

LEPT--low energy photon therapy (LEDs)

(LLLT IS low energy laser therapy)

Example 1

Chronic Leg Ulcers

Fifty patients with infected or non-infected chronic leg ulcers, which had failed to respond to conventional therapy for more than 10 weeks, were treated by LEPT. The chronic leg ulcers were of different etiology and included venous ulcers, diabetic ulcers, decubitus ulcers, burns and post-traumatic ulcers. A combination of protocols 1 and 3 (Table 8) was used for non-infected wounds and a combination of protocols 1 and 2 (Table 8) was used for infected wounds. Following LEPT treatment, 40 of the ulcers (80%) were completely healed, 5 ulcers (10%) were reduced in size and 5 ulcers (10%) were unchanged.

Twenty four patients with 32 infected or non-infected ulcers of various etiology (venous ulcers, diabetic ulcers, decubitus ulcers, post-traumatic ulcers, etc.), which had failed to respond to conventional therapy, were treated by LEPT. Conventional therapy was the same for all three groups of patients and included cleansing with saline, application of wet-to-dry dressing followed by a kling. Total of 15 patients with 18 ulcers were treated with real LEPT, 5 patients with 10 ulcers received placebo LEPT and 4 patients with 4 ulcers received conventional therapy only. Placebo LEPT was provided with the LEPT device looking identical to a real LEPT, however it was producing no output optical parameters. Neither the patient nor the personnel involved in the study were aware of the treatment area the patient was in. This methodology completely satisfied double-blind study requirement. After 10 weeks of treatment the total ulcer size decrease in the real LEPT group was 79.4%, in the placebo group total ulcer size decrease was 31.9% from baseline, and in the control group (conventional therapy only) 45.8% total ulcer size decrease from baseline.

A comparison of the results obtained in the present study with those previously obtained by others using conventional therapy or low energy laser therapy are shown in Table 11, which illustrates the superior results obtained with the LEPT treatment of the present invention. 64 year-old patient, female, presented with the leg ulcer of post-traumatic origin and venous insufficiency. The first onset of the ulcer was 45 years ago after a car accident. The patient had three attempts at skin grafts which had failed. The patient did not allow another surgery. Allergy to antibiotics and to some dressings, severe pain and inflammation developed.

The ulcer's size was 3.9 cm.sup.2. The patient received LEPT treatments with the following protocol: IR-7-probe, 880 nm, 12 mW, 10 Hz, modulation frequency 1.2 Hz, 25 sec contact on the skin surrounding ulcer and R-22 probe, 660 nm, 6 mw, CW, for 180 s at the distance 7 cm over the ulcer area. After three courses of LEPT (60 treatments total) the ulcer healed completely.

Example 2

Carpal Tunnel Syndrome

Twenty one patients with carpal tunnel syndrome who had been receiving conventional therapy were treated with LEPT three times a week for five weeks. A combination of protocols 8, 19 and 20 (Table 8) was used. Conventional therapy included wrist immobilization at night, specific chiropractic manipulations and vitamins C, E and B.sub.6. No corticosteroid injections during the course of LEPT were applied. Fifteen patients (71.4%) were free of symptoms and had returned to work after treatment. These patients remained free of symptoms after 6-18 months of follow up examinations. Two patients (9.5%) had reduced symptoms and 4 patients (19.1%) did not respond.

A comparison of the results obtained in the present study with those previously obtained by others using conventional therapy or low energy laser therapy are shown in Table 12, which illustrates the superior results obtained with the LEPT treatment of the present invention.

Example 3

Acute Whiplash Injury

Fifty four patients with acute whiplash injury were randomly assigned to three groups. Group 1 (17 patients) received manipulation therapy (MT), Group 2 (18 patients) received MT plus exercise and Group 3 (19 patients) received MT, exercise and LEPT (protocols 6 and 7, Table 8) were administered three times a week for eight weeks. In both protocols 100 Hz frequency and 1.2 Hz modulation frequency were used.

Analysis of variance (ANOVA) was used to test if the patients were properly randomized prior to the study. ANOVA test did not reveal any statistically significant difference between 3 groups in the extensor neck muscle strength (EMS) and uninterrupted sleep (US) at night prior to the study.

