

# Lymphedema:

## Don't Sweat the Swelling!



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## Presenters:



**Tami Colley, OTR/L, CLT**

- ❖ Years treating Lymphedema: 14
- ❖ Practice Location: Outpatient Rehab
- ❖ Lymphedema Certification from: Klose



**Carolyn Block, OTR/L, CLWT, CLT-LANA**

- ❖ Years treating Lymphedema: 10
- ❖ Practice Location: Home Health
- ❖ Lymphedema Certification from: International Lymphedema and Wound Training Institute (ILWTI)

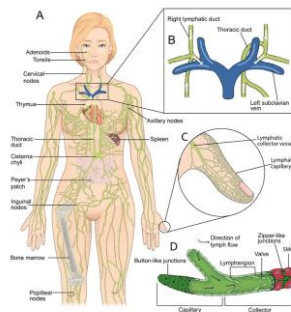
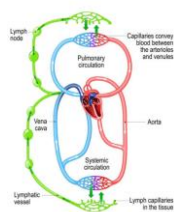
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## Objectives:

1. A basic understanding of the lymphatic system & Causes of Lymphatic Dysfunction
2. Understanding that there is 4 components to lymphedema complete decongestive therapy treatment
3. Identify at least 3 types of lymphedema that can impact QOL
4. Identify at least 2-3 signs/symptoms of clinical/subclinical lymphedema
5. Identify whom is able to provide lymphedema treatment and how to initiate some type of treatment while waiting
6. Sign and Symptoms of PAD with testing: ABI scoring for safe compression use
7. Identify if current compression is appropriate; options for adaptive equipment to don/doff compression

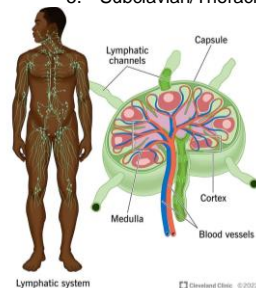
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Lymphatic system



### Let's take a trip through the Lymphatic System!

1. Interstitial space
2. Lymph Collectors
3. Lymph Vessels
4. Lymph Nodes
5. Subclavian/Thoracic Duct



Defining Lymphedema

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# WHAT IS LYMPHEDEMA?



Lymphedema is a condition characterized by dysfunction of the lymphatic system resulting in chronic progressive soft tissue edema.

Long-standing disease leads to irreversible swelling, fibrosis, and fatty deposition.

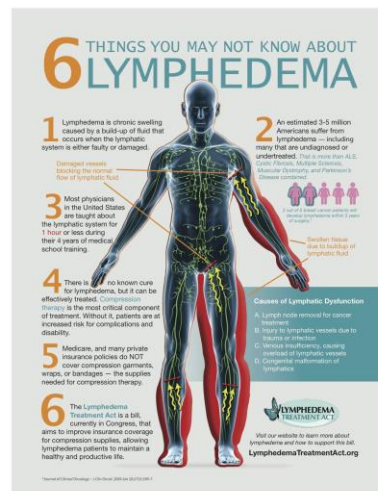
Advanced lymphedema is both disfiguring and debilitating contributing toward impaired quality of life for afflicted individuals.<sup>3</sup>

Defining Lymphedema

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## Causes of Lymphatic Dysfunction

1. Congenital malformation of the Lymphatics
2. Lymph node removal and/or radiation for cancer treatment
3. Injury to lymphatic vessels due to trauma, infection, or surgeries
4. Venous insufficiency, causing overload of lymphatic vessels



Defining Lymphedema

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## Body parts where symptoms occur

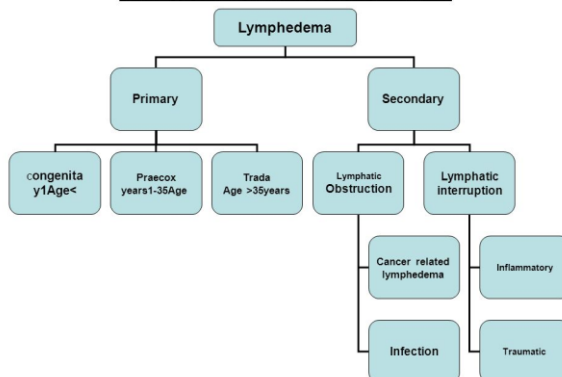
- | Upper Quadrant   | Lower Quadrant   |
|--|--|
| <ul style="list-style-type: none"> <li>• Upper extremities</li> <li>• Chest/Breast</li> <li>• Trunk</li> <li>• above belly button</li> </ul> | <ul style="list-style-type: none"> <li>• Lower extremities</li> <li>• Genitals</li> <li>• Abdomen- below the belly button</li> </ul> |
| <ul style="list-style-type: none"> <li>• Abdomen</li> <li>• Head and Neck, oral</li> </ul>   |  |

