of mothers, babies and families through education and collaborative partnerships of public and private organizations.” HMHB, which promotes folate for women of childbearing age, fitness during pregnancy, breastfeeding, early childhood immunizations, and child passenger safety has recently taken up oral health as a “developing issue.” Efforts to date include (1) a resource webpage on oral health³³; (2) production of a 2006 pamphlet sponsored by Sunstar Butler toothbrush manufacturer entitled “Baby Your Oral Health: What you need to know about oral health and pregnancy,” which cites “mounting evidence” of the perio-preterm relationship; and (3) announcement on its home page of a new “Brush for Two—For Baby and You” campaign sponsored by the makers of the Sonicare toothbrush. A January 2006 press release explains the relevant science as follows: “Poor oral health weakens the immune system and makes one susceptible to periodontal disease. The bacteria responsible for periodontal disease can enter a woman’s bloodstream and can easily spread to her developing fetus. This periodontal infection can trigger the release of a chemical called prostaglandin, which is believed to cause premature labor.”

MOD Prematurity Campaign

“I want my 9 months” is the name of a new component of the MOD’s ongoing multifaceted prematurity campaign. A review of the campaign’s web materials noted attention to infections but no specific reference to periodontal disease. Just prior to the RIPP Meeting (in March 2004), MOD released its only relevant statement as a medical director’s non-official report which reviewed the literature and found insufficient evidence to support action on an “intriguing” relationship between periodontal disease and prematurity. The organization’s current website notes that “Studies suggest that premature labor is often triggered by the body’s natural immune response to certain bacterial infections, such as those involving the genital and urinary tracts and fetal membranes. Even infections far away from the reproductive organs, such as periodontal disease, may contribute to premature delivery.” While MOD has provided little public attention to the perio-preterm relationship, its Washington, DC, chapter sponsors a “Mama and Baby Bus” mobile dental clinic that promotes the oral-systemic connection according to the PBS Healthy Body Healthy Mind broadcast noted above.

Among other related organizations that peripherally address the issue are:

- Oral Health America through its National Periodontal Disease Coalition which features the more generalized oral-systemic health connection;
- Children’s Dental Health Project through management of the American Academy of Pediatric Dentistry’s HRSA-funded “Improving Perinatal and Infant Oral Health” Program³⁴ which cites the perio-preterm literature on its website; and
- The Women’s and Children’s Health Policy Center at Johns Hopkins University through its perinatal health framework project which notes the “role of infections in perinatal health.”

While this review does not extend to local policies and programs, the searches conducted for this review serendipitously identified various efforts to target specific consumer groups. One typical example is the Colorado Community Health Network’s Spanish language “oral health and your healthy baby” program³⁵ that claims that periodontal treatment during pregnancy will reduce the chance of premature birth.

6. State Health Agencies

At least 14 states (AR, AL, CA, CO, GA, ID, IL, LA, NV, NH, NY, SC, UT, and WV) appear to have either implemented or worked to advance policy and/or programmatic activities that address the oral health of pregnant women, particularly those who are low income. In the seven states that were studied for this paper (AR, AL, ID, IL, LA, UT, and WV), the majority of activities were administered by the state Title V MCH Services Block Grant, Oral Health, Medicaid, and/or Healthy Start programs.

The study states have implemented a range of policy and programmatic activities to address the oral health of pregnant women, including the perio-preterm relationship. Activities include the following:

1. Inclusion of a state Title V MCH Services Block Grant performance measure on the number of pregnant women who receive at least one dental visit during the second trimester of pregnancy.
2. Tracking of oral health services for pregnant women in state surveys (e.g., PRAMS, Pregnancy Risk Assessment Tracking System [PRATS]). Based on findings from another as yet unpublished study, 21 states have implemented an oral health supplement in PRAMS.
3. Inclusion of a question regarding bleeding gums on the state birth certificate.
4. Coverage of oral health services for pregnant women under Medicaid.
5. Efforts to expand coverage of oral health services for adults and/or pregnant women enrolled in Medicaid in general and as part of state Medicaid reform efforts.
6. State Medicaid agency requirements in contracts with primary care contracting agencies to provide oral health promotion and education activities (e.g., video, brochure) by case managers at predetermined prenatal care visits.
7. Cleaning and periodontal screening and recording, and related follow-up for all pregnant women enrolled in Medicaid.
8. Promotion of the importance of oral health in pregnant women among health care providers (e.g., OB/GYNs) and other providers and systems who serve pregnant women and new moms (e.g., local health departments, WIC programs, Early Head Start).
9. Development and distribution of anticipatory guidance to health care providers (e.g., OB/GYNs).
10. Development and implementation of public service announcements and other promotion and education activities (e.g., health fairs, “community baby showers”) on the importance of good oral health care during pregnancy.
11. Identification of dental providers who will serve pregnant women enrolled in Medicaid and surveys of dentists to establish databases for physician to dentist referrals.
12. Support of a state-level study of Medicaid data to examine the perio-preterm relationship in order to provide data that bolsters existing programmatic efforts and proposed efforts to expand Medicaid coverage.

