

White Papers

New Research and Commentary on the Oral-Systemic Relationship*



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The *American Journal of Cardiology* and *Journal of Periodontology* Editors' Consensus: Periodontitis and Atherosclerotic Cardiovascular Disease

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What does this article teach us?

There has been mounting evidence accumulating over the past decade that supports a strong association between periodontal disease and cardiovascular risk. This Editors' Consensus paper reports on a very focused review of the existing evidence in an effort to provide guidance statements that have value to both the periodontal and cardiovascular clinical and research communities.

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Periodontal disease is common, with mild to moderate forms affecting up to 50% of adults in the United States. Studies have demonstrated that moderate to severe periodontitis increases the level of systemic inflammation, and indeed inflammation is the common thread tying many disease processes together.

*Most published research to date shows that there is a possible association between periodontitis and systemic health. A causal relationship between the two has not yet been clearly established.

This Issue's Advisors



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The host response to challenges such as lipids and bacteria, initially thought to be protective in nature, can be destructive in certain high risk individuals, leading to the development of chronic diseases, such as atherosclerotic disease and periodontitis. Inflammation can operate in all stages of both atherosclerotic and periodontal diseases, increasing the risk for cardiovascular events (MI and stroke) and tooth loss. Common risk factors between the two diseases include genetics, advancing age, male gender, stress, smoking, diabetes mellitus, rheumatoid arthritis, and obesity. It is noteworthy, however, that periodontitis has also been reported to be a risk factor or marker independent of traditional risk factors for coronary artery, cerebrovascular, and peripheral arterial diseases.

Moderate to severe forms of periodontitis can lead to an acute-phase inflammatory response, as measured by elevations in blood levels of cytokines, TNF- α , and C-reactive protein (CRP). High

levels of CRP, measured by a high-sensitivity assay (hsCRP), are predictive of future acute myocardial infarction, unstable angina pectoris, and the onset of systemic arterial hypertension, diabetes mellitus, and stroke, independent of blood lipid levels. Treatment of periodontitis reduces the level of systemic inflammatory mediators. In untreated cases of periodontitis, bacterial species found predominantly in periodontal pockets have also been found in atheromas, deposits of lipid-containing plaques on the innermost layer of an arterial wall.

What are the clinical implications of this article?

The editors state that although causality of periodontal disease generating CVD cannot be confirmed with a high level of confidence, they do note that those patients with moderate-to-severe periodontitis should be informed that they might be at an increased risk of atherosclerotic CVD. Cardiologists and family physicians should be sensitive to this and refer CVD patients to their dental care providers for a complete periodontal assessment.

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Similarly, general dentists, periodontists, and dental hygienists need to conduct careful assessments to identify risk factors for both periodontal disease and CVD, and refer patients with periodontal disease for a complete physical examination, measurement of blood pressure, blood lipid profile, blood glucose measurement, and a plasma hsCRP evaluation if they have not had such a work-up within the past 12 months. In general, patients with periodontitis who have two or more known major atherosclerotic CVD risk factors should be referred for medical evaluation.

Both dental and medical practitioners should discuss lifestyle changes, including weight management and stress reduction,

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to reduce the risk of CVD as part of their preventive education. For those patients who report a smoking habit, a smoking cessation program should be offered. This program could be supported by the dentist or dental hygiene provider, or managed by the patient's physician. For those patients diagnosed with hypertension, dentists and physicians should coordinate the selection of antihypertensive medication to avoid the worsening of periodontal conditions with the development of gingival hyperplasia, such as can occur with the use of calcium channel blockers..

Periodontitis patients can also assess their own risk for future CVD events by calculating their Reynolds Risk Score (<http://www.reynoldsriskscore.org>) or by using the National Cholesterol Education Program Risk Calculator (<http://hp2010.nhlbi.nih.net/atpiii/calculator.asp>).

How should this article impact treatment of my patients?

Due to the complex pathophysiology of periodontitis and its impact on the risk for CVD, the bacteria, risk factors, and inflammation all need to be addressed when developing a treatment plan. The focus should be on reducing the impact of biofilm and resolving gingival inflammation. Treatment of moderate to severe periodontitis, sufficient to reduce the clinical signs of the disease, also decreases the level of systemic inflammatory markers, such as CRP.

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Use of systemic antibiotics, locally delivered antibiotics, host-modulation therapy, and surgery are treatment considerations that have been shown to facilitate bacterial control and heal bone and soft tissue attachments. Regular biofilm removal and instruction in maintaining excellent oral hygiene at home is critical to preventing periodontitis. Product recommendations should

include the use of interdental devices and mouthrinses. For those patients who are already challenged by both oral and systemic disease, the toothpaste recommended should offer both antibacterial and anti-inflammatory properties. Colgate Total, for example, contains triclosan, known for its ability to both kill the bacteria and reduce the inflammation associated with gingivitis, which, if left untreated, can lead to more serious forms of periodontal disease.

It is surmised that if greater emphasis on research efforts to better understand the underlying mechanisms regulating the progression of periodontitis and CVD can be identified, the development of treatment protocols to reduce the inflammatory burden might be enhanced. This landmark article offers excellent treatment recommendations based on the best evidence available to date. It is anticipated that support of future large-scale human clinical trials may lead to improved means to better manage both diseases.

Finally, a close collaboration between dentists and physicians is warranted to minimize differences in outcome measures. Oral healthcare providers are well positioned to help identify people at risk for atherosclerotic cardiovascular disease, and appropriate referrals and treatment can enhance the overall health and well-being of their patients.



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