

# CUNNINGHAM'S TEXTBOOK OF ANATOMY

ELEVENTH EDITION

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## THE LYMPHATIC SYSTEM

The role of the lymphatic system in absorption is mentioned on page 837. The fluid absorbed by its vessels is called lymph, and is colourless, except that from the intestine (chyle), which appears milky during digestion because of its fatty content. Not all parts of the body have lymph vessels, for they are absent from avascular tissues and from the central nervous system; and possibly from muscle and bone marrow.

In their course lymph vessels are interrupted by lymph nodes which serve in part as filters (see below), and in part as sources of lymphocytes. Most of the lymph passes through at least one lymph node—generally more—before reaching the blood stream, but in a proportion of the animals studied by Engeset (1959a) lymph travelled from the testis to the thoracic duct without passing through any nodes.

The lymph capillaries from which lymph vessels arise are abundant in the skin, mucous membranes, glands, serous membranes and synovial membranes and are essentially sub-epithelial in position.

The **superficial lymph vessels** lie in the skin and subcutaneous tissues; they frequently accompany the superficial

veins and, in the limbs, they join the deep vessels at constant sites.

On each side of the body the cutaneous lymph vessels converge from three large areas upon three groups of lymph nodes [FIGS. 1146, 1147, and 1173]: (1) from the skin of the lower limb, perineum, external genital organs, and the trunk below the level of the umbilicus—to the superficial inguinal lymph nodes in the groin; (2) from the skin of the upper limb and the trunk above the umbilicus to the level of the clavicle in front and halfway up the back of the neck behind—to the lymph nodes in the axilla; (3) from the scalp, face, and the rest of the neck—to the cervical nodes.

The **deep lymph vessels** drain the lymph from parts deep to the deep fascia, and they tend to accompany the blood vessels of the region.

In the limbs and trunk they are relatively scanty and arise primarily in the synovial membranes of the joints. In relation to muscle they are probably mainly passengers although lymph capillary networks have been described on tendons; and some observers believe that they occur also in the fibro-areolar tissues of muscle.

The **lymph nodes** also are divided into superficial and deep groups. The former lie in the superficial fascia and are comparatively few; they are associated more particularly with the superficial lymph vessels of the limbs and the trunk. The deep nodes of the limbs also are comparatively few, but those of the head, neck, and trunk are numerous.

### GENERAL PLAN OF THE LYMPHATIC SYSTEM

From the capillary plexuses, collecting vessels run towards the lymph nodes. On reaching a node the vessels, called **afferent vessels**, penetrate the capsule at numerous points, and the lymph percolates slowly through a meshwork of lymph sinuses lined by phagocytic cells [p. 943]. These cells take up from the lymph particulate material, such as bacteria which have entered the tissues, or inhaled carbon particles, and are an important part of the body's defence. **Efferent vessels** from the nodes either run with afferent vessels into another node of the same group or pass on to another group; and from the most proximal group of each chain of nodes the efferent vessels unite to form **lymph trunks** which are named: (1) lumbar; (2) intestinal; (3) bronchomediastinal; (4) subclavian; (5) jugular. Each trunk drains a definite territory of the body, and they all empty into great terminal vessels—the thoracic duct and right lymph duct [pp. 943-4]—which open into the great veins in the root of the neck [FIG. 1145], forming the only lymphaticovenous communications, apart from the occasional direct entry into the great veins of the subclavian, jugular, or bronchomediastinal trunks (Engeset, 1959b).

For a more detailed account of the lymphatic system than that which follows, Rouvière (1932) should be consulted. The

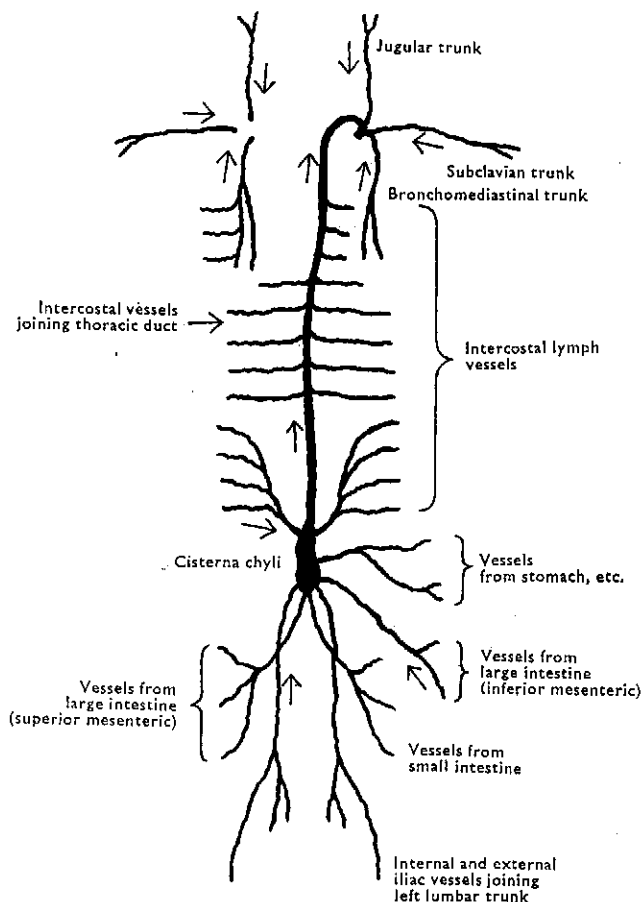


FIG. 1145 Diagram of main lymph vessels.