Dr. Hanaa Mohammed

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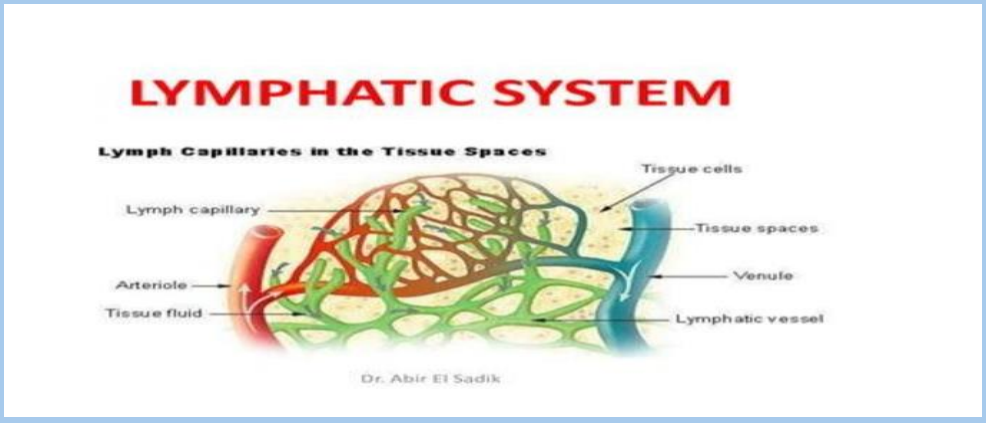
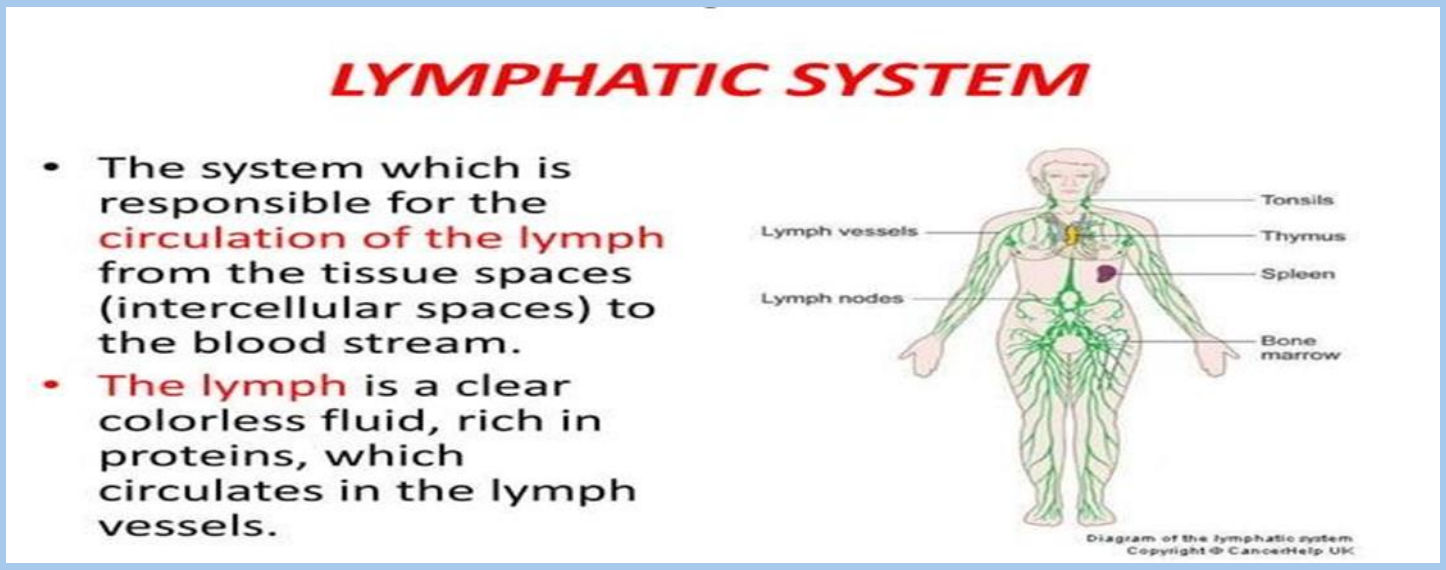




