

## Aqua Lymphatic Therapy - An Alternate Approach to Controlling Lymphedema

By: *Dorit Tidhar, MScPT, CLT, ALT*

*McGill University Health Centre Lymphedema Program, Montreal, Canada*

Lymphedema therapy requires full participation by patients. The conventional 'gold standard' therapy of comprehensive decongestive therapy (CDT) begins with an intensive phase in which the patient's limb(s) have to be bandaged for 24 hours every day in order to reduce the swelling. The length of treatment depends on several factors that include severity, staging, complexity of the lymphedema, and the quality of the bandaging. Usually, most of the edema reduces in the first 2 weeks. The patient will complete the intensive phase on reaching a measurement plateau that could take an additional 2 weeks to achieve. In order to maintain the results, the patient needs to be fitted with a garment which she/he will wear during the day<sup>1</sup>; however, recent published literature shows that wearing a garment during the day during the maintenance phase is probably not enough<sup>2-5</sup>.

According to recent studies examining the conventional components of CDT, in addition to wearing the garment during the day, patients need to exercise and to bandage overnight. Unfortunately, adherence rates are disappointing since these treatments are highly demanding. Studies that were published by Lasinski et al in 1994, 1997, and 2002 reported that 52% were able to follow a strict protocol of 24-hour compression and twice-a-day exercise; these patients improved over time. However, those who had less than 75% adherence could not control their lymphedema and got worse over time<sup>2-4</sup>. Moreover, a recent study by Tidhar et al from 2009

showed that 40% of women with upper extremity lymphedema who had 0% adherence got worse over a 3-month period<sup>6</sup>.

The conventional approach has yet to provide long-term solutions for non-adherent patients and for those who cannot follow the full strict protocol. Aqua Lymphatic Therapy (ALT) is a recently-published method that was designed to help people with lymphedema in their maintenance phase to maintain the results of the intensive phase<sup>6-8</sup>.

ALT is a combination of aquatic exercises and a self-massage technique based on the principles of the Casley-Smith remedial exercise program for lymphedema. It integrates principles of lymphatic anatomy and physiology with the effect of immersion and movement in water. ALT incorporates the physical forces of the water, with a major force the hydrostatic pressure (HP). HP applies force with a mechanism comparable to compression garments (applying gradient force from higher to lower pressure). Importantly, the pressure gradient by water exceeds the pressure gradient provided by compression garments. HP increases directly with the depth of water. When immersed, the addition of each centimeter of depth will increase the HP by 0.73 mmHg (1.85 mmHg/inch). For example, the pressure on feet at a depth of 100 centimeters would be 73 mmHg (more than the pressure applied by a class 3 compression garment). This pressure is pleasant and

imperceptible. In addition, the pressure exerted on a body that is immersed in water is equal in all directions at every depth. This is of utmost importance as some parts of the body<sup>9</sup> (i.e. chest & breast, genitals, ankle & wrist, fingers & toes) often do not experience equalized pressure by compression garments or by bandaging<sup>6-8</sup>.

A lymphotome is a skin area that drains lymph fluid into regional lymph nodes. For example, the upper chest lymphotome drains the skin of the arm, front and back chest into the lymph nodes under the armpit. Excess lymph fluid has to pass through healthy lymphotomes and into functional lymph nodes. Immersion in water may be insufficient for treating lymphedema. HP lacks the ability to redirect the lymph fluid to healthy lymphotomes. Therefore the sequence of exercises in ALT is important. First, healthy lymphotomes are activated proximally by breathing exercises in order to clear the reservoir. Second, proximal movements of thorax, abdomen, and shoulder girdle are performed in conjunction with self-massage. Lastly, exercises are performed to clear the affected lymphotomes into the healthy ones by performing self-massage and movements that involve distant joints of the limbs (ankle, wrist etc.)<sup>10</sup>.

The water temperature ranges from 31°C to 33°C (78.8-91.4°F). At this temperature slow limb movement can be performed without increasing the swelling. The buoyancy of the water holds the limb afloat, enabling exercises and self-massage with minimal effort<sup>6-8</sup>.

ALT is a self-treatment in a group setting. The participants are given a chart with their limb measurement results every month to help them decide how best to continue their individual treatment plan. ALT thus provides them with the tools they need to carry out self-treatment at their convenience. The physiotherapist serves as a resource, but does not direct the individual plans of care. This provides opportunities for active self-directed care that may enhance self-motivation, independence, and self-esteem.

In a research study that was published in 2010 (Tidhar et al), women participated in 12 weekly sessions of ALT for arm lymphedema. These women experienced an average reduction of 53ml after the first session and 98ml after the last session, regardless of their severity at the beginning. These immediate results are very good when one considers that lymphedema can be defined as 200ml difference between arms<sup>6</sup>.

