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Clinical Proof Book
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Postoperative swelling after elbow surgery: influence of a negative pressure application in comparison to manual lymphatic drainage—a randomized controlled trial

Weber, M., Rahn, J., Hackl, M., Leschinger T., Dresing, K., Müller, L., Wegmann, K., Harbrecht, A. 2023. Archives of Orthopaedic and Trauma Surgery, June 2023.

Purpose: Postoperative soft tissue swelling is a significant factor influencing outcomes after elbow surgery. It can crucially affect important parameters such as postoperative mobilization, pain, and subsequently the range of motion (ROM) of the affected limb. Furthermore, lymphedema is considered a significant risk factor for numerous postoperative complications. Manual lymphatic drainage is nowadays part of the standardized post-treatment concept, basing on the concept of activating the lymphatic tissue to absorb stagnated fluid from the tissue into the lymphatic system. This prospective study aims to investigate the influence of technical device-assisted negative pressure therapy (NP) on early functional outcomes after elbow surgery. NP was therefore compared to manual lymphatic drainage (MLD). Is a technical device-based NP suitable for treatment of lymphedema after elbow surgery?

Methods: A total of 50 consecutive patients undergoing elbow surgery were enrolled. The patients were randomized into 2 groups. 25 participants per group were either treated by conventional MLD or NP. The primary outcome parameter was defined as the circumference of the affected limb in cm postoperative up to seven days postoperatively. The secondary outcome parameter was a subjective perception of pain (measured via visual analogue scale, VAS). All parameters were measured on each day of postoperative inpatient care.

Results: NP showed an overall equivalent influence compared to MLD in reducing upper limb swelling after surgery. Moreover, the application of NP showed a significant decrease in overall pain perception compared to manual lymphatic drainage on days 2, 4 and 5 after surgery ($p < 0.05$).

Conclusion: Our findings show that NP could be a useful supplementary device in clinical routine treating postoperative swelling after elbow surgery. Its application is easy, effective and comfortable for the patient. Especially due to the shortage of healthcare workers and physical therapists, there is a need for supportive measures which NP could be.

Efficient peri-operative and post-operative decongestive instrument-based negative pressure treatment and mechanical vibration for anti-oedematous swelling treatment of a trauma and orthopaedic patient at the lower extremity - A quality study

Dresing, K., Fischer, A.-C., Spering, C. & Saul, D. June 2021. International Journal of Burns and Trauma. PMID: 34336378

Background: The perioperative management of trauma cases and orthopedic procedures is negatively influenced by tissue swelling and edema. They delay surgical treatment, extend stay in hospital and prolong the overall time of convalescence. In case of traumatic or postoperative edema the limited transport capacity (missing muscle pump and destruction of lymphatic channels) is casual. Edema mostly results in pain, limited function of the extremity, change in shape, higher infection rate and wound disorders. Manual lymph drainage (MLD) is a treatment option with respect to the complex physical decongestion (CPD).

Objective: To evaluate whether a device-based negative pressure lymph drainage (NPLD) is capable of reducing posttraumatic and perioperative swelling of the lower extremity effectively and sustainably.

Methods: Prospective quality study submitted to the Ethics Committee. The patients only received the procedures after signing the informed consent. The negative pressure was applied locally by using LymphaTouch® device (LT) (FDA approved) with a silicone-coated applicator. The lymphatic drainage had been either applied by a local stationary manner or by using the "Lift + Twist" technique. A negative pressure has been adjusted between 50-250 mm Hg depending on the skin and tissue texture. The frequency was chosen between 90-70 Hz. Type of application: pulsed or continuous negative pressure treatment. The procedure always began in the supraclavicular fossa and continued until reaching the area of surgery in the lower extremity. Duration approx. 30 min. The patient was encouraged to drink fluids after the LymphaTouch treatment (LTT). The results were documented by measurement of the girth and movement according to neutral-zero-method (NZM) and photographs.

Results: 101 patients with injuries/surgical interventions to the lower extremity, age: 64.9 ± 13.17 years. The swelling was more pronounced at the knee. After 4 treatments, there was a measurable decrease in swelling of 11.6% at the lower extremity. In patients with trauma to the hip joint or hip interventions, the swelling at the femur was reduced by 8.6% between LTT 0 vs. 4. In patients with trauma to the knee joint and surgical interventions, significantly more female patients showed a positive effect to LTT. The mobility improved substantially, while the level of pain decreased. The patients reported immediate pain relief. No complications occurred.

Conclusion: The perioperative and posttraumatic swelling at the lower extremity can be positively affected by the LT-NPLD within the first days. The preoperative duration until surgical intervention was decreased. The postoperative stage of wound and soft tissue swelling was reduced.

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Effective peri-operative and post-operative decongestive instrument-based negative pressure treatment and mechanical vibration for anti-oedematous swelling treatment of a trauma and orthopaedic patient at the upper extremity - A quality study

Dresing, K., Fischer, A.-C., Spering, C. & Saul, D. June 2021. International Journal of Burns and Trauma. PMID: 34336378

Queries: In case of traumatic or post-operative oedemas, it deals with the limited transportcapacity (missing muscle pump, destruction of lymphatic channels) for congestion. Consequences of oedema are e.g. change in shape, pain, limited functionality, higher infection and wound disorders. Manual lymph drainage (MLD) is an important treatment with respect to the complex physical decongestion (CPD). MLD activates the lymph drainage and reduces the post operative complications.

Objective of the study: Evaluation whether an instrument-based negative-pressure lymphdrainage (NPLD) can reduce peri-operative swelling effectively.

Methodology: Prospective study submitted to the Ethics Commission. The negative pressure was applied locally with the Lymphatouch®(LT) (FDA permitted) using a siliconecoated applicator. Treatment can be done in a local stationary manner or by using the “Lift + Twist” - technique. Pressure between 20-250mm HG was applied depending on the skin and tissue texture. The frequency was chosen between 90-70 Hz. Type of application: pulsed or continuous negative pressure treatment combined with high-frequency vibration. The process is always started in the supraclavicular fossa area, continued till the OP area at the upper extremities, duration approx. 30 min. The patient was encouraged to drink fluids after the LymphaTouch treatment (LT). The actions have been taken after the clarification, documentation of the findings (measurement, photo).

Inclusion criteria: Patient (P) with injury at the upper extremity, elective P, age > 18 years, consent Girth measurement, movement according to NNO, Statistics: Multi-variance, Wilcoxon test not parametric

Results: 45 P upper extremity, 3,5±1 NPLD. The swelling was more pronounced at the elbows in case of shoulder and upper arm injuries. The difference in swelling between younger and older patients (oP) was significantly less favorable for oP at the upper extremity. After 4 treatments, there was a measurable decrease in swelling of 19.9% at the UE. The reduction 15 cm prox. + direct at the elbow was significantly the best in the T-test as well as the hand mobility.

