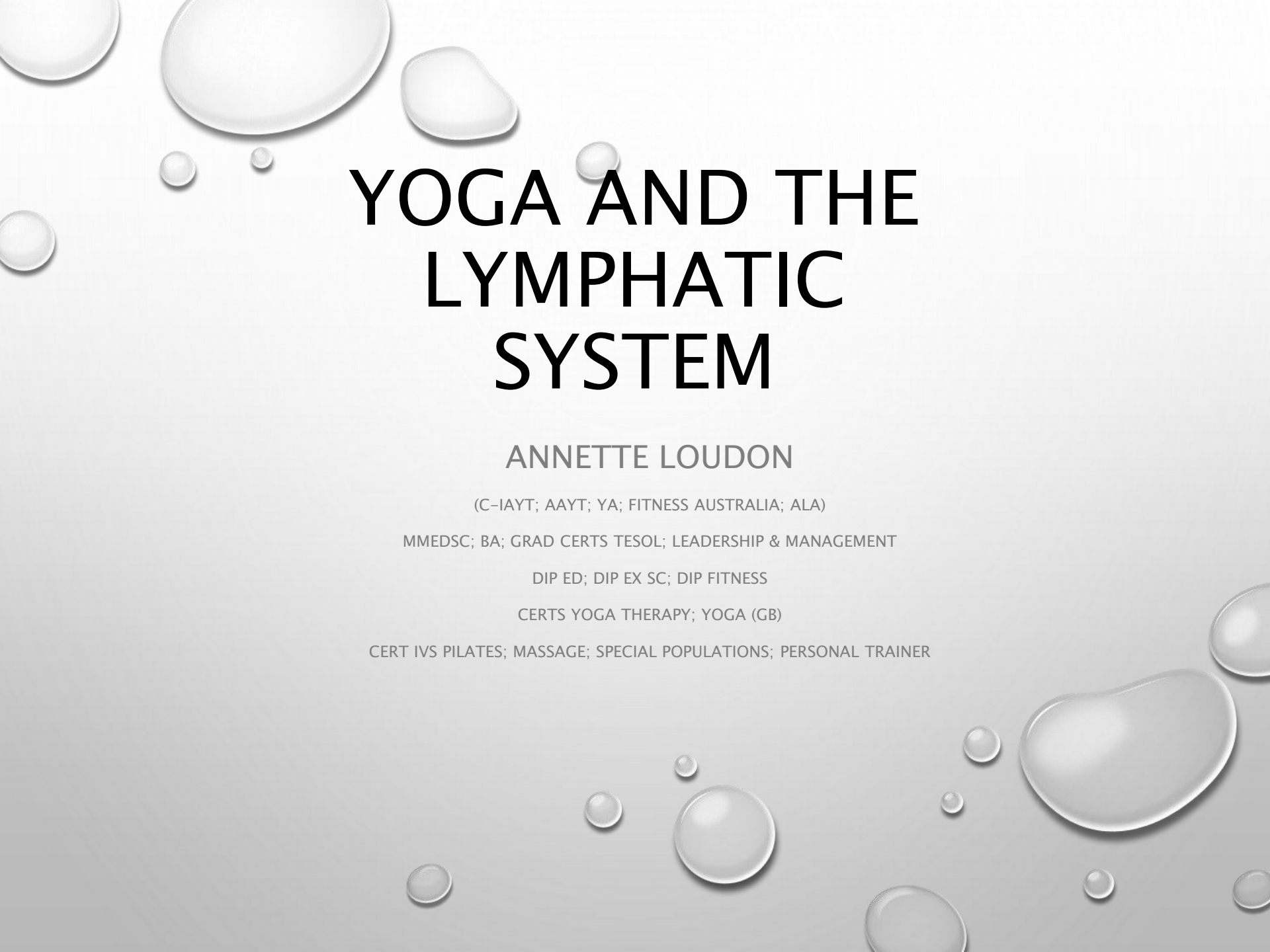




YOGA AND THE LYMPHATIC SYSTEM

ANNETTE LOUDON

(C-IAYT; AAYT; YA; FITNESS AUSTRALIA; ALA)

MMEDSC; BA; GRAD CERTS TESOL; LEADERSHIP & MANAGEMENT

DIP ED; DIP EX SC; DIP FITNESS

CERTS YOGA THERAPY; YOGA (GB)

CERT IVS PILATES; MASSAGE; SPECIAL POPULATIONS; PERSONAL TRAINER

Growing a lymph node into cells to fight cancer:

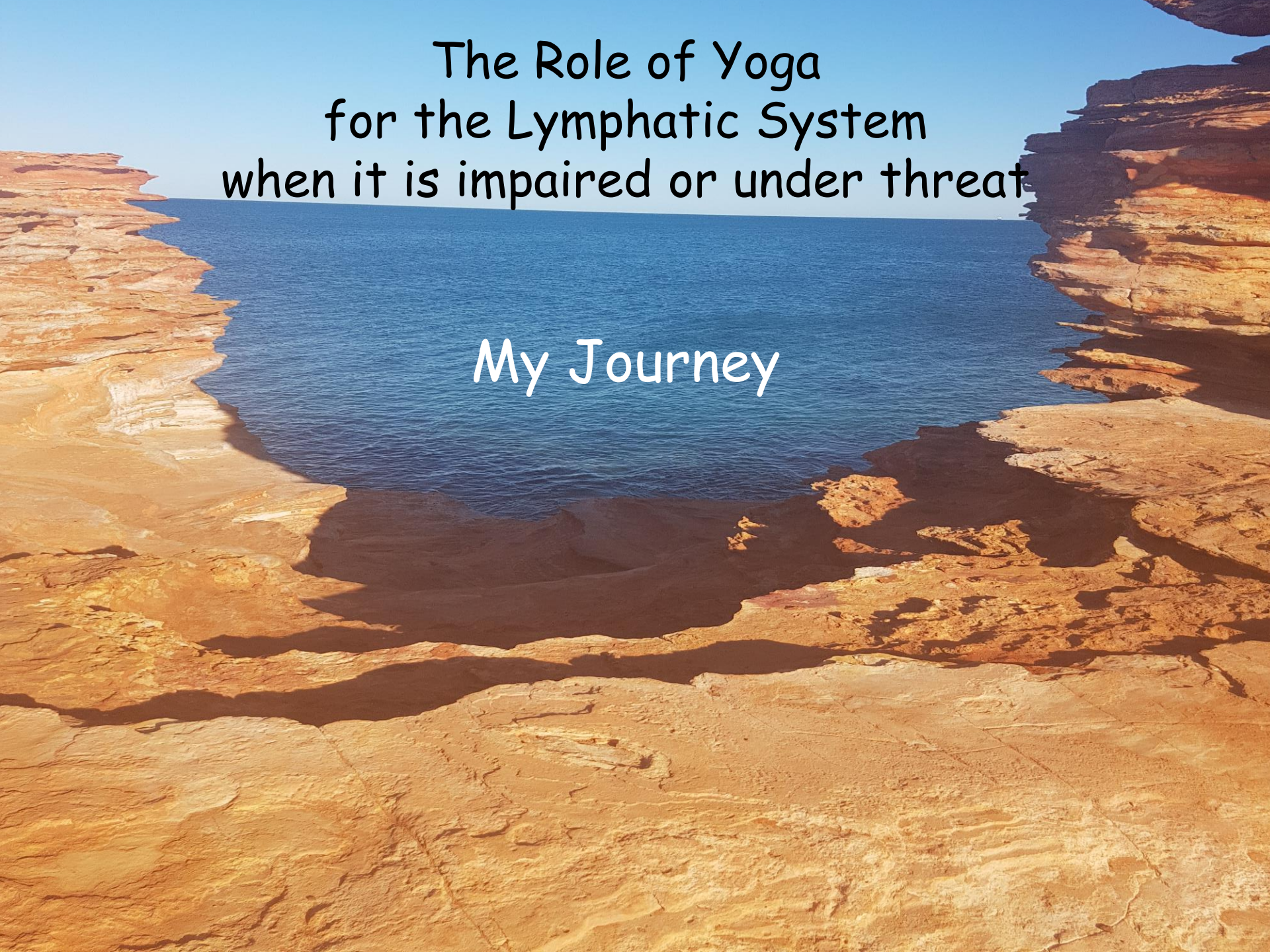
Pancreas

Lung

Brain



10/12/2014



The Role of Yoga for the Lymphatic System when it is impaired or under threat

My Journey

Yoga for:

Impaired lymphatic system





Observation

Experience

Evidence-based research

Philosophy of Yoga



Secondary arm lymphoedema from
breast cancer treatment



Secondary arm lymphoedema from breast cancer treatment - Risk factors

Surgery

Removal of lymph nodes

Radiotherapy

Taxanes in chemotherapy

Reactions to treatments

Genetic tendency

High filtration rate

High BMI

Lymphoedema: primary and secondary



Effects

Swelling and sensations

Fibrous tissue

Compromised immune system

Threat of infection

Altered movement/functional patterns

Lowered wellbeing/QoL

Optimum Treatment

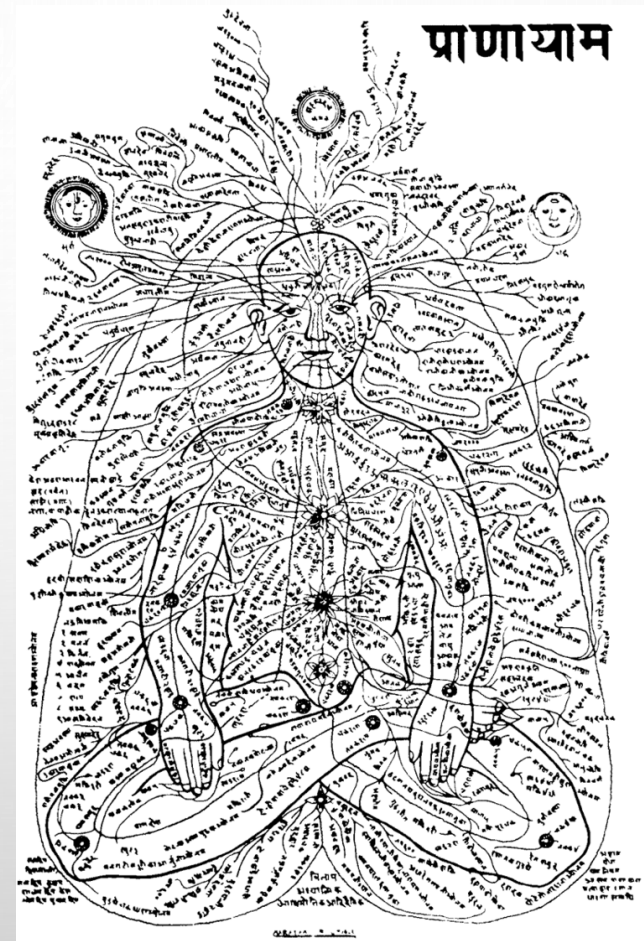
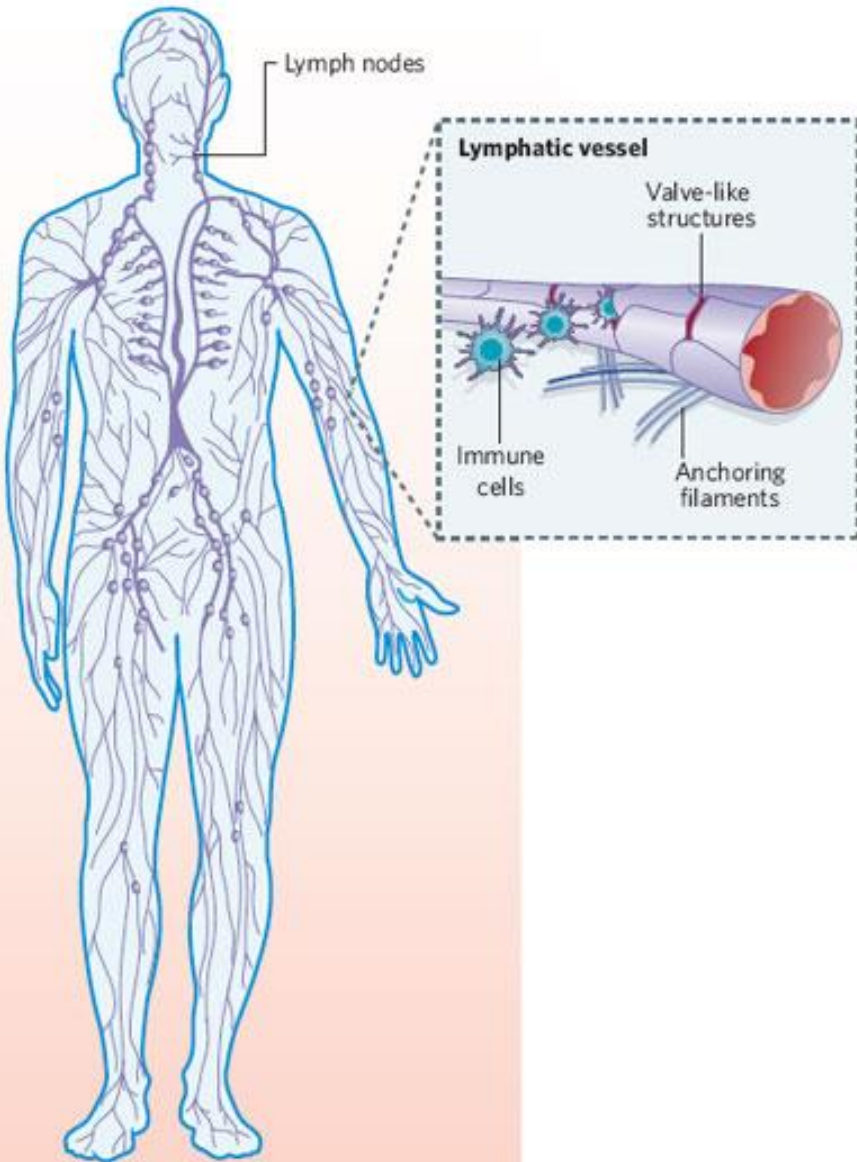
Manual Lymphatic drainage

Compression

Self-management



THE LYMPHATIC SYSTEM



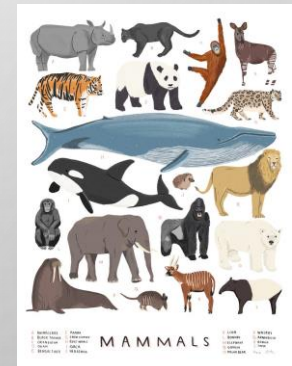
Genetic development?



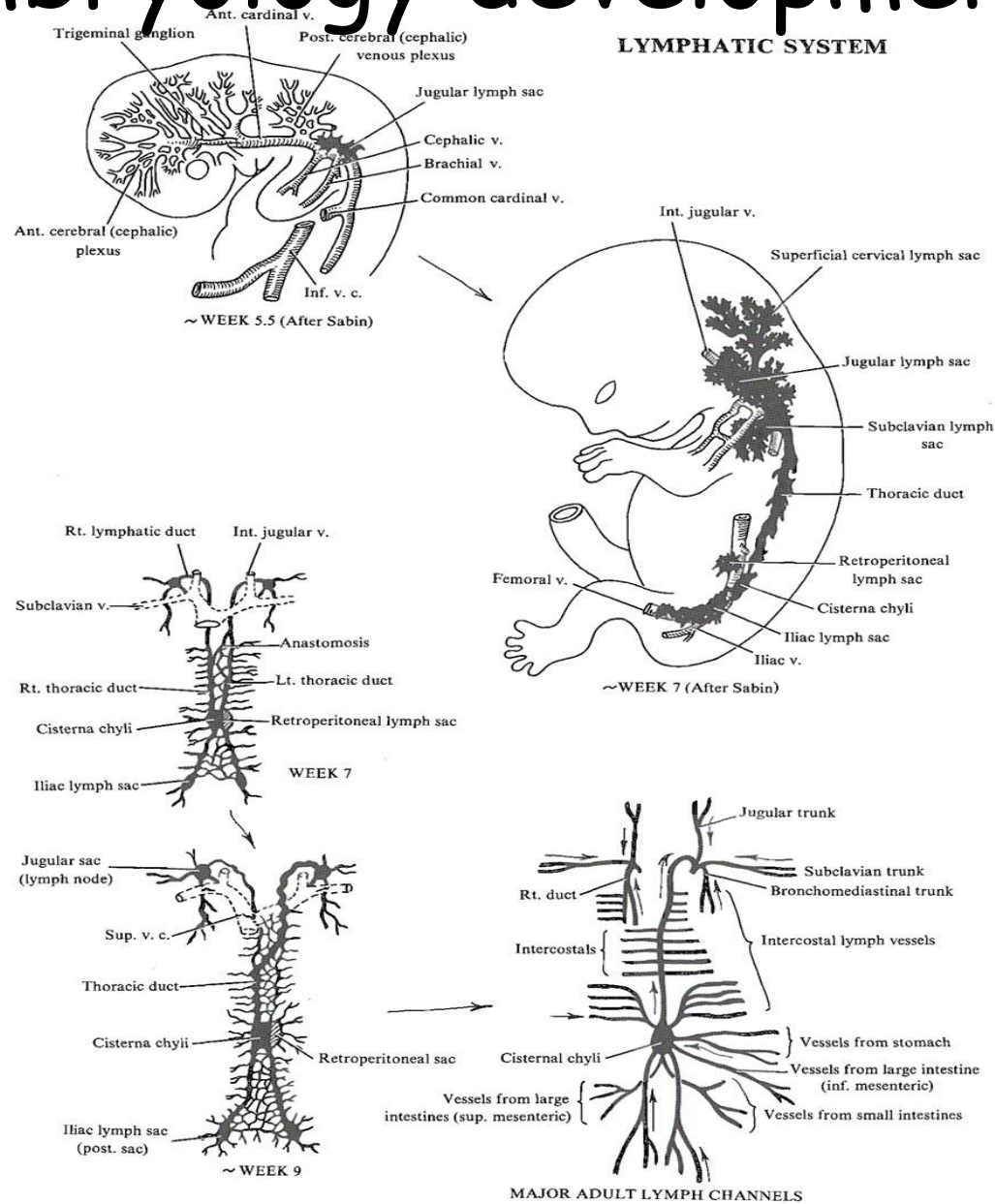
- Primitive form found in zebra fish.
- Amphibians, reptiles, and flightless birds have lymphatic heart.



- Flying birds and mammals lost the lymph heart and instead acquire lymph nodes for the immune functions.



Embryology development?