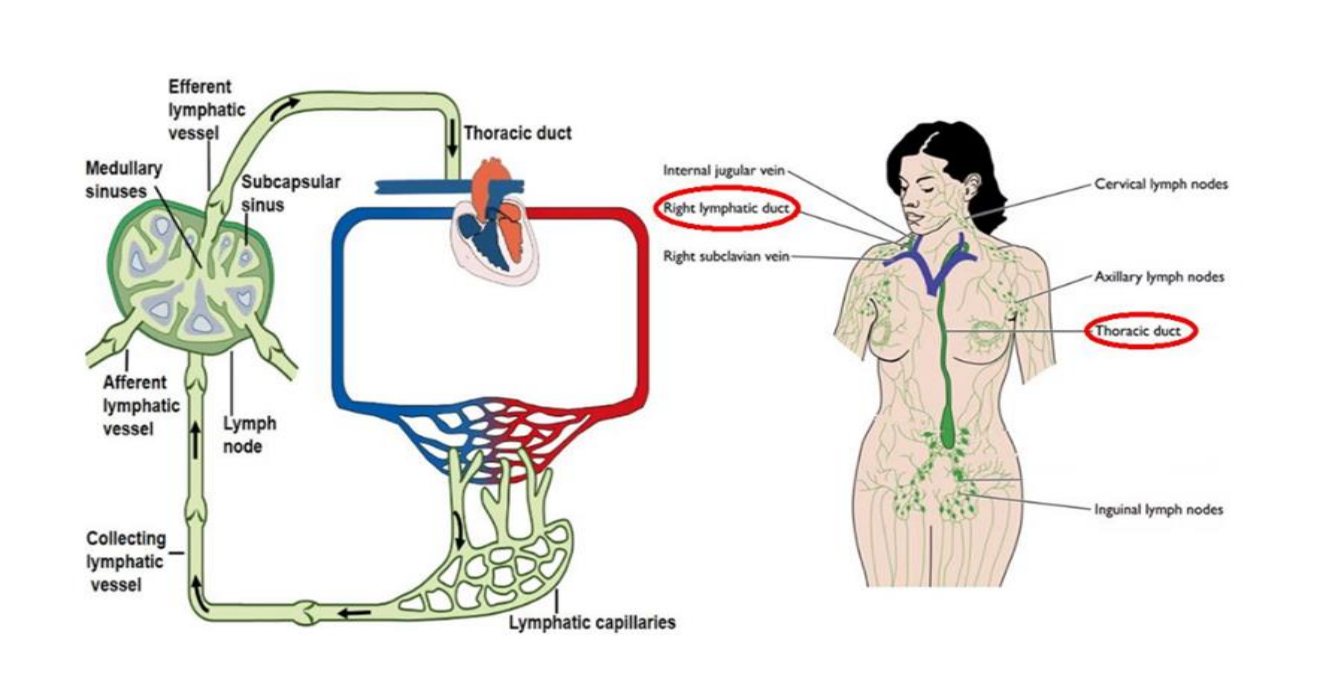
The lymphatic system is composed of:

1. Lymph.

2. Lymphatic vessels.

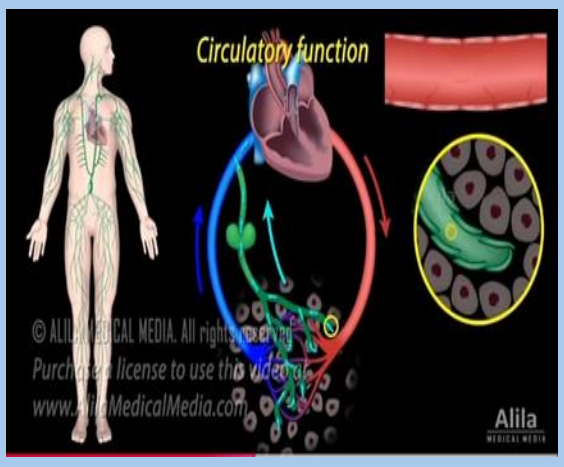
3. Lymphoid tissues.

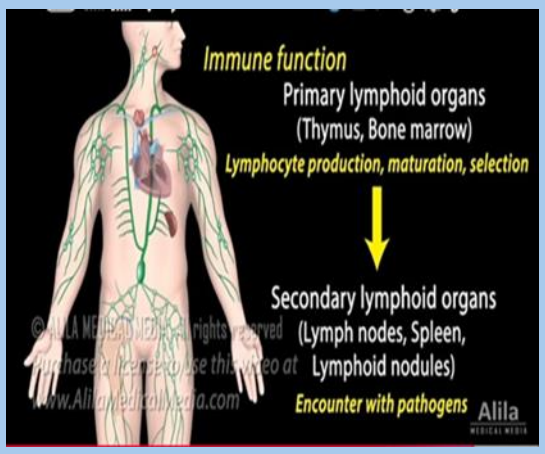
4. Lymphoid organs.



I. Lymph

- **It is a clear fluid that escapes from capillaries by filtration into tissue spaces**
- **It returns back to blood stream via lymphatic vessels.**





