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### Kerry Lepicek, RDH

Kerry is a registered dental hygienist with over 20 years of clinical experience. She works at Clinical Research Dental as a Clinical Specialist in Dental Hygiene and Education. She has lectured both locally and internationally. Kerry is knowledgeable on the topics of oral biofilm, halitosis, the oral-systemic connection, and the dental hygiene process of care. Her focus is on educating her patients and the dental profession on health and wellness.

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## RISK ASSESSMENT INSIGHTS FOR DISEASE MANAGEMENT

**T**he battle against periodontal disease is not for the easily shaken. It demands strength, endurance, grit, and grace. As we know, the recent CDC report states that 47.2% of adults over the age of 30 have some form of periodontal disease and that this increases to 70% over the age of 65. This discouraging statistic places an immense calling on us as dental professionals. There has never been a greater time in history to finally take charge of these statistics and begin to treat and eliminate the disease rather than simply manage it.

As oral health specialists, we need a solid understanding of the risk factors of the disease, bacterial components, the host immune response, and the oral-systemic implications involved. It is time that we abide by current and emerging research and implement

technology that will improve the oral and systemic health of our patients. The American Academy of Periodontology states that periodontal disease is “Inflammation of the periodontal tissues resulting in clinical attachment loss, alveolar bone loss, and periodontal pocketing.” Do we, the prevention specialists, feel adequately prepared to deal with the inflammatory component of periodontal disease? Additionally, are we employing assessment tools that can help us consider the specific level of risk of our patients to create a personalized care plan to proactively address their needs?

Although periodontal disease is multifaceted, the recolonization of keystone pathogens is worthy of strategic confrontation. Keystone pathogens bind to host cells and penetrate the local epithelial lining. This triggers the inflammatory process in

the body's attempt to protect itself. Inflammatory mediators are sent to the infected tissue with tissue restoration being the intended result. In healthy individuals, this process functions well; however, when the inflammation is chronic, as with periodontal disease, these inflammatory mediators become overproduced. Pathogenic bacteria continue to proliferate resulting in a state of dysbiosis for the host, continuing the cycle and leading to bone and tissue destruction.

Fundamentally, fighting periodontal disease requires meticulous removal of oral biofilm, which reduces the pathogenic bacterial load and stress on the immune system. However, with traditional periodontal debridement, these pathogens may return to baseline levels faster than we realize. This means that in addition to pristine removal of the oral biofilm, there are other adjunctive therapies and home care strategies we should be considering.

### ADVANCED RISK ASSESSMENT STRATEGIES

**Genetic DNA testing:** To achieve optimal results, we must leverage adaptive technologies to implement a more proactive approach to disease. Would you consider offering genetic DNA testing for your patients if this was an option? A test of this nature would enable us to determine a patient's potential predisposition for periodontal and caries disease. The future is here, and it is now possible to test the genetic susceptibility of an individual to developing these common diseases.

This is largely due to the development of a polygenetic risk score (PRS) that illustrates how an individual's risk for developing these conditions compares to the broader population baseline. An individual's PRS is made of genetic variants that have been identified through genotyping to be associated with either periodontal disease or caries using large Genome-Wide Association Studies. This brings into effect the concept of personalized medicine as the test plots

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an individual's relative risk of developing periodontal disease and dental caries against a standard population. Using biomarkers, geneticists have been able to identify genetic markers associated with these conditions. Genetic testing has been made possible through a Canadian company called AI Genetics, through their test kit called Oral-Risk which is being distributed through Curion. This technology can empower patients to take a proactive approach to preventing periodontal disease or caries and facilitate opportunities for open conversation between patients and their oral health care team. Many patients decline periodontal care or fail to acknowledge the significance of maintaining their periodontal health. However, leveraging technology like genetic testing can aid in acquiring patient acceptance of necessary treatment and collaboration with the clinician to enhance their periodontal health. Consider the changes you would make if you could rewrite your potential history for either of these diseases. Consider also how this knowledge could help your patients make informed decisions before periodontal surgeries, future implant surgeries, recall frequency, homecare tools, preventative and therapeutic procedures and more.

**Bacterial DNA Testing:** In addition to testing a patient's DNA, bacterial testing presents another layer of personalized medicine. Current assessment strategies are unable to specify the types and amounts of the pathogens present.

As a dental professional, have you ever been puzzled by your patient's unresponsive oral tissues? If so, it might be worth taking a closer look at their salivary bacterial profile. By analyzing the patient's periodontal, Candida, and Streptococcus mutans pathogen load, it's possible to objec-

tively identify their bacterial risk. Understanding the type and amount of bacterial species present can help you make informed treatment recommendations and improve your clinical outcomes.

Bacteria present in the mouth are not confined to the oral environment or pockets alone. When bleeding occurs in the mouth, these pathogens can enter the bloodstream and spread throughout the body wherever blood flows. Periodontal pathogens have also been linked to various systemic diseases such as rheumatoid arthritis, cardiovascular disease, diabetes, and Alzheimer's.