Conclusion: The perioperative and post-traumatic swelling states at the upper extremity can be sustainably and positively affected with the LT-NPLD. The pre-operative duration up to the planned operation can, likewise, be reduced like the post-operative phase. Thanks to the decrease in swelling, the patient can be operated earlier, discharged earlier and needs less analgesics.

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Treatment of Breast Cancer-Related Lymphedema with a Negative Pressure Device: A Pilot Randomized Controlled Study

Lampinen, R., Leano, J., Smoot, B., Mastick, J., Miaskowski, C., Brinker, L. & Lee, J. Q. Archives of Phydical Medication and Rehabilitation. April 2021.
https://doi.org/10.1016/j.apmr.2021.03.022

Purpose/Hypothesis: 1 in 5 women develop lymphedema (LE) following breast cancer (BC) treatment. If untreated, LE may become chronic and result in persistent swelling, inflammation, skin thickening, and abnormal fibro-adipose tissue deposition. Current conservative treatments do not specifically address secondary soft tissue changes that may limit response to treatment. The purpose of this pilot randomized controlled trial (RCT) is to evaluate efficacy of treatment for chronic LE using a negative-pressure device, which mobilizes skin and subcutaneous tissue to support lymphatic circulation.

Subjects: Data were analyzed for 28 women (informed consent provided) who were >1 year post active BC treatment and have had unilateral upper extremity LE for >1 year. Women were randomized into the negative-pressure device treatment group (n=14) or the manual lymphatic drainage (MLD) control group (n=14).

Material/methods: This study compared negative-pressure massage using the LymphaTouch device (Helsinki, Finland) to MLD. Both groups used the Vodder unilateral upper extremity LE sequence. All participants received twelve 1-hour treatments over 4 to 6 weeks. Patients completed demographic and clinical questionnaires, and the Disability of Arm, Shoulder, Hand (DASH). Objective measures included bioimpedance (L-Dex; Impedimed) and limb volume (ml) calculated from limb circumference. T-tests and ANOVA (General Linear Model–Repeated Measures) were used to evaluate within and betweengroup differences and interaction effects.

Results: Average age was 62.4 years (SD 12.3) and BMI was 29.0 (SD 9.6). Mean baseline interlimb volume difference (affected vs unaffected limbs) was 511.3 ml (SD 378.2) and L-Dex was 29.0 (SD 23.3). Differences between groups at baseline were not statistically significant for age (p=0.108), BMI (p=0.802), L-Dex (p=0.218), DASH (p=0.259) and interlimb volume difference (p=0.076). The LymphaTouch group demonstrated slightly greater improvement in L-Dex, volume, and DASH scores, compared to the MLD group. However, only the between-groups difference in the change in L-Dex reached statistical significance, favoring the LymphaTouch group (L-Dex change: MLD mean +2.79 L-DEX units, SD 5.08); LymphaTouch: mean -4.16 L-Dex units, SD 7.51; interaction p=0.008).

Conclusions: Treatment with the negative-pressure massage device resulted in statistically significantly greater improvement in L-Dex scores compared to MLD, in women with unilateral upper extremity LE of >1-year duration. Slightly, but not statistically significantly greater improvements were also observed in volume and self-reported function. Three adverse events were recorded during the study but all were deemed unrelated to the treatment.

Clinical Relevance: Further research is needed to identify effective treatments for chronic LE that addresses not only limb volume but also secondary soft tissue changes. This can improve our ability to offer targeted interventions and improve outcomes for patients impacted by breast cancer-related LE. Results from this pilot study will guide the development of a larger, hypothesis driven RCT.

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Development of a Musculoskeletal Ultrasound Protocol to Examine Upper Extremity Rehabilitation Outcomes in Systemic Sclerosis

Murphy, S. L., Krause, D., Roll, S. C., Gandikota, G., Barber, M. & Khanna, D. Journal of Diagnostic Medical Sonography. November 2020. doi:10.1177/8756479320965210

Objectives: This study developed a musculoskeletal ultrasound (MSUS) protocol to evaluate rehabilitation outcomes in systemic sclerosis.

Materials and Methods: Three MSUS methods (gray-scale, Doppler, strain elastography) and two acquisition techniques (long- vs short-axis; transducer on skin vs floating on gel) were examined in the forearm before and after rehabilitation treatment. For gray-scale, tissue thickness measures and intrarater and interrater reliability were calculated (intraclass correlation coefficients [ICCs]), and paired t tests examined differences among techniques.

Results: Five people with diffuse cutaneous systemic sclerosis participated. The most validand reliable gray-scale technique was with the transducer in long-axis, floating on gel. Doppler and strain elastography did not detect changes. Both dermal and subcutaneous thickness measurement error was small; intrarater and interrater reliability was good to excellent. Preliminary data indicate that treatment may lead to dermal thinning.

Conclusion: A replicable protocol was established and may be an adjunct to rehabilitation outcome measurement in systemic sclerosis.

Reduction of Postoperative Swelling with a Negative Pressure Treatment - A Prospective Study

Saul, D., Fischer, A.C., Wolfgang L. & Dresing, K. 2020. Journal of Orthopaedic Surgery 28(2), 1-5. May 2020. doi:10.1177/2309499020929166.

Purpose: Perioperative swelling and edema are the main factors that influence the time to definitive operative care, healing rate, as well as postoperative infection rate. Device-based negative pressure treatment is a new method to reduce post-traumatic and postoperative swelling of the upper extremities. The objective of this study was to evaluate a new negative pressure treatment with LymphaTouch® (Helsinki, Finland) to reduce perioperative swelling in upper extremity injuries.

Methods: We analyzed 45 patients (26 female and 19 male) after operative treatment of upper extremity injuries. A predefined treatment algorithm of 30 min using LymphaTouch® was performed on the patients every day for five consecutive days. Swelling was measured according to the neutral-zero method with six points of measurement.

Results: A total of 16 patients underwent an operation on their upper arm. An average of 3.5 measurements was performed per patient, with the start of therapy at a mean of 5.13 days after the operation. All of the measured circumferences except the elbow and 10 cm below the elbow were reduced from day 0 to 3. The percent reduction of swelling (relative to day 0) was 10.36%, 11.35%, 17.34%, and 3.25% for days 1–4, respectively. The reatest reduction of circumference was obtained in the metacarpus (51.6%) and wrist (33.1%).

Conclusion: The LymphaTouch® system and a 30-min treatment program can reduce postoperative swelling of the upper arm, wrist, and hand on the first 5 days after surgery. The ease of learning and self-applicability of LymphaTouch® makes it interesting for further controlled randomized trials.

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Effects of Negative Pressure Soft Tissue Therapy to Ankle Plantar Flexor on Muscle Tone, Muscle Stiffness, and Balance Ability in Patients with Stroke

Kim, K. R., Shin, H. S., Lee, S. B., Hwang, H. S., & Shin, H. J. 2018. Journal of International Academy of Physical Therapy Research (JIAPTR), 9(2), 1468-1474. https://doi.org/10.20540/JIAPTR.2018.9.2.1468

Purpose: To investigate the immediate effects of negative pressure soft tissue therapy on muscle tone, muscle stiffness and balance in patients with stroke.