II. Lymphatic Vessels

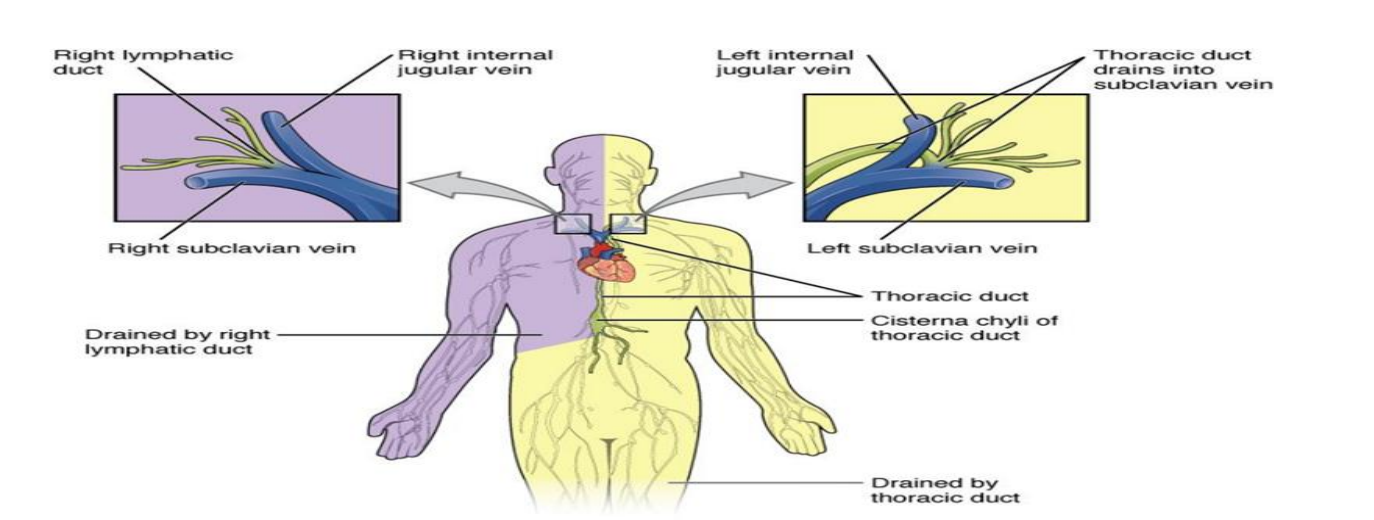
- They begin as blind-end capillaries which unite to form lymphatic vessels.
- They have multiple valves to allow passage of lymph in one direction.
- The lymphatic vessels are connected to form two large lymphatic ducts;

1-Right lymphatic duct: drains lymph from:

- Right side of head & neck.
- Right upper limb.
- Right side of thorax.

2. Thoracic duct: drains lymph from the rest of the body.

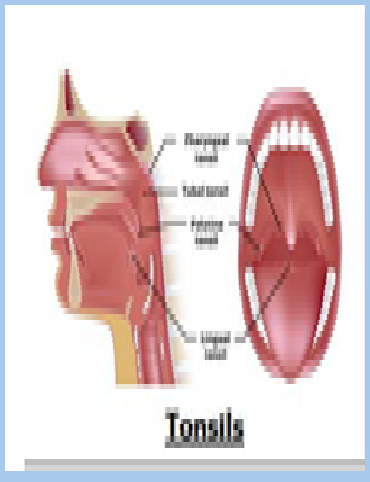
- The ducts terminate at the junction of the internal jugular and subclavian veins.
- Lymphatic vessels are absent in some tissues as: central nervous system, bone marrow, teeth and avascular tissues (as cartilage).



Lymphoid Tissues

- They are tissues that contain aggregations of lymphocytes.
- They include; mucosal associated lymphoid tissue & tonsils.

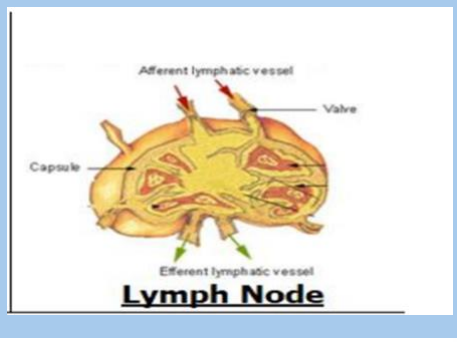
A. Mucosal associated lymphoid tissue (MALT): in the wall of tubular organs.
B. Tonsils: they are non-encapsulated aggregations of lymphoid tissue located within the pharynx (pharyngeal, tubal, palatine and lingual tonsils).



Lymphoid Organs

- They are encapsulated aggregations of lymphocytes.
- They include the lymph nodes, spleen and thymus gland.

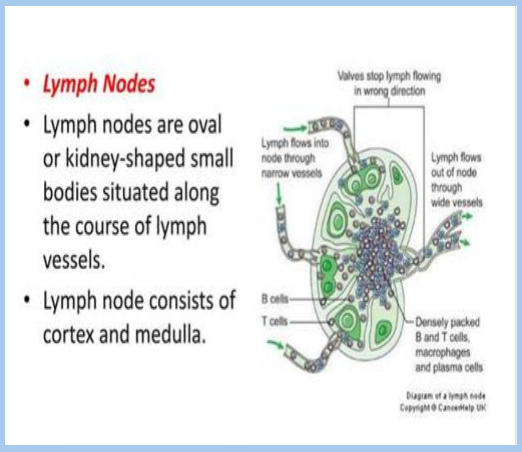
Lymph nodes:

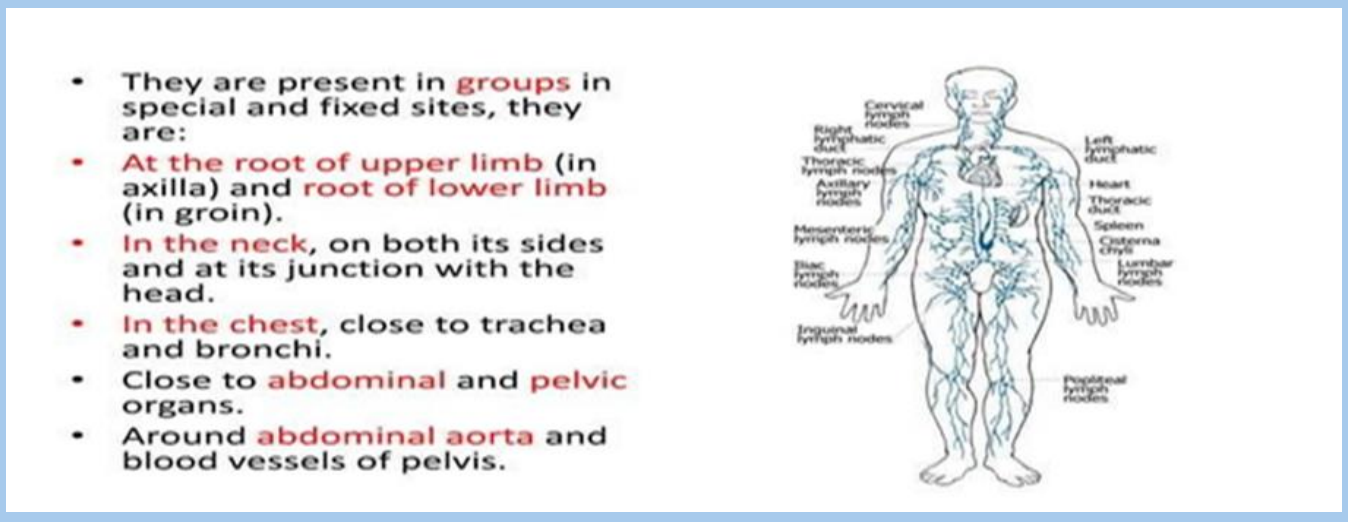


- They are small kidney-shaped lymphoid organs situated along the course of lymph vessels.
- They are present in groups in the different body regions (cervical, axillary, inguinal, etc. .....).
- The lymph enters the lymph node through afferent vessels and leaves it through efferent vessels.

Function: filtration of lymph and also contain lymphocytes which are important in the immune process.

- They become enlarged when infected by microorganisms and when infiltrated by malignant cells.





Spleen:

It is a lymphoid organ located in the upper left part of the abdomen.

Functions:

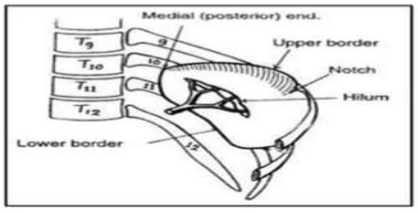
1. Destroy old RBCs.

2. Blood reservoir.

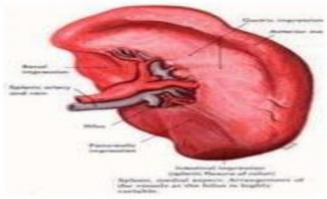
3. Part of immune system.

Spleen

- **Position**: It lies in the upper left part of the abdominal cavity, deep to the 9th, 10th and 11th ribs.

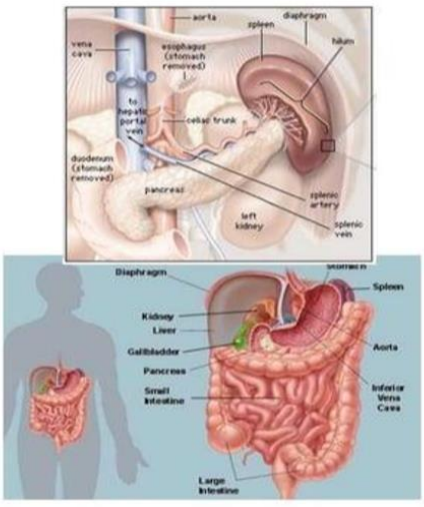


- **Shape**: Wedge-shaped, it has:
- **Two ends**:
  - ***Medial*** (narrow end).
  - ***Lateral*** (broad end).
- **Two borders**:
- ***Upper border:*** sharp and notched.
- ***Lower border:*** smooth and rounded.



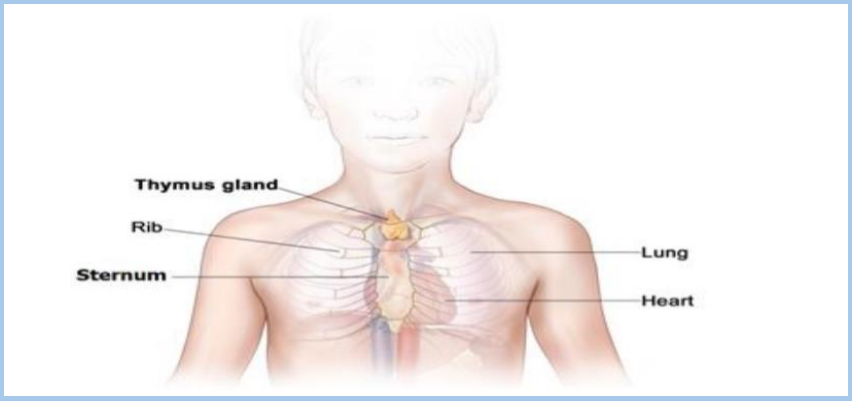
- **Two surfaces:**
- *Diaphragmatic:* convex surface related to diaphragm.
- *Visceral*

  Related to 4 viscera:
- a- Stomach.
- b- Left colic flexure.
- c- Tail of pancreas.
- d- Left kidney.



Thymus Gland:

- It is a lymphoid organ located in the thoracic cavity behind the sternum.
- It increases in size during childhood reaching maximum size at puberty then begins to decrease in size and activity (Involution).
- Function: T lymphocyte maturation.



