

# Chronic Pain



## Are You Ready for a **NON Invasive** Drug Free Pain Management?

You no longer need to live with constant pain. Low level Pulsed Infrared Light Therapy (PILT) consistently resolves pain and inflammation issues. PILT can play a significant role in reducing chronic pain and inflammation, as well as pain associated with neuropathy, fibromyalgia and other chronic pain issues. A full and active life can be yours with treatments of 20 minutes a day.

## How Does Low level Pulsed Infrared Light Therapy Reduce Pain?

Using Low level PILT stimulates your body's cells to release Nitric Oxide into the blood and surrounding tissue. This relaxes the cells found in the arteries, veins, capillaries and lymph vessels. When these muscles relax, they dilate the blood vessel, which increases circulation significantly. With this increase in circulation, the body can more easily heal the affected area by replacing damaged cells more quickly by increasing RNA and DNA synthesis. Using Low level PILT also stimulates the release of Adenosine Triphosphate (ATP) which carries energy to cells, and aids in the production of endorphins, which help to facilitate long term pain relief.

Low level PILT uses a combination of non-visible (infrared) and visible (red or blue) light waves. Infrared light has a much larger wavelength and is able to penetrate deeper into soft tissue. Therefore, infrared light is more effective for bones, joints, deep muscles, etc. The combination of both, however, has been shown to ease pain and accelerate the healing process by:

- Increasing circulation
- Triggering the production of endorphins which helps to facilitate long term pain relief.
- Relieve swelling by increasing lymphatic system activity
- Stimulating the release of Adenosine Triphosphate (ATP) which carries energy to cells.
- Replacing damaged cells more quickly by increasing RNA and DNA synthesis.

# Neuropathy



Don't let foot and leg pain prevent you from doing the things you enjoy.

***Low Level pulsed infrared light therapy is FDA cleared for improving:***

- ***Improving circulation***
- ***Relieving pain.***

Low level PILT has been clinically proven on thousands of patients to significantly reduce:

- Foot pain
- Leg pain
- Tingling
- Numbness
- Inflammation
- Swelling
- **Loss of sensation**

that often occurs due to **diabetic** and **chemotherapy** and other related peripheral neuropathy.

As a direct result, people experience:

- an improvement in balance
- sensation in their feet
- sensation in their legs

## **How Does Low level PILT generate relief from Neuropathy?**

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# Wound Healing

**Light therapy is an exciting new alternative therapy that is becoming very widely used by doctors, home health care workers and clinicians.**

Wound Healing is defined as 'wound repair, an intricate process in which the skin or organ repairs itself after injury'. Unfortunately, healing is sometimes a very lengthy and painful process for those with chronic and hypoxic wounds.

The National Library of Medicine states "Studies show that blue light significant influences wound healing. Furthermore, our data suggest that light therapy can play an important role in normotrophic wound healing by affecting keratin expression". [Read the full report.](#)

## How Do Health Lights Heal Your Wounds?

Low level pulsed Infrared light therapy (PILT) is a combination of non-visible (infrared) and visible (red or blue) light waves.

Visible light feature are beneficial for problems close to the skin:

- Wounds,
- Cuts
- Scars
- Infections.

Infrared light is more effective for:

- Bones
- Joints
- Deep muscles

When PILT is applied to a wound(s) or infection, it stimulates the body's cells to release Nitric Oxide from blood and endothelial cells. This Nitric Oxide then activates enzymes which cause vasodilatation, allowing for a more rapid healing of wounds, including chronic and hypoxic.



# Skin Rejuvenation

## Low Level Pulsed Infrared Light Therapy is a ffective for Skin Issues

We have seen dramatic results from people struggling with:

- Acne
- Eczema
- Psoriasis
- Rosacea
- Scleroderma

PILT slows down the growth of:

- Diseased cells
- Inflammation
- While generating oxygen and better circulation in the healthy cells
- Allowing them to take over after enough treatments.

Plus the Nitric Oxide released into the bloodstream from PILT:

- Creates an anti-inflammatory effect within the body
- That acts as an anti-bacterial agent for the skin
- To begin and accelerate the healing.

