



The Link Between Periodontal Disease and Systemic Diseases: State of the Evidence 2005

By Janyce Hamilton

The race is on. The stakes are high. Whoever wins in the battle of whether periodontal disease causes systemic diseases, cleans up. There are at least two scenarios: If periodontal disease is cleared of all reasonable risks, patients can breathe a sigh of relief about the deeper implications of their chronic periodontal disease. Or, the researchers fighting for a shrinking slice of grant funding, insurers, dental organizations, and other stakeholders win because their value increases with life-or-death research findings justifying the medical necessity of dental practitioners treating a common human health scourge: periodontal disease.

This report looks at research findings that have led to the claims that periodontitis increases the risk, or is a cause of, systemic diseases as of 2005. In addition, leaders in the dental profession provide their insights into what clinicians can and cannot say to patients in a way that minimizes credibility, if not liability, risks.

Dentists Confused Over Periodontal-Systemic Research Findings

The National Institute of Dental and Craniofacial Research, National Institutes of Health, has long maintained that: "Oral health is not an independent entity cut off from the rest of the body. Rather, it is woven deeply into the fabric of overall health."¹ What researchers are trying to determine is whether oral health is woven into that fabric with paper or steel threads.

Specifically, what is the relationship between periodontal disease and systemic diseases? There are three possibilities:

- **No relationship:** Periodontal disease and systemic disease are random concomitant occurrence/happenstances or coincidences.

- **An association:** Periodontitis is a marker for systemic disease — along with many others — showing the patient is at an increased risk, but with no causation.

- **A causal relationship requiring intervention:** Periodontitis is a contributing cause that initiates or aggravates systemic diseases.

Which is it? And what does a dentist say to patients who ask about stories they read in the *New York Times* and *Reader's Digest*, or saw on CBS News?

This link came to the forefront in the late 1980s, when preliminary research in dental journals identified systemic diseases also seen in those with periodontal disease.² It was observed that the periodontitis-plagued may also have cardiovascular disease,² and that the pregnant and periodontitis-plagued may also have premature labor and delivery.³ By the 1990s, the term "periodontal medicine" was seen in the literature.⁴ In the early 2000s, dentists were being instructed to warn their patients that these systemic diseases may worsen when they have periodontal disease.⁵

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The proposed mechanisms behind increased risk and causation theories have tended to be in two camps: infection vs. inflammation, with some commonality between them.

The century-old, “focal infection theory”^{6,7} also called “oral sepsis” once held that bacteria migrated throughout the body, causing arthritis, mental disease, and a host of other ills. By the middle of the 20th century, medicine and dentistry concluded that medical surgery and tooth extraction had no effect on ending the ills. More recent trials also negate the focal infection theory. A 2003 study of 7,774 adults with a history of myocardial infarction and known *Chlamydia pneumoniae* exposure on whether or not antibiotic intervention would prevent heart attacks as a byproduct of preventing infection came up empty.⁸ Other large, double-blind, randomized studies indicate coronary heart disease outcomes are not reduced by eliminating infection through antibiotics.^{9,10}

Meanwhile, antibiotics are not recommended routinely during pregnancy, and if they were, there is scant evidence that their prevention of infection would reduce preterm birth.¹¹ In fact, in a large NIH-funded, multicenter, randomized, controlled trial, metronidazole was found to increase the risk for adverse pregnancy outcomes.

In addition, the speculation that infectious bacteria of necrotic pulps leaking out apices and seeding elsewhere in the body to cause systemic diseases has been dismissed by the American Association of Endodontists after decades of debate.¹²⁻¹⁴

The winds of the microbial causation theory changed direction in recent years.

The other camp has theorized that inflammatory enzymes from periodontitis lesions found circulating in the bloodstream¹⁵ may be the culprit.^{16,17} Could C-reactive protein and cytokine markers — increased in periodontitis patients — predict strokes and heart attacks? Another hypothesis is that periodontitis is linked to the presence of fibrinogen and ultimately thrombogenesis.¹⁸ Yet, some researchers say it has not been established that C-reactive protein is a strong predictor of coronary heart disease.¹⁹ Inflammation is a sign of healing as well as infection, so it may not be as ominous as charged. Others point out that the inflammation from other sources — for example, sinusitis, allergies, rheumatoid arthritis, and hemorrhoids — all should be guilty of causing systemic disease if this were the case.

