



The Lymphatic System

- ▶ **Lymphatic system: a collection of lymphoid organs and cells, lymph, and lymph channels**
 - ▶ **Lymphatic vessels: convey lymph from all parts of the body (through lymphatic capillaries) toward the circulation**
 - ▶ **Clears the body from excess fluids, and some proteins, provides it with immunity, and guards against harmful antigens**
 - ▶ **Absorption and transport of fats (**Lacteals**)**
 - ▶ **It may be the site of the primary tumor or the vehicle for the spread of other tumors**
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Lymphatic vessels

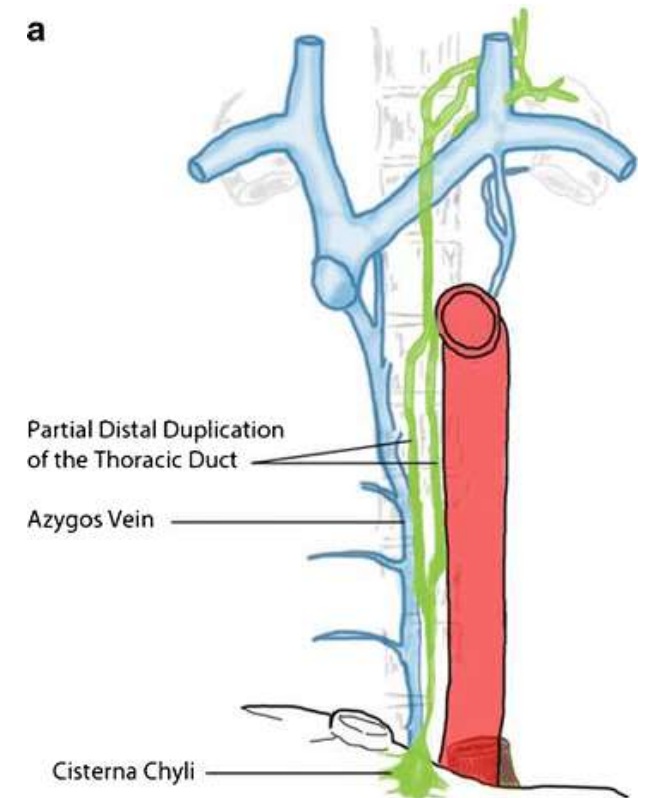
- ▶ **Start as a blind-ended tubes**
 - ▶ **Can absorb proteins and large particles**
 - ▶ **Resemble veins but they have valves giving lymphatics a beaded appearance**
 - ▶ **Lymph is the fluid inside them**
 - ▶ **Lymph vessels stop at strategic points to filter lymph before reaching the circulation**
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Major Lymphatic Ducts

Thoracic Duct

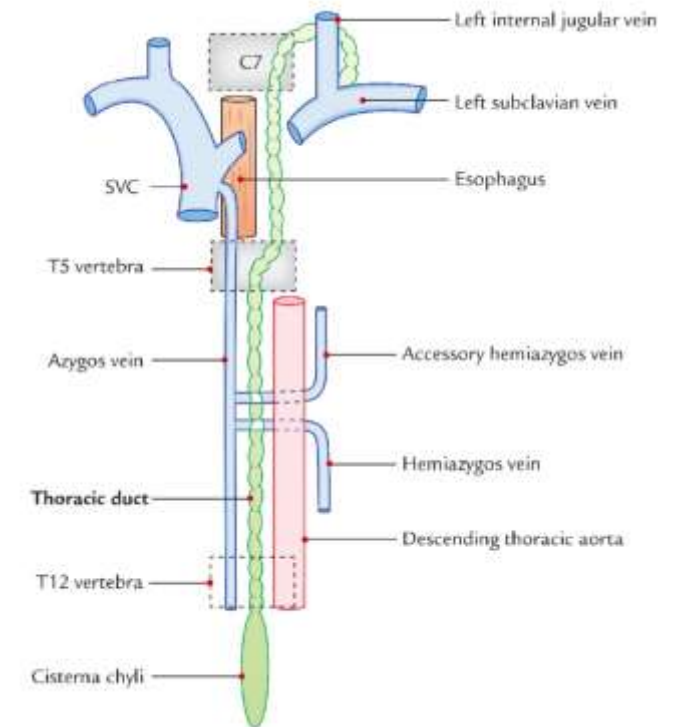
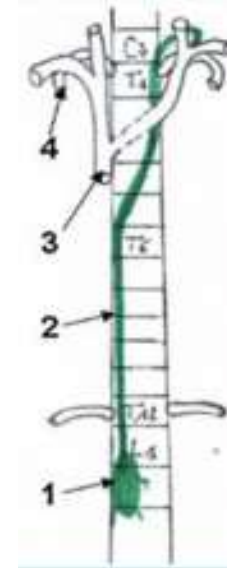
- ▶ Begins in the abdomen at the level of L₂ as a dilated sac called **Cysterna Chyli**
- ▶ **Cysterna Chyli** considered a plexiform convergence of lumbar trunks, one or more intestinal trunks, and two descending thoracic trunks
- ▶ Ascends vertically to enter the thorax through the **aortic hiatus** in the diaphragm at level T₁₂

