Understanding and Managing Lymphedema

Monadnock COMMUNITY HOSPITAL

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MONADNOCK COMMUNITY HOSPITAL

About us

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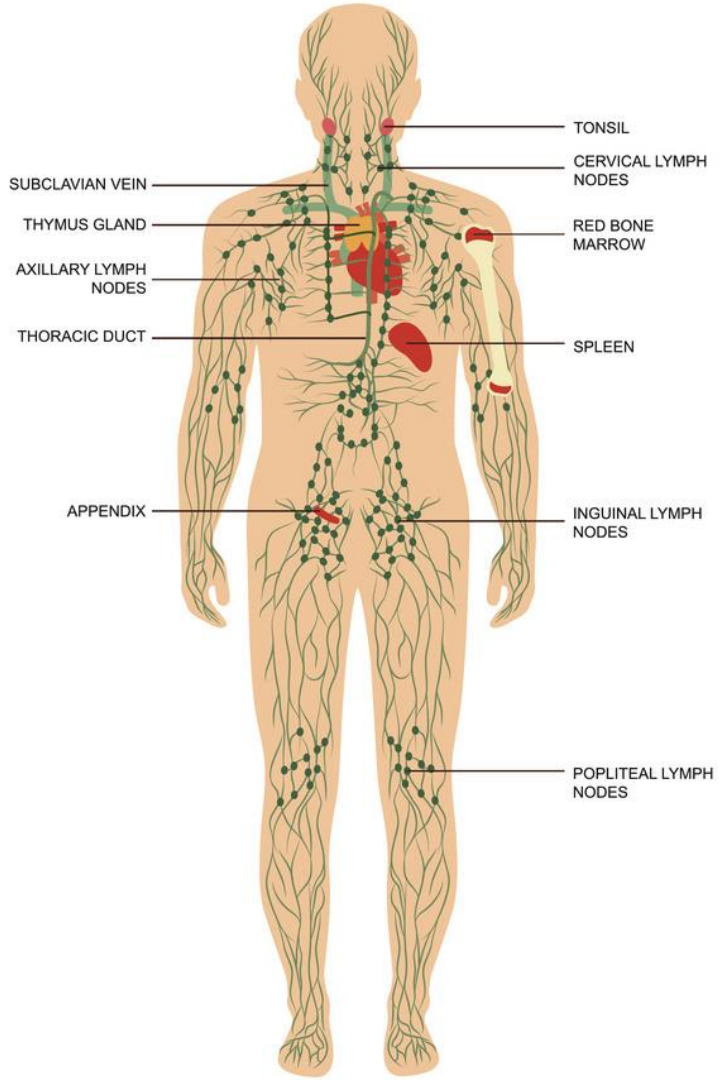
What is the Lymphatic System?

- The lymph system lays parallel with the circulatory system and functions to filter harmful bacteria, make white blood cells, increase immunity, maintain a fluid balance in the body, and assist in digestion.

- Vessels sit just below the surface of the skin and are located near joints, such as arm pits, elbows, hips, knees, along the neck, as well as deep within our abdomen surrounding our organs.

- Lymph vessels have one-way valves but no musculature, as our arteries do, they rely on muscle pump and movement to move the fluid up the chain of valves to the next node.