The truth emerges in science eventually, and the peri-

odontitis-systemic disease question is no exception. In the meantime, patients don’t always respond reasonably to the news that they face “uncertain risks.”

The Pregnant Worry for Their Fetuses

Chat rooms on BabyCenter.com and similar Internet sites are filled with expectant mothers fearful of their oral diseases’ risks to their unborn, some saying “My dentist told me so.” Surveys have not been done to assess what dentists are telling pregnant patients, or how dentists perceive the risks of periodontal disease to the unborn. Therefore, analysis must turn toward the kinds of messages dentists are receiving.

In published studies, authors often provide clinical implications in the abstract, discussion, or conclusion sections of their articles; the dental and lay public media distribute these far and

wide, but often without discussing the limitations of the study to place it into perspective. The hope is to educate the dental community to equip patients with the research findings that can influence their oral care behaviors. The outcome theoretically would be to prevent morbidity, such as mental

retardation, and mortality, such that occurs in greater numbers with low-birth-weight (5.5 pounds and less) preterm babies.

“Certainly, only value is added in educating expectant mothers, whether the relationship is causal or just a strong association,” commented Gwyn Dilday, a public relations spokesperson for CIGNA, Glendale, Calif.

Indeed, some dental researchers echo these sentiments.²⁰ A 2003 systematic review suggested that scaling and root planing may significantly reduce a women’s chance of having a preterm birth.²¹

However, some of the brochures, press releases, and education sheets found in dentists’ offices may sound a little more persuasive. For example, suppose a brochure stated that preliminary studies show that pregnant women with periodontal disease may reduce the risk of preterm babies by up to 80 percent by getting periodontal treatment. The words “preliminary” and “may” within one sentence point to the speculative nature of the claim, but suppose the words are not highlighted for emphasis. The pregnant reader might instead infer: “I’ve got to get periodontal treatment or I may have a miscarriage or premie.” Telling the pregnant that all the emerging data says treating periodontal disease in those who are pregnant cuts prematurity dramatically if not outright prevents it may seem a good idea to some, but is the

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patient also told how many studies have said this, and how well they were designed, and that there are university studies showing no such relationship?²²

Studies may find an association, which they sometimes call an “increased risk.” Many studies have done just this, in fact; and it has confused some dentists who try to explain to their patients without scaring them that an “increased risk” does not necessarily mean that periodontal disease is causing the systemic disease. That is, showing someone may be “at increased risk for” can be confused with “increasing the risk of.” It just isn’t yet known if those who deliver preterm small babies who have periodontal disease suffer from both outcomes because of another factor or a combination. Some studies have failed to assess whether such women lacked personal attention to oral hygiene, suffered drug/alcohol use, had a history of bacterial vaginosis or antibiotic treatment during pregnancy, and so forth. This results in there being insufficient evidence as of 2005 to say periodontal disease is a contributing cause of preterm labor and delivery.

According to Bruce Pihlstrom, DDS, MS, acting director of the Division of Clinical Research and Health Promotion, NIDCR/NIH, Bethesda, Md., the studies so far show associations of varying strengths between periodontal disease and systemic diseases.

“But the evidence for causal association is not available yet,” Pihlstrom said. In 2003 alone, the NIDCR invested more than \$20 million in clinical studies to investigate the relationships between periodontal disease and systemic conditions such as diabetes, cardiovascular disease, pulmonary disease, and adverse pregnancy outcomes.

“One of the strongest ways to prove causation is to demonstrate that reducing a ‘risk factor’ like periodontal disease will reduce the systemic disease. That is, if you treat periodontal disease, will it really reduce the systemic disease?” he said.

In this regard, the NIDCR is currently investing \$17.4 million to fund two large independent Phase III multicenter clinical trials involving more than 2,600 pregnant women to see if periodontal treatment will reduce the incidence of preterm birth.

The study is expected to be completed in 2006. If it shows treatment will indeed reduce preterm birth, Pihlstrom says, the next step would be to get the word out to the profession and the public and develop guidelines for treatment.

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The Atherosclerotic Keeping Teeth Clean

Media messages swirling around the public say that the gum disease infection releases bacteria into the bloodstream that causes clots and may cause a heart attack or stroke.

