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## New Age Periodontics: What's Coming Down the Pike

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A whole new light is emerging as we continue to learn more about periodontitis, one of the most interesting and baffling diseases. We are entering a new age as we look at periodontal disease from a different perspective. New modes of therapy have arrived, and laser treatment has expanded rapidly over the last several years. Treatment with locally administered antibiotics has become common. Utilization of host modulators such as subantimicrobial doses of doxycycline are popular. As we progress, risk assessment will become increasingly important, as well as a patient's nutritional status and antioxidant assessment and supplementation.

Dentistry is a rapidly changing and evolving profession. Chances are if you attended dental school or hygiene school more than 3 years ago, much of what you were taught has already changed or been improved. There is a problem in dentistry. We are professional "clingons." We cling to what we were taught in school and consider what we learned as the gospel truth forever, even if we graduated 30 years ago. I recently came upon a practitioner who swears that silver point endo is the only way to go. Many still treat periodontal disease with peroxide and baking soda or iodine, and many non-light-activated cold cure composites are placed each day. Open your mind. Hold on to your hat!

There is an overwhelming volume of information out there. Reading the journals regularly, attending relevant continuing education classes, and consulting with sales representatives do help to keep us up to date. Unfortunately, although all dentists get the journals, few read them thoroughly, some read only what interests them, and many don't read them at all. Much of our continuing education is devoted to practice management subjects, and many dentists will not give even the most competent sales rep the time of day. We need to change. The winds of change are blowing.

Periodontal therapy is one of the most rapidly changing and exciting areas of dentistry. With more than 90% of adults over 55 and more than 70% of adults 35 to 44 affected by periodontal disease,<sup>1</sup> one would think that the treatment of this disease would dominate every practice in America. According to Dr. Roger P. Levin, "The truth is that 73% of our colleagues do not probe and record periodontal pocket depths, even once a year. Periodontal disease is still an epidemic due to the overall lack of diagnosis that is taking place."<sup>2</sup>

A dental examination without a periodontal examination is an incomplete examination. It's akin to going to a physician for your annual medical checkup and not having your heart checked with a stethoscope. What kind of a medical examination would that be?

Over the last several years the relationship between periodontal disease and several life-threatening systemic diseases has emerged and is well-accepted. Studies have shown relationships to cardiovascular disease,<sup>3</sup> diabetes,<sup>4</sup> respiratory disease,<sup>5</sup> low-birthweight babies, and pre-term deliveries.<sup>6</sup> The American Academy of Periodontology has published pamphlets for each of these relationships. Periodontal disease has also been mentioned in articles on pancreatic cancer,<sup>7</sup> gastric ulcers,<sup>8</sup> and Alzheimer's Disease.<sup>9</sup> For years our focus has been on saving a patient's teeth and restoring the form and function of the masticatory system. Our focus must now include the salvation of the patient's life. Our treatment must include periodontal evaluation and either treatment or referral.

The interception and control of periodontal disease now takes on a different shade. A periodontally focused practice has never been more important, especially as patients have become better read and educated about the mouth-body connection. Patients will demand a higher quality of service and expect depth of knowledge. Many will come with a "full education" from brochures and from the Internet. The volume of information available is endless. Dentistry must be prepared to meet patients' needs and answer their questions. Staying abreast of the latest and the greatest will position the dentist to provide the highest level of care.

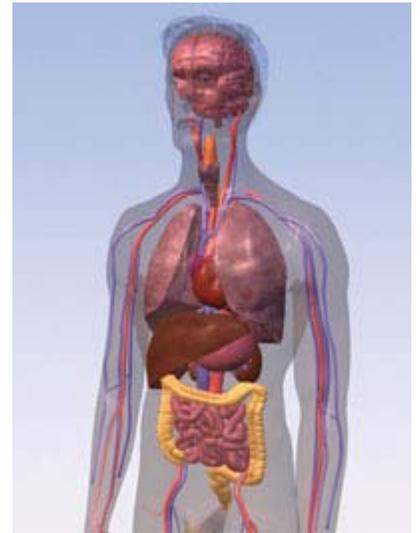
For years the mouth-body connection was a hypothesis. Confirmation of the relationship between periodontal disease and systemic disease is the most important thing that has happened in dentistry in 100 years. This relationship has focused attention on a disease that is pandemic. It has awakened the medical community and has reminded physicians that the mouth is a part of the body. Many physicians, performing cardiac surgery or joint replacement surgery, now require written certification from a dentist that the patient's mouth is infection-free. Well-informed and well-read physicians treating patients with diabetes will insist on periodontal care. The mouth-body connection directs us to a higher level of care and can provide a significant source of revenue.

