

2026-27

D.PHARM 1ST YEAR

**HUMAN ANATOMY &
PHYSIOLOGY**

CHAPTER 7

PART- 2

**LYMPHATIC
SYSTEM**



□ Lymph Nodes

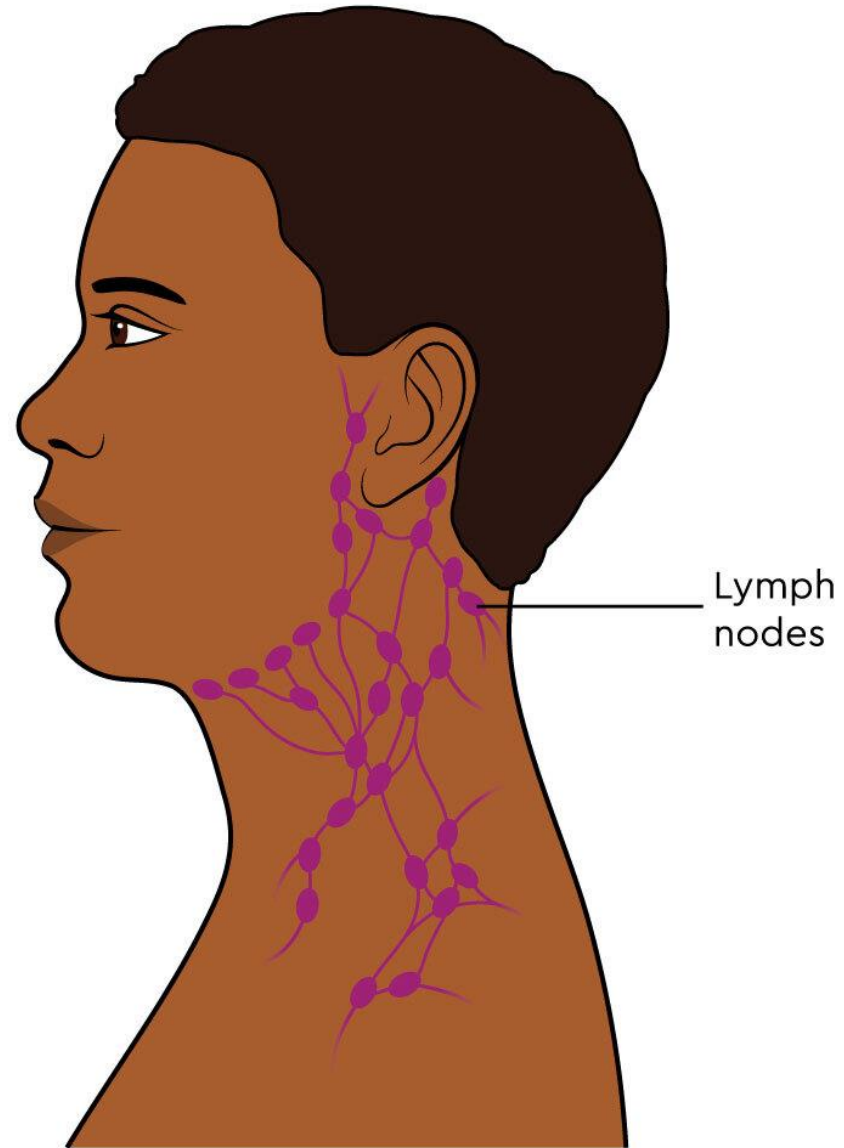
- The lymph nodes are **bean-shaped tissues** found along the lines of lymphatic vessels.
- They act as filters that trap the germs that lead to activation of antibodies in the blood.
- There are around **800** lymph nodes found in our body, out of which **300** are found in the **head** and **neck** region.
- Lymph nodes are also found in the **underarm** and **abdominal** areas.

Structure of lymph nodes

- ❖ **Capsule** – Outer connective tissue covering.
- ❖ **Cortex** – Contains mainly **B lymphocytes** and lymphoid follicles.
- ❖ **Paracortex** – Mainly contains **T lymphocytes**.
- ❖ **Medulla** – Contains medullary cords and sinuses with lymphocytes and macrophages.
- ❖ **Afferent lymphatic vessels** – Bring lymph **into** the node.
- ❖ **Efferent lymphatic vessel** – Carries filtered lymph **out** through the hilum.

Main functions

- ❑ **Filter lymph** – Remove bacteria, viruses, foreign particles, and damaged cells.
- ❑ **Immune response** – Contain **lymphocytes (B cells and T cells)** that recognize and destroy pathogens.
- ❑ **Antibody production** – B lymphocytes can produce antibodies against infections.
- ❑ **Macrophage activity** – Macrophages engulf and destroy microorganisms and cellular debris.
- ❑ **Lymphocyte proliferation** – Lymphocytes multiply when an immune response is required.



□ Mucosal Membranes

- The mucosal associated lymphoid tissue (MALT) is a small concentration of lymphoid tissue found in submucosal membranes such as:
 - ❖ **thyroid, breast, nasopharynx, salivary glands, gastrointestinal tract, eyes and skin.**
- They contain **B** cells, **T** cells and **macrophages** that encounter germs or pathogens that enter the mucosal epithelium.

