

Lymphedema

Presented By

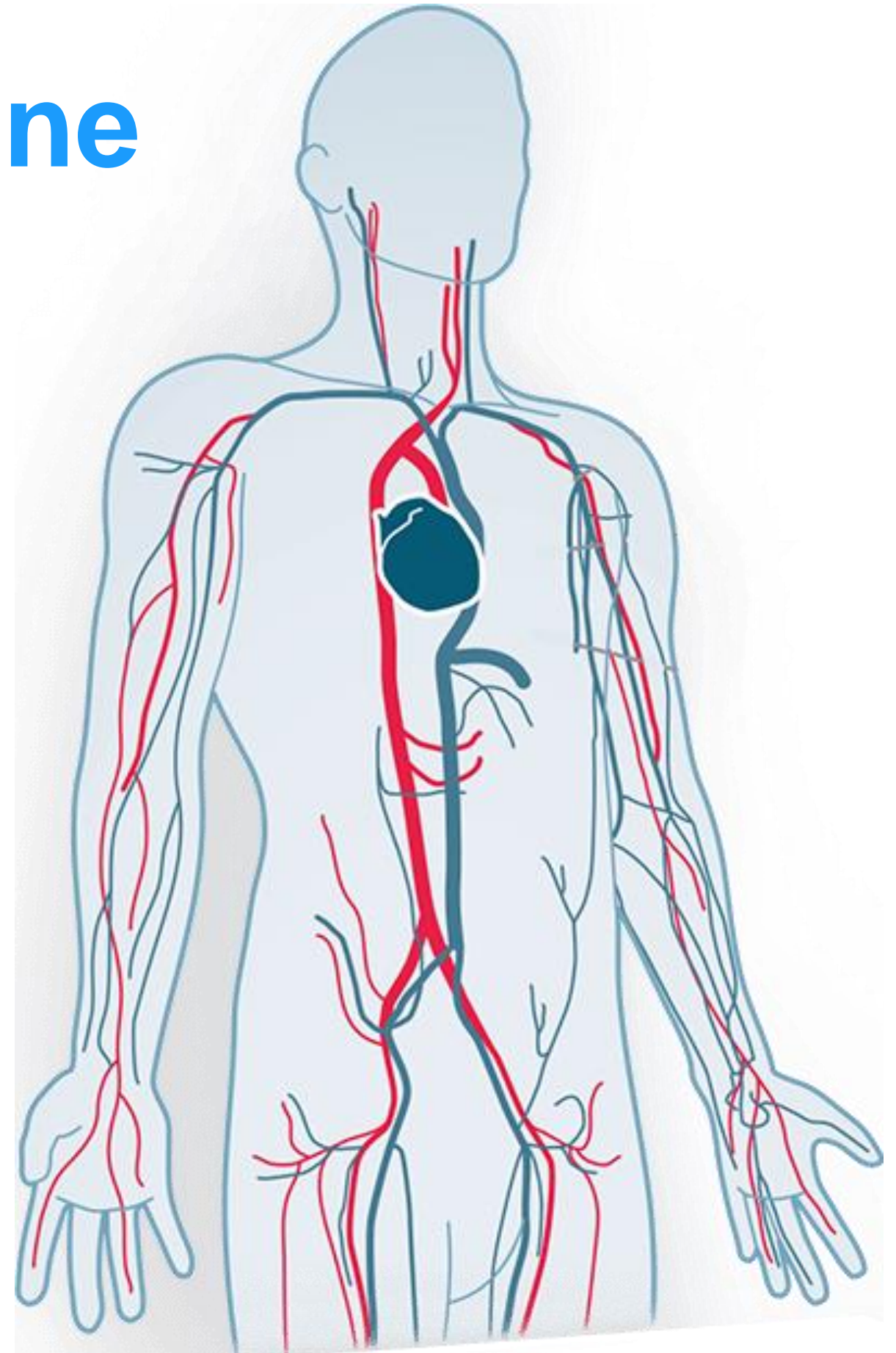
Deborah Torres

Active Life Orthotics, Prosthetics & Compression



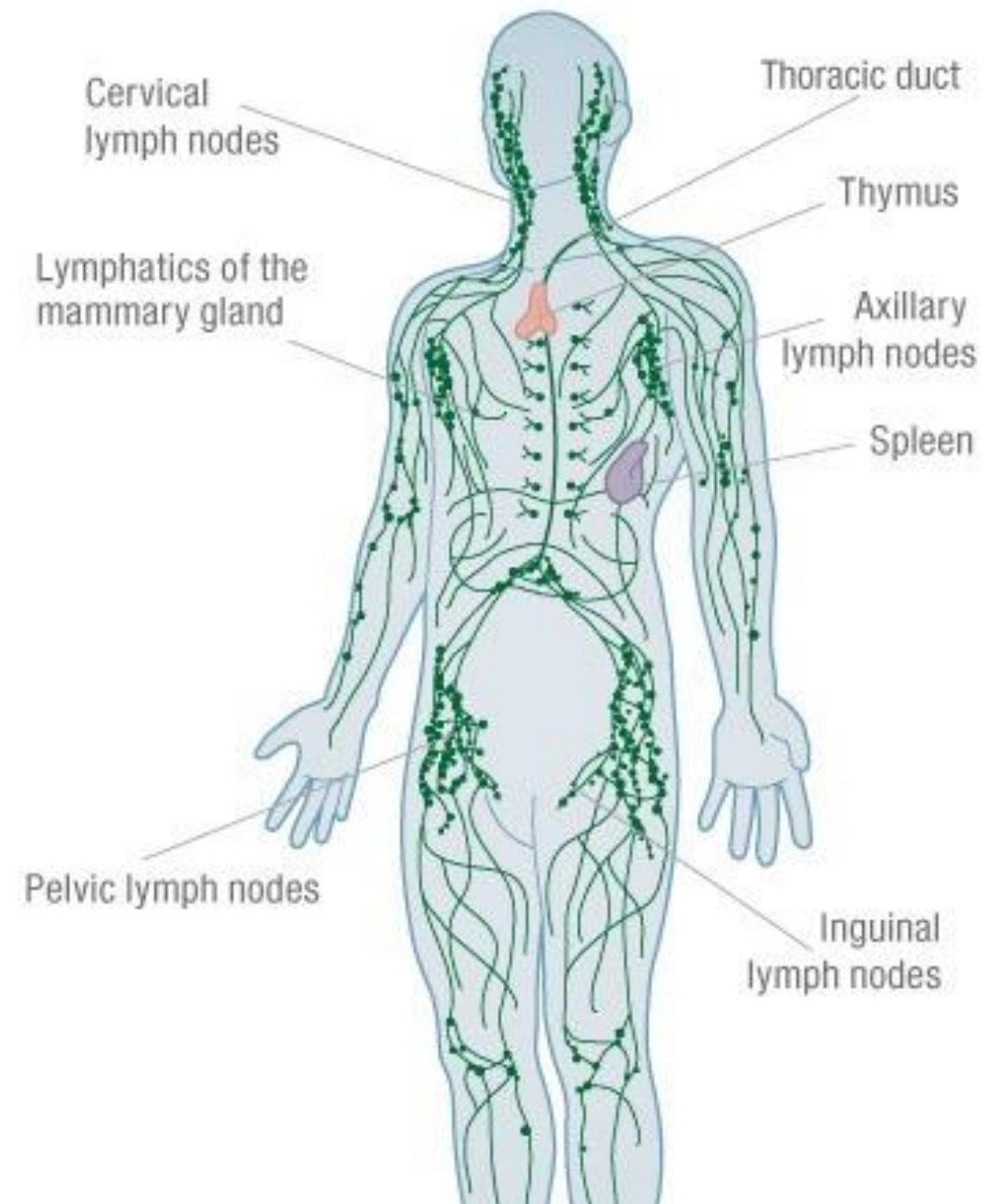
Outline

- **The Lymphatic System**
- **What Causes Lymphedema?**
- **Stages of Lymphedema**
- **Lymphedema Treatment**
- **Questions and Answers**