Defining Lymphedema

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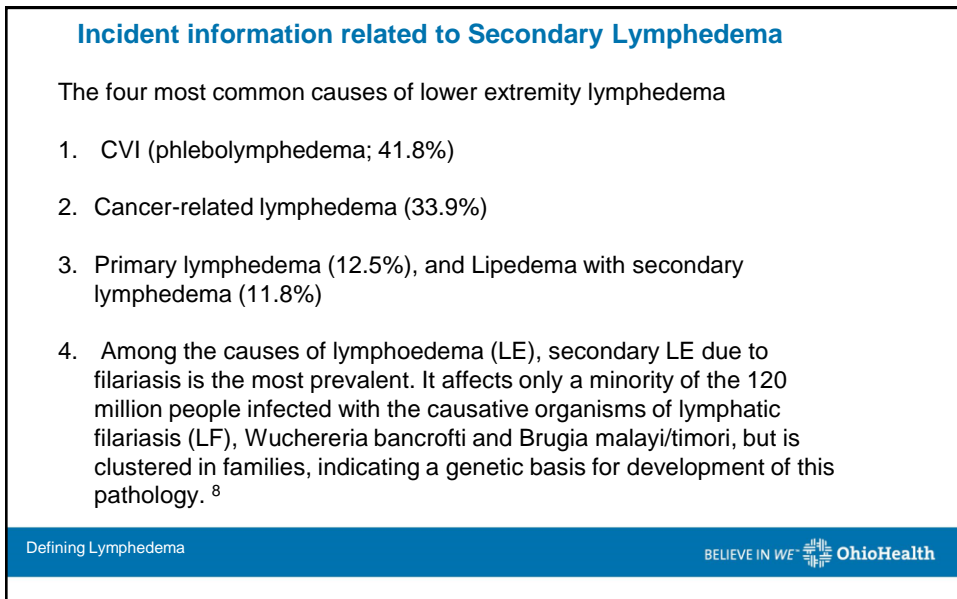
## All Edemas are Lymphedema but...

### Etiology (Classification) of Lymphedema:



Defining Lymphedema

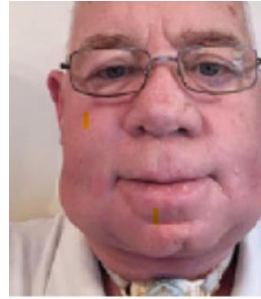
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## Cancer Related Lymphedema



BCRL affects approximately 1 in 5 patients treated for breast cancer, and it has a significant negative impact on patients' quality of life after breast cancer treatment, serving as a reminder of previous illness<sup>2</sup>



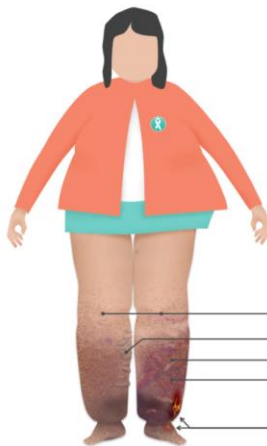
In head and neck cancer, lymphatic and soft tissue complications can develop throughout the first 18 months post-treatment, with greater than 90% of patients experiencing some form of internal, external, or combine lymphedema<sup>2</sup>

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## Phlebolympoedema Visible Symptoms

Chronic Venous Insufficiency & Lymphoedema

© Lymph Info Trust



### Failure of Two Systems

Venous  
Circulation System

Impaired  
Vein Function

+

Lymphatic  
Circulation System

Overloaded  
Lymphatic System

- Swelling of one or both legs, ankles and feet
- Varicose veins
- Thickened / hard skin
- Changes in skin colour  
*Hyperpigmentation & purple/brown colour from blood leaking into tissue.*
- Open wounds and ulcers