Impetus for State Public Program Efforts

The impetus and direction for efforts on the perio-preterm relationship varied across the states. In some states, programmatic activities and policies were in direct response to early research on the perio-preterm relationship. In fact, in the case of one state, the state Title V MCH director dedicated a portion of state Title V MCH funds (\$50,000) to develop an initiative to address the perio-preterm relationship as a result of attending the 2004 RIPP planning meeting. In other cases, state activities targeted to pregnant women were primarily developed to improve access to oral health services for pregnant women or to promote the oral health of children at a young age (by targeting pregnant women). Activities that address the perio-preterm relationship were a secondary goal but were implemented because of the early study findings on the perio-preterm relationship. Finally, several states implemented activities because they view education about the

importance of oral health for pregnant women as an important goal in and of itself, regardless of earlier or recent research findings.

Impact of Recent NIDCR Clinical Trials Study on State Efforts

The study states were asked whether they envisioned the recent NIDCR study findings as having an impact on current and/or future policy and programmatic activities. All of the study states indicated that it was too soon to determine the impact of the NIDCR study on state efforts, and no states had developed any formal position on the matter. A few states indicated that they would be discussing the NIDCR study in advisory committee or other organizational management team meetings.

While no formal positions on the NIDCR study had been taken in the study states, nearly all of the state respondents speculated that they did not envision the study findings as having a marked impact on current or future policy and programmatic efforts. Again, many states indicated that promotion of oral health for pregnant women is an important goal. One state indicated that they expected the NIDCR findings to have a negative impact on efforts to expand Medicaid coverage of oral health services for pregnant women. This particular state was waiting for the study outcomes to bolster their education efforts with state policymakers. However, programmatic activities would continue to be advanced in this particular state.

Case Studies

Case studies of efforts in four selected state public programs are highlighted below.

- Alabama

The Alabama Medicaid Maternity Care Program requires primary care contracting agencies to provide oral health promotion and education activities by case managers at the 4th and 5th prenatal care visits. Activities conducted during these prenatal visits include a video about the importance of oral health care, and *Healthy Teeth for You and Your Baby*—a brochure about oral health care during pregnancy that includes a section about infant oral health (available in English and Spanish).

In addition, the Maternity Care Program promotes oral health among physicians who see women enrolled in Medicaid during prenatal and postpartum visits. In 2004, the program sent letters to OB/GYNs encouraging oral health education and promotion. The letter included a copy of the brochure and anticipatory guidance on oral health for pregnant women.

The Alabama Medicaid Dental Program covers certain routine preventive and restorative services for children under age 21 enrolled in Medicaid; however, it does not cover any type of dental care for adults, including pregnant women. As a result, the program serves as a source for educating pregnant women about the importance of oral health during pregnancy, and a link to oral health services for pregnant women.

- Idaho Perinatal Oral Health Project

The Idaho Perinatal Oral Health Project was created in 2004 with \$50,000 in support from the state's Title V MCH Services Block Grant program. The Project targets pregnant women, particularly those served by the state's Medicaid program. During SFY 2004, 42% of Idaho deliveries were paid by the state Medicaid program and 6.9% were LBW. Only 13% of pregnant women enrolled in Medicaid received any dental service during SFY 2004. Finally, only 37.6% of pregnant women of all income levels in Idaho went for dental care during their pregnancy, according to 2001 PRATS data. The PRATS data and research findings highlighted at the 2004 RIPP meeting on the impact of periodontal disease on birth outcomes were the impetus for the development of the project.

The Project is designed to create a statewide infrastructure to educate pregnant women about the importance of dental care during pregnancy and to refer those women with oral health risk factors or untreated dental disease for care as needed. More specifically, the project works to:

1. Educate health providers and consumers about the possible link between maternal periodontal health and birth outcomes and the importance of good oral health and dental care during pregnancy;
2. Integrate oral health with prenatal care by having medical providers conduct oral health screening, provide education, and make referrals to dental providers; and
3. Improve pregnancy outcomes by identifying women with periodontal problems and referring them for needed dental care.