The Newman-Keuls' multiple-range test was used to obtain more complete and accurate analysis of data obtained after the course of therapy.

The Newman-Keuls' test revealed statistically significant improvement (SS) in both, EMS and US parameters measured in Group 3 vs. Group 1 and SS improvement in US in Group 3 vs. Group 2. The Newman-Keuls' test did not reveal any SS improvement in US in Group 1 during the course. In Group 2 SS improvement was first observed only after 8 weeks of therapy. In Group 3 SS improvement in EMS was observed much earlier: after 4 weeks of therapy. (See Table 13.)

Example 4

Acute and Chronic Musculoskeletal Conditions

Patients having a range of acute and chronic musculoskeletal conditions were treated by LEPT according to the protocol of the invention as described herein. Most of the patients treated had failed to respond earlier to conventional treatments such as pharmacotherapy and physiotherapy using heat, transcutaneous nerve stimulation, interferential and ultrasound. One hundred ninety nine patients received a course of LEPT. LEPT treatment provided significant improvement of 60-85% of musculoskeletal conditions.

Eighty five patients with osteoarthritis were treated with LEPT (protocols 8-10, Table 8), of these patients, 59 showed significant improvement and 5 showed some improvement.

Fifty patients with low back pain were treated with LEPT (protocols 8, 11, 13, 24, Table 8), of these patients, 39 were free of symptoms or showed significant improvement and 5 showed some improvement.

Seventy three patients with degenerative disc disease were treated with LEPT (protocols 8, 11, 13, 24, Table 8), of these patients, 44 showed significant improvement.

Thirty two patients with tension headache and neck pain were treated with LEPT (protocols 13, 14, 15, 24, Table 8), of these patients, 24 showed significant improvement and 2 showed some improvement.

Twenty patients with spurs were treated with LEPT (protocol 15, Table 8), of these patients, 17 were free of symptoms.

The results from the above-noted LEPT treatments are summarized in Table 14.

Examples of case histories are provided below

Female, age 39--Acute left shoulder capsulitis: abduction increased 15.degree. after the first treatment with 60% decrease in pain. Abduction increased to 90.degree. following second treatment. Following three LEPT treatments (protocols 8, 14, 24, Table 8) abduction almost normal, pain minimal and no further treatment required.

Male, age 37--Acute right medial collateral ligament strain: after one LEPT treatment (protocols 4, 5, Table 8) was able to resume playing hockey and following two additional LEPT treatments patient was completely pain free and totally able to resume all normal activity.

Male, age 55 three year old rotator cuff tear, which was aggravated by swimming and golf: Had surgery contemplated and utilized cortisone injections, anti-inflammatory and analgesic medications. Pain free and full range of motion following five LEPT treatments (protocols 8, 9, 11, 24, Table 8).

Male, age 74 developed decreased flexion of right elbow. He stopped playing tennis, could not bring a cup of tea to his lips, or shave his neck. X-rays showed a spur on the proximal tip of the radius. After 24 LEPT treatments (protocols 11, 24, Table 8) and

manipulation, X-rays showed a spur of 1/3 the original size. Patient could now raise a cup of tea for drinking, able to shave and returned to playing tennis. Follow-up 18 months examination revealed that the patient was still free of symptoms.

Female, age 31 years with rheumatoid arthritis for 10 years, had generalized stiffness, with aches and pains. She came into the clinic with a walking cane. Forward flexion of her body showed `finger to floor` was 24", and it took her 15 minutes to climb the subway stairs. After 15 consecutive LEPT treatments (protocols 8, 9, 10, 11, Table 8) and manipulative therapy, she no longer uses the cane, `finger to floor` is 6" and she is up the subway stairs in 5 minutes.

Female, age 41 with chronic cervical degenerative disc and joint disease along with pain for 15 years. After 15 consecutive LEPT treatments (protocols 6, 7, 11, 24, Table 8), manipulative therapy and specific neck exercises, she no longer experiences pain, has increased motion, sleeps better and smokes 50% fewer cigarettes per day. Modulation frequency 1.2 Hz in CW mode was used in protocols 6 and 7.