Methods: In total, 20 patients with stroke and assigned to the negative pressure soft tissue therapy group (NPST, n=10) or, placebo-negative pressure soft tissue therapy group(Placebo-NPST, n=10). Both groups underwent NPST or placebo-NPST once a day during the experimental period. MyotonPRO was used to assess the parameters for muscle tone and stiffness. Biorescue was used to assess the parameters for balance.

Results: Each group showed improvements in muscle tone, muscle stiffness, and balance ability ($p<.05$). Especially, Muscle tone, muscle stiffness, and anterior length in the limit of stability were the significant improvement on NPST group ($p<.05$). The results of the study suggest that the NPST is effective in improving muscle tone, muscle stiffness, and balance ability in patients with stroke.

Occupational Therapy Treatment To Improve Upper Extremity Function In Individuals With Early Systemic Sclerosis: A Pilot Study

Murphy, S. L., Barber, M. W., Homer, K., Dodge, C., Cutter, G. R. & Khanna, D. 2018. Arthritis Care & Research, 70(11), 1653-1660. https://doi.org/10.1002/acr.23522

Objective: To determine feasibility and preliminary effects of an occupational therapy treatment to improve upper extremity (UE) function in patients with early systemic sclerosis (SSc) who have UE contractures.

Methods: A one-arm pilot clinical rehabilitation trial was conducted at a university health system. Participants with SSc and ≥ 1 UE contractures (N=21) participated in a total eight weekly in-person occupational therapy sessions. The therapy consisted of thermal modalities, tissue mobilization, and UE mobility. Between sessions, participants were instructed to complete UE home exercises. Feasibility was measured by present enrollment and session attendance and duration. The primary outcome measure was QuickDASH, secondary and exploratory outcomes included PROMIS physical function, objective UE measures, and skin thickening. Linear-mixed models were performed to determine treatment effects on primary and secondary outcomes.

Results: Fifty percent (24/48) of potentially eligible participants were interested. Of those, 88 % (21/24) enrolled: and 19 out of 21 (91%) completed the sessions. The mean (SD) age was 47,9 years (±16.1); 100 % had diffuse SSc, and mean disease duration was 3.1 years. At eight weeks, participants reported statistically significant improvement on QuickDash and PROMIS physical function measures (p=.0012 and p=.00). Forty – seven and 53 % percent of the sample achieved improvements that exceeded minimally important difference.

Conclusion: In-person treatment sessions were feasible for individuals with SSc and demonstrated statistically significant and clinically meaningful improvements on UE and physical function. Future studies need to examine effects against a control condition and examine durability of treatment effects.

Modeling Of Interstitial Fluid Movement In Soft Tissue Under Negative Pressure–Relevance To Treatment Of Tissue Swelling

Iivarinen, J. T., Korhonen, R. K., & Jurvelin, J. S. 2016. Computer Methods In Biomechanics And Biomedical Engineering, 19(10), 1089-1098. https://doi.org/10.1080/10255842.2015.1101073

Purpose: Journal publication that uses computer-based finite-element model of soft tissue to analyze how pulsating and continuous modes in LymphaTouch device affect fluid flow, velocity, and pressure. The model response was matched with negative pressure (suction) measurements in human (N=11) forearm. Two experimental suction protocols were simulated to evaluate their impact on interstitial fluid flow in soft tissues. Simulated continuous suction was up to 27 times more efficient in fluid transportation compared to the cyclic suction.

Methods: A finite-element model was created using pQCT imaging and by doing measurements of soft tissue response to negative pressure on eleven healthy volunteers (nine males, twowomen). The negative pressure and suction protocols were performed using LymphaTouch device and the registered data was analyzed using Matlab software. Two protocols were analyzed, cyclic and continuous. The simulated cyclic procedure consisted of five 100mmHg suctions and 1cm lengthwise movement. The pulsation was set at 2 s (one second suction, one second zero-pressure period). Similarly, the continuous treatment protocol consisted of one 100mmHg suction with simultaneous 4 cm (in 4 s) lengthwise movement at a constant speed of the suction head.

Results: The study found that the continuous suction method with simultaneous change of treatment position induced higher fluid pressure, velocity transients, and more effective fluid movement along the treatment direction than the cyclic method. It is to be noted that the model does not take into account how negative pressure treatment of edema may affect pressure-dependent promotion of the interstitial fluid flow into lymphatic system and/oractivation of the lymphatic system in transportation of lymph fluid. In other words, the role of lymphatic system is not included in the model, meaning that the conclusion stating that continuous mode is more effective for moving fluid, applies better in areas where lymphatic system does not fully work.

Experimental And Computational Analysis Of Soft Tissue Mechanical Response Under Negative Pressure In Forearm

Iivarinen, J. T., Korhonen, R. K., Julkunen, P. & Jurvelin, J. S. 2013. Skin Research and Technology, 19(1), e356-e365. https://doi.org/10.1111/j.1600-0846.2012.00652.x.

Background: Instrumentation, relying on the use of negative pressure (suction), has been introduced to reduce pathological tissue swelling. Then relative contribution of skin, adipose tissue and muscle, to overall mechanical response is not known.

Method: Under suction, stretch of soft tissues in the forearm of human subjects (N=11) was experimentally measured at rest and under venous occlusion. Three dimensional, fibrilreinforced hyperplastic finite element (FE) model was constructed, the model response was matched with the experimental measurement and mechanical characteristics of each tissue were derived. Parametric analyses were conducted to evaluate the impact of different tissues on the total stretch.

Results: The model suggested that, at large strains, the stretch response was more sensitive to changes in the elastic modulus of skin than those in adipose tissue. During venous occlusion, reduction of the stretch of forearm tissues was related to stiffening of the skin and adipose tissue, as evidenced by increased modulus of 27 ±21 % and 35 ± 26 %, respectively.

Conclusion: The method based on suction may be used to diagnose and monitor skin changes in properties of soft tissues, especially those of skin, as well as tissue swelling typical to pathological condition such as edema..

Content of Conference Presentations & Case Studies

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Preparatory methods in occupational therapy for chemotherapy-induced peripheral neuropathy (CIPN): A case study

Harris, A. 2020. Belmont University, OTD Capstone Projects. https://repository.belmont.edu/otdcapstoneprojects/27/

Abstract: Invasive breast cancer affects an estimated 268,600 women per year. However, the mortality rate for breast cancer has declined and the approximate number of deaths from is less than one-third of new cases. Along with the heightened chance of survival, there is also an increase in the side-effects of aggressive treatment options. The treatments such as surgery, chemotherapy, and radiation therapy may be curative but provide occupational limitations of their own. Chemotherapy-induced peripheralneuropathy (CIPN) is a debilitating, long-lasting side effect of many chemotherapy regimens. CIPN is estimated to affect 10-80% of patients and may last over six years following the conclusion of treatment.