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Thoracic Duct Cont.,

- ▶ Starts at the right side of the aorta and ascends in a helical fashion until it becomes at the left side of the esophagus at T₄
- ▶ Ascends, then turns left, and down to end at the beginning of Lt. brachiocephalic vein at **left venous angle**
- ▶ It drains most of the body



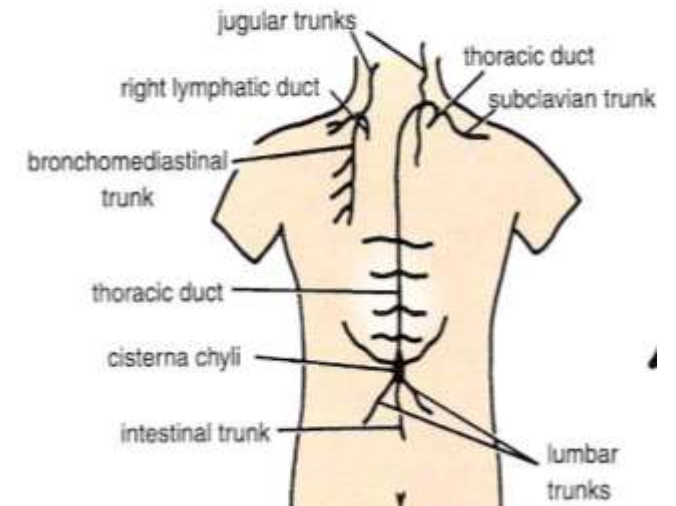
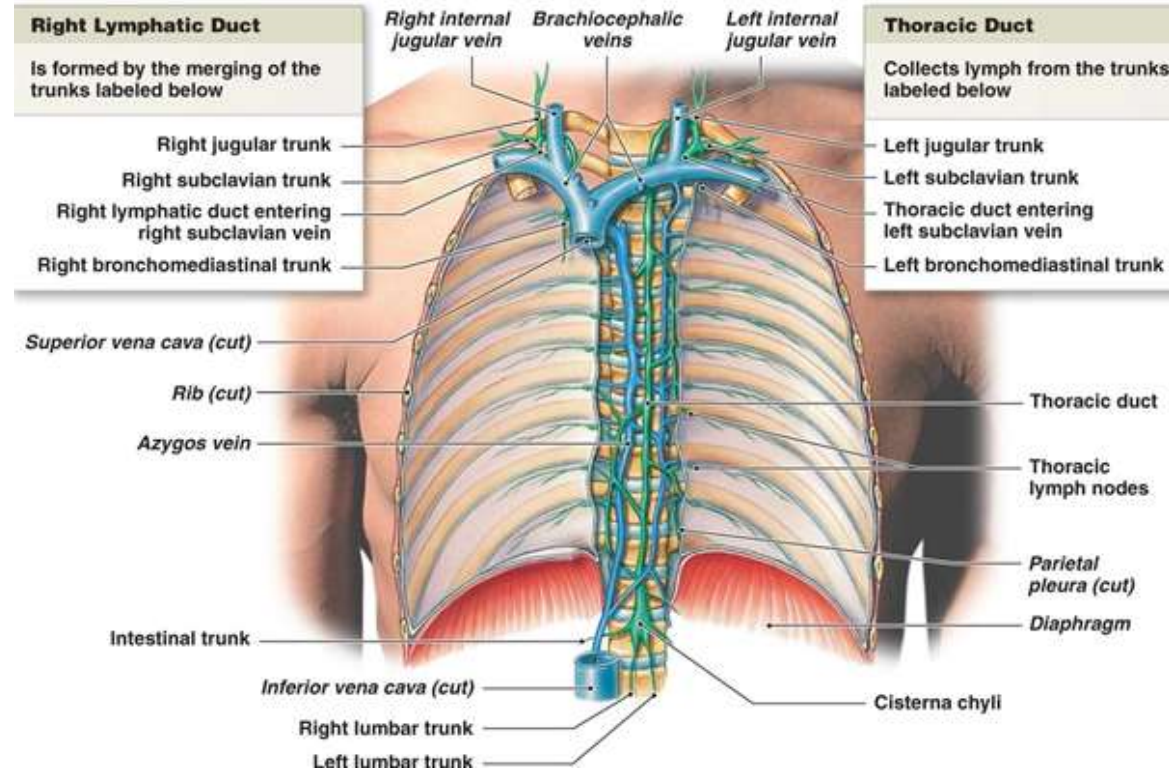
Right Lymphatic Duct

