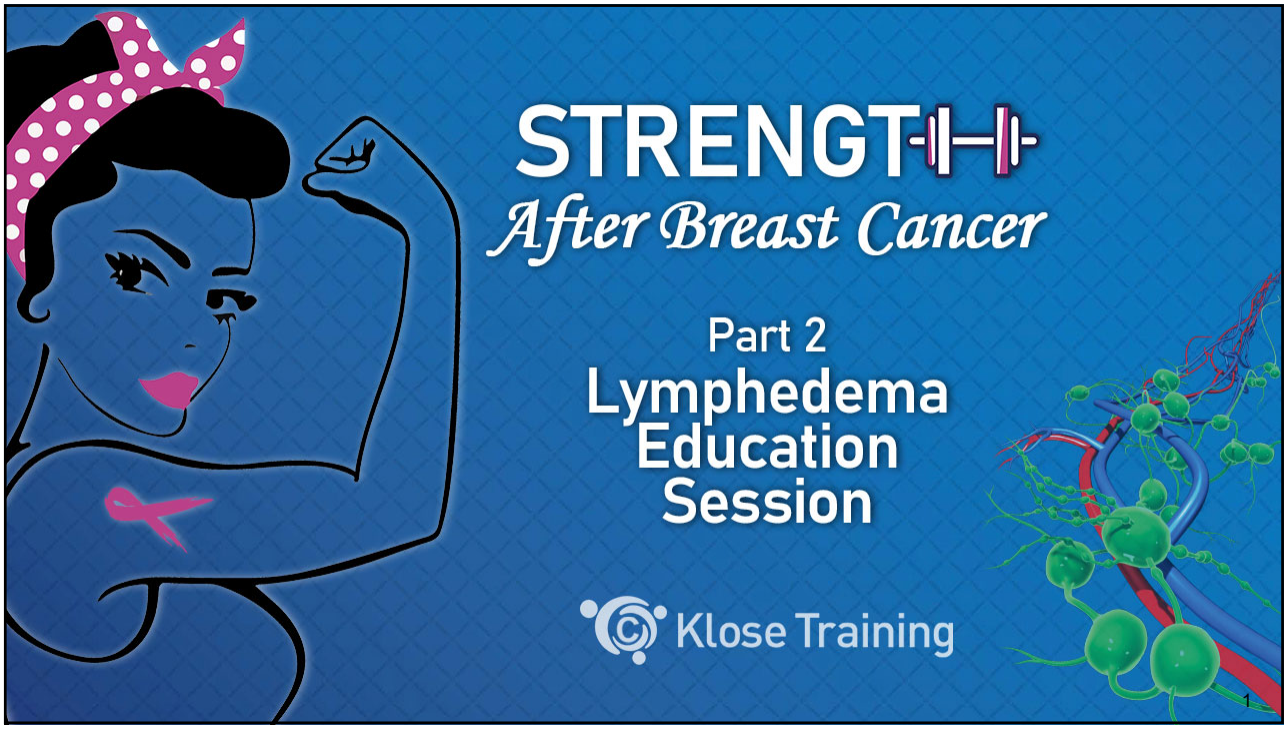
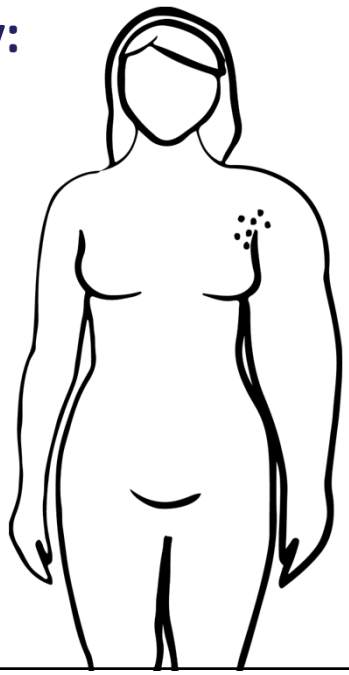
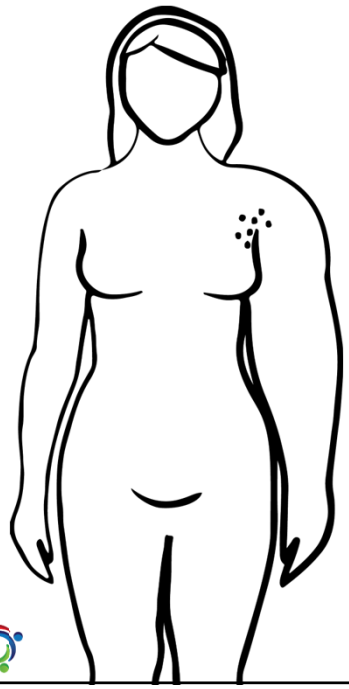


Questions we will answer today:

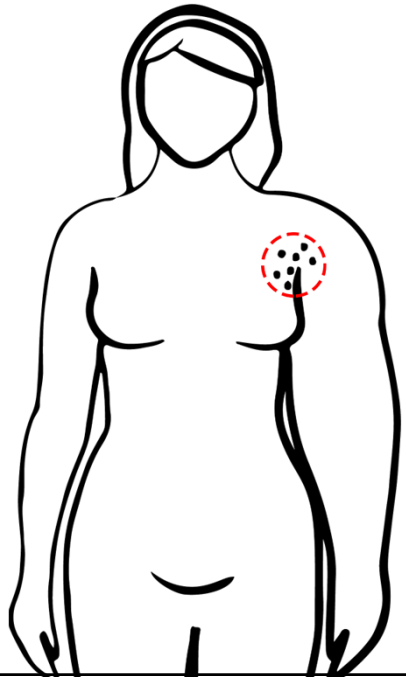
- What is lymphedema?
- Who is at risk?
- When is it likely to occur?
- Why does it happen?
- How do I reduce my risk?
- How is it treated?
- What are the exercise guidelines?