Lymph pumps by:

Breathing

Muscle movement

The arterial pulse

Contraction of smooth muscle that lines the lymphatic vessels

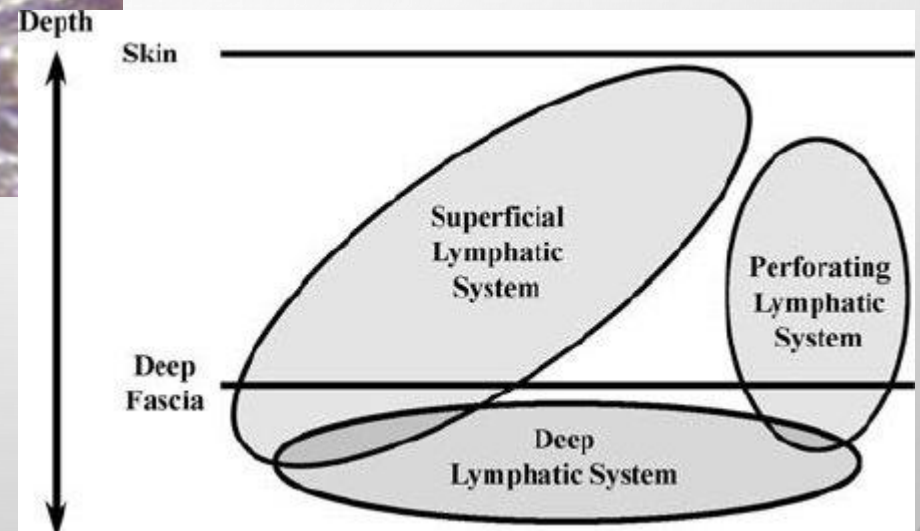




www.davidbarlowarchive.com



In the fascia

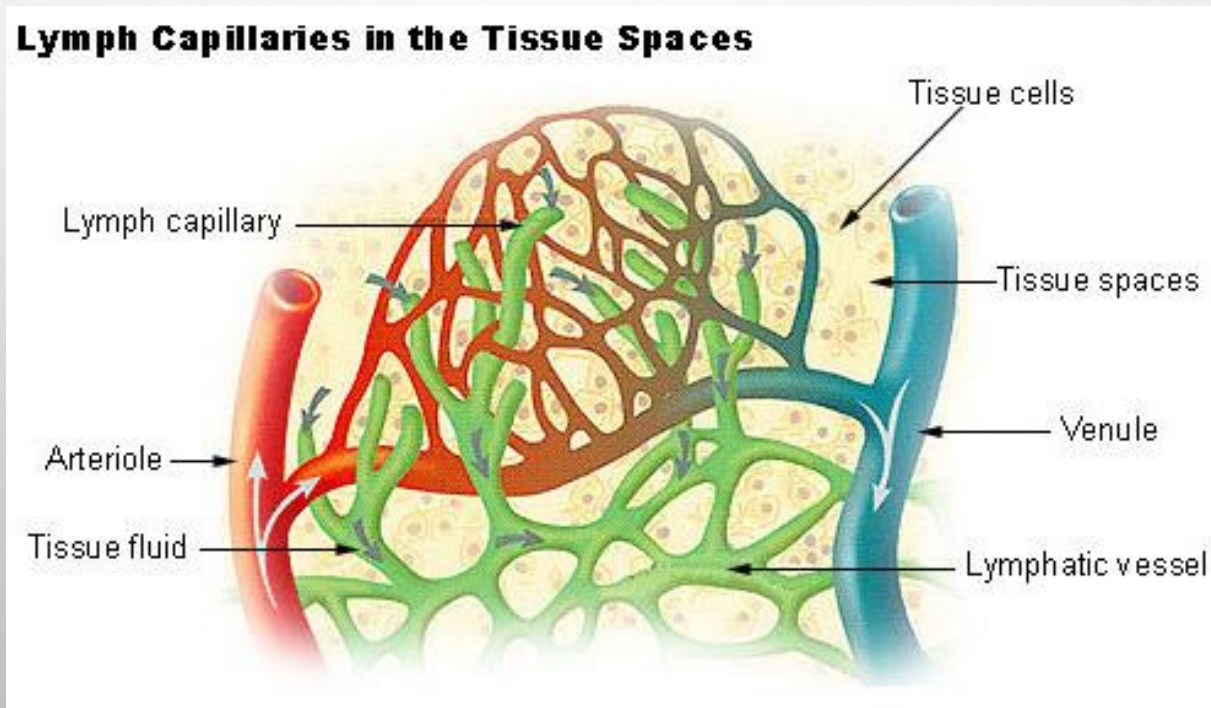


(Suami, 2007)

Function?

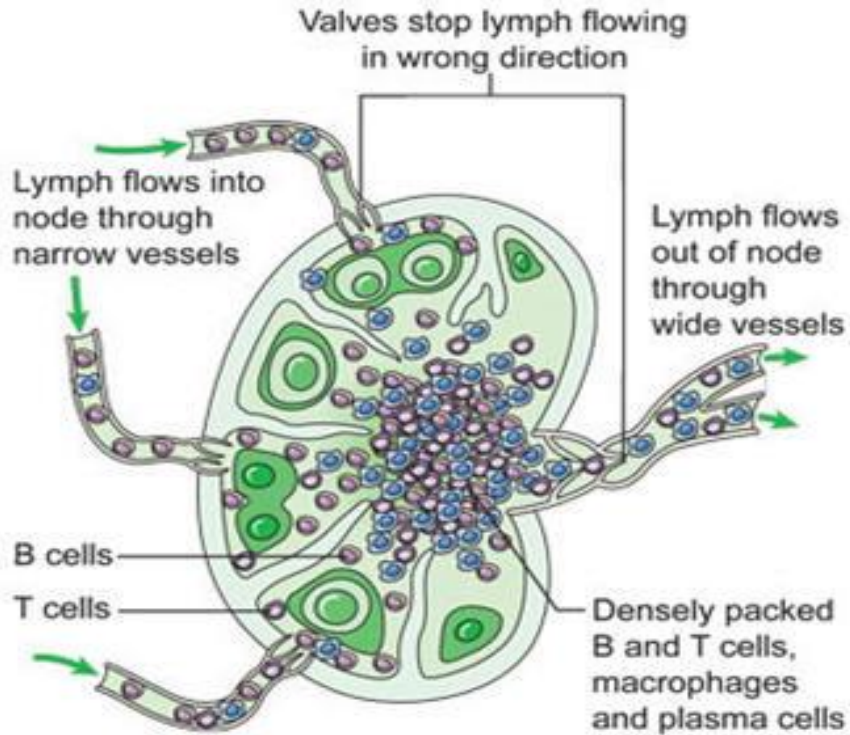
Clear interstitial fluid

proteins, fat, bacteria, viruses



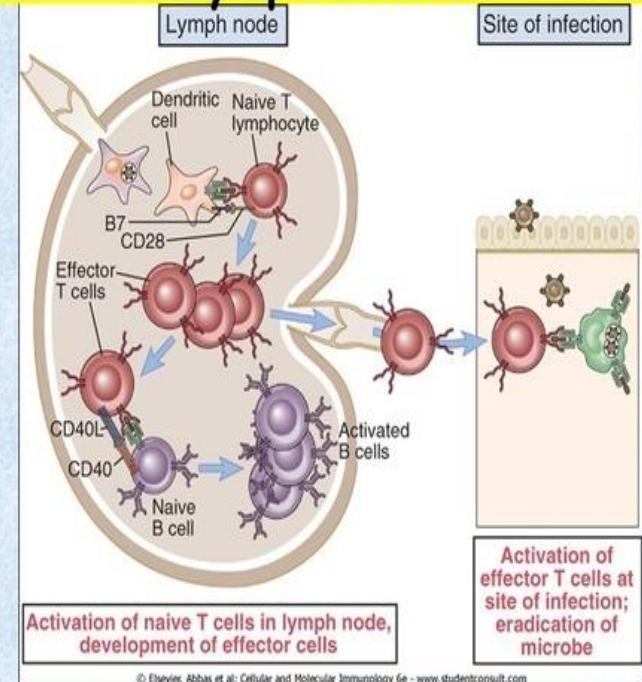
Function?

Immune system



Cancer Research UK

Activation of Lymphocytes in Lymph Nodes

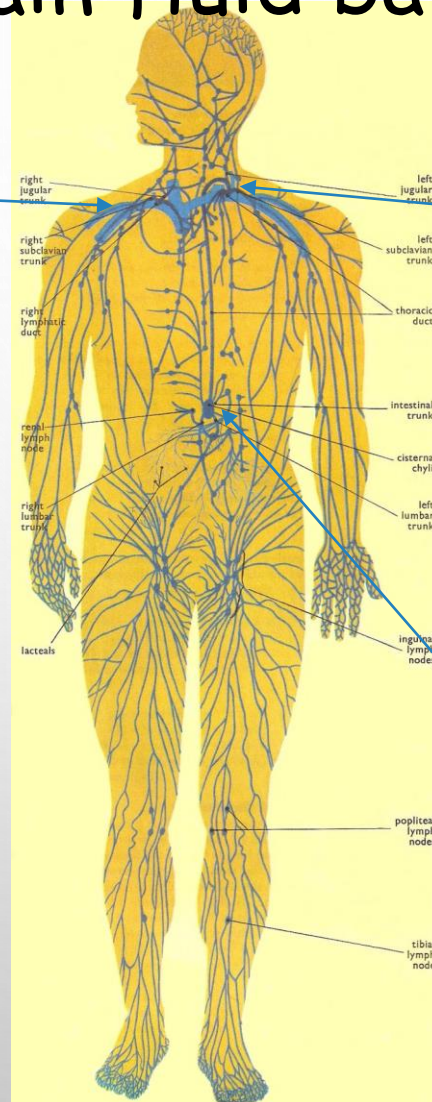
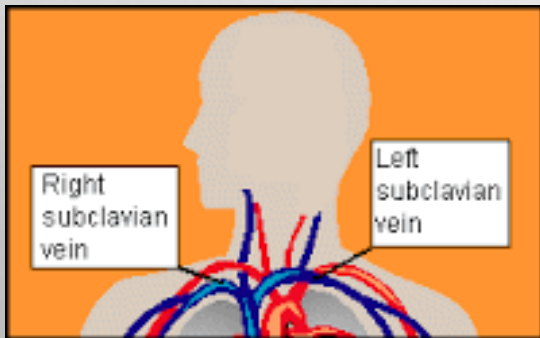


© Elsevier, Abbas et al: Cellular and Molecular Immunology 6e - www.studentconsult.com

Function?

Maintain fluid balance

Right Lymphatic duct (trunk) flows into the right subclavian vein.



