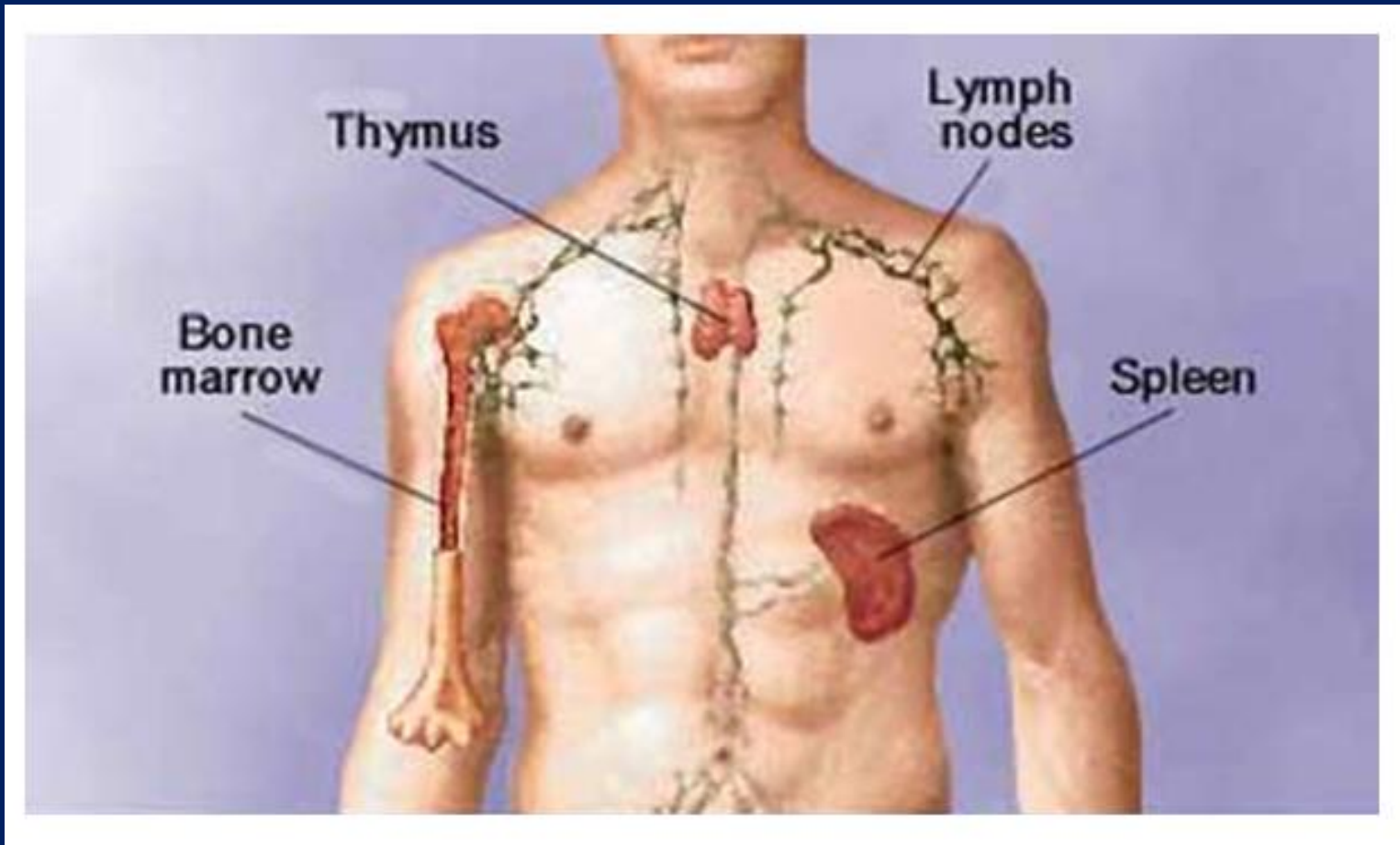