This case study highlights the treatment of a 64-year-old female who developed CIPN throughout the treatment of breast cancer. The client reported symptoms of CIPN during follow-up for lymphedema maintenance with the occupational therapist. The client agreed to complete a trial using LymphaTouch™ to decrease symptoms of CIPN. She completed six sessions, each lasting 25 minutes in duration. Objectively, the client demonstrated increased two-point discrimination, vibratory sensation, strength, and increased sensation in portions of her hands and feet. However, portions of her feet decreased in sensation, her balance remained in a normal range, and while overall, her strength increased, it was still below the norm for her age range. The client subjectively reported increased ability to complete meaningful tasks, decreased impact of CIPN, and no disability regarding ADL's. While the objective measures had mixed results, the client's self-perception about the impact of CIPN on herof CIPN on her ability to complete desired tasks suggest increased self-efficacy and quality of life.

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Preparatory methods in occupational therapy for radiationinduced fibrosis (RF): A case study

Harris, A. 2020. Belmont University, OTD Capstone Projects. https://repository.belmont.edu/otdcapstoneprojects/27/

Abstract: Invasive breast cancer affects an estimated 268,600 women per year. However, the mortality rate for breast cancer has declined and the approximate number of deaths from breast cancer is less than one-third of new cases. Despite the increased chance of survival, there is also an increase in the side-effects of aggressive treatment options. The treatments such as surgery, chemotherapy, and radiation therapy can be curative but provide occupational limitations of their own. Mild-to-moderate radiationinduced fibrosis syndrome (RF/RFS) affects 43-58% of patients who receive radiation therapy for breast cancer. RFS is a long-term progressive side-effect of radiation therapy with limited treatment options.

This case study aims to use LymphaTouch™ as a preparatory method in occupational therapy treatment to decrease the effects of RF. By addressing these debilitating effects of RF, the study aims to promote a return to meaningful tasks. The client was found to have deficits in strength, range of motion, skin mobility, satisfaction with breasts, and physical well-being. The client reported decreased quality of life in relation to her RF. The client completed eight sessions of treatment using LymphaTouch™. Following the intervention, the client was found to have increased skin elasticity in 14 out of 16 segments assessed on her right breast as well as strength and range of motion within functional limits. Despite objective changes, the client reported decreased physical wellbeing and continued to report no satisfaction with breasts. The objective benefits may provide for a more successful outcome of the surgery due to an increase in skin elasticity and mobility. This case study demonstrates promising results in addressing RF using the LymphaTouch™ device. Further development of a standardized protocol and testing is warranted.

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The effect of LymphaTouch® vs. a sham treatment on immediate pain and range of motion in acute low back pain

Greenstein, J., Etnoyer-Slaski, J., Huffman, A. & Behm. D. 2019. The 21st Annual Performance Health Scientific Advisory Committee (TRAC) Research Meeting

Background: Low back pain is the number one global burden, affecting 80% of people in the US at some point in their life. The LymphaTouch® is a medical treatment device which uses the effects of negative pressure in tissues for pain and swelling. It has been shown to improve pain 63.9%, with an average 3.5 decrease in pain scores in back and hip patients.

Purpose: The purpose of this study is to determine the effect of LymphaTouch® versus a sham treatment on pain and range of motion in individuals with acute low back pain

Design: Single-blind randomized clinical trial

Methods: A convenience sample of forty acute low back pain patients were recruited from an outpatient chiropractic clinic at their initial appointment. Participants were 18 years or older and diagnosed with acute low back pain. Exclusionary criteria \ included less than 18 years of age, pregnancy, cancer, a corticosteroid injection within the past 2 weeks, previous back surgery, acute deep vein thrombosis, acute infection, congestive heart failure, cardiac edema, kidney dysfunction, and any conditions in which increased venous and lymphatic return is undesirable. Eligible patients who agreed to participate in the study completed the informed consent, demographics information questionnaire (including pain medication usage), rated their overall pain on the Numeric Pain Rating Scale (NPRS), the Oswestry Disability Index (ODI), and the Functional Rating Index (FRI) [T0]. Following the doctor's evaluation, range of motion (ROM) was assessed using a digital goniometer and pain rated during each motion. Participants were then randomized into either the LymphaTouch® group [A] (n=30) or sham treatment group [B] (n=30). The participants were blind to which group they were assigned. Following the group selection, each participant received their assigned intervention. After the respective intervention, both groups immediately rated their overall pain and repeated the ROM tests [T1]. Then, all participants completed a satisfaction questionnaire about the intervention they received.

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The effect of LymphaTouch® vs. a sham treatment on immediate pain and range of motion in acute low back pain

Greenstein, J., Etnoyer-Slaski, J., Huffman, A. & Behm. D. 2019. The 21st Annual Performance Health Scientific Advisory Committee (TRAC) Research Meeting

Statistical Analysis: Statistical analyses were completed using the SPSS software (Version 26.0, SPSS, Inc. Chicago, IL). First, Mauchly's test of sphericity was conducted for all dependent variables. If the assumption of sphericity was violated, the Greenhouse- Geisser correction was employed. A mixed model repeated measures 2-way ANOVA (2 groups x 2 times) was used to analyze the data. Paired t-tests with Holm–Bonferroni corrections were used to decompose significant interactions, and Bonferroni post hoc tests were used if main effects were found. Significance was set at $p \leq 0.05$. For significant maineffects and interactions, eta (proportion of variance associated with one or more main effects, or interactions) and observed power (statistical power of the test based on the effect size indicating the probability of finding a statistical difference) were calculated. Eta values represent; small (0.01), medium (0.06), and large (0.13) effects. Cohen's d effect sizes (ES) were also calculated for significant specific interactions. Effect size (d) magnitude of change were calculated for interactions and reported as trivial (<0.2), small (0.2-0.49), medium (0.5- 0.79) or large (≥0.8) effect sizes (d) (Cohen 1988). Data is reported as mean ± SD.

Results/Conclusion: A total of 41 participants enrolled in the study with 38 having completed the study, 20 in the LymphaTouch® group (7M, 13F) and 18 in the sham treatment (11M, 7F). There was no significant between group effects ($p=0.26$) for pain, however there was a main effect for time ($p<0.0001$, eta: 0.34, Observed Power: 0.988) with a 10.04% ($d=0.34$) decrease from baseline (7.071.9) to post-treatment (6.362.15). A significant time x group interaction ($p=0.001$, eta: 0.27, Observed Power: 0.945) demonstrated a 18.5% ($d=0.59$) pain reduction with LymphaTouch® Group from baseline (7.02.03) to post-treatment (5.72.3). There was no significant ($p=0.16$) change over time for the Sham Group. For trunk flexion ROM, there was no significant between group effects

Graded Negative Pressure: Does It Have A Place In The CDT Treatment Model?

Donahue, P. & Donahue, M. J. 2019. 9th Conference of the International Lymphoedema Framework

Objective: To test the hypothesis that mobilization of protein-enriched hardened tissue using graded negative pressure therapy in conjunction with CDT will improve patient-valued functional outcomes compared to CDT alone.