- ▶ It drains the Rt. Subclavian, Rt. Jugular, and Rt. Bronchomediastinal trunks
- ▶ Collects lymph from the Rt. Side of head and neck, Rt. Upper limb and Rt. Side of the chest
- ▶ It opens at the beginning of the right Brachiocephalic vein



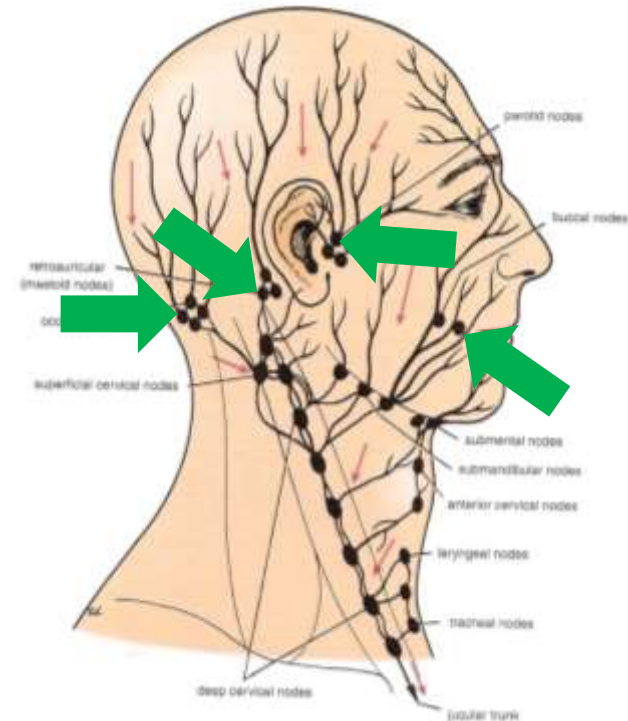
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The relationship between the right lymphatic and thoracic ducts and the venous system



