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The Lymphatic System

The lymphatic system is probably one of the most overlooked systems of the body and yet efficient lymphatic circulation is absolutely vital to both the prevention of illness and more generally to healing and well being.

Whilst most people have a fairly good idea of what the cardiovascular system is and its importance to health, many people will have at best a shaky understanding of the lymphatic system.

However, this is not the case everywhere and many physicians in Continental Europe recognise the importance of efficient lymphatic circulation to health and as a consequence, stimulation of the lymph flow is the fourth most commonly prescribed medical treatment.

What is lymph?

Lymph is a clear fluid derived from blood plasma which has seeped through capillary walls to fill tissue spaces. This fluid enters blind-ended vessels in the tissues and is returned in a one-way system via progressively bigger vessels and ultimately two ducts to the subclavian veins in the chest into the circulation.

Lymph capillaries have the same structure as blood capillaries but are more permeable allowing the entry of fluid, large proteins and cell debris. Every day about 21 litres of plasma leaches from the circulation into the tissues and whilst most is returned to the venous end of the capillaries, about 4 litres of fluid are drained away by the lymphatic vessels. Without this, the tissue would rapidly become water-logged, the blood volume would fall and the cardiovascular system would fail.

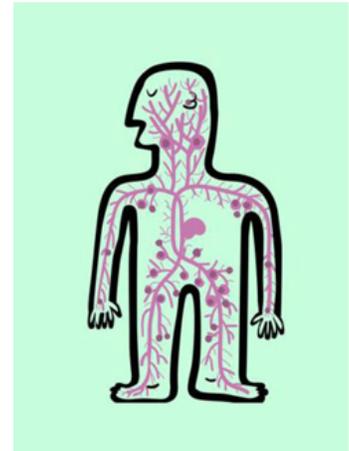
In fact, the lymphatic system interfaces more extensively with the cells than the circulatory system and is said to carry 4-5 times as much lymph by volume as the cardiovascular system carries circulating blood. All body tissues have lymphatic vessels except for the central nervous system, bones and the surface of the skin.

The lymphatic system comprises the lymph circulatory system consisting of lymph capillaries and larger vessels which are studded with lymph nodes ('glands') along with other lymphoid tissues and organs such as the spleen, thymus, bone marrow, tonsils, adenoids and appendix.

Lymph vessels called *lacteals* are present in the lining of the gastrointestinal tract, predominantly in the finger-like projections known as villi in the small intestine. While most other nutrients are absorbed into the capillaries that serve the villi and from there pass on to the liver via the portal venous system, fats are absorbed into the lacteals from where they enter the lymphatic circulation thus by-passing the liver.

Unlike the circulation, the lymphatic system has no central pump, but the muscles in the walls of the larger vessels contract rhythmically (the lymphatic pump), movement of adjacent structures such as muscles and arteries also compresses the vessels serving to move the lymph along and rhythmic breathing also acts to draw lymph into the thorax when inhaling. The lymphatic vessels contain millions of parachute-type valves that permit lymph flow in only one direction - usually against gravity.

The right side of the chest, head, neck and arm all drain into the right subclavian vein. The left side of the chest, head, neck, left arm, abdomen and both legs drain into the larger left thoracic duct as shown below.



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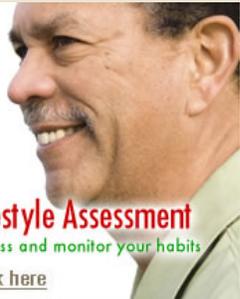


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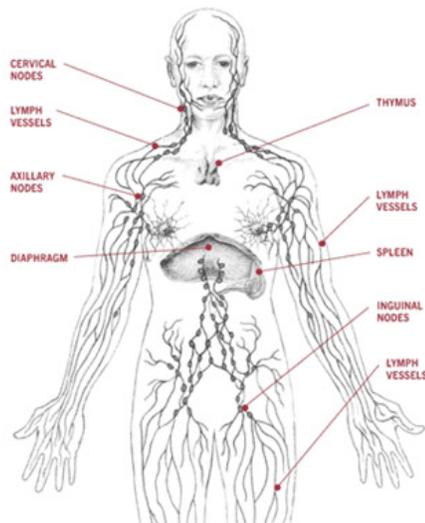
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THE LYMPHATIC SYSTEM