Each of the state's seven health districts has received funds to support local plan development and project implementation designed to engage dental and medical providers. A project kick-off was held in February 2006 in conjunction with the Idaho Perinatal Project Winter Conference. In addition, through the support of public and private funds, the state developed and aired a public service announcement (PSA) on the importance of good oral health during pregnancy from August through December 2005 on all television stations in the southwest Idaho market. PSA placements targeted low income women ages 18-34 years. The estimated viewing audience was 51,120. Finally, health districts are conducting a local survey of dentists to establish a database for physician to dentist referrals.

Like many states, Idaho is in the midst of Medicaid reform. As a result, a Request for Proposal was recently posted that will include state outsourcing of dental coverage to insurers. It is estimated that 80% of Medicaid and SCHIP enrollees, including pregnant women, will be covered by the plan.

- Louisiana

Louisiana provides basic dental services (i.e., restorative, hygiene, extractions) for pregnant women under the Medicaid *Expanded Dental Services for Pregnant Women* program, with eligibility from conception through birth. The Louisiana

Medicaid program allocates \$2 million annually for this program. Under this program, OB/GYNs are required to make the referral for dental treatment (i.e., they are the gatekeeper for the program). This requirement has created some barriers to getting eligible pregnant women into care because it does not enable other health care providers (e.g., family physicians) to make such referrals.

The state oral health program, with support from MCHB (State Oral Health Collaborative Systems grant), developed a marketing campaign (i.e., public service announcements, hotline, promotion with providers and pregnant women) to educate pregnant women about the availability of oral health services under Medicaid. The program works to find dental providers available to serve pregnant women enrolled in Medicaid, and to educate OB/GYNs and dental providers about the importance of oral health for pregnant women.

Finally, the state Title V MCH program has developed a program, *Partners for Healthy Babies*, that includes educational information on a website and information on how to gain access to Medicaid services on a hotline. Educational handouts are provided to pregnant women at health units, practitioners' offices, health fairs, and other health-related venues.

- West Virginia Healthy Start Program

The Helping Appalachian Parents and Infants (HAPI) Project—West Virginia's Healthy Start program funded by HRSA—is housed in the West Virginia University, Department of OB/GYN. The HAPI Project provides a range of services to eligible prenatal and postpartum women, including information/education on healthy pregnancy behaviors, postpartum depression, infant development, wellness, family building, healthy relationships, and healthy behaviors. Eligibility for the HAPI Project is open to any recipient of *Right from the Start* services, the state's Medicaid program for pregnant women at or below 150% of the federal poverty level up to 60 days postpartum.

In 2004, the OB/GYN Department approached the University's School of Dentistry to develop a program on improving the oral health of pregnant women. As a result, the HAPI Project added an oral health component to its services for pregnant women that includes 1) cleaning and periodontal screening and recording (PSR) for all pregnant women who participate in the Healthy Start program, 2) education of pregnant women about the importance of oral health overall and particularly during their pregnancy, 3) provision of a Sonicare toothbrush (donated by Philips Oral Health Care), 4) dental visit after delivery for follow-up PSR, 5) monthly supply of toothpaste (provided by Crest) and replacement brush heads (Philips), and 6) education about the importance of oral health in infants and young children along with provision of an infant toothbrush to new moms.

Since September 2005, 508 pregnant women received one oral health service (e.g., education) and 352 pregnant women were referred to a dentist and received

a PSR. The program has conducted other educational activities including participating in a Community Baby Shower (e.g., “health fair” for pregnant women), working with Early Head Start, and grand rounds with pediatric and OB/GYN residents.

The West Virginia Medicaid program does not cover oral health services for pregnant women. However, the state is in the midst of implementing Medicaid reform and there are plans in the state’s Medicaid reform package to provide coverage of dental services for pregnant women. It is not clear when this provision will be implemented.

7. Federal Agencies

- CDC: In addition to the CDC information provided above, the Division of Oral Health website includes 2005 updated postings from a 2003 Conference on Public Health Implications of Chronic Periodontal Infections in Adults³⁶ suggesting that further research is needed to determine the public health and clinical implications of the perio-preterm relationship.
- NIDCR: A current consumer brochure on periodontal disease³⁷ summarizes knowledge on the perio-preterm relationship with a question/answer (box below) suggesting that the association remains speculative but reinforcing the value of oral health for its own sake.

Can periodontal disease cause health problems beyond the mouth?

