How it works

The Science and Technology behind Cold Laser

Laser Classification

Class 1

Safe under all conditions. Maximum permissible exposure (MPE) cannot be exceeded. i.e. Laser printers, CD Players, Laboratory Analytical equip.

Class 2

If directly viewed for long periods of time, eye damage can result. Only applies to visible - light lasers (400–700 nm) i.e. Laser pointers

Class 3

3A - Safe if handled carefully, with restricted beam viewing. MPE can be exceeded, but with a low risk of injury. i.e. Laser scanners

CLT

***3B - Hazardous if eye is exposed directly*; Protective eyewear is required where direct viewing of a class 3B laser beam may occur. Must be equipped with a key switch and a safety interlock.**

Class 4

All lasers with beam power greater than class 3B. **By definition, a class-4 laser can burn the skin, in addition to potentially devastating and permanent eye damage as a result of direct or diffuse beam viewing. These lasers may ignite combustible materials, and thus may represent a fire risk.** Class 4 lasers must be equipped with a key switch and a safety interlock. Most industrial, scientific, military, and medical lasers are in this category.

Advantages of CLT Laser Therapy

- Highly Effective (>90%)
- Non-allergenic
- Easy to apply
- No side effects
- No complications
- Completely Safe
- Cost effective

- Not contraindicated for patients with:
  - Pace makers
  - Metal implants/plates
  - Prosthetics
  - Transplants

- Superior alternative to:
  - Analgesics
  - NSAID's
  - Other medications
  - Soft tissue surgery

CLT Laser vs. Common Modalities

Mechanisms of Action

	CLT Laser Therapy	TENS	Ultrasound Therapy	Shockwave Therapy	IFC
Increased ATP Production	✓				
Inhibition of Nociceptor (Pain) Signaling	✓	✓			✓
Endorphin Release	✓	✓			✓
Angiogenesis	✓			✓	
Tissue Regeneration	✓		✓		
Reduction of Inflammation	✓		✓		
Thermal Effect			✓		

Contraindications

Over Uterus in Pregnancy	✗	✗	✗	✗	✗
Directly over Malignancies	✗	✗	✗	✗	✗
Impaired Skin Sensation		✗	✗	✗	✗
Pacemakers		✗	✗		
Risk of Hemorrhage or Thrombosis			✗	✗	
Bone Fractures			✗	✗	
Epilepsy					✗
Cardiovascular Disease					✗
Metal Implants				✗	

CLT LASER is MORE than just another Modality!!

"LLLT for just 30 seconds is better than Ice for 20 minutes in recovery of muscle injury" Ernesto Cesar Pinto Leal-Junior. Light emitting diode therapy (LEDT) and cryotherapy in skeletal muscle recovery after eccentric exercise. In: 2013 Annual Conference of the North American Association for Light Therapy, 2013, Palm Beach Gardens.

Who Is Using Cool Laser Therapy And Where?

Theralase CLT Lasers are used by various healthcare providers in outpatient clinics across North America and Europe, including:

- Medical Doctors and Specialists
- Naturopaths
- Chiropractors
- Physical Therapists
- Massage Therapists
- Dentists
- Podiatrists
- Nurses
- Veterinarians

PHOTOCHEMISTRY

- 1st Law of Photochemistry (Grotthuss-Draper Law) essentially states that light of the right wavelength must penetrate to the tissue of interest to get a result.

- 2nd (Stark-Einstein Law): Light that is absorbed will cause a photochemical reaction.

CRITICAL FACTORS FOR OPTIMAL TREATMENT:

- Choosing the energy level of the photons (wavelength) to target the chromophore of choice without a thermal effect

- Getting the photons through to the target tissue (power) without exceeding the thermal limits of tissue (Maximum Permissible Exposure – 500 mW/cm^2)

What is CLT?

