

Physiological Effects of Low Intensity Laser Therapy

PATIENT INFO

What is Laser Therapy?

Laser therapy is the use of monochromatic light emission from a low intensity laser diode (250 milliwatts or less) or an array of high intensity Super Luminous Diodes (providing total optical power in the 1000-2000 milliwatt range) to treat musculoskeletal injuries, chronic and degenerative conditions and to heal wounds. The light source is placed in contact with the skin allowing the photon energy to penetrate tissue, where it interacts with various intracellular biomolecules resulting in the restoration of normal cell function and enhancement of the body's healing processes. The specific effects and conditions treated by Low Intensity Laser Therapy are presented below.

CLINICIAN INFO

SHORT TERM EFFECTS

- Production and release of beta-endorphins (these are morphine like substances produced by various cells in the body that inhibit the sensation of pain)
- Cortisol production is increased (cortisol is the precursor of cortisone). This enables the body to combat the stress associated with trauma or the disease process
- The short-term effect is significant in 5-10% of cases during or after the conclusion of the initial treatment, but is not as important as the long term or cumulative effect

LONG TERM OR CUMULATIVE EFFECT

- ATP (adenosine triphosphate) production is increased resulting in improved cellular metabolism
- DNA (deoxyribosenucleicacid) production, the protein building block of tissue is substantially increased
- Neurotransmission is facilitated due to elevated levels of serotonin and acetylcholine
- Mitochondrial activity is stimulated resulting in cell replication etc.
- Modulation of macrophages, fibroblasts and other cells
- Angiogenesis (formation of new blood vessels)
- Regulates cell membrane potential, essential in NA, CL and K ion transfer (electrolyte balance)
- Cytokines and other chemicals enhancing cellular communications are released

OTHER EFFECTS

- The immune response is stimulated
 - Lymphatic drainage is improved
 - The histamine response is positively altered
 - Production of growth hormone is increased
 - Stimulation of the healing processes is accompanied by relief of symptoms
- It should be noted that many other positive physiological activities are modulated and extensive research is currently in progress to fully explore these changes.

SUMMARY

Absorption as a result of photon bombardment of various bio-molecules in the cell results in the transformation of light into biochemical energy. This is a cumulative effect and requires sufficient stimulation in order to initiate response. Typically 5-20 treatments varying from 15-30 minutes in duration are required. The end result of low intensity laser irradiation is the restoration of normal function of the cell unit. Conversely, worldwide research to date has failed to record any negative effects from this process. It should be noted that normally functioning cells are not adversely affected by the irradiation. In contrast to other therapies, Low Intensity Laser Therapy is curative rather than simply modulating symptomatology. Continued research in the Meditech and other laboratories should further enhance the effectiveness of this existing technology. After treatment the patient may have an exacerbation of pain for a varying period of time. If this occurs, utilize pain medication, and/or ice and let the therapist know prior to the next treatment.

Massage Therapy Applied together with Low Intensity Laser Therapy

What is Massage Therapy(MT)?

Massage Therapy spans a wide variety of therapeutic approaches, working to improve an individual's health and well-being. It involves the manipulation of joints and soft tissues (i.e. muscles, skin, connective tissue, tendons and ligaments) using a range of techniques: Swedish style massage, hydrotherapy, craniosacral therapy, rhythmic mobilizations, myofascial therapy; remedial exercise & laser therapy. These techniques help reduce and prevent stress, tension, and discomfort of injuries or chronic conditions encouraging the body's own natural healing process. (Massage Therapy Act, 1991) **Low Intensity Laser Therapy stimulates natural healing, effectively, together with massage therapy.**

Massage Therapy Scope of Practice

The practice of massage therapy is the assessment of the soft tissue and joints and the treatment and prevention of physical dysfunction and pain of the soft tissue and joints by manipulation to develop, maintain, rehabilitate or augment physical function, or relieve pain.

Low Intensity Laser Therapy (LILT)

LILT is the application of Superluminous and Laser diodes for the treatment of a variety of medical conditions. LILT utilizes light energy to stimulate tissue for the purpose of regeneration and accelerated healing. This therapy is non invasive, easily applied, (no physical stress) & very effective.



Sample of conditions effectively treated:

- * Musculoskeletal conditions
- * Inflammatory conditions
- * Sports & auto accident pathologies
- * Pain reduction - elimination
- * Lumbosacral pathologies(chronic)
- * Lymphedema
- * Diabetic polyneuropathy
- * Fibromyalgia
- * Degenerative conditions

Studies include:

Meditech Laser Rehabilitation Clinic compared the efficacy of laser therapy with and/or without massage therapy during over 4,800 laser applications and 1,200 massage treatments. Findings indicated that massage therapy with laser treatment yielded the best results. There was no statistical difference whether laser or massage was applied first (**Kahn, 2003**).