Maybe. But so far the research is inconclusive. Studies are ongoing to try to determine whether there is a cause-and-effect relationship between periodontal disease and:

- an increased risk of heart attack or stroke,

- an increased risk of delivering preterm, low birth weight babies,
- difficulty controlling blood sugar levels in people with diabetes.

In the meantime, it’s a fact that controlling periodontal disease can save your teeth — a very good reason to take care of your teeth and gums.

A search of the NIDCR site on the term “pregnancy” also identified for the period 2005-2006 (1) a press release on the recent clinical trial,³⁸ (2) a report of an animal model relating oral bacteria to preterm birth,³⁹ and (3) a 2006 synopsis of a negative European study on the perio-preterm relationship.⁴⁰

An earlier NIDCR posting that had been reported to the RIPP Forum planning meeting could not be retrieved. It had reported that “If additional studies confirm periodontal disease as a risk factor for preterm low-weight babies, researchers suggest that eliminating periodontal infection in pregnant women could reduce the number of such births by approximately 45,500 at a savings in intensive care costs of \$1 billion.”

- US Army⁴¹: An Army-wide presentation prepared for use by dental officers on “pregnancy and your oral health” cites the Jeffcoat article and claims that perio treatment during pregnancy may reduce premature birth.

8. Consumer Information on the Web

Googling “periodontal disease and preterm birth” resulted in approximately 137,000 hits. To simulate the way that a consumer might obtain information from the web, the top ten hits were reviewed (appendix 1). Of these, six are intended for the general public and four for health professionals. Of those targeting the public, all were dated or updated in 2005 or 2006 (with one undated). Recommendations for consumers include pre-conception attention to oral health, pregnancy inclusion of dental visits, and claims that dental treatment for periodontal disease during pregnancy “may,” “will,” and “will not” reduce unfavorable birth outcomes.

Key Themes and Observations

1. The perio-preterm relationship has been subsumed in oral-systemic health rubric. Recent programs, policies, and product promotions have incorporated the perio-preterm relationship within the larger context of oral-systemic health concerns. Dental professionals and agencies that support them have been remarkably active in promoting new findings suggesting systemic relevance of oral health. This stands in sharp contrast to the longstanding failure of dentistry to adopt older and better established science on caries pathogenesis and management into practice and professional promotion. The difference in adoption may reflect that the systemic-oral health connection does not require dentists to modify their clinical practices or procedures while adoption of the caries science would markedly impact normative dental practices and procedures.
2. Additional information on the perio-preterm relationship has been made available to the public and health professionals since the 2004 RIPP Forum planning meeting. Based on a comparison of findings of a search prepared for the RIPP Forum planning meeting in 2004 and the current review, it appears that a great deal more information is available on the web to the public and the professions on the perio-preterm relationship. Information for consumers, however, is broad ranging, of variable quality and authenticity, and contradictory.
3. Public and private insurance coverage of periodontal benefits for pregnant women has increased. Dental insurance carriers have been particularly engaged in developing targeted periodontal benefits for pregnant women while some state governments have either expanded oral health coverage in Medicaid for adults and/or pregnant women, or are working to include such coverage in current plans for Medicaid reform or expansion.
4. Scientific statements regarding the perio-preterm relationship vary significantly and in some cases, lack factual data. Scientific explanations regarding the perio-preterm relationship vary widely from the cautiously stated putative biologic pathways of

frequently referenced peer-reviewed papers to the objectively erroneous claims inherent even in traditionally reliable sources. The 1996 Offenbacher paper, perhaps because it is the first and is quotable, appears to remain the most frequently cited scientific source.

