

From Our Office to Yours...

Cross-sectional studies of very large groups have long indicated a relationship between periodontitis and cardiovascular disease, stroke, diabetes and chronic pulmonary disease.

Studies support the hypotheses that disease-causing bacteria associated with periodontal infections and the endotoxins released by these microorganisms enter the circulatory system and contribute to disease entities which are manifested in other parts of the body, such as the heart or brain.

*This current issue of **The PerioDontaLetter** reviews the most current information on the possible connection between periodontal disease and major systemic disease.*

As always, we welcome your comments and suggestions and look forward to working with you as we explain to our patients the need to control periodontal disease for their general health.

The Impact of Periodontal Disease on Major Systemic Conditions

In February 2004, the American Heart Association announced research findings from Finland that evaluated 256 cardiac patients with similar demographic characteristics. Researchers found in this patient population that

a poor oral health diagnosis is a strong predictor of heart disease.

The principal author, Dr. Sokja Janket of the University School of Dental Medicine and Harvard University School of Public Health, suggests that dentists advise patients

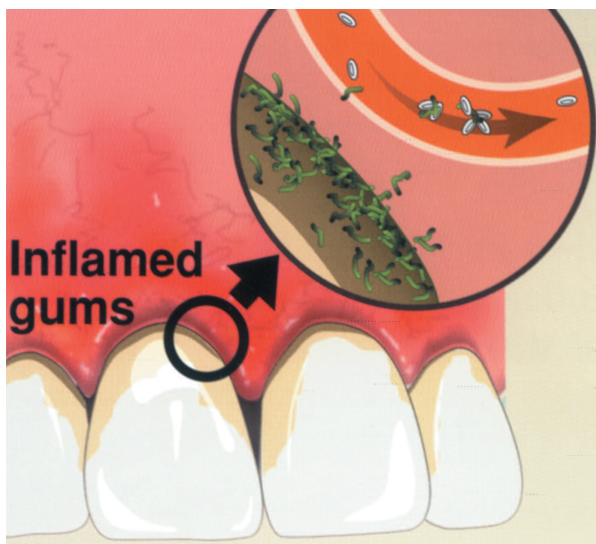


Figure 1. This illustration shows how bacteria may enter the bloodstream and attract platelets.

(Illustration courtesy of the Oral Health Letter, The Chronicle of Oral and Systemic Health Information for the Public through the State University of New York at Buffalo)



Figures 2 and 3. It is easy to be deceived by the clinical appearance of gingival tissues which may appear healthy on the surface, but which may have deep pockets which always have subgingival infection. These two photos show bleeding on probing indicating inflammation and current infection.

with poor oral health to seek cardiac examinations, even if they do not exhibit symptoms of heart disease. Researchers are actively working to develop an understanding of the underlying factors contributing to this unusually high correlation between periodontal disease and systemic diseases.

Scientists also theorize that bacteria contributing to periodontal disease also activate white blood cells inducing a systemic inflammatory and immune response that may contribute to cardiovascular disease and stroke.

The most widely studied pro-inflammatory molecule associated with this reaction is C-reactive protein (CRP). Another pro-inflammatory cytokine, Interleukin-6, may produce a similar systemic response. CRP, which is elevated dramatically during acute inflammation, augments the immune response to certain antigens, activates complement, and increases the production of monocytic, inflammatory tissue factors.

Studies by D'Autio, Matilla et al and Craig et al indicate periodontitis may increase the inflammatory burden and increase cardiovascular risk based on the concentration of serum CRP.

Recently, researchers have also noted a stronger relationship between stroke, periodontitis and CRP. Beck and Offenbacher noted in a 2002 review that bleeding sites and pocket depths might be a better reflection of systemic risk than measurements of attachment or bone loss. This may explain why studies which only measured radiographic changes and indices of attachment loss often fail to accurately reflect the impact of periodontal disease on systemic conditions.

For every heart attack patient with high cholesterol and plaque-clogged blood vessels in the previously referenced studies, there is one with low cholesterol and apparently whistle-clean arteries. In the mid-1980s, a

small band of researchers began to suspect that other disease processes, specifically inflammation, was the major contributing factor in the second type of patient. Peter Libby and others proposed that an overactive immune system was attacking the plaques that accumulate in almost every adult's heart, causing them to rupture and spew their contents in the form of heart-stopping clots.

In female patients, cholesterol levels may not be as predictive of cardiovascular risk as C-reactive protein. Newly-developing protocols for assessing cardiac risk and stroke prevention call for tests highly specific of CRP levels, in addition to lipid profiles. Risk assessment utilizing CRP is particularly important for women with diabetes. Women in this category have an eight times greater risk for cardiovascular disease, and women who smoke and use contraceptives are three to five times more likely to experience a cardiovascular event.



Figure 4. After scaling, root planing and antimicrobial therapy, the gingival tissues appear clinically healthy.

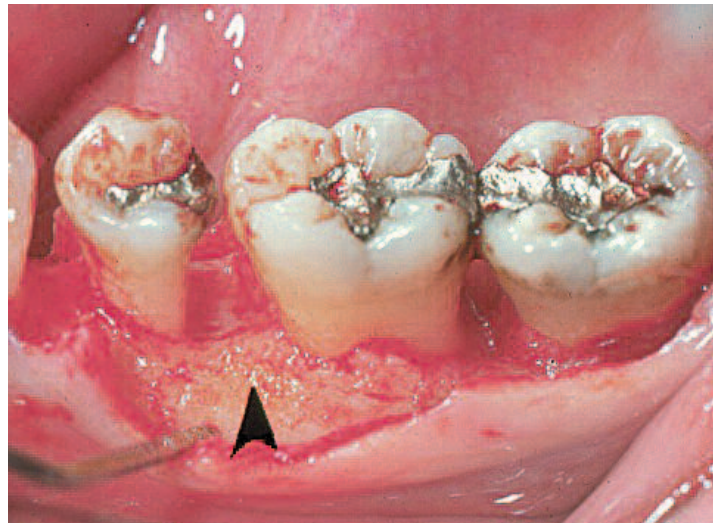


Figure 5. However, flap reflection in an area with pockets greater than 5mm in depth reveals significant reverse osseous architecture with intrabony defects.