Transformation of Light Energy into Chemical Energy by the Body to Stimulate & Accelerate Healing of Inflamed, Injured and Diseased Tissues

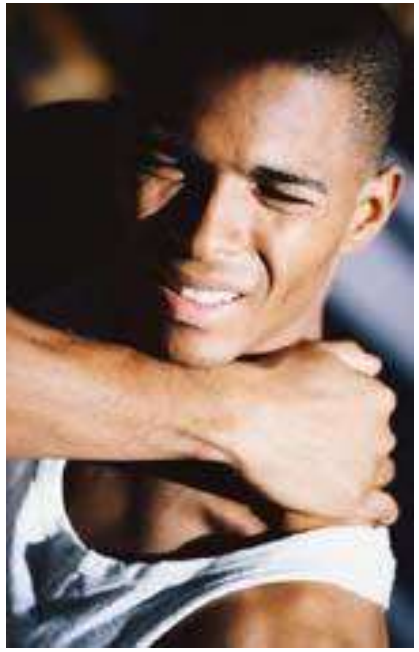
- Non-Invasive
- Pain-Free
- Safe/Non-Toxic

Studies and CLT

- Over 5000 published articles on light therapy
- Over 300+ randomized, double blind studies
- 200+ studies are added each year to PubMed

How Does Theralase Work?

Light ***must be absorbed*** by a ***photoacceptor*** in order for a photochemical reaction to take place (1st Law of Photochemistry)

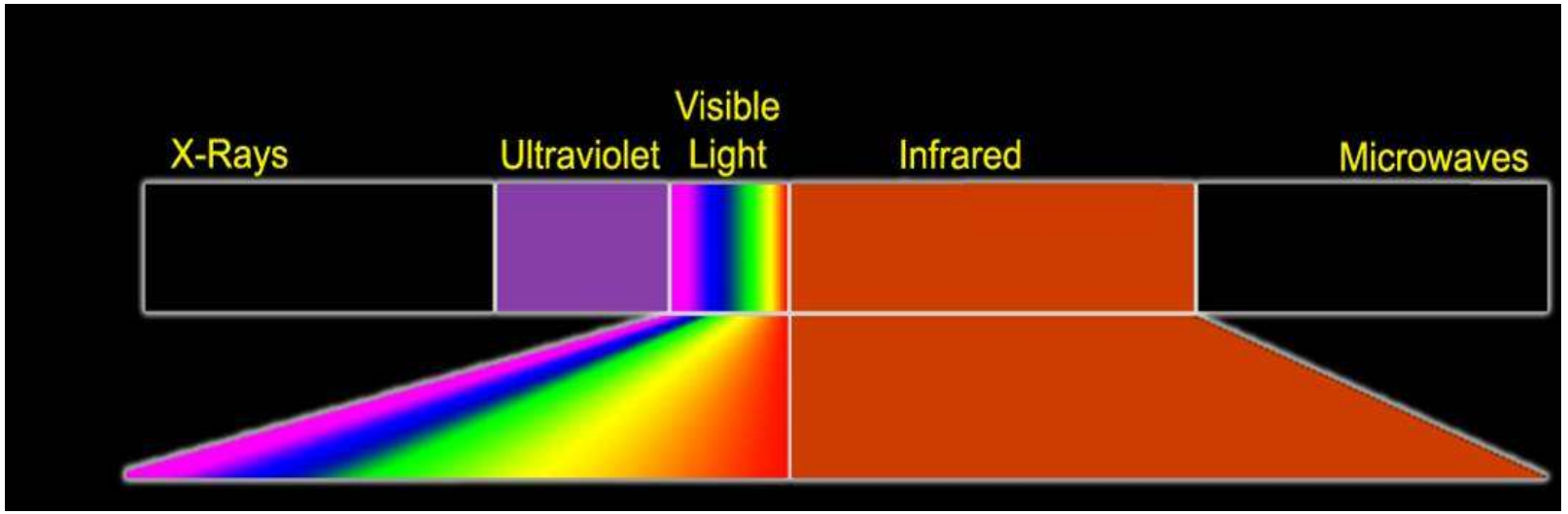


KNOWN PHOTORECEPTORS

Plants – Chlorophill + Carotenoids

Animals
- Rhodopsin (vision)
- Hemoglobin (Blood)
- Myoglobin (Muscle)
- Cytochrome C Oxidase (All Cells)

CLT LASERS: Therapeutic Window



600nm 950 nm

Cell Damage

Laser Therapy

Heat

ELECTROMAGNETIC SPECTRUM (EM Radiation)

Therapeutic window is located between 600nm-950 nm.
Visible Light 400 nm-700 nm.