The basic model of periodontal therapy remains prevention, detection, treatment, and maintenance. New modalities are inserted into the model for comprehensive therapy and will significantly change the old model.

Recently, Gottehrer and Berglund<sup>10</sup> wrote an eloquent review on Antimicrobial Host Response Therapy In Periodontics in Dentistry Today. It has been clear that although bacteria have been considered the primary etiologic factor in periodontal disease, the host response is just as important, if not more. The immune system modulates the body's response to disease. Matrix metalloproteinases (MMPs) and collagenase are enzymes that destroy bone and are activated by inflammatory mediators. Subantimicrobial doses of tetracycline have been shown to inhibit these MMPs and have become an important part of therapy.<sup>11</sup>

Similarly, free radicals play an important role in the development of periodontal disease.<sup>12,13</sup> Bacteria in periodontal pockets produce collagenase, hyaluronidase, endotoxins, and antigens that trigger immunologic reaction. Neutrophilic lysosomes produce oxygen-derived free radicals, collagenase, serine proteases, and histamines. Patients with chronic periodontal disease have lower levels of antioxidants, especially glutathione.<sup>14</sup> Antioxidants can neutralize the free radicals. A better understanding of how antioxidants function in the pathogenesis of periodontitis, and the effects of diet and nutritional supplementation on antioxidant status, may lead to new strategies on the treatment of the disease. An accurate and low-cost noninvasive laser test to measure a patient's antioxidant levels

is commercially available and will become part of the prevention and treatment modules (Biophotonic Scanner [Pharmanex]). It is well-accepted that antioxidants play a major role in the immune system, fighting cancer and aging.<sup>15</sup> Studies have shown that antioxidant levels play a role in periodontal disease and that periodontal disease significantly improves when these levels are restored to accepted levels.<sup>16,17</sup> High-quality pharmaceutical-grade nutritional supplements are now proven to make a difference, elevate antioxidants and beta carotenoids, and become part of every module in the



model. The laser test for antioxidants provides a method to measure these levels on an ongoing basis and to confirm the effectiveness of a supplement. Nutritional assessment and supplementation are not new to dentistry, and the role of the dental hygienist as a nutritional counselor will enjoy renewed attention and importance.

Inexpensive risk assessment, analysis, and presentation software is on the market and provides a reliable indicator of susceptibility based on a medical and dental profile collected at examination.<sup>18</sup> This too will become a part of the prevention, detection, and maintenance modules. Genco<sup>19</sup> and his group at Buffalo have shown that periodontal disease raises C-reactive protein (CRP) levels. CRP is a stronger predictor of heart attack than is cholesterol level. When the periodontal disease is treated, the CRP levels are diminished. Similarly, HbA1c levels have become important in the monitoring of diabetes.<sup>20</sup> When a diabetic patient's periodontal status is improved, his or her diabetes and HbA1c level is improved.<sup>21</sup> In-office tests for both CRP and HbA1c are now commercially available and will surely become part of our armamentarium (Cholestech LDX high sensitivity C-reactive protein [hs-CRP] Test [Cholestech]; A1CNow diabetes monitor [Metrika]). Laser therapy has been somewhat controversial over the years, but with proper expectations and correct use this mode of therapy works and has great value. A comprehensive review of the use of lasers as part of phase I periodontal therapy appeared in the April 2007 issue of *Dentistry Today*.<sup>22</sup> Locally administered antibiotics have become a part of periodontal scaling and root planing procedures.<sup>23</sup> They do not magically repair periodontal defects; bone doesn't magically grow back. And they do not eliminate the need for periodontal surgery. They do, however, effectively destroy bacteria and allow the tissues to heal in a bacteria-free environment. Pocket depths do decrease with their usage.<sup>24</sup> What is more important about locally administered antibiotics is, once again, the relationship between periodontal infection and the 5 systemic diseases. If we can eradicate the bacteria, then we should be curbing their effect on the body's immune system, helping to modulate the disease. I have preached for several years that every periodontal pocket 5 mm in depth or greater should be treated with a locally administered antibiotic, even if periodontal surgery is planned. The infection must be controlled as soon as possible. The primary risk factor for periodontal disease is smoking.<sup>25,26</sup> Smoking makes a patient 500% to 2,000% more likely to develop periodontal disease.<sup>27</sup> Approximately 75% of periodontal disease is attributable to smoking.<sup>28</sup> How can we effectively treat the disease without including a smoking cessation program in the model? A US Public Health Service-sponsored clinical practice guideline urges all healthcare providers to make tobacco-use cessation counseling a routine part of clinical practice.<sup>29</sup> It won't be long before most offices offer this as an important and critical part of comprehensive therapy.