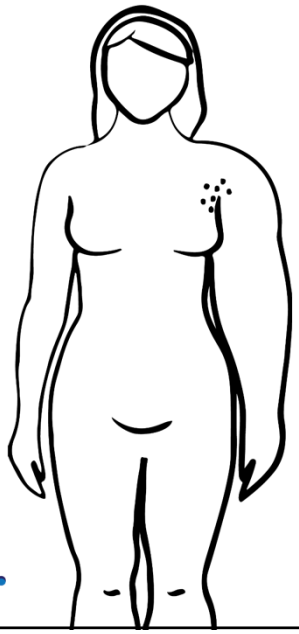
What is lymphedema?

- Lymphedema is an abnormal accumulation of protein-rich fluid in the tissue which can result in swelling of a body part and fibrosis.
- It only impacts region of body affected by lymph node removal/damage
  - Upper body for breast cancer survivors
  - Lower body for endometrial cancer survivors



Who is at risk?

- Removal of lymph nodes
- Damage to the lymph system
- Other factors
  - Obesity
  - Poor diet

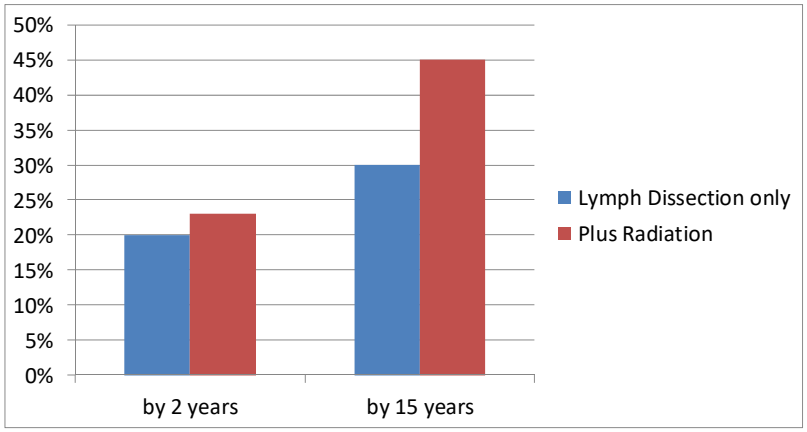


How is lymphedema acquired and how rapidly?

- Once lymphatics are removed or damaged, lymphedema may occur at any time.
- Occurs most often within 3 years of breast cancer treatment.
- Lymphedema usually occurs slowly and steadily.

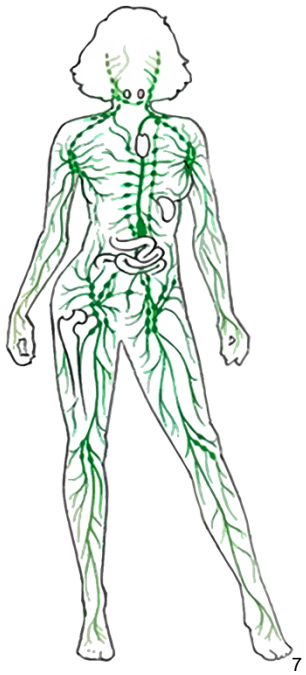
Secondary Arm Lymphedema Incidence & Prevalence

Among 1151 women followed 15 years



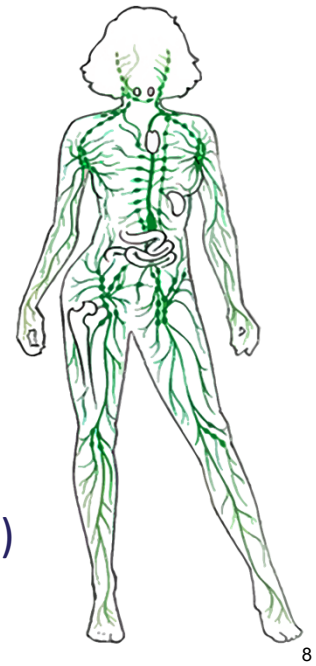
What does the lymphatic system do?

- Surveillance against cancer/infection
- Balances fluid and proteins in the circulatory system by transporting approximately 6 liters of lymph fluid per day
- Assists fat digestion



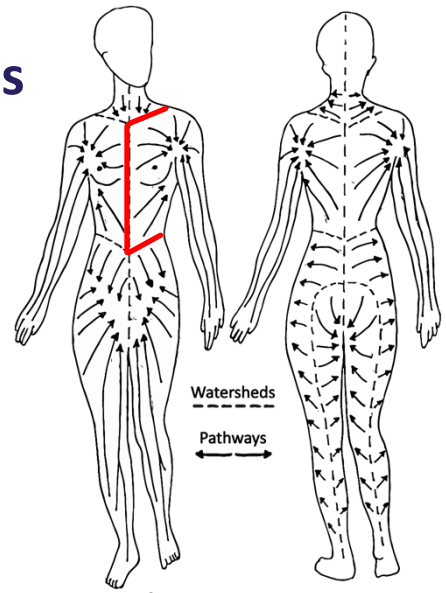
Functions of the Lymphatic System
(continued)

- Transports proteins
- Removes excess water
- Absorbs fat molecules from the gut
- Removes cellular debris and foreign material (e.g. bacteria, viruses, cancer cells)



Lymphatic Drainage Territories of the Skin

The AT RISK region is the region where nodes were removed and the tissues that were draining lymph fluid toward those nodes.



