

## ABSTRACT

### An open clinical study of Low Energy Photon Therapy (LEPT) for musculoskeletal and neuromuscular disorders

Salansky N (1992)

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**OBJECTIVES:** A review of the published scientific literature and a priori clinical evidence indicated that LEPT could potentially be effective in relieving pain associated with chronic musculoskeletal conditions and neuromuscular disorders. Of particular interest were situations where chronic conditions (e.g. degenerative joint disease) did not respond to conventional forms of therapy (e.g. physiotherapy modalities such as TENS, ultrasound, etc. as well as pharmaceuticals such as NSAIDs). Chronic was defined as a condition that has persisted for more than 6 months since its onset. The objectives of the study were to verify efficacy of LEPT in relieving such chronic pain and to develop recommendations related for conducting a follow-up double blind study.

**METHODS:** The study was an open clinical trial that included 215 patients (86 males and 129 females, average age 60.3 years of age) suffering from chronic musculoskeletal and neuromuscular disorders. All patients had either failed to respond to conventional treatment modalities such as medications, conventional physiotherapy (TENS, ultrasound), or achieved only minor improvements. All patients were treated with 3-5 times per week with low energy photon therapy. A full course of treatment consisted of 8-12 sessions.

The outcome of the treatment was measured by relative degree of morning stiffness, range of motion, swelling, drug consumption and pain level, using a self-report visual analog scale ("VAS"). These measures were classified by degree of improvement as:

- Significant improvement (SI) was defined as an improvement in all evaluation criteria  $\geq 75\%$ .
- Improvement (I) was an improvement in all evaluation criteria  $\geq 50\%$ , but,  $< 75\%$ .
- Marginal improvement (MI) was an improvement in 2 – 5 of the evaluation criteria by  $\geq 25\%$ , but  $< 50\%$ .

**RESULTS:** Sixteen (16) patients dropped out of the study, leaving 199 who completed the full course of treatment. Eleven (11) patients opted out for personal reasons and five (5) patients experienced aggravation of their preexisting conditions, which did not appear to be related to the treatment.

Overall results for the residual sample indicate that 129 patients (65%) with chronic musculoskeletal and neuromuscular conditions experienced improvement or significant improvement after LEPT. This is remarkable considering these patients previously had been unresponsive to any other forms of therapy. IN addition, 30% of patients reported they had discontinued the use of analgesics and decreased their use of NSAIDS during the course of the study.

Degree of improvement by nature of conditions treated with LEPT is reported in the following table:

Condition treated	No. of patients	Significant Improvement & Improvement	Marginal Improvement	No Effect
Osteoarthritis	54(100%)	37 (68%)	9 (17%)	8 (15%)
Soft Tissue Conditions	69 (100%)	47 (68%)	16 (23%)	6 (9%)
Degenerative Disk Disease	62 (100%)	37 (67%)	14 (22%)	11(18%)
Neuromuscular Conditions	14 (100%)	8 (57%)	4 (29%)	2 (14%)
All Conditions Combined	199 (100%)	129 (65%)	43 (22%)	27(13%)