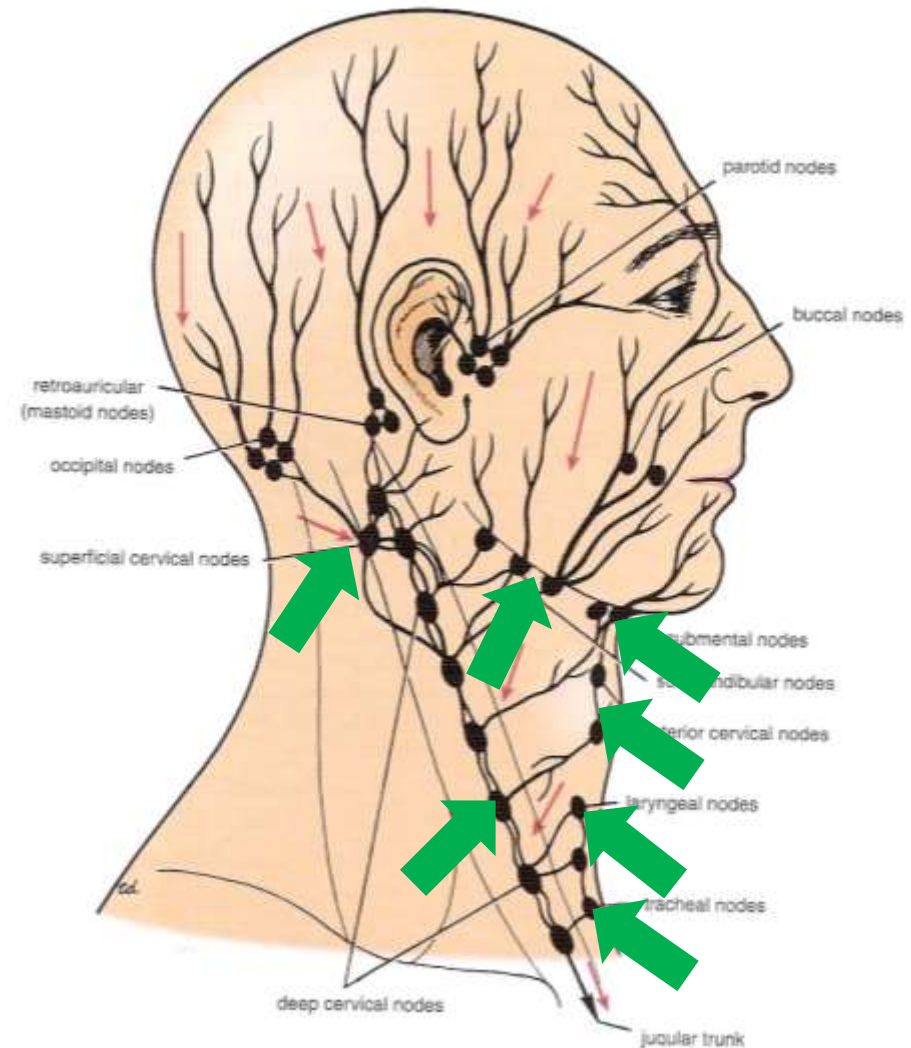
Lymph from Head and Neck

- ▶ Lymph is collected from entire head and neck and ends in either one of the jugular trunks
- ▶ Lymph is filtered in at least one lymph node in regional lymph nodes
- ▶ Regional lymph nodes include the following:
 1. Occipital
 2. Retroauricular
 3. Parotid
 4. Buccal



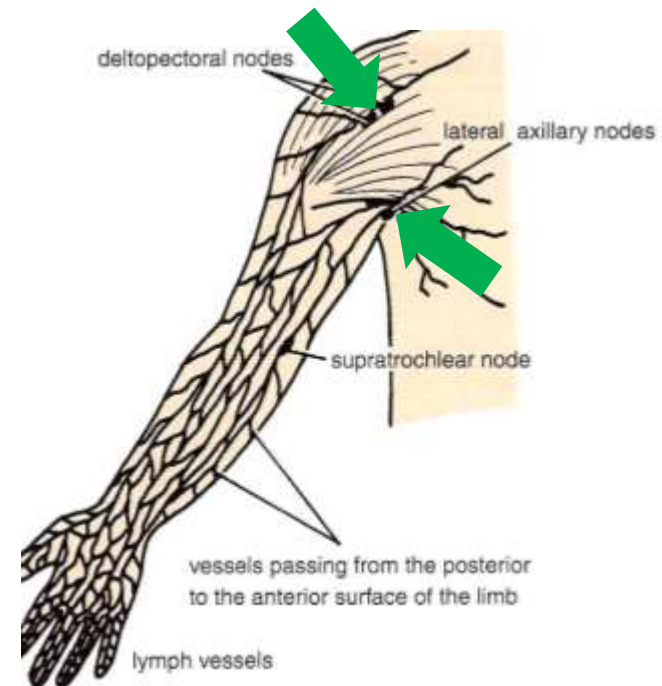
Cont.