Patients assume if the risk wasn’t certain, their dentist wouldn’t have told them about it, and the Associated Press wouldn’t have a headline such as “Floss or Die?”²³ Other news outlets have attention-grabbers such as “By Gum, Your Life Is in Danger,”²⁴ “Are My Bad Teeth Killing Me?”²⁵ and lead sentences such as “Severe gum disease may hasten death in people with diabetes.”²⁶

According to Vince Iacono, DMD, president of the American Academy of Periodontology, Chicago, in a 2003 systematic review, reviewers concluded that periodontitis is “modestly associated” with arterial disease and that patients

and health care providers should be informed that periodontal intervention may prevent the onset or progression of atherosclerosis-induced diseases.²⁷ Iacono also stated that: “We do not have evidence that suggests periodontal disease or treatment cause heart attacks.”

A 2004 meta-analysis found 1.13 relative risk of cardiovascular disease in those with periodontitis.²⁸ (This “increased risk” is less probable than getting a nervous-system tumor from electricity transmission by living under or approximate to overhead powerlines and boxes, relative risk 1.49.²⁹)

The NIDCR is supporting preliminary studies to determine the feasibility of conducting multicenter Phase III trials to determine if periodontal treatment will reduce the incidence or severity of cardiovascular disease, stroke, pulmonary infection, or diabetes.

It is possible that periodontitis has a causative role in coronary heart disease, but additional studies, especially interventional studies, are needed before it can be assumed.^{30,31} Some believe that atherosclerotic cardiovascular disease is the most complicated multifactorial disease presently known. In the statistics section of many studies, only a sentence is provided that states: “After controlling for risk factors, it was determined ...” but no factors are listed specifically. According to Philippe Hujoel, MSD, DDS, PhD, researcher, periodontist and professor in the Department of Dental Public Health Sciences, School of Dentistry, University of Washington, Seattle, confounding factors (especially behaviors such as smoking and factors such as socioe-



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conomic status, cholesterol medication, lipid profile, diabetes mellitus, gender, family history of coronary heart disease, stress, obesity, age, blood pressure) explain the small associations found in most studies as of 2005.³¹⁻³³

“Considering these commonalities in causal risk factors, it would be surprising if such associations between periodontitis and cardiovascular disease were not shown,” Hujoel said. As of 2005, there is insufficient evidence to say arterial disease events can be prevented by reducing periodontal disease. Many of the existing studies have either had small study sample sizes, mild-to-moderate odds ratios (1.2-1.5), or relative risks instead of absolute risk rates. If a role is found in the NIDCR study, speculation is that it will be rather limited.³⁴

The American Heart Association is among those awaiting the outcomes of better studies, such as multicenter studies (which would be initiated should preliminary studies such as the one by NIDCR show feasibility of the hypothesis to justify such costly trials). The AHA Advisory on Oral Health and Cardiovascular Disease states that as yet “No substantial evidence has been presented that oral microorganisms are etiologic for cardiovascular disease nor that they cause or exacerbate acute cardiovascular events ... [and] at this time, the promotion of dental treatment expressly for the purpose of prevention of atherosclerotic cardiovascular disease and/or acute cardiovascular events is not recommended.”³⁵

Dental Insurance Industry Anticipating Positive Link

It wouldn't exactly be bad for business in the dental benefit plan industry if definitive evidence tags periodontitis “it” — The oral disease that increases the incidence and severity of systemic diseases.

“Our biggest competitors are medical benefits, which are consuming the limited health care dollars at an alarming rate,” Robert D. Compton, DDS, chief dental director of Delta Dental Plan of Massachusetts, Boston, explained. More and more, medical benefits are being yanked from retirees as is, so a worrisome decline in dental benefits in the population is a real possibility unless something is done and fast.

To this end, insurance industry sources admit that several dental plan companies are being proactive in pursuing different strategies for designing a competitive advantage now, confident that the findings will confirm a causative role. But as they position themselves for market inroads, they are being rather vague on exactly what they are doing.

Speculation is these behind-closed-doors meetings are aimed at trying to get advising dental checkups to be included in the clinical guidelines of “wellness programs” and “disease management programs” whose physician well-visits are reimbursed by medical benefits. Maybe this strategy wouldn't cover the cost of the actual dental services, but just that a dental visit be formally prescribed by a physician (due to systemic risks of their periodontitis) would be a major change in the standard of care. It would be a boon for the dental benefit industry if, for example, a physician would tell the woman contemplating becoming pregnant to visit a dentist for an exam to make sure she has a healthy mouth or she will be at increased risk of a preterm baby. If during a wellness visit, the physician also tells the patient in a high-

risk category of heart attack, stroke, and pulmonary event and those with diabetes to get dental care, all the better. Of course there's no guarantee that physicians would follow the clinical guidelines, because currently they haven't read much about the purported periodontitis-systemic disease connections in their medical journals. (To this end, dental insurers are calling on dental researchers to start submitting their manuscripts to such journals.)