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## Filariasis

CC1=NC2=C(C=C1)SCC2=NC(=O)OC  
 albendazole

CCN(CC)C(=O)N1CCNCC1  
 diethylcarbamazine

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## Lymphedema vs Lipedema


LYMPHEDEMA

LYPEDEMA

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Gender	Obesity	Lipedema	Lymphedema	Lipolymphedema
	M or F	Almost exclusively female	Male or female	Almost exclusively female
Time at onset	Childhood onward	Ages 10 – 30	Childhood (primary) adult (secondary)	Typically age 30 and up
Family history	Common	Common	Only for primary	Occasionally
Effect of dieting	Positive	None	None	None
Effect of elevation	None	Minimal	None	Helpful until fibrosis develops
Pitting edema	Absent	Minimal	Pitting may stop as fibrosis progresses	Usually present to some degree
Pain	None	Present in legs	None in early stages	Present in legs
Area affected	All parts of the body	Bilateral legs, buttocks, thighs (feet spared), arms (hands spared)	Feet affected first, then progressive leg involvement; unilateral more common	Feet affected eventually
Bruises easily	No	Yes	No	Yes
Stemmer's sign	Absent	Absent	Present	Present

Advances in Skin & Wound Care 2010;23: 81-92

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## Symptoms of Lymphedema

1. Heaviness in extremity
2. Decreased flexibility/ range of motion in joints
3. Trouble fitting the arm into a jacket or shirt sleeve, leg into pants, foot-ankle into shoes
4. Recurrent Cellulitis
5. Skin changes
  - Papillomas and fibromas
  - Dry skin
  - mossy foot
  - Hyperkeratosis
  - redness
  - tightness, redness, or hardening rash, itching, redness, pain, or skin
  - lipodermatosclerosis-inverted champagne bottle
  - bra is tighter





## Symptoms of Lymphedema



Figure 3. Characteristic 'mossy' skin changes around the toes.

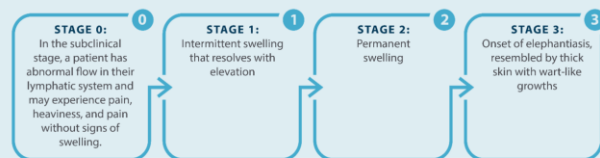


Figure 1. Bilateral podoconiosis and characteristic hyperkeratosis.

Symptoms of Lymphedema

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### STAGES OF LYMPHEDEMA



Source: Johns Hopkins Medicine



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## Subclinical Lymphedema

<https://pubmed.ncbi.nlm.nih.gov/25495384/>

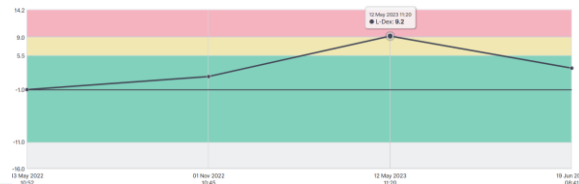
Periodic monitoring of women at high risk for LE with BIS allows early detection and timely intervention for LE, which reduces the incidence of clinical LE from 36.4% to 4.4%. This may have implications for quality of life and health care costs.



SOZO: Available at 5-7 sites within Ohiohealth Cancer Services

Routine: Complete preop, 3/6/9/12 months post op

If testing in yellow, use compression garment, if testing in red, use clinical judgement



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## Lymphedema



Lipodermatosclerosis

Symptoms of Lymphedema

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## Compression Screening

- Using ace wraps, TED hose, tuba grip and swelling past the containment wall of these garments or having problems
- Compression socks more then 6-9 months old, or have runs/holes
- Using a Velcro garment wrong or with out foot compression
- Only using a compression pump with no compression maintenance garment
- Chronic or stalled wounds with having high exudate
- Lymphorrhoea- leakage of lymph onto the skin



Referring for treatment

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## IS IT NON COMPLIANCE OR IS IT A BARRIER?

- Do they know how to use the compression or is it the wrong compression?
- Are they up and moving or in a dependent prolong position?
- Are they elevating and still moving?
- Are they only using a compression pump

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## Questions when Needing a Lymphedema Referral

What questions could you ask the patients?