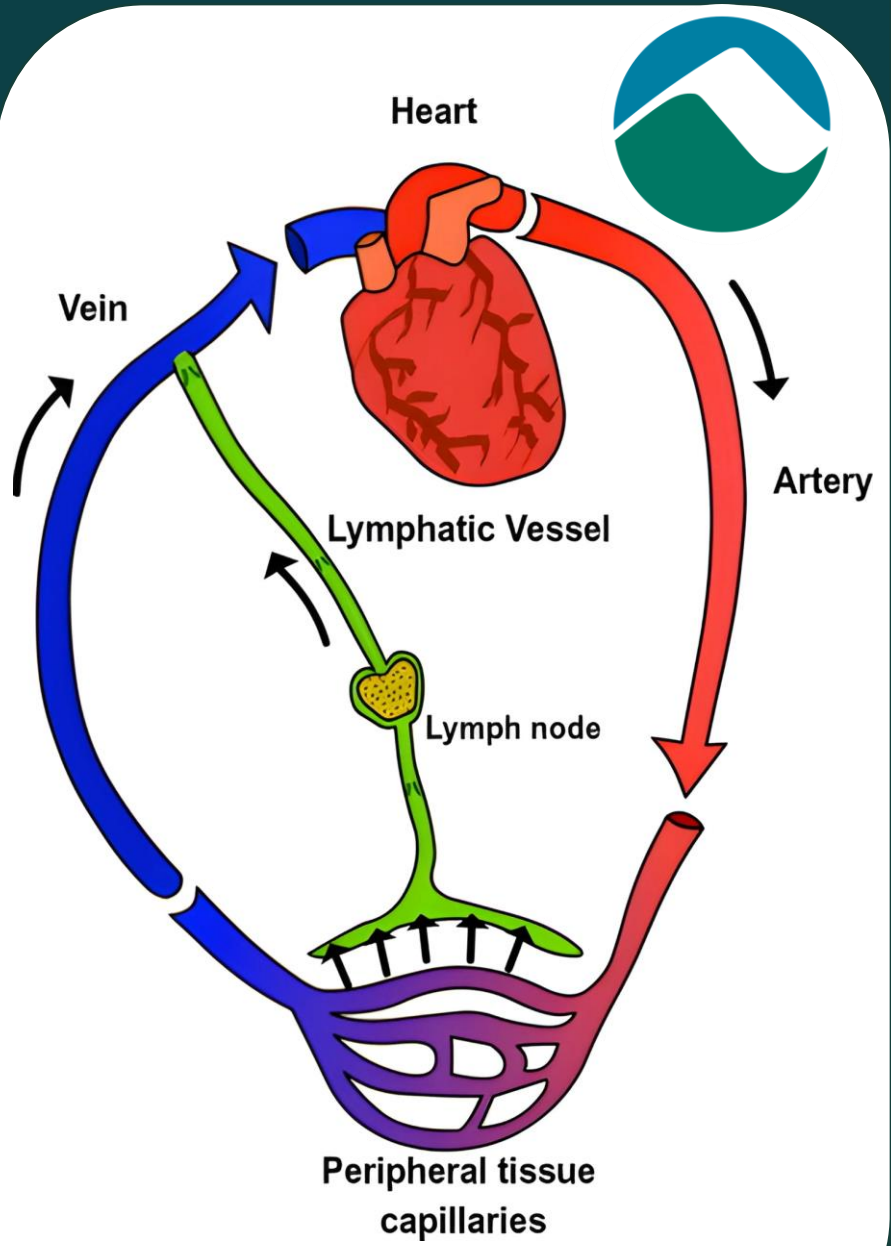
Lymphatic System



https://nurseslabs.com/lymphatic-system-anatomy-physiology/

Lymphatic and Circulatory Systems

- Blood is pushed from the heart through arteries into capillaries to feed tissue cells.
- 70% of the used fluid is picked back up by the venous system to bring back to heart.
- 30% is picked up by the lymphatic system to be cleansed and filtered before being brought back to the circulatory system at the subclavian vein.
- The circulatory system then brings the excess fluid to the kidney's to be excreted.



https://anatomypubs.onlinelibrary.wiley.com/doi/10.1002/dvdy.20179

What is Lymphedema?

- An abnormal accumulation of fluid outside the cells caused by a mechanical insufficiency with a protein build up.
- When there is an overflow of fluid in the system, the lymphatic system gets overloaded and backed up, therefore the extra fluid sits in the space outside the blood vessels waiting to be picked up by the lymphatic system.
- There are various reasons this may happen:
    - Long-term swelling from trauma, injuries, surgeries
    - Lymph vessel destruction, lymph node removal, radiation, chemotherapy
    - Tumor, infection, burns
    - Compromises of the vascular system
    - Congenital malformation of the lymph vessels

Is there a difference between Edema and Lymphedema?

