

# CLINICAL STUDIES

**Lympha Press**

## Lympha Press® Compared With In-Clinic Manual Lymph Drainage

This randomized trial compared Lympha Press® to MLD performed in-clinic. Lympha Press® and MLD were equally effective at reducing swelling. (Study funded by research grants from the Cancer Foundation of Sweden)

*A randomized study comparing manual lymph drainage with sequential pneumatic compression for treatment of postoperative arm lymphedema.*

PUBLICATION: K. Johansson, E. Lie, C. Ekdahl, J. Lindfelt. Department of Physical Therapy and Department of Surgery, University Hospital, Lund, Sweden., (1998) *Lymphology*, 31, 56-64.

STUDY SIZE: 28 patients

Manual lymph drainage (MLD) was compared with Lympha Press® for treatment of unilateral arm lymphedema in 28 women previously treated for breast cancer. Following two weeks of therapy with a standard compression sleeve with maintenance of steady arm volume, patients were randomly assigned to either of two treatment regimens (MLD performed according to Vodder technique for 45 min/day, and Lympha Press® with a pressure of 40-60 mmHg for two hours/day). Both treatments were carried out for two weeks.

RESULTS: MLD and Lympha Press® each significantly decreased arm volume but no significant difference was detected between the two treatment methods.

## Lympha Press® Combined With In-Clinic Manual Lymph Drainage

Patients with severe lymphedema and shoulder pain were treated with Lympha Press® and in-clinic MLD. Treatment decreased arm volume by an average of 170 ml, improved arm mobility and dramatically reduced pain.

*Severe lymphedema of the arm as a potential cause of shoulder trauma.*

PUBLICATION: R. Avrahami, E. Gabbay, B. Bsharah, M. Haddad, A. Koren, J. Dahn, A. Zelikovski. (2004) *Lymphology*, 37, 202-205.

STUDY SIZE: 10 patients

This study assessed the role of lymphatic physical therapy in reducing disabling shoulder pain in patients with lymphedema of the shoulder. Ten women with arm lymphedema after surgery for breast cancer were examined. All had shoulder pain. Five patients had a tear in the supraspinatus muscle and five had chronic bursitis. Treatment consisted of manual lymph drainage and pneumatic compression with Lympha Press®.

RESULTS: The combined treatment reduced arm volume by an average of 170 ml, with improvement of arm mobility and a drastic reduction in shoulder pain. Lymphedema of the arm can cause severe shoulder trauma, pain and disability. Proper treatment can reduce these effects. Patients should be referred for early treatment and follow-up to avoid permanent damage to the shoulder muscles.

Adding Lympha Press® advanced pneumatic compression to an abbreviated in-clinic MLD session provided the same treatment results as a longer session devoted exclusively to manual therapy.

*Intermittent pneumatic compression acts synergistically with manual lymphatic drainage in complex decongestive physiotherapy for breast cancer treatment-related lymphedema.*

PUBLICATION: G. Szolnoky, B. Lakatos, T. Keskeny, E. Varga, M. Varga, A. Dobozy, L. Kemény. (2009) *Lymphology*, 42, 188-194.

STUDY SIZE: 27 patients

This study investigated whether the combination of Lympha Press® with manual lymph drainage (MLD) could improve complete decongestive physiotherapy (CDT) treatment outcomes in women with secondary lymphedema after breast cancer treatment. A randomized study was undertaken with 13 subjects receiving MLD (60 min) and 14 receiving MLD (30 min) plus Lympha Press® (30 min) followed by standardized

components of CDT including multilayered compression bandaging, physical exercise, and skin care 10 times in a two-week-period. Efficacy of treatment was evaluated by limb volume reduction and a subjective symptom questionnaire at the end of the treatment, and one and two months after beginning treatment. The two groups had similar demographic and clinical characteristics. Although a significant decrease in the subjective symptom survey was found for both groups compared to baseline, no significant difference between the groups was found at any time point.

**RESULTS:** The application of Lympha Press® with MLD provides a synergistic enhancement of the effect of CDT in arm volume reduction.