Male, age 42 with chronic low back pain and radiation into the left hamstring and popliteal muscles. MIR studies indicated a mild disc bulge at L4-L5. After 8 consecutive LEPT treatments (protocols 13-15, 24, Table 8), manipulative therapy and specific exercises, patient has returned to jogging without pain, radiation or stiffness, and has increased range of movement.

Female, age 71 year complained of severe knee pain with frequent episodes of swelling, causing her to be practically immobile. She was able to trace back her knee problem as having begun at age 51 and could recall only a few periods of remission, lasting no longer than three weeks, after having received steroid injection. Functional inquiry indicated episodes of frequent abdominal pain (very sensitive to weather changes) and back pain which, on their own, she felt she would have been able to tolerate. However, in conjunction with the knee pain, she was not able to tolerate these symptoms. Her past history indicated that she had good health until age 50, it was later found that she has polyolithiasis, for which she had not been operated on. She also has a tendency towards constipation and epigastric pain. She suffers from arteriosclerotic heart disease, with stable angina pectoris, and is on multi-pharmacy treatment. In addition, she is constantly taking different types of non-steroid anti-inflammatories. Musculoskeletal examination revealed the presence of moderate varus alignment of the knees, of at least 7-10 degrees. There was moderate joint effusion in the left knee, with significant patellofemoral and medial joint compartment crepitation, on the left more so than on the right. X-ray showed considerable osteoarthritis changes involving both knees.

The patient underwent 12 LEPT treatments (protocols 8, 9, 10, 11, Table 8). During and after treatment, the patient was able to report a decrease in the frequency of her non-steroid anti-inflammatory intake, and said that she had remained free of severe knee pain for the past 11/2 months.

Male, 70 year old complained of right shoulder pain, which had become particularly

bothersome over the past few weeks, and which had begun depriving him of adequate sleep. The patient stated that the pain had developed gradually over the last three months, and that it had not been responding to conventional physiotherapeutic treatment modalities, using heat and TNS. Interferential treatment had also failed to improve his condition. The patient was unable to tolerate anti-inflammatory drugs because of gastrointestinal upset. He stated that, using potent analgesics such as Tylenol #3, he was only able to sleep for short periods. The patient mentioned that in the past he had experienced a few similar-type episodes affecting the right shoulder, but that these had always been easily controlled by means of conventional physiotherapy treatment. Examination of ranges of right shoulder movement showed significant decrease. In particular, abduction was approximately 70 degrees, and external rotation, with elbow flexed, was no more than 5 degrees. He had pain and tenderness over the rotator cuff area, with clicks and crepitation on external rotation. X-rays of the cervical spine and left shoulder were not contributory and, in particular, there was no calcification present. The patient was treated as suffering from right rotator cuff tendinitis.

He obtained 10 LEPT treatments (protocols 8, 9, 10, 11, 24, Table 8), and was able to report a significant improvement in his level of pain, as well as an improvement in his sleep pattern, which began developing gradually following the third LEPT treatment.

Female, 47 year old Esthetician, came to the doctor's office complaining of right heel pain, which was particularly bothersome in the mornings when the heel had to support the full pressure of her body weight. The patient stated that this problem had developed gradually over the preceding six to seven months. The patient was diagnosed to be suffering from plantar tendinitis and was treated by means of conventional modalities, such as ultrasound, heat, and steroid injections to the heel, all of which failed to achieve appropriate results. Her past history revealed that she suffers from peptic ulcer disease and is, therefore, unable to tolerate any non-steroid anti-inflammatory medication. Examination showed no neurological deficit present. There was localized pain on the middle of the heel.

The patient reported a significant improvement on her fourth LEPT treatment session (protocols 11, 24, Table 8) and after 10 treatments her pain had disappeared completely.

Male, 43 year old with chronic neck stiffness, decreased range of movement and intermittent radiation into the right biceps. After 15 LEPT treatments (protocols 13-15, 24, Table 8), manipulative therapy and specific neck exercises he has no longer neck stiffness, increased range of movement and no radiation into the right biceps. He also sleeps better.

Female, 43 year old with chronic low back pain and burning sensation in her feet--"feels like I am walking on hot coals". After 10 treatments of LEPT (protocols 13-15, 24, Table 8) and manipulative therapy, she is experiencing a 50% decrease in both her low back pain and the burning sensation in her feet. She reports also that she is walking nearly normally.