5. Many public and private entities that promote the perio-preterm relationship do so with qualified statements. Various entities have been anxious to promote the perio-preterm relationship but recognize that the science is not yet firm. Most, but not nearly all, information provided to the public utilizes qualifying statements and subjunctive mood to protect against unwarranted claims. According to *Medical News Today*,⁴² Listerine’s advertising claim may be one of the most carefully vetted statements since its manufacturer had earlier lost a lawsuit for claiming that rinsing with Listerine was equivalent to flossing. The advertisement states that “Emerging science *suggests* that there *may* be a link between the health of your mouth and the health of your body. Physicians and dentists *don’t yet know* the exact connection... but several *theories* exist” (emphasis added).
6. Competition and marketing is a key driver of public awareness activities in the private sector. Particularly in the case of dental insurers, industry competition has fueled action on the perio-preterm relationship. In the case of consumer oral hygiene products, the perio-preterm relationship has been viewed as a unique marketing opportunity.
7. Many private efforts lack attention to oral health for its intrinsic value. During the two-year period reviewed, lesser attention was evident in private-sector efforts to promoting dental care and oral health for its own sake than for its potential (but unproven) relationship to systemic health including birth outcomes. However, several state oral health programs noted the importance of promoting oral health for pregnant women and children as an important context and backdrop to work on the perio-preterm relationship.
8. Many private efforts lack targeting to populations at higher risk for periodontal disease. In general, it appears that with the exception of state-governmental programs that build on the perio-preterm relationship, photographs, language, and sources do not equitably target minority populations that are at higher risk for experiencing periodontal disease.
9. The absence of national professional guidelines appears to hinder efforts in both the public and private sectors. A number of sources, programs, and policies appear to struggle with recommendation language for the public. In addition, state public programs lack information and guidance to help direct programmatic and policy decisions and efforts. The absence of national professional guidelines appears to hamper the effort to provide the public with recommendations. The traditional advice to seek dental care during the second trimester is being challenged by those who advocate earlier dental intervention with the expectation that earlier treatment may be more salutary for birth outcomes.

10. The private and public sectors will advance policy and programmatic efforts in the absence of national guidelines based on existing research, yet these efforts vary significantly in their scope and focus, and lack cohesion and consistency across the efforts.

Recommendations

1. Support additional research on the impact of periodontal disease in pregnant women on birth outcomes.
2. Develop initiatives and activities that promote the importance of oral health for its own sake.
3. Develop and widely disseminate and promote authoritative guidelines regarding oral health care for pregnant women to health and oral health providers including dentists and obstetricians/gynecologists through key professional associations (e.g., AAPD, ADA, AAP, ACOG).
4. Conduct a RIPP meeting to provide state public programs (e.g., oral health, Title V MCH, Medicaid) with information and guidance about addressing the perio-preterm relationship from a programmatic, policy, and health care coverage perspective.
5. Develop a national consensus statement on the perio-preterm relationship among key federal agencies (e.g., MCHB, CDC, NIDCR) and national organizations (e.g., AAPD, ADA, ACOG, AMCHP, MOD) to minimize confusion and provide guidance to the public and private sectors, particularly with regard to the recent NIDCR clinical trial report.
6. Conduct additional research on states' policies and practices related to oral health and pregnant women, including efforts to address the perio-preterm relationship, to further understand states' work in this area and to identify best practices, policies, and effective strategies for use with other states interested in advancing related efforts.

Top 10 hits from Google Search on “Periodontal Disease and Preterm Birth”

Site	Title	Sponsor	Year	Rank Order	Author	Audience	Science	Recommendation
http://www.cedip.cl/Temas/PTDandPERIODONT/Is%20there%20a%20link%20between%20periodontal%20disease%20and%20preterm%20birth.htm	Is there a link between periodontal disease and preterm birth?	Medical Economics, Inc.: Contemporary OB/GYN journal	2003	1	Kim Boggess, M.D., FACOG, paper of same title—general article on perio-preterm relationship	OB/GYN M.D.'s	Mothers who do not have protective IgG and IgM responses to oral pathogens have higher prematurity rates, suggesting that maternal infection, without protective immunity, may cause systemic dissemination of these pathogens, which in turn may be passed on to the fetus.	If large-scale clinical trials can confirm the link between oral infection and prematurity, OB/GYNs can offer at-risk patients appropriate advice on oral hygiene, antibiotics, and dental treatment.
www.parenting.ivillage.com/pregnancy/pregnancycomplications/0,,463s,00.html	Premature labor: Can periodontal disease cause preterm birth?	iVillage (Women's informational site)	undated	2	Kim Loos, D.D.S., article of same name—general article on perio-preterm relationship	general public (women)	It is not completely understood how periodontal disease affects pregnancy. Research suggests that the bacteria that cause inflammation in the gums can actually get into the bloodstream and target the fetus, potentially leading to premature labor and low birth weight babies.	The best strategy is to prevent the development of periodontal disease. For women who are planning to get pregnant, a thorough periodontal exam and appropriate treatment should begin prior to pregnancy. For women who are already pregnant, meticulous oral hygiene and frequent professional cleanings may be helpful.
www.perio.org/consumer/pregnancy-news.htm	Dental procedure may reduce risk of premature births	American Academy of Periodontology	2003, modified 2005	3	AAP press release on Jeffcoat study—interventional study report	general public (dental consumers)	84% reduction of premature births in women who were less than 35 weeks pregnant and who received scaling and root planing. Researchers also found that adjunctive metronidazole therapy (an antibiotic used to treat infections) did not improve pregnancy outcome.	“This is important information for the public and the medical community,” said Gordon Douglass, D.D.S., president of the American Academy of Periodontology. “Every mother wants to reduce her risk of having an unhealthy baby. A simple periodontal examination can give her the comfort of knowing that her oral health will not contribute to increasing her risk of having a preterm baby.”

