

# Lymphedema

Lymphedema is a challenging condition to treat, often accompanied by pain, loss of mobility and even physical deformity. Pneumatic compression therapy is fast becoming an essential component of any comprehensive treatment program. Patients like the ease of use, while physicians benefit from the clinical outcomes. Understanding the lymphatic system is an important key to understanding chronic swelling or lymphedema.

Pneumatic compression therapy is a non-invasive therapy that applies sequential gradient pressure to improve circulation, decrease edema and aid in healing venous stasis ulcers. Chronic swelling and venous ulcers can be caused by primary developmental abnormalities or by secondary means. Secondary lymphedema may occur due to surgery, radiation, trauma, venous insufficiency, cancer or infection.

## The Lymphatic System

Our lymphatic system is a sophisticated network of lymphatic vessels and lymph nodes, which align closely with the blood circulation system. Our blood circulation system consists of veins, arteries and capillaries. From the heart, arteries carry oxygenated blood and nutrients to our tissue and organs, where they branch out into a large number of narrow tubes with porous walls called capillaries. The capillaries lead back to large vessels called veins which transport deoxygenated blood, metabolic waste products and carbon dioxide away from our organs.

The lymphatic system plays an important role within this circulatory system. The lymph system has a very similar structure to that of the circulatory system. Lymphatic vessels, which are present throughout our body, start as larger conducting vessels and eventually branch out into tiny tubes or capillaries.

One of the jobs of the lymph capillaries is to pick up lost protein and fluid and transport them through progressively larger lymph vessels. This waste accumulates as colorless, protein-rich "lymph fluid" which flows through the lymph vessels, where it is filtered by the lymph nodes. Lymph flow occurs from peripheral lymphatics to the lymph nodes (distal to proximal movement). Eventually the lymph fluid is emptied back into veins through the lymph nodes, thus connecting the lymphatic system with the blood vessel system. Major lymph node bearing areas include the neck, chest, and abdomen, with minor areas including the knees.

Lymphedema is an accumulation of fluid that causes the arms, legs, groin, abdomen or chest walls to swell. When lymph fluid exceeds the lymphatic transport capacity, protein-rich fluid is forced to collect in the surrounding tissues. This underproduction of the lymph system is either classified as primary lymphedema or secondary lymphedema. If a patient is born with a lymphatic system that fails to keep pace with fluid volume this is classified as primary. Secondary lymphedema results from some sort of trauma to the lymphatic system. This trauma can be the result of a number of different events such as surgery (major to very minor), lumpectomy, radiation, obesity, disease, auto or miscellaneous accidents. If left untreated, this stagnate protein-rich fluid will become a culture medium for bacteria that can result in various infections.

## Stages of Lymphedema

### Stage      Description

**Stage 0**    A latent or sub-clinical condition where swelling is not evident despite impaired lymph transport. Stage 0 may exist months or years before overt edema occurs (Stage I-III).

**Stage I**    Early accumulation of fluid relatively high in protein content (e.g., in comparison with 'venous' edema) that subsides with limb elevation. Some pitting may occur.

**Stage II**    Limb elevation alone rarely reduces tissue swelling and pitting may or may not occur as tissue fibrosis develops.

**Stage III**    Lymphostatic elephantiasis. Pitting is absent and trophic skin changes such as acanthosis, fat deposits, and warty overgrowths develop.

## How is Lymphedema Treated?

Unfortunately, there's no outright cure for lymphedema. Instead, the condition is managed in an effort to minimize its effects by seeking to decrease the swelling, control the discomfort or pain, and avoid complications.

Lymphedema treatments include:

- **Exercise:** Special kinds of exercises that gently contract muscles can aid in pumping lymph fluid out of the swollen limb.

- **Massage:** Specially trained physical or massage therapists can provide manual lymph drainage, a series of gentle massage maneuvers that encourage lymph flow out of the affected limb. However, people who have active cancer, infections, blood clots or congestive heart failure should not undergo this form of treatment.
- **Compression:** Compression can also encourage the flow of lymph out of the affected arm. Compression can be provided in a number of ways, including elastic bandaging, a special compression sleeve or stocking, or the use of pneumatic compression pump.

## **Quality Treatment at Home**

Home treatment is an important component of lymphedema therapy. Treatment at home with pneumatic compression therapy is easy and effective, saves time and money on clinic visits, and increases patient compliance.