- Have you ever met with a lymphedema therapist?
- Do you have a pump and who got it for you? Was it your doctor?
- When was the last time you used your pump? Do you know how to prime your lymph nodes pre pumping?
- Who instructed you to get the compression garment? Where did you get it?
- Do you have compression garments? How did you get them? Where did you get them and wearing them, is there a reason why?

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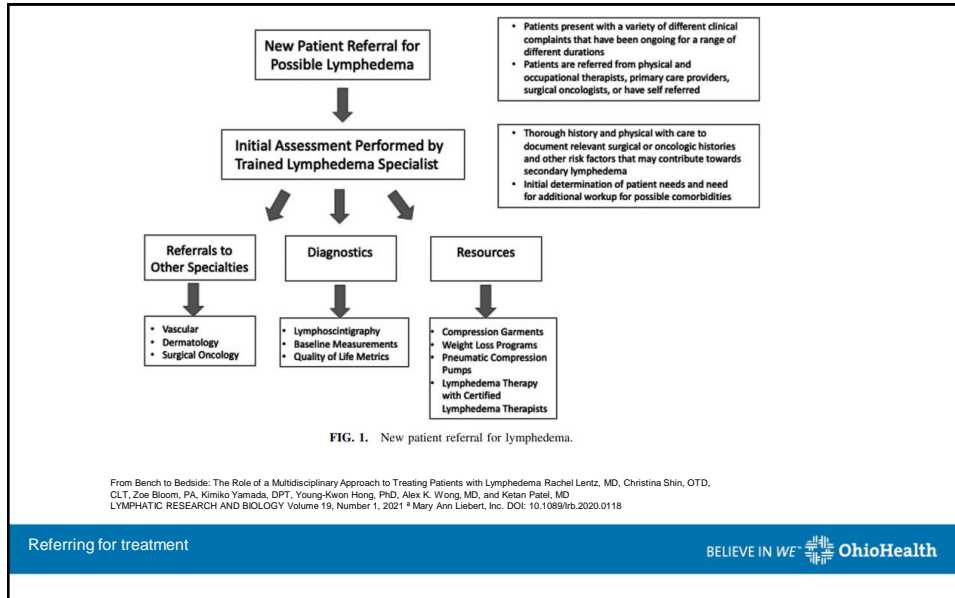
## A Non CLT eval – What to do?

### DO WHAT YOU DO!!

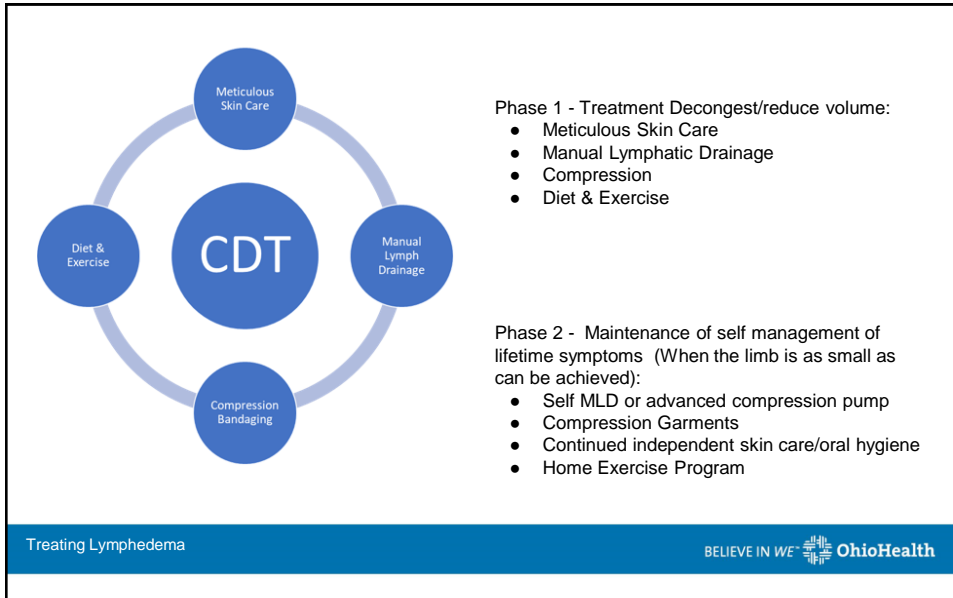
Do a typical Evaluation!