Methods: Six patients with advanced secondary arm or leg lymphedema received sequential CDT with and without graded negative pressure therapy. Therapy was provided by the same trained lymphedema physical therapist. Patient Specific Functional Scale (PSFS) outcome measure was evaluated pre and post the course of treatments.

Results: Patients improved with both conservative therapies. PSFS scores support all six patients' expressed thoughts of greater improvement when graded negative pressure was utilized in their care. They felt tissue softer, lymphedema easier to manage and limb feeling lighter with less pain.

Conclusion: In this pilot study, the inclusion of graded negative pressure therapy with CDT provided further improvements in patient valued outcomes than CDT alone. Further investigation is needed to evaluate

Significant Improvement In Quality Of Life After Treatment Of Lower Extremity Lymphedema With Negative Pressure Application

Mackenzie, A. & Donahue, P. 2019. 26th World Congress of Lymphology. September 2017

Abstract: The patient case presented was conducted to assess if CDT combined with PhysioTouch has a patient—valued- impact on the patient´s expressed pain & quality of life. A 55-year-old female diagnosed with secondary Stage III lower limb lymphedema. She received ten weekly treatments of MLD combined with PhysioTouch treatment, one session lasted 60 minutes. Pain was assessed using the VAS scale, volumetric measurements obtained via perometry, clinical assessment of skin and superficial tissue mobility via palpation, QOL measures: Patient Specific Functional Scale (PSFS) & Lower Extremity Functional Scale (LEFS).

The conclusion was that QOL and pain improved which patient reported and compared to previous courses if CDT treatments. The results indicate that; Pain improved: VAS reduced from 4/10 to 1 /10, PSFS improved by four points, LEFS improved by eleven points

A Clinical Audit to Demonstrate the Use of a Negative Pressure Device in an MLD Sequence to Improve Both Clinical and Patient Perception Treatment Outcomes

Whitaker, J. C. 2015. 25th World Congress on Lymphology. September 7th-11th 2015. San Francisco, USA.

Abstract: Case study that investigates how PhysioTouch in conjunction with Manual Lymphatic Drainage improves lymphatic drainage compared to RCT Bandage studies. The case showed that PhysioTouch with MLD achieved in just four days comparable change in excess limb volume being than RCT Bandage studies performed over 19 days. (Badger et al, 2000). 65-year-old lady with unilateral Primary Lymphedema. PhysioTouch was used on four consecutive days to perform the Casley-Smith MLD method. The lady completed a simple patient self-reported rating scale questionnaire on skin, tissue, visual improvement and range of movement. Limb volumes were recorded using the 4cm tape-measure technique

The change in excess limb volume was 39% and absolute limb volume was 5%. The patient's self-valuation showed improvement in all areas questioned and comments noted were very positive. Overall, the treatment outcomes measured showed favorable results with the change in excess limb volume being comparable to RCT Bandage studies performed over 19 days. (Badger et al, 2000). Tissues were notably softer and visually reduced in size. Range of movement and fit of clothing from a patient's perspective were also improved.

The Benefit of One Session on a Negative Pressure Device When Used in a Manual Lymphatic Drainage (MLD) Sequence in Primary Lymphoedema

Whitaker, J. C. 2015. 25th World Congress on Lymphology. September 7th-11th 2015. San Francisco, USA.

Abstract: Case study that investigates how PhysioTouch in conjunction with Manual Lymphatic Drainage improves lymphatic drainage for primary lymphedema patient. After one-hour treatment, 19% of lost lymphedema was recorded using 4cm tape-measure technique. Also, based on subjective observation tissues were softer and shape improved. A 65-year-old lady with unilateral Primary Lymphedema - stage IIb, was given a one-hour MLD session using the Casley-Smith technique with a NPD. The NPD was set at 80mmHg. Limb volume measurements using the 4cm tape-measure technique were taken and volumes were recorded in milliliters. Measurements were taken immediately before and directly after the treatment.

Actual changes in excess limb volume was measured at 198ml, which indicated that 19% of the lymphedema had been lost in only one hour. Case study concluded that introducing PhysioTouch to MLD substantially reduces the change in limb volume after just one session. Also, the patient rated the treatment very favorably and requested the continuation of future treatments with this device.

A New Vacuum Suction Device For Management Of Lymphedema

Vuorinen, V.-P. & Airaksinen, O. 2009. 22nd International Congress of Lymphology, Program & Abstract book pp. 121. September 21st-25th 2009. Sydney, Australia.

Introduction: Lymphedema of the extremities is a general problem for many medical conditions (post-operative, post-traumatic and after radiotherapy). Manual lymphatic drainage, intermittent pneumatic compression treatment and compression garments are used generally for management of the edema of extremities. However, the efficacy of these therapies has not been established, and depends a lot on the expertise of the caregiver. Aim of this paper is to present a new vacuum suction device for assisting in the therapy of lymphedema.

Methods: According to literature, increasing negative pressure of lymph capillaries, and stimulation of lymphangiomotoricity via deformation of tissues increases the lymph flow and lymph drainage. Based on this theoretical foundation, a new vacuum suction device called LymphaTouch® (HLD Healthy Life Devices Ltd, Helsinki, Finland) was developed. The device consists of a main unit and different sized treatment heads. The main unit is computer controlled which enables constant or pulsating treatment modes and measurement of changes in skin elasticity. With these properties the therapy can be optimized. Controlling the treatment intensity based on the tissue response is also possible.

Conclusion: During classical lymphatic drainage therapy it is difficult to control the compression and suction phase. By using this new device, the pressure conditions in the tissue will be controlled exactly. Also, the therapist induced variability will be reduced. All these facts will influence the quality of treatment.

Management Of Post-Mastectomy Lymphoedema By Novel Vacuum Suction Device, A Case Report

Vuorinen, V.-P. & Airaksinen, O. 2009. 22nd International Congress of Lymphology, Program & Abstract book pp. 118. September 21st-25th 2009. Sydney, Australia.

Abstract: Case study was performed on a 56-year-old female who had overcome mastectomy with lymph node evacuation. In 2002, lymphedema started to develop in patient's right arm and had progressed to stage 2. The patient has received CDT annually and wears a compression sleeve. The patient was treated with LymphaTouch. The manual part of CDT was replaced by therapy given with the LymphaTouch device, except for the handling of lymph nodes which was done manually. The patient received a series of ten treatments lasting one hour each. Arm circumference was measured before and after treatments. Whole body tissue composition was measured by InBody® 720. InBody measurement showed 185 ml reduction in the edematous arm and whole-body fluid decreased by 900 ml (3%). Based on circumference measurement, edema reduced by 3%. The patient graded the treatment as pleasant.