Male, 25 year old, diagnosed with bursitis in the sub deltoid bursa for the past year, resulting in decreased range of motion, inflammation and pain. Treatment strategy was implemented and after a full course of LEPT treatments (protocols 4, 11, 24, Table 8), patient retained complete range of motion, experienced no further inflammation or pain.

Example 5

Post-Surgical Complications

More than 100 patients having a range of post-surgical complications, such as swelling, scars, were treated by LEPT according to the protocol of the invention as described herein. LEPT treatment resulted in faster resolution of post-surgical complications, smooth and tender scar formation and improvement of old scar tenderness, elasticity and softness.

Examples of case histories are provided below

Male, age 47--two previous laminectomies and surgeon hesitant regarding a third: Patient was reduced to a level of an invalid with constant left thigh pain and severe walking limitations. Following ten LEPT treatments (protocols 8-11, 24, Table 8), patient was able to stand normally and walked relatively normally with diminished pain by 60%.

Female, age 24 suffered chronic headaches and dizziness. As a child she had TMJ surgery to control her headaches. After 8 consecutive treatments of LEPT (protocols 22-24, Table 8), manipulative therapy and specific upper cervical exercises, she no longer experiences headaches and dizziness. She sleeps better and has more energy in the day.

Male, surgical face lift which did not take well. There was a tremendous amount of swelling and redness around the neck area of the scar. He has completed 6 LEPT treatments (protocols 4-5, Table 8), and the swelling--has significantly subsided, the redness has disappeared and the scar healing has taken effect, and is hardly noticeable.

Example 6

Acute Trauma and Chronic Post-traumatic Conditions in the Soft Tissues and Bones

One hundred twenty patients having a range of acute trauma and chronic post-traumatic conditions in the soft tissues and bones were treated by LEPT according to the protocol of the invention as described herein. Conditions treated include post-traumatic conditions in muscles, ligaments, joints, bones, etc. such as whiplash, sprains, strains and sport injuries in the foot, ankle, leg, knee, neck, shoulder and elbow. LEPT treatments were administered in accordance with protocols 4, 5 (Table 8) at acute stage followed by protocols 8, 11, 24 (Table 8) for subacute stage of post-traumatic conditions.

Treatment with LEPT resulted in fast resolution of swelling, hematoma, inflammation and pain and accelerated regeneration of injured soft tissue, bone fracture consolidation,

soft scar formation, muscle function and general recovery. Examples of case histories are provided below.

Female, multiple injuries, car ran over her. Back sprain, knee swelling. After treating her 2.times.week with LEPT for a period of 4 weeks, she is 85% recovered. Before starting LEPT MD wanted to operate on knee to remove calcium build-up causing immobility. Now she can walk and has significant movement in knee, the surgery has been put off.

Male, 33 year old with severe lacerations on hand. Extension palmar branch of ulnar nerves damage, patient unable to flex or grip with hand. Before completion of full course of LEPT treatments patient had significant improvement in grip and flex abilities, no pain or inflammation was apparent. Patient discontinued treatment.

Crushed hand injury from job accident. Fracture of the metacarpal bone. Extreme swelling, edema and pain, suggested treatment was to surgical incise hand to alleviate extreme edema and inflammation. LEPT treatment was offered and after first treatment 85% of swelling subsided, pain was almost completely diminished. Patient returned to work the next day. After 3 LEPT treatments condition was under control.

Non-Union of the Tibia--After 21-22 LEPT treatments, re X-ray was performed. No change in bone fusion noted. However, soft tissue was completely healed and pain was substantially reduced.

Gun Shot Wound--A wound inflicted in the web space of hand between thumb and index finger. Conventional therapy failed to improve severe swelling, deep, open wound of 1/4 inch, tremendous pain and slight infection. After first LEPT treatment swelling had subsided, inflamed area was greatly reduced and cicatrising had commenced. By 4 LEPT treatment the total wound was closed and normal healing was underway.