Superficial Lymphatic Drainage Pathways of the Skin

Fluid and Molecular Exchange at the Blood Capillary

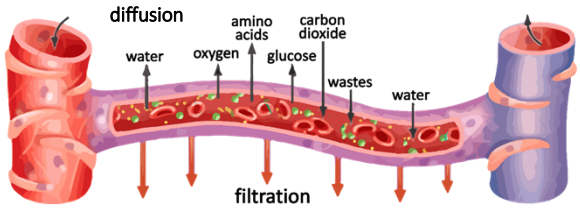
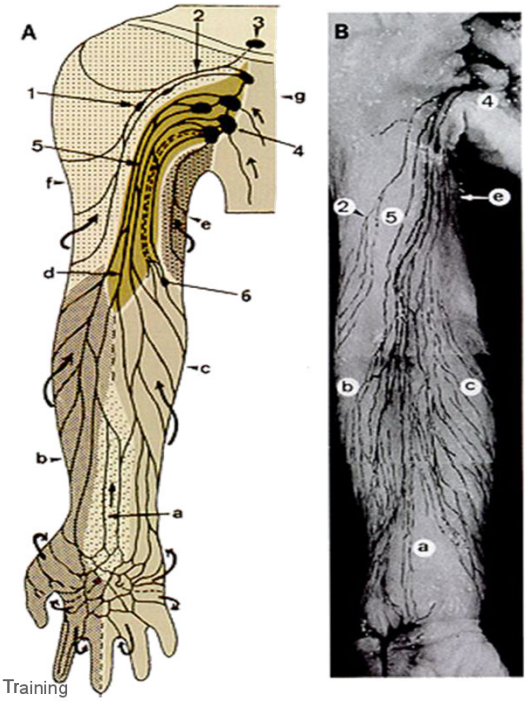


Illustration of diffusion and filtration across the blood capillaries

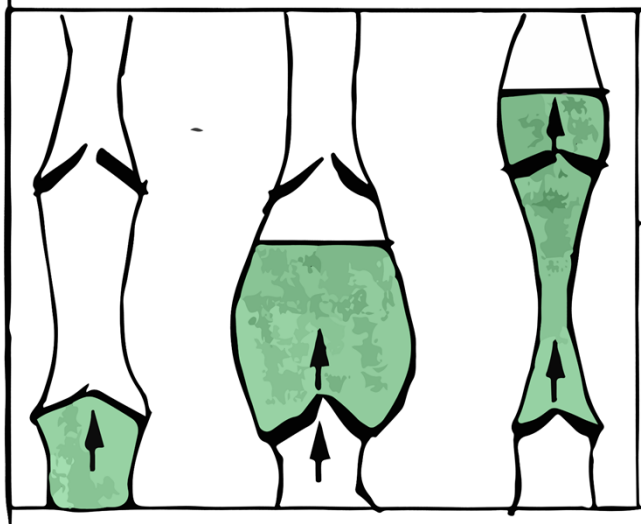
- Diffusion is the most important process for the nourishment of the tissues.
- Filtration is the movement of fluid from the capillaries to the interstitium (tissues)