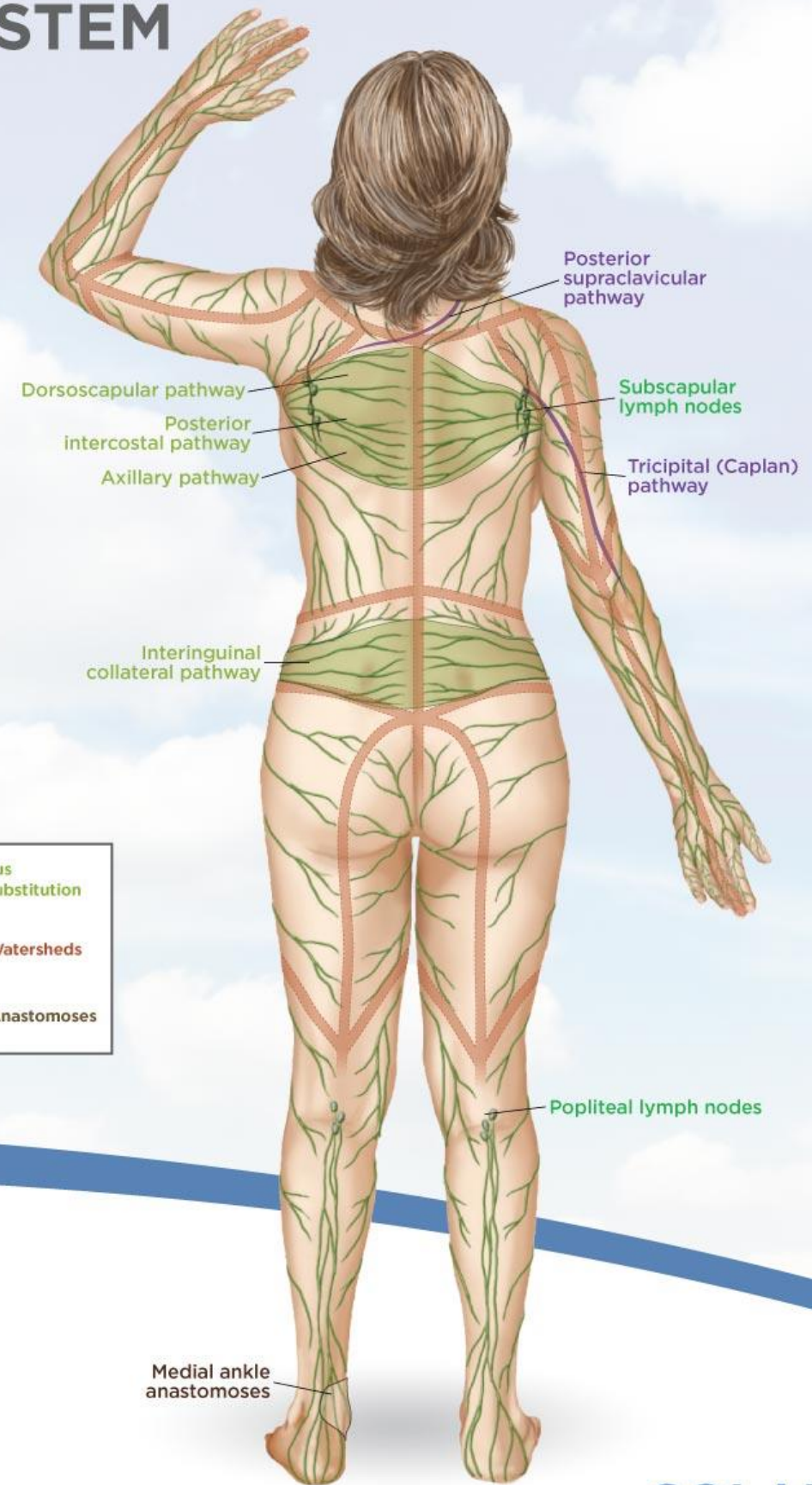
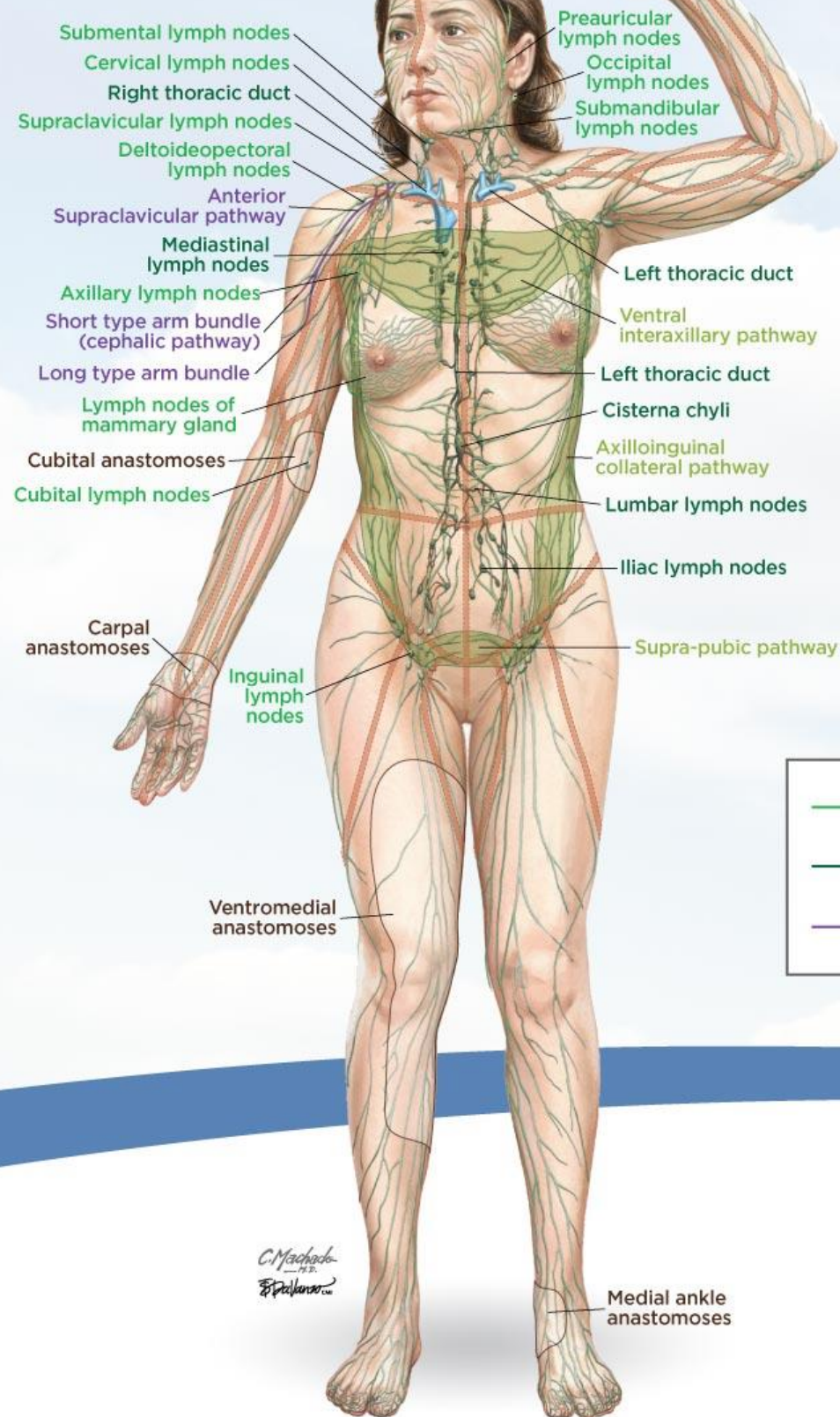


The Lymphatic System

- The lymphatic system is responsible for the production, transport and filtration of lymph fluid throughout the body.