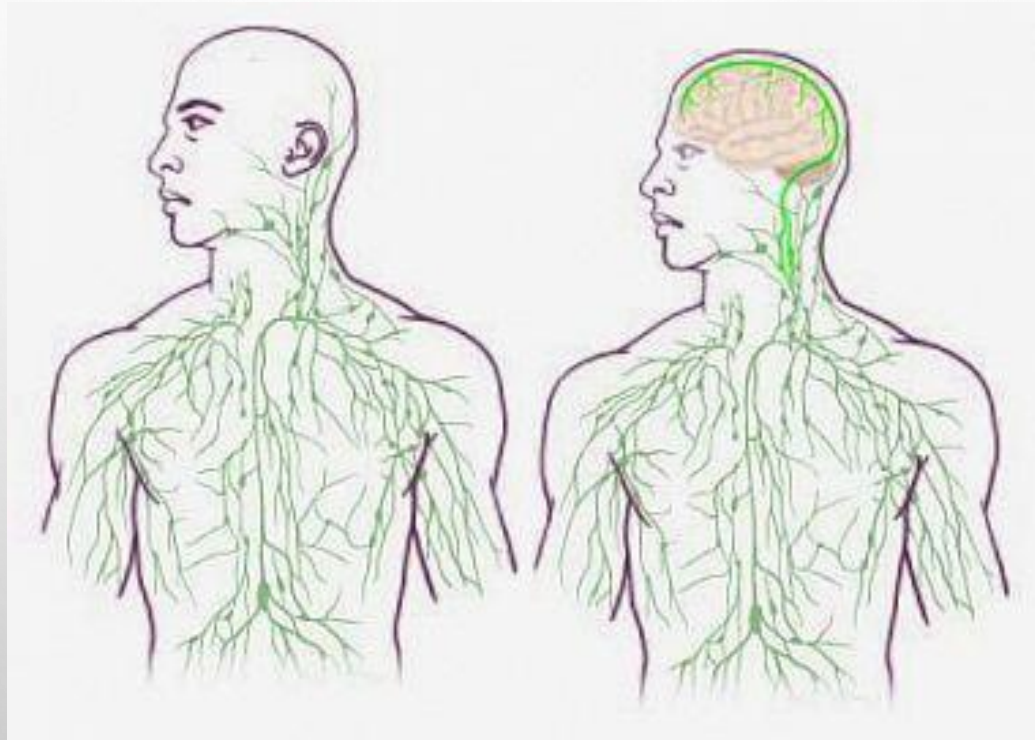
Thoracic trunk (left lymphatic duct) flows into the left subclavian vein.

Cisterna chyli that collects the lymph from the intestines and lumbar and allows it to flow to the thoracic trunk.

Function?

Clear the brain of waste eg amyloid beta.

Glymphatic system – cleared by Glial cells.

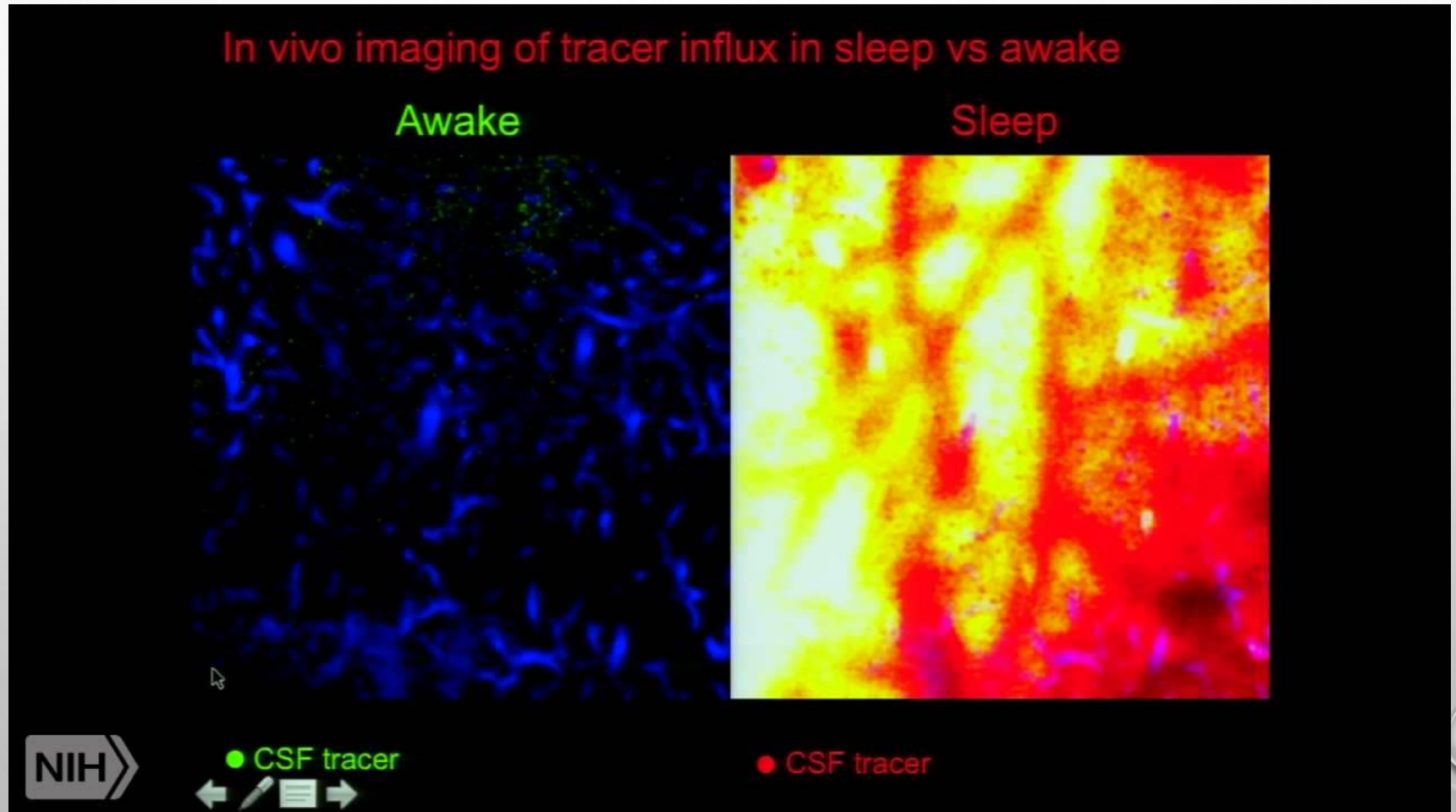


<https://www.nih.gov/news-events/nih-research-matters/lymphatic-vessels-discovered-central-nervous-system> date accessed 13.8.18

Function?

Clears during sleep

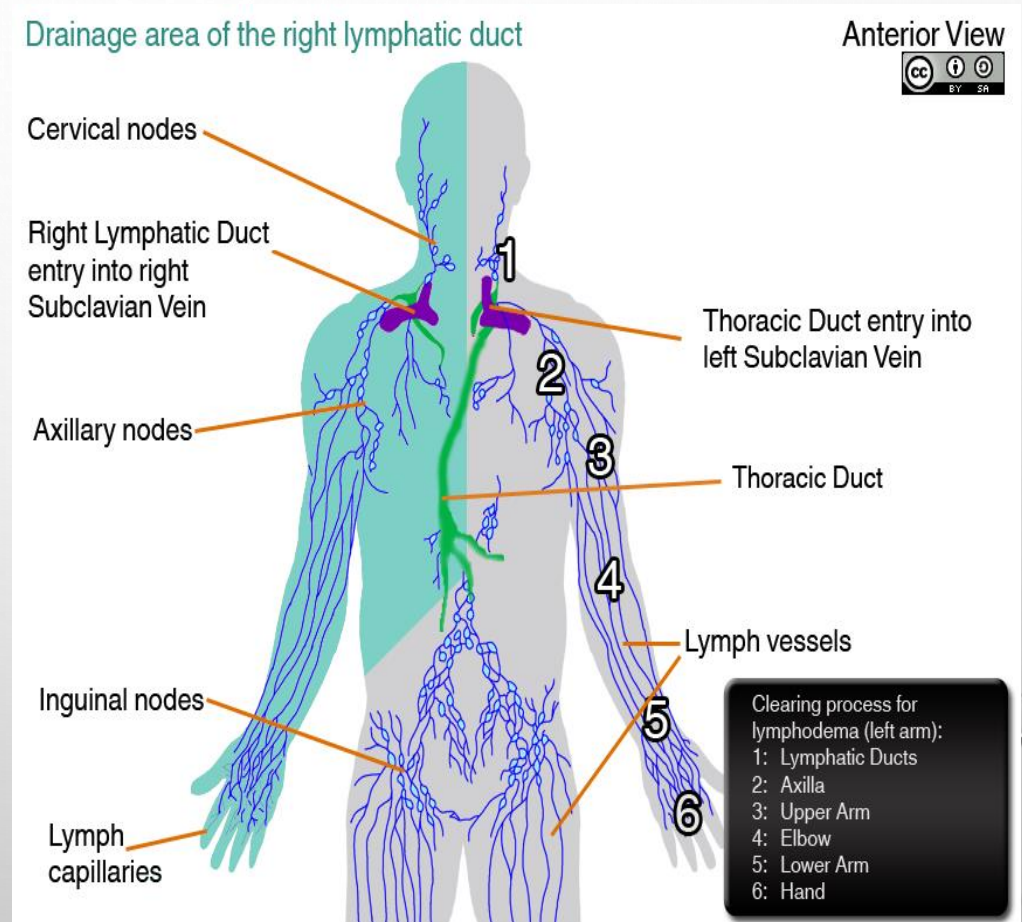
- reduce immune inflammation?





Key points from lymphatic research

Clear from proximal to distal.



