A Biological Approach

With standard periodontal treatment still dominated by mechanical and surgical therapy, and with a lack of good biologically based medical treatments, what can biological dentistry contribute to the conversation?

Two major concepts: recognize periodontal disease as an infection and see periodontal disease as a whole-body context.

First, recognize periodontal disease as an infection. We know that the bacteria are involved. We know specific microbes, are living in a microbiome that has become pathogenic. But we don’t currently have a reliable way of altering the details of their ecology, or for using pro-biotic methods to restore a healthy microbiome. So, we’re left with the task of disinfection: a strategy to kill them all.

Second, see periodontal disease in a whole-body context. Ask questions such as: Are there health and lifestyle risk factors at play that can be addressed? Is the patient as healthy as they can be? Is the patient sufficiently well-nourished to be able to do the wound healing necessary to resist periodontal disease?

In essence, a line distinguishing the biological approach from basic mechanical treatment could be drawn between therapies that involve excision of tissue and therapies that involve enabling those tissues to heal.

Disinfection Strategy

Our discussion of disinfection strategies begins with the pioneers who witnessed microbes in the gingival environment, created techniques for brushing, and formulated protocols for anti-infective treatments. It is clear why all the pioneers of non-surgical periodontal care used microscopes: the pathogenic microbes all look different than the normal ones.

The key to anti-infective therapy is:

- Look
- Disinfect
- Look Again

Our arsenal also includes ozone therapy, infra-red laser energy treatment, and herbal methods for disinfection.

Well-known Risk Factors

Well-known risk factors include:

- Smoking
- Poor oral hygiene
- Genetic susceptibility
- Gender (males are more likely to have gum disease)
- Hormonal changes in females, especially during pregnancy, just before menstruation, when using oral contraceptives, or after menopause
• Weak or compromised immunity and illnesses such as diabetes, cancer, and AIDS
• Certain medications, especially Fosamax for osteoporosis and bisphosphonate drugs for cancer patients
• Medicines that cause dry mouth
• Drug abuse
• Alcohol abuse
• Issues with dental restorations or bite
• Unsatisfactory diet, especially consumption of sugar and acids
• Mouth breathing, creating dry conditions
• Older age

Less Well-known Risk Factors
Less well-known risk factors include:
• Relative vitamin C deficiency
• Sugar
• Mercury-silver filings

Relative Vitamin C Deficiency
Vitamin C is a necessary cofactor in the formation of collagen cross-linking, for wound healing and repair. Periodontal disease may be thought of as a localized form of scurvy. Smokers use up a great deal of vitamin C in metabolizing the tobacco toxins, which is one possible mechanism for their higher risk. On the other hand, supplementing the diet with vitamin C has been shown to improve the health of oral tissues.


Sugar
The following chart is from an old study on rats.
Mercury-Silver Filings

Mercury bone loss and increased inflammation are documented effects of mercury-silver filings that contact the tissue.


Nutritional Support

Nutritional support for periodontal disease includes good general health, good general nutrition, and smoking cessation. In cases where a patient continues to lose ground to periodontal disease despite our therapeutic efforts, we can often find nutritional deficiencies or other lifestyle issues that, when corrected, will allow the therapies to work.

Specific nutrients that tend to be lacking in diseased tissue:

- Vitamin C
- Vitamin D
- Coenzyme Q-10
- Folic Acid
- Mineral cofactors, trace elements
- Acid-Base balance (controls proper mineral deposition)
- Nitric oxide precursors (influence proper mineral deposition)
The Keyes Method

If periodontal disease is to be treated without surgery, there must be a way to convert the infected, inflamed, anaerobic, highly-oxidized, and acidic environment of the pocket into a healthy place. This is, not to physically eliminate the pocket, but to make it aerobic, non-inflamed, and free of infection, so the tissues can heal.

This ideal led to the next major advance in non-surgical periodontics with the career of Paul H. Keyes, DDS. Dr. Keyes received his dental degree from the University of Pennsylvania in 1941, and embarked on an illustrious career in dentistry and dental research. He served a long term as dental director of the US National Institutes of Dental Research, from 1954-1980.

Dr. Keyes brought a new, biologically oriented perspective to the surgically focused dental profession. He formulated a comprehensive multi-stage protocol for his anti-infective treatments that have come to be known as “the Keyes Method.” Even though the method was developed in the 1950s and 60s, it remains the backbone of anti-infective, non-surgical, hygiene-based periodontal treatment today.

Note the steps outlined here are taken from Dr. Keyes' website: [http://www.paulhkeyes.com/](http://www.paulhkeyes.com/) with comments from the IAOMT in italics.

