Further notes on the lymphatic system and the application of lymphatic drainage

"We strike at the source of life and death when we go to the lymphatics" AT Still (Father of Osteopathy)

Some Cool Facts:

Lymph is everywhere that there are blood vessels however there is no lymphatic system in:

- Cartilage
- Eye cornea
- Epidermis
- Placenta
- Inner ear

For every blood vessel in the superficial tissue there are 2/3 lymph vessels.

Hyaluronic Acid is released when we get soft tissue injuries, actually creating the gel matrix, turning lymphatic fluid into a gel like substance.

MLD promotes 'thixotropy'. This is the movement of fluid from a gel to a fluid state.

Watersheds:

Watersheds happen in the superficial lymphatics – the deep layers DO NOT have such watersheds

MLD Effects:

- Anchoring filaments
- Lymphangion contraction rates

The lymphatics contract at a rate of approximately 3 inches per minute.

The lymphatics have their own **"Intrinsic contractility"**

Lymphangions act as the 'pace maker' cells, they have their own 'auto-motoricity'

MLD increases the frequency and amplitude of lymphangion contraction:

1.5-3 litres per day increases to 10-20 litres per day for 24-72 hours post session.

MLD increases the opening of the fenestrations by 30% therefore proteins and water molecules can get inside the lymph collectors and moved away from the area.

MLD increases the capacity of the lymph collectors by opening the fenestrations so that 30% more protein and H2O molecules enter the lymphatic capillaries.

The deep internal lymphatics are moved by the pumping rhythm of the veins and arteries. The peristaltic movement of the smooth muscle contractions of the abdomen also moves the deep lymphatic fluid.

One protein molecule in the interstitial space *attracts 3 water molecules* so it can get very crowded in any space where protein molecules have sat for too long – think Oedema

This is not healthy for the tissues or cells. We need to maintain the fluid pressure, which is very specific.

There is 30% more immune-competent cell production post lymphatic drainage.

50% of the bodies 400-700 lymph nodes are in the deep abdominal pelvic nodes (mesenteric layer)

<u>Sequence of the lymphatic system:</u>

Lymphatic capillaries - Pre-lymphatics (no valves) – Lymph collectors (no valves) – Pre collectors one cell think (valves and lymphangions and spiral muscles surrounding them three cells thick) - Nodes

<u>Lymph Nodes:</u>

- Concentrate and return lymph to the blood circulatory system
- Filter lymph
- Destroy toxins
- Produce immunity

50% of the bodies 400-700 lymph nodes are in the deep abdominal pelvic nodes (mesenteric layer)

The Cysterna Chylii and the Thoracic Duct:

At T4-T7 the thoracic duct crosses to the LHS and then leads up to the LTD (left thoracic duct) The thoracic duct sits posterior to the heart.

The **thoracic duct** is about the thickness of a skinny pencil.

The **bifurcation of the Aorta** occurs just below the level of the naval.

The **Cysterna Chylii** represents the joining of the two lower lymph trunks.

MLD Stroke protocol:

- Weight of the hand
- End of stretch
- Release
- Must include the "Active/Passive phase" with each contact

Lymphoedema is a type of Oedema where by:

'an abnormal accumulation of fluid occurs in the extracellular spaces due to the damaged or over taxed lymph system.'

General Oedema:

- Symetrical
- Bilateral
- Lymphodynamic (the lymph system is still working)

Causes:

- Liver failure
- Kidney failure
- Heart issues
- Hormones
- Pregnancy
- Medications
- Allergies
- Starvation/Malnutrition

Local Oedema:

- Unilateral

Causes:

- Sprain
- Strain
- Cancer
- Surgery
- Beestings
- Infections
- Inflammation
- Venous insufficiency

Diuretics work on our kidneys, not on the lymphatic system because it does not facilitate the drawing away of protein into the lymph vessels.

Cellulitis:

Cellulitis: A spreading bacterial infection underneath the skin surface characterized by redness, warmth, swelling, and pain. *Cellulitis* commonly appears in areas where there is a break in the skin.

Proteins are like candy to bacteria and the bacteria that causes cellulitis is attracted to the protein in the interstitial spaces.

New treatment protocol for cellulitis: after two days of antibiotics MLD treatment may commence.

Pre and post surgery:

Pre surgery MLD creates optimal tissue space which means the scalpel cuts cleaner.

Post Surgery MLD assists with vein and lymph vessel regeneration (Veins 12 days/ Lymph vessels 14 days) Lymph nodes DO NOT regenerate.

Forming the MLD protocol for specific treatments:

- Check contraindications
- Check client specific issues
- **Devise a treatment protocol specific to the time available and the issues presented on the day**