## **Could you have more vibrant and youthful looking skin?**

### Reverse the Aging Process with low Level Pulsed Infrared Light Therapy (PILT)

Low level PILT release Nitric Oxide into your system! Nitric Oxide improves circulation. Activating a protein called Myosin inside the cells. Causing an increase in the production of collagen. When the Collagen fills in the wrinkles. You can generate a younger more vibrant looking texture to your skin.



## **Neuropathy A. Kirkner**

Neuropathy, a condition where the nerves running from the brain or spinal column become damaged, is a very troublesome problem for clinicians and patients alike. Patients view the condition as incurable and the only treatment as a lifetime of cascading medications, taking one family of medications to offset the effects of another. Despite the drugs, however, many patients continue to experience burning, tingling, a loss of sensation and balance, the development of wounds from trauma or infection, and even the threat of amputation. Clinicians dislike having to tell patients this diagnosis because they feel that there is not much to offer and since they know too well the downward spiral that their patients are likely to endure. What can be done for these patients? Let's first discuss the etiology of neuropathy.

There are three major types of neuropathy: post-chemo, diabetic related, and idiopathic. There are also other ways to get neuropathy—mono neural neuropathies that are a result of trauma, and disease-related neuropathies that are a result of other illnesses such as Guillain Barre, Charcot Marie Tooth, and multiple sclerosis. I am only going to address the more common neuropathies associated with diabetes, post-chemo, and idiopathic because of their similarity in pathology and because they are so prevalent in our society. Peripheral neuropathy has a singular pathology that, in my opinion, is mostly overlooked. In each and every case there has been vascular embarrassment that has caused the loss of C-fibers to the tissue. The microcirculation that has been necrotized by diabetes, post-chemo or from a cause that is unknown (idiopathic), must be restored before the C-fibers can regenerate. The other nettlesome problem we have with this diagnosis is there is no way to measure C-fiber function. Currently, no reliable neurological test exists to measure these unmyelinated fibers, and therefore any improvement or further deterioration is reliant solely on patient feedback. There is the flash response from laser Doppler that claims to measure change in the vascular flow when the C-fibers fire. Unfortunately, success of this test has been spotty at best and, at present, is expensive and has no established criteria<sup>1</sup>. So, we are left with a problem that cannot be measured and with a very difficult treatment protocol.

The question then becomes: how can we improve the microcirculation in a specific area? In order to do this, we must induce angiogenesis in a specific area of the body in order to promote growth of the C-fibers. How does the body accomplish angiogenesis? The major factor of angiogenesis is nitric oxide (NO). Through activation of guanilate cyclase (GC), NO leads to cGMP formation, which then stimulates growth of the microcirculatory bed<sup>2</sup>. By following this chain reaction back to the beginning, we can see that it would be beneficial to activate endothelium-based NO at the site of ischemia, the area damaged by the reduced blood flow.

What are the best activators of NO? There are several agents that activate NO: nitroglycerin, L-arginine, and Sildenafil, to name a few. But ingesting or injecting medications is not the answer, since the delivery is generalized. In the case of neuropathy, we need a specifically-focused NO release. The best choice in this case is near-infrared light delivered to the area of neuropathy. Near-infrared light—either collimated (laser) or non-collimated (by light-emitting diodes)—has been demonstrated to locally increase angiogenesis. The efficacy of using a laser is limited by its small area of delivery and by the need of the clinician to hold the laser-head device at the site for the entire treatment. Non-collimated near-infrared light, using LEDs, can be delivered to a large area and can be left, unattended, with no limitations such as bony prominences, etc. Whichever method is chosen, however, the development of angiogenesis and subsequent regrowth of the C-fibers will result in your patients proclaiming that they have restored sensation, diminished pain, and improved balance. Understanding how to restore microcirculation to areas of the body damaged by restricted blood flow is a huge breakthrough for patients suffering from neuropathy, and we should no longer view neuropathy as a hopeless condition. Our ability to stimulate angiogenesis and to regrow C-fibers, along with critical improved nutrition and lifestyle changes, should result in significant improvement in this patient group.