- ROM
- Strength
- Coordination (fine motor, gross motor, intra/interlimb coordination)
- ADL status (important and to be addressed later)
- Use of adaptive equipment
- Skin Integrity
- Girth Measurements (both limbs, document anchor points!)
- Gait Analysis
- Posture

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## What is Complete Decongestive Therapy (CDT)?



## Ensuring Safe Treatment of CDT

- Compensated CHF dx with EF & < 35%
- Uncontrolled/unstable blood pressures
- Volume overload; acute sudden onset of edema
- Active angina
- Current DVT or suspected PE or history
- Renal failure/hemodialysis
- Acute infection Gout
- Untreated cancer
- Bleeding AAA
- History Hyperthyroidism
- Untreated/acute infections
- PAD (ABI <0.5 or vascular clearance)

Treating Lymphedema

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How can a non CLT help until a patient is seen by a lymphedema therapist or already reduced

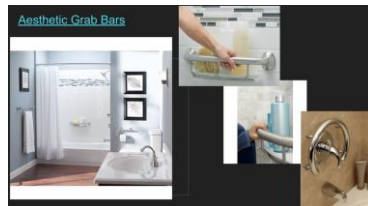
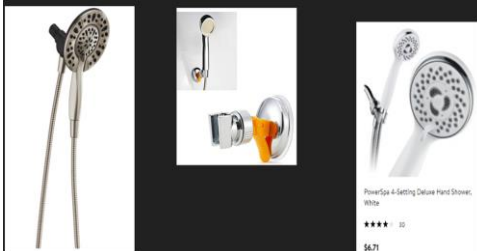
PHASE 1 TREATMENT Phase	
1. Skin Care	YES!
2. Exercise	YES!
3. Manual Lymphatic Drainage	NO – CLT
4. Compression	1-reduction- CLT 2.maintenance phase don/doffing garments yes

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## Meticulous Skin Care

Evaluate the ability to complete bathing task

### Hand Held Shower Head



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## Meticulous Skin Self-care



use moisturizer creams and soaps with neutral pH and fragrance and alcohol free



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## Meticulous skincare



**SP Ableware Roll Easy Lotion Applicator with Pivoting Handle and 2 Interchangeable Massage Rollers**

[https://www.amazon.com/Maddak-Roll-Lotion-Applicator-741330050/dp/B000TYO1TS/ref=sr\\_1\\_5?keywords=ableware+roll+easy+lotion+applicator&qid=1687269869&srefix=ableware+roll%2Caps%2C97&sr=8-5](https://www.amazon.com/Maddak-Roll-Lotion-Applicator-741330050/dp/B000TYO1TS/ref=sr_1_5?keywords=ableware+roll+easy+lotion+applicator&qid=1687269869&srefix=ableware+roll%2Caps%2C97&sr=8-5)



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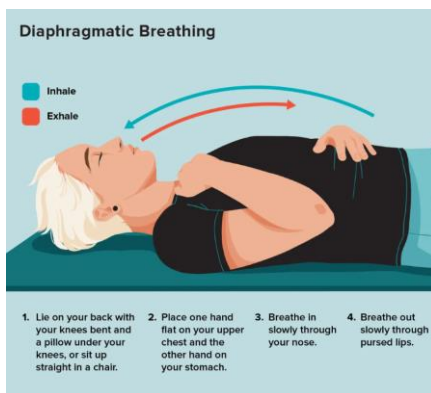


## Exercising and Compression Mechanism in the Treatment of Lymphedema

- There was a mean reduction of 46.2 mL ( $\pm 66.95$  mL, 1.2% reduction of volume; paired t-test p-value  $< 0.02$ ) in volume while walking with a well-adjusted compression garment.
- The volume increased by an average of 74.5 mL ( $\pm 99.75$  mL, 1.9% increase of volume; paired t-test p-value  $< 0.007$ ) while walking without any compression

## Lower/Upper extremity exercises

- Joint motion (still ok to add resistance)
- Distal to proximal
- Typical LE: Ankle circles, knee flex/ext, marching
- Typical UE: Open/close fist, wrist circles, elbow flex/ext, shoulder circles
- Most beneficial when compression is ON



## Aquatics

- Hydrostatic pressure of the water
- Weightlessness for patient



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## Trunk exercises

- Mainly to focus on stretching transverse pathways
- Lymph nodes up and down spinal column as well