To the contrary, Arthur Ollendorff, MD, associate professor of Obstetrics and Gynecology, Department of Obstetrics and Gynecology, College of Medicine, University of Cincinnati, said he does know about the linkage studies and “There are no good studies that show that improving dental hygiene will decrease preterm labor. Those studies are ongoing.”

Dental insurers remain upbeat that the ongoing research will come down on their side. “As more research is completed to establish the strengths of these risk-factor links, you will find more and more dental plans trying to raise awareness about them [to purchasers and patients],” Compton said. The hope is that the awareness will create a demand that will change medical plans over time to include disease management programs.

Compton is not alone in his hopes. Mary Lee Conicella, DMD, National Dental Utilization Management lead consultant and interim chief dental officer, Aetna, like all dental insurance professionals, hopes the day will arrive when companies with medical plans for employees finally see the benefits of adding a dental plan for promotion of overall health.

According to Compton, in 2001, a normal pregnancy in

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Massachusetts costs \$4,982. A premature infant with no medical complications cost \$78,583. With medical complications, it runs into the hundreds of thousands of dollars and threatens the quality of life of the child. Preterm birth accounts for 60 percent of all neonatal mortality and 50 percent of all perinatal health care costs in the United States. "If a scaling and root planing can reduce the risk of a preterm delivery, it would seem to be a good investment," he said.

Evelyn Ireland, CAE, executive director of the National Association of Dental Plans, cautions dentists on using findings outside the mainstream to diagnose treatment need: "To base the procedure on prevention of a potential medical condition without a demonstrated dental condition may draw coverage into question." To this end, there is the possibility that periodontal treatments will be done to "prevent heart disease" but the dental benefit plan will be billed for it as "necessary" and routine dentistry.

Some are impatient, however, saying dentistry should not "fiddle around" and be afraid to talk to patients for yet another decade, since the research might not be "perfect" by then either. Instead, it is argued that dentists take a preventive, public-health approach and treat everybody with periodontal disease. This may have been the point behind the sentiment expressed by one panelist at the Centers for Disease Control and Prevention's conference "Public Health Implications of Chronic Periodontal Infections in Adults" who pointed out that the decision to adopt the widespread public health measure of treating people with antibiotics to prevent bacterial endocarditis initially was instituted without any [intervention] outcome data.³⁶ At the time, the morbidity associated with endocarditis was greater than that associated with antibiotics to prevent the malady.

So why not do the same for periodontitis to prevent systemic disease now?

Thomas J. Pallasch, MS, DDS, is emeritus professor of dentistry, University of Southern California. He is also a member of the American Heart Association's Committee on Rheumatic Heart Disease, Endocarditis and Kawasaki Disease and was primarily responsible for drafting the committee's position on cardiovascular disease and oral health. He is also an expert witness in dental negligence throughout the country and knows what constitutes physical or financial "patient abuse" in front of a judge and jury. He is concerned that tort litigation will be needed before "specious speculation damaging to patients" ceases.

"No matter what the outcome will be, it is likely that the tort system will become involved. Dentists will be accused of overemphasis/underemphasis or overtreatment/undertreatment. The purported association of dental disease with cardiovascular disease or preterm birth could place the dentist in medicolegal difficulties if the claim is made after an adverse event that she/he did not do 'all that was possible' to prevent it," Pallasch said.

If dental treatment is claimed to alter the course of these serious diseases, he anticipates that attorneys will enter the arena with claims of lack of or suboptimum diagnosis or treatment. "Hence the need for very strict and well-defined guidelines based on meticulous research and these medicolegal considerations."