■ Area drained by right lymphatic duct
■ Area drained by left thoracic duct

THE LYMPHATIC DUCTS

The lymphatic system fulfils several important and diverse functions including:

- ⌚ Filtering pathogens
- ⌚ Manufacturing white blood cells and generating antibodies
- ⌚ Returning excess fluids and proteins to the circulatory system thus preventing tissue swelling and falling blood volume
- ⌚ Acting as the inner excretory mechanism of the body providing the means for each cell to eliminate waste
- ⌚ Absorbing and transporting fatty acids and fats as chyle from the circulatory system
- ⌚ Transporting white blood cells and antigen-presenting cells between lymphoid tissues and
- ⌚ Handling toxins that enter the body through external sources such as foods or air pollution.

Lymph nodes and follicles

Lymph nodes are small masses of lymphoid tissue enclosed in a fibrous capsule that range in size from 1 mm to 2 cm. They are often situated at junctions between lymph vessels and typically have several vessels entering the node and just one vessel carrying lymph away from the node.

Lymph nodes are highly organised and lymph from most tissues filters through at least one node before returning to the blood stream. All orifices are particularly well served with lymphatic tissue to protect the body against the ingress of pathogens. For this reason lymph nodes are particularly numerous around the heart and lungs, in the neck, pelvis, armpit and groin, and in association with the blood vessels of the intestines.

One of the functions of the lymph system is to pick up microbes, cancer cells and cell debris and to deliver these to the lymph nodes where they can be destroyed and/or antibodies produced as required. As the nodes become filled with bacteria or debris and as antibody production increases, the nodes expand and these are often referred to as 'swollen glands'.

Less well organised lymph tissue can be found in the intestines in the form of patches of lymphoid follicles known as the mucosa-associated lymphoid tissue (MALT). Other lymphoid follicles can be found in the five sets of tonsils which open into the ear, nose and throat.

The spleen is the largest lymphatic organ and it lies just behind the stomach. The role of the spleen is to fight infection and destroy worn-out red blood cells in the body.

The lymphatic system and immunity

Lymphocytes are the white blood cells responsible for immunity and they develop in bone marrow and are then either processed by the thymus to become T-lymphocytes or by the bone marrow to become B-lymphocytes. T-lymphocytes provide *cell mediated immunity* and B-lymphocytes provide *antibody mediated immunity*. Whilst the thymus and the bone marrow generate and prime lymphocytes, the secondary lymphoid organs then nurture the young lymphocytes and initiate an adaptive immune response.

In *cell mediated immunity* naive T-lymphocytes from the thymus, encounter an antigen in circulation either from outside or inside the body and become sensitised to it. They then circulate through the blood and lymph until they encounter the specific antigen to which they have been sensitised. This then initiates clonal expansion of three different kinds of T-lymphocytes to combat the invader.

In *antibody mediated immunity* Y-shaped antibodies are produced by lymphocytes which bind to, and cause destruction of, a particular foreign protein. So the health of the lymphoid tissue is absolutely vital not only to overall health but specifically to the immune response.

Congested and retrograde lymph

When confronted with a toxin, the body's first reflex is to eliminate it, but because we have labelled such detoxification reactions as 'illness' and vigorously suppress them the body is then forced to accommodate the toxins. This leads to any number of different disease symptoms and the degenerative disease process begins unheralded.

Lymphoedema is the swelling caused by the accumulation of lymph fluid, which may occur if the lymphatic system is congested and although it usually affects the limbs, the face, neck and abdomen may also be affected. Some disorders that are particularly recognised to affect the lymphatic system causing swelling of the lymph nodes include infections such as infectious mononucleosis (glandular fever) and cancers such as Hodgkin's and non-Hodgkin's lymphomas.

In fact, any swollen lymphatic tissue such as tonsils, adenoids or the appendix is symptomatic of a blockage in the lymphatic system and, as you are probably already aware, surgeons are inclined to remove such tissues. This is symptomatic treatment and may ultimately create more problems than it solves by further compounding the blockage in the lymphatic circulation. In particular, the removal of tonsils is thought to permanently affect lymphatic drainage of the head.