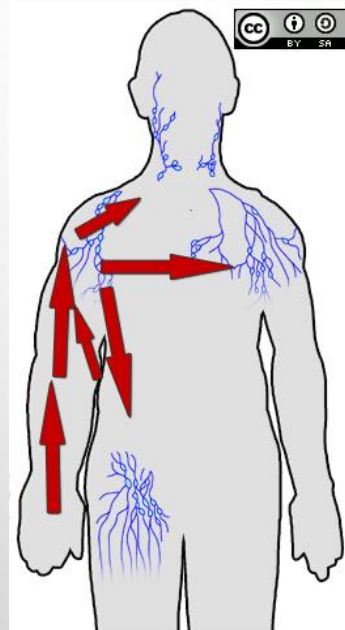
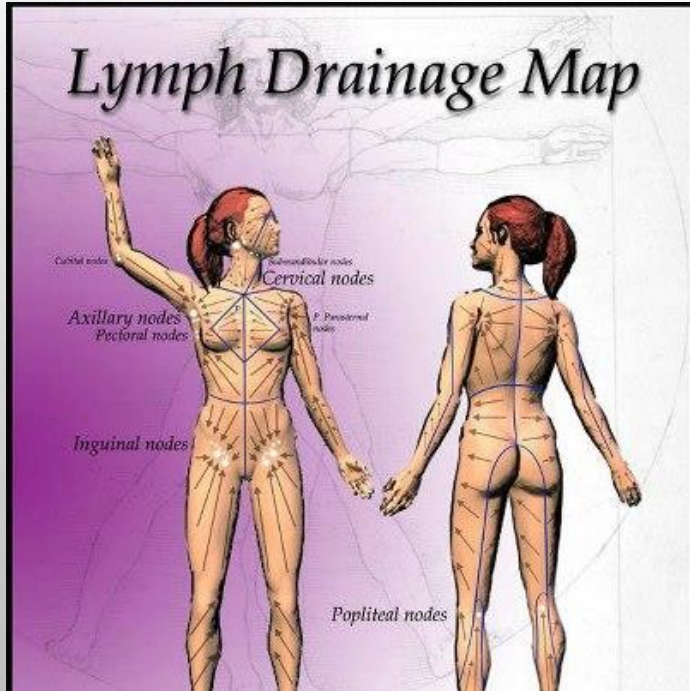
(Foldi, 2005)

(Casley-Smith 2009)

(Loudon et al; 2012)

Key points from lymphatic research

Lymph flows to specific nodes and tries to create alternate pathways if blocked.



http://www.lymphnet.org/community_resources.html

(Foldi, 2005)

(Casley-Smith 2009)

(Loudon et al; 2012)

Key points from lymphatic research

It is an action of SNS.

It moves slowly.

To not overtax the system - rests.

(Foldi, 2005; Casley-Smith 2009; NLN, 2011; Loudon et al; 2012; Sing et al. 2016)

Key points from lymphatic research

Slow breathing and muscle contraction create pressure changes for the lymph to move.

Elevation will help it drain.

Key points from lymphatic research

Exercise must be supervised and progressive;

Individualised.

Slow warm up and cool down;

Tune in with person;

Restore QoL; biomechanics; symmetry.

(Foldi, 2005; Casley-Smith 2009; NLN, 2011; Loudon et al; 2012; Sing et al. 2016)

Contra indications

Heat or cold

Repeated actions eg hammering

Held positions eg carrying shopping, driving

Insect bites/scratches

Interactions with yoga

Fascial system;

Breathing and body movement;

Importance of sleep/deep rest/meditation;

Elevation/balance/symmetry;

Supervised/Progressive/Individualised.

Yoga also offers deep theoretical path

Aim:

Vedanta/Samkhya/Tantra

Inner and Outer connection

"Swastha"

To be established in self/Self.

"There is a light that shines beyond everything...this is the light that shines within your heart". *Chhandogya Upanishad*



Yoga also offers

Balance
eg SNS and PNS.



Ha – Sun Method activity
mental challenge

Eg pump lymph (moving or held postures)

Tha – Moon Method restoration
reflection

Eg rest so lymph can flow and no
overload/yoga nidra

(Parker, 2013; Telles, 2000)

Yoga also offers

Integration of whole.

And improved immune function.



Kosha system

Healthy immune function

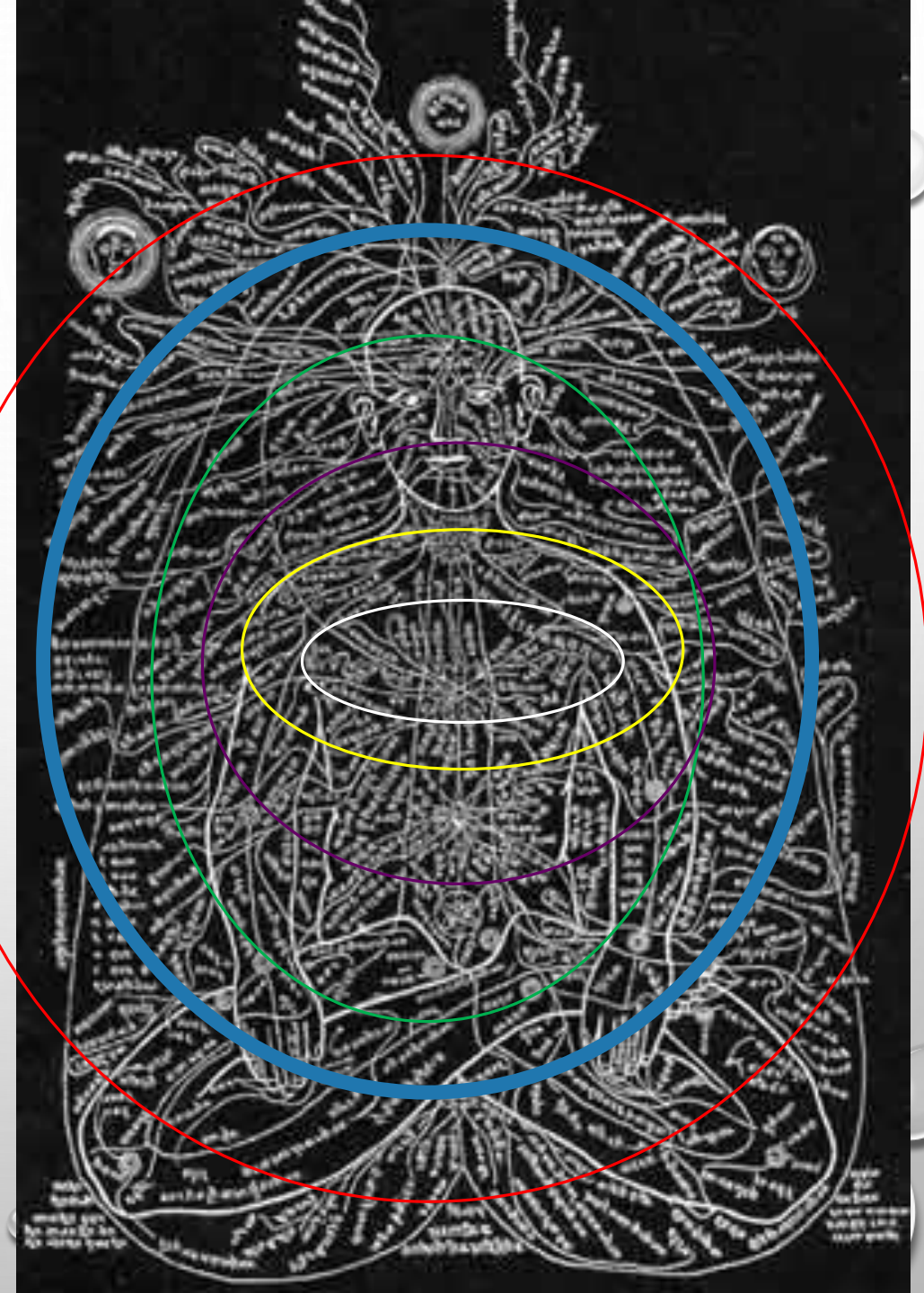
- Balance of kosha



- Flow of prana

Improved immune
Function

(Yoga pratap, 2009)



Evidence base of yoga and immune disorders - inflammation

Increasing evidence base, including reviews:

Even though the existing evidence is not entirely consistent, a general pattern emerged suggesting that yoga can downregulate pro-inflammatory markers.

It is hypothesized that longer time spans of yoga practice are required to achieve consistent effects especially on circulating inflammatory markers.

Overall, this field of investigation is still young, hence the current body of evidence is small and for most immune parameters, more research is required to draw distinct conclusions.

(Falkenberg et al. 2018)

Yoga also offers

8 stages of Patanjali



Evidence base of yoga and Neuroscience.

Bottom up practices (Breathing/Postures/Yama/Niyama):

Lateral, bilateral, whole = creates brain plasticity, more integration of frontal cortex & connection through Corpus Collosum.
(Villemure et al. 2015)

Stretching = improves immune response and reduces pain.
(Berrueta et al. 2016)

Rhythms and repetition = improves integration of brain
(Berchicci et al. 2017)

Sensory awareness = stimulates sensory nervous system and insula = interoception & less emotional response to pain.
(Villemure et al. 2014)

Evidence base of Neuroscience.

Top down practices

(Pratyahara/Dharana/Dhyana/Yama/Niyama):

Increased grey matter = prefrontal cortex functioning.

(Lazar et al. 2005; Holzel et al. 2010;2011)

Reduced activation of amygdala = reduced emotional reaction to pain.

(Zeiden et al. 2011)

Increased activation of Caudate and basal ganglia =

Cognitive behaviour adaptiveness;

Improved memory;

GABA and dopamine pathways enhanced;

Adaptive behaviour;

Unlearning habits

(Gard et al. 2015; Van der Kolk et al. 2015)



Yoga

Balance:

SNS and PNS

Pro- and anti-inflammatory markers

Integration:

Creates mind-body integration and well-being.