5. Submandibular
6. Sumental
7. Anterior cervical
8. Superficial cervical
9. Retropharyngeal
10. Laryngeal
11. Tracheal
12. Deep cervical



Lymph from the Upper Limb

- ▶ Superficial lymph vessels accompany superficial veins
- ▶ They drain superficial structures
- ▶ Deep lymph vessels accompany deep veins
- ▶ They drain deep structures
- ▶ Both end in lymph nodes in axilla

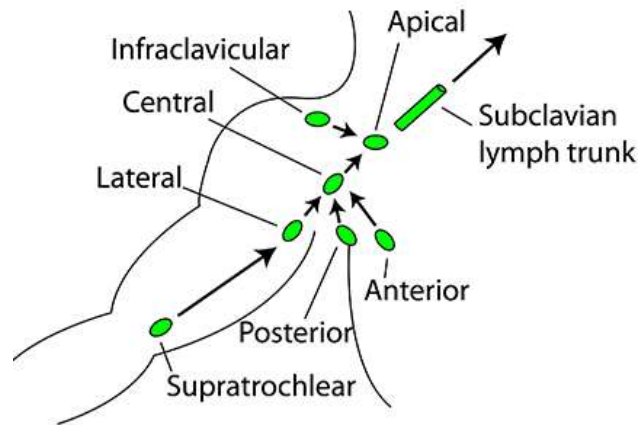


Axillary Lymph Nodes

- ▶ They drain upper limb, lateral part of the breast, and superficial lymph of thoracoabdominal wall above umbilicus

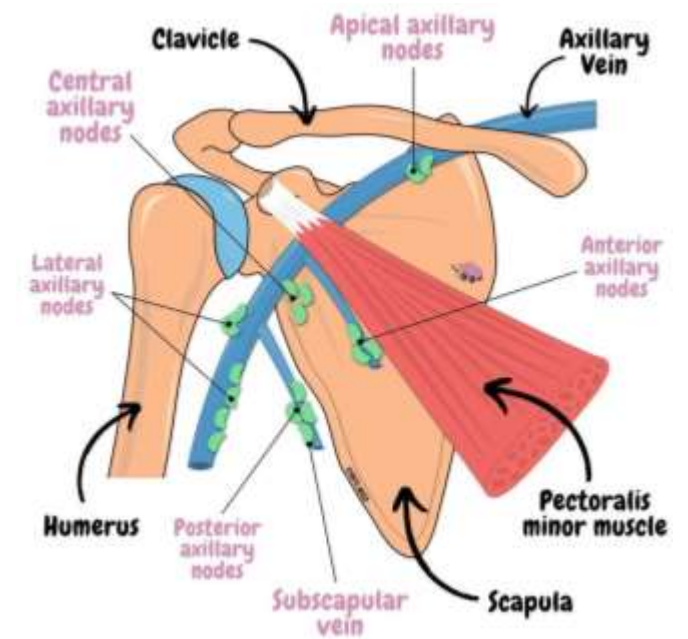
- ▶ They include:

1. Anterior (Pectoral)
2. Posterior (Subscapular)
3. Lateral (Humeral)
4. Central
5. Apical
6. Infraclavicular



Mnemonic for axillary lymph nodes: "APICAL"
A - Anterior
P - Posterior
I - Infraclavicular
C - Central
A - Apical
L - Lateral

75% of lymphatics from the breast drain to axillary nodes. Others to internal thoracic, abdominal nodes or to other breast