Studies by Andriankaja, Genco et al conclude the association between periodontal disease and the risk of myocardial infarction is strong and independent of smoking in young individuals. In older individuals, they found the association weaker and also that smoking appears to play a more important predictive role.

Recent studies published in the New England Journal of Medicine indicate that standard antibiotics do not work for the secondary prevention of heart disease. Yet evidence that infection is a stimulus for athero-thrombosis continues to mount. An editorial writer for the journal recommended that we begin anew to investigate this association.

Pockets which patients cannot keep clean on a daily basis almost assuredly have inflammation at the base of defects. At this time, it seems prudent that pocket reduction/elimination treatment is still the appropriate course of action not only for these

patients' dental health but for their systemic health as well.

Periodontal Disease and Diabetes

In 2003, the National Institute of Dental and Craniofacial Research reported that people with noninsulin-dependent diabetes mellitus (Type 2) are three times more likely to develop periodontal disease than nondiabetic individuals.

It is reasonable to assume that the risk is greater in insulin-dependent Type 1 diabetics. **Susceptibility to periodontal disease is one of the most common sequelae of diabetes.** The many oral health complications associated with uncontrolled diabetes include, but are not limited to, gingivitis, periodontal disease, salivary gland dysfunction, increased susceptibility to bacterial, viral and fungal

infections, caries, periapical abscesses, loss of teeth, loss of taste, and burning mouth syndrome.

Studies have demonstrated that non-compliant patients with Type 1 diabetes who do not maintain rigorous control of their diabetes, experience more extensive and severe periodontal disease than patients who maintain rigorous diabetic control. One study showed periodontal disease is six times more likely to occur in people with diabetes than in people without diabetes.

Grossi et al and Saremi et al found that effective treatment of periodontal disease in diabetics reduces hyperglycemia and insulin requirements, improves glycemic control and prevents, delays or reduces the severity of diabetic complications such as diabetic retinopathy.

As a result of this compelling evidence, they instituted a program of diagnosis and treatment of periodontal disease into the

"I believe that, some time in the future, leading cardiologists will wonder in retrospect, how information so needed by their patients could have been overlooked or neglected for so long."

Charles C. Bass, MD, American Heart Journal

routine treatment regimen for diabetics.

Many authorities believe the host response to periodontal pathogens increases insulin resistance. Within the past two years research has begun to point towards a correlation between the severity of periodontal inflammation, pocket depths and glycemic control. The most prevalent theory suggests that the severity of inflammation combined with the large surface area of the pocket wall increases systemically disseminated molecules which induce inflammation.

Periodontal Disease and Respiratory Infections

Studies of the relationship between periodontal disease and respiratory infections by Scannapieco et al reveal that periodontal disease may increase a person's risk for chronic obstructive pulmonary disease (COPD). Other data by Scannapieco uncovered a correlation between the amount of periodontal disease and vital lung capacity. They also demonstrated that patients with periodontal disease experience twice as many respiratory infections as healthy patients.

The periodontal and respiratory health of 13,792 patients was analyzed. The study demonstrated that patients with periodontal disease,

defined by individuals exhibiting a mean loss of attachment (MAL) greater than 3mm., were found to have nearly a one-and-a-half times greater risk of COPD. A distinct trend was also noted revealing that lung function apparently diminished with increased attachment loss. This suggests that periodontal disease activity may contribute to the progression of COPD.

It appears that aspiration of oral pharyngeal flora brings respiratory pathogens into the tracheobronchial tract allowing respiratory pathogens to colonize the oral and pharyngeal tissues which, in turn, causes pneumonia. Comprehensive periodontal treatment and enhanced oral hygiene reduced pneumonia and death two to five fold. More research and clinical trials are necessary to determine if periodontal therapy reduces the incidence of pulmonary infections in patients with COPD.

We recommend a risk profile as part of a diagnostic workup which can be used to develop risk modification strategies to be incorporated into a periodontal treatment plan. The risk profile should include age, gender, hormone replacement therapy, smoking habits, and medical conditions including diabetes mellitus. Other important indices should include pocket depths and bleeding on probing.

The periodontal status of patients should be closely monitored and patients with high risk for heart disease, especially women, should be aggressively treated with periodontal therapy. Monitoring of individual sites during maintenance and active care for these sites as they are discovered may help control elevation of inflammation in the body.

Periodontal Disease and Preterm Low Birth Weight Babies

US researchers have concluded there is a link between periodontal disease and preterm delivery low birth weight babies in women over 25. Preterm delivery is defined as a gestation period of less than 36 weeks, and delivery weight less than 2400 grams (5.2 lbs.) is considered to be low birth weight. The jury is still out on the magnitude of the link between periodontal disease and preterm delivery and/or low birth weight babies. However, strong link or not, it is common sense to provide pregnant patients with thorough dental hygiene and periodontal care before, during, and after the pregnancy.

We hope this review of the possible connection between local inflammatory disease and major systemic disease better helps you explain to your patients the need to control periodontal disease for their general well-being.

We invite you to call us to discuss individual patients or to provide you with written information regarding the perio-systemic connection.

