



جامعة الدُّنْعَاءُ

# ANATOMY

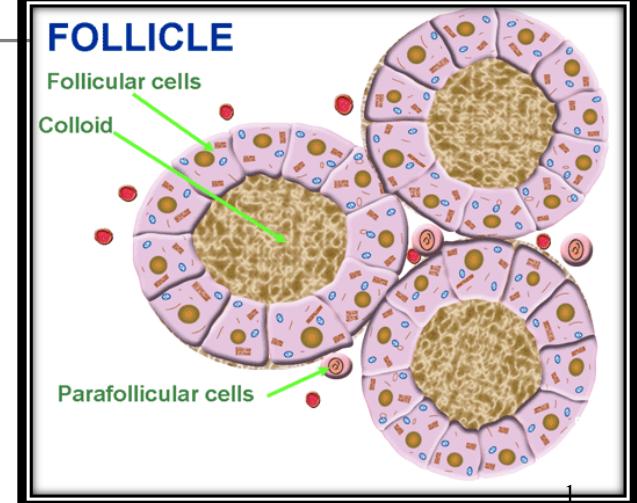
MORPHINE ACADEMY

MORPHINE  
ACADEMY

21 - December - 2025 (ج ٢٠٢٥)

# The Endocrine System

Dr. Mustafa Saad  
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# Endocrine Glands

هي عباره عن Glands [و]  
cell structures  
هي اي ال Cells تفرز Products  
أو chemical signals

hormones [و] lines

A group of secretory cells that release their products, chemical signals called hormones, usually into the circulation. The secretions never pass through ducts

ducts

+ Direct to the Blood  
جهاز الغرض بين الغدد الهرمونية، Endocrine Gland،  
اما الـ Exocrine تكون عن طريق ducts، و تكون Gland (بما في ذلك وليس بـ)

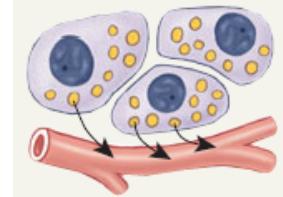


Fig.1: Endocrine secretion.

## ■ Endocrine glands include:

- ① Pituitary, ② thyroid, ③ parathyroid, ④ adrenal, and ⑤ pineal glands.

مهمات على الـ E.G بـ ملائمه :-

- Hypothalamus, thymus, ①pancreas, ovaries, testes, kidneys, stomach, liver, small intestine, skin, heart, adipose tissue, and placenta also have endocrine function

الغدد الهرمونية المهماء جزء من U.S  
endocrine function

جهاز الغرض بين الغدد الهرمونية

# The Hypothalamus

جزء من الـ  
diencephalon

- Part of the diencephalon of the brain.
- Located inferior to the thalamus.  
الposition  
اللسانية  
Thalamus
- *It's a major link between the nervous and the endocrine systems.* connection  
النخاع بين الـ nervous sys و الـ endo. sys  
secretes of horm. هرمونات  
secretion by the Hypothalamus  
بالناتي للتحفيز أو التحفيز أو التحفيز أو التحفيز  
anterior & posterior pituitary  
Hypothalamus  
الغدة النخامية
- It's connected to the pituitary gland by blood vessels and nerve fibers.  
through the blood circulation  
الجسم من خلال الدورة الدموية  
through nerve fibers  
الجسم من خلال الأعصاب
- It secretes a number of hormones that control the secretions of the pituitary gland.

Function  
1. مسؤول عن مهام الشرب والجوع  
drinking & eating  
2. مسؤول عن درجة الحرارة  
Temperature  
3. مسؤول عن التحكم بالجسم الداخلي  
ANS

# The Pituitary Gland (The Hypophysis)

- Located in the hypophyseal fossa of the sphenoid bone.
- Considered as the 'Maestro Gland' because it releases various hormones that control all the major endocrine glands of the body.
- It's formed of two anatomical and functional parts:
  1. The Adenohypophysis (Anterior Pituitary)
  2. The Neurohypophysis (Posterior Pituitary)

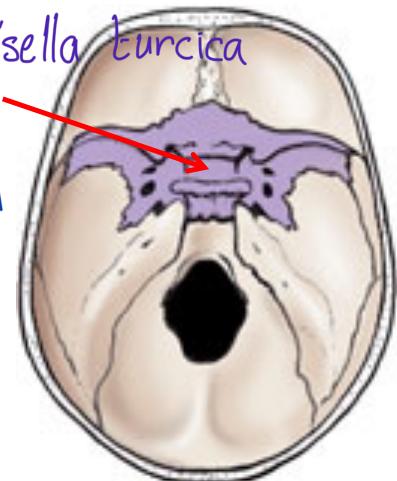


Fig.2: The sphenoid bone.