One mechanism by which lymph circulation may be adversely affected is that fat soluble toxins such as mercury will end up in the lymphatic system and be absorbed into the walls of the lymphatic vessels over time. This will slowly cause the automatic pumping of the lymph vessels to be compromised and ultimately to cease and this then causes stagnation and congestion within the system and as both the lymphatic pump and the lymphatic valves fail, may allow for reverse lymphatic flow.

An additional issue is that the muscles adjacent to the lymphatic ducts (pectoralis minor) can go into spasm preventing efficient emptying of the lymph into the circulation. Because of the restriction, the system cannot dispose of dead bacteria and cell debris and the nodes and other lymphoid tissues can swell and may become and inflamed as in tonsillitis, for example. Fluid can also accumulate within the system causing oedema in the form of swollen ankles or puffy eyes.

If lymphatic flow is impaired, the lymph becomes thick and toxic and can become a breeding ground for infection. And as the lymph is returned to the circulation, the infection can spread to any organ or part of the body. In this way the lymphatic system can harbour pathogens which become resistant to treatment resulting in recurrent or chronic infections and even death. The various systems and organs affected also slowly become less efficient and sluggish as they fill with their own waste.

A toxic, sluggish lymphatic system is at the core of the fluid retention, muscle soreness and generalised inflammation experienced by many individuals with fibromyalgia and chronic fatigue. In one study, 80 percent of overweight women were found to have sluggish lymphatic systems and getting this system flowing smoothly is the key to weight loss and improved feelings of well-being.

Signs of a sluggish lymphatic system include:

- ⦿ Aches and pains
- ⦿ Fibromyalgia, chronic fatigue syndrome, lupus or another chronic immune system disorder
- ⦿ Lumps and growths
- ⦿ Allergies
- ⦿ Chronic sinusitis, tonsillitis and/or sore throat
- ⦿ Enlarged prostate gland
- ⦿ Heart disease and hypertension
- ⦿ Eczema & other skin conditions
- ⦿ Repetitive or chronic infections and/or slow wound healing
- ⦿ 'Autoimmune' conditions such as systemic lupus erythematosus and multiple sclerosis
- ⦿ Bloating and swelling such as swollen ankles or puffy eyes
- ⦿ Inflammation
- ⦿ Headaches
- ⦿ Excessive sweating
- ⦿ Obesity and cellulite
- ⦿ Anaemic conditions
- ⦿ Problems digesting fat
- ⦿ Low back pain and/or arthritis
- ⦿ Cancer
- ⦿ Ear or balance problems infections
- ⦿ Nocturnal tooth grinding
- ⦿ Nocturnal breathing difficulties
- ⦿ Sleeping or relaxing with the arms raised over the head
- ⦿ Numbness and/or tingling in the extremities
- ⦿ Frequent nocturnal urination and
- ⦿ A lowered red blood cell count.

The lymphatic system is a major route of cancer spread as cancer cells from a primary tumour can either become trapped in lymph nodes, or small lymph vessels or can spread against the normal flow of lymph as it becomes stagnant or retrograde leading to secondary tumours.

Improving the lymphatic circulation is key to helping the body to cleanse the toxic deposits that are linked to pain, cellulite, fatty deposits and chronic and degenerative disorders.

Dietary advice

Water Drink plenty of water to constantly flush through the lymphatic system. Inadequate amounts of water will cause the lymph to become thick and sluggish.

Avoid refined and processed food All the usual advice about avoiding synthetic and chemically enhanced foods applies. Also avoid fatty and refined foods - eat whole, natural, unprocessed foods as much as possible.

Raw fruit The enzymes and acids in raw fruit are powerful lymph cleansers, especially when eaten on an empty stomach. Include more raw fruits, vegetables, salads and juices in your diet.

Cranberry juice The flavonoids, malic acid, citric acid, quinic acid and enzymes in cranberries and cranberry juice help to emulsify stubborn fat within the lymphatic system. Ensure that you drink only pure, unsweetened juice as the pasteurised versions do not have the same benefits. The juices can be diluted with water and mixed with apple juice to taste.

