

A Smart System

– boosting dental outcomes

By Peter Mackley



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It's interesting to compare general concepts and work methods from one profession to another. Many advances in one industry can be directly attributed to the lessons learnt from another.

A surgeon would not operate on a patient without a complete diagnosis which typically involves a visual examination, scans, radiographs and laboratory tests, all to confirm the status and extent of the specific disease. The combined diagnostic elements provides the surgeon with a complete picture of the disease status and creates a valuable baseline that is used to confirm the success of the combined treatment outcome. Periodic post surgery/treatment scans and laboratory tests are routinely conducted to confirm the success of the treatment and to rule out recurrent disease experiences or the onset of new disease sites. With this in mind let's look at a smart system that is boosting dental health outcomes.

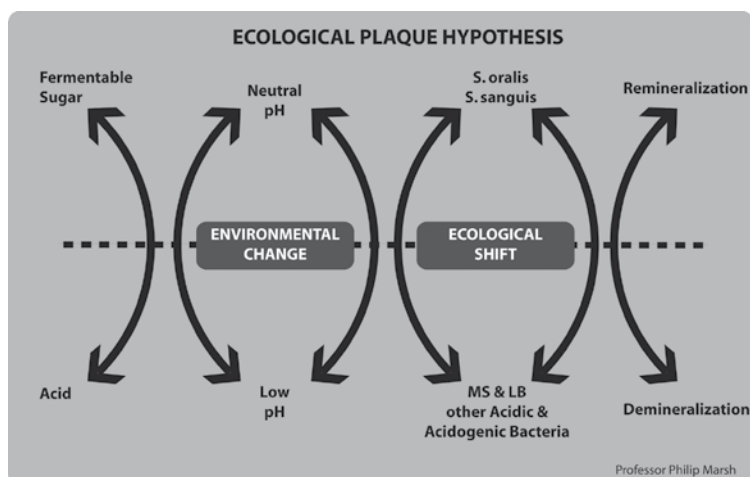
It is well documented that dental caries is a multi-bacterial biofilm disease. It is driven by change in the pH causing an ecological shift in the bacterial population within the biofilm, that coats the enamel surface of teeth^{1,2}. Acids are often referred as the worst offenders as they can cause prolonged periods of low pH pressure, this in turn drives the ecological shift within the biofilm.

When this is linked to other known risk factors such as a reduced saliva production or a poor saliva buffering capacity, prolonged periods of downwards pH pressure encourages destructive bacteria to thrive placing even great pressure on the biofilm^{1,3}. Dental professionals see the end result of these experiences on a daily basis. These problems are generally treated with a restorative approach. The patient presents with a cavity, so the tooth is filled. Cervical erosion is visible, so a Class V restoration is placed. Surgical intervention alone does not stop the problem and in fact if the disease is not addressed sufficiently by correcting the bacterial infection it can have an adverse affect on the newly placed dentistry and other sites. Managing caries as a disease is all about the chemistry within the oral cavity and specifically about the biofilm at the enamel interface.

ATP-Bioluminescence is a well established metric for the measurement of bacteria in many industries. In recent years much research and development has been devoted to adapt this technology, creating a timely and more effective way to help dental professionals to become better equipped in the diagnose and quantification of caries as a disease. Researchers at Oregon Health Science University have proven that ATP-Bioluminescence is a highly predictive test, used for the rapid assessment and quantification of plaque bacteria⁴. The CariScreen ATP test from CariFree is a patent pending technology that offers dental professionals a unique assessment tool which aids in the understanding and diagnosis of the caries disease. The benefits of the CariScreen ATP test can be applied across all aspects of dentistry including general, aesthetic, paediatric, orthodontic, hygiene, preventative and prosthodontic.

How is the CariScreen ATP test used?

A special swab is wiped across several teeth to obtain a biofilm sample. The swab contains a special reagent solution that when



mixed with the sample generates light, which is measured by the CariScreen ATP meter. Simply put the CariScreen ATP test measures the level of acidic and acidogenic bacteria within the biofilm. With a total test time of just 30 seconds, it is a quick and convenient way to incorporate that important bacterial component as part of any comprehensive examination.

How are the CariScreen ATP results interpreted?

The CariScreen ATP test has an operating range from 0-9999. Test results <1500 are considered to be "low risk", while result >1500 are considered to be "at risk". Charting the test results provides a valuable visual baseline that both you and the patient can readily understand.

Monitoring treatment outcomes

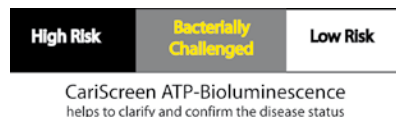
The CariScreen ATP test is also an effective way to confirm treatment outcomes. (Fig 1) Having the convenience to simply measure change in the biofilm ecology opens a whole new understanding of the caries disease. The CariScreen ATP test is a great way to identify individual risk factor changes within ones lifestyle. Individuals who screen as "at risk" should be further assessed to establish the impact which risk factors may be contributing to the ecologic change within their biofilm. CariFree offers a caries risk assessment form for this purpose. The Californian Dental Association Foundation is now actively encouraging its 21,000 member dentists to conduct CaMBRA, Caries Management By Risk Assessment, for all patients. CaMBRA is a unique approach to dentistry that helps dentists assess the risk of cavities and other oral problems, it's the first of its kind to move dentistry towards a medical model of

preventative care⁵.

Identifying this destructive ecological shift within the biofilm, offers dental professionals the new element of time in preventing the onset of the caries disease. Antibacterial and pH strategies can be employed and monitored to correct the bacterial imbalance. Further discussion on these strategies will be included in Part II of this report.

Who should be tested?

