

What is a Laser?

The laser is the latest and most advanced of our light sources.

The word Laser is an acronym for:

Light **A**mplification by **S**timulated **E**mission of **R**adiation.

What does radiation mean when you are speaking of Lasers?

“Radiation” is often misinterpreted since it is also used to describe radioactive materials and ionized radiation. The use of the word “radiation” in terms of laser light is merely an expression of energy transmission.

There are Two types of Medical Lasers:

1. High Power Lasers are used to cut, coagulate and evaporate tissues. The Energy range for the surgical lasers is between 3000 and 10,000 milliwatts.
2. Low Power Lasers are used to stimulate tissue repair through a process of bio-stimulation.
The Microlight 830 Laser is 90 milliwatts.

What is Low level Laser Light?

Low-level laser light is compressed light of a wavelength from:

- the cold, red part of the spectrum of electromagnetic radiation.
- It is one precise color (pure light ...not a whole spectrum)
- It is coherent (it travels in a straight line)
- Monochromatic (a single wavelength)
- Polarized (it concentrates its beam in a defined location or spot).

These properties allow laser light to penetrate the surface of the skin with no heating effect, no damage to the skin and no known side effects. Rather, laser light directs biostimulative light energy to the body's cells which the cells then convert into chemical energy to promote natural healing and pain relief.

What is LLLT?

Low Level Laser Therapy is the new internationally accepted term for bio-stimulation with low energy lasers in order to achieve therapeutic effects.

Other names for the LLLT:

- Cold Laser
- Non-thermal Laser

What is Low Level Laser Therapy?

Low level laser therapy is the application of red and near infrared light over injuries or wounds to improve soft tissue healing and relieve both acute and chronic pain.

How Does the Low Level Laser Therapy Heal?

Low level lasers supply energy to the body in the form of Non-thermal photons of light. Light is transmitted through the skin's layers; the dermis, epidermis and subcutaneous tissue. When low level laser light waves penetrate deeply into the skin, they optimize the immune response of our blood. This has both an Anti-inflammatory and immunosuppressive effects.

The Physiological Effects of Low Level Laser Therapy:

1. Increased Cellular Metabolism – Stimulate Cell Growth
2. Improved Blood circulation and vasodilatation
3. Analgesic effect
4. Anti-inflammatory and anti-edematous effect
5. Stimulation of Wound Healing

The Benefits of the LLLT:

- Relieves acute and chronic pain
- Increases the speed, quality and tensile strength of tissue repair
- Increases blood supply
- Stimulates the immune system
- Stimulates nerve function
- Develops collagen and muscle tissue
- Helps generate new and healthy cell and tissue

- Promotes faster wound healing and clot formation
- Reduces inflammation and edema

Many Acute and Chronic conditions can be improved or eliminated with LLLT including:

- | | | |
|---------------------|------------------------|----------------|
| -Pain relief | Carpal Tunnel Syndrome | Tennis Elbow |
| -Wound Healing | Arthritis | Golfer's Elbow |
| -Migraine Headaches | Low Back Pain | TMJ |
| -Tendonitis | Pressure Sores | Burns |
| -Fibromyalgia | Swelling | Hematoma |
| Sprains & Strains | Post-operative Pain | Acne |

What are the contraindications for LLLT?

Patients with pacemakers, pregnancy, labile epilepsy and patients with Cancer.

Laser Safety:

LLLT is a safe procedure. Due to the low level, nonthermal nature of the laser, there is no tissue destruction or other hazards that you would find associated with the higher powered lasers. However, all lasers share the same basic physical beam properties and because of the coherent nature of the laser beam, ocular damage is the main concern for the LLLT user. The Operator should not attempt to stare directly into the beam. Suitable goggles to attenuate the wavelength should be worn by both the operator and patient.

Laser Physics:

Wavelength is measured in nanometers

- The Microlight 830 has an 830 nanometer wavelength

Power is measured in milliwatts

- The Microlight 830L has 90 milliwatts of power

Photons are a bundle of energy

Energy is measure in Joules

- The Microlight 830 had 3 Joules of Energy

Formulas:

ENERGY = POWER X TIME

Wavelength + Power + Time = Joules

Microlight 830

3(diodes) x830nm + Power 3(diodes) 30mW + Time 3(cycles) 33 Sec. = 3 Joules
(2490) + (90) (99) = 3 Joules

What is a L.E.D?

-**L**aser **E**mitting **D**iode

-40milliwatts of Power

-635 Nanometer wavelength

-A Visible Red light

- **Does Not** penetrate below the skin surface or into the tissue below.