## Lympha Press® Combined With In-Clinic Manual Lymph Drainage, Bandaging, And Exercise

This case report describes in-clinic reduction of massive lower extremity lymphedema resulting in a total weight loss of 179 lbs.

### *Treatment of monstrous elephantiasis.*

**PUBLICATION:** F-J Schingale, (1999) *Lymphologie in Forschung und Praxis*, Special edition.

**STUDY SIZE:** Case report

Inpatient treatment of a young primary lymphedema patient is described. Patient was bedridden for years due to massive swelling of her legs. Therapy was performed with manual lymph drainage, bandaging, Lympha Press®, and guided exercise in the Lympho-Opt Klinik in Germany. Patient was discharged after six months with a reduction of 81.2 kg (179 lbs).

**RESULTS:** Combination therapy with MLD and Lympha Press® is effective in treating an extreme case of lymphedema.

## Lympha Press® And Protein Uptake

This imaging study demonstrated that Lympha Press® treatment increases lymph transport and protein uptake in the affected extremities.

### *Experimental studies on the efficacy of pressure wave massage (Lymphapress) in lymphedema.*

**PUBLICATION:** H. Partsch, A. Mostbeck, G. Leitner. (1981) *Z. Lymphology*, 5(1), 35-9.

Isotopic lymphography was performed on several patients before and after treatment with Lympha Press®. Labeled albumen was also injected to determine speed and extent of protein transport. Limb volume was measured before and after treatment. There was a significant volume reduction. The Lympha Press® was tested against the Jobst single cell pump, and the tracer was transported much more rapidly than with the single cell pump, peaking at five minutes of treatment. Tissue albumen was reduced. The water component of the edema was reduced more rapidly.

**RESULTS:** Lympha Press® sequential pneumatic compression treatment improves lymph transport and removes proteins. Compression garments should be worn in between treatments.

In this study, treatment with intermittent pneumatic compression (IPC) facilitated radiocolloid transport to the proximal portion of the limb and in the lymphatics, and propelled tracer from the injection site to the lymphatics.

### *Factorial analysis in radionuclide lymphography: assessment of the effects of sequential pneumatic compression.*

**AUTHORS:** F. Baulieu, J.L. Baulieu, L. Vaillant, V. Secchi, J. Barsotti. (1989) *Lymphology*, 22(4), 178-185.

**STUDY SIZE:** 12 patients

The effects of intermittent pneumatic compression (IPC) in 12 patients with lower or upper limb lymphedema were studied using a computer-based technique (factorial analysis) of dynamic lymphoscintigraphy. After subcutaneous injection of radiocolloid into the first interdigital web space of the arm or leg, scintigraphic recordings consisted of 40 consecutive one-minute frames of both lower extremities or an edematous upper extremity. Pneumatic compression by Euroduc (six patients) or by Lympha Press® (six patients) was applied during the final 20 minutes of the recording. A three factors factorial analysis (FA) was performed successively for each extremity. FA allowed "uncontaminated" curves to be displayed distinct from neighboring structures and corresponded to dynamic tracer activity in the interstitium, at the injection site and within lymphatic vessels. Based on the results of lymphatic vascular factorial analysis, a beneficial effect of IPC was detected in 18 of 22 limbs examined. FA processing suggested that IPC facilitated radiocolloid transport in the proximal portion of the limb and also propelled the tracer from the injection site toward the lymphatics.

## Inpatient Reduction With Lympha Press®

**In this study, patients obtained safe and rapid reduction averaging 45% loss in circumference. Follow up at three and six months showed that patients who were compliant with compression garments maintained 50% or more of their reduction.**

### *Sequential pneumatic compression for lymphedema: a controlled trial.*

PUBLICATION: Richmand DM, O'Donnell TF Jr, Zelikovski A. (1985) *Arch Surg*, Oct, 120(10), 1116-1119.

