Low Intensity Laser Therapy

A New Approach to Healing and Pain Reduction

HISTORY

Some of you may remember the Starship Enterprises' Doctor McCoy using a small black device to miraculously treat injuries and wounds. Back then, it was labeled "science fiction". However, the truth is that this "Star Trek technology" has been in existence for 40 years.

In the early 1960's, several European and American surgeons experimented with a new procedure known as *Laser Surgery*. When laser surgery was compared to standard scalpel surgery, several significant benefits were observed: the laser provided faster healing times as well as considerable reductions in bleeding, swelling, pain and scar tissue production.

It was clear that the reduction in bleeding was due to the high energy (hot) laser vaporization of tissue, which sealed blood vessels. However, it was more difficult to explain why swelling and pain were reduced, or why healing times were decreased by one-third to one-half. Equally puzzling was the virtual elimination of scar tissue – an amazing feat considering that the body heals by scarring over torn or similarly traumatized tissue.

Endre Mester, a brilliant Hungarian scientist in Budapest, found the answers. He published his first research paper in 1968, which suggested that from the hot, high energy light beams used in surgery, there escaped the cold, low energy light waves that struck tissue on both sides of the incisions. It was this low energy light that caused the reduction in swelling and pain, the acceleration of healing, and the virtual elimination of scar tissue formation.

The European medical profession quickly became aware that low intensity lasers could heal tissue more effectively and painlessly. They have produced reams of scientific documents detailing how low energy light beams cause cells to heal and thus virtually eliminate pain.

HOW LASER ENERGY WORKS

The word *laser* is an acronym for Light Amplification by Stimulated Emission of Radiation. High energy laser devices, as mentioned above, are used in surgery as well as in military weapons. Low energy laser devices are utilized in classroom pointers, and now, by doctors for eliminating pain and healing tissue.

To understand how light is able to effect such changes, it is necessary to examine a few basic terms and physical principles. First, light travels in waves and is classified according to wavelength – the distance from one peak of a wave to the next corresponding peak of a wave. Standard light measurements are delineated in *nanometers* (nm). A meter is 39.37 inches (3.7 inches longer than a yard), a nanometer is *one-billionth* of a meter.

The color of light is dependent upon its wavelength. Humans see light and colors with wavelengths between 400 and 700 nm. Extremely small wavelengths of one nm are X-rays, which, due to their short length, are able to penetrate living tissue. Profoundly longer wavelengths are used to operate microwaves, televisions, and AM/FM radio frequencies.

This wide variety of wave lengths comprise what is called the electromagnetic spectrum. The chart on the next page depicts the various wavelengths in the spectrum and their uses.

All electromagnetic energy, including light, travels in bundles called *photons*.

On September 24, 2005, the American Academy of Pain Management endorsed Low Intensity Laser Therapy as a safe and effective form of treatment for pain. This is consistent with findings of practitioners throughout the world. The Food and Drug Administration has already approved the use of Low Intensity Laser devices.

In addition, both the Fibromyalgia Network and the National Fibromyalgia Associations have endorsed Low Intensity Laser Therapy as safe and effective treatment for this terribly debilitating condition.

ELECTROMAGNETIC SPECTRUM

AM Radio	10,000 cm
TV & FM	100 cm
Microwave	10 cm
Visible Light	400—700 nm
Infrared	1 mm to 750 nm
Ultraviolet	10 nm
X-rays	1 nm
Gamma and Cosmic	000 nm

When introduced into the body, these photons cause biological changes. Random photons from ordinary sunlight constantly bombard human skin surfaces. Lasers focus these photons, allowing them to follow the same path in a perfect order.

Effects of energy released from lasers depend upon wavelength and wattage. For example, some high-energy lasers penetrate several hundredths of an inch below the skin's surface and vaporize all tissue in their paths. However, *low* energy laser devices penetrate deep into tissue *without causing heat or tissue damage.*

PHOTON INDISPENSABILITY

Most life on Earth is dependent upon photons from the sun. Chlorophyll in plants absorbs photons and transforms them into energy. By a process known as photosynthesis, these weightless bundles of light energy become glucose and oxygen, replacing the oxygen that is continuously being consumed.