Our aim in yoga - arm lymphoedema

Obtain medical clearance

Follow lymphatic clearing protocol

To enable lymph to flow - soften the tissue - recreate pathways

Not to overtax the lymphatic system

Reduce physical symptoms

Boost immune system

Recreate functional and optimal movement patterns

Increase symmetry

Reduce stress reactions - improve QoL

Optimal inner and outer health





Evidence base of yoga and BCRL

8-week RCT

1.5 hour class and 45 min daily home-practice

N=28

Results 1 – lymphoedema – no increase; QoL – symptoms reduced; tissue density – upper arm improved (Loudon et al. 2014)

Results 2 – Abduction strength of shoulder and pelvic stability improved (Loudon et al. 2016)

Evidence base of yoga and BCRL

Results 3 –

Improved wellbeing;

Increased awareness of physical body;

Improved physical, mental and social functioning;

Benefit of group;

Nine women = transformative journey through illness.

(Loudon et al. 2017)

Evidence base of yoga and BCRL

Individual improvements

- Self-report and partners:

Eg increased strength/ROM/stability/ease of movement/joy/sangha.
reduced lymphedema/fibrosis/pain/reactiveness/periods of depression.

Full Protocol

(Loudon et al. 2017b)

- Allied health professionals:

Lymph therapists; doctors, nurses:

Reduced swelling and tissue density;

Happier; increased ability to stay calm during tests.

Lower limb lymphoedema (LLL)

primary and secondary



Our aim in yoga - LLL

Get medical clearance

Follow lymphatic clearing protocol

Check treatment history

Include plenty of elevation - beginning, middle, end

Continue to clear central lymph/create alternative pathways

Work with person to create or change postures

Create stability and balance/symmetry

Stepping forwards and backwards eg Salutes

Create alternatives for class situation

Improve QoL

Always get feedback

Evidence base yoga and lower limb lymphoedema



(Narahari et al.
2011)

Narahari's team in Kerala Ayurveda, Western Dermatology, Yoga



Baseline 27/03/2009 After 55 days 21/05/2009

2 weeks supervised treatment

Home program

Come back for testing (45 and 95 days approx.)

Evidence base of yoga and LLL

Narahari's team in Kerala
Ayurveda, Western Dermatology, Yoga

Reduced infection

Reduced lymphoedema

Improved gait

(Aggithaya et al. 2015)

Evidence base of yoga and LLL

Observation and feedback from students with primary and secondary lower limb lymphoedema.

“it gave me back control, I could do something for myself” Sue, bowel cancer Kangaroo Island.

“My legs became really weak after the melanoma was removed along with lymph nodes. The warrior and salutes make me feel I am getting strong again and I think my legs are now stronger”. Phillipa, Victoria 2017 melanoma.

“Having a safe practice that I can do in a class normalises me and I finally feel as if I’m doing yoga”. Donna, KI 2015 primary lymphoedema Kangaroo island.

Evidence base of yoga and lymphoedema

By observation and feedback from Allied health professionals:

Lymph therapists

Doctors

Nurses

Occupational therapists

Eg improved function, softer tissue, equanimity, speed of recovery after surgery.

Lipoedema



Lipoedema



Our aim in yoga - lipoedema

Obtain medical clearance

Follow lymphatic clearing protocol

To reduce fibrosis

To encourage good lymphatic drainage

Boost immune system

Recreate functional and optimal movement patterns

Increase stability and strength (mobility often really good)

Reduce physical symptoms

Reduce stress reactions - improve QoL

Confidence building is utmost importance

Optimal inner and outer health



How can we use yoga to
enhance lymphatic flow?

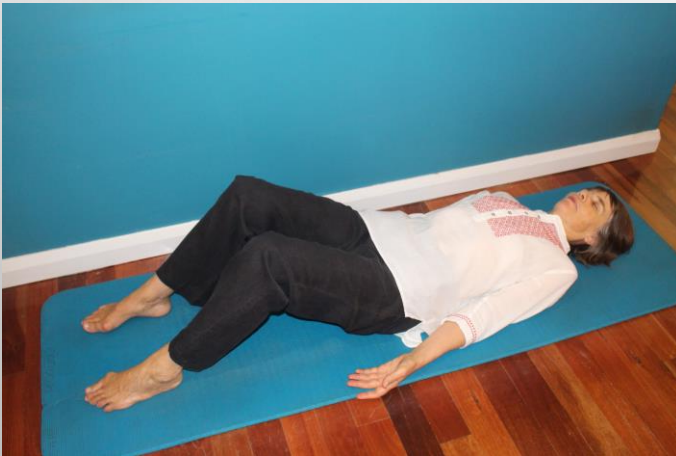
Compromised system



Pratyahara/Yama/Niyama Settling/Centering

For awareness

Equanimity



Pranayama

Slow breathing



pressure changes

- Empty lymphatic system to venous system – clear the pathway
- Mobilise the scar/fibrotic tissue
- Use muscles affected by surgery



- Calm the mind

Pranayama & bandha

Abdominal compression eg

Moola and Uddiyana bandha or Kapalbhati



Asana/Dharana/Dhyana
Commence and finish with a chant
Empty lymphatic system to venous system



& create agni/ joy

(Ryan, 2012; Porges, 2009)

Pranayama & Asana

Full yoga breath may aid emptying



(Vaagas and Ryan, 2003;Piller (personal communication))

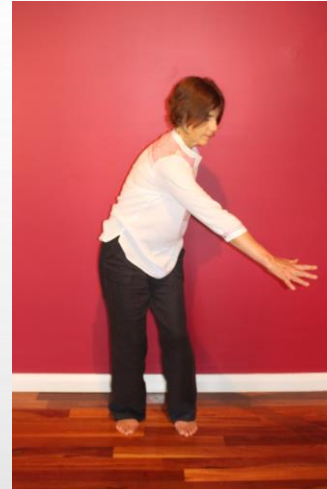
Asana

Moving 5-7 reps

Unilateral,



Contralateral,



Slow/rhythmic

Bilateral



Rests

(Loudon et al. 2017, 2016; Schmitz et al. 2009; NLN 2015; Van der Kolk, 2013; Foldi & Strossenreuther, 2005)

Asana

Based on the principles of lymphatic drainage

Clear nodes

Proximal to distal eg axilla

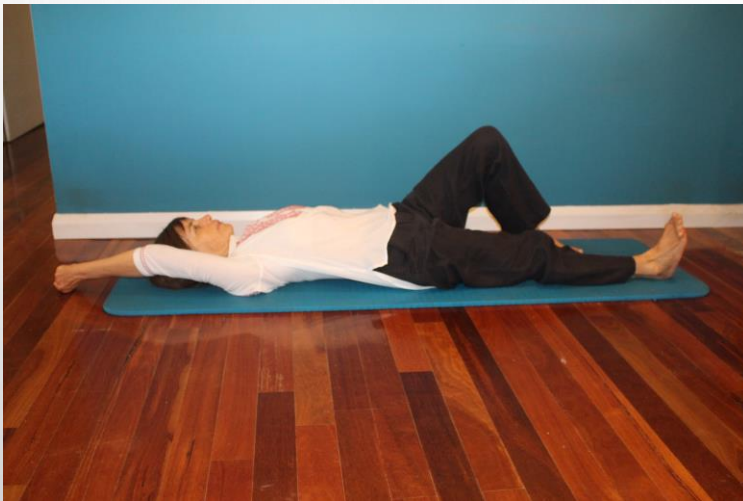
Slow

Rests after movement



Asana

Then pump the lymph from distal areas



(Loudon et al, 2017; 2016; 2012; Casely-Smith, 1999; Foldi & Strossenreuther, 2005)

Asana

Clenching
of the fist after
inhalation, and

Release on
Exhalation.



Asana

Dorsiflex ankle on inhalation - extension
Plantar flex ankle on exhalation - flexion



Asana

Create alternative pathways/if necessary



(Loudon et al, 2017; 2016; 2012; Casely-Smith, 1999; Foldi & Strossenreuther, 2005)

Asana

Gradually increase difficulty



Asana

Rotation

Kinematic movement patterns

Empties cisterna chyli?



Asana

Stable to less stable

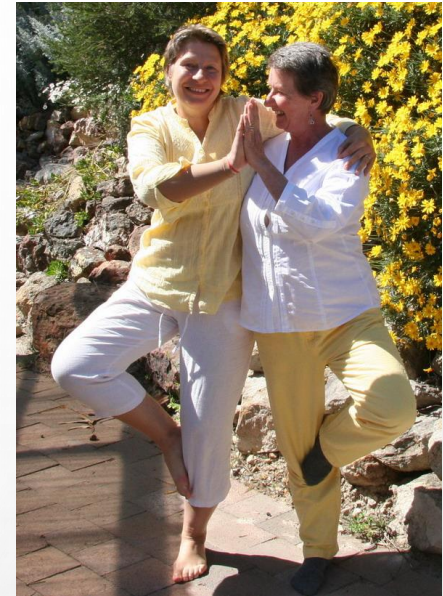


(Loudon et al. 2017; 2016; Schmitz et al. 2009; NLN 2015; Foldi & Strossenreuther, 2005)