PRIMARY AND COLLATERAL LYMPHATIC SYSTEM



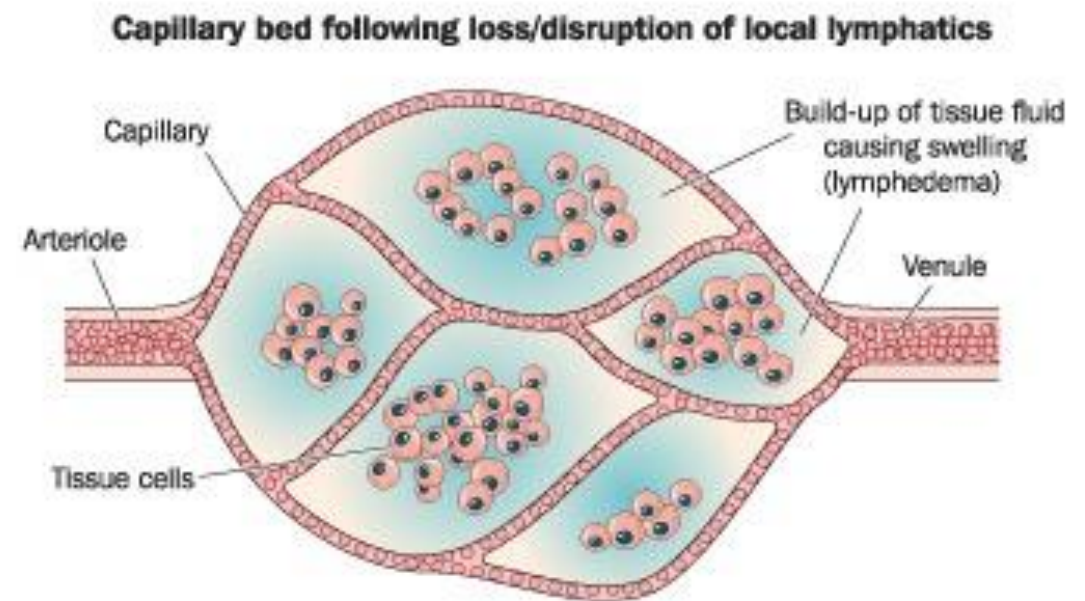
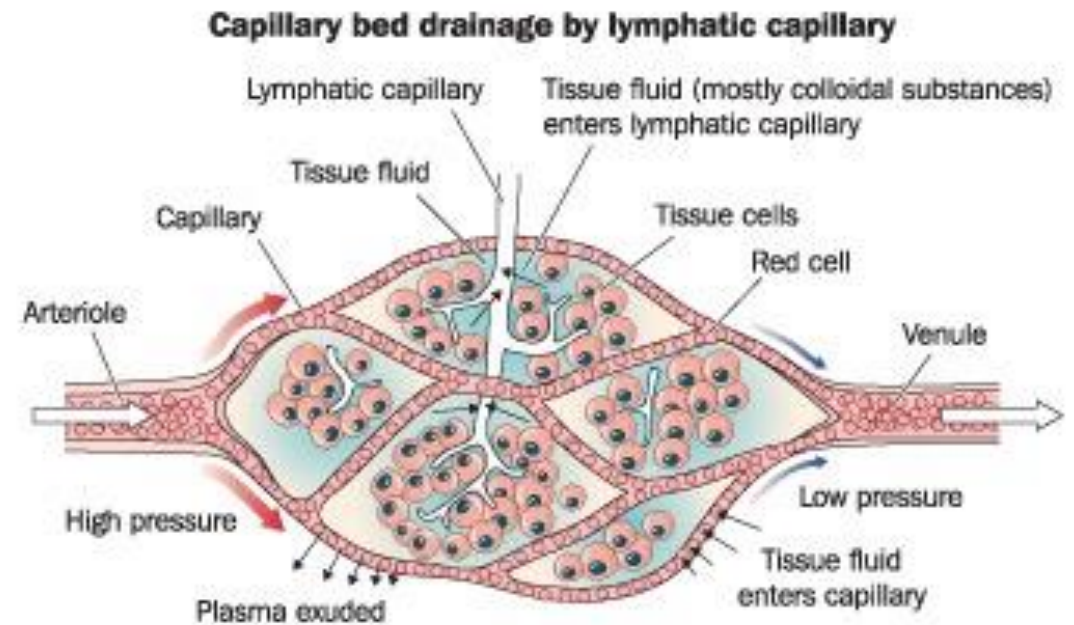
Superficial Lymphatic System	Subcutaneous Collateral/Substitution Pathways
Deep Lymphatic System	Lymphatic Watersheds
Accessory Drainage Pathways	Deep to Superficial Anastomoses

3 Main Functions of the Lymphatic System

- **Fight infection**
- **Lipid (fat) absorption**
- **Drain excess fluid**

What Do Lymph Nodes Do?

- Filter bacteria, toxins and dead cells
- Produce lymphocytes for fighting infection
- Concentrate and filter lymph fluid
- Regulate protein concentration in lymph



What Happens When Lymph Nodes are Removed?

What is Lymphedema?

- **When a patient gets a blockage in their lymphatic system and swelling (EDEMA) occurs.**
- **What is Lymph Fluid?**
- Colorless, yellow or white depending on concentration.
- Full of infection fighting cells or what we call LYMPHOCYTES.

Types of Lymphedema

Primary lymphedema

Primary lymphedema is due to a developmental defect (malformation, dysplasia) of the lymph vessels and/or lymph nodes. Primary lymphedema can be either congenital or hereditary and is usually unilateral.

Types of Lymphedema

Secondary Lymphedema

Caused by an insult to the lymphatic system and can appear at any age.