The Keyes Perspective

“Periodontists talk about eliminating anatomical defects and monitoring the results of therapy with probes. We eliminate the bacterial risk factors and monitor the results microscopically. How else can you know if you’ve controlled the infection?”

Dr. Keyes quoted in the New York Times, 1982

Clinical Exam and Microbiological Diagnosis

Evaluations of tissue damage are supplemented with microscopic assessments of periodontal disease associated microorganisms (PDAM) and the presence of white blood cells (WBC).

*There is a very good reason why all the pioneers of non-surgical periodontal care used microscopes. The pathogenic microbes all look different than the normal ones.*


Patient Education

Patients are informed about the nature of periodontal infections, specific bacterial risk factors, how tissue damage occurs, and the possibility of transmission of organisms from person to person.

*This most important point is too often overlooked. Periodontal pathogens are transmissible, and it is strongly recommended that patients encourage their relationship partners to get their oral plaque examined and treated if necessary. Dogs and cats are subject to periodontal disease too, and the same pathogens can be transmitted by intimate contact.*
Learning Aid
Biological Periodontics

Professional Treatment
Treatment includes meticulous debridement of root surfaces (1-10 hours) and irrigations with antiseptic AGENTS to the depths of all pockets.

- We must recognize that many of the oral pathogens lead a double life— in the plaque and in the bloodstream. Our therapy must not force them from the sulcus into circulation, so disinfection comes before debridement. Gross debridement is done just enough to get access to the sulcus.

- The key to anti-infective therapy is: Look, Disinfect, Look Again. Repeated monitoring using the microscope during hygiene appointments is essential to confirming the success of disinfection. Even the most skilled hygienist has at times been frustrated to see how resistant some species of pathogens are to disinfection.

- A quadrant approach does not work for disinfection, as convenient as it may be for debridement. The pathogens will simply spread from the untreated areas back to quadrant that was treated. The whole mouth must be disinfected at each appointment, and our concepts of scheduling should be modified accordingly.

- Pocket disinfection is accomplished using a professional pump irrigator with a needle cannula, or with the irrigation function of an ultrasonic device, or both. Disinfecting solutions can be diluted hypochlorite, chloramine-T, povidone iodine, ozone-saturated water, etc. The more important factor is: get another sample, make a new slide and check to see how thoroughly disinfected the sites are.

For the first time in dentistry QUALITY of HOME CARE IS MEASUREABLE BY USING A MICROSCOPE. The word CLEAN NOW HAS A NEW DEFINITION.

Patient Instruction
Patients are instructed in an EFFECTIVE self-care program using INSTRUMENTS and AGENTS that combat PDAM. We suggest the toothbrush be used with 10-12 brushfuls of BAKING SODA and PEROXYL. COMPLIANCE in homecare is an absolute must.

There are so many instruments available for good home care in addition to the traditional Bass brush and floss. Electric and sonic toothbrushes, interdental brushes, and pump irrigators that are adapted for patients to learn to do deep pocket irrigation daily with a biocompatible disinfecting solution.

Monitoring
After an appropriate interval the patient’s progress is assessed by MONITORING SUBGINGIVAL microorganisms and the prevalence of white blood cells (WBC).

The life cycle of these organisms is well known. A decimated population of spirochetes, for example, will take about ten weeks to re-establish sufficient numbers to again cause disease. We recommend no more than three months between visits to monitor the subgingival flora under the microscope.

Modulation of Therapy
If disease related microbial complexes have not been converted to ones associated with health (BACTERIAL CONVERSION), and if white blood cell levels remain high, IN-OFFICE TREATMENTS and SELF-CARE PROGRAMS need to be MODULATED. Additional AGENTS and DELIVERY SYSTEMS should be considered (CUSTOM-FIT DELIVERY TRAYS). Systemic antibiotics may be necessary to “CLEAR THE INFECTION” from the body and COMPLIANCE is very important.

Systemic treatment is more likely necessary if amoebas are seen in the slides.

Maintenance
The frequency of maintenance or recall visits will depend on such factors as: patient’s age, immune system response, diet, smoking, general health, COMPLIANCE with homecare, dexterity, chances of reinfection, the extent of prior tissue damage, etc. Theoretically, patients can be maintained by professional therapy alone. The length of time between visits will be influenced by the levels of control attained by both professional and self-care measures after initial therapy. THE DISEASE PROCESS HAS HISTORICALLY BEEN PROGRESSIVE but can now be CONTROLLED by treating it like an INFECTION.

The frequency of maintenance visits, again, will depend upon the life cycle of the organisms involved, and visual microscopic confirmation that the patient has been successful in controlling their return.