Ideally all patients should be tested at least annually regardless of their previous dental history. Typically patients are classified as either a "low risk" or "high risk", by nature of their visual examination and previous dental history. This is very much a "black or white" approach, however there are significant areas of "grey" that often go unchecked. The CariScreen ATP test is a simple and convenient way to identify likely abnormalities. (Fig 2)



High Risk Group

A high risk patient typically presents with a cavitation or other visual symptoms such as white spot lesions or radiographic lesions. Screening this type of patient will not change the diagnosis as they have the caries disease, however it may change the treatment options and will provide an invaluable bacterial baseline. Having a baseline allows treatment outcomes to be confirmed, delivering a new level of quality assurance in patient care. Confirming the ecological shift within the biofilm boosts dental outcomes and confirms the need for additional treatment cycles and considerations.

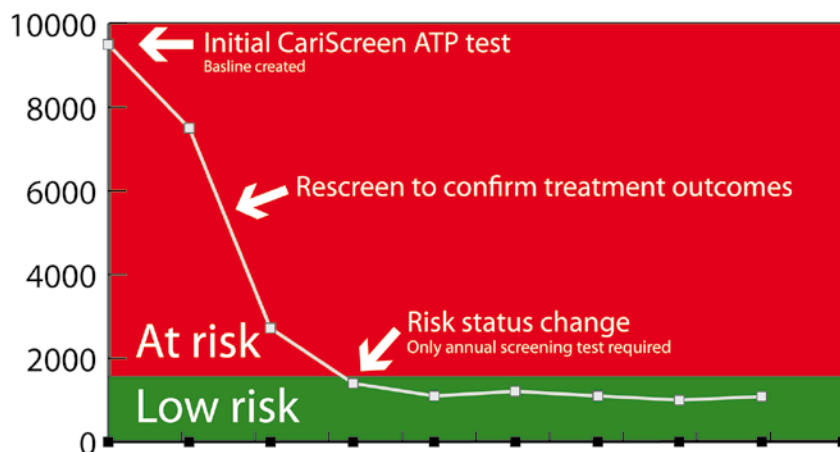


Figure 1

Caries Management By Risk Assessment

is as simple as 1,2,3

CariFree



I have been using the CariFree system since its inception 4 years ago. It has been the single most effective caries treatment concept and program I have used in 35 years of practice. It has had a dramatic and positive effect on the dental health of my caries active patients.

Dr. Graeme Milicich.

Screening

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Prescription

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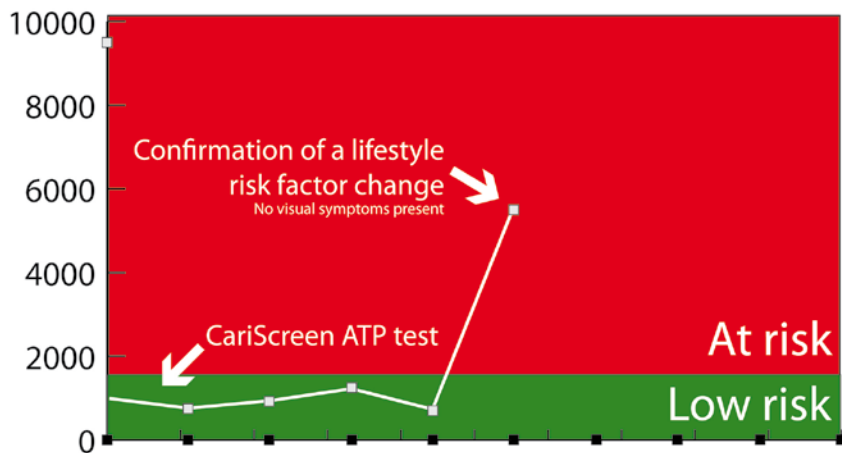


Figure 2

Stopping treatment prematurely can have an adverse effect, as the acidic and acidogenic bacteria within the diseased biofilm will continue to thrive and repopulate, continuing to create an acidic environment that is self serving^{1,2}. Rescreening delivers a new level of quality assurance, facilitating a more rounded and science based management approach.

Low Risk Group

Bacterial confirmation of low risk patients is vital to ensure that they remain cavity free. Good oral hygiene habits and a previous history of being cavity free is no guarantee that the patient will remain that way. Many individuals can have multiple lifestyle risk factors in play that typically

go unchecked. The CariScreen ATP test is a quick and effective way to see the net bacterial result of these lifestyle factors. This is not a definitive test but when viewed with the other known risk factors, a more complete picture is certainly available. The obvious question should be asked, How can a bacterial disease be identified/quantified, if no bacterial testing is being done?

Typically, practices that routinely screen all patients find that 30-40% of their low risk group are bacterially challenged. This means that they have presented with an overpopulation of the harmful acidic and acidogenic bacteria within the biofilm. How does this occur? Frequent snacking or consumption of acidic beverages can

create downwards pH pressure on the biofilm. Linking this with another risk factor, such as a reduced saliva flow, or a poor buffering capacity can further weaken the body's natural protective factors. A good oral hygiene routine may be the only thing preventing new cavities from developing, however should this frequency reduce or a further lifestyle change occurs, additional pressure would be placed on the biofilm causing catastrophic change^{1,2}. The net result may present as new cavities, ringbark caries around a veneer or crown, or white spot lesions on a patient who is having their teeth straightened. ♦

Reference:

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3. Caries risk assessment in practice for age 6 through adult. John Featherstone MCS PHD, Sophie Domejean-Orliaguet DDS, Larry Jenson DDS MA, Mark Wolff DDS PHD and Douglas Young DDS MS MBA. CDA Journal Vol 35 No10.
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5. California Dental Association Foundation launches new risk assessment campaign, 10 September 2008. www.cdafoundation.org

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