Examples of Causes:

Surgery / Radiation for Cancer

Trauma

Infection

Chronic Venous Insufficiency

Obesity

Signs & Symptoms

- **Swelling in the arm or leg**
 - Onset may be slow or rapid
 - Progressive
 - Pitting
 - Most often starts distally
- **A heavy or tight feeling in the affected area**
- **Cellulitis**
- **Fibrosis**
- **Positive Kaposi-Stemmer's Sign**

Stemmer's Sign



Cellulitis



Stages of Lymphedema

- **Stage 0** - Latent
- **Stage 1** - Reversible/Mild
- **Stage 2** - Irreversible/Moderate
- **Stage 3** - Elephantiasis/Severe



Stage 0 - Latent

1. Swelling is not evident
2. May exist for years without showing edema
3. Most patients don't show symptoms
4. Patient at risk of developing lymphedema



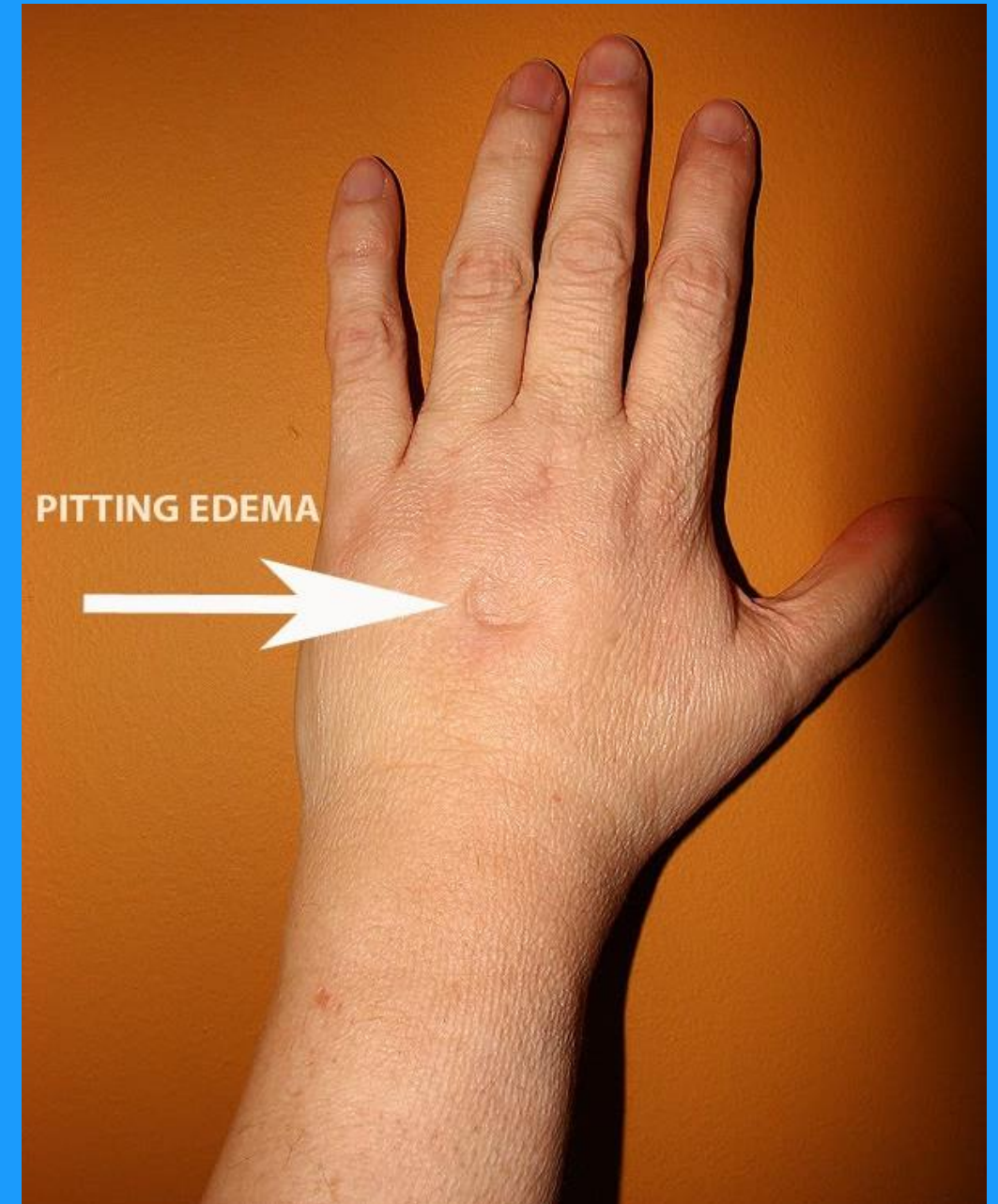
Day time: class 1

Circular Knit / Sheer to Moderate
Sleeve, Sleeve/Glove/Gauntlet
Knee, Thigh, Pantyhose

Night time: Not Indicated

Stage 1 - Reversible/Mild

1. Pitting may occur
2. Reversible because edema can go away with elevation or compression.
3. Skin is typically soft with no dermal fibrosis.



Day Time: Class 1 or 2

Circular Knit / Sheer to Moderate

Flat Knit if not Controlled by Circular Knit

Seam / Cut & Sew

Night Time: Indicated if not controlled by Day
Garments

Strap design

Chipped Foam

Stage 2 - Irreversible/Moderate

1. Swelling does not go away with elevation
2. Early dermal fibrosis is starting to develop
3. Does NOT reverse with compression
4. With prolonged treatment and compliance, dermal fibrosis can improve & reverse



Day time: Class 2

Circular Knit / Moderate

Full Knit

Flat Knit / Short Stretch Properties

Combination of Circular / Flat Knit and Strap Design

Night time: Indicated if not controlled by Day Garments

Strap design

Chipped Foam

Seamed / Cut and Sew

Stage 3 - Elephantiasis/Severe

1. Swelling visible during exam
2. No Pitting
3. Possible lobules



Day time: Class 2, 3, or 4

Flat Knit / Short Stretch Properties

Combination of Flat Knit and Strap Design

Possibly Layered Compression

Night time: Indicated

Chipped Foam Indicated for Fibrosis

Strap Design

Goal of Lymphedema Management

- Decongestion
- Latency Stage, Stage 0; Sub-Clinical Stage
- Maintain Reduction
- Prevent/Eliminate Infections
- Remove Fibrotic Tissue

Lymphedema Treatment

- CDT / MLD
 - Complete Decongestive Therapy
 - Manual Lymph Drainage
- Compression
 - Bandaging
 - Wrap Garments
 - Chipped Foam Garments
- Pumps



