RESEARCH SUMMARY

Laser Therapy Conditions

Dr. Thiel has done in-depth research into low intensity laser therapy (LILT or LLLT) and has found many interesting articles from various sources. The general findings of each of these articles are outlined below.

NERVE REGENERATION

Increase Of Neuronal Sprouting & Migration Using 780 NM Laser Phototherapy As Procedure For Cell Therapy

Rochkind, S., et al.
Lasers and Surgical Medicine, Published April 2009.

Low Intensity Laser Therapy stimulated migration and fiber sprouting of neuronal cell aggregates, developed large size neurons with dense branches interconnected networks of neuronal fibers and therefore can be considered as potential procedure for cell therapy of neuronal injury or disease.

Phototherapy In Peripheral Nerve Regeneration: From Basic Science to Clinical Study

Rochkind, S.
Neurosurgery Focus, Published 2009.

Using low intensity laser therapy accelerates and enhances axonal growth and regeneration after injury or a reconstructive peripheral nerve procedure. Laser activation of nerve cells, their growth, and axonal sprouting can be considered as potential treatment of neuronal injury.

Phototherapy In Peripheral Nerve Injury: Effects on Muscle Preservation & Nerve Regeneration

Rochkind, S.
Internal Review of Neurobiology, Published 2009.

The function of de-innervated muscle can be restored, not completely but to a very substantial degree by laser therapy treatments if initiated at an early state post injury. In peripheral nerve injury, laser treatment has an immediate protective effect by decreasing scar tissue and by decreasing degeneration in motor neurons. In addition, it increases axonal growth and myelinization of the nerve. Laser irradiation accelerates migration, nerve cell growth, and fiber sprouting. Laser activation of nerve cells, their growth, and axonal sprouting can be considered as potential treatment for neural injury.

Laser Phototherapy (780 NM), A New Modality In Treatment of Long-Term Incomplete Peripheral Nerve Injury: A Randomized Double-Blind Placebo Controlled Study

Rochkind, S., et al.
Photomedicine and Laser Surgery, Published 2007.

This study suggests that in patients with long term peripheral nerve injury, non-invasive laser phototherapy, or LILT, can progressively improve nerve function which leads to significant functional recovery.

BONE HEALING

The Influence of Low-Intensity Laser Therapy on Bone Healing

T. Ebrahimi, et al.
Journal of Dentistry of Tehran University of Medical Sciences, published 2012 Autumn.

This article investigates the use of low intensity laser therapy to supply direct biostimulative light energy to the cells in an attempt to accelerate fracture healing. In addition, this study takes a look at 25 other relevant articles on the matter. This study found that low intensity laser therapy can accelerate bone healing by stimulating stem cells and osteoblastic activity.

Effect Of Low-Level Laser Therapy on The Fracture Healing Process

Kazem, S., et al.
Lasers and Medical Science, Published April 2009.

The results of this study show that the use of laser could enhance callous development in the early stages of the healing process and therefore should be recommended as an additional treatment in non-union fractures in humans.

The Effects of Low-Level Laser Therapy on Bone in Diabetic & Nondiabetic Rats

Bayat, M., et al.
Photomedicine and Laser Surgery, Published August 2009.

LILT increases the bone lamella density of compact bone and also increases the bone strength.

JOINT DISORDERS

A Systematic Review of Low Level Laser Therapy With Location-Specific Doses For Pain From Chronic Joint Disorders

Bjordal, J., et al.
Australian Journal of Physiotherapy, Published 2003.

In this study global health status improved in patients who received low level laser therapy. There was significantly reduced pain and improved health status in patients with chronic joint disorders.

CARPAL TUNNEL SYNDROME

The Effectiveness of Conservative Treatments of Carpal Tunnel Syndrome: Splinting, Ultrasound, And Low-Level Laser Therapies

Dincer, U., et al.
Photomedical Laser Surgery, published January 2009.

With a sample size of 100 individuals and being followed for three months, investigators found that each group had improvements to varying degrees. It appeared that a combination of ultrasound or LILT therapy with splinting was more effective than splinting alone in treating carpal tunnel syndrome.

Carpal Tunnel Syndrome Treated With A Diode Laser: A Controlled Treatment Of The Transverse Carpal Ligament

Photomedical Laser Surgery, published December 2008.

Low Intensity Laser Therapy was effective in alleviating pain and symptoms and improving functional ability of the fingers and hand strength for mild to moderate carpal tunnel syndrome patients with no side effects.

The Effects of Low Level Laser In Clinical Outcome & Neurophysiological Results of Carpal Tunnel Syndrome

Shooshtari, S., et al.
Electromyography Clinical Neurophysiology, Published 2008.