Content of Research Reports

- LymphaTouch And PhysioTouch Treatment As A Part Of Active Physiotherapy: Effect On Pain And Swelling
- Influence Of LymphaTouch® Treatment Method For Pain And Edema In Context Of Active Physiotherapy
- Effect Of PhysioTouch Treatment On Perception Of Doms And Recovery After Heavy Resistance Exercise

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LymphaTouch And PhysioTouch Treatment As A Part Of Active Physiotherapy: Effect On Pain And Swelling

Hietanen, S., Puustinen, T., Jouhki, I., Palomäki, K. & Taskinen, T. 2014. Internal report

Abstract: The target of this study was to chart the effectiveness of LymphaTouch® and PhysioTouch® as part of active and conservative physiotherapy. The study focused on examining the change in pain during the treatment period and in the change in swelling. In addition, the need for pain medication and the change in the need for pain medication was defined.

As a basis for the study, preliminary research carried out in 2010 was used. The results of this previous study showed that it was justified to expand the study to this second phase. A total of 37 rehabilitation and physiotherapy professionals participated in the study in Finland. Altogether 202 patient cases were reported from different treatment areas with upper groups of leg, arm, mid-body, and the neck and shoulder area which were then divided in more detail into subgroups based on symptoms. The treatment periods and treatment session durations of the patients varied according to the real treatments.

The results have been reported from situations corresponding to heterogeneous and actual treatment situations. The changes in the VAS scale was the factor studied with the most detail in this study. The result was that the VAS change in all the patients groups was significant; 30%. The individual patient experiences of using PhysioTouch and LymphaTouch as part of the treatment course were primarily positive.

Influence Of LymphaTouch® Treatment Method For Pain And Edema In Context Of Active Physiotherapy

Airaksinen, O., Vuorinen, V.-P. & Raittila, S. 2011 Internal Research Report

Abstract: A pilot study that concentrates on analyzing how LymphaTouch treatment influences pain and edema in conjunction with active physiotherapy. Total of 18 patients were analyzed. For some patients over 50% pain reduction was recorded.

The purpose of this study was to investigate how the introduction of a 20-minute LymphaTouch treatment to a standard active therapy session changes edema and pain. Pain was recorded with the standard VAS scale and edema with measurement bands, by palpation, and by visual observation. The study included 18 patients with neck-shoulder, knee, wrist, and elbow pain. Three wrist patients were excluded from data as their therapy did not include LymphaTouch treatment. Each patient had a doctor's referral for active physiotherapy.

Research data from a total of 66 therapy sessions were analyzed for all the indications. Researched showed that already 20-minute use of LymphaTouch was effective and for some patients even 50% pain reduction was recorded

Effect Of PhysioTouch Treatment On Perception Of Doms And Recovery After Heavy Resistance Exercise

Nummela, A. & Mikkola, J. 2013. Research Institute for Olympic Sports -KIHU, Jyväskylä.

Background: Delayed muscle soreness (DOMS) is a familiar experience for the athletes. A number of treatment strategies have been introduced to help alleviate the severity of DOMS and to speed up the recovery of the muscles, but still exercise is most effective means of alleviating pain during DOMS. The present study was planned to investigate where the PhysioTouch treatment alleviates the severity of DOMS, speeds-up the elimination of muscle trauma and inflammatory markers and speeds-up the recovery of force production after heavy resistance exercise in recreational athletes.

Methods: A group of 14 recreational strength athletes performed 5 x 10 repeated maximum squat twice: with or without the PhysioTouch treatment (PTT and NOT, respectively) during four days of recovery. The maximal force production was measured with isometric leg press test and countermovement jump before and after the squat exercise and during four days of recovery. Furthermore, muscle trauma and inflammatory markers were measured before and after the squat exercise and four days during the recovery. The blood markers were leukocytes, CK, LDH, Mb, CRP and cortisol. Subjective perception of DOMS was rated on a visual analog scale from 0 to 100 mm.

Results: Maximal isometric force and the height of countermovement jump decreased significantly ($P<0.001$) but no significant difference was observed between NOT and PPT. Subjective perception of DOMS increased significantly after the squat exercise ($P <0.001$) and reached the highest value two days after exercise. DOMS was significantly lower in PTT than not three days after squat exercise ($P<0.05$). All blood markers except CRP increased significantly during squat exercise but there were no significant differences between PTT mand NOT ($P<0.05$).

Conclusion: The result of this study indicate that PTT decreased the perception of DOMS after a strenuous squat exercise in recreational strength athletes. However, PTT did not speed up the elimination of muscle trauma markers after squat exercise and PTT did not influence on the recovery of force production in athletes who were to strength training.

Lymphatic Therapy Using Negative Pressure, A Clinical Study With The LymphaTouch Device

Vuorinen, V.-P., Iivarinen, J., Jurvelin, J. & Airaksinen, O. 2013. Research Report #5320003/221, Finnish Funding Agency for Technology and Innovation, August 2013.

Abstract: A clinical study comparing lymphatic therapy administered on breast cancer lymphedema patients with a negative pressure device to manual lymph drainage (MLD) therapy. Aim was also to verify the physiological effects of LymphaTouch therapy in swollen tissue and to establish the safety of lymphatic therapy administered with the LymphaTouch device. Research showed that LymphaTouch reduced over 3x more limb volume than MLD. Also, patient degree of disability (DASH) reduced by 30% and Quality of Life (FACT-B) improved by 14%.

The study consisted of 13 female patients, seven treated with LymphaTouch and six with MLD (Vodder method). Each patient had undergone mastectomy involving removal of the axillary lymph nodes and been diagnosed with lymphedema of an upper extremity as a result. Both patient groups were treated 10 times by the same therapist. Total treatment time was 90 minutes, out of which 60 minutes was used for lymphatic therapy. The treatment also included arm measurements and standard compression bandaging. The only difference between the two groups was the type of lymphatic therapy administered, either MLD or LymphaTouch. The study was funded by European Union.

The results of the treatment were measured using various methods, including volumetric limb measurement, limb circumference, MRI measurement of limb volume, tissue stiffness, and body composition analysis (InBody). Additionally, patient degree of disability was assessed using FACT-B and Quality of Life using DASH questionnaires. The study results showed significant improvement using LymphaTouch over MLD for both objective and subjective measurements. MRI measurement showed over 3x improvement in limb volume reduction (2% MLD vs. 7% LymphaTouch) and skin stiffness was improved mby over 4x (2% MLD vs. 9% LymphaTouch). Patient's quality of life was improved nearly 3x more for LymphaTouch group of patients (5% MLD vs. 14% LymphaTouch). While MLD showed no change for degree of disability, LymphaTouch group reported over 30% reduction (0% MLD vs. 30% LymphaTouch).

Content of Degree Thesis

- LymphaTouch® treatment method for the symptoms of osteoarthritis of the knee
- Effect of LymphaTouch Treatment on Pain, Swelling and Range of Motion in the Acute Phase of Ankle Ligament Injury
- The Effects of LymphaTouch Treatment Method After Ankle Sprain
- The Effect Of The LymphaTouch Treatment Method On Recovery After Heavy Hypertrophic Resistance Exercise
- Perceived Recovery Of American Football Players After LymphaTouch Treatment
- Effect Of Lympha System Activation In Athletes' Recovery
- Is LymphaTouch-Treatment Effective For Shin-Splint? A Quantitative Study On Patients' Experience
- The Effectiveness Of LymphaTouch-Treatment In Carpal Tunnel Syndrome

LymphaTouch® treatment method for the symptoms of osteoarthritis of the knee

Saloranta, E. & Korhonen, M. 2021 . Thesis for Degree Programme in Physiotherapy, Bachelor of Healthcare. Oulu University of Applied Sciences.