STUDY SIZE: 25 patients

A prospective study of seven patients with upper extremity and 18 patients with lower extremity lymphedema was performed. Treatment was applied for 24 hours in an inpatient setting. All extremities showed a decrease in circumferential measurements. Lower extremity leg volume was reduced by 45%. No elevation in serum muscle enzyme levels was noted. The Lympha Press® reduced lymphedema rapidly and safely. Follow up at three to six months after treatment showed that patients who were compliant with use of static compression garments maintained retention of 50% or more of their reduction.

**This study in a group of 49 patients showed that treatment of lymphedema with Lympha Press® and compression stockings was associated with long-term maintenance of reduced limb girth in 90% of patients.**

### *Long-term results of compression treatment for lymphedema.*

PUBLICATION: C.J. Pappas, MD, and T.F. O'Donnell Jr., MD, FACS. (1992) *Journal of Vascular Surgery*, 16, 555-564.

STUDY SIZE: 49 patients

The long-term courses of 49 patients managed by one surgeon were reviewed to assess the long-term effects of a program entailing (1) sequential external pneumatic compression (SEP), (2) elastic compression stockings to maintain the post-SEP girth, and (3) daily skin care. Limb girths measured at nine levels on the limb were obtained serially in follow-up visits (mean: 25 months) by an independent observer to provide an objective response to therapy. The relative reduction was determined by the difference between the pretreatment, postacute treatment, and long-term treatment girths. In long-term follow-up, 26 of the patients maintained a full response (reduction at >3 levels), whereas 10 maintained a partial response (reduction at ≤3 levels). At late follow-up, calf and ankle girths were reduced by an absolute value of 5.37 ± 1.01, and 4.63 ± 0.88 cm in the full-response group and 5.43 ± 1.58 and 3.98 ± 1.18 cm in the partial response group over pretreatment measurements. The degree of subcutaneous fibrosis in relationship to the duration of the edema appeared to influence results greatly. The treatment of lymphedema with SEP and compression stockings is associated with long-term maintenance of reduced limb girth in 90% of patients.

## Pneumatic Compression For Self-Management At Home

**This survey found that 100% of patients using pneumatic compression in the home rated pneumatic compression more effective than self-applied MLD, bandaging, elastic/rigid and quilted compression.**

### *Practical lymphedema self-management: An assessment of patient satisfaction and perceived effectiveness of treatment modalities.*

PUBLICATION: K.Ashforth, J. Cosentino. (2012) *Lymphology*, 45 (Suppl), 367-370.

STUDY SIZE: 30 patients

The purpose of this study was to examine preference for, and compliance with home treatment modalities for individuals living with lymphedema. Thirty people with lymphedema resulting from cancer with surgery and lymph node excision were surveyed for satisfaction and compliance with their home care regimen. All had received treatment with compression, skin care, elevation, exercise and training in self-performance of manual lymphatic drainage (MLD). Those surveyed carried out individualized home programs which included self-MLD, bandaging, elastic, quilted and rigid compression garments, and use of an intermittent pneumatic compression pump (IPC). Those who had access to all modalities (based on insurance coverage) rated pneumatic compression most effective (100%) followed by quilted compression (72.7%) and MLD and elastic compression (each 63.6%).

**This review article summarizes the uses, recommendations and benefits of pneumatic compression therapy at home.**

**PROPER PRESSURE: Transitioning lymphedema patients to home care with pneumatic compression.**

PUBLICATION: K.Ashforth, (2012) *Advance for Physical Therapy and Rehab Medicine*, 23(15), 19-21.

This article describes the application and use of Lympha Press® pneumatic compression for home care, including types of systems, criteria for selection, insurance coverage issues, contraindications and choice of pressure. If edema is limited to the extremities, an extremity-only appliance is usually sufficient and has the advantage of being lower profile and easier to comply with. However; if the lymphatic system in the trunk is damaged, it needs treatment as well. Appliances have been developed to treat the trunk and torso. Pneumatic compression can be particularly effective for patients who have widespread edema or have limited range of motion, strength and endurance. Patients using pneumatic compression at home have high compliance and satisfaction levels.

