

## Chapter 28 - The Lymphatic System

The lymphatic system is a **one-way** system of dead-end vessels. **They collect fluid from around cells and return it to the blood.** Lymph **nodes** are swellings in the lymph vessels. They help the body **fight infections.**

If the lymph is blocked then fluid builds up and causes **swelling.**

Blood in arteries is under high pressure. Water from the blood is forced out of the capillaries. This is called **tissue fluid** or interstitial fluid, extracellular fluid, ECF.

This tissue fluid has **white blood cells** and **proteins** only. 1 Litre of this is formed per hour in your body.



## Tissue fluid is drained away in 2 ways

**90%** is drawn back into the capillaries near the veins

**10%** enters the lymph vessels.

It is now called **Lymph**.

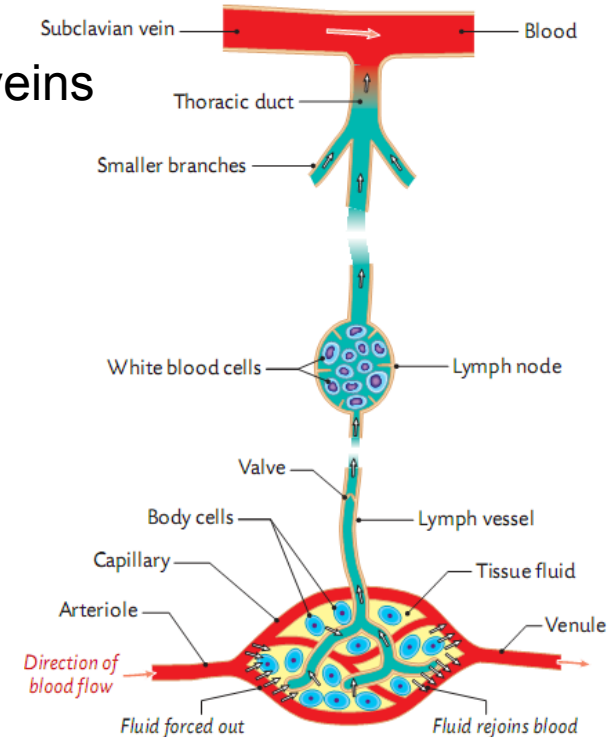
It is milky white and full of white blood cells, proteins and fats.

## Lymph Vessels

1. Muscular walls of vessels
2. Body movements.

The vessels have **valves** to ensure lymph only flows towards the shoulders.

There are two main vessels, the **thoracic duct** on the left and the right **lymphatic duct**. These ducts empty into the bloodstream at the subclavian veins under the collar bones.



## Lymph Nodes

These are **swellings** on the lymph vessels.

They contain large number of white blood cells (lymphocytes) which fight infections.

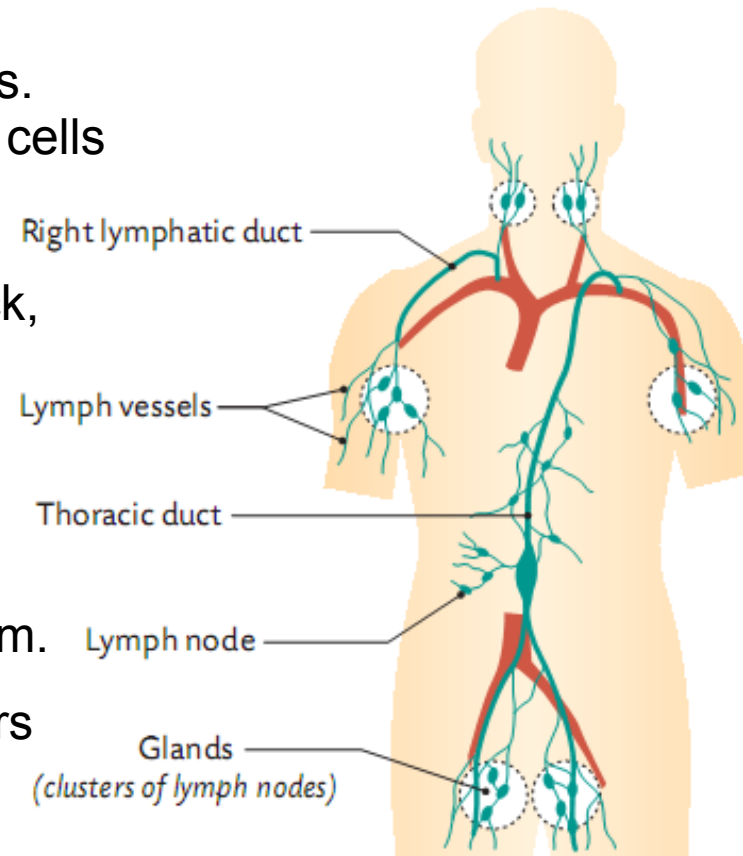
The nodes are in groups that form glands.

These glands are found in the tonsils, neck, armpits, groin etc.

### The nodes fight infection by

1. **Filtering bacteria** from the lymph
2. **Maturing lymphocytes** and storing them.

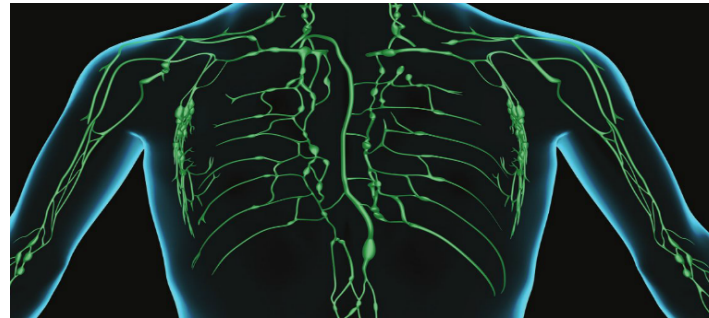
Some of these engulf bacteria and others make antibodies.



## Functions of the Lymphatic System

The Lymphatic system links various parts of the body.

**Plasma** → **Tissue fluid** → **Lymph** → **Plasma**



The functions are,

1. To **collect tissue fluid** and return it to the blood.
2. To **defend** the body against infection. →
3. Absorbs and **transports Fats** in the digestive system.

Filters out microorganisms  
 Stores Lymphocytes  
 Kills invaders by engulfing them or by making antibodies