### Where Do We Start?

So where do we start? You must identify the disease before you can treat it. Dr. Levin's words echo, "The truth is that 73% of our colleagues do not probe and record periodontal pocket depths, even once a year.

Periodontal disease is still an epidemic due to the over-all lack of diagnosis that is taking place."<sup>2</sup>

It all starts with a patient's first visit to the office. Every new patient, young or old, should be examined thoroughly for periodontal disease as part of a comprehensive and complete dental examination. Keep in mind that the more complete the examination, the larger the list of problems. The larger the list of problems, the more extensive becomes the treatment plan, thus maximizing our opportunity to restore the form and function of the masticatory system, restore and maximize the patients' medical and dental health, and at the same time create profit for the practice. It's a win-win proposition. It just doesn't make sense to cut corners when it comes to examining the patient.

A complete review of the patient's medical history and nutritional profile is an important part of the examination, as well as his or her nutritional and antioxidant status.

A modern, comprehensive health history form is essential. Risk factors should be determined, discussed, and recorded. PSR is not a periodontal examination, it's merely a screening tool.<sup>30</sup> A periodontal examination, at minimum, consists of 6-point pocket depth probings, notation of bleeding points and suppuration, mobility measurements, grading of furcation involvement, and evaluation of soft-tissue consistency, contours, texture, and recession. An assessment of occlusal type and examination for fremitus, interferences, and hyperocclusion should be included. Each of these examination items is important. Pocket depth measurements coupled with recession measurements reveal the amount of attachment loss. Bleeding upon probing suggests an ulcerated pocket lining and is still viewed as the most reliable indicator of disease. Suppuration is direct evidence of infection. Mobility measurements help us to determine a prognosis and can help direct our attention to the cause, which can be bone loss, traumatic occlusion, or both. Furcation grading is probably the most important measurement for multi-rooted teeth and often can dictate the prognosis for that tooth. Soft-tissue texture, consistency, and contour reveal a great deal about the status of the inflammation below. By recording all of these parameters, a baseline can be established so that we can update these parameters moving forward and illustrate the effectiveness of our treatment to our patients and third parties.

Appropriate radiographs must be exposed on a regular and continuing basis: full-mouth radiographs at least once every 5 years and bite-wings annually. X-rays should be mounted properly instead of stored in the chart in a little manilla envelope. Panoramic radiographs are marginal, at best. Panoramic radiographs are magnified, distorted, and not diagnostic for periodontal disease unless supplemented with 7 vertical bite-wings. But by the time you have ushered the patient to and from the panoramic machine, exposed the film, transported it to the processor, and exposed the bite-wings, you probably could have taken 2 full-mouth series of radiographs. You just cannot compare the clarity and detail of a panoramic radiograph with a periapical radiograph.

Once all of the diagnostic data has been collected, a detailed treatment plan can be formulated and presented to the patient. With the appropriate supportive documentation regarding the mouth-body connection, patients are interested and motivated to proceed with comprehensive therapy. Everyone wants to live longer and be disease free. It is our obligation to help patients understand how important their periodontal health is as a component of their general health and wellness.

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