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Some Dental Experts Caution Against Promoting Any Links Until Larger and Better Studies Find Anything

Some dental groups and insurers are encouraging dentists to talk to the patients about the possible systemic risks from periodontal disease. Then the question becomes, "Which patients and what wording do I use?" Does one wait until periodontal disease is present at a moderate to advanced stage, and not say anything if just mild or if merely gingivitis? Or should all patients hear about the potential links since one study found that severity of periodontal disease had no association with self-reported cardiovascular disease and diabetes?³⁷

For periodontitis patients who are already in an alleged risk category (heart disease, diabetes or pregnant), Conicella would tell their dentists, "Talk to your patient and say that there is a biologically plausible reason to believe that chronic infection increases your risk. And talk to her physician yourself saying that there might be a connection between her periodontal disease and her pregnancy risk. We want their physician to be aware."

But if dentists take this approach today, is there no turning back? Once a dentist talks to a patient and calls his physician or cardiologist to say "we feel concerned about the early studies thus far showing periodontal disease will likely be found a serious risk to your patient's heart health," does a drumbeat begin? After all the buildup, 18 or 72 months from now, how does the dentist go back and tell that same patient and his or her physicians "never mind"?

Patience and prudence may be in order before using



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strong or definitive wording to patients because, contrary to the conclusions of several individual studies or their abstracts printed in dental journals, there is no hard evidence as of 2005 to prove periodontal disease causes or increases the incidence or severity of any systemic disease, according to those interviewed, and a dental literature search conducted for, this study.³⁸ Periodontal disease may disrupt glycemic control in diabetes³⁹ and could contribute (along with home hygiene and chewing) to rare bacteremias and brain abscess.⁴⁰ For the immune-compromised (e.g., those with AIDS, chemotherapy/radiotherapy recipients, those with pneumonia, fragile elderly with swallowing disorders, etc.), deep periodontitis pockets are more potentially worrisome as channels and reservoirs of bacteria and viruses, yet bacteremias from the activities of daily living are common, short-lived, and likely don't create any more problems in those with a healthy as opposed to diseased mouth.^{14,41}

Richard J. Manski, DDS, MBA, PhD, senior scholar with the Agency for Healthcare Research and Quality, Center for Financing, Access and Cost Trends, Rockville, Md., said he understands the importance of looking at the possible association between periodontal disease and systemic diseases. Yet, nudging for premature consensus isn't the answer. "It is understandable that some might be concerned and some might hypothesize that an association exists," Manski said, "but I think we as a profession should be careful and patient before we make any kind of statements about formal associations, and subsequent recommendations for changes to the standard of care. It is important that researchers fully explore all the possible confounders that may have been involved in all of these prior studies." Furthermore, Manski said final consensus about the relationship between periodontal disease and systemic diseases should be "contingent upon supporting formal evidence gathered through the application of rigorous research protocols."

In other words, the current research, while not necessarily substandard, is not sufficient to make formal statements about potential risks and to encourage treatment because of those potential risks. Too many authors of published studies have failed to control for, or at least address in the discussion portion of their articles, the multiple risk factors common to both periodontal disease and arterial diseases, such as smoking. The same is true for premature births and periodontal diseases that did not control for overall detrimental health factors such as drug or alcohol use, socioeconomic factors, antibiotic use, and bacterial vaginosis.

Tossing in phrases with swaying power, such as "emerging science shows" and "further evidence indicates" could be viewed as declarative and should be reserved for when and if the science that has accumulated is of the more rigorous

Table 1

Cost-Benefit and Numbers-Needed-to-Treat Analysis

Thomas Pallasch, MS, DDS

Some determinations are needed before informed consent of the patient can be obtained regarding the potential value of any proposed periodontal treatment prevention of systemic disease events.

- 1.** First, a significant relationship between oral health/periodontal disease and coronary vascular disease or preterm birth needs to be established by multiple prospective blinded randomized longitudinal and interventional studies.
- 2.** Second, the "number needed to treat" must be established. This is the number of patients with periodontal disease needed to be treated to prevent one adverse cardiovascular event or to significantly retard the progression of cardiovascular disease. For example, will it be 100, 1,000 or 10, 000 patients or more?
- 3.** Third, the number needed to treat will then be used to determine the risk and cost-benefit ratios. For example, how much will it cost in dollars to prevent a single adverse event? Will it be \$10,000, \$100,000 or a million dollars?
- 4.** Fourth, once the cost-benefit ratios are determined, then the adverse events of periodontal treatment will need to be balanced against the financial costs of treating possibly hundreds and thousands of patients and the possibility that only a few will ever benefit significantly.

types (i.e., the interventional, randomized, placebo-controlled studies, some of which are concluding at the end of 2005, 2006, and 2009).