- Edema is caused by a chemical failure or decreased reabsorption rates in the body, such as CHF, Renal Disease, Arterial Insufficiency, and Thyroid disorders or by trauma to the tissue. Edema can resolve if the primary condition is addressed
- Long term, chronic edema can lead to lymphedema if the fluid becomes rich in proteins causing a shift in homeostasis. Lymphedema is harder to self correct and requires treatments.
- Lipedema is a loose connective tissue disorder that presents itself at various life stages. Symptoms include symmetrical pear-shaped lower extremity edema from ankles to pelvic crest, does not include the feet. It can also affect the arms. Skin is more sensitive to touch and bruising. Treatment sessions tend to be the same.

Stages of Lymphedema

Stage 0 - Latency

- No noticeable swelling
- Sensory symptoms, such as tightness, heaviness, tingling, clothes fitting differently.
- Important to seek intervention, to avoid worsening
- May or may not need compression
- Reversable

Stage 1 – Spontaneously Reversable

- Swelling intermittent
- Pitting caused by protein buildup, thickening the lymph
- Elevation will provide relief and reduce swelling
- Important to seek interventions to avoid worsening to stage 2

Stage 2 – Spontaneously Irreversible

- Obvious signs of swelling that do not go away with elevation
- Tissue is firmer, less pitting, caused by the formation of fibrosis
- Fibrosis is the scarring of the tissue, due to prolonged presence of stagnant lymph

Stage 3- Lymphostatic Elephantiasis

- Tissue becomes very fibrotic and hard
- Thickening on the surface
- Great potential for open and seeping areas, poor skin integrity
- High risk for infection
- Can lead to decreased or loss of function of the limb
- However, treatment is still beneficial and can have a remarkable impact on tissue softening and decongestion

When would I want to seek treatment?

- Noticeable swelling or a limb feels larger than the other
- Limb feels heavy, achy, skin feels tight, clothing fitting tighter
- Noticeable skin changes, dry, flaky, scaley skin
- Venous insufficiency, hematomas, residual edema from trauma or surgery

Now is the time to address the edema, before it damages the tissue and vessels requiring further interventions with more advanced stages.

When should treatment be delayed?

- Acute Congestive Heart Failure (must be 8 weeks stable)
- Acute Renal Failure (must be 8 weeks stable)
- New sudden onset of edema (must be cleared of DVT, CHF and renal failure)
- Arterial Insufficiency
- Active Infection (local or systemic)
- Aortic Aneurysm

At any time during your treatment, if you become short of breath, notice changes to urinary output, increased fatigue, increased swelling or sudden onset of pain, sudden weight increase, stop home treatments and remove compression.

Call your doctor immediately.

Evaluation and Monitoring

There are various diagnosing options including

- Clinical examination in MD's office
- Circumference measurements with limb comparison
- Water displacement volume measurements
- Bioelectric impedance analysis (BIA)
- Tissue tonometry
- Perometry infrared measurement of limb volume
- Ultrasound
- MRI/MRV- venous assessment and demonstrates lipodystrophy (fluid vs fat)
- ICG (Indocyanine green lymphangiography)
- Lymphoscintigraphy with Technecium -99

So, what does a treatment session look like?

Complete Decongestive Therapy (CDT) Phase I and Phase II

In 1892, Alexander von Winiwater published “Die Elephantiasis” this was the beginning of understanding and treating lymphedema with CDT. Emil and Estrid Vodder advanced these concepts the coined the phrase manual lymphatic drainiage in 1932.

Over the years the basic components of CDT have remained the gold standard treatment for conservative care for the diagnosis of lymphedema

Examination-First, a thorough intake will take place, patient will be cleared for any contraindications through appropriate medical specialist. A health history will be taken; skin inspections and measurements of the affected limb will be recorded.