Complete Decongestive Therapy

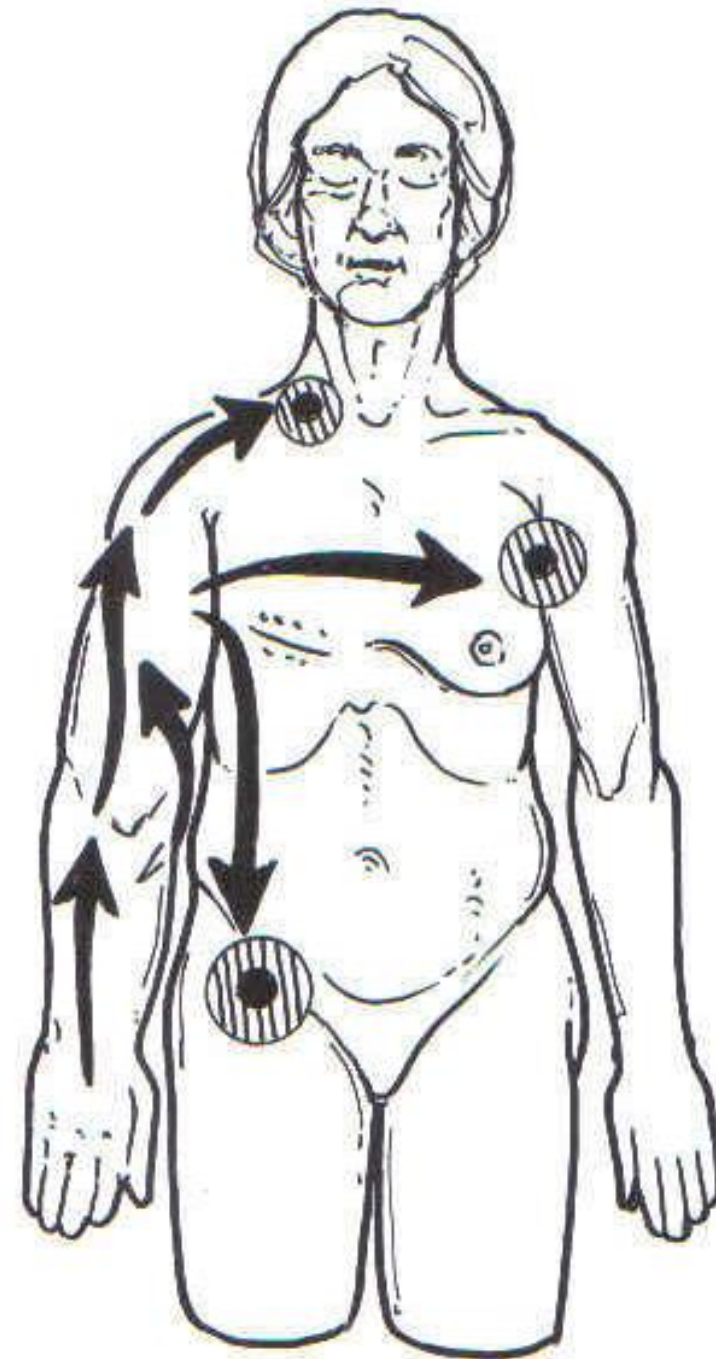
Main treatment for Lymphedema.

Shown to be safe and effective.

Phase 1 Initial reductive phase	Phase 2 Maintenance phase
Goal: reduce the size of the affected limb and improve the integrity and condition of the skin.	Ongoing, individualized self-management phase to insure the gains of phase 1 are maintained long term.

Manual Lymph Drainage (MLD)

- Improve the activity of lymph vessels
- Mobilize lymph fluid
- Re-route lymph flow around blocked areas into more centrally located, healthy areas



Bandaging



What Does Compression Do?

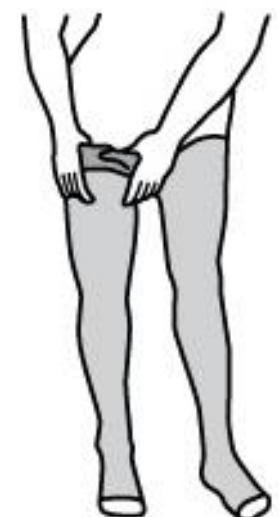
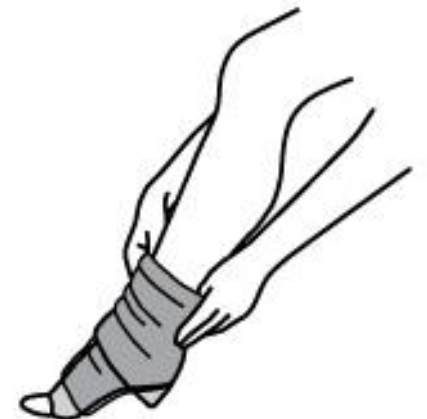
Once your lymphatic vessels have been “awakened” with MLD, compression is applied to help move the extra fluid out of the limb, and to keep it from coming back into the limb.

The idea behind compression therapy is to assist the tissue by applying pressure from the outside, which helps move the fluid into the lymphatic system, where it is filtered, concentrated, and returned to your body.



Compression Garments

- Wrap Garments
- Flat Knit & Circular Knit Garments
 - Knee High
 - Thigh High
 - Pantyhose
 - Toe Caps
 - Chaps
- Chipped Foam Garments
 - Tribute, Caresia



Garment Selection Considerations

- Age
- Tolerance
- Strength
- History
- Compliance
- Financial / Insurance
- Size



Chipped Foam Garments

Often referred to as
“Night Garments”.

The foam channels designed into
these garments can help soften
up those hard fibrotic areas.



Non-Elastics (Chipped Foam)



Flat Knit Garments

Custom Garments that can be knit into extremely complex shapes and sizes.

These garments have less stretch and provide better edema control than circular knit.

The process allows for garments to bridge the gaps of any skin fold or crease preventing the garment from digging in and irritating the skin.



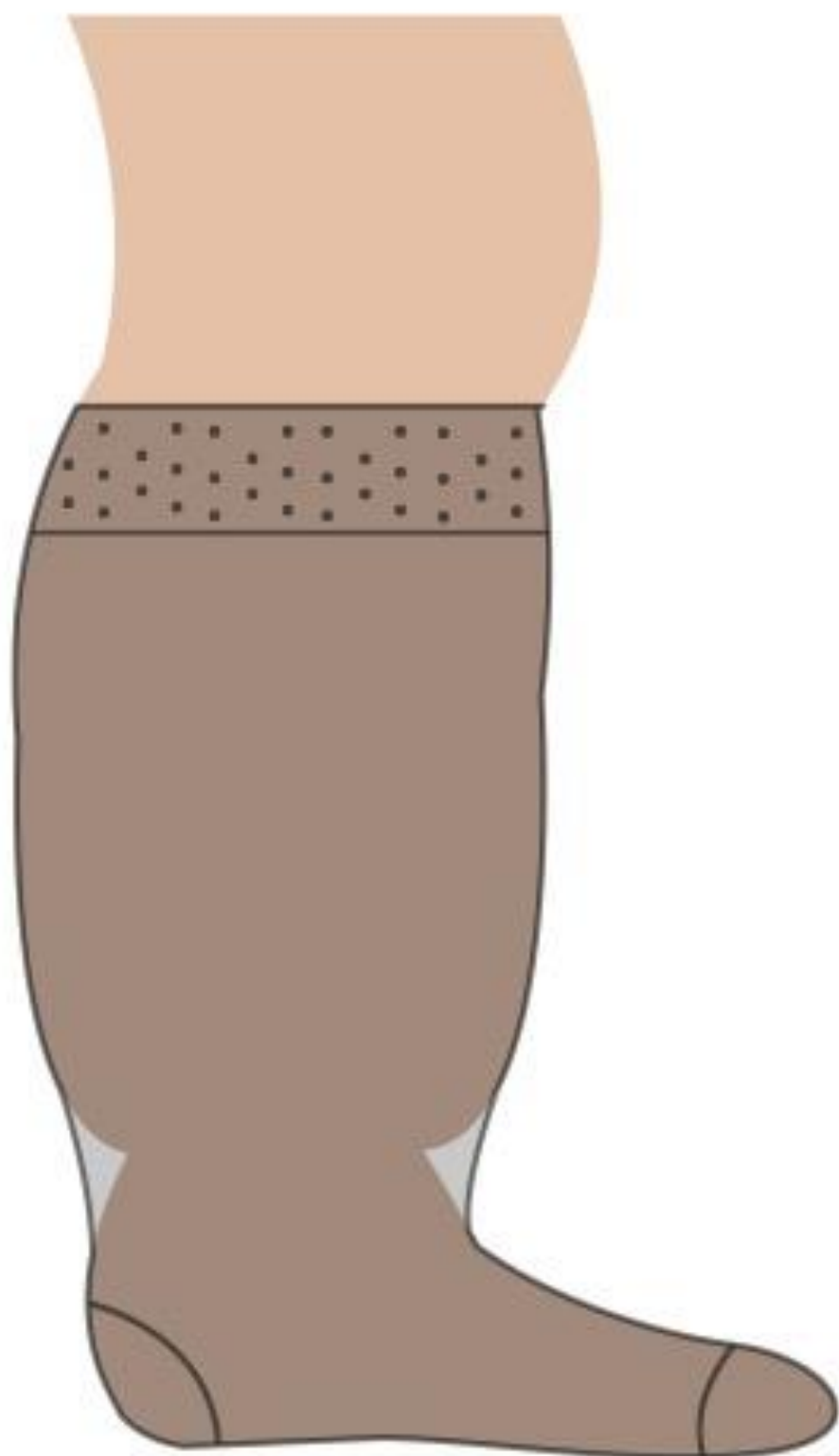
Circular Knit Garments

These garments are seamless and more tubular shaped versus custom garments.