UE (Arm)
Lymph Drainage



Földi's Textbook of Lymphology 2012

Lymphangion - Lymph vessel transport unit



Regulation of propulsion

1. Lymph volume / wall tension
2. Autonomous regulation

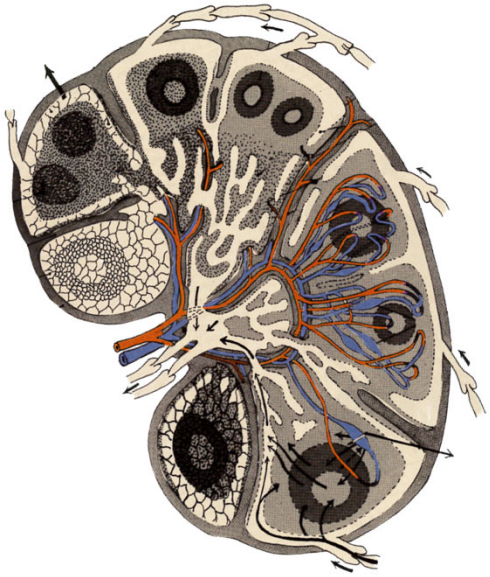
stimulation by mechanical irritation

=

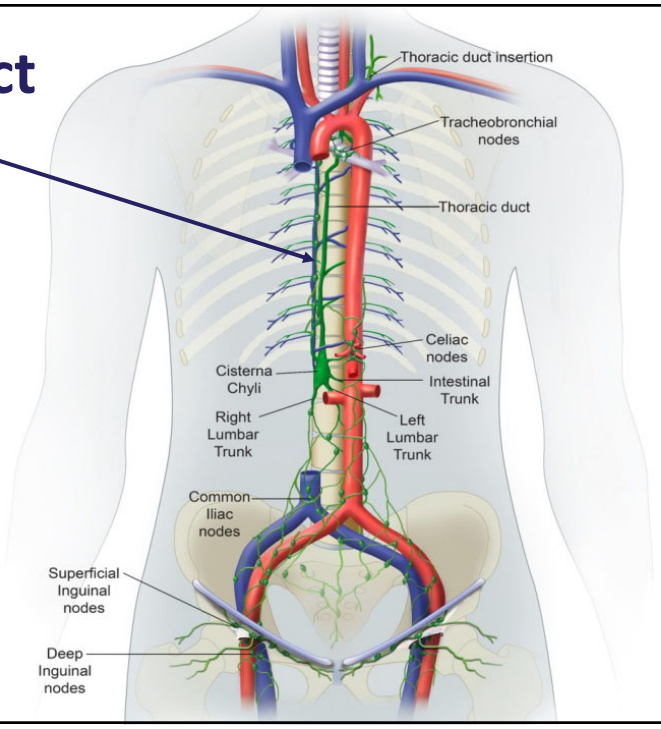
effect of manual lymph drainage

Frequency in resting: 6-10 beats/minute; Increases 10x with exercise

Lymph Node

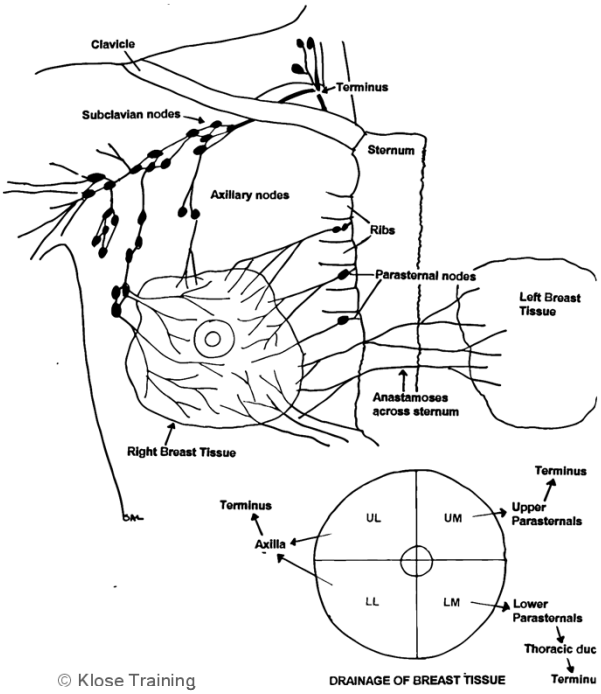


Thoracic Duct

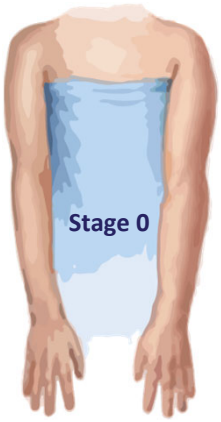


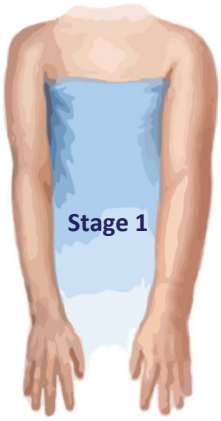
ScienceDirect.com

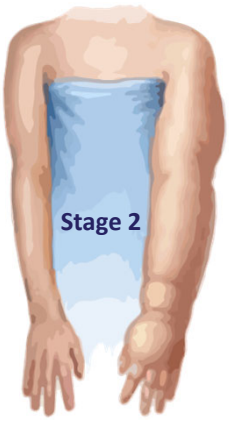
Breast Lymphatic Drainage

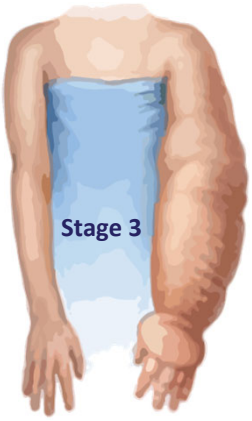


Stages of Lymphedema









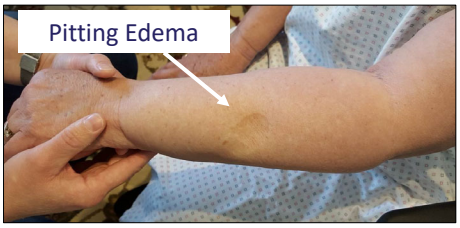
Stage 0
- latent, sub-clinical

Stage 1 (Spontaneously Reversible)
- present during the day sometimes goes away overnight
- Pitting starts between stage 1 & 2

Stage 2 (Spontaneously Irreversible)
- Lymphedema is still present after a night's rest even if improved

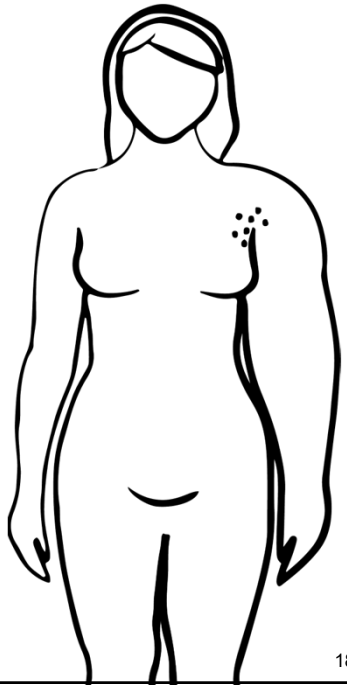
Stage 3
(Lymphostatic Elephantiasis)
- Rarely seen in Breast Cancer

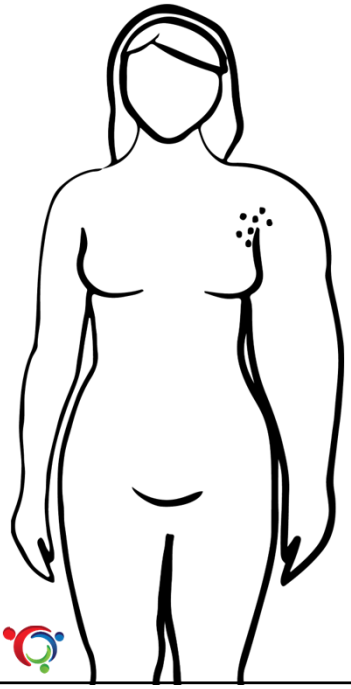
Breast Cancer Related Lymphedema (BCRL)



What changes occur with an altered lymph system?

- Excess protein in the tissues
- Accumulation of excess fluid in the limb
- Decreased oxygenation
- Slow tissue healing time
- Formation of fibrosis





What does lymphedema feel like?