"Flashy titles belong in the checkout stand at the grocery store, not in scientific journals that report on original research," Hujoel wrote. "Having a poor pregnancy outcome and being told that it was 'caused' by poor oral hygiene may put an incredible guilt trip on a new mother."

But that is not the American Academy of Periodontology's aim when it releases study findings showing linkages. "As the go-to source for information about periodontal health, it is the AAP's goal to release responsible messages to the public not only about periodontal health, but the mouth and body connection as well. And, good oral health cannot hurt, but can only help," Iacono, AAP president said.

Pallasch says there's a risk/cost benefit consideration that's getting lost in the debate. He has concerns regarding periodontal treatment for cardiovascular disease or preterm birth as a public health issue (Table 1).

What's at Stake in Proving the Perio-Systemic Disease Connection?

Skeptics have lodged their conspiracy theories for why the periodontitis-systemic disease link is being eyed with such ardor. Their theories are that governmental dental agencies want the perio-systemic cause proven to ensure congressional funding; researchers and universities want it to ensure grant funding; organizations want it to keep their membership staying tuned-in to learn new practices to keep busy because periodontal disease is no longer increasing but rather decreasing in the population; dental benefit plans want it to be included in clinical guidelines so physicians can recommend dental care, increasing demand for services, and driving businesses to add dental plans.

Wanting something of personal benefit is one thing, but letting one's biases influence policy decisions, communications, study design or conclusions drawn, articles rejected vs. accepted, invitations to speak at conferences, is another, they say. Currently, there is no proof of these potential biases as being intentional; and hopefully none will appear in the future.

Dentistry has always wanted what is best for the patient in terms of oral and systemic health outcome, first and foremost. But the supporting players in achieving this outcome for patients need to survive. Is it so wrong to root for a win-win scenario?

The research continues its teeter-tottering: Down with the findings could mean lawsuits/license censure for those stretching the facts about the health risks of periodontitis to patients; up with the findings in proving the link will mean an expanded role of dentistry in maintaining patients' whole-body health.

"We'll know in two years which it is," commented a dental insurance source.

Not so fast, say the other contingent of purist researchers, concerned that using phraseology like "a growing body of evidence" indicates a dangerous risk in not being willing to wait for years of careful research to prove or disprove the speculation.

There's a lack of good studies to justify the current leap to conclusions circulating in dentistry, according to several experts in dentistry. Meanwhile, few studies are published by journals whose editors, reviewers and boards who may deem them nonconforming to the certain "fashionable dogmas" that are considered the cutting edge of advanced research.⁴²

Some could interpret this as a proactive approach to preemptively disturb the patient so that the typically anticipated objections are dwarfed by the stated systemic health implications.

"It is interesting how no ink is wasted on alternative explanations" for systemic disease, said Hujoel, who also said genetics, socioeconomic status, race, age, and smoking status are insufficiently, or incompletely, controlled for when evaluating periodontitis-systemic disease associations.

"No good evidence exist for perio-systemic disease associations among never-smokers," Hujoel said. "As a result, periodontitis is a little like yellow finger stain; both appear to be associated with a wide variety of systemic disease, but it is not clear whether this association is causal."

"It is possible that dental diseases and/or their treatments may have more subtle effects on systemic health. Time will tell if the periodontic-systemic disease story will turn out to be the Chicken Little story or not. If not, research in this area has the potential to be of significant public health importance. The challenge will be to system-

ically review the accumulating evidence, to objectively determine levels of belief to emerging hypothesis, and to invest resources into those areas that appear to be the most promising," Hujoel said.

Lawyers will be as ready to pounce on the overpromoters as they will be the underinformers, depending on how the research plays out. Some dentists warn that criticizing another dentist in a court of law, or to a dental board or other regulatory agency, for not informing patients of the systemic risks of periodontal disease is fraught with peril because of the limited evidence.³²

Legal fees are a detriment to individuals and organizations. It would behoove the profession to speak with a unified voice and neither emphasizes to patients nor dentists that there are proven systemic risks caused by periodontitis, nor say the opposite: that oral health has no bearing on systemic health. Otherwise, it could be messy, and unnecessarily drain individual and organizational budgets.