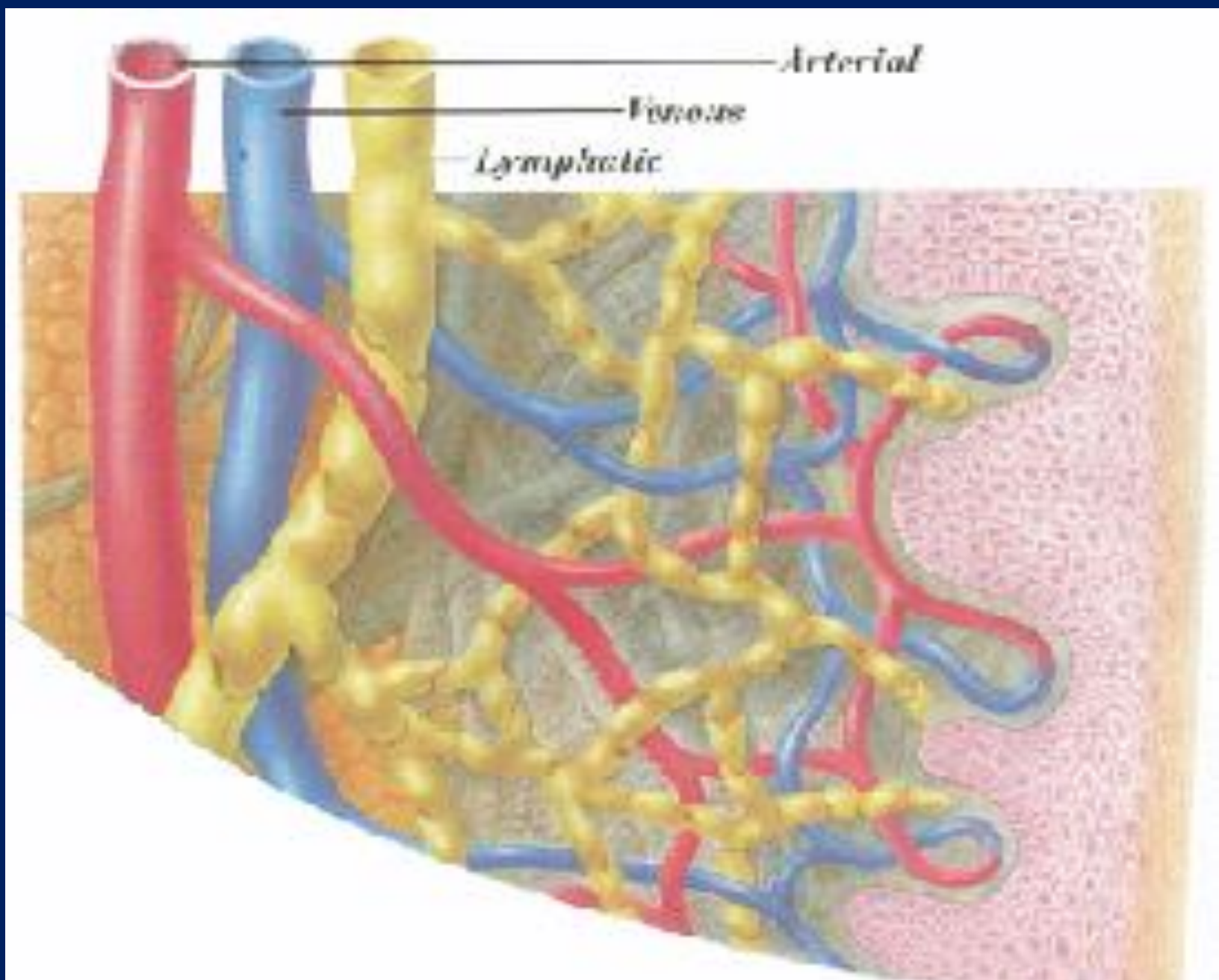