## Head and neck Exercises

- Focused on cervical LN along sides of neck
- Submental and jaw line



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## What is Manual Lymphatic Drainage (MLD)

- Initially developed by Emil and Estrid Vodder, then revamped and matured by the Foldi clinic in Germany.
- There are 3 general rules of study, The Vodder Technique, The Foldi Technique, and the LeDuc technique. More and more are being added annually
- In all of them, superficial lymphatic vessels are stimulated primarily to remove excess fluid from the interstitial space. To do this, physiotherapist generally apply gentle grip at low pressure. <sup>5</sup>
- **IF PATIENT IS GOING TO A MASSAGE THERAPIST....**They must let the massage therapist know that they have lymphedema or are at a risk.

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## Effects of MLD

### **MLDs effects on lymph system**

MLD is applied gently on the skin to increase the contraction of the smooth muscles around the superficial lymphatic vessels, thereby increasing the lymph flow. MLD enables lymph and tissue fluid to move forward and also increases the frequency and amplitude of the contraction and relaxation movement of the lymphatic collectors <sup>5</sup>

### **Nervous System**

Reduce the firing of the sympathetic system

### **Effects pain tolerance and pain threshold**

Effects of this are limited, but can inhibit the pain receptors with gentle touch

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## Effects of MLD

### Musculoskeletal

treatment group showed a statistically significant decrease in blood lactate dehydrogenase and aspartate aminotransferase concentrations immediately after a treatment session and immediately after a 48 hour observation. The decrease in serum levels of skeletal muscle enzymes following MLD indicates the potential of potential regenerative and repair mechanisms for skeletal muscle cell integrity following structural damage associated with physical activity. <sup>5</sup>

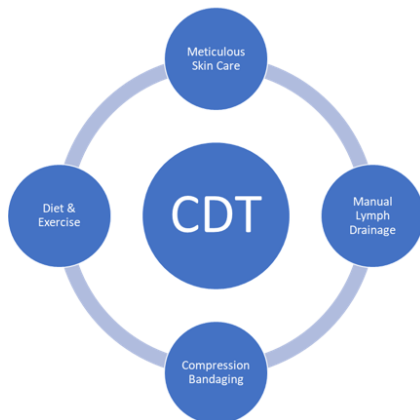
### Venous Flow

Multiple studies demonstrate appropriate use of MLD due to increase of venous recycling

### Fatigue

Only one study during the research review which demonstrated decreased fatigue after intense workout

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#### Phase 1 - Treatment Decongest/reduce volume:

- Meticulous Skin Care
- Manual Lymphatic Drainage
- Compression
- Diet & Exercise

#### Phase 2 - Maintenance of self management of lifetime symptoms (When the limb is as small as can be achieved):

- **Self MLD or advanced compression pump**
- Compression Garments
- Continued independent skin care/oral hygiene
- Home Exercise Program

Treating Lymphedema

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## Basic vs. Advanced Pneumatic Compression?

Basic PCD



Flexitouch® Plus



TACTILE MEDICAL |

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## COMPRESSION PUMPS

- MOST Insurances will approve, however there are insurance guidelines that need to be followed.
- More chambers = better gradient compression
- Usually difficult to get an advanced pump approved if physicians have already gotten a basic pump

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# Compression Pumps

## Flexitouch® Plus system FDA Indications for Use & Contraindications

### Indications for Use

- The Flexitouch Plus system provides adjustable, gradient, sequential compression therapy for:
  - Primary & secondary lymphedema
  - Post mastectomy edema
  - Edema following trauma and sports injuries
  - Post immobilization edema
  - Venous insufficiencies
  - Reducing wound healing time
  - Treatment and assistance in healing stasis dermatitis, venous stasis ulcers, or arterial and diabetic leg ulcers

### Contraindications

- Contraindications include:
  - **Heart failure** (acute pulmonary edema, decompensated acute heart failure)
  - **Acute venous disease** (acute thrombophlebitis, acute deep vein thrombosis, acute pulmonary embolism)
  - **Severe peripheral artery disease** (critical limb ischemia including ischemic rest pain, arterial wounds or gangrene)
  - **Active skin infection/inflammatory disease** (acute cellulitis, other uncontrolled skin or untreated inflammatory skin disease)
  - **Active cancer** (cancer that is currently under treatment, but not yet in remission)
  - **Any circumstance where increased lymphatic or venous return is undesirable**
  - **During pregnancy** (applies to Flexitouch Plus trunk accessory).