Playing It Safe in Dental-Patient Communications on Diagnosis, Informed Consent, Treatment Planning

Some dental practice management gurus are coaching dental teams on how to phrase potential perio-systemic risks of preliminary research findings in such a way that they sound like established facts.

Hypothetically, suppose a patient in the dental chair is told she needs periodontal therapy. She is then told "a large body of evidence indicates a striking association between



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oral health and systemic health risks.” Last, a list of deadly diseases is rattled off to explain what “systemic health risks” means. If this scenario occurred, the patient could feel uneasy about whether she should risk delaying treatment. If financial difficulties force her to delay treatment, could her uneasiness linger?

Here is an example from a newsletter on how to “increase hygienist revenue by 400%” through, in part, communicating with the patient in a way that makes it easier for the staff to make future appointments.⁴³ Hygienists are given an example of things to consider telling patients with moderate or advanced periodontitis, such as: “This is a serious infection which increases your chances of heart disease and stroke.”⁴³

This may achieve the intended outcome of agreeing to treatment and scheduling an appointment for such treatment. But some could interpret this as a proactive approach to preemptively disturb the patient so that the typically anticipated objections are dwarfed by the stated systemic health implications. The strategic risk could backfire if the patient asks his or her physician about this and is told “not really,” or the research eventually finds it isn’t so.

Because the possibility of the systemic links is exciting, it is easy for dentists, hygienists, dental organizations, and researchers to downplay or ignore the research findings that don’t conform with the faith and hope for future research horizons. As an analogy, 15 to 20 years ago Americans started taking a betacarotene (vitamin A) supplement daily after preliminary research indicated it would help prevent cancer. This recommendation to take vitamins was based on about 12 epidemiological studies, according to Hujoel. They were flawed in that they did not restrict to never-smokers. After about \$100 million was spent in three randomized, controlled trials, vitamin A supplements were shown not to decrease, but to increase, cancer risk. The same mistake should not be made in the study of periodontitis-systemic disease associations. Hujoel said the results among never-smokers should be clearly presented, not hidden, so dentists can avoid making the same mistakes that plagued the vitamin A story.

As of 2005, for most of the U.S. and international major dental and medical associations contacted for this article, the risk of scaring people (by saying that associations that have been found so far implicate periodontal disease as increasing the risk of heart attacks and preterm babies) is not worth the financial benefit (increasing treatment acceptance and demand for dental care). More evidence is needed before they will go on record with policy statements, a call for clinical guidelines, or a patient education campaign.⁴⁴

Table 2

Health Fraud and Sanction From Promoting False Claims to Patients

Robert S. Baratz, MD PhD, DDS
Scientific Advisor to DentalWatch.org and Quackwatch.org

Anyone promoting dental (or any medical) procedures and practices with unproven information meets the definition of health fraud unless they proclaim the claim as unproven and speculative. As with “false advertising” someone could be subject to sanction. The California Business and Professions Code* has consumer protection provisions against false claims. Studies have demonstrated that “scare tactics” of telling people the consequences of smoking, high fat intake in the diet leading to high cholesterol levels, obesity, and inactivity, all linked to cardiac disease, don’t change behavior much in getting people to change these bad habits.

**Editor’s note: California Codes, Business and Professions Code, Section 650-657 excerpts: “651. (a) It is unlawful for any person licensed under this division or under any initiative act referred to in this division to disseminate or cause to be disseminated any form of public communication containing a false, fraudulent, misleading, or deceptive statement, claim, or image for the purpose of or likely to induce, directly or indirectly, the rendering of professional services or furnishing of products in connection with the professional practice or business for which he or she is licensed. [Such act] is likely to mislead or deceive because of a failure to disclose material facts ... intended or likely to create false or unjustified expectations of favorable results ... [including making] a scientific claim that cannot be substantiated by reliable, peer reviewed, published scientific studies.” Being found guilty of these charges could result in a misdemeanor punished by suspension or revocation of license.*

“There are no systemic diseases proven to be caused by periodontal disease,” Helen Ristic, director of Scientific Information for the American Dental Association, Chicago, said. “What the research shows is that periodontal disease is associated with certain systemic diseases. So it could be that the systemic disease affects oral health resulting in periodontal disease or vice versa. Or some other factor causes both the systemic disease and periodontal disease. Currently, research has not demonstrated a cause and effect.”

