

Lymphoedema 101

Everything you need to know to make a difference

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We must pay more attention to the lymphatic system

- **Early Advice**
 - can reduce Lymphoedema risk (once you know risk factors)
- **Early signs of Lymphoedema**
 - can now be easily detected
- **Early intervention**
 - can reduce the severity of Lymphoedema
 - can slow the progression of Lymphoedema
 - can reduce health system and patient costs



Why we must pay attention to the lymphatic system

- The lymphatics are a sewer – it must flow!
- Good lymph flow is needed for cell health
- Slow lymph flow means more fat deposits
- Reduced lymph flow means more infections
- Our immune responses are poor when lymph flow is poor

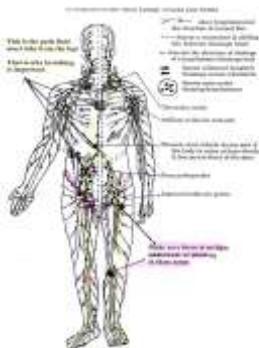


Overview of the System Drainage

Think, assess and act Holistically



Number and Location of Major Lymph Collectors and Nodes vary between all of us



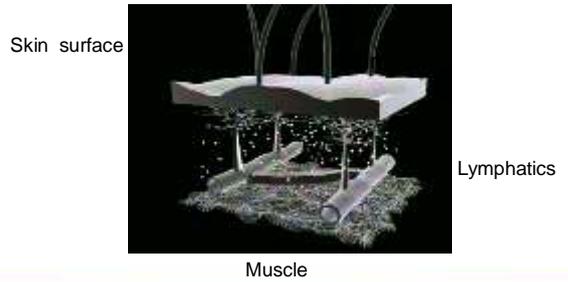
Why this big picture ?
We need to empty the buckets first!



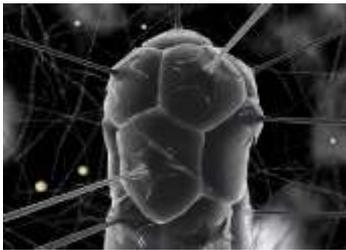
Critical knowledge

What ever leaks out of the Blood Vessels must be taken up by the lymphatics !
 (The lymphatic system is more important than we previously thought)

Organization of the superficial Lymphatic System



Functioning of the lymphatic system



KEY POINT

Accumulated fluids must be helped to enter and move along lymph vessels



Lymph Collectors

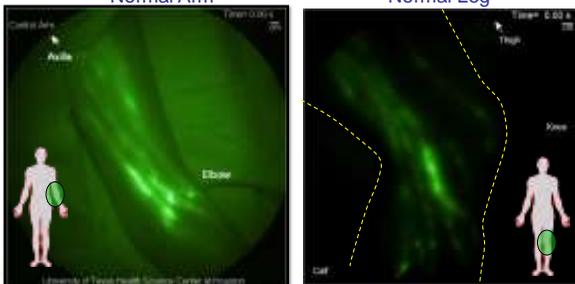
- Beat about 6-10 times/min
- Beat rate varies with load
- Most above our muscles
- Constrained by fibrous tissues
- Constrained by external pressure
- Helped by surrounding muscle movement



We can see lymphatics working using ICG imaging (Normal Lymphatics)

Normal Arm

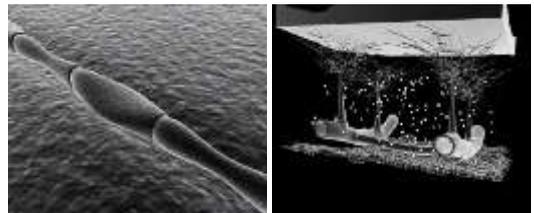
Normal Leg



NIRF Imaging, Inc.



When our muscles move or our tissues are moved it helps lymph flow



Lymph Nodes



- 30% lymph taken up into the veins in the nodes
- Important for defence against bacteria
- Important to empty them before other treatments

General parts of the Lymphatic System

General drainage areas are called
Lymphatic Territories

Each Lymphatic Territory separated by
boundaries called
Watersheds



Territories and Watersheds
Arms and Trunk
But every person is different!



Territories and Watersheds
Trunk and legs
But every person is different!

Important facts about our lymphatic system

- It's
 - Low pressure (not like blood pressure)
 - Small volume
 - Slow flow and slow acting

Assessing Risk- is Important

For those of you who don't have lymphoedema but are worried about getting it and who want to be pro-active

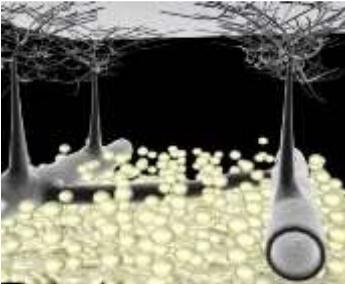
Risk factors which contribute to lymph Load

- The skin quality – barrier function
- Blood pressure – when high
- Strength of small blood vessels
- Infection of wounds, cuts and scratches
- Weight and fats in diet
- Issues with veins- they are also a drainage system so if they don't work more load is put on lymphatics

Soft tissue damage another risk factor!
Keep away from Sharks!