# Parts of the Pituitary Gland (Fig.3\*)



**Anterior pituitary**

Pars tuberalis

Pars intermedia

Pars distalis

Optic chiasm

Median eminence

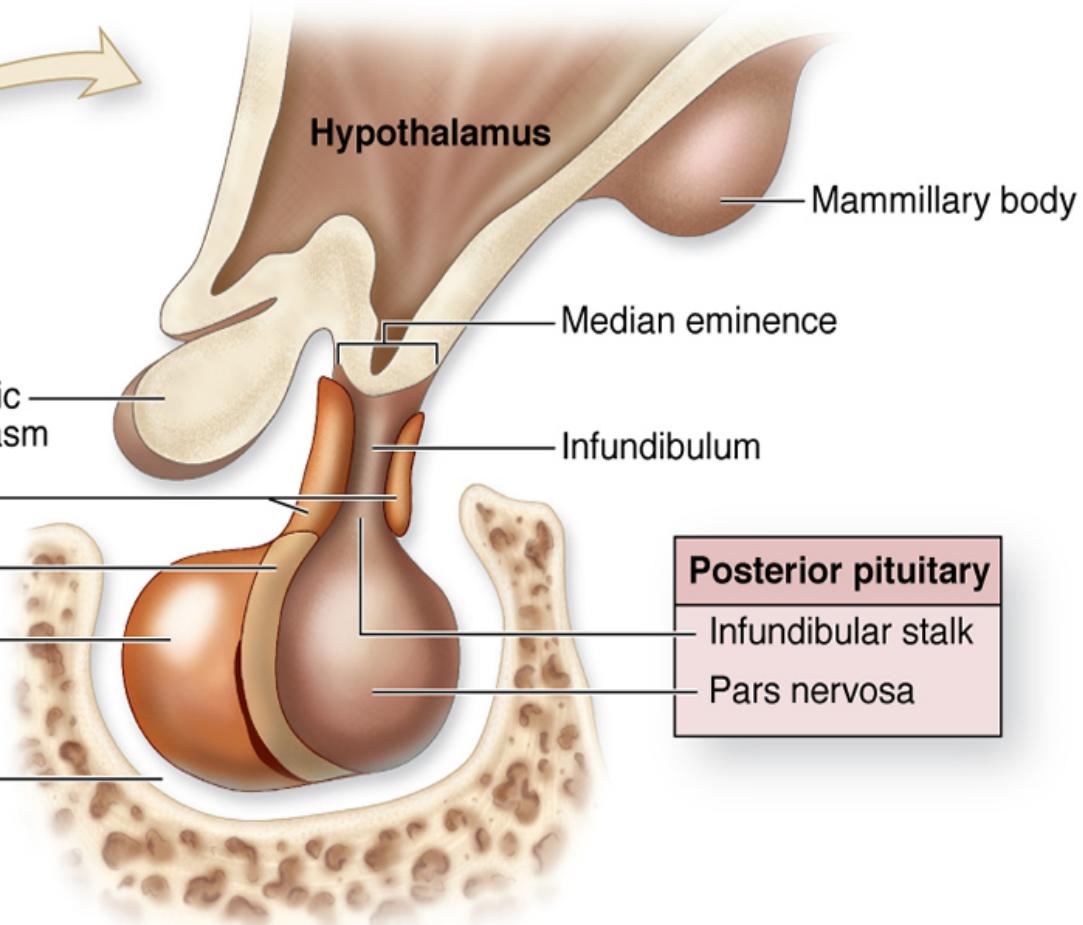
Infundibulum

**Posterior pituitary**

Infundibular stalk

Pars nervosa

Hypophyseal fossa  
in sella turcica of  
sphenoid bone



# Blood supply of the pituitary



مخطق بدم سواد بالسبيل الوردي blood circulation in pituitary gland

- The blood supply derives from two groups of vessels coming off the internal carotid artery:
  1. The **inferior hypophyseal arteries** provide blood mainly for the neurohypophysis.
  2. The **superior hypophyseal arteries** form a primary capillary network irrigating the stalk. The capillaries then rejoin to form venules (the hypophyseal portal veins) that branch again as a larger secondary capillary network in the pars distalis. Through this hypophyseal portal system, hormones from the hypothalamus pass to the anterior pituitary gland.
- Hormone-rich venous blood leaves the pituitary gland by the **anterior and posterior hypophyseal veins**