Lymphatic Disorders



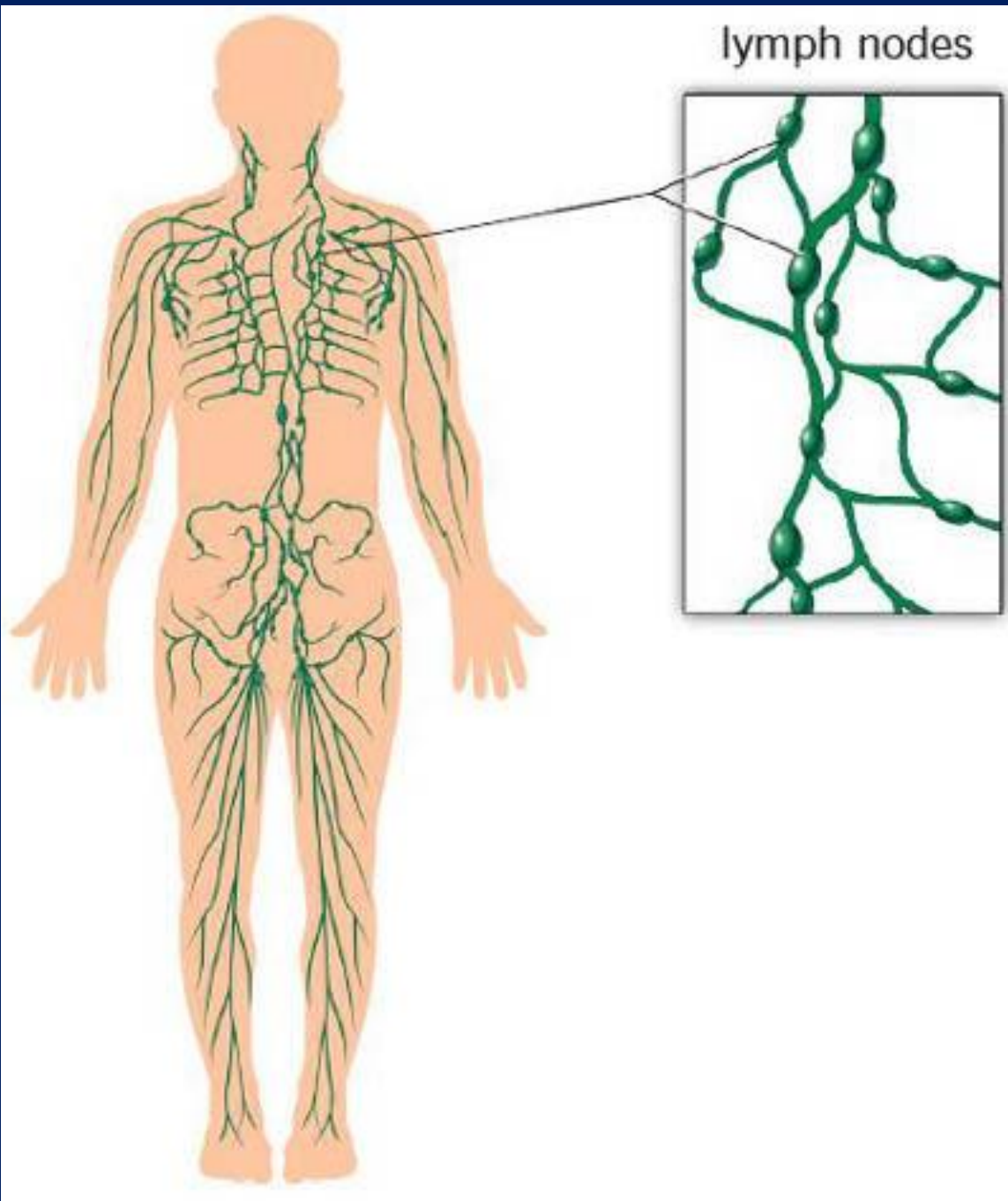


Arterial

Venous

Lymphatic

lymph nodes



Lymphedema

- Excessive and persistent accumulation of extravascular and extracellular fluid and proteins in tissue spaces
- Caused by a disturbance of the water and protein balance across the capillary membrane
- Increased concentration of proteins draws greater amount of water into interstitial spaces
- Exceeds transport capacity of the lymphatic system, leading to lymphedema

Lymphedema

Also develops when lymph vessels or lymph nodes are missing, impaired, damaged or removed

Primary lymphedema –rare, caused by absent lymph vessels at birth, or caused by abnormal lymphatic vessels.

Secondary lymphedema –due to blockage or interruption that alters the lymphatic system.

Secondary lymphedema

can develop from infection, malignancy, surgery, scar tissue formation, trauma, deep vein thrombosis (DVT), radiation or other cancer treatment.

Disorders of the Lymphatic System Leading to Lymphatic Insufficiency

- Congenital Malformation
- Infection and Inflammation
- Obstruction or Fibrosis
 - Trauma, Surgery, Neoplasms
 - Radiation Therapy
- Surgical Dissection of Lymph Nodes
- Chronic Venous Insufficiency

Clinical Signs and Symptoms of Lymphedema

- Edema of the dorsum of the foot or hand
- Decreased range of motion, flexibility and function
- Usually unilateral
- Worse after prolonged dependency
- No discomfort or a dull, heavy sensation; sense of fullness

Clinical Manifestations of Lymphatic Disorders

- Lymphedema
- Increased girth and weight of the limb
- Sensory disturbances
- Stiffness and limited range of motion
- Decreased resistance to infection