## **References**

1. Schmitz&Peterson, Neurogenic Inflammation in Human and Rodent Skin, Physiology, (Feb. 1,2001),Vol. 16 pp.33-37
2. Powell,Carnegie,Burke, Reversal of diabetic peripheral neuropathy and new wound incidence, Advances in Skin and Wound Care 17, 295-296, 298-300

## Development and evaluation of fiber optic probe-based helium-neon low-level laser therapy system for tissue regeneration--an in vivo experimental study.

[Prabhu V<sup>1</sup>](#), [Rao SB](#), [Rao NB](#), [Aithal KB](#), [Kumar P](#), [Mahato KK](#).

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### Abstract

We report the design and development of an optical fiber probe-based Helium-Neon (He-Ne) low-level laser therapy system for tissue regeneration. Full thickness excision wounds on Swiss albino mice of diameter 15 mm were exposed to various laser doses of 1, 2, 3, 4, 6, 8 and 10 J cm<sup>-2</sup> of the system with appropriate controls, and 2 J cm<sup>-2</sup> showing optimum healing was selected. The treatment schedule for applying the selected laser dose was also standardized by irradiating the wounds at different postwounding times (0, 24 and 48 h). The tissue regeneration potential was evaluated by monitoring the progression of wound contraction and mean wound healing time along with the hydroxyproline and glucosamine estimation on wound ground tissues. The wounds exposed to 2 J cm<sup>-2</sup> immediately after wounding showed considerable contraction on days 5, 9, 12, 14, 16 and 19 of postirradiation compared with the controls and other treatment schedules, showing significant ( $P < 0.001$ ) decrease in the healing time. A significant increase in hydroxyproline and glucosamine levels was observed for the 2 J cm<sup>-2</sup> irradiation group compared with the controls and other treatment groups. In conclusion, the wounds treated with 2 J cm<sup>-2</sup> immediately after the wounding show better healing compared with the controls.

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[Lancet](#). 2009 Dec 5;374(9705):1897-908. doi: 10.1016/S0140-6736(09)61522-1. Epub 2009 Nov 13.

## Efficacy of low-level laser therapy in the management of neck pain: a systematic review and meta-analysis of randomised placebo or active-treatment controlled trials.

[Chow RT](#)<sup>1</sup>, [Johnson MI](#), [Lopes-Martins RA](#), [Bjordal JM](#).

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Erratum in

[Lancet](#). 2010 Mar 13;375(9718):894.

Abstract

### BACKGROUND:

Neck pain is a common and costly condition for which pharmacological management has limited evidence of efficacy and side-effects. Low-level laser therapy (LLLT) is a relatively uncommon, non-invasive treatment for neck pain, in which non-thermal laser irradiation is applied to sites of pain. We did a systematic review and meta-analysis of randomised controlled trials to assess the efficacy of LLLT in neck pain.

### METHODS:

We searched computerised databases comparing efficacy of LLLT using any wavelength with placebo or with active control in acute or chronic neck pain. Effect size for the primary outcome, pain intensity, was defined as a pooled estimate of mean difference in change in mm on 100 mm visual analogue scale.

### FINDINGS:

We identified 16 randomised controlled trials including a total of 820 patients. In acute neck pain, results of two trials showed a relative risk (RR) of 1.69 (95% CI 1.22-2.33) for pain improvement of LLLT versus placebo. Five trials of chronic neck pain reporting categorical data showed an RR for pain improvement of 4.05 (2.74-5.98) of LLLT. Patients in 11 trials reporting changes in visual analogue scale had pain intensity reduced by 19.86 mm (10.04-29.68). Seven trials provided follow-up data for 1-22 weeks after completion of treatment, with short-term pain relief persisting in the medium term with a reduction of 22.07 mm (17.42-26.72). Side-effects from LLLT were mild and not different from those of placebo.

### INTERPRETATION:

We show that LLLT reduces pain immediately after treatment in acute neck pain and up to 22 weeks after completion of treatment in patients with chronic neck pain.

### FUNDING:

None.

Comment in

[Neck pain and low-level laser: does it work and how?](#) [[Lancet](#). 2009]

[Low-level laser therapy for neck pain.](#) [[Lancet](#). 2010]

[Clinical trials report. Low-level laser therapy in the management of neck pain.](#) [[Curr Pain Headache Rep](#). 2010]

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