Green vegetables The chlorophyll along with the vitamins and minerals supplied assist the body to cleanse the lymph.

Essential fatty acids Include plenty of fresh nuts and seeds and their cold-pressed oils in the diet.

Herbs for lymphatic cleansing

A biannual lymphatic system cleanse of about 3 weeks at a time is recommended to establish and maintain health. However, those that are overweight or have an immune disorder may wish to cleanse more frequently or for longer periods under the supervision of a health-care provider. The following are just some of the herbs that are useful for lymphatic system cleansing:

Echinacea Famous for its immune enhancing abilities, when echinacea is combined with astragalus congestion and swellings of the lymphatic system reduce.

Astragalus The Chinese have been using astragalus, which they refer to as *huang qi*, for thousands of years for its ability to strengthen the life-force and act as an excellent lymphatic system cleanser.

Cleavers This herb cleanses the blood, urinary tract and lymphatic system and also decreases congestion and inflammation in the tissues. Do not use cleavers if you are diabetic or have poorly controlled blood sugar levels.

Goldenseal In addition to having anti-inflammatory properties, goldenseal encourages lymphatic cleansing.

Wild indigo root Aids the elimination of microbes and cleanses the lymphatic system, improves lymph flow and reduces swelling in the lymph glands. Do not use wild indigo if you're pregnant or nursing.

Other herbs are available but should be prescribed under the supervision of a health care professional. Women who are pregnant or breastfeeding shouldn't undertake a lymph cleanse, nor should people with diabetes or other chronic health problems, except under supervision.

Promoting lymph circulation

Several physical techniques can be used to promote lymphatic circulation.

Manual Lymphatic Drainage (MLD) is a therapy in which the practitioner uses a range of specialised and gentle rhythmic pumping techniques to move the skin in the direction of the lymph flow. It was developed in the early 1930's by Dr. Emil Vodder and is particularly beneficial in:

- 🌀 Promoting the healing of fractures, burns, torn ligaments and sprains
- 🌀 Improving many chronic conditions such as sinusitis, rheumatoid arthritis, scleroderma, acne and other skin conditions
- 🌀 Helping to boost the immune system as part of 'detox'
- 🌀 Minimising scarring and stretch marks
- 🌀 Relieving fluid congestion such as swollen ankles, tired puffy eyes, the swollen legs of pregnancy and the lymphoedema that occurs after cancer treatment.

Skin Brushing Dry skin brushing using a natural bristle brush and working in strokes from the extremities towards the heart daily helps to promote the flow of lymph and also to enhance detoxification via the skin.

Exercise Any kind of exercise such as brisk walking will promote lymphatic circulation, however, rebounding on a mini-trampoline or jogging are particularly beneficial. In fact, Dr. C. Samuel West calls rebounding 'lymphacising' as with each bounce all the lymphatic valves open and close simultaneously and the changes in gravitational force encourages lymphatic flow against gravity increasing lymph flow as much as fifteen times!

Many fibromyalgia and chronic fatigue sufferers have poor exercise tolerance and rebounding provides gentle, low impact exercise. Use a rebounder with a stabiliser bar and start with just a couple of sessions of a few minutes a day.

Deep breathing also helps to pump the lymph by creating a vacuum within the chest that promotes lymphatic circulation and also helps to provide oxygen.

Massage Any kind of massage will help to stimulate lymphatic circulation, but in particular the muscles which lie adjacent to the lymph ducts (pectoralis minor) can become tense causing restriction or blockage of the drainage of lymph into the venous system. If the region a few centimetres below mid-clavicle is particularly tender then it is worth massaging this region to help relieve the muscle spasm and also to touch this area with one hand whilst massaging the outside of the leg between the hip and knee and the small of the back on the affected side to help promote drainage.

Further resources

You might also be interested in the following:

[Body Basics](#)

[The Tonsils: Key to Health](#)

[How the Body Heals](#)

[Exercise](#)



Read

[The Role of Toxic Metals in Fatigue Syndromes](#)

[Systemic Lupus Erythematosus](#)

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Video

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The Lymphatic System: Article summary

This article looks at the many vital roles of the lymphatic system, the signs of sluggish or retrograde lymph flow and ways to improve lymphatic circulation.



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