

DENTAL LASER PERIODONTAL THERAPY LANAP[®] WITH THE PERIO LASE[®] MVP-7[™] DIGITAL LASER

Indications & Guidelines for the use of the PerioLase[®] Dental Laser in periodontal infections:

1. Resistant areas of gum tissue: These are areas that do not adequately respond to conventional home care and periodontal cleaning such as prophylaxis or root planing and scaling. These areas are noted by pocket depths of 4 millimeters or more, and /or bleeding that occurs within 7 seconds of pocket probing.
2. Refractory (re-occurring) periodontal disease: this is the re-appearance of the acute (obvious) periodontal disease that previously responded to conventional periodontal therapy.
3. Non-responding periodontitis: This involves patients who, despite proper treatment, good home care and professional follow-up visits, have local or generalized areas that never responded to conventional procedures, and tooth loss is expected.
4. Acute pain of gum tissue origin: This is a dental emergency where the person is impaired, debilitated, or incapacitated due to severe pain (usually localized to a specific area). Laser treatment is "palliative", to reduce the severity of symptoms and create increased patient comfort.
5. Abscess or "gum boil": This may be a dental emergency, or may merely be an urgent need of the patient to have an acute infection treated to reduce the severity of the condition by interrupting the infectious process, until more definite therapies can be performed.
6. Medically compromised patients: These patients have serious underlying systemic (general body) health conditions, diseases, or debilitations who are consequently at high risk with conventional periodontal therapy. Systemic health disease that have significant dental /oral maxillo-facial tissue effects include any blood or immune system disorder (e.g. *Diabetes, Hemophilia, Acquired Immune Deficiency Syndrome*). Also, patients with skin diseases (e.g. *Systemic Lupus, Erythema Multiforme, Scleroderma*).
7. Occlusal Trauma: These patients have interferences between the teeth that have caused, or are now causing, damage to the dentition and /or supporting bone and gum tissues. This may be caused by a number of different factors which may include but are not limited to: bruxing, grinding, interferences (both working and /or balancing), tartar buildup, infection, tooth extrusion, and apical infection of any derivation. Prematurities themselves may cause further supporting structure damage contributing to greater bone loss and tissue infections.



General Effects of PerioLase® Lasing in Gum Pockets:

The Laser beam is carried in an optical quartz fiber, about the diameter of a small paper clip end or the thickness of 3 human hairs. The fiber-optic tip of the laser works in four basic ways in the gum pockets and surrounding tissue:

1. Photo Ablation:

Half of the laser beam is high energy photon wave. These photon waves create highly concentrated light energy that will selectively vaporize and destroy unhealthy tissues, bacteria, and other harmful substances associated with disease, while leaving healthy tissue unharmed.

2. Photo Acoustics:

The other half of the laser beam are "particles" of high energy photon waves. These laser light-wave particles create ultra-sonic (sound) waves when the fiber-optic tip is activated within the tissue fluid in gum pockets. The resulting sound waves cause sonic vibrations, or mini shock-waves, that loosen hard deposits of calculus on the surface of diseased teeth.

Unhealthy debris from sonic shock waves and pathologic proteins are then subject to vaporization, further sonic breakdown, and, most often, removal during irrigation (rinsing) of the gum pocket.

3. Photo Disruption -- The Plasma Effect

Tissue can be removed independently of laser beam energy absorption by the target tissue. Tissue removal in this case, is not being vaporized. Instead, the atoms and molecules of the tissue are mechanically separated (ionized) and therefore destroyed. This mechanical separate of tissue atoms and molecules occurs as the result of a unique phenomenon of laser photon energy -- called "plasma".

Plasma can be seen as a brilliant orange colored halo that forms between the fiber-optic tip and the surface of the target tissue. At the same time, a "pop" or "crack" sound can easily be heard after each pulse of the laser. This is known as the "plasma effect".

Plasma has been referred to as a "fourth state of matter". The plasma effect occurs from the build-up of very high pressures of air and gas, which is first caused by very rapid temperature elevation at the laser-tip. This small area of very high pressure, then de-pressurizes explosively and causes the "popping" and "cracking" sounds (like a sonic boom).

Note that the laser beam is not in direct contact with the target tissue -- only the plasma and the resulting area of high pressure. It is the explosive release of air pressure (like opening a shaken can of carbonated beverage) that causes the mechanical destruction of the target tissue.

4. Photo Vaporization -- Photo Thermal Effects

Absorption of laser light by the atoms and molecules of the target tissue, leads to increased vibrations which converts to heat, which destroys selected tissue. Increased absorption of laser energy, or additional time on the target tissue, will cause additional molecules in the tissue to similarly increase their rate of vibrations, conversion to heat, and tissue destruction.



Specific Therapeutic Effects of the PerioLase® Dental Laser in Gum Pockets:

The *PerioLase® MVP-7™ Free Running Pulsed Nd:YAG laser* appears to have the following specific effects on the gum and bone tissue that surround the teeth in the gum pockets:

1. Free Running Pulsed Nd:YAG laser changes the cementum surface of healthy and diseased teeth providing acceptable root surfaces for fibroblast attachment.
2. Selectively vaporizes epithelial tissue, inflamed tissue and infected tissue, while leaving fibrous supporting tissue unharmed. Denatures pathologic proteins, inactivating them.
3. Destroys harmful enzymes in the gum pocket that cause inflammation and that dissolve bone.
4. Vaporizes and destroys disease causing germs and bacteria in the gum pocket.
5. Vaporizes and destroys acid by-products of disease causing germs and bacteria in the gum pocket.
6. Vaporizes and destroys plaque and calculus, the hard deposits on the tooth surface where bacteria live.
7. Vaporizes and destroys harmful hormones (e.g. prostaglandins) released to fight infections.
8. Sonically vibrates hard, resistant tartar deposits from the tooth surface.
9. And creates healthy pockets creating an atmosphere which generates new bone growth and stimulates osteoblasts (bone growing cells).

Specific Tissue Healing Effects of the PerioLase® Dental Laser in Gum Pocket:.

1. Caulerizes (seals) bleeding sites, resulting in little or no post-therapy bleeding.
2. Caulerizes (seals) exposed nerve-endings, resulting in greatly reduced or eliminated post-treatment discomfort.
3. Sterilizes lased tissue.
4. Lased gum pockets are immediately made anti-septic.
5. May directly stimulate osteoblasts (bone growing cells) to grow new bone.

Usual Post-Procedure Expectations with the PerioLase® Dental Laser in Gum Pockets:

1. Any sensitivity experienced during the procedure is usually gone well before you are out of the office door.
2. Due to the sterilizing aspects of the laser, post-procedure inflammation or swelling will be minimal or non-existent.
3. Due to the nerve cauterization aspects of the laser, post-procedure discomfort or sensitivity will be minimal or non-existent.
4. Due to the blood vessel cauterization ability of the laser, post-procedure bleeding will be slight or non-existent.
5. Tissue healing time will be greatly reduced.
6. Tissue healing will be uneventful, if not completely unnoticed
7. Residual, associated post-procedure "side effects" will be greatly reduced, if not completely absent.