In distal diabetic polyneuropathy treatment, "application of laser irradiation...was effective in combined therapy as well as a monotherapy" (**Kalinina 1998**).

Laser therapy combined with Manual Lymphatic Drainage (MLD) is the treatment of choice for Lymphedema (**Moore 2001**).

Scar contractures, hypertrophic scars and keloids are effectively treated with manual therapy (**Brissett 2001**) & laser therapy (**Dyson 2001**). Combined therapy provides physical remodeling & cellular healing.

Contact Meditech International Inc., for more clinical results information: info@meditech-bioflex.com

Kahn F, Comparison of treatment outcomes with massage and/or Low Intensity Laser Therapy. Clinical Report, Meditech International, Inc. 2003; Kalinina OV et. Al., Infrared laser therapy in distal diabetic polyneuropathy. Zh Nevrol Psikhiatr Im S S Korsakova. 1998;98(6):23-5.; Moore K. Lymphedema treatment strategies 2001; Brissett AE, Sherris DA Scar contractures, hypertrophic scars and keloids. Facial Plast Surg. 2001 Nov; 17(4):263-72; Dyson M, Evidence based use of Light and other forms of Phototherapy for Tissue Repair. Kings College, Guys Hospital Campus, University of London, Clinical Report 2001.

Low Intensity Laser Therapy to Relieve Pain



By Dr. W.
Gifford-Jones M.D.

What can you do if you've tried every conceivable way to relieve pain? You've been treated by anti-inflammatory drugs, cortisone, painkillers, physiotherapy, massage and finally, surgery. Yet the pain continues unabated. A technique, known as "Low Intensity Laser Therapy" (LILT) could be the answer.

Dr. Fred Kahn is Director of the Meditech Laser and Rehabilitation Centre in Toronto, and a specialist in pain control. He believes in curing the pain by curing the cause. I've talked to several of his patients about how LILT eased their pain and changed their lives.

PC, a 43-year-old jogger, collided with a glass door on returning to her hotel. When the door shattered, a large fragment of glass penetrated her knee. It left her with osteoarthritis and a life on crutches. Doctors claimed knee replacement was her only hope to relieve pain. After 11 treatments with LILT over a five-week period, PC threw away the crutches and returned to work.

GM, an 85-year-old former World War II pilot, had four back operations. A surgical error caused nerve damage, another resulted in infection and 26 weeks in hospital. Cysts formed in his spine and he required a morphine pump to ease the pain. Now after a three-month

treatment with LILT he walks upright without a cane and is being taken off morphine. He says he's 75 percent improved and can't believe it's happened.

A 17-year-old equestrienne had the misfortune of a 1000 pound horse falling and rolling over her hip joint. This left her with a visible limp and an audible click when she walked. Specialists told her they had little to offer but painkillers for her pain and drugs to treat her subsequent depression.

When seen by Dr. Kahn she had extensive soft tissue damage in the hip and thigh and so much injury to the joint capsule of the hip that it almost popped out with every step. After four treatments with LILT the pain had subsided and she stopped pain medication. She continued treatment three times a week until she returned to a normal gait.

LILT jump-starts the body's natural healing process by sending energy into the muscles and joints that's then transformed into biochemical energy. This decreases swelling, accelerates healing time and increases the pain threshold.

Dr. Kahn says LILT also triggers release of endorphins, morphine-like substances that inhibit the sensation of pain. It also increases cortisol, the forerunner of cortisone and angiogenesis, the formation of new blood vessels along with a number of other physiological processes.

The majority of patients seen at Meditech suffer from degenerative arthritis involving

the lumbo-sacral spine. Sixty percent of these patients also have degenerative disc disease, bulging discs causing compression of spinal nerves or spinal stenosis, a narrowing of the diameter of the spinal column. In the process of evolution, learning to stand upright has exacted a toll on the human spine. Maybe we should have stayed in the trees!

Another large group of patients suffers from sports injuries. These younger patients respond quickly to LILT. At the clinic I also saw several patients suffering from The Shoulder-Neck-Arm Syndrome and The Carpal Tunnel Syndrome both related to long hours at the computer.

"You have to live with your pain". But this is not always the case.

Others had rheumatoid arthritis and diabetic ulcers of the feet.

Many patients have been told, "You have to live with your pain". But this is not always the case. Rather, the use of low intensity laser therapy has proven to be a pain-buster alternative, and improves over 90 percent of patients who have significant problems. And it does not involve the use of medication, a huge advantage today.

I discovered that Dr. Kahn, a dedicated physician, and I, share the same wavelength. We deplore seeing patients drugged into oblivion by painkillers. And we both believe that surgery should be done only as a last resort.

Today doctors, even with the help of MRIs, often can't be sure of what's causing pain. In these instances, tincture of time along with a course of LILT may be the best solution.