Complete Flexitouch Plus Instructions for Use are available in the system User Guide, or at [Tactilemedical.com](http://Tactilemedical.com)

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## Compression during Phase I treatment

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### Compression therapy for chronic cellulitis

A study conducted in Australia measured the cost of recurrent cellulitis versus the cost of compression in 2017/18.

Of the 43 cellulitis group participants,

- 27 (63%) presented to the emergency department
- 24 (56%) were admitted to hospital
- 41 (95%) had one or more general practitioner appointments
- 23 (53%) required nonprescription pain relief
- 15 (35%) required prescription pain relief for their most recent episode

The total mean cost for a non hospitalized episode of cellulitis was \$1826, whereas the mean cost for a hospitalized episode was 7.4 times higher, being \$13,567.

Of the 40 compression group participants

- 23 (58%) received compression bandaging to reduce their edema before the provision of compression garments.

The total mean cost for compression therapy over 18 months was \$2326

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## Preparing clients for obtaining proper compression supplies



- Possibly needing to pay out of pocket for treatment supplies or maintenance supplies or a co-pay
- Nurse navigator
- Might need to meet with a social worker for supplies or maintenance garment needs

<https://lymphedematreatmentact.org/>

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### PERIPHERAL ARTERY DISEASE

**PERIPHERAL ARTERY DISEASE (PAD)** occurs when arteries in the leg become narrowed or clogged, causing less blood flow.

**SIGNS & SYMPTOMS**  
DO YOUR LEGS LIMIT YOU? LEG PAIN IS NOT NORMAL.

If you have PAD, you are at a **HIGHER RISK FOR HEART ATTACK, STROKE, & LIMB LOSS.**

**Find Out IF YOU HAVE IT**

**What YOU Can Do TO PREVENT PAD**

Don't smoke or get help to quit. Control your blood pressure, cholesterol and diabetes. Stay active and exercise daily. Talk to your health care team and know your options.

Go to [CardioSmart.org/PAD](https://www.CardioSmart.org/PAD) to learn more about Peripheral Artery Disease.

### Ankle-brachial pressure index (ABPI) detecting for peripheral arterial disease (PAD)

**Stanford Medicine 25**

ABI Value	Interpretation	Recommendation
Greater than 1.4	Calcification/Vessel Hardening	Refer to vascular specialist
1.0-1.4	Normal	None
0.9-1.0	Acceptable	None
0.8-0.9	Some Arterial Disease	Treat risk factors
0.5-0.8	Moderate Arterial Disease	Refer to vascular specialist
Less than 0.5	Severe Arterial Disease	Refer to vascular specialist

Referring for treatment
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## Commonly Used and Washable Items





## Swell spots



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## Foam/Texture Inserts



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## Compression for Phase II (Some compression from phase I can be used in phase II)

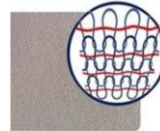
## Maintenance Compression



circular Knit  
compression

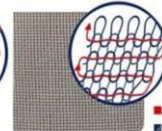
Flat Knit compression

Circular-knit technique



Schematic representation of a circular knitted fabric. Changes in shape due to different mesh heights and thread tension.

Flat-knit technique



Schematic representation of a flat knitted fabric. Changes in shape by increasing or decreasing stitches.

■ Elastic inlay yarn  
■ Knitting yarn

### Potential Dangers of Round/Circular Knit Compression Garments

In cases of limb distortion such as skin folds, nodules or concave sections of the leg, a round (circular) knit garment is not advised. Such fabrics will 'creep' which can cause pressure sores, discomfort, and restrict the transport of lymph.

## Edema wear



EdemaWear Stockinette is a soft, safe and effective treatment for edema of all types that uses an innovative compression system to reduce swelling.

- Easy to apply, latex-free, breathable and more comfortable than other compression garments.
- Wear EdemaWear stockinet on any edematous extremity.
- EdemaWear enhances lymphatic function leading to a decrease in painful inflammation sensation at the level of the skin.