http://www.dentalgentlecare.com/pregnancy_and_gingivitis.htm	Pregnancy & Gum Disease	Private practice of Dr. Dan Peterson, Gering NE - extensive information on multiple studies and links to AGD and other sites	2006	4	Dan Peterson, D.D.S.	general public - practice patients	Mothers with gum disease have six times greater risk of delivering preterm, low-birth-weight babies! (Referencing Offenbacher JADA study)	Pregnant women who receive treatment for their periodontal disease can REDUCE their risk of giving birth to low birth-weight or pre-term babies. (referencing J Periodont Aug 2002).
http://www.cdc.gov/OralHealth/conferences/periodontal_infections13.htm	Oral Health Resources - Conferences and Presentation Materials ...	CDC Division of Oral Health	2003 modified 2005	5	Marjorie Jeffcoat, D.M.D.	professions and general public	Similar to #3	These findings indicate that root planing dental treatment of pregnant women with periodontitis may reduce preterm birth in this population. Adjunctive metronidazole therapy did not improve pregnancy outcomes. Larger trials are needed to achieve statistical significance, especially at less than 35 weeks' gestational age.
www.ada.org/prof/resources/topics/topics_evidencebased_periodontaldisease.pdf	ADA.org: Periodontal Disease as a Risk Factor for Adverse ... (Titled: Periodontal disease as a risk factor for adverse pregnancy outcomes: summary of a systematic review)	American Dental Association	undated 2004?	6	Unattributed	dentists	Researchers have suggested that maternal bacterial infections, such as those caused by periodontal diseases, may be potential risk factors for preterm birth and low birth weight infants.... Scannapieco and colleagues found moderate evidence to support an association between periodontal disease and adverse pregnancy outcomes, but no definitive evidence that a relationship is causal or that periodontal treatment reduces risk.	Dentists would continue to promote the importance of good oral health and provide appropriate treatment to all patients with periodontal disease, including pregnant women. There is not evidence at this time to suggest that a specific oral health treatment during pregnancy will have a positive effect on infant morbidity, mortality, or long-term health complications.

www.cda-adc.ca/jcda/vol-68/issue-3/165.pdf	Periodontal Disease and Preterm Delivery of Low-Birth-Weight Infants	California Dental Association Journal	2002	7	Tim McGaw, D.D.S., M.D.	dentists	Postulated mechanisms [of periodontal disease as an independent risk factor for PLBW] include translocation of periodontal pathogens to the fetoplacental unit and action of a periodontal reservoir of lipopolysaccharides or inflammatory mediators. However, non-causal explanations for the correlation [between periodontal disease and PLBW] can also be offered.	Prospective studies, and eventually interventional studies, will be necessary before periodontitis can be considered a causal factor for PLBW.
http://www.mayoclinic.com/health/preterm-labor/PR00118	Preterm labor: Prevention is key	Mayo Clinic	2005	8	Mayo Clinic Staff	general public	Researchers have found a link between gum disease and preterm birth.	Can preterm labor be prevented? Take care of your teeth. Brush and floss daily, and visit your dentist for regular cleanings and dental care.
http://www.medicalnewstoday.com/medicalnews.php?newsid=55652&nfid=crss	Research Shows No Direct Link Between Periodontal Disease And ...	Medical News Today	2006	9	Unattributed	general public and health care professionals	Scientists suspected that bacteria from infected gums could enter the bloodstream and cause the immune system to provoke changes in tissues and organs elsewhere in the body, leading to premature labor.	"Although treatment for periodontal disease didn't have a direct impact on risk of pre-term birth, expectant mothers should continue to visit their dentists and maintain good oral health," said Michalowicz. "This study showed that dental checkups and treatment are safe and effective at the appropriate times during pregnancy."
http://content.nejm.org/cgi/content/short/355/18/1925	NEJM -- Preterm Birth and Periodontal Disease (November 06 editorial from NEJM)	New England Journal of Medicine	2006	10	Robert L. Goldenberg, M.D., and Jennifer F. Culhane, Ph.D.	subscribers	none	none

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