Female, age 46--Low back pain injury 21/2 years ago: in constant pain and specialists contemplating surgery. Patient had difficulty walking, sitting and sleeping. After 8 LEPT treatments pain free and able to engage in normal activity with minimal pain.

Male, 44 years had a history of 3 whiplash injuries 13 years ago. Presently has left cervical pain with radiation into left shoulder and headaches. X-rays showed moderate degeneration of the C5-6 disc with a straight cervical spine. After 15 LEPT treatments and specific exercises, patient has no headaches, no cervical pain or radiation and increased ability to sleep. X-rays showed a return to the normal lordotic cervical curve.

Female, 56 year old who operates a Ballet School, in addition to teaching ballet. She complained of severe back pain, which she had developed suddenly after bending forcefully while still trying to retrieve something from the floor. Over the next few days, her back pain deteriorated further, to the point where she required assistance in order to even dress herself. Analgesic and myorelaxants failed to help her. The patient was desperate to return to work for fear of losing her business. She was advised to immediate LEPT therapy. On examination ten days after the onset of symptoms, she still appeared to

be in acute distress, as she required help in order to get up out of the chair and onto the examining table. On examination her range of back movement were significantly reduced, as she was hardly able to reach to the knees on flexion. She had pain and tenderness over the lower paravertebral muscle group. The patient's response to LEPT therapy was immediate, with a gradual improvement in pain level and ranges of back movement after 12 treatments. A two week observation period following treatment, indicated that the patient was free of symptoms.

Male, 41 year old was referred to Toronto Chiropractor Clinic. He had two motor vehicle accidents--"hyperextension whiplash injuries", the last being 12 years ago. At consultation, patient was experiencing neck pain on the left side with low grade radiation into the left biceps. This condition was of permanent nature. Under strenuous activities such as gardening or carrying heavy grocery bags on the side, the radiation would progress to his left hand and index finger. Physical examination revealed normal reflexes and grip strength. The flex or extensor neck strength ratio was inappropriate, whereby the flex or strength had increased compared to the extensor. X-rays showed that the cervical spine had lost its normal lordotic curve. There was also degenerative changes at C5C6. The course consisted of 15 LEPT treatments to the posterior and left lateral cervical spine, 3.times.week. A few sessions were missed, so that the total course duration was six weeks. The special exercises were done 5.times.week at nights before bed. After the course of LEPT and exercises the patient was free of symptoms. Re X-rays showed that the patient's cervical lordosis became close to normal. Follow-up 18 months examination revealed that the patient continued to do exercise and was free of symptoms.

Example 7

Repetitive Strain Injuries

Patients having a range of repetitive strain injuries were treated by LEPT according to the protocol of the invention as described herein.

Male, 43 years old with history of `carpal tunnel` symptoms for one year. After 4 treatments with the LEPT (protocols 17-20, Table 8) and specific manipulation of the wrist, he no longer suffers with these symptoms.

Male, 66 year old was presented with bilateral wrist pain. He had previously consulted an orthopedic surgeon and was booked for bilateral surgical release of the median nerve for carpal tunnel syndrome. The patient works in a dental lab and is required to perform repeated movements of the wrist and forearm while pinching and grasping small instruments. He first noticed pain in the wrists and thumb while riding his motorcycle. This progressed to pain and numbness while sleeping which awakened him. Relief was achieved by shaking the hands. Finally, he was unable to perform his job adequately as his grip was too weak. The patient was undergoing treatment for low back pain when he informed me of his wrist pain and forthcoming surgery. We discussed LEPT therapy for his carpal tunnel syndrome and treatments began immediately.

The diagnosis was based on patient history, the nerve conduction and EMG studies done by the orthopedic surgeon. In addition, the Phalens test and Tinels sign were positive and reproduced pain along the median nerve. There was bilateral atrophy of thenar eminence. Therapy included LEPT 3.times.week, vit. C, vit. E, vit. B6 supplementation, also the patient was instructed to wear wrist braces to immobilize the wrists at night. Specific chiropractic manipulation was carried out on dyskinetic joint of the wrists, elbow and neck as required. Soft tissue therapy included trigger point therapy along the forearm wrist flexor muscles and myofascial release, as required. Complete resolution of the symptoms was achieved after 35 LEPT treatments (protocols 17-20, Table 8). The surgery was cancelled and there has been no reoccurrence to date, 15 months following the end of treatment.