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## Night Garment



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## Assistance with ADLs

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### Bed Recommendations



[Bed Cane Demo Clip](#)

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## Juzo Gator



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## ARION DONNER



Easy slide arm

I

Compression Sock  
Donner  
Closed Toe Slide Solution



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## Medi Arm Butler

### medi Arm Butler: Step by step instructions



1. Slip the arm sleeve over the semi-circular cylinder. Please ensure that the seam is not exactly in the middle, but slightly off to one side.

- Arm sleeves for the right arm – seam off to the outside right (at about 4 o'clock)
- Arm sleeves for the left arm – seam off to the outside left (at about 8 o'clock)



2. Now lay the **medi Arm Butler** around your arm. To stabilise it, anchor the front angle against the front edge of the table.



3. Slide your hand into the opening. Remember to carefully hold the cuff of the arm sleeve on the Butler firmly with the other hand.



4. Now slide your arm evenly into the arm sleeve without twisting it.



5. Check once again that the arm sleeve is sitting properly and, if applicable, turn up the topband or attachment.



The Donning Butler

## Sources:

1. Lymphedema Bryan C. Sleigh; Biagio Manna. [Author Information and Affiliations](#) Authors Sleigh<sup>1</sup>; Biagio Manna<sup>2</sup> Affiliations <sup>1</sup> Mercer University School of Medicine <sup>2</sup> RWJUH/Barnabas Health System. Last Update: September 18, 2022. a<sup>2</sup>.
2. Breast cancer-related lymphedema: risk factors, precautionary measures, and treatments. Gillespie TC, Sayegh HE, Brunelle CL, Daniell KM, Taghian AG. *Gland surgery*. 2018;7(4):379.
3. From Bench to Bedside: The Role of a Multidisciplinary Approach to Treating Patients with Lymphedema Rachel Lentz, MD, Christina Shin, OTD, CLT, Zoe Bloom, PA, Kimiko Yamada, DPT, Young-Kwon Hong, PhD, Alex K. Wong, MD, and Ketan Patel, MD
4. LYMPHATIC RESEARCH AND BIOLOGY Volume 19, Number 1, 2021 <sup>a</sup> Mary Ann Liebert, Inc. DOI: 10.1089/lrb.2020.0118
5. Compression Therapy Is Cost-Saving in the Prevention of Lower Limb Recurrent Cellulitis in Patients with Chronic Edema Elizabeth Webb, MPH,1,2 Bernie Bissett, PhD,2 Teresa Neeman, PhD,3 Francis Bowden, MD,4 Elisabeth Preston, PhD,2 and Virginia Mumford, PhD
6. Investigation of the Less Known Effects of Manual Lymphatic Drainage: A Narrative Review Franz-Josef Schingale, MD,1 Murat Esmer, MSc,2 Buse Ku" peli, MSc,2 and Damla U" nal, PT3 LYMPHATIC RESEARCH AND BIOLOGY Volume 00, Number 00, 2021 <sup>a</sup> Mary Ann Liebert, Inc. DOI: 10.1089/lrb.2019.0091

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8. Filariasis and lymphoedema [Parasite Immunol](#). 2009 Nov; 31(11): 664–672.doi: [10.1111/j.1365-3024.2009.01133.x](#) K M PFARR, <sup>1</sup> A Y DEBRAH, <sup>1,2,3</sup> S SPECHT, <sup>1</sup> and A HOERAUE<sup>1</sup>
9. Exercising and Compression Mechanism in the Treatment of Lymphedema [Stelamarys Barufi](#) • [Henrique Jose Pereira de Godoy](#) • [Jose Maria Pereira de Godoy](#) • [Maria de Fatima Guerreiro Godoy](#) Published: July 02, 2021 DOI: 10.7759/cureus.1612

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## How to become a CLT or CLWT

- GET TRAINED!
- Required to sit for the LANA (Lymphedema Association of North America)
- Successfully complete a 135-hour course in Complete Decongestive Therapy (CDT)
- Possess a current, unrestricted US state or international license or registration as a Registered Nurse, Occupational Therapist, Certified Occupational Therapy Assistant, Physical Therapist, Physical Therapist Assistant, Medical Doctor, Doctor of Osteopathic Medicine, Doctor of Chiropractic, Massage Therapist, or Certified Athletic Trainer
- Meet minimum 12 college-credit hour science requirements
- Submit completed application with \$430 application fee

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