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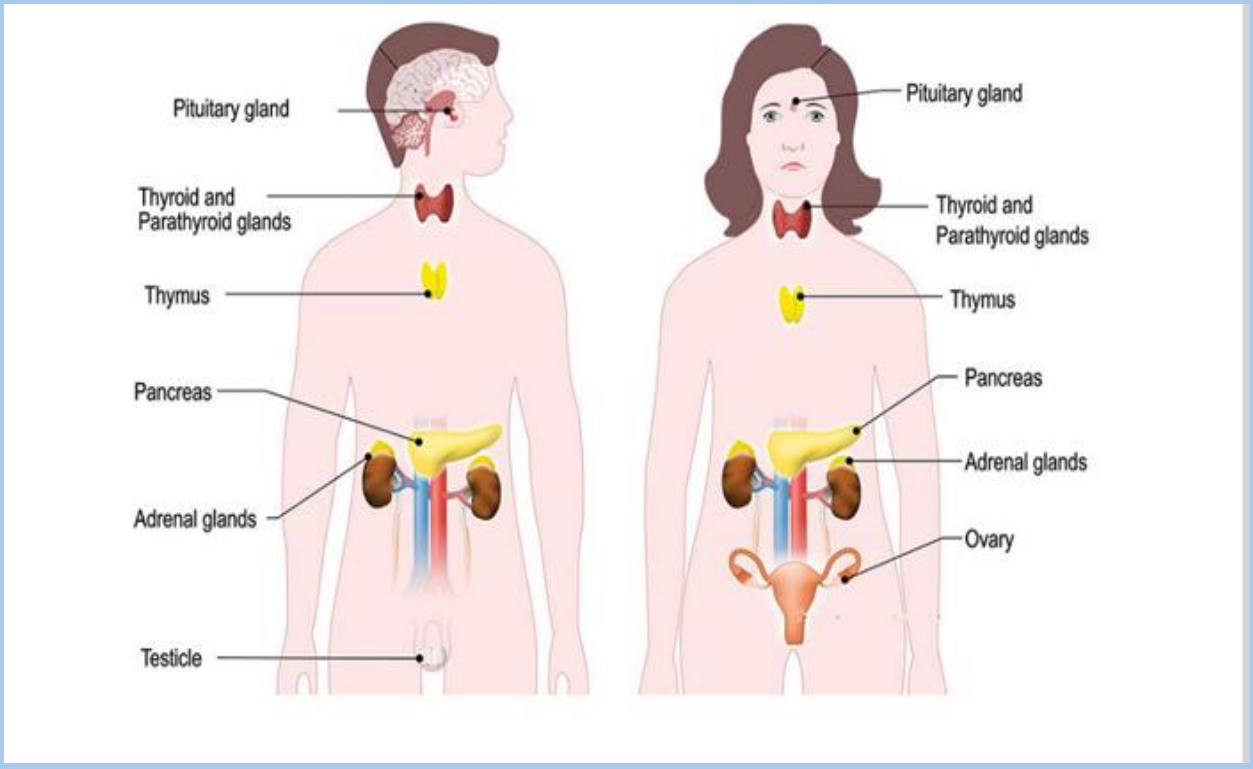
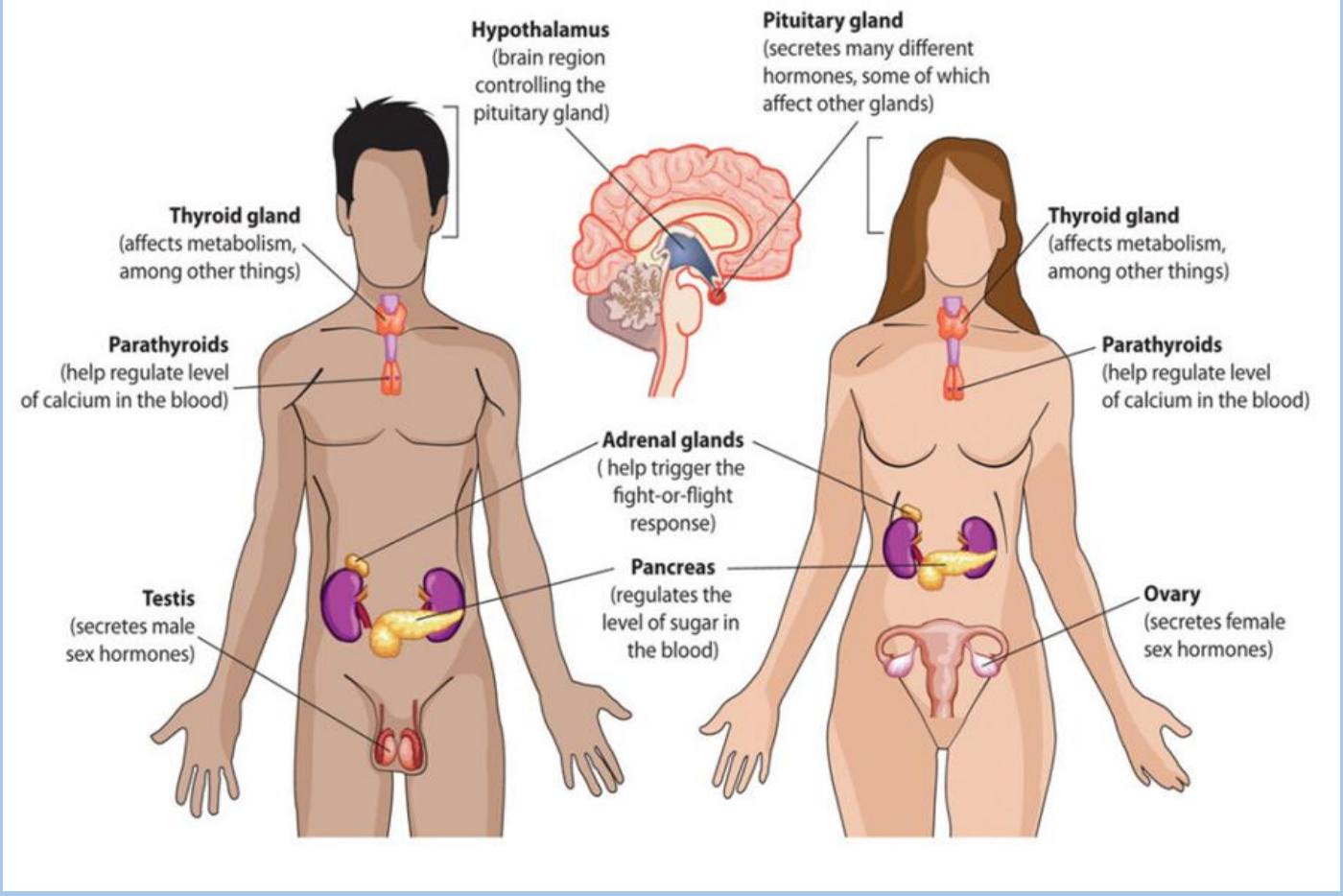
ENDOCRINE SYSTEM