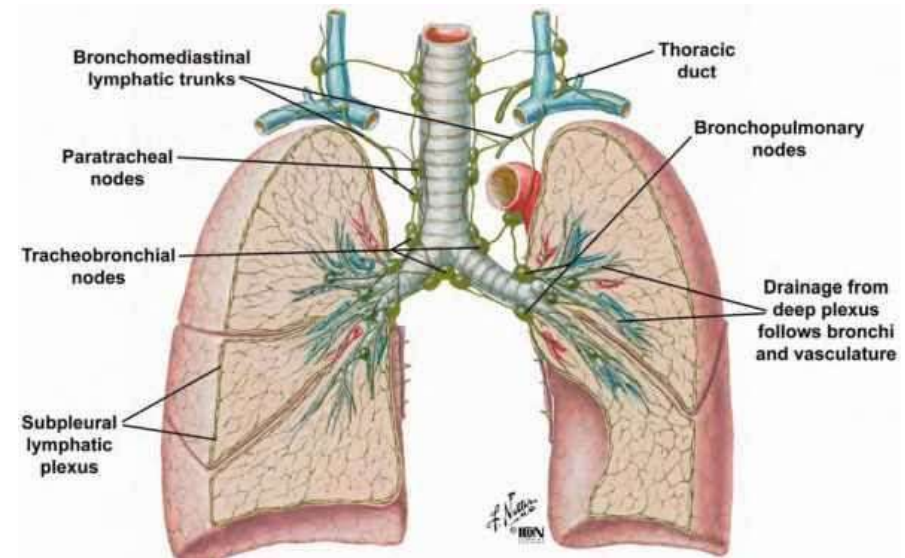


Lymphatics of the Lungs

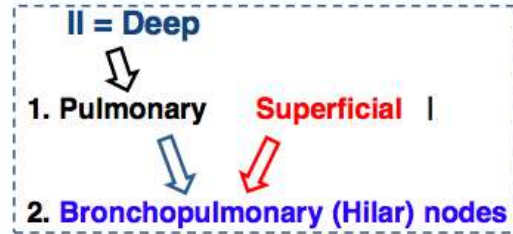
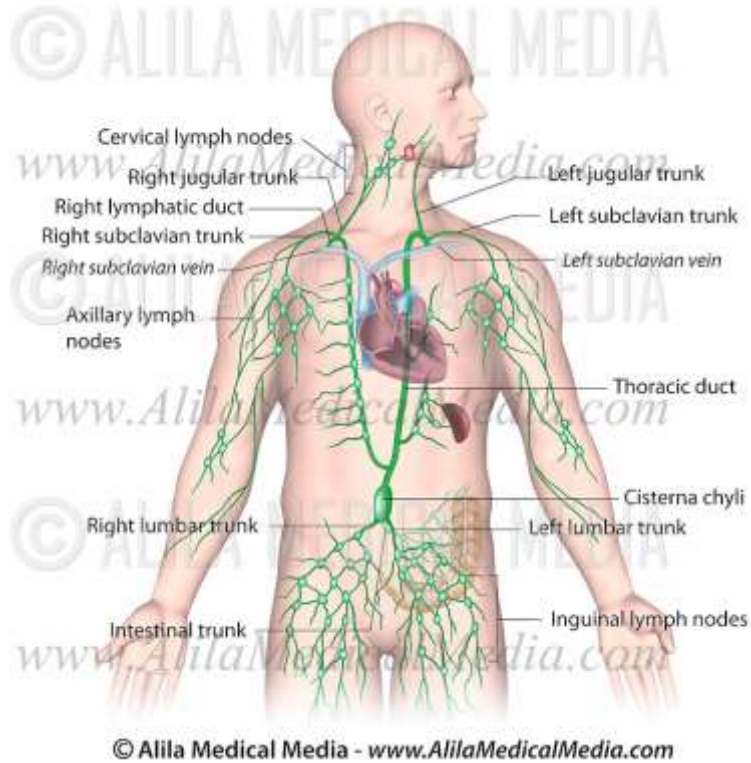
- ▶ **Superficial pulmonary plexus (subpleural):**
drains into Bronchopulmonary (Hilar) lymph nodes.

- ▶ **Deep pulmonary plexus:**
along the bronchial tree and pulmonary vessels.
Drain into pulmonary nodes,
then to Bronchopulmonary
(Hilar) nodes.

