

THE LYMPHATIC SYSTEM

It consists of

- Lymphatic Conducting channels
- Lymphoid Tissues
- Lymphoid Organs

Lymphoid Conducting Channels: They Consist of

1. The Lymphatic Capillaries
2. The Lymphatic Vessels
3. The Lymphatic Trunks: *Nine lymphatic Trunks*
 - Right and Left Jugular Trunk
 - Right and Left Subclavian Trunk
 - Right and left Bronchomediastinal Trunk
 - Right and Left lumbar trunk
 - Intestinal Trunk
4. The Lymphatic Ducts
 - The Thoracic Duct
 - The Right Lymphatic Duct

Lymphoid Tissues:

1. Diffuse lymphoid Tissues
2. Lymph Nodules

Lymphoid Organs:

1. Lymph nodes
2. Tonsils
3. Thymus
4. Spleen

Thoracic Duct

- Length from 30-40 cm
- Begins at upper end of Cisterna Chyli (T_{12})
- Relations:
 - Left: Aorta*
 - Right: Azygos Vein*
 - Back: Vertebral Column*
 - Front: Esophagus*
- Pass through Aortic Hiatus of Diaphragm
- Ends in Left Venous Angle (Junction of Left Subclavian and Internal Jugular Vein)

Cisterna Chyli

- Saccular dilatation in lymphatic route from abdomen and lower limbs
- Situated
 - Infront of (L_1)
 - Right of Abdominal Aorta

The Right Lymphatic Duct

- Opening into junction of Right Venous Angle
- Receives lymph from right side of head and neck, Right Subclavian trunk, Right side of thorax, right lung, right side of heart and right bronchomediastinal trunk

Lymph Nodes of Head

Lymph Nodes	Location	Lymph Collected	Draining into
Occipital Lymph Nodes	Deep to splenius capitis	Vessels from occipital region	Deep Lateral Cervical Lymph nodes
Mastoid Lymph Nodes	Superficial to attachment of Sternocleidomastoid	Lymph from Parietal Region	Deep Lateral Cervical Lymph nodes
		Temporal region	
		Retroauricular region	
Parotid Lymph Nodes	Superficial to parotid gland	Vessels from forehead	Deep Lateral Cervical Lymph nodes
		Temporal region	
		Lateral auricular aspect	
		External acoustic meatus	
Submandibular Lymph nodes	Beneath deep cervical fascia in submandibular triangle	Vessels from facial region	Deep Lateral Cervical Lymph nodes
		Organs of oral cavity	
Submental Lymph nodes	Between anterior bellies of two digastrics muscles	Central part of lower lip	Deep Lateral Cervical Lymph nodes
		Chin and tip of tongue	

Lymph Nodes of Neck

Lymph Nodes	Location	Lymph Collected	Draining into
<u>Anterior Cervical Lymph Nodes</u>			
Superficial anterior cervical lymph nodes	Along anterior jugular vein	Superficial structures of anterior jugular vein	Deep Lateral Cervical Lymph nodes
Deep anterior Cervical Lymph Nodes	They include, prelaryngeal, thyroid, pretracheal, paratracheal lymphnodes	Lymph from larynx	Deep Lateral Cervical Lymph nodes
		thyroid gland	
		cervical part of trachea	
		esophagus	
<u>Lateral Cervical Lymph Nodes</u>			
Superficial lateral cervical lymph nodes	Along external jugular vein	Superficial structures of lateral region of neck	Deep Lateral Cervical Lymph nodes
Deep lateral Cervical Lymph Nodes	Lie along Internal Jugular Vein, Some lie along accessory Nerve and transverse cervical blood vessels. Divided into Superficial and deep		
1. <i>Superior Deep lateral Cervical Lymph Nodes</i>	along Internal Jugular Vein, Retropharyngeal Nodes		
2. <i>Inferior Deep lateral Cervical Lymph Nodes</i>	along lower part of Internal Jugular Vein Supraclavicular lymph nodes, that is Virchows Nodes for cancer of stomach or esophagus		

Lymphatic Drainage of Upper Limb

Lymph Nodes	Location	Lymph Collected	Draining into
Cubital Lymph Nodes	Superficial to deep fascia, near blood vessels of cubital fossa	Ulnar half of hand and forearm	Pass to axillary lymph nodes
Infraclavicular Lymph Nodes	Appear beside Cephalic Vein, Inferior to clavicle	Lymph Vessels along Cephalic Vein	Drain to axillary lymph nodes
Axillary Lymph Nodes	<u>Divided into five groups</u>		
1. <i>Anterior Group (Pectoral Lymph Nodes)</i>	Lies along lower border of pectoralis minor	Rain skin and muscles of anterolateral body wall above umbilicus and centrolateral part of	Apical Axillary Nodes

		mammary glands	
2. <i>Lateral Lymph Nodes</i>	Along Axillary Vein	Drain whole limb except those accompanying the cephalic vein	Central, apical and supraclavicular lymph nodes
3. <i>Posterior Group, (Subscapular lymph nodes)</i>	Lower margin of posterior wall of axilla	Skin and muscles of lower part of back of neck and dorsal aspect of trunk	Central and apical lymph nodes
4. <i>Central lymph Nodes</i>	Fat near base of axilla	Three preceding groups of axillary lymph nodes	Apical lymph nodes
5. <i>Apical lymph nodes</i>	Apex along medial side of axillary vein	Central group and upper peripheral region of mammary glands	Subclavian trunk