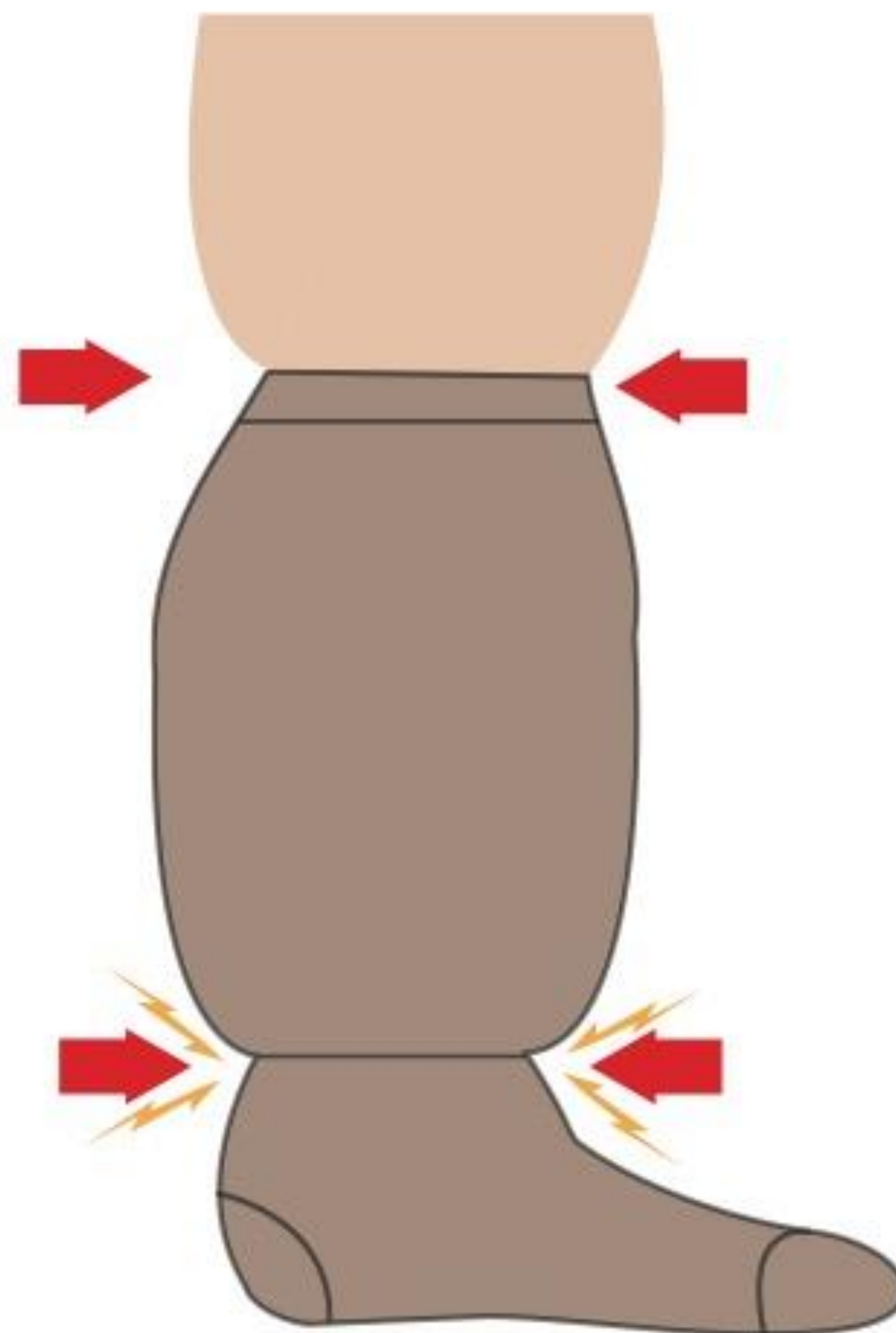
Circular knitted garments have a bit more stretch and are best suited for patients with mild to moderate lymphedema with normally shaped limbs.