Tertiary Lymphoid Organs

- Tertiary Lymphoid Organs (TLOs) are found at the site of **chronic inflammations, graft rejections, or some cancers.**
- They are not as densely populated with lymphocytes as primary and secondary lymphoid organs, but they **elicit immune responses** when **inflammatory conditions arise.**

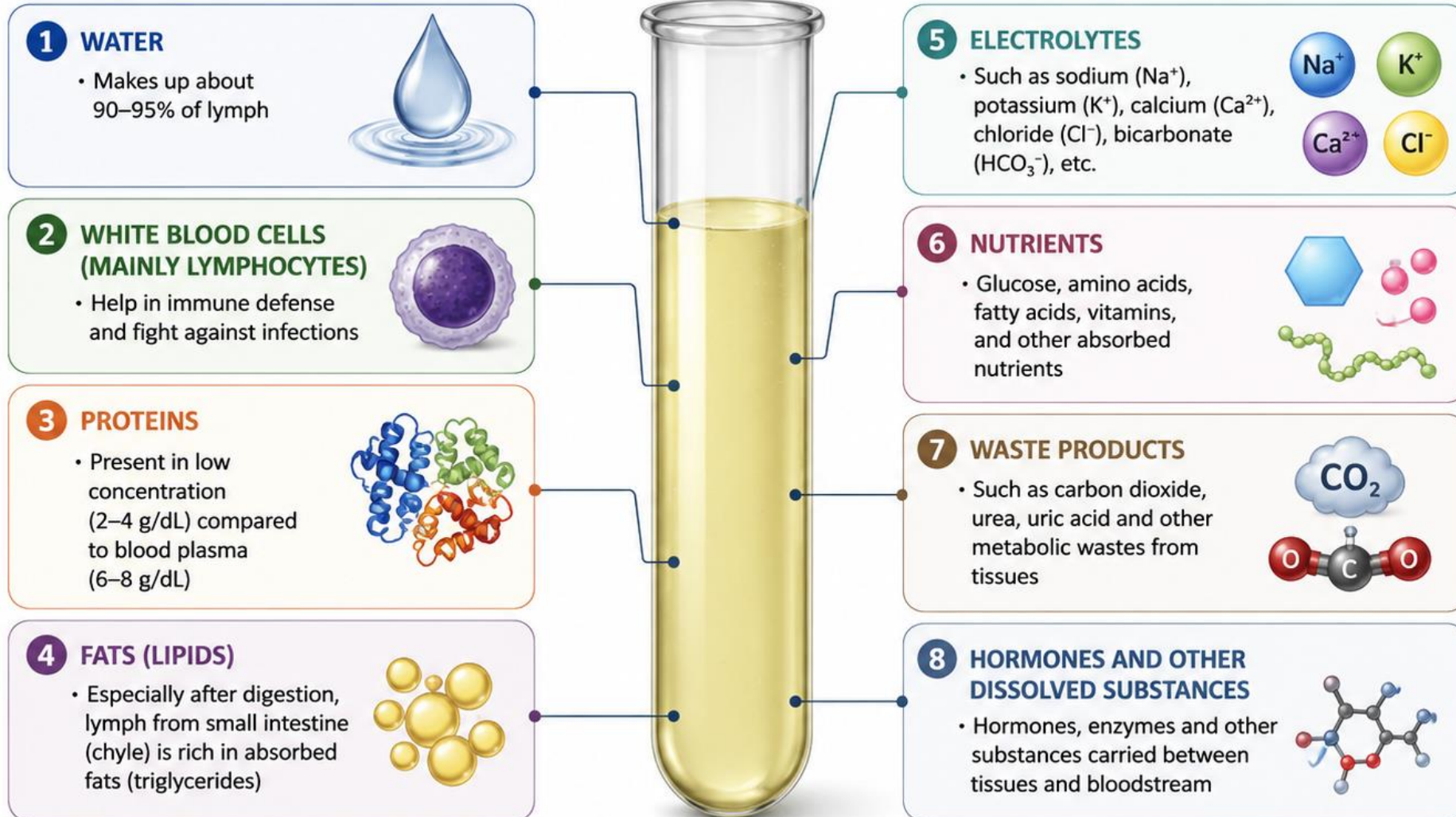
Lymph



- It is a **colourless** fluid that circulates throughout the lymphatic system.
- The main role of the lymphatic system is to act as a **filter against microbes, organic wastes, toxins and other debris.**
- It carries **lymphocytes** throughout the body that fight against infections.

COMPOSITION OF LYMPH

Lymph is a clear to pale yellow fluid that circulates in lymphatic vessels.



Lymphatic Ducts

Feature	Right Lymphatic Duct	Thoracic Duct
Length	Short, about 1–2 cm	Long, about 38–45 cm
Drains	Right upper quadrant of body	Rest of the body
Areas drained	Right side of head & neck, right upper limb, right side of thorax	Both lower limbs, abdomen, left upper limb, left side of head & neck, left side of thorax
Percentage of body	About 25%	About 75%
Begins from	Right jugular, right subclavian and right bronchomediastinal trunks	Cisterna chyli

Opens into	Junction of right internal jugular and right subclavian veins	Junction of left internal jugular and left subclavian veins
Lymph carried	Mainly lymph from right upper body	Lymph from most of the body
Special feature	Smaller duct	Largest lymphatic duct

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