OraVital's BiofilmDNA™ testing method collects samples from the saliva, supragingival and subgingival biofilm, and the tongue. The analysis reveals the levels of specific pathogens and the overall biofilm burden. BiofilmDNA™ tests for:

- **Red Complex bacteria:** Porphyromonas gingivalis, Treponema denticola, and Tannerella forsythia
- **Orange complex bacteria:** Peptostreptococcus micros and Fusobacterium nucleatum
- Streptococcus mutans
- Aggregatibacter actinomycetemcomitans
- Candida albicans

The DNA report will detail the quantity of specific pathogens through a logarithmic scale making it easy to see changes in the bacterial population and evaluate treatment modality results.

### MANAGING PATHOGENIC LOAD

**Lasers:** The diode laser is a valuable adjunctive therapy tool when considering the bacterial component, host-immune response, and oral systemic connection. Diode laser energy is

attracted to, absorbed by, and therefore interacts with melanin, hemoglobin, and water. This means that the laser will have a pronounced effect on red-complex bacteria and inflamed tissue, while its impact on gram-positive bacteria and healthy tissue will be less significant. As the laser energy is absorbed, it initiates a gentle photothermal reaction within the targeted bacteria, causing a temperature increase until the cell undergoes vaporization via lysis of the cell membrane. The diode laser can reach microorganism colonies that are hidden within granulation tissue and epithelial lining. The reduction in bacteria exceeds what can be achieved solely through mechanical instrumentation. Furthermore, research has shown that lasers can also lead to a delay in the recolonization of pathogenic bacteria for up to 90 days.

Without intervention, pathogenic bacteria persist in proliferating, resulting in a state of dysbiosis for the host, perpetuating the cycle and leading to bone and tissue deterioration. Soft tissue diode lasers provide a non-toxic, non-pharmaceutical solution to curb the overproduction of inflammatory mediators and rapid recolonization of pathogenic bacteria.

## PATIENT HOMECARE

True, patient-specific care includes a partnership where the patient and clinician work together to create change. Making homecare recommendations based on your patient's specific level of risk, combined with knowledge of their unique pathogenic burden provides an opportunity for ultimate personalization.

In addition to lasers and oral probiotics, antibiotic rinses can also be considered to reduce the bacterial load.

## RINSES

An antibiotic rinse delivery method results in high saliva levels to target bacteria on the tongue, the back of the throat and within subgingival and supragingival biofilm for a whole mouth treatment. The rinse is formulated to target the specific

bacterial DNA report profile.

Research shows, using an antibiotic rinse can reduce bleeding on probing by 87% and pocket depths by 1-2 mm within 2 weeks. OraVital's rinses are compounded using a variety of antibiotic and antifungal combinations, including metronidazole, tetracycline, amoxicillin and/or azithromycin in combination with nystatin.

## INTERPROXIMAL RECOMMENDATIONS

Is your interproximal cleaning strategy evidence-based? The Journal of Clinical Periodontology states that "flossing cannot be recommended other than for sites of gingival and periodontal health, where interdental brushes (IDBs) will not pass through the interproximal area without trauma. Otherwise, IDBs are the device of choice for interproximal plaque removal." It is time to consider alternative options that patients will comply with to improve our chances of moving them from dysbiosis to symbiosis. Consider introducing IDBs if this is not already part of your recommendations.

## POWER BRUSH

Power brushes outshine manual toothbrushing in evidence-based literature. Using oscillating rotating power brush technology, along with floss, a CPC rinse, and stannous fluoride dentifrice, can significantly improve gum health. According to a recent 12-week study, 100% of the test group transitioned from gingivitis to a healthy state (<10% bleeding site), while only 7% of the control group showed improvement. Offering home care kits in your practice can provide an easy-to-implement program for your patients, resulting in less inflammation and bleeding, making appointments easier for both the patient and the clinician.

## REPOPULATION

Oral probiotics are a new approach to treating and managing periodontal and caries issues. These probiotics come in the form of lozenges that

contain live bacteria and are used to promote a healthy balance of microorganisms in the mouth. Lactobacillus reuteri lozenges work by attaching to the teeth and gingival surfaces, creating a protective barrier that reduces bacterial adhesion and inflammation. They are commonly used for patients who have caries, periodontal disease, halitosis, and implant diseases. BioGaia's oral L. reuteri treatment has been shown to reduce the number of periodontal pathogens in the subgingival microbiota. Recent studies have demonstrated that L. reuteri ATCC PTA 5289 can inhibit the development of an acid tolerance response (ATR) in the early stages of biofilm formation in common oral bacteria. This effect is strain-specific and involves the down-regulation of key genes involved in maintaining intracellular pH and acid stress adaptation in streptococci. Probiotics are safe and easy to use and can be a great addition to your oral hygiene routine. By restoring the natural balance of bacteria in the mouth, BioGaia's oral probiotics can help promote a healthy oral environment.

## CONCLUSION

After analyzing our risk assessment data, we can create a comprehensive treatment plan that addresses in-office and at-home care strategies. By testing patients' genetic and bacterial DNA risks, treating periodontal inflammation, reducing periodontal pathogens and restoring a state of symbiosis; we can decrease the risk of irreversible damage from chronic inflammatory conditions. We have an opportunity to advance our profession, by creating even more customized care plans with our patients that focus on their unique risk factors and the oral-systemic connection. **OH**

**Disclaimer:** Kerry Lepicek has previously worked with OraVital and Beth Parkes is currently employed by Curion, the exclusive distributor of OralRisk.

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References can be viewed on our website: [www.oralhealthgroup.com](http://www.oralhealthgroup.com)