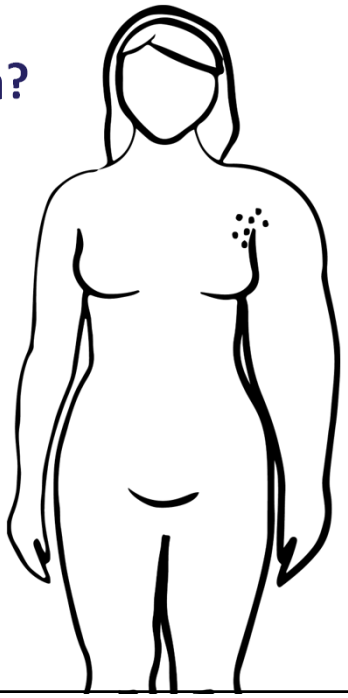
- Tightness or heaviness in the limb
- Achy
- Pins and needles
- Tenderness in the elbow
- 'Odd' sensations
- "Pain of congestion"
- Discomfort

- NOT "Unbearable pain" Unbearable pain may be indicative of:
  - malignant lymphedema
  - radiogenic plexopathy
- NOT muscle soreness

Let's discuss the difference…

How can you reduce your risk of developing/worsening lymphedema?

- Lymphedema risk reduction practices
  - Screening
  - Reporting changes/infections
  - Body weight
  - Skin care
  - Exercise
  - Avoiding Trauma/Constriction
  - Compression garments (if appropriate)
  - Avoiding Extremes of Temperature
  - Care with surgeries on affected side



Screening

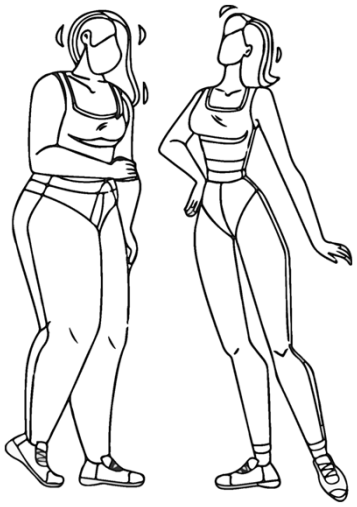
- Get regular check ups with a professional with lymphedema training
  - Timing determined by your risk level
  - Higher risk, more frequent

Reporting changes/infections

- Notice whether the affected side:
  - Increases in size
    - Report an increase in size to your CLT
  - Changes in sensation, color, temperature, or skin condition
  - Gets infected (red, warm, elevated body temperature)

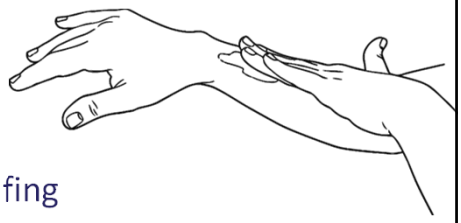
REPORT CHANGES THAT MAY INDICATE INFECTION TO A PHYSICIAN OR EMERGENCY ROOM!

Body Weight



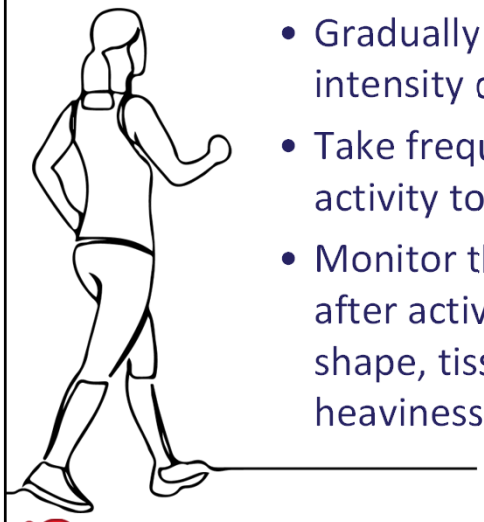
- Excess body weight is a risk factor for lymphedema.
  - If you do not have lymphedema, maintaining a healthy body weight will reduce your risk of onset
- HOWEVER, research shows that 8% weight loss does not result in reduced arm swelling in those already diagnosed with lymphedema
  - If you are already diagnosed, be aware that weight loss may not improve arm swelling

Skin Care

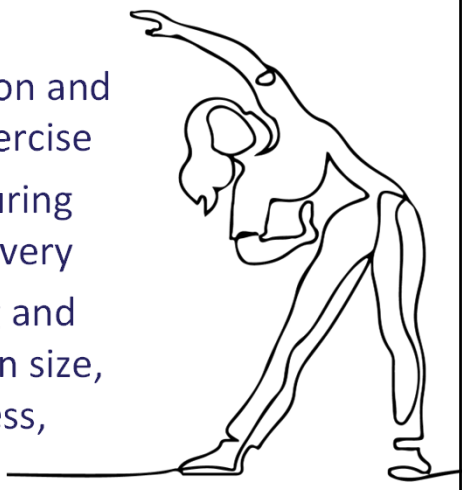


- Avoid trauma/injury and reduce infection risk
- Keep arm clean and dry
- Apply moisturizer daily to prevent chapping/chafing
- Attention to nail care; Do NOT cut cuticles
- Protect exposed skin with sunscreen and insect repellent
- Use care with razors to avoid nicks and skin irritation (shave axilla with electric razor)
- If possible, avoid punctures such as injections and blood draws
- Wear gloves while doing activities that may cause skin injury
- If scratches/punctures to skin occur, wash with soap and water, apply antibiotics, and observe for signs of infection
- If a rash, itching, redness, pain, increased skin temperature and swelling, fever, or flu-like symptoms occur, contact your physician immediately

Exercise



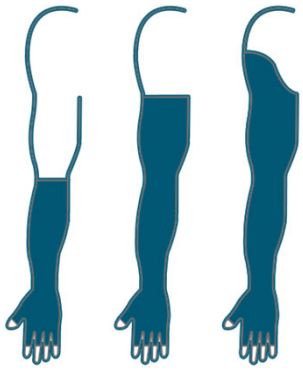
- Gradually build up the duration and intensity of any activity or exercise
- Take frequent rest periods during activity to allow for limb recovery
- Monitor the extremity during and after activity for any change in size, shape, tissue, texture, soreness, heaviness, or firmness