Laser Therapy as a new conservative treatment is effective in treating carpal tunnel paresthesia and numbness and improved the subject's power of hand grip and electrophysiological parameters.

Treatment Of Carpal Tunnel Syndrome by Low-Level Laser Versus Open Carpal Tunnel Release (Surgery)

Elwakil, T., et al.
Lasers and Medical Science, Published November 2007.

Low Intensity Laser Therapy has proven to be an effective and non-invasive treatment modality for carpal tunnel syndrome, especially for mild to moderate cases when pain is the main presenting symptom.

Low Level Light Effects On Inflammatory Cytokine Production By Rheumatoid Arthritis Synoviocytes

Yamaura, M., et al.
Lasers and Surgical Medicine, Published April 2009.

This study demonstrates that pain relief within the joint of those suffering from rheumatoid arthritis may involve a reduction in the level of pro-inflammatory cytokines and chemokines produced by the synovium. This mechanism illustrates the beneficial effects of Low Intensity Laser Therapy on other inflammatory conditions.

The Effect of Low-Level Laser in Knee Osteoarthritis: A Double-Blind, Randomized, Placebo-Controlled Trial

Hegedus, B., et al.
Photomedicine and Laser Surgery, Published 2009.

This study shows that Low Intensity Laser Therapy reduces pain and improves microcirculation of the area treated. In this study there was a significant improvement as far as reduction of pain, joint circumference, pressure sensitivity, and increased range of motion.

Efficacy Of Different Therapy Regimes of Low-Power Laser in Painful Osteoarthritis Of The Knee: A Double-Blind And Randomized-Controlled Trial

Gur, A., et al.
Lasers in Surgery and Medicine, Published 2003.

Statistically significant improvements were indicated in respect to all parameters such as pain, function, and quality of life.

NECK PAIN

Efficacy of Low-Level Laser Therapy in The Management of Neck Pain: A Systematic Review & Meta-Analysis of Randomized Placebo or Active-Treatment Controlled Trials

Chow, R., et al.
Lancet, Published 2009.

This study demonstrates that Low Intensity Laser Therapy reduces pain immediately after treatment in acute neck pain and up to 22 weeks after completion of treatments in patients with chronic neck pain.

Low-Level Laser Therapy for Acute Neck Pain with Radiculopathy: A Double-Blind Placebo-Controlled Randomized Study

Konstantinovic, L., et al.
Pain Medicine, Published August 2010.

This study investigated the clinical effects of low level laser therapy in patients with acute neck pain and radiculopathy. This study found that there were statistically significant differences with reduced pain to the arm and improved range of motion in the neck. This study clearly indicated that low level laser therapy gave more effective short term relief in arm pain and increased range of neck extension in patients with acute neck pain with radiculopathy when compared to a placebo group.

MUSCLE PATHOLOGIES

Evaluation Of Low Intensity Laser Therapy In Myofascial Pain Syndrome

Carrasco, T., et al.
Cranio, 2009 October

Low intensity laser therapy was effective in reducing pain experienced by patients with myofascial pain syndrome.

Efficacy Of Low Power Laser Therapy In Fibromyalgia: A Single-Blind, Placebo-Controlled Trial

Gür, A., et al.
Lasers and Medical Science, Published 2002.

This study took place in the Physical Medicine and Rehabilitation School of Medicine in Turkey. Low energy lasers were widely used to treat a variety of musculoskeletal conditions including fibromyalgia. Forty female patients took part in this study. They were all diagnosed with fibromyalgia. This study demonstrated that laser therapy is effective on pain, muscle spasm, morning stiffness, and total tender point number in fibromyalgia and suggested that this therapy method is a safe and effective way to treat patients with fibromyalgia.

ACHILLES TENDON HEALING

Low Level Laser Irradiation Promotes Cell Proliferation & MRNA Expression of Type 1 Collagen & Degeneration In Achilles Tendon Fibroblasts In-Vitro

Ken, C., et al.
Journal of Orthopedic Research, Published May 2009.

In this study, when compared to the control group, the cell proliferation of irradiated Achilles tendon fibroblasts were significantly more in the laser group.

An In-Vivo Experimental Evaluation of He-Ne Laser Photostimulation In Healing Achilles Tendons

Elwakil, T.
Lasers and Medical Science, Published March 2007.

Laser photostimulation reported a greater value after surgical repair of ruptured and injured tendons for a better functional outcome and it can be applied safely and effectively in humans especially with respect to the proposed long term clinical outcome.

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