Lymphedema Location



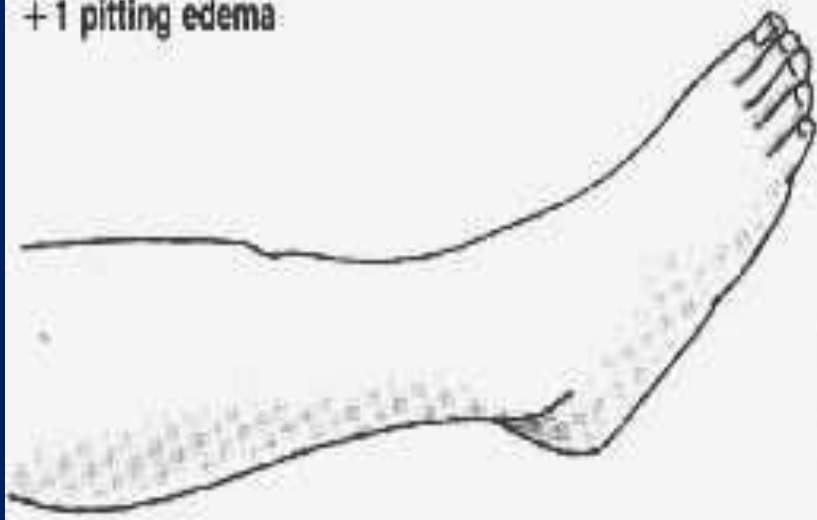
Severity of Lymphedema

- Mild lymphedema: One to two cm increase in girth measurements between the involved and non-involved limb
- Moderate lymphedema: Two to five cm increase in girth measurement
- Severe lymphedema: Greater than five cm increase

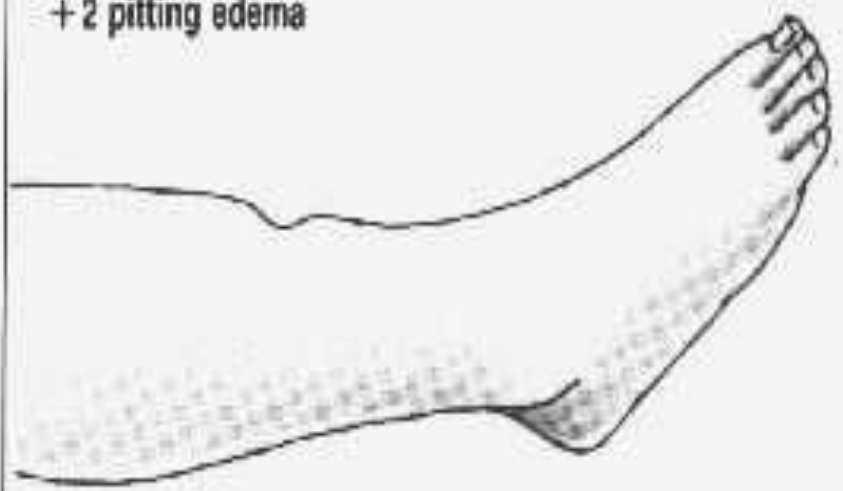
Types of Lymphedema

- Pitting edema
 - Short duration edema
 - Finger indentation of the skin
- Brawny edema
 - Tissue feels hard upon palpation
 - Indicates fibrotic changes
- Weeping
 - Fluid leaks, wound healing is impaired
 - Occurs mostly in the lower extremities

