

# New developments in perio: Tri-Immuno-Phasic therapy

US periodontal therapist William Hoisington has developed a new technique for treatment that allegedly tackles the issue of periodontal disease in an entirely new way. Tri-Immuno-Phasic periodontal therapy, otherwise known as TIP, allows practitioners to go under the gum line and destroy anaerobic bacteria – aggressive pathogens that are rumoured to not only cause degeneration of dental bone and gums, but also penetrate the body's circulation and contribute to more serious health complications such as heart disease, osteoporosis, premature birth and infertility to name a few. In this article, Hoisington explains how a simple DNA test and TIP therapy can mean regenerated dental bone, saved teeth and improved whole body health

The recently introduced DNA test for pathogenic bacteria is changing thinking about how best to treat periodontal disease (Ashmoto et al 1996). The quick and inexpensive test clearly demonstrates the essentially anaerobic nature of the periodontal bacterial pathogens and thus the aerobic way to combat them.

Here follows descriptions of five of the most pathogenic species.

## Pathogenic species

### ***Actinobacillus actinomycetemcomitans***

- A small, gram negative, facultatively anaerobic, non motile rod, not considered part of normal flora but a true infectious agent
- Associated with juvenile localised periodontitis
- Possesses many virulence factors: leucotoxin (kills human neutrophils and monocytes), immunosuppressive factor, bone resorption mediation factor, fibroblast proliferation depression factor, causes release of lysosomal products from damaged immune cells, perturbs adaptive mechanisms, delays antibody synthesis, invasive implicated in endocarditis,

pericarditis, meningitis, osteomyelitis, pneumonia and sub-cutaneous abscess

- Sensitive to Amoxicillin, Claritromycin and Doxycycline, practically insensitive to Metronidazol

- Transmittable from parent to child.

### ***Porphyromonas gingivalis***

- A gram negative, non motile small strictly anaerobic rod, has numerous fimbriae for attachment
- Not considered part of normal flora
- Virulence factors: possesses very strong proteolytic enzymes, collagenases, chemical adherence factors (attaches to erythrocytes and causes agglutination), decomposes immunoglobulins, invasive implicated in coronary artery disease
- Transmissible from parent to child and to a lesser degree between partners.

### ***Tannerella forcythensis (Bacteroides forsythus)***

- A strictly anaerobic, gram negative, fusiform rod
- Associated with refractory periodontitis, considered a major periodontal pathogen, possesses strong proteolytic properties
- Sensitive to Metronidazol and Clindamycin but resistant to Doxycycline.

William Hoisington is a periodontal therapist, treating patients with TIP therapy in Seattle, USA.

He developed the TIP technique with an implant research group at the University of Nice. Visit [www.periofirst.com](http://www.periofirst.com) for more information

## ***Treponema denticola***

- An anaerobic, spiral shaped bacteria from the spirochete family, nearly impossible to culture, can support small quantities of oxygen
- Very strongly proteolytic, invasive in cooperation with other bacteria
- Antibiotic sensitivity in vivo is not evident.

## ***Prevotella intermedia***

- Strict anaerobe, gram negative rod, can ferment complex sugars
- Highly proteolytic
- Sometimes associated with halitosis
- Sensitive to Metronidazol and Clindamycin.

The result of the DNA test is presented in the form of a graph that shows species distribution and relative quantities of bacteria (see Figure 1, page 32).

The results of the study indicate that there are at least 46 different combinations of the assessed periodontal pathogens in subjects with periodontitis, and at least 10 different antibiotic regimens might be required to specifically target the various pathogen complexes (Beikler et al 2004). The test results are also delivered with the suggested antibiotic regimen to follow.

## **The goal of aerobic periodontics**

While other kinds of bacteria, viruses, yeasts and parasites all have their role to play, it is the anaerobic pathogens with their virulence and invasive nature that open the way for the synergy with other organisms to break connective tissue attachment and form pathologic periodontal pockets.