Example 8

Neurological and Neuromuscular Conditions

Patients having a range of neurological and neuromuscular conditions were treated by LEPT according to the protocol of the invention as described herein.

Female, 51 year old who works as a medical secretary, complained of the spontaneous onset of numbness and a tingling sensation involving the left hand. Shortly after, these symptoms settled into the inner border of the left forearm, and the fourth and fifth digits of the left hand. Her functional inquiry was unremarkable. Prior to this development she has been in a good health. Objectively, the patient was free of any neurological deficit, and in particular, was found to have no organic pathology present in the distribution of the medial or ulnar nerves. The patient was seen by a orthopedic surgeon and a neurologist, as well as by a rehabilitation medicine specialist, all of whom agreed that there were no objective findings, compatible with nerve degeneration, present. This was substantiated by X-ray examination as well as by EMG studies. All the specialists agreed that the patient was suffering from left ulnar neuropathy. Initially, the patient was treated by means of TNS, analgesics, and vitamins, for a period of four weeks, displaying very little improvement in her symptoms. Ten LEPT treatments (protocols 21-24, Table 8) have proven to be successful, as following the LEPT therapy the patient has been asymptomatic for the last two months.

Example 9

Dermatological Conditions

Patients having a range of dermatological conditions were treated by LEPT according to the protocol of the invention as described herein.

The patient with chronic ulcers were treated in accordance with protocols 1-3, Table 8, depending on the ulcer condition (infected, acute inflammatory condition or non-infected ulceration).

47 year old patient, diabetic--had bilateral toe amputation followed by skin grafting. Skin graft healed slowly and 3 ulcers developed on both feet which did not respond to any conventional therapy. After the first course of 19 LEPT sessions administered for 2 out of 3 ulcers (3.times.week) 1 ulcer healed and 1 improved. After the second course of 29 LEPT treatments all ulcers healed.

65 year old female presented with 2 ulcers: L tibial ulcer which persisted for 3 years and right distal tibial ulcer which did not heal for 1 year. There were 3 skin grafts attempts over the years and all failed. The patient complained of burning sensation around all ulcers that kept her up at night. After 6 LEPT treatments (3.times.week) she was able to expose ulcers to air without pain. After 8-10 treatments her night pain was markedly reduced. Her right tibial ulcer healed after 30 sessions of LEPT and left tibial ulcer healed after 48 sessions of LEPT. Six months follow-up the patient is free of ulceration.

73 year old patient, male presented with 35 cm² ulcer on his big toe and adjacent foot area. The ulcer did not respond to conventional therapy for more than 3 months and was heavily bacteria-contaminated and had a lot of necrotic tissue. LEPT treatments were provided 3.times.week. After 20 LEPT treatments ulcer decreased in size by 50% and the patient had 2 weeks interval in LEPT. After this interval in LEPT 2 new breakdown areas developed on the same foot. LEPT treatments were resumed on all 3 ulcers, 3.times.week. After total 42 LEPT treatments all ulcers completely healed. At the 14 months follow-up the patient is still free of ulceration.

60 year old female was admitted to Hospital burn-unit with burns 20 cm² to the right foot, scalded by hot tea. Burn was infected and did not respond to antibiotic treatment and daily cleaning for 3 weeks. Plastic surgeon intended to do skin grafts, but decided to try LEPT first. The patient was treated daily (5.times.week). After 14 sessions burns completely healed.

96 year old female with pressure ulcer 3 cm diameter on heel which did not heal for 1 year. Plastic surgeon tried to close the defect but skin graft broke down. Patient was being treated with dressings but they did not help. Patient complained of pain and was taking 3-4 Tylenol #3 daily. Patient received 10 consecutive LEPT treatments. After 10 treatments pain medications reduced to 1-2 Tylenol #1 tablets per day. After 25 treatments (5 weeks) ulcer healed.