In this study<sup>6</sup>, the mean adherence rate to self-management (self-massage, compression garment and/or bandages, exercises) was lower than 30% at entry time and during the study period. Adherence to the ALT was on average 79%. Eighty-six percent of the women adhered to more than 75% of the ALT sessions. This was significantly higher, compared with other self-management therapies. The reasons for that may be: the novelty of the treatment; the fact that the frequency was once-a-week compared to every-day for the self-management elements; the immediate improvement in measurements that the women saw which motivated them to continue; or that the increase in the psychological and social dimensions of quality of life over the three-month period just made the women feel better.

There was no change in mean volume over a 12 weekly session period (overall 3 month of intervention) for the whole group even though there was volume reduction immediately after the sessions. When interviewing each individual, it was found that for those who adhere to a sleeve only during the day time (50% adherence) between sessions, the lymphedema had even improved over time<sup>6</sup>.

Since adherence is crucial for controlling lymphedema, the fact that women could adhere to the ALT much more than the traditional CDT maintenance protocol is promising when trying to reach the portion of patients that have difficulty with the conventional protocol. ALT may benefit many individuals, especially those who have problems controlling lymphedema with the conventional protocol or cannot, or will not adhere to it.

An ideal program for non-adherent patients would be to do the least possible and still achieve and maintain good results. In order for us to help non adherent patients, we need to assess the residual effect of ALT. How long does it take until the influence of the therapy wanes? This question is currently being investigated in an on-going study, in order to provide people with the right dosage for success.

No study has been done on aquatic exercises and lower extremity lymphedema. ALT was assessed in individual case studies and provided good results over time (Thidar, unpublished data). Since gravity plays a big role in increasing volume, people with lower extremity lymphedema require good compression support during the day, regardless of therapy. Participants in ALT who wanted to improve their lymphedema over time needed to apply a garment or bandages to dry skin immediately after a session. From a series of 10 lower-extremity patients, an average reduction of 457ml was noted in therapy periods of 2-6 months.

Until we have more answers from our research studies, patients can participate in the pool exercises, and assess for themselves what is the best frequency and treatment period that keeps their lymphedema under control. It is important to get physician clearance before participating in any pool activity, and to check the sanitary condition of a pool. Interestingly, the bacteria that causes erysipelas (cellulites) is not present in pool water, but is actually harbored on the skin. Intact skin preservation is of utmost importance.

For more information you, visit the website: [www.aqua-lymphatic-therapy.com](http://www.aqua-lymphatic-therapy.com)

Email address: [aqua.lymphatic.therapy@gmail.com](mailto:aqua.lymphatic.therapy@gmail.com)

## References

1. Lymphoedema Framework (2006) Best practice for the management of lymphoedema. International consensus. MEP, London.
2. Boris M, Weindorf S, Lasinski S. Persistence of lymphedema reduction after noninvasive complex lymphedema therapy. *Oncology (Huntingt)*. 1997 Jan;11:99-109; discussion 110, 113-4.
3. Lasinski B, Boris M. Comprehensive lymphedema: management results of a 5 year follow-up. *Lymphology*. 2002;35 (suppl):301-304.
4. Boris M, Lasinski B. Lymphedema reduction by noninvasive complex lymphedema therapy. *Oncology*. 1994; 8:95-106.
5. Vignes S, Porcher R Long-term management of breast cancer-related lymphedema after intensive decongestive physiotherapy. *Breast Cancer Res Treat*. 2007;101:285-290.
6. Tidhar D, Katz-Leurer M Aqua lymphatic therapy in women who suffer from breast cancer treatment-related lymphedema: a randomized controlled study. *Support Care Cancer*. 2010;18:383-92. Epub 2009 Jun 3. Erratum in: *Support Care Cancer*. 2010;18:393.
7. Tidhar D, Shimony A, Drouin J. Aqua Lymphatic Therapy for Post Surgical Breast Cancer Lymphedema. *Rehabilitation Oncology* 2004; 22; 6-14.
8. Tidhar D, Drouin J, Shimony A. Aqua Lymphatic Therapy in Managing Lower Extremity Lymphedema. *J Support Oncol*. 2007;5:179-183.
9. Bruce E. Becker, Andrew J. Cole (2004) *Comprehensive Aquatic Therapy*, 2nd edition. Butterworth-Heinemann. 2nd chapter:19-56.
10. Casley-Smith JR, Casley Smith JR (1997) *Modern treatment for lymphedema*, 5th edn. The Lymphology Association of Australia, Adelaide Chapters 17, 21, 45.