Chester Douglass, DMD, MPH, PhD, runs the Oral Epidemiology Program at Harvard University. “We conduct a lot of studies, and we can’t figure it out yet. I’d tell a patient right now, ‘We do have evidence that there are associations, but we don’t know what the causal pathways might be,’” he said.

Don’t tell a patient there’s no relationship, don’t say the other extreme, and don’t mention the subject for patients who don’t have periodontal disease. To the pregnant patient, Douglass would say: “There are some studies that show relationships between periodontal disease and preterm low-birth-weight babies. Because it is associated, let’s take care of it and not take chances. A dental hygien-

ist can reduce the disease in your mouth with scaling and root planing and home care mouthrinse.”

But avoid reshaping the periodontium surgically during pregnancy, he said.

For the person with heart disease or pregnancy, Douglass said, “Be careful not to scare them into treatment. Don’t overdramatize or frighten them. ... It’s not honest to say ‘floss or die’ because you will lose the trust your patients have in you.”

“I haven’t noticed an irresponsible reporting of AAP messages in most cases,” Iacono, AAP president, said, adding that reporters’ interviews usually result in a responsible story with the exception of a few outliers.

“Floss or die” is, of course, a little harsh.

“We must avoid the common practice of presenting doctrine without data. Otherwise, we will face an avalanche of ill-conceived lawsuits and risk having our scientific credibility further eroded in the public eye,” wrote Pallasch in a 2000 *Journal of the California Dental Association* report.⁴¹

In **Table 2**, a representative for the not-for-profit consumer health information group Quackwatch comments on legal risks of promoting dental services with unproven health information. Dentists are not immune to being duped by the heavy promotion of positive research findings. Within the population of dentists, some may “lack the ability and knowledge to understand the difference between speculation and scientific fact,” said physician-dentist Robert Baratz, MD, PhD, DDS, assistant clinical professor of medicine at Boston University School of Medicine.

Dentists have the ability and knowledge, they just happen to be hindered by time constraints when it comes to dissecting the original and conflicting research in 200 journals bombarding the printing presses each month that are somehow linked to dental disease or systemic diseases that may be affected by periodontitis. Abstracts may be the only thing that is read. This lack of time, however, can get practitioners into trouble (**Table 2**).

“If a dentist can be sued via a class-action litigation for overtreatment of periodontal disease, then surely the medicolegal ramifications of espousing an association or causation for a disease when none exists and then exploiting this for personal gain are extraordinary. Such legal action may be taken individually or collectively against a dentist who

allegedly has been using the threat of, say, CVD morbidity or mortality, to sell dentistry,” Pallasch said. Proper discussion involves the following: “Explain to a curious patient that any association between periodontal disease and cardiovascular disease and preterm birth is a work in progress with no definitive information at this time.”

The evidence for adverse outcomes from major systemic diseases including preterm delivery and arterial diseases increasing because of periodontal disease is underwhelming.⁴⁰ The leading dental organizations, their publications, and authors should strive to make simple declarative statements that clarify that proof that periodontal disease causes systemic diseases and their adverse outcomes does not exist.

One of Pallasch’s favorite sayings is “science is organized skepticism.” He concluded: “We are now telling our public

that links between oral health, cardiovascular disease and preterm birth are ‘established’ when this is simply not the case. What gain is there in not doing these studies right when later scrutiny ... will readily detect their serious faults and judge them of no value? What do we then say? That we hoped we would not get caught?”

**“It’s not honest to say
‘floss or die’ because you
will lose the trust your patients
have in you.”**

Chester Douglass, DMD, MPH, PhD

Conclusion

“The future of dental practice will be dramatically altered if subsequent research confirms that periodontal disease is a true risk factor for systemic disease and that the initiation or progression of these medical conditions can be reduced by periodontal treatment.”⁴⁵

Until that day arrives, prudence is a virtue in good science. While insurance, government, academia, researchers, organizations, and dental practitioners may yet see the day when causality is proven, all in dentistry should refrain from leaning into a probability stance. And, individual researchers must not disregard the beguiling power of economic interests can have in coloring their own assessment of the science. More dental research is needed to make sure periodontal disease is not a noncausative bystander, or dentists who have been told to promote the links will think they were misled into crying wolf. Manski said dentistry needs to be certain of these morbidity and mortality links before telling the world about them. Otherwise, he said, if they aren’t borne out, the public who became convinced of the importance of dental care through these alleged risks might just think dentistry isn’t very important after all.

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