Asana

Symmetry and balance

Gradually extending hold



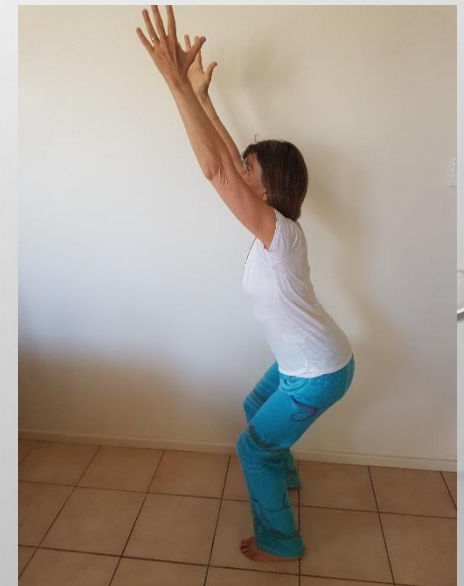
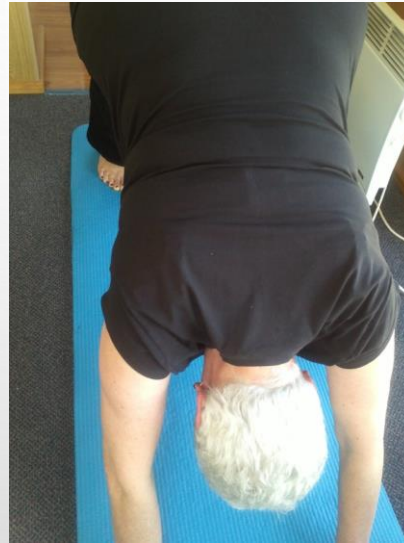
Asana

Forward and backward stepping



(Brown et al. 2014; Buren 2000)

Asana Core/pelvic/shoulder stability



Asana

And slowly introduce strength



Asana

Continue to clear lymph back to venous system

• Eg Standing Cat / Rowing



Asana

Flowing and slow movement

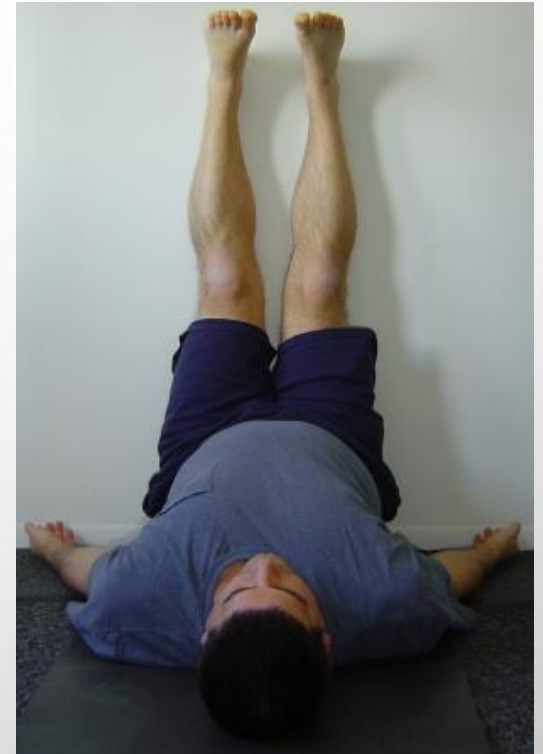
To warm up/cool down



Work into fascial system

Elevation

Continue to drain the lymph



Pranayama

Balance

Cool down

Calm NS



(Telles et al. 1994)

Dharana/Dhyana

Relaxation and Meditation

Activate PNS

Clear/focus the mind

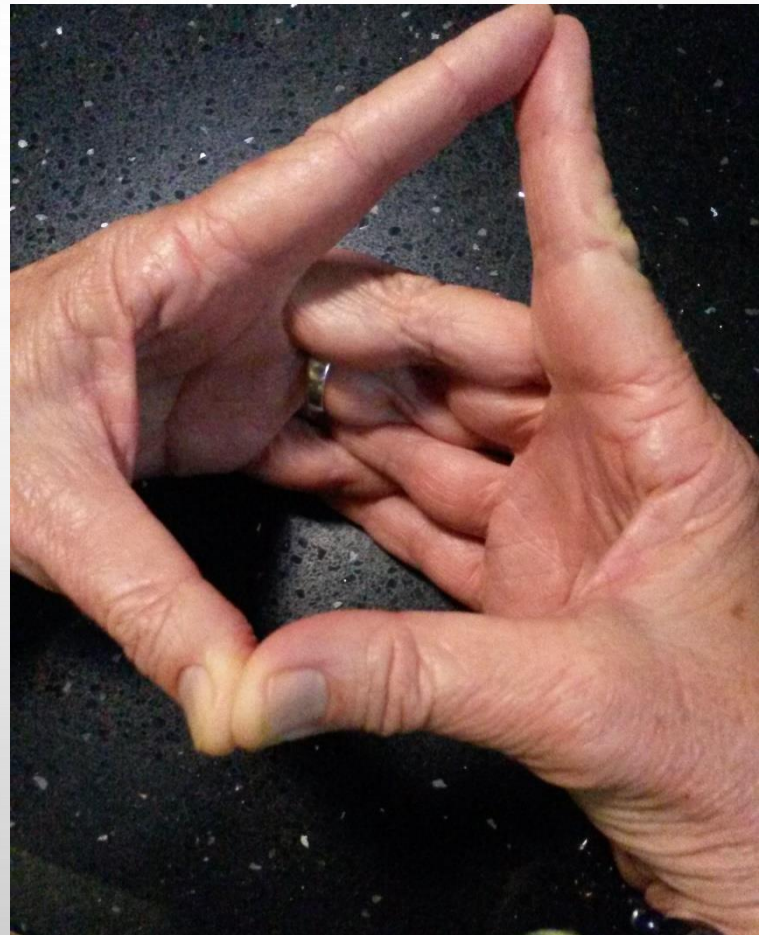


Long-term benefits

Neuroscience



Mudra



Pranayama

Slow full breathing and chant

To empty lymphatic system back to venous system.



Risk of/Worsening – lymphoedema

Follow lymphatic clearing protocol

From diagnosis:

Lymphatic Session to prepare tissue
Breathing
Mental practices

Refer to lymph therapist

After surgery:

Breathing with moolabhandha and mental practices.
Upper body surgery – Lower body movements.
Lower body surgery – Upper body movements.

After medical clearance:

Slow progression of lymphatic yoga
Individual variation.

Always get feedback.



Yoga

Prepare tissue for surgery, build up prana/immune system and prepare ANS

Lymphatic gentle yoga

Mantra playing

Recorded practices:

Pranava Darshana

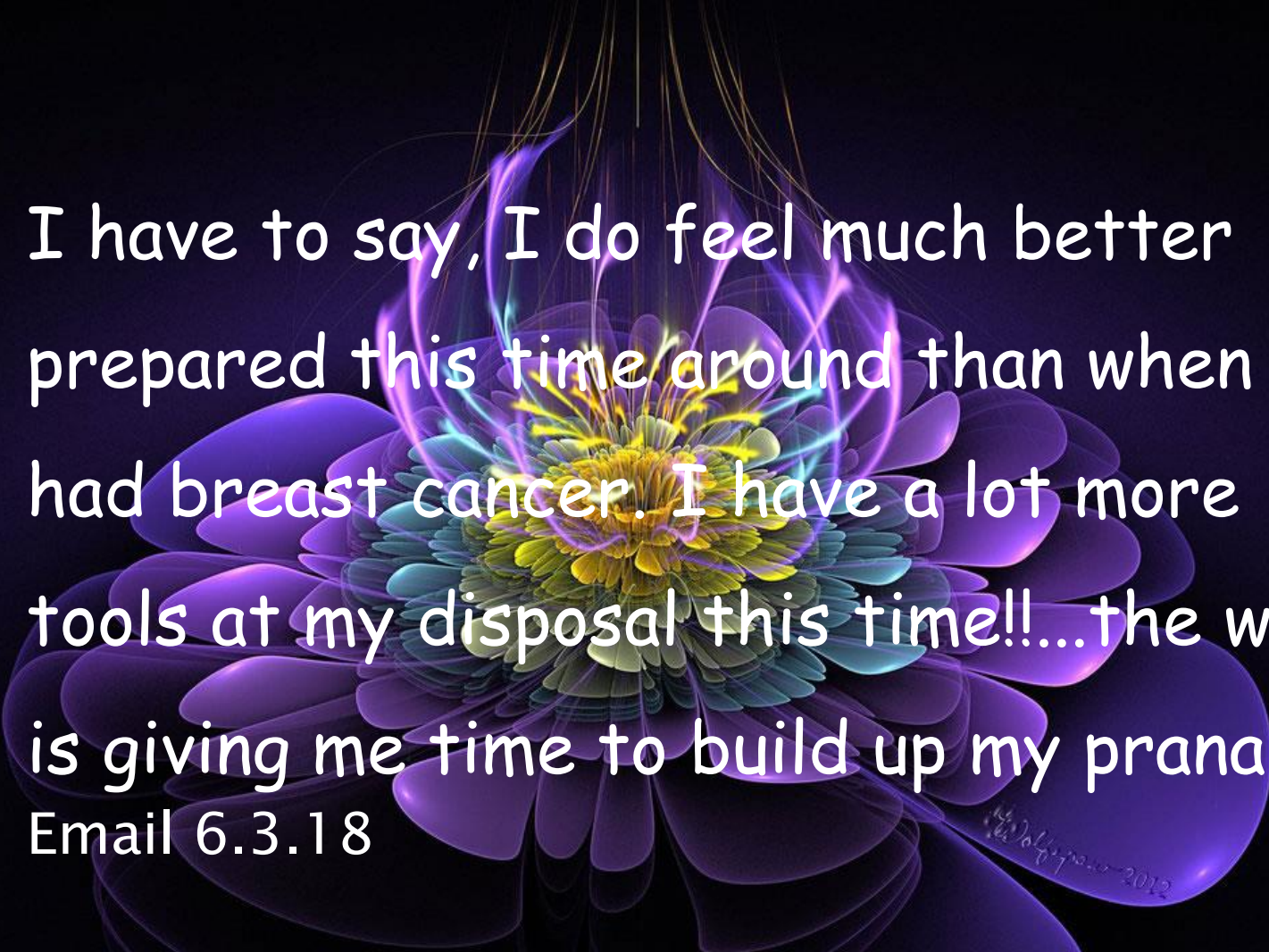
Prana Vidya practices

Spinal Channel

Yoga Nidra

17.2.18

Finger breathing, nadi shodan, square breathing and brahmari for surgery and rock/yantra.