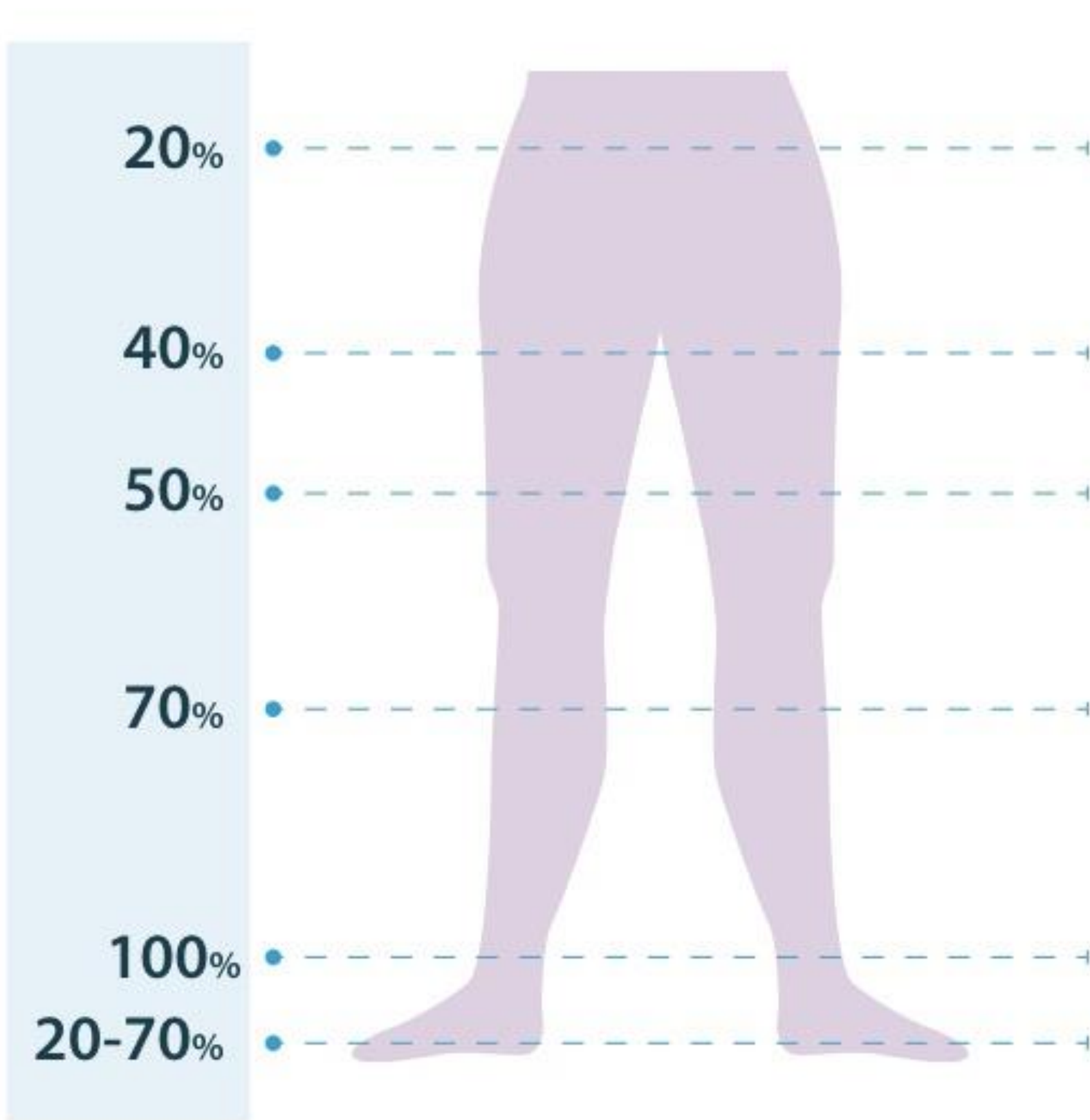


Flat Knit



Circular Knit





Wrap Garments

Compression wraps should be the next choice for patients who cannot wear compression stockings or sleeves for their maintenance compression.



Non-Elastics (Strapping)



Donning Aids

The Butler



Donning Aids

The Slippie



Donning Aids

Donning Gloves



Sizing & Measuring

15-20, 20-30 and 30-40 mmHg

Basic 4410/11/12

	I	II	III	IV
G	44-66 cm 17 1/4"-26"	48-71 cm 18 3/4"-28"	52-76 cm 20 1/2"-29 3/4"	56-81 cm 22"-32"
G with silicone	44-62 cm 17 1/4"-24 1/2"	48-67 cm 18 3/4"-26 1/4"	52-72 cm 20 1/2"-28 1/4"	56-77 cm 22"-30 1/4"
C	28-38 cm 11"-15"	31-42 cm 12"-16 1/2"	34-46 cm 13 1/4"-18"	37-50 cm 14 1/2"-19 1/2"
B	18-21.5 cm 7"-8 1/2"	21.5-25 cm 8 1/2"-9 3/4"	25-28 cm 9 3/4"-11"	28-31.5 cm 11"-12 1/2"

PCSZ-01-29

20-30 and 30-40 mmHg

2501/02, 2581/82, 2001/02, 2081/82, 4601*/02*, 3511/12, 2061/62, 4201/02

	I	II	III	IV	V
G	41-60 cm 16 1/4"-23 1/2"	50-68 cm 19 1/2"-26 3/4"	54-75 cm 21 1/4"-29 1/2"	57-79 cm 22 1/2"-31"	62-85 cm 24 1/2"-33 1/2"
G with silicone	45-55 cm 17 3/4"-21 1/2"	50-61 cm 19 1/2"-24"	54-68 cm 21 1/4"-26 3/4"	57-73 cm 22 1/2"-28 3/4"	62-78 cm 24 1/2"-30 3/4"
C	29-38 cm 11 1/2"-15"	34-43 cm 13 1/4"-17"	37-49 cm 14 1/2"-19 1/4"	41-53 cm 16 1/4"-21"	46-58 cm 18"-23"
B	18-21 cm 7"-8 1/4"	21-24 cm 8 1/4"-9 1/2"	24-27 cm 9 1/2"-10 3/4"	27-31 cm 10 3/4"-12 1/4"	31-35 cm 12 1/4"-13 3/4"

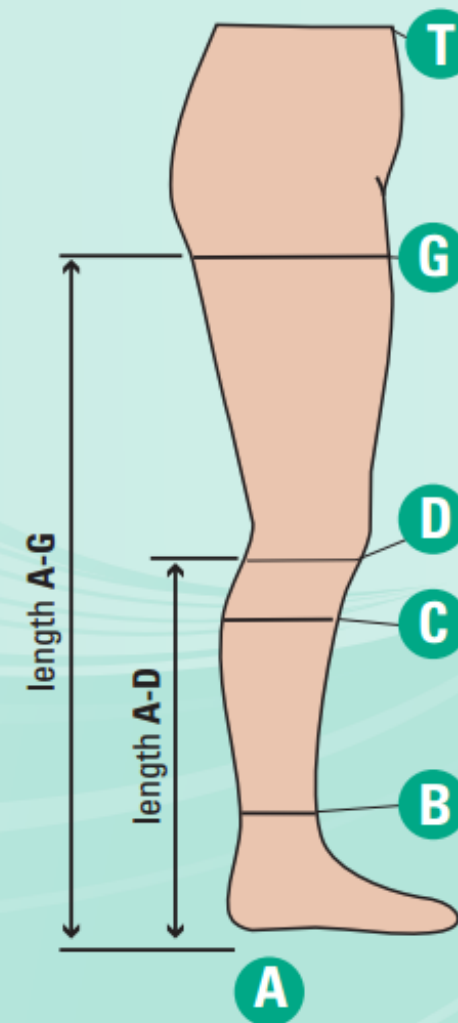
PCSZ-01-02d

* Not available in size I

40-50 mmHg





3513, 3513L

I	II	III	IV	V	VI
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UltraSheer 15-20 mmHg*, 20-30 mmHg*, 30-40 mmHg*
forMen 20-30 mmHg*, 30-40 mmHg*