A plan of care will be developed based on this clinical information for which components are required, duration and frequency of treatment.

- Intensive phase will see the most reduction in limb size
- Compression- short stretch bandages or Velcro wraps

CDT – Phase I Compression

Manual Lymphatic Drainage

https://stirlingtherapies.com.au/manual-lymphatic-drainage/

- Specialized form of manual intervention that stimulates the lymphatic system to improve its ability to absorb and transport fluid
- MLD uses a light skin stretching technique to stimulate healthy lymphatic vessels and enable decongestion of swollen body regions
- High Importance of seeing a qualified provider to ensure proper techniques are utilized to not overload the system.
- Begin treatment proximally and progress distally, always pulling towards the trunk
- Fibrosis, cording, axillary web syndrome, sclerosing lymphangitis
- Your therapist will teach you and a caregiver self drainage techniques

Skin Care and Integrity

- Proper skin care promotes healthy tissue and prevents infection
  - Moisturizing the tissue
    - Low PH, non-scented creams
    - CeraVe, Aveeno, Eucerin, Cetaphil, Aquaphor
  - Keep it clean
    - Washing with non-scented, antibacterial soaps
  - Attending to small cuts to prevent infections and/or chronic wounds
  - Daily Skin checks

Compression Garments and Pneumatic Pumps

- There's a variety of garments available and should be sized and fitted by a trained therapist or garment fitter
- Various styles, types, and compressions available
- Velcro style
- Short stretch bandaging
- Custom vs off the shelf
- Stockings, sleeves, gloves
- Not everyone needs compression nor will tolerate garments

https://tactilemedical.com/resource-hub/resources/what-are-the-benefits-of-compression-therapy/

Compression Garments and Pneumatic Pumps, cont'

- Pneumatic Pumps
  - Involves a Pneumatic sleeve being applied to the limb and sometimes the trunk which inflates and deflates simulating MLD to encourage fluid absorption and decongestion of the limb

https://tactilemedical.com/comfortease/comfortease-upper-extremity-compression-garments/

Exercise

- Exercise is incorporated throughout treatment
- Water Therapy
- Low intensity, repetitive, while wearing compression if tolerated
  (For example: 1-2# PRE's, 8-10 reps of 2 sets, 3x/week)
- Encourage gentle muscle pumping which aids in the absorption and transport of the lymphatic fluid out of the limb
- Research suggests exercises is not only safe for people with lymphedema but also encourages muscle strength and promotes a healthy lifestyle
- Work with your therapist to individualize your appropriate home exercise program

Sclerosing Lymphangitis (Axillary Web Syndrome, Cording)


https://cancerrehabpt.com/blog/axillary-web-syndrome

Syndrome causes a hardening and adherence of the lymph vessels.

Symptoms

- Tightness of affected area
- Loss of shoulder motion
- Pain in affected area, limb, trunk and/or breast tissue

Treatment includes

- Manual therapy
- Stretching
- Modalities

How does cancer and lymphedema connect

- Surgical management
- Radiation
- Chemotherapy
- Cancer Medications

Surgical interventions for prevention or management of lymphedema

LYMPHA: Prophylactic microsurgery procedure done during breast cancer surgery. Anastomosis of the lymphatic channel to a nearby vein with valve competency

LVA: Lymphovenous anastomosis: a lymph vessel to vein bypass to redirect lymph fluid into the venous system. This is usually done early in the disease process.

VLVT: Vascularized lymph vessel transplant

VLNT: Vascularized lymph node transplant: Taking a viable lymph node from a donor site and transferring it to an edematous region, spontaneous anastomosis between donor site and transferred lymph node is required.

Combination approach: LVAs plus VLNT

Liposuction

Alternative Therapies

New Therapies emerging

- Multiple Gene Therapies
  - Apelin, VEGFC, Interlukin 6
- Drug Therapies
  - Acebilustat, Rosovastatin
- Surgical options
  - Thoracic Duct Venous Junction Lymphoplasty

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