Avoid Trauma/Limb Constriction

- If possible, never have blood pressure taken on the arm at risk
- Wear loose fitting clothing and jewelry
- Trauma can include:
  - Cuts
  - Cut cuticles
  - Falls and fractures

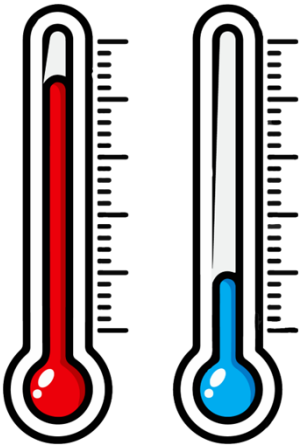
Compression Garments



- IF NEEDED
- Should be well fitting
- Support the limb with lymphedema for strenuous activity (e.g. weight lifting!)
- If you have lymphedema, wear a well fitting compression garment for air travel

Extremes of Temperature

- Avoid exposure to extreme cold, which can be associated with rebound swelling, or chapping of skin.
- Avoid prolonged (> 15 minutes) exposure to heat, particularly hot tubs and saunas
- Avoid immersing limb in water temperatures above 102 degrees

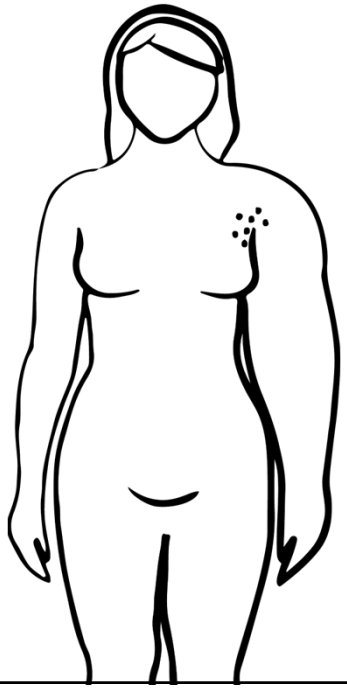


Care with Surgery

- Evaluate the affected limb prior to surgery
- Ask how long swelling should last after surgery
- Work with your lymphedema therapist to revise your care if needed, post surgery

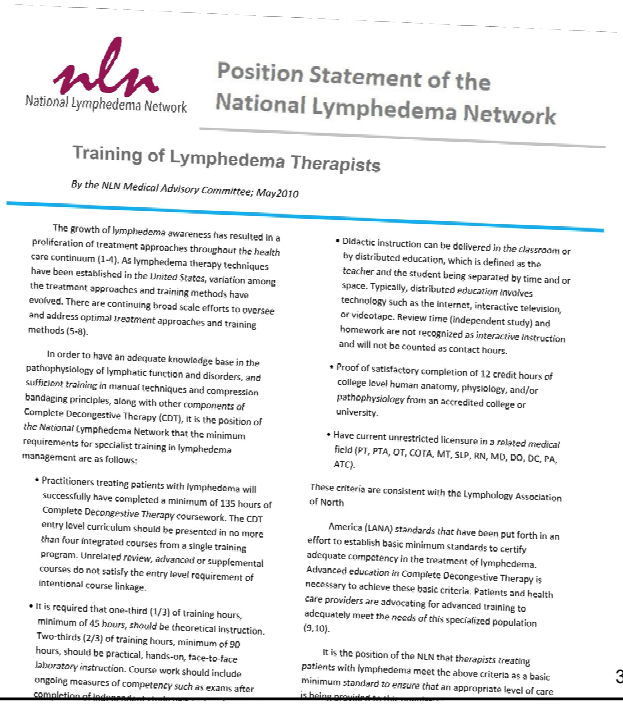
What can you do if you develop lymphedema?

- Get evaluated by your doctor or certified lymphedema therapist (CLT).
- Earlier treatment results in faster response to treatment thereby decreasing the length of therapy.



Training of Lymphedema Therapists

- Handout from NLN
- Be sure your therapist meets these minimum requirements



National Lymphedema Network

Position Statement of the National Lymphedema Network

Training of Lymphedema Therapists

By the NLN Medical Advisory Committee; May2010

The growth of lymphedema awareness has resulted in a proliferation of treatment approaches throughout the health care continuum (1-4). As lymphedema therapy techniques have been established in the United States, variation among the treatment approaches and training methods have evolved. There are continuing broad scale efforts to oversee and address optimal treatment approaches and training methods (5-8).

In order to have an adequate knowledge base in the pathophysiology of lymphatic function and disorders, and sufficient training in manual techniques and compression bandaging principles, along with other components of Complete Decongestive Therapy (CDT), it is the position of the National Lymphedema Network that the minimum requirements for specialist training in lymphedema management are as follows:

- Practitioners treating patients with lymphedema will successfully have completed a minimum of 135 hours of Complete Decongestive Therapy coursework. The CDT entry level curriculum should be presented in no more than four integrated courses from a single training program. Unrelated review, advanced or supplemental courses do not satisfy the entry level requirement of intentional course linkage.
- It is required that one-third (1/3) of training hours, minimum of 45 hours, should be theoretical instruction. Two-thirds (2/3) of training hours, minimum of 90 hours, should be practical, hands-on, face-to-face laboratory instruction. Course work should include ongoing measures of competency such as exams after completion of
- Didactic instruction can be delivered in the classroom or by distributed education, which is defined as the teacher and the student being separated by time and or space. Typically, distributed education involves technology such as the internet, interactive television, or videotape. Review time (independent study) and homework are not recognized as interactive instruction and will not be counted as contact hours.
- Proof of satisfactory completion of 12 credit hours of college level human anatomy, physiology, and/or pathophysiology from an accredited college or university.
- Have current unrestricted licensure in a related medical field (PT, PTA, OT, COTA, MT, SLP, RN, MD, DO, DC, PA, ATC).