ENDOCRINE SYSTEM

It is the system that includes all ductless glands in the body.

It is classified as a system from the functional point of view and mostly there is no direct anatomical relation between its components. It includes the following glands:



1. Pituitary gland (Hypophysis cerebri)

- It is also known as the master gland.
- It lies at the base of the brain in a depression called sella turcica.
- It is connected to the hypothalamus by the pituitary stalk (infundibulum) that contains nerve fibers & blood vessels.
- It is divided into two lobes; anterior & posterior.

- ***Anterior lobe (adenohypophysis):***

- Has no important neural connection with the hypothalamus.

- Secretes the following hormones:

Growth hormone (GH).

2. Prolactin.

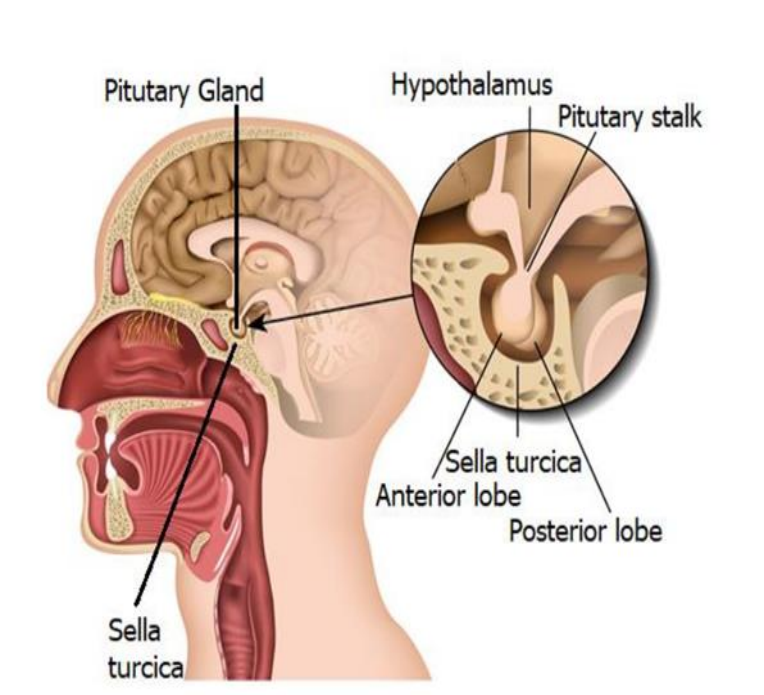
3. Lutinizind hormone (LH).

4. Follicle stimulating hormone (FSH).

5. Thyroid-stimulating hormone (TSH).

6. Adreno-cortico-tropin (ACTH).

7. Melanocyte stimulating hormone (MSH).



- ***Posterior lobe (neurohypophysis):***

- Has a rich neural connection to the hypothalamus.

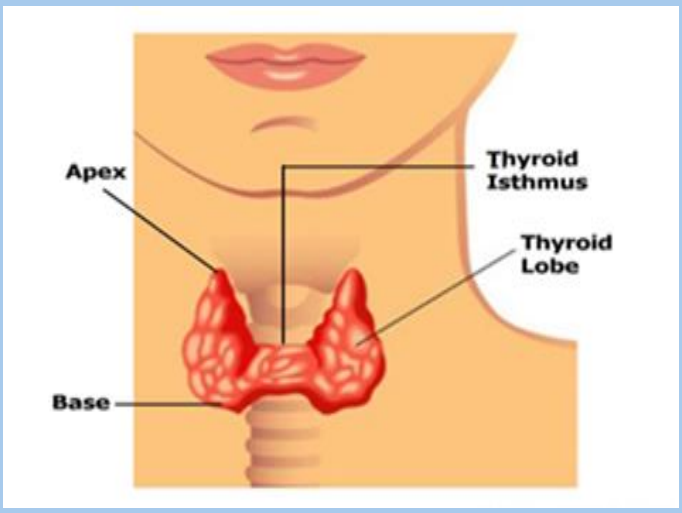
- Secretes the following hormones:

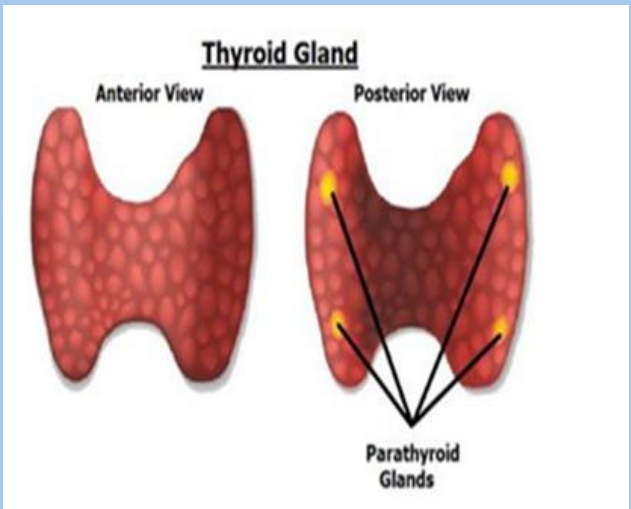
1. Oxytocin.

2. Vasopressin (anti-diuretic hormone [ADH])

2-Thyroid gland

- It lies in the lower part of the front of the neck.





 It consists of two lobes, right and left,

connected by isthmus.

 Each lobe is conical in shape having

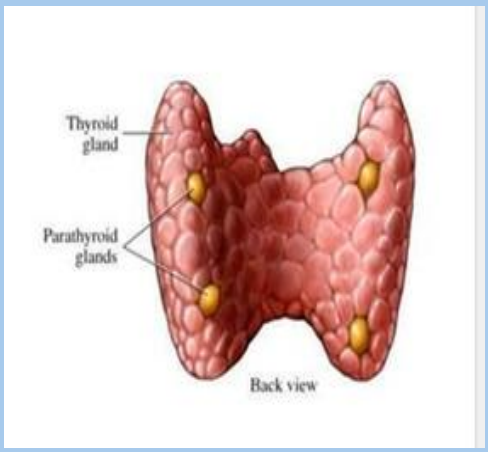
apex, base and 3 surfaces; medial, lateral

and posterior surfaces

 It secrets three hormones: Thyroxine (T4), triiodothyronine (T3) and

calcitonine (by the parafollicular cells).

3. Parathyroid glands



 Four small rounded pea-shaped glands.

 They are embedded in the posterior surface of the thyroid gland.

They secret the parathyroid hormone (PTH).

4. Thymus gland

 It is located in the thoracic cavity behind the sternum (in front of the heart &

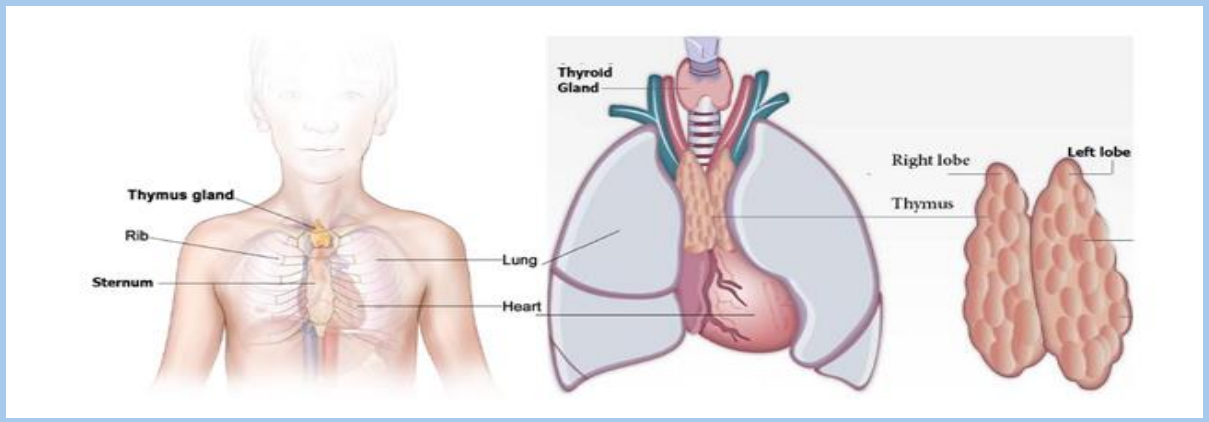
pericardium).

 It consists of two lobes, right and left, connected by connective tissue.