Female, 77 year old presented with mixed arteriovenous etiology ulcer on the right foot more than 200 cm². The ulcer onset happened in 1976 and had been open since then with occasional closing. This ulcer persisted growing in size and became bacteria-contaminated despite different dressings and antibiotics used. The underlying causes of this ulcer was venous insufficiency, ischemia and osteomyelitis. Three previous skin grafts failed. Recently, the patient developed allergy to some dressings. Besides ulcer history, patient had in 1986 hysterectomy followed by radiation therapy after being diagnosed with adenocarcinoma uteri. The course of

LEPT started at the end of September '93. The LEPT therapy was provided 2-3.times.week. The ulcer remained bacteria-free for a few months (.about.55 treatments) and size decreased by 50% and a bridge of new skin formed on the anterior part of the right foot separated one huge into 2 smaller ulcers. Taking into account the patient's age, nutritional status, failed skin grafts, bacteria contamination of the wound prior our treatment commencement the decrease in size by 50% was a major achievement.

Female, 82 years old had 2 venous stasis ulcers for about 2 months prior to receiving LEPT. During this period, nurses were visiting her for about 3.times.week for dressing changes with the wound showing little or no healing. Nursing visits were reduced after starting LEPT, although continued to monitor other health problems. The wounds (the largest approximately 1.5 cm in diameter) after initiating LEPT were healed following 27 sessions over 9 weeks. The staff also noted improved color in the affected limb after only a few treatments. The lady also had cellulitis, dementia and anemia. Although this case was difficult with other aspects of home-care, the compliance with LEPT treatments was total.

57 year old diabetic patient had a 2 cm in diameter ulcer on the metatarsal head of his left foot. He had a history of ulcers over a period of 10 years with his diabetes. In late November he was admitted to DECH with cellulitis and received surgical debridement of this current ulcer. EMII nurses began following him in mid December for IV therapy and dressing changes, with the wound showing only limited or no healing by mid March. He also had peripheral neuropathy, hypertension and nephropathy. After 30 LEPT treatments, this wound had closed. Nurses originally were visiting 3.times.week diminishing to only 1.times. week as IV therapy discontinued and patient was managing own dressing changes at the time LEPT started. These visits were discontinued shortly after as the physiotherapist carried out the care required.

Female, 58 years old with Multiple Sclerosis had two wounds (2 cm and 1 cm in diameter) in her coccygeal region for over two years. The wounds showed little success in healing. Nurses had been visiting 2-3.times.week since mid November '93 but this had decreased to 1.times. week in February '93. The lady was paraplegic with decreased sensation in her lower limbs. The wounds were due to friction resulting from inefficient transfers. 28 LEPT treatments were given over a 9 1/2 week period, resulting in closure of both wounds.

A 48 year old female had been suffering from herpes simplex attacks on her lips, for 30 years. These attacks were especially frequent in a cold time of year and under stressful conditions. Painful herpes simplex lesions did not respond to any conventional therapy and usually it took from 9 to 15 days for a lesion to get healed. Low Energy Photon Therapy with a dose 8 J/cm.sup.2 and a wavelength of 660 nm was used to treat the lesion locally. The patient experienced immediate pain relief and lesion became dry within 1-2 days after the first treatment. One to three LEPT treatments were enough to reduce lesion healing time to 3 to 6 days. The next lesion

never appeared again at the spot previously treated by LEPT. The patient successfully used a home LEPT unit to treat herpes simplex lesion early on the lesion onset and to prevent lesion development as well during one year. For three years follow-up after the last LEPT course the patient did not have any herpes simplex attacks.

Tables 11, 12, 13 and 14 which follow show comparative analysis of LEPT versus conventional therapy for skin ulcers, carpal tunnel syndrome, and acute whiplash injury respectively, as well as a summary of LEPT results which have been achieved to date. In addition, the information given in the appended claims is hereby incorporated into the disclosure.