Factors which may add load and slow flow:
Being Overweight



Risk assessment forms

You can fill out one of these after this session

You will see on the form risks which are **beyond your control** and those which are **under your control**

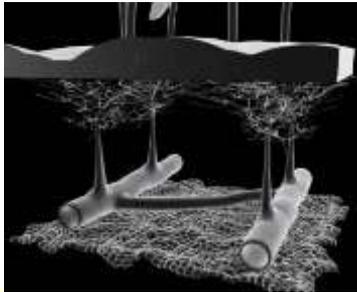
Tick those which apply and add up the numbers
You end up with **HIGH, MEDIUM** and **LOW Risk levels**

Risk factors – beyond your control

Lymphatics and Veins are close together:
Problems with veins can cause problems with lymphatics



Factors which may damage the lymphatic system: **Surgery**



Factors which may damage the lymphatic system: **Radiotherapy**



- Reduces potential for lymph capillary regeneration
- Reduces ability of lymph collectors to pulsate
- Reduces lymph flow through area



The Fat Connection

- When lymph flow is slow
 - More fat deposits
- Fat cells produce inflammatory molecules
- Diet may affect the inflammatory process



About Lymphoedema

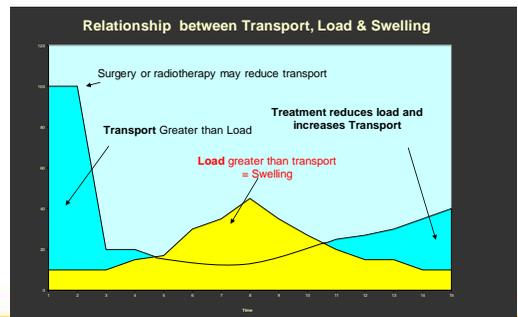


Lymphoedema (primary and secondary)

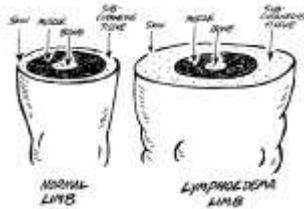
With earlier detection, targeted and sequenced treatment we hope we can gain better outcomes in the future



Lymphoedema



Lymphoedema –Where the changes occur – near the surface of the body

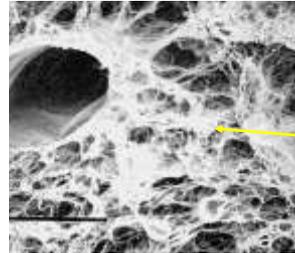
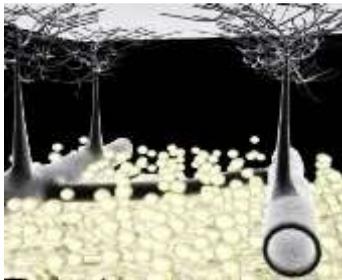


Development of Lymphoedema

Three major stages

- Fluid
- Fatty/fluid
- Fibrous/fatty

Progression: Fat then Fibre



Increased induration

The Problem of fibrosis prevents pulsation of lymph vessels

Detecting lymphoedema

We are improving our ability in this area.

Early Detection can make a difference

- Treatments are much simpler
- We are dealing mostly with fluid
- You can manage if given good information

Whole limb and segmental Fluids Bio-impedance Spectroscopy



Presence of fluid means a current failure of the lymphatic system to remove it



Local area fluids at various depths

Tissue Di-Electric Constants:



Presence of fluid means a current failure of the lymphatic system to remove it



Measuring fibre in the Tissues Tonometer, Indurometer and fibrometer



Fibre generally occurs more as lymphoedema progresses but may also be found near the surgery area or where you have had radiotherapy



Something simple: Detecting Local area Fluid

- Pitting test
 - Check fluid in each lymph territory
 - Applied thumb pressure for about 30 seconds



Excess fluid (Pitting) means current lymphatic drainage problems



Something simple: Stemmer Sign –Detecting Fibre

Positive Stemmer Sign – Skin fold cannot be picked up



Fibre generally occurs more as lymphoedema progresses but may also be found near the surgery area or where you have had radiotherapy



Lymphoedema: A problem of balance

Load

Transport Capacity/Flow



How much change in load volume could make a difference?

- Normal lymph flow from ARM is about **5 ml per hr.**
 - With an infection or poor skin care it can double
- Normal lymph flow from a LEG is about **20 ml per hr**
 - With an infection or poor skin care it can double

It does not take much better skin care to reduce the load on the lymph system by these small amounts.



Factors which determine Lymph Flow

- Load (greater load = greater flow)
- Pulsation rate of lymph collectors
- Activity of skeletal muscles
- Pressure (variation) in Chest and Tummy areas
- External pressure (variation) on vessels



Be aware that simple events may slow lymph flow

- Bloating
- Constipation
- Shallow Breathing
- Constant external pressure in wrong place



Key issues

- Early Identification of structural and functional changes
- Early intervention and its monitoring
 - Targeted and sequenced treatment
- Roles for you the patient, partner and carer
 - Independence for key management areas
- Think, Assess, Treat Holistically



BUT

How can we be sure its really lymphoedema?



Differential Diagnosis

Most important is giving accurate information about

Family History
Medical History
Surgical History
Current Medications

Even with no other information a better diagnosis can be made on this comprehensive information



Full History taking will expose

- Other reasons why limbs might be swollen

- Thyroid Problems - Myxoedema
- Vascular Problems- Phleboedema
- Blood Pressure Problems- Oedema
- Genetic, metabolic disturbances – Lipoedema

(Each of these may be present underlying a lymphoedema)

- Activity, occupation, BMI may also impact limb size and changes significantly



SUMMARY: The Lymphatic System

- It's our body's sewerage system
- Nearby blood vessels affect it
- It's easily damaged
- Most problems are close to the surface
- It's a lazy system
- We can make it work harder/better
- We can detect lymphoedema early
- Early advice can **reduce**
 - **The risk** of lymphoedema
 - **The severity** of lymphoedema
 - **The progress** of lymphoedema



Think and act Holistically