The purpose of this thesis was to describe experiences of the trial subject of LymphaTouch® treat-ment for osteoarthritis of the knee and measure possible changes in inflammation and range of motion restrictions during the treatment period. This thesis is case study of one study subject who suffers from osteoarthritis of the knee. Our goal was to produce information for LymphaTouch Oy of one case about how LymphaTouch® treatment can be used for treating the symptoms of osteo-arthritis of the knee. Our learning objective was to develop the skills needed to conduct research and to learn more about physical treatments.

The trial subject underwent five treatments during the two-week treatment period with the Lympha-Touch® treatment method. The subject completed the WOMAC questionnaire before the first treat-ment session and after the last treatment session. The perimeter of the study subject's symptomatic knee and the range of motion in the directions of extension and flexion were measured before and after each treatment session. In addition, the study subject wrote a free-form diary during the treat-ment period in which he wrote about his functional abilities and the pain and stiffness of the symp-tomatic knee.

The research results of the case study were obtained and presented by means of a quantitative and qualitative research method. The results of the WOMAC questionnaire completed by the study subject before and after treatment were calculated according to the calculation guidelines devel-oped for it, and the results were compared with each other. The research results obtained from the measurements of knee joint edema and movement restrictions were presented in the form of dia-grams and opened in the text. The study subject's experiences during the treatment period were described using a diary written by the study subject and a table of exercise times during the treat-ment period was compiled.

According to the results of the case study, the study subject felt a reduction in knee pain, stiffness, and functional impairment. The study subject felt that during the treatment period, physical activity did not produce as much pain as before. However, there was not such a large change in the amount of range of motion and swelling that would explain the study subject's feelings. The case study was conducted in collaboration with a physiotherapist for ethical and patient safety reasons.

Effect of LymphaTouch Treatment on Pain, Swelling and Range of Motion in the Acute Phase of Ankle Ligament Injury

Kaipainen, A. & Ravaska, I. 2020. Thesis for Degree Programme in Physiotherapy, Bachelor of Healthcare. Lapland University of Applied Sciences.

Abstract: The purpose of this thesis was to test the effects of LymphaTouch® treatment on the acute phase symptoms of secondary or tertiary ankle ligament injury, i.e. pain, swelling and the limited mobility of the joint. The aim was to provide LymphaTouch Inc with information on one case of how LymphaTouch treatment affects the symptoms of the acute phase of the ankle ligament injury. From the customer perspective, the aim was to intensify rehabilitation so the customer could return to her sport as quickly as possible. In addition, the aim was to bring more information to the entire physiotherapy field about one health technology device and to give physiotherapists information about LymphaTouch® treatment. The aim was also to improve our own skills needed in the research process and our own professional expertise in physiotherapy.

The research was carried out as a case study and the results were collected and presented by means of quantitative research. Target person for the case study was found by mapping sport clubs and organisations in Rovaniemi. When the target person who met the study criteria was found, a two-week intervention period was started, in which LymphaTouch® treatments were conducted every three days. Same measurements were done every treatment time, before and after. After the intervention period, research results were analyzed by reviewing research results of one treatment time and of the whole intervention period. In the analysis the individual variables were under review. The results were presented in the form of diagrams and tables. Based on the results of the study, in this case LymphaTouch® treatment could reduce swelling and increase range of motion in the ankle ligament injury in every treatment time. There was no consistent evidence of pain in a one singular treatment session. However, when looking at the whole intervention period, the pain decreased significantly

The Effects of LymphaTouch Treatment Method After Ankle Sprain

Mäkinen, L. & Kosonen, S. 2019. Thesis for Degree Programme in Podiatry, Metropolia University of Applied Sciences.

Abstract: The purpose of this thesis was to provide a protocol for the use of the LymphaTouch treatment method in the aftercare of a sprained ankle for a case study. Another purpose was to consider other possible uses of the device in podiatry. The thesis was carried out in cooperation with LymphaTouch, a Finnish healthcare technology company. Ankle sprain is one of the most common musculoskeletal injury, and we wanted to explore possible new ways to improve its rehabilitation. In our work, we used upper and lower ankle joint mobility and ankle circumference as measurements.´Based on our theoretical knowledge, we designed a protocol to treat ankle sprain and selected appropriate gauges for it.

The Effect Of The LymphaTouch Treatment Method On Recovery After Heavy Hypertrophic Resistance Exercise

Kuronen, S. 2014. B.Sc. Thesis for Degree Programme in Physiotherapy, JAMK University of Applied Sciences.

Abstract: The purpose of this study was to investigate whether LymphaTouch® treatment speeds up the recovery after heavy hypertrophic resistance training with men doing recreational strength training. This thesis was part of the LymphaTouch 2013-project which was implemented in cooperation with the Research Institute of Olympic Sports (KIHU), HLD Healthy Life Devices Oy and the University of Jyväskylä. The aim of the study was to gain reliable research data on the impact of LymphaTouch® treatment.

The purpose of this thesis was to determine the impact of the LymphaTouch® treatment and the function of the lymphatic system. In this study, recovery was examined based on the muscle trauma and inflammation markers in the blood samples, force production and subjective recovery sensations. In addition, swelling of the lateral thigh muscle was examined by using ultrasound. 14 recreational athletes completed two research weeks. During one week, they were treated with LymphaTouch® device according to a strict recovery protocol after resistance training for three recovery days. On the fourth recovery day, only recovery measurements were performed. During the other week, the subjects did not receive any treatment. Hence, each subject also had the role of being a control subject and their recovery was compared between two weeks. The order of the weeks was randomized so that seven subjects received treatment on the first research week and remaining seven subjects on the second week.

The results of this study indicated that LymphaTouch® treatment did not speed up the elimination of muscle trauma or inflammation markers. The muscle trauma marker creatinine kinase (CK) was even higher on the third recovery day of the treatment weeks. However, the subject had less delayed muscle soreness (DOMS) and they felt more recovered during the treatment week. The treatment did not influence on the force production, and no explanations could be found for the athletes' personal recovery sensations.

Perceived Recovery Of American Football Players After LymphaTouch Treatment

Hyvönen, H. & Salonen, E. 2013. B.Sc. Thesis for Degree Programme in Podiatry, Metropolia University of Applied Sciences.

Abstract: The aim of this study was to examine if LymphaTouch® treatment method, which activates the superficial lymphatic capillary network, is suitable for the American football players' re-covery between practices. There was a need for this kind of study because more knowledge about the possibilities of LymphaTouch® treatment method is needed. The cooperation partners in our thesis were HLD Healthy Life Devices Oy, the developers of LymphaTouch® treatment method and Kir-Fix Oy who lent us the LymphaTouch® equipment. In addition, Vantaa TAFT was our cooperation partner and our study sample consisted of eight of the team's players. The treatment period was executed in April and May 2013 and the treatment was given in the team´s sport stadium facilities after practices. The suitability of LymphTouch® treatment method was estimated by players after the treatment: they compared their recovery after LymphaTouch® and without it. Both quantitative and qualitative methods were used in this study. The material was collected by using questionnaires.