بتذكرة أعزائي لاما حفينا عن وبطالج عن Arch of Aorta  
Brachiocephalic 3 blood vessels left common carotid، left common carotid، Left subclavian  
وحتى left common carotid، بالعكس left common carotid، Right common carotid+ Right subclavian artery =  
يرجع ينقسم إلى common carotid، Right common carotid+ Right subclavian artery =  
Internal & External carotid، رج ينقسم لقسمين، لعوق، بس يهسح وليس Thyroid cartilage of Larynx  
ال داخلاً skull ويختفي كل المناطق الموجودة بالBrain، أحوال External carotid رج يختفي هناك الوجه والعنق  
والعين وهو. لذة ال pituitary موجودة داخل ال skull فبالنالي هي لزمن يكون ال Branch تبعها جائى من ال Internal carotid  
Superior hypophyseal artery (أو Branches) بس يدخل داخل ال skull، يعطى واحد من ال Internal carotid، External carotid  
Posterior part (أو Anterior part) (Inferior hypophyseal artery) بالنسبة لل Internal carotid، رج يجي يختفي (Inferior hypophyseal artery)  
وواحد بس وهو واحتى Capillaries، رج يختفي وهو يكتسب من ال Capillaries، يعني عندك Pituitary  
تبعد ال Pituitary (أو)، إلى سرتناها، Neurohypophysis (أو)، بعدين رج يكون عندك  
Posterior hypophyseal vein (أو)، وهو من ال vein وعدها Venules، بعدين رج يطلع اسماء Capillaries، حيث عرفناشو إلى يختفي  
Superior hypophyseal artery (أو)، طبع من اللي يختفي المترافق لل Anterior، واحد اسماء Posterior، المترافق  
جاء لطبع

بعملات شبکه من ال Capillaries ي تكون حوالين الا Stalk يخزن يلاته للتحقق ، ف أول capillary روح ي تكون لك إيمان هون أشر عليه ما يبرر فهو هو 😊

بعد ما يخزّنها ويكونها Capillary Vein يطلع عندها Vein Hypophyseal portal Vein طالع من Stomach، وروح يحيى على منفذة من الـ

شو الهرمونات التي تكوت بالمنطقة الـ anterior ؟ كل الـ Hormones التي تأتي من Hypothalamus والتي تتحكم بالـ Pituitary glands

رَحْ لَيَجِيِّ عن حَلِيقِ circulation فِي الْوَالِيِّ كُلِّ الْHormones رَحْ لَيَجِيِّ مِنْ هُونَ وَلَخْدِيِّ هَاهِيِ الْمَنْطَقَةِ عَمَّ بِأَشْ عَلَىِ مَهْوَرَةِ blood.