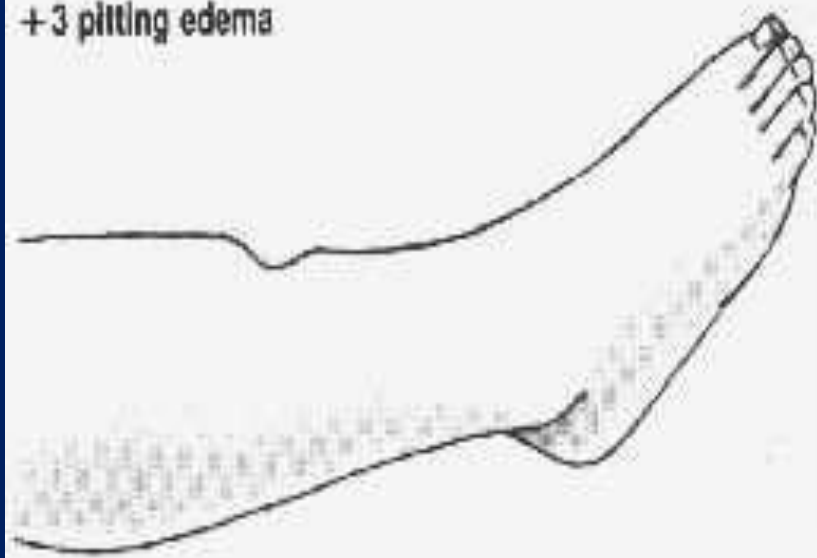
+1 pitting edema



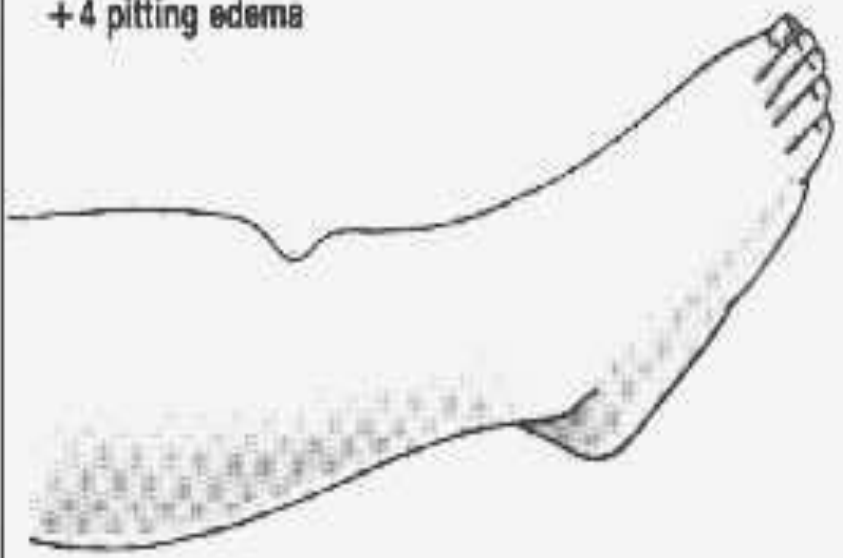
+2 pitting edema



+3 pitting edema



+4 pitting edema



Examination and Evaluation of Lymphatic Function

Special Considerations

- History, systems review
- Daily activities and position of limb
- Functional assessment
- Skin integrity
- Girth measurements
- Volume measurements

Components of a Decongestive Lymphatic Therapy Program

- Elevation
- Manual lymphatic drainage
- Compression
- Exercise
- Skin care
- Daily living precautions

Elevation

- Elevate the involved limb when using a sequential compression pump
- Elevate limb when sleeping, resting, and during sedentary activities
- Compressive bandages or garment should be worn during periods of elevation

Manual Lymphatic Drainage

- Slow, very light, repetitive stroking and circular massage movements performed in a specific sequence, limb elevated whenever possible
- Proximal congestion in the trunk, groin, buttock, or axilla is cleared first
- Direction of massage is towards specific lymph nodes
- Usually involves distal to proximal stroking

Manual Lymphatic Drainage

- Labor and time intensive
- Specialized training needed
 - Continuing education
 - Certification

Manual Lymphatic Drainage



Exercise

- Active range of motion, stretching, and low-intensity resistance exercise is incorporated with manual drainage techniques
- Exercises should be performed with compressive bandages or garment

Exercise

- Exercises are performed in a specific sequence, often with the limb elevated
- Low-intensity cardiovascular/pulmonary endurance activities included
- Deep breathing and relaxation also incorporated



Exercise

- Exercises performed in a specific sequence can assist lymph flow
- Awareness of other medical conditions
- Patient education

Exercise



Compression

- No-stretch, non-elastic or low-stretch elastic bandages are used
- Sports bandages, such as ACE wraps, are NOT recommended in the treatment of lymphedema
- Compressive garments are available
- Use of a sequential, pneumatic compression pump on a daily basis may be recommended

Compressive Bandages





Intermittent Compression Devices

Contraindications

- Deep vein thrombosis
- Local superficial infection
- Congestive heart failure
- Acute pulmonary edema
- Displaced or acute fractures

Skin Care and Hygiene

- Lymphedema increases risk of skin breakdown, infection, and delayed wound healing
- Proper skin care
- Inspection
- Protection

Treatment Works



Treatment Works



Treatment Works



Treatment Works



THE END