It is by opening the entry into the deeper tissues that bacteria and other organisms can enter the circulation. Researchers are finding periodontal pathogens in the atherosclerotic plaques of the coronary arteries (Fiehn et al 2005). While the exact mechanism of how these bacteria might cause a rupture in the artery or accelerate blockage remains to be elucidated, the fact that these bacteria can provoke connective tissue destruction at a distance certainly is potentially alarming. Chronic inflammation in a pocket without a deepening pocket was previously considered acceptable, but in light of the medical aspect of that inflammation, our responsibility is

engaged to do better for our medical colleagues and our patients. Healing periodontal disease like broken bones heal is the goal of aerobic periodontics.

## **Periodontal disease and premature births**

One of the clearest connections of periodontal disease to medical problems is premature births (Jeffcoat et al 2003). It can easily be argued that each woman entering reproductive age could benefit from a bacterial DNA test and aerobic treatment. This test also reveals the patients who are the most at risk before destruction occurs because they harbour already at a young age the most aggressive species of bacteria.

A Japanese study showed these pathogens already present at eight to 11 years of age (Suda et al 2003). Aerobic treatment responds most completely to the implications of this DNA information. To durably defeat anaerobic bacteria requires periodontal therapy that creates and maintains aerobic conditions. This approach is also called Tri-Immuno-Phasic periodontal therapy (TIP) with Bone One Session Treatment (BOST).

## **The development of TIP and BOST**

TIP and BOST have been elaborated and tested over the past several years on over 2,500 patients with remarkably consistent success in saving teeth thought lost, and limiting anaerobic bacteria generated inflammation to an acceptable minimum (Hoisington et al 2005).

Healing periodontal disease is a relatively new concept. Most writing on the subject speaks of managing periodontal disease, acquiescing to its chronic nature, slowing it down, or reducing pockets. Whole text books have been written with only a reference to wound healing.

This article describes how periodontal disease can be healed. Damaged bone can be healed similar to how a broken bone heals. Damaged bone can regenerate with a gain in attachment. Teeth can be saved that look like it is too late. This article will show that the limit to what patients can accomplish to save teeth with their healing potential is sometimes astonishing. Not extracting teeth initially, but rather setting

Figure 1: A example of the DNA test for pathogenic bacteria results

Figure 2: The gingiva is intentionally stretched using the rounded back of curettes

Figure 3: The clot that is firmly attached to the clean bone serves as a scaffold. The stem cells can move on along it and up the root surfaces at the rate of 0.5mm per day for eight days and thicken the layer on the clot

Figure 4: As healing time increases, the pockets gradually fill in from the bottom with very dense, partially mineralised connective tissue in about four to six weeks, and finally will become acellular

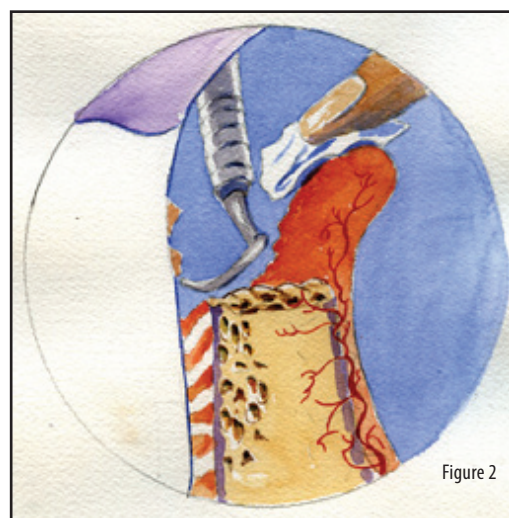
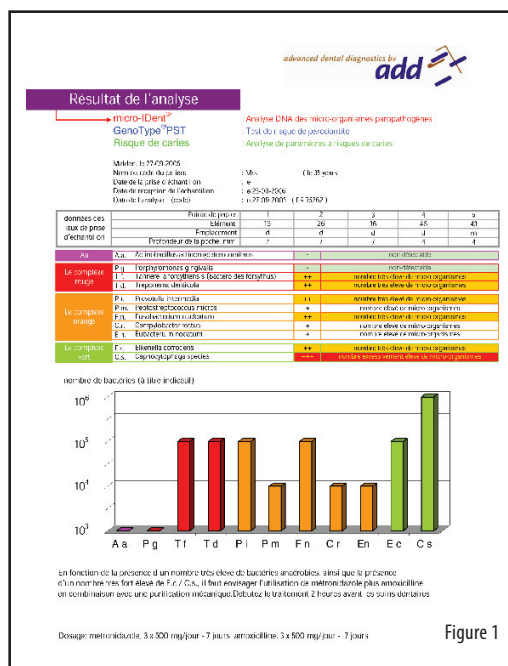