Then to tracheal bronchial (**Inferior or carinal**) and (**lateral or paratracheal**) to end in the Broncho-mediastinal trunk and then to **Right lymphatic duct** or **Thoracic Duct** on the left side



▶ Z



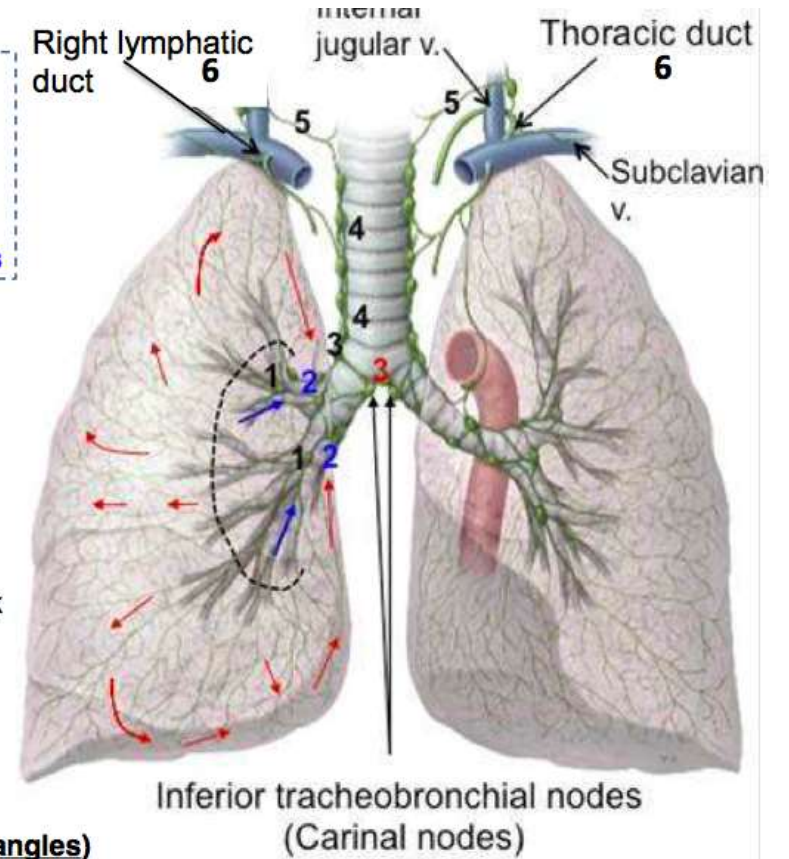
3. Tracheobronchial nodes
(Superior & Inferior → Carinal)

4. Paratracheal nodes

5. Bronchomediastinal lymph trunk

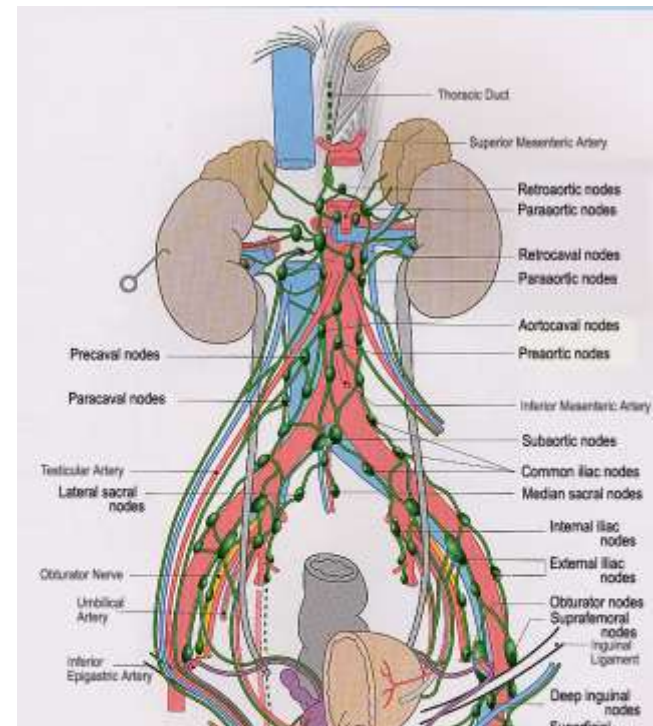
6. Left → Thoracic duct &
Right → Right lymphatic duct

7. Venous system (rt. & lt. Venous angles)



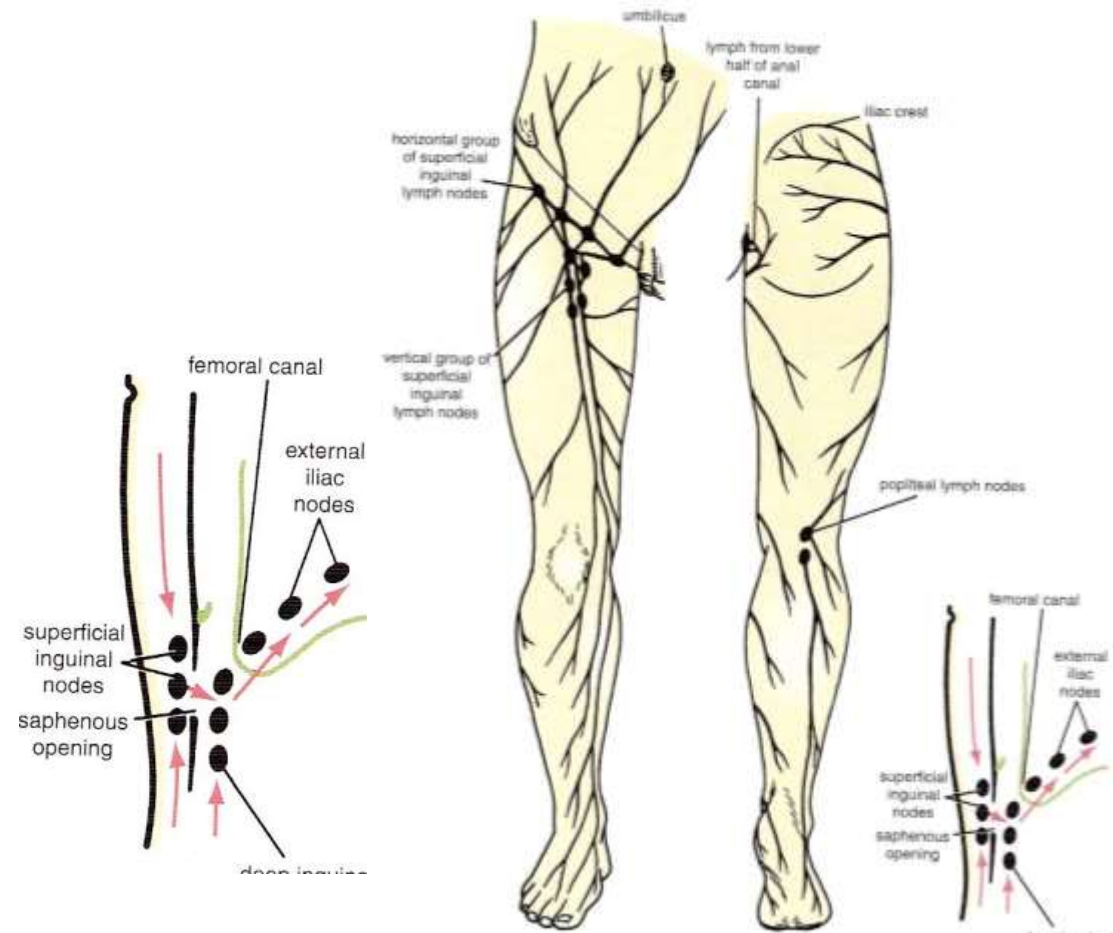
Lymphatics of Abdomen and Pelvis

- ▶ Most of the abdominal wall, all viscera drain into **Thoracic Duct**
- ▶ All parts of GIT, liver, spleen, and pancreas drain into **preaortic nodes**
- ▶ Their efferent form **Intestinal Trunk**
- ▶ Remaining parts drain into **paraaortic nodes**
- ▶ Their efferent forms **Rt. and Lt. Lumbar Trunks**



Lymphatics of Lower Limb

- ▶ Superficial lymph vessels accompany superficial veins
- ▶ Deep lymph vessels accompany deep veins
- ▶ All lymph vessels drain into **Deep Inguinal Lymph Nodes**



Lymphatics of Lower Limb Cont.

Superficial inguinal lymph nodes

- ▶ Lie in superficial fascia
- ▶ Horizontal group: drains anterior abdominal wall below umbilicus, perineum, external genitalia, lower anal canal
- ▶ Vertical group: drain superficial parts of L.L except posterior and lateral part of leg and lateral side of foot

Deep inguinal lymph nodes:

- ▶ in femoral canal and drain superficial inguinal and deep structures of L.L.