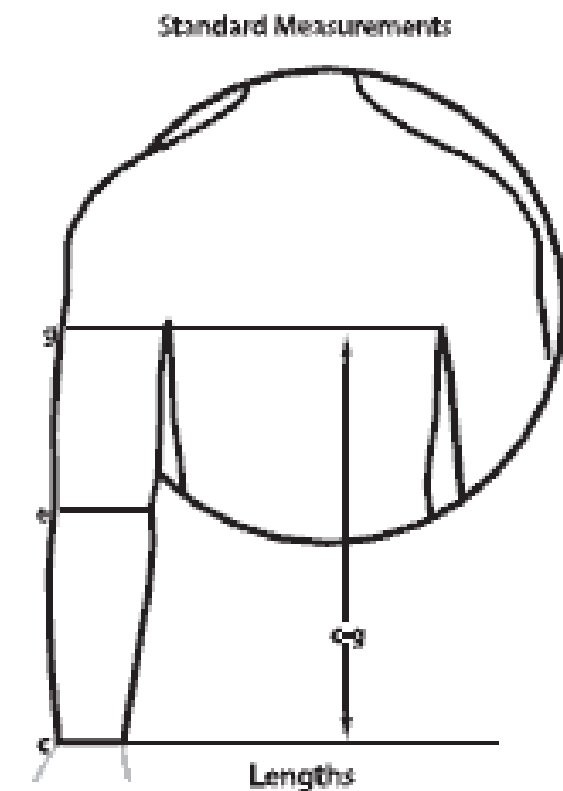
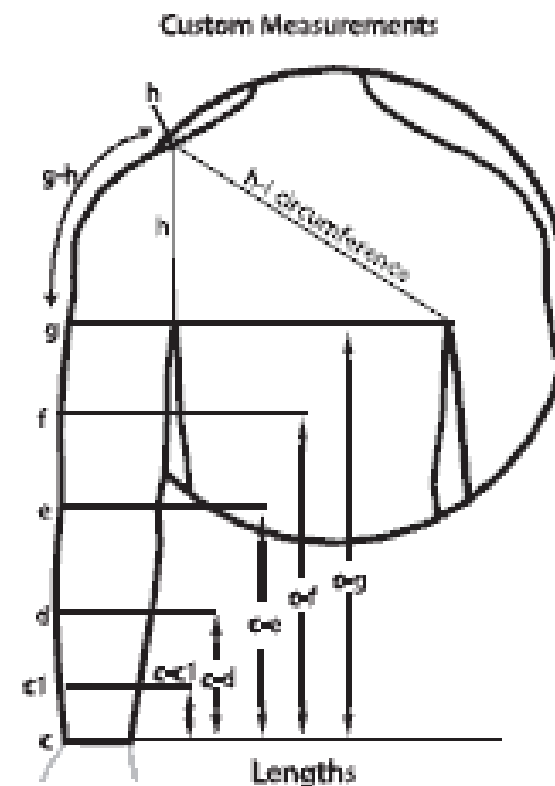
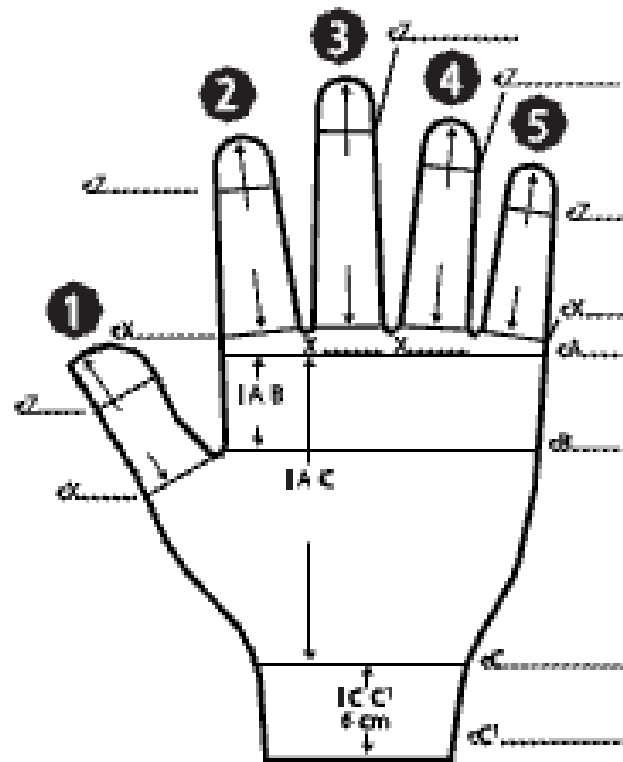
Opaque 15-20 mmHg*, 20-30 mmHg*, 30-40 mmHg*
Relief 20-30 mmHg*, 30-40 mmHg*

SIZE	ANKLE 	CALF 	THIGH 	HIP 	HIP (Maternity)
S	7"-8 1/4" (18-21 cm)	11"-15" (28-38 cm)	15 3/4"-24 3/8" (40-62 cm)	28"-46" (71-117 cm)	32"-52" (81-132 cm)
M	8 3/8"-9 7/8" (21-25 cm)	11 7/8"-16 1/2" (30-42 cm)	18 1/8"-27 1/2" (46-70 cm)	30"-50" (76-127 cm)	34"-56" (86-142 cm)
L	10"-11 3/8" (25-29 cm)	12 1/2"-18 1/8" (32-46 cm)	21 1/4"-30 3/4" (54-78 cm)	32"-54" (81-137 cm)	38"-80" (91-152 cm)
XL	11 1/2"-13" (29-33 cm)	13 3/8"-19 5/8" (34-50 cm)	23 5/8"-32" (60-81 cm)	40"-65" (102-166 cm)	44"-71" (112-180 cm)
LT	10"-11 3/8" (25-29 cm) for shoe size > 12	12 1/2" - 18 1/2" (32-46 cm) for leg length > 19 3/4" (50 cm)	—	—	—
LFC	10"-11 7/8" (25-30 cm)	18" - 24" (46-61 cm)	—	—	—
XLFC	12"-14" (30-36 cm)	18" - 24" (46-61 cm)	—	—	—

Circumference Measurements		Lengths		Fabric:	
		<input type="checkbox"/> High Rise Back KT Front _____ KT Back _____		<input type="checkbox"/> Elastic (Please chose compression) <input type="checkbox"/> Elastic Circular Knit <input type="checkbox"/> Elastic Flat Knit <input type="checkbox"/> Non-Elastic / Straps <input type="checkbox"/> Non-Elastic / Chipped Foam	
		All lengths taken on the medial side of the leg left right		Features: <input type="checkbox"/> Zipper <input type="checkbox"/> Silicone Band <input type="checkbox"/> Adjustable Waist <input type="checkbox"/> Open Toe <input type="checkbox"/> Closed Toe <input type="checkbox"/> Pad <input type="checkbox"/> Lining <input type="checkbox"/> Knitting Marks	
		lT lH lG/lK lF lE lD lC lB1 lB lA Open Toe lZ Full Foot			

Instructions for Measuring for Lower Extremity Compression Garments:

1. Measure when patient is at smallest size
2. Measure standing
3. First mark length landmarks
4. Measure lengths from floor up medial leg
 A foot length - heel to base of foot at base of 5th met head
 Z foot length - entire foot length
 E1 - length - center of popliteal crease to floor
 K1 length - public bone to floor
 K2 length - gluteal fold to floor
5. Measure circumference at length landmarks
 A1- around base of foot at 1st met head
 A - around base of 5th met head
 Y - 45 degree angle around heel and instep (foot should be at 90 degrees)
 B - smallest ankle above ankle bone
 B1 - where achilles tendon meets calf muscle
 C - largest calf
 D - Smallest measurement below knee (above calf)
 E - Mid patella
 F - Mid thigh
 G - top of thigh
 K - top of thigh around both legs
 H - largest hip
 T - patient's preferred waist
 K1 - Patient's preferred waist to crotch (pubic symphysis)
 K2 - Patient's preferred waist to gluteal fold



1. Measure When Patient is at Smallest Size
2. Measure Hand Placed Flat on Table Top, Trace Hand
3. Measure Arm Seated or Standing – Medially
4. First Mark Length Landmarks
5. Measure Lengths

HAND	ARM
C' Wrist to Garment End (8cm)	C' 8cm Proximal from C
A-C Wrist to Metacarpals	D Midpoint Between C and E
A-B Base of Thumb to Metacarpals	E Mid Elbow
X-Z Finger Base to Garment End	F Mid Bicep
	G At Axilla
	G-H Outside Shoulder g to h

6. Measure Circumference at Landmarks

A Metacarpals	F Mid Upper Arm Around Biceps
B Base of Thumb / Web Parallel to A	G Axilla
C Smallest Wrist	H Vertical from Axilla Up and Over Shoulder
C' 8cm Proximal to C (or Desired Length of Glove)	HI Shoulder Across Chest Under Opposite Arm Returning to It
D Midpoint Between Wrist and Elbow	X Base of Finger / Thumb
E Elbow	Z Distal Finger / Thumb –Where Garment Should End

Notes:

Questions & Answers

Contact Information

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