Consumption of plants by humans and animals releases energy stored as glucose. Energy is also received from the sun, but in much smaller amounts than from food. However, even in these small amounts, sun energy can be essential to maintaining proper health. When sun-produced photons directly strike human skin, they convert cholesterol forms into vitamin D. Vitamin D is essential to the body because it maintains bone strength and immunity. Recent studies have also identified a relationship between proper amounts of Vitamin D intake and a diminished incidence of tumors and at the same time shown that a *deficiency* of Vitamin D has been associated with a higher risk of breast and colon cancers.

In addition, photons entering the body through the eyes are absorbed by several different light-sensitive chemicals that are responsible for our ability to differentiate between colors.

It is clear from the above examples that photons are important to the body in ways other than that generated by the laser.

WHAT PHOTONS DO

Before a photon produces any effect, it must be absorbed by cells inside a body. Regardless of how this occurs, separate events take place when this energy is released:

1. Another photon with less energy is liberated. Since our bodies are not 100% efficient in their usage of energy, some energy escapes. This energy "leakage" contributes to energy fields that surround all living organisms commonly called auras.
2. Photons can trigger cellular changes, a process called photobiostimulation (photo = light; bio = life or cells; stimulation = excite or make active). An example of this is the production, release and use of enzymes.

THE CELL

Every cell in the body contains a nucleus that harbors a genetic code that tells the cell what to do. Like military generals, the nucleus orders soldiers around. These "cellular soldiers" are called mitochondria and they are responsible for doing the work that is necessary to maintain the cell. Therefore if there's a breakdown somewhere in those cells, and the mitochondria do not do their jobs properly, pain and dysfunction will result.

MITOCHONDRIA AND ENZYMES

Why are mitochondria so vital to the cell? They are microscopic organs that play important roles. They produce energy, alter the make-up of fatty acids, facilitate the removal of internal waste products (such as carbon dioxide), and they promote the influx of oxygen and other beneficial elements.

As previously stated, when mitochondria do not function properly, neither do their cells. This can cause entire organs – the kidney, liver, pancreas and lungs for example – to be affected. In such widespread conditions such as *fibromyalgia* (characterized by widespread severe aching, fatigue and weakness), vast amounts of body tissue appear to not function properly.

Enzymes play a vital role as well. Enzymes are specific proteins secreted by cells that can cause chemical changes in other substances. They are absolutely critical for bodily function and health. A breakdown in the enzyme production mechanism can cause problems throughout the body.

So what is the relationship between low intensity lasers to microscopic mitochondria and these crucial enzymes of the body? Lasers ensure a mitochondria's proper function and they moderate the production of enzymes.

LOW INTENSITY LASER THERAPY

Given the above information delineating the value of light and photons to the human body, it is not surprising to learn that the secret behind Low Intensity Laser Therapy (LILT) is its usage of photons.

There are literally volumes of scientific data demonstrating the positive effects of LILT on mitochondria and enzymes. Clinically significant therapeutic improvements have been documented in mice, dogs, cats and, most importantly, humans.

Included in the research are reports of stunningly successful breakthroughs using LILT throughout the world. A thirteen year Japanese study involved more than 12,000 patients who achieved amazingly consistent results.

However, Food and Drug Administration (FDA) officials showed no interest until a significant 1993 General Motors study. One hundred and sixty permanently disabled employees, many having undergone failed surgery for Carpal Tunnel Syndrome, participated in the study. Divided into two groups, one received LILT treatment, while the other was treated with similar instruments – but the lasers were non-functional. Neither group was informed which instrument was being used. Following the experiment, 45% of those who received real LILT treatments returned to work.

Low Intensity Laser Therapy has been classified by the FDA as "a non-significant risk device for pain attenuation (reduction or elimination)" and has received FDA approval.

General Motors was so enthusiastic that it established treatment centers in seven of its manufacturing plants. Success rates treating Repetitive Stress Syndrome (Carpal Tunnel being the most common form) soared to 85%. In comparison, surgery success figures are 30-50%. More important, during LILT treatment, employees were able to continue working.

It is conceivable that LILT could become the most significant medical advance of the 20th century, an accolade that previously belonged to World War II discoveries of penicillin and sulfa. LILT alleviates most all sensations of pain while also bringing back feelings in areas previously numb. It shrinks overgrown scar tissue, yet it also stimulates tissue growth. While LILT removes excess pigment, it can also restore pigment in areas where it is lacking. It mobilizes the healing components within immune systems, but it can also decrease harmful inflammatory processes within the body.

The beauty of LILT is the photon normalization of tissue, accomplished through the activation of enzymes. Photons have no effect on normal functioning cells—they only have positive effects on those that are functioning abnormally.