الآن بالرغم

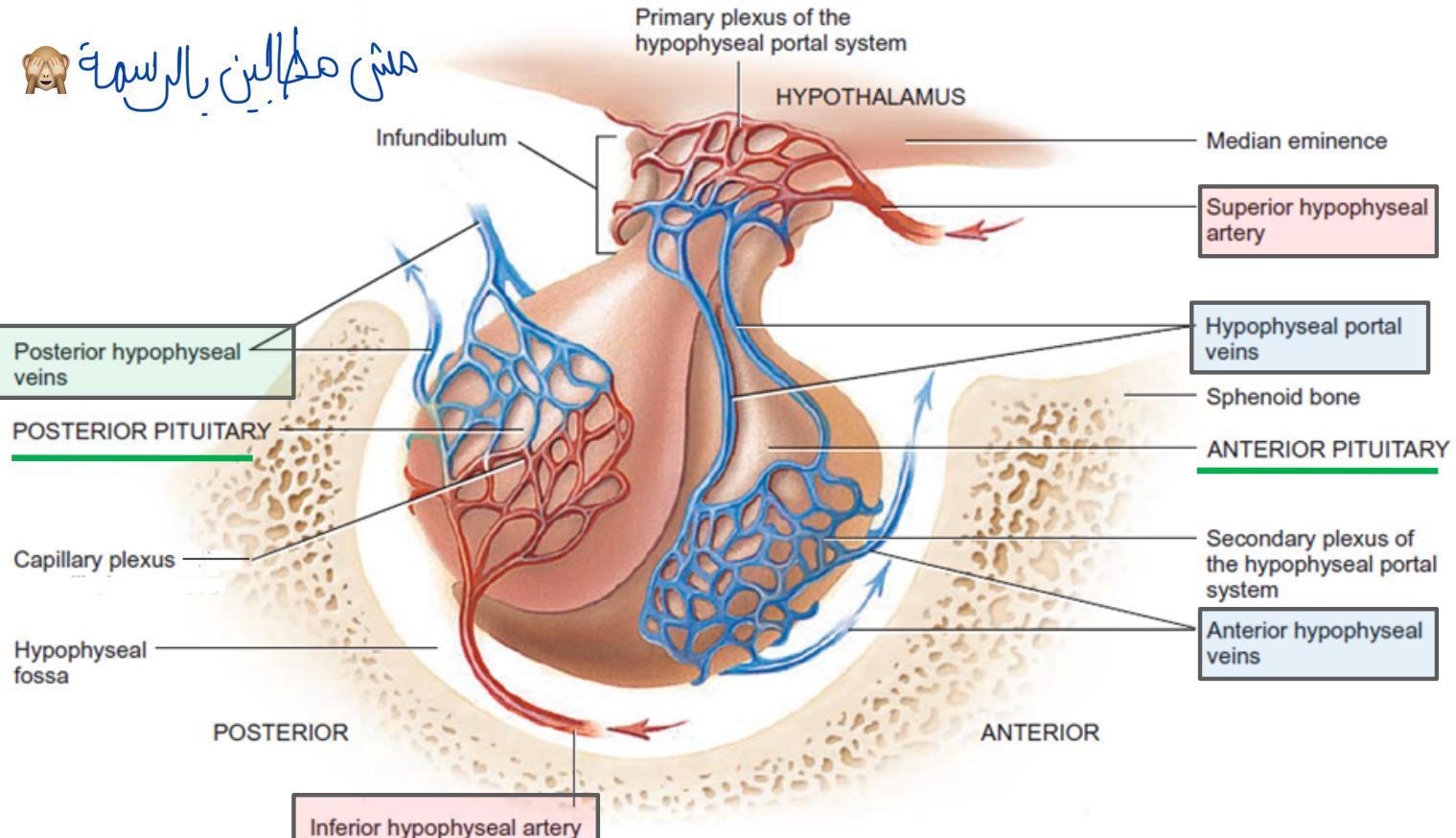


Fig.4: Blood supply of the pituitary gland.

# Anterior Pituitary

الفرق بين الـ Anterior و Posterior Pituitary  
الـ Anterior Pituitary ينبع من الـ Hypothalamus  
فـ Anterior Ability (الـ Hypothalamus) تنسج هرمونات  
الـ Posterior Pituitary (الـ Posterior Hypothalamus) هي جسيمة  
just as a store في Posterior

direct ○ The synthesis and release of hormones of the anterior pituitary are controlled by releasing and inhibiting hormones from the hypothalamus and by feedback regulation.

- Hypothalamic hormones made by neurosecretory cells transported by axons to hypophyseal portal system.
- Anterior pituitary hormones act on other glands.

## Hormones secreted by the anterior pituitary

Hormone	Target
① Growth Hormone (GH)	Several بحسب الموضع
② Thyroid Stimulating Hormone (TSH)	Thyroid gland
③ Adrenocorticotropic Hormone	Adrenal cortex
④ Follicle Stimulating Hormone (FSH)	Ovaries and Testes
⑤ Leutinizing Hormone (LH)	
⑥ Prolactin هرمون الثدي	Breast

# Posterior Pituitary Releasing ~~hormones~~

- ***Does not synthesize hormones.***
- **Releases the following hormones:** *also*
  - 1. Oxytocin →
  - 2. Antidiuretic Hormone (ADH) = Vasopressin
- Contains:
  1. Nerve endings
  2. Astrocyte-like cells called ***Pituicytes.***
- Cell bodies of neurons in the hypothalamus synthesize these hormones. They're then transported through axons in the ***hypothalamo-hypophyseal tract*** to the nerve endings in the posterior pituitary. Here they remain stored. When need arises, they're released from the nerve endings to pass into blood.