These criteria are consistent with the Lymphology Association of North

America (LANA) standards that have been put forth in an effort to establish basic minimum standards to certify adequate competency in the treatment of lymphedema. Advanced education in Complete Decongestive Therapy is necessary to achieve these basic criteria. Patients and health care providers are advocating for advanced training to adequately meet the needs of this specialized population (9,10).

It is the position of the NLN that therapists treating patients with lymphedema meet the above criteria as a basic minimum standard to ensure that an appropriate level of care is being provided

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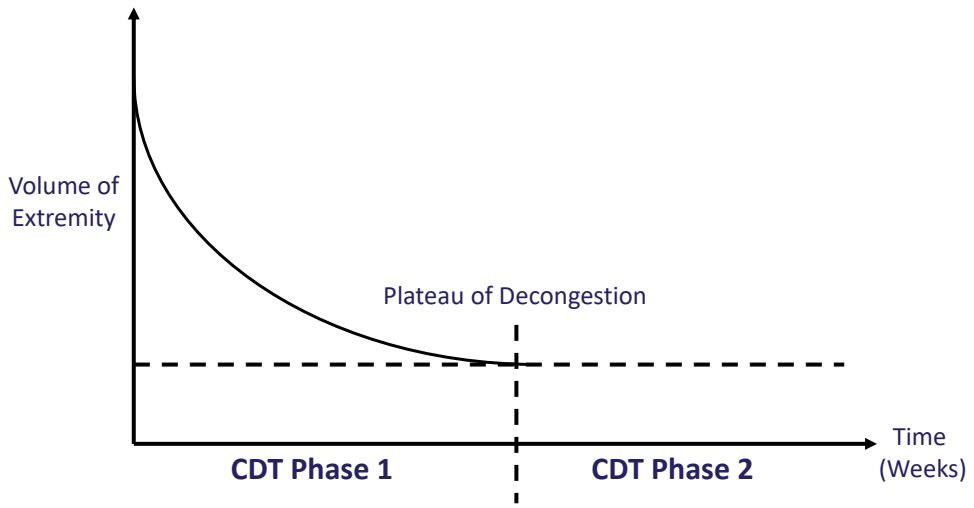
How is lymphedema treated?

Complete Decongestive Therapy (CDT) is an effective therapy for lymphedema and other swelling disorders.

32

Complete Decongestive Therapy



Complete Decongestive Therapy

Phase 1: Decongestion

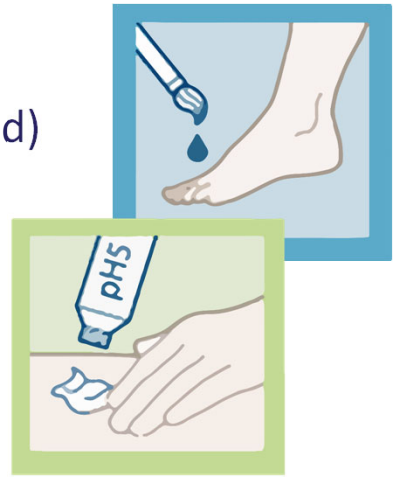
- Meticulous Skin Care
- Manual Lymph Drainage (MLD)
- Gradient Compression Bandaging
- Remedial Exercises
- Compression Garments

Phase 2: Self-Care
(Maintenance)

- Meticulous skin Care
- Compression Garment (daytime)
- Gradient Compression Application (nighttime)
- Self-MLD
- Remedial Exercises
- Follow-up Assessment

Meticulous Skin & Nail Care

- Low pH, gentle soaps
- Moisturizer (low pH also recommended)
- Do not cut cuticles in manicures
- Prevents infection
- Keeps skin working optimally



Manual Lymph Drainage

Expert Stretching of the Skin

Manual Lymph Drainage

- Drains the congested areas
- Reduces the risk of infection
- Normalizes the size and pressure in the limb
- Reduces pain/discomfort

Compression Therapy

Gradient, short-stretch bandaging

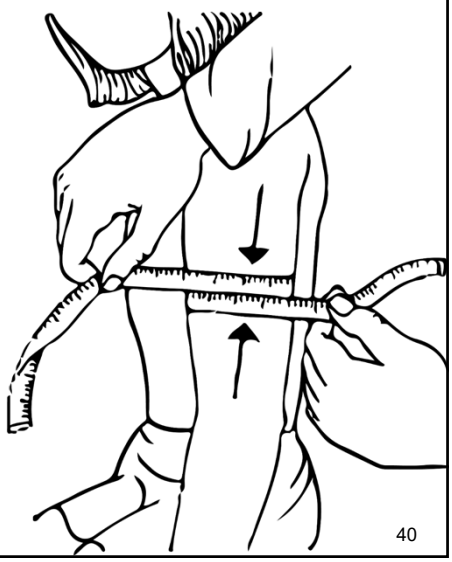
Medical Compression Garment

Gradient Compression Bandaging

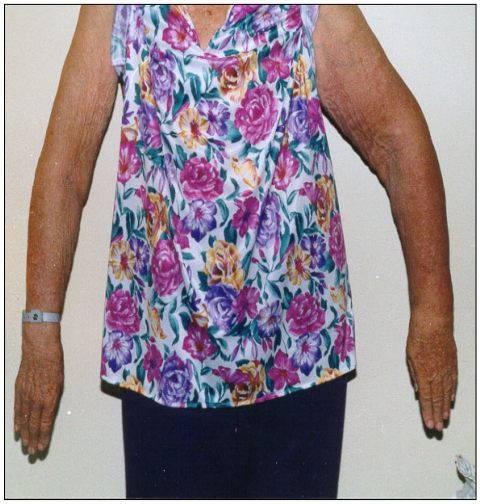
- Decreases the filtration rate
- Prevents re-accumulation of fluid
- Softens fibrosis
- Provides external counter pressure during exercise