TABLE 11		
Comparative analysis of LEPT/LLLT/conventional		
therapy		Efficacy
efficacy for skin ulcers		
of ulcer		
healing		
Condition	LEPT (IMI Inc.) product Conventional Therapy	LLLT
Infected & non-infected	86% at SGH, Toronto	No
SS		
difference	33.3%	
venous leg ulcers	Note: Note: 86% out of 22 chronic ulcers which didn't	Note: 46
pts. were		
treated in two groups by Conventional therapy	respond to CT healed after the course of LEPT	
real &		
placebo LLLT (for 12 weeks).sup.2. included cleansing with	(9 week average).sup.1	No SS
difference	saline, application of paste 93% at EMH, Fredericton	Note:
	bandage, followed by a SS p < 0.001	42 pts.
Were		
treated with real vs. support bandage plus exercise	Note:	
placebo LLLT		
(for 12 weeks).sup.3. program - only 3 out of 9 ulcers	11 ulcers out of 18 healed completely and 7	
ulcers No		
SS difference	healed after 12 weeks of CT.sup.2. improved significantly (79.4% average ulcer	
size Note:	decrease) after 10 weeks in real LEPT	
treatment 12		
chronic leg ulcers were treated	group, in placebo LEPT group only 31.9% of	
with real		
vs. placebo LLLT, total of	total ulcer area decrease was observed; 20	

treatments.sup.4.

none of the ulcers healed completely.

Legend:

- LLLT--low energy laser therapy;
- LEPT--low energy photon therapy;
- CT--conventional therapy;
- SGH--Scarborough General Hospital;
- EMH--Extra-Mural Hospital;
- SS--statistical significance;
- pts.--patients

References:

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TABLE 12

Comparative analysis of LEPT/LLLT/conventional

therapy

efficacy for carpal tunnel syndrome

Efficacy

of CTS

healing

Condition

LEPT

LLLT

Conventional Therapy

Carpal tunnel syndrome 15 patients free of symptoms & returned to work

76.1% (by 60-80% limited) pain (CTS) 11-40% of patients remained (71.4%)

reduction

only

free of symptoms in 6-18 2 reduction of symptoms (9.5%)

Only

36.5%

had limited (by 60-80%) months follow-up after the These patients remained free of symptoms

after pain

reduction after 6 months.sup.1. course of therapy. 6-18 months follow-up.

62%

return

to work

Note:
Note:

note:

wrist immobilization with

21 patients with CTS received LEPT

160

pts.

were given 8 points splint, nonsteroid anti-
(3 .times. week, 15 Rx total).
conservative
treatment program inflammatory drugs, plus
real or
placebo LLLT (3 .times. week, corticosteroid injections 15
Rx
total). The difference in terms into the carpal tunnel.^{3,4,5}
of
return to
work was statistically
significant
(62% vs. 38%) in real vs.
placebo
LLLT. There were no
mention of
follow-up.^{sup.2.}
Legend:
LLLT--low energy laser therapy;
LEPT--low energy photon therapy;
CTS--carpal tunnel syndrome;
CT--conventional therapy;
pts.--patients
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Tunnel
Carpale, Laser & Technology, Vol. 3, No. 1-2, pp. 36-39, 1993.
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TABLE 13

Comparative analysis of LEPT Manipulative Therapy/Exercise program
efficacy

for acute whiplash injury
 Efficacy of LEPT in combined therapy for
 whiplash injury*

Condition	MT + Ex + LEPT	MT + Ex
Acute whiplash injury EMS (neck extensor muscle strength) EMS		
9% improvement	23% improvement	15% improvement
10% improvement	37% improvement ss p < 0.01	22% improvement

US (uninterrupted sleep) US

ss--statistically significant
 *54 patients with acute whiplash injury were randomly assigned to

the following 3 groups:
 17 patients received manipulation therapy (MT)
 18 patients received MT plus exercises (Ex)
 19 patients received MT + Ex + Low Energy Photon Therapy (LEPT)
 Therapy was administered 3 .times. week for 8 weeks.

TABLE 14

Clinical Entity	# of Cases	SI	I	MI
Effect				
Osteoarthritis	54	15 (28%)	22 (41%)	9 (16%)
(15%)				
Soft tissue	69	24 (35%)	23 (33%)	16 (23%)
(9%)				
pathological conditions				
Degenerative disc disease	62	20 (32%)	17 (27%)	14
(23%) 11				
(18%)				
Neuromuscular conditions	14	3 (21%)	5 (36%)	4
(29%) 2				
(14%)				
Total	199	62 (31%)	67 (34%)	43 (22%)
(13%)				

Legend:
 SI--significant improvement
 I--Improvement
 MI - marginal improvement