Figure 2



Figure 3

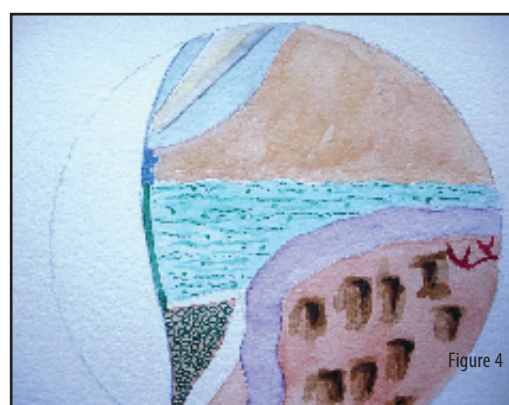


Figure 4

up conditions for healing and waiting the required time for healing forms the foundation of aerobic periodontics.

### How it works

The first thing to understand is where are the anaerobic bacteria. Of course they are in the thick plaque that is deep sub-gingival on the roots of the teeth. What is less appreciated is that they are also in the porosities of the degenerated bone.

Certain bacteria can be found inside the soft tissue. Creating access to remove these bacteria from both the roots and the bone in pockets that are 7-9 millimetres deep has traditionally led to the use of periodontal flap surgery. Studies show that certain anaerobes can be best attacked inside the tissue with antibiotics (Beikler et al 2004). The advantage here of the DNA test is that it shows which antibiotic or combination to choose.

Studies also show that without this

information the chance of choosing the exact right antibiotic or combination is barely one in 10 (Beikler et al 2004). Judged in the context of aerobic conditions, the surgical approach has three problems:

1. Surgery cuts off circulation to the bone
2. It lets air in that dries the bone cells. (The combination of 1 and 2 leads to the well-known cell death, necrosis, colonisation by spirochetes and loss of an extra millimetre of bone)
3. Placing sutures excludes the possibility of oral hygiene so anaerobic conditions are quickly re-established.

With Widman type flaps it is hoped to close the pockets with epithelial attachment. This type of attachment is however notoriously unstable with pockets often opening up again completely in a few months' time. With osseous surgery to reduce pockets the attachment is unstable scar tissue that often leaves the bone still exposed and leads to the return of disease. Patients and practitioners also strongly resist it because of the pain, aesthetic problems of long teeth, mobility and sensitivity. For the medical risk aspect, too many patients who decide nonetheless to have surgery, stop after just part of the mouth being treated. For grafting techniques the results are too unpredictable with 50% failures of certain techniques (and in any case impractical if nearly all the teeth are suffering from advanced bone loss).

The aerobic answer to this problem is to take advantage of the elasticity of the gingiva to intentionally stretch it open without cutting it. This is done with the rounded back of curettes in a three-stage process. The tissue becomes more stretched as the instruments advance down to the bone level (see Figure 2).

Here the curettes are inverted to allow the rounded tip of the curettes to plasty the surface of the bone and remove any attached granulation tissue or degenerated attachment. The goal is a smooth, regular bone surface and fresh bleeding to flush out bacteria and toxins from the porosities. Access all the way down to the bone surface also means superb access to the deep root surfaces. If the sticky plaque layer and most of the calculus is removed the conditions are right, where the immune reaction of inflammation can change into one of