Garment Measurement

- Should be custom fitted
- Take serial measurements over time (every 6 months) to ensure the garment still fits



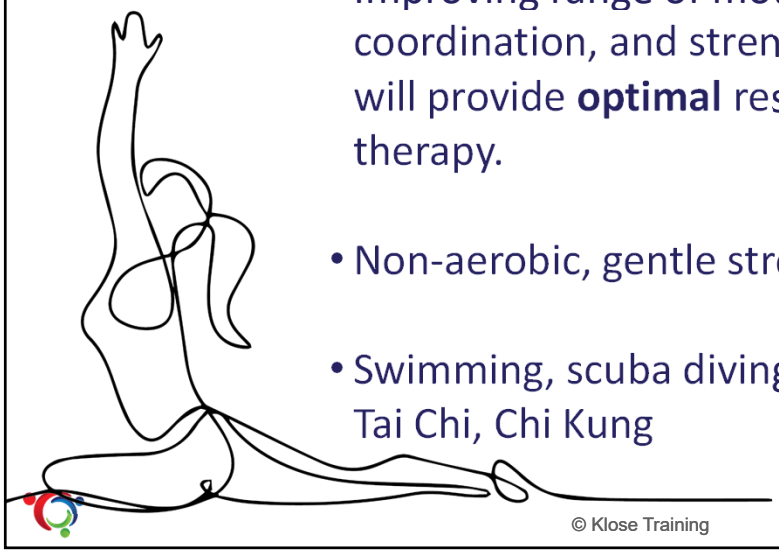
Patient with BCRL Before and After CDT



Custom Compression Garment

Essity-Jobst Confidence Custom Compression Garment

Remedial Lymphedema Exercises



- Improving range of motion, endurance, coordination, and strength where possible will provide **optimal** results in decongestive therapy.
- Non-aerobic, gentle stretching
- Swimming, scuba diving, singing, yoga, Tai Chi, Chi Kung

Diaphragmatic Breathing

- Abdominal breathing stimulates the transport of lymph back to the heart through the thoracic duct.

What are the NLN exercise guidelines?

- Exercise is essential for effective lymphedema management
- Pre-exercise clearance by a lymphatic therapist is essential
- After completing CDT (which includes specific remedial lymphedema exercises) lymphedema patients should work with their therapist to design a self-management exercise program
- Individuals with or at risk for lymphedema can and should perform aerobic and resistance exercise
- Starting with a PT/OT with lymphedema training is advisable but shifting to work with an exercise professional after initial evaluation is safe
- Patients with confirmed lymphedema should wear compression garments during exercise
- Progression should be gradual to avoid overuse
- The benefits of exercise outweigh the risks of disuse

NLN exercise guidelines (continued)

- Flexibility/ Stretching
  - May improve lymph flow by decreasing scarring and tightness
  - Avoid over stretching
- Strength training
  - Modifications are needed
  - Adequate rest between sessions is crucial
  - Modify your program according to your symptom response
  - Progression should be gradual

NLN exercise guidelines (continued)

- Aerobic conditioning
  - Thought to be beneficial for individuals with lymphedema
  - Deep respiration enhances lymph drainage
  - Avoid injury by increasing gradually
  - Avoid getting overheated
  - Modify your program according to your symptom response

More Exercise Guidelines

American Cancer Society nutrition and physical activity guideline for cancer survivors

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ASCO special articles

Exercise, Diet, and Weight Management During Cancer Treatment: ASCO Guideline

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SPECIAL COMMUNICATIONS

Exercise Guidelines for Cancer Survivors: Consensus Statement from International Multidisciplinary Roundtable

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ABSTRACT

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Exercise Guidelines for Cancer Survivors: Consensus Statement from International Multidisciplinary Roundtable. *Med. Sci. Sports Exerc*
Vol. 51, No. 11, pp. 2375–2390, 2019. **Purpose:** The number of cancer survivors worldwide is growing, with over 15.5 million cancer su
vivors in the United States alone—a figure expected to double in the coming decades. Cancer survivors face unique health challenges as
result of their cancer diagnosis and the impact of treatments on their physical and mental well-being. For example, cancer survivors often ex
perience declines in physical functioning and quality of life while facing an increased risk of cancer recurrence and all-cause mortality com
pared with persons without cancer. The 2010 American College of Sports Medicine Roundtable

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Summary of Guidelines

	During Treatment		Post Treatment	
	Aerobic	**Resistance**	**Aerobic**	**Resistance**
ACSM	30 min 3x weekly	2x weekly	150-300 min/weekly	2x weekly
ACS	Recommended but not specific		150-300 min/weekly	No comment
ASCO	Recommended	Recommended	Not the focus of the guideline	

What does exercise help?

STRONG Evidence	MODERATE Evidence
Anxiety	Bone Health
Depressive Sx	Sleep
Fatigue	
HR-QOL	
Lymphedema	
Physical Function	

Strength After Breast Cancer

- Based on a large clinical trial conducted at Penn
  - 154 survivors WITHOUT lymphedema
  - 141 survivors WITH lymphedema
- Women who participated had these benefits:
  - 50% reduced likelihood of lymphedema worsening
  - 70% reduced likelihood of lymphedema onset among women with 5 or more nodes removed
  - Improved strength and energy
  - Improved body image
  - Reduced body fat
  - Prevented decline in physical function

PAL Physical Activity & Lymphedema

For more information about lymphedema, visit:

- National Lymphedema Network (NLN) – lymphnet.org
- Lymphatic Education & Research Network (LE&RN) – (lymphaticnetwork.org)
- American Cancer Society (ACS) – cancer.org
- Moving Through Cancer Initiative of the American College of Sports Medicine
  - exerciseismedicine.org/eim-in-action/moving-through-cancer