**RESULTS: As an adjunctive treatment for appropriate patients, pneumatic compression is an effective tool for achieving decongestion in both the acute and maintenance phases of treatment. Its high degree of patient acceptance, as well as availability, make it a valuable treatment option.**

**This clinical report describes successful home therapy with Lympha Press® pneumatic compression, exercise, compression and education, maintaining a 2-year circumferential reduction of 23%.**

### *Home therapy for lymphedema*

PUBLICATION: A. McLeod, (1989) *Home Health Care*, Summer, 18-19.

A description of a home lymphedema treatment program for children, as applied by the Hospital for Sick Children in Canada. Lympha Press® pneumatic compression treatment was applied at home after an in-patient assessment. Lympha Press® treatment was provided according to an individualized routine, with the limb in elevation, use of a recommended compression garment, specific exercise, education, skin hygiene and infection prevention. All components of the home program must be followed if the benefit is to be maximized. Six of nine patients were followed for two years and showed a positive response to the full regime, with a mean decrease in involved limb circumference of 23%. Pneumatic compression treatment as an adjunct to a conservative home program offers a much needed advancement to the medical management of lymphedema.

## Lympha Press® and Lympha Pants™ Used With Complete Decongestive Therapy For Lipedema

**In this study, treatment with MLD, compression therapy and Lympha Press® with Lympha Pants™ reduced leg volume, capillary fragility and pain associated with lipedema.**

### *Lymphedema treatment decreases pain intensity in lipedema.*

PUBLICATION: G. Szolnoky, E.Varga, M.Varga, M.Tuczai, E. Dósa-Rácz, L. Kemény. (2011) *Lymphology*, Dec;44(4), 178-82.

STUDY SIZE: 38 patients

Lipedema is a disproportional obesity featuring light pressure-induced or spontaneous pain. On the basis of our clinical observations, lymphedema therapy, as practiced in our clinic, reduces the perception of pain beyond leg volume reduction. We therefore aimed to measure pain intensity prior and subsequent to treatment. Thirty-eight women with lipedema were enrolled in the study with 19 patients undergoing treatment and 19 serving as the control group using exclusively moisturizers. Treatment consisted of once daily manual lymph drainage (MLD), intermittent pneumatic compression (IPC), and multilayered short-stretch bandaging performed throughout a 5-day-course. Pain was evaluated with a 10-item questionnaire, a pain rating scale (PRS), and the Wong-Baker Faces scale. Treatment resulted in a significant reduction of pain with a decrease in mean scores of all three measures. In the control group, only PRS showed significant decrease.

**RESULTS:** This treatment regimen not only reduces leg volume and capillary fragility, but also reduces pain intensity in patients with lipedema

This article describes the use of Lympha Press® with Lympha Pants™ as part of a postoperative therapeutic regimen to prevent lymphedema after liposuction for lipedema.

## *Therapeutic concepts to prevent lymphedema after lymphological liposculpture in lipedema.*

**PUBLICATION:** F-J. Schingale. (2006) *Orthopaedie Technik*, September.

This report describes operative liposuction and postoperative therapies applied to attain results. Postoperative therapies include modified manual lymph drainage for the first day to prevent transport of anesthetic into the circulation. This is followed by bandaging. Over the next few days, manual lymph drainage, bandaging and pneumatic compression with Lympha Pants™ are applied. After the series of liposuction procedures are complete, the patients are given flat-knit compression garments to wear for six months. Liposculpture is not completely without risks and side effects. However, these can be considerably reduced.

**RESULTS:** High quality surgical competence together with pre and postoperative care offer the best conditions for the outcome of the procedure and rule out postoperative complications, particularly the development of lymphedema, as much as possible.

## Results

### CASE ONE:

Before treatment, during reduction phase, after treatment, and after one year home maintenance. Treatment consisted of Lympha Press®, manual lymph drainage, bandaging and exercise.



### CASE TWO:

Before treatment and after ten days of Lympha Press® treatment.



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