## The 12 advantages of aerobic periodontal treatment

1. No incisions or sutures mean less discomfort.
2. Hygiene restarts the next day.
3. With incisional flaps, circulation is cut off to the bone surface and it is exposed to the air, so surface bone cells die and a millimetre more of bone is lost. When the tissue is just stretched, the bone surface stays covered with fluid, is protected and retains its circulation. No further bone is lost and another source of discomfort is eliminated.
4. The gingival tissue tends to stay near its original height, thus preserving aesthetics and minimising sensitivity.
5. No wound from cutting and bone surface death means the immune reaction is fast regeneration healing, rather than slow wound healing with scarring and bacterial colonisation of dead tissue (by spirochetes). With regeneration healing, inflammation quickly leaves. Swelling, pressure and discomfort decrease rapidly. Teeth tighten.
6. Any minor retreatment later on is easy by stretching open again.
7. Teeth with severe bone loss, considered hopeless or too late for flap surgery, often are saved because they tighten up after BOST as actual gain in bone height and density (with reappearance of the dense cortical bone layer) occurs.
8. Stretching tissue is faster and not traumatic, the whole mouth treatment is over in one appointment and reinfection is reduced.
9. If any aesthetic, crown and bridge work or implants need to be carried out, they can commence sooner since the healing is quicker and a healthy base is established.
10. Since the procedure is not traumatic, just long, no disagreeable pain medications are needed, usually only a pain killer the night of the procedure. No work need be lost. Sensitivity is much reduced also, so it is easy to keep a positive attitude toward the process, aiding the healing.
11. There is less need for follow-up frequent cleaning.
12. The healed results may be more durable due to a more reliable attachment. Complete healing with tight teeth, a solid bite, no bleeding, and healthy, dense, springy, tissue, with no pockets, relieves psychological stress (worrying if the disease is getting worse or if pathological bacteria are getting into the bloodstream). The elimination of inflammation also seems to greatly reduce clenching and grinding of teeth that is like an 'itching' or effort to force out excess stagnant blood. Often niteguards can be eliminated.



# Periodontics

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regeneration. This type of healing happens with the help of the stem cells from the periodontal ligament. However, these stem cells are very delicate and will not venture out into an environment that is still infected or highly inflamed. They also don't like to be burned with hydrogen peroxide or other aggressive chemicals.

The clot that is firmly attached to the clean bone serves as a scaffold (see Figure 3). The stem cells can move along it and up the root surfaces at the rate of 0.5mm per day for eight days and thicken the layer on the clot. To permit this activity it is also important to keep the epithelial attachment away from the roots. This is done with the oral hygiene technique that keeps the pocket open and also inhibits the reformation of the sticky layer (yellow cone at the top).

As healing time increases, the pockets gradually fill in from the bottom with

very dense, partially mineralised connective tissue in about four to six weeks, and finally will become acellular (see Figure 4). The final healed result with the bone crest cortical layer reformed and the disappearance takes about nine months. This healing is visible on X-rays.

Once this initial healing at four to six weeks has happened, whatever further treatment is required, whether selective surgery, implants, orthodontics, restorative or prosthetic dentistry, it will be easier in a better environment with a fully engaged and aware patient. Waiting the full nine months before committing to definitive treatment can have advantages.

One final advantage of this process is the change to lifestyle and nutrition, encouraging better overall health. Less energy spent fighting disease means more energy is available for productive work or fun activities.

## Do you want to find out more?

A course on the TIP technique will be held on Friday and Saturday 23 and 24 June at the University of Nice Medical School, France.

The TIP course is part of the first forum on basal implantology. TIP for pre-implant preparation and basal implantology with Diskimplants have developed in parallel. The Diskimplants are inserted laterally and rest on the basal/cortical plates of bone. This allows them to be placed in very small bone volumes.

During the two-day course, delegates will be able to see a direct surgery for basal implantology performed by the inventor Dr Gerard Scortecci, hear several other speakers present their cases including the best known American implantologist, Dr Carl Misch, and see how these cases are restored. Delegates will be able to see every aspect of TIP presented in poster/table clinic format by William Hoisington and several trained practitioners from France, Belgium and Russia.

Learn more about bacterial DNA tests (including doing one on yourself) N2 periodontal probing, stretch flaps, instrumentation, splinting and aesthetic correction, aerobic oral hygiene, and the healing sequence. The cost for the full two days is €300 payable to the University of Nice Medical School. The whole TIP programme will be presented in English, as will a lot of the basal programme.

To request a PDF version of the full programme, email [william@periofirst.com](mailto:william@periofirst.com).