Beyond even this, laboratory studies have proven that photons do not have to come in direct contact with every cell that is not working properly. Systemic (entire body) effects result in improvement in areas not directly exposed to photons. This is possible because photons, traveling within the body, eventually stimulate the pineal gland, which usually functions according to the amounts of light energy it receives through the eyes. The pineal gland acts as a biological clock that regulates other glandular operations in the body. It accomplishes this by releasing dozens of regulating chemical substances plus major neurohormones (hormones which affect nerves) such as Dopamine, Melatonin, and Seratonin. Endorphins, the body's natural plain relievers, are also released. They will cause a relaxing of trigger points in muscles and can initiate a very rapid relief of pain in a local area. Since light energy is the primary source of stimulation for this gland, LILT is paramount in maintaining or restoring normal function.

Worldwide, there has not been even one report of significant long term side effects. Chronic arthritic pain has disappeared; Carpal Tunnel Syndrome has healed; pain has been eliminated in shoulders, arms, hands, elbows, knees, ankles, hips and jaws. Patients with fibromyalgia – a debilitating condition that causes several pain and fatigue – have returned to normal lives. *Trigeminal neuralgia*, which can cause unbearable face pain, disappeared. People who have not walked without a walker or cane in 30+ years now jog. People who haven't slept a full night in 40 years, now sleep soundly.

Patients who have had unsuccessful surgeries get better. Scar tissue problems heal or disappear. There have been phenomenal results treating torn cartilages, damaged nerves, open wounds, diabetic lesions, headaches, strains, sprains, and miscellaneous athletic and accident-related injuries.

Dentists using LILT have successfully treated dry socket problems, gum disease and jaw (TMJ) problems. Other patients have reported that LILT has reduced and/or eliminated their snoring problems.

LILT has been effective in eliminating and/or reducing chronic pain, no matter what the cause. Success rates with the LILT have been 90%. Even more amazing about this statistic is that most all of the patients have tried every other known or conventional treatment without success. Of course, it must be remembered that *nothing cures everything* – and while the laser is a remarkable instrument, each case must be evaluated independently by a qualified health care practitioner.

PHOTOBIOMODULATION

Photobiomodulation is not new; it is a new term for the older commonly used term "photo-biostimulation". However, harnessing and refining this therapy through "tuned" lasers is a relatively recent development that has been used worldwide for about 20 years. It may soon become humanity's premier healing tool.

Properly used, LILT is a safe, effective, natural therapy for an extensive variety of health problems. It may eliminate the need for many medications and surgical procedures by allowing the body to naturally heal itself. Low Intensity Laser Therapy is as natural as sunlight and as safe as pure water and is lower in cost than traditional approaches to managing pain.

ABOUT THE AUTHOR

Dr. Leonard Rudnick, a licensed Chiropractor trained at the world renown Palmer University, has extensive experience with a multitude of low intensity laser devices. He was a principal investigator for clinical trials with two such devices that received FDA approval.

At the time of this writing, he has treated approximately 7,000 patients in a 10 year period. and delivered approximately 500,000 stage applications on these patients. Based on extensive research, knowledge and experience, the low intensity laser device of choice is the BioFlex Professional Laser System produced by Meditech International, Inc. in Toronto, Canada. It meets all of the essential criteria necessary to have the highest percentage of success.

PROJECTED COST ESTIMATES	**STANDARD MEDICAL**		**LOW INTENSITY LASER**
	With Insurance	Without Insurance	
Average for pain medication	$25 / month ($300)	$75 / month ($900)	- 0 -
Other related medications	$25 / month ($300)	$75 / month ($900)	- 0 -
Visit to Specialist (twice per year)	$35 x 2 ($70)	$90 x 2 ($180)	- 0 -
Visit to Primary Care Physician	$15 / visit x 6 ($90)	$50 / visit x 6 ($300)	- 0 -
Tests, scans, etc.	$150	$750	- 0 -
Co-pay Yearly	$250		
Twelve 30 minute LILT sessions			$660*
Twelve 60 minute LILT sessions			$1,320*
TOTAL	**$1,160**	**$3,030**	**$660 or $1,320**
RESULTS	Still have pain	Still have pain	Pain GONE or dramatically reduced
	Treatment and Costs continue	Treatment and Costs continue	When treatment is finished, no additional cost or treatment is needed

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