The results of this study showed that especially experiencing muscle stiffness but also muscle soreness decreased among players after LymphaTouch® treatment compared to recovery without treatment. The treatment did not seem to have any effect on performance. According to most players LymphaTouch® treatment is suitable for enhancing recovery. The results of this study are quite promising but because of the small study sample the results can't be generalized. These results can be utilized by the users of LymphaTouch®, for example podiatrists, physiotherapists and lymph therapists

Effect Of Lympha System Activation In Athletes' Recovery

Sanelma, H. 2013. B.Sc. Thesis for Degree Programme in PhysioTherapy, School of Healhcare, Rovaniemi University of Applied Sciences.

The aim of this study was to gather information of the positive effects of using lymphatic system activation for athletes recovery from daily training. Test subjects were athletes from Finnish junior and A- national team of Nordic combined. The activation of lymphatic system was done with LymphaTouch® device using recovery treatment protocol. The results of this study are based on subjective experience of test subjects. Purpose of this study was to give new information about using LymphaTouch® in sports for study commissioner, HLD Ltd. Quantitative research method was used in this research. During the intervention, test subjects were answering to questionnaire for their daily experience of training strain, recovery and their subjective benefits from the treatment. The test subjects were 15-21- year-old active national team level athletes. The intervention was carried out on the Finnish national teams last training camp preparing them for the season. The results of this research show that the athletes felt the recovery treatment with LymphaTouch® device benefited their training with better recovery.

Is LymphaTouch-Treatment Effective For Shin-Splint? A Quantitative Study On Patients' Experience

Moilanen, T. & Päivänen, J. 2012. B.Sc. Thesis for Degree Programme of PhysioTherapy, Social Service, Health and Sports, Savonia University of Applied Sciences.

Abstract: The purpose of this thesis was to determine how LymphaTouch® treatment effects on anterior leg pain and physical exercise among research group. The aim of the study was to examine, whether research persons leg pain was reduced and whether their moving ability was increased during the treatment. Pain was evaluated during palpation, walking, running and on rest. Moving ability was examined by person's subjective disadvantage to exercise caused by shin splint, and by painless walking and running distance. The aim was also to gather experience of LympaTouch® treatment on general level.

Twenty research persons received six LymphaTouch® treatments in period of three weeks, all with identical treatment procedure. The measurements for the study were made just before the first, and after the last treatment. The instrument for this trial was developed based on previous studies and theory. NRS-scale was used for measuring pain. Research group consisted of women and men, aged mostly from 18 to 30. Persons exercised regularly and suffered from anterior leg pain, which was increased after exercise and had existed at least a week.

When compared the means of existing pain, there was reduction on every measured aspect, especially in cases of pain on rest and during running. Disadvantage to exercise caused by shin splint, was reduced. Painless walking distance was increased among 40 %, and painless running distance among 25 % of research persons. 65 % of research persons told that they experienced at least a little help from LymphaTouch® treatments as 10 % told they received no help at all. The trial suggests that there might be use for LymphaTouch® treatment in care of shin splints though further study should be made with larger research group and more controlled trial.

The Effectiveness Of LymphaTouch-Treatment In Carpal Tunnel Syndrome

Röntynen, J. & Tuomainen, M. 2011. B.Sc. Thesis for Degree Programme of PhysioTherapy,

Social Service, Health and Sports, Savonia University of Applied Sciences.

Abstract: The purpose of this study was to determine effectiveness of LymphaTouch® treatment in Carpal Tunnel Syndrome. The study subjects were applied by advertisement and private persons who had very likely the carpal tunnel syndrome were included in the study. Ten study subjects were participating in this study, and six of them had the treatment in both wrists. Therefore, the sample size of this study was 16 wrists (n=16). Seven wrists were diagnosed by a doctor. LymphaTouch® treatment was given six times to the study subjects with model of carpal tunnel treatment. Treatment was given 2-3 times a week on average. In first and last course of treatment the study subjects filled the initial and the final questionnaires and they were tested with the initial and the final measurements. After three weeks from the last course of treatment the study subjects filled another final questionnaire. The effect of treatment to the symptoms and hand function were determined in questionnaires and measurements. In questionnaires the study subjects evaluated the volume of symptoms with visual analogue scale. Hand function was measured with Jamar the hand grip strength meter, Pinch the thumb opposition strength meter, goniometer and Phalen's, Tinel's and Tetron's provocative tests. Numeric study material was analyzed by counting arithmetic means and ranges. Open questions were analyzed by itemizing the contents. LymphaTouch® treatment effected individually and the differences in treatment effects between the study subjects were high. LymphaTouch® treatment reduced experienced symptoms (50 %) and hand function improved on average except hand grip strength. In addition the degree of disability to symptoms in daily living reduced (51 %). LymphaTouch® treatment reduced the symptoms of carpal tunnel syndrome and improved the hand function at least in short-term. LymphaTouch® treatment is worth of trying as alternative conservative treatment. More research is needed because the sample size of this study was small.

This device helped me, and it saved my life

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Tammy Woodham was diagnosed with stage III tongue cancer that relapsed two and a half years later with multiple metastasis in her head- and neck-area.

She worked long time with a physical therapist to treat the swelling that was caused by cancer treatments and found out that she has a disease called secondary lymphedema.

LymphaTouch immediately released all the pressure that Tammy has had in her chest for a long time and she felt herself free again. She can move and talk much better than before LymphaTouch® treatments.

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My hands wish I had discovered this device years ago

The application of the LymphaTouch® is not only an asset for patient care (always the primary objective in my mind) but also alleviates stresses on the hands of the therapist. My hands wish I had discovered this device years ago and whilst it cannot reverse the arthritic changes that have already occurred in my fingers, it most certainly will minimise further deterioration and already has reduced the pain I previously experienced on a daily basis.

Natalie Perkins
Principal Physiotherapist & Owner Bodyworks Physiotherapy, Australia

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LymphaTouch© is one of the best negative pressure devices in the market for its portability and its durability, just what Football needs.

It is a great addition for hands on treatment which allows you to reach deeper levels than just hands on alone.

Jose Luis Rodriguez Robledo, PT

Former First Team Physiotherapist at Liverpool FC

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LymphaTouch is an integral technology for professional surfers

From abdominal scar tissue remediation to promote intra abdominal pressure, to preventatively optimizing fascial plane function in and around bony prominences like the Pelvis, Hip and Knee the LymphaTouch© has become an integral technology on tour. It is perfect for acute injury recovery through facilitating lymphatic decompression.

Dr Chris Prosser B.Sc. B.App.Sc.(Chiro). C.C.S.P
Medical Director, World Surf League

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