I have to say, I do feel much better
prepared this time around than when I
had breast cancer. I have a lot more
tools at my disposal this time!!...the wait
is giving me time to build up my prana.
Email 6.3.18

© 2012



6.4.18

Skin and subcutaneous tissue, fascia and some of the muscle, took the muscle aside and denuded the bone, so took the fascia from that section of the tibia/shinbone, and then stitched the muscle in place around the bone.

**Hyalinised inflammatory
myofibroblastic tumour,
completely benign**



11.4.18

Donor site for skin graft

Yoga

After surgery: Internal pulsation, Prana/Immune and ANS

Full yoga breath with moolabandha

Recorded practices:

Prana Vidya practices

Pranava Darshana

Spinal Channel

Yoga Nidra

Finger breathing, nadi shodan, and tiger eye in palm and rose quartz.

Nurses: amazed by Paula's calm attitude and desire to help herself.



16.4.18



14.5.18



23.8.18



Yoga

● Recovery, Prana/Immune and ANS

Sitting and lying lymphatic yoga 1.5.18

Add standing lymphatic yoga 26.5.18

Including Tree pose

Restorative chest opening.

Kept up meditation practices and yoga nidra and wearing mala.

Physios amazed at Paula's progress, she also did her physio during this time.

I think Prana Vidya helped with

everything. I believe it boosted my

immune system, sped up healing,

helped with pain and stress.



Started
Standing
Salutes 12.6.18

23.8.18



19.4.18

23.8.18



Yoga

Recovery, Prana/Immune and ANS

Add some divine fascial practice

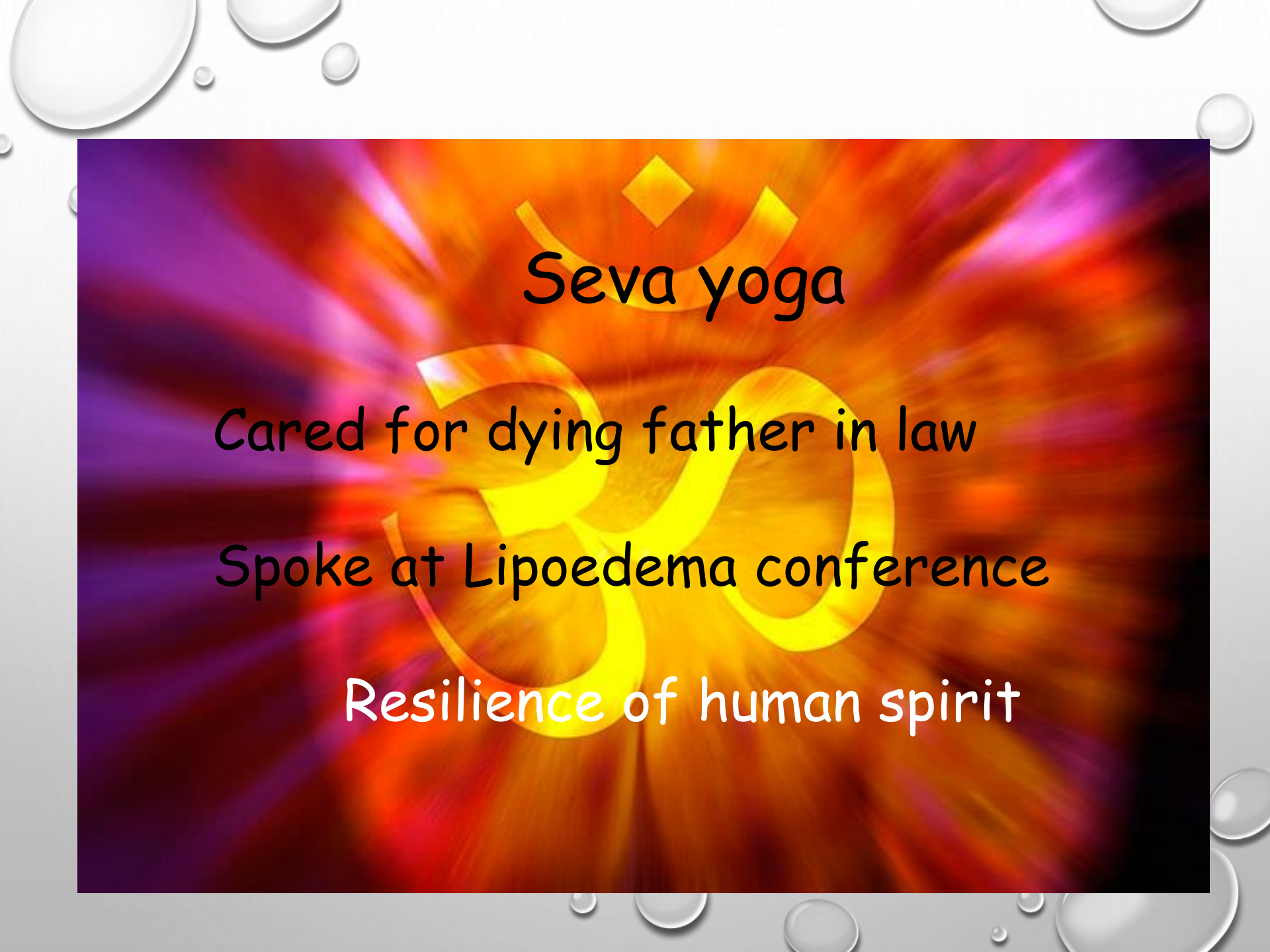
move to beautiful mantra from your heart centre.

Meditation practices and yoga nidra continue

20.8.18

So I did this morning. I had the Gayatri Mantra playing, first the Deva Premal version, which is beautiful, and then the chant itself, chanted by Brahmins. It was wonderful. I intend to do this regularly. I think I need this, very much. And I am reminded to chant the Gayatri, which I have not done for a long time.





Seva yoga

Cared for dying father in law

Spoke at Lipoedema conference

Resilience of human spirit



To sum up:

Yoga for the lymphatic system has great affect and can help to regulate:

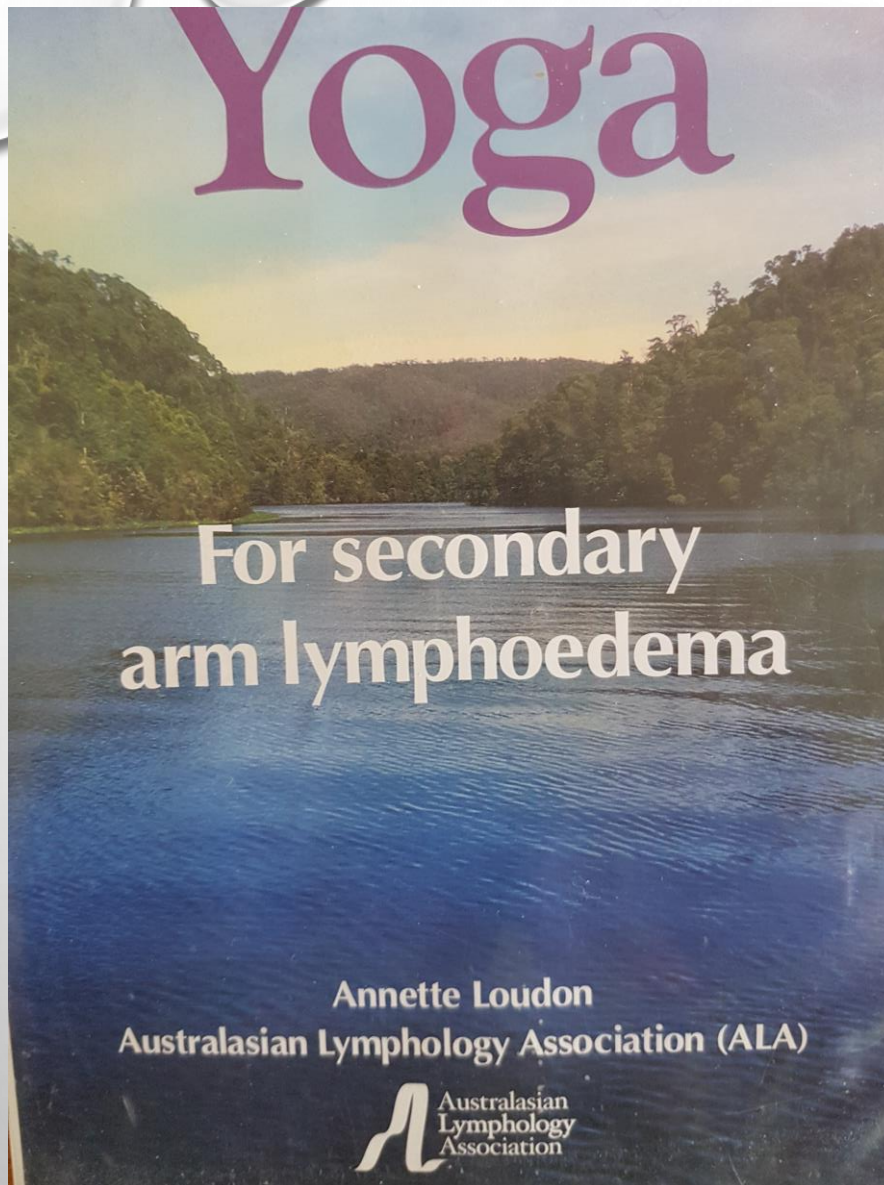
Lymphatic flow

Immune response

QoL and wellbeing

Connect us to our “self/Self” in the internal and external environment.





Online and face-to-face
courses

Yoga for the Lymphatic System

forestmy@hotmail.com

www.lymphoedema.org.au

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