Lymph Drainage of Thorax

Lymph Nodes	Location	Lymph Collected	Draining into
<i>Lymph Nodes of Thoracic Wall</i>			
Parasternal lymph nodes	Anterior end of intercostals space	Deeper parts of anterior region of thoracic wall and from medial part of mammary gland	Forming bronchomediastinal trunk
Intercostal Lymph Nodes	Posterior parts of Intercostal spaces	Receive deep lymphatic vessels from posterolateral aspect of chest	Thoracic duct
Superior phrenic lymph nodes	On thoracic surface of diaphragm and there are three groups, anterior, middle and posterior	Drain diaphragm, parietal pleura, pericardium, and convex hepatic fissure	Parasternal, anterior and posterior mediastinal lymph nodes
<i>Lymph Nodes of Thoracic Contents</i>			
Anterior mediastinal lymph nodes	Anterior part of superior mediastinum and anterior mediastinum	Thymus, thyroid, heart and pericardium	Efferents unite with tracheobronchial lymph nodes to form right and left bronchomediastinal trunk
Posterior mediastinal lymph nodes	Posterior mediastinum	Esophagus, pericardium, and diaphragm	End in Thoracic duct
Lymph nodes of trachea, bronchi and lungs	They include four groups		
1. <i>Pulmonary Lymph Nodes</i>	Angle between lobar and segmental bronchi		Tracheobronchial lymph nodes
2. <i>Bronchopulmonary Lymph Nodes</i>	Hilus of each lung		Tracheobronchial lymph nodes
3. <i>Tracheobronchial lymph Nodes</i>	Superior Group and Inferior Group		Paratracheal lymph Nodes
4. <i>Paratracheal lymph Nodes</i>	Sides of trachea		Efferents unite with anterior mediastinal lymph nodes to form right and left bronchomediastinal trunk

Lymph Drainage of Abdomen

Lymph Nodes	Location	Lymph Collected	Draining into
<i>Lymph Nodes of Abdominal Wall</i>			
<u>Anterior Abdominal Wall</u>			
Superficial lymphatic vessels	Above Umblicus		Axillary Lymph Nodes
	Below Umblicus		Superficial Inguinal Lymph Nodes
Deep Lymphatic Vessels	Upper part		Parasternal lymph nodes
	Lower part		External Iliac lymph Nodes
<u>Posterior Wall</u>			
Deep lymphatic Vessels	Along lumbar arteries		Lumbar lymph nodes
Lumbar Lymph Nodes	Along abdominal aorta and IVC	Posterior abdominal wall, Abdominal paired Viscera, Common Iliac Nodes	Right and left lumbar trunks
<i>Lymph Nodes of Abdominal Viscera</i>			
<u>Paired Viscera</u>			
Lymph vessels	Paired Viscera		Lumbar Lymph Nodes
<u>Unpaired Viscera</u>			
Celiac Lymph nodes	Front of abdominal aorta close to origin of celiac artery	The right and left gastric lymph Nodes	Unite with Superior Mesenteric and Inferior Mesenteric Lymph nodes to form Intestinal trunk, They drain into Cisterna Chyli
		The right and left gastroepiploic lymph nodes	
		Pyloric lymph nodes	
		Hepatic lymph nodes	
		Pancreaticosplenic lymph nodes	
Superior Mesenteric Lymph Nodes	Close to origin of superior mesenteric artery	Lymph nodes of mesentery	Unite with Celiac lymph nodes and Inferior Mesenteric Lymph nodes to form Intestinal trunk, They drain into Cisterna Chyli
		Iliocolic lymph nodes	
		Right colic lymph nodes	
		Middle colic lymph nodes	
Inferior Mesenteric Lymph Nodes	Close to origin of inferior mesenteric artery	Left colic lymph nodes	Unite with Celiac lymph nodes and Superior Mesenteric Lymph nodes to form Intestinal trunk, They drain into Cisterna Chyli
		Sigmoid Colic lymph nodes	
		Superior rectal lymph nodes	

Lymph Drainage of Pelvis

Lymph Nodes	Location	Lymph Collected	Draining into
Lymphatic Vessels of Pelvic Wall	Follow Internal Iliac artery		Iliac or lumbar lymph nodes
Lymphatic Vessels of Pelvic Viscera			Internal Iliac lymph nodes
Sacral lymph nodes	Along median and lateral sacral vessels	Posterior wall of pelvis, rectum, prostate, urethra	Common Iliac lymph nodes
Internal iliac lymph nodes	Surround internal iliac vessels and its branches	Pelvic wall, Viscera, deep part of perineum, gluteal, posterior femoral muscles	Common Iliac lymph nodes

External Iliac lymph nodes	Along external iliac vessels	Inguinal lymph nodes and a part of pelvic viscera	Common Iliac lymph nodes
Common Iliac lymph nodes	Along common iliac blood vessels	External and Internal Iliac lymph nodes	Lumbar lymph nodes

Lymph Drainage of Lower Limbs

Lymph Nodes	Location	Lymph Collected	Draining into
Superficial Lymphatic Vessels	Follow great Saphenous Vein		Superficial inguinal lymph nodes
	Some follow Small Saphenous vein		Popliteal lymph nodes
Deep Lymphatic Vessels	Lymph vessels of foot and leg		Popliteal lymph nodes
	Lymph vessels from thigh		Deep Inguinal lymph nodes
<i>Inguinal Lymph Nodes</i>			
Superficial Inguinal Lymph Nodes	<i>Upper group:</i> Immediately below inguinal ligament	Lymphatic vessels from lower part of abdominal wall	Deep Inguinal Lymph Nodes and External Iliac Lymph nodes
		External Genitalia	
		Gluteal region	
		Perineum	
	<i>Lower Group:</i>	Superficial lymphatic vessels of lower limb except lateral side of calf	
Deep Inguinal Lymph Nodes	Medial to femoral vein and femoral canal	Lymph from deep structures of lower limb and perineum	External Iliac lymph nodes
		Superficial Inguinal lymph nodes	
		Popliteal lymph nodes	