 Its activity increases in size during childhood reaching maximum size at

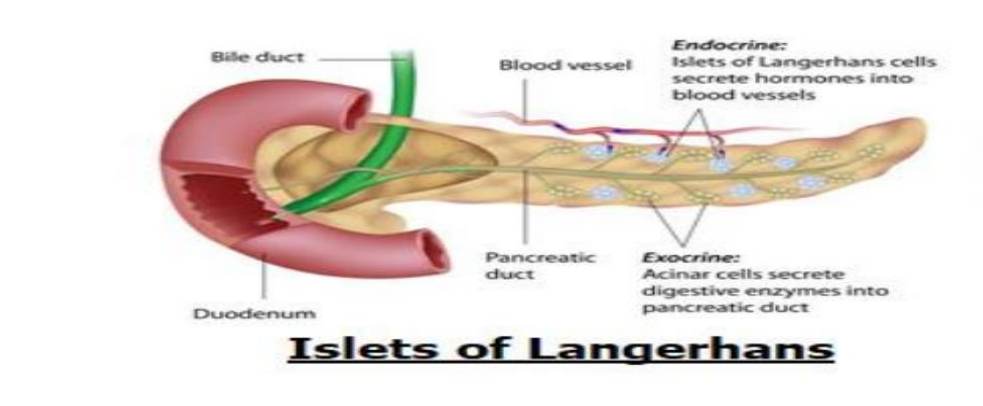
puberty then begins to involute (decrease in size and activity).

 It secrets the thymosin hormone.



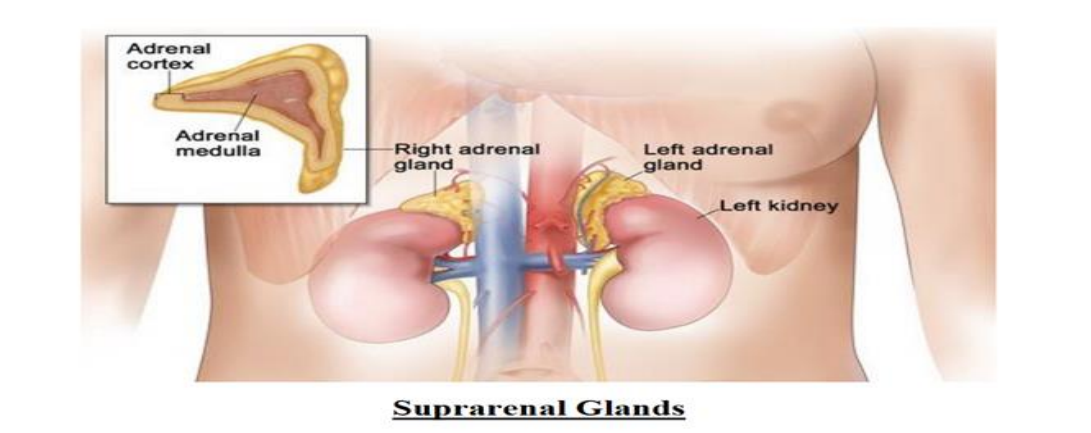
5. Islets of Langerhans of pancreas

- The islets form discrete masses within the pancreas.
- They are composed of different cells which secrete different hormones.
- Alpha cells: secrete glucagon.
- Beta cells: secrete insulin.
- Delta cells: secrete somatostatin.
- PP cells: secrete pancreatic polypeptide.



6. Adrenal (Suprarenal) glands

- Pair of glands (right & left) that lie on the upper pole of the corresponding kidney.



 Each gland is formed of an outer layer called cortex & inner core called medulla.

 The suprarenal cortex secrets:

1. Mineralocorticoids (aldosterone).

2. Glucocorticoids (cortisol).

3. Gonadocorticoids (androgens).

 The suprarenal medulla secrets: catecholamines (adrenaline &noradrenaline)

7-Testes

 Endocrine part of the testis is the interstitial cells of Leydig.

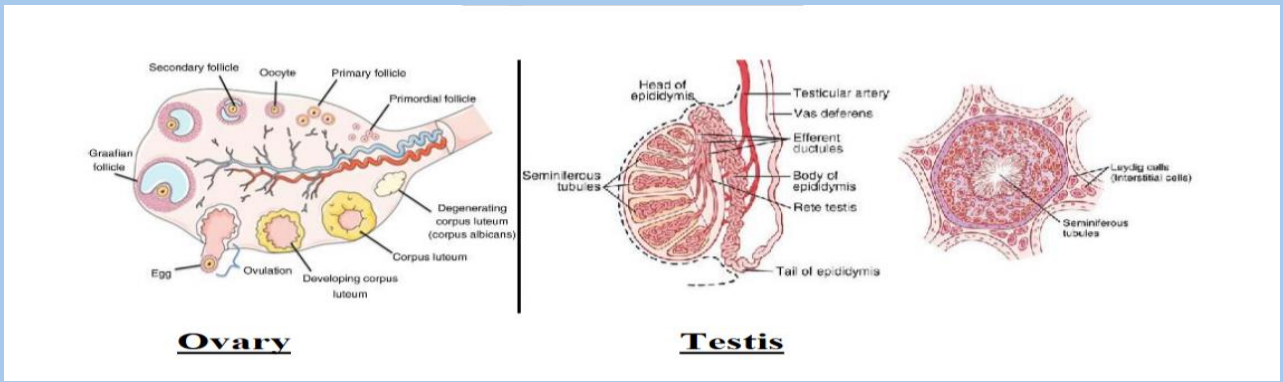
 They lie in the connective tissue spaces between the semineferous tubules.

 They secret testosterone hormone.

8. Ovary

 Endocrine part of ovary is formed by the cells forming ovarian follicles except the ovum.

 These cells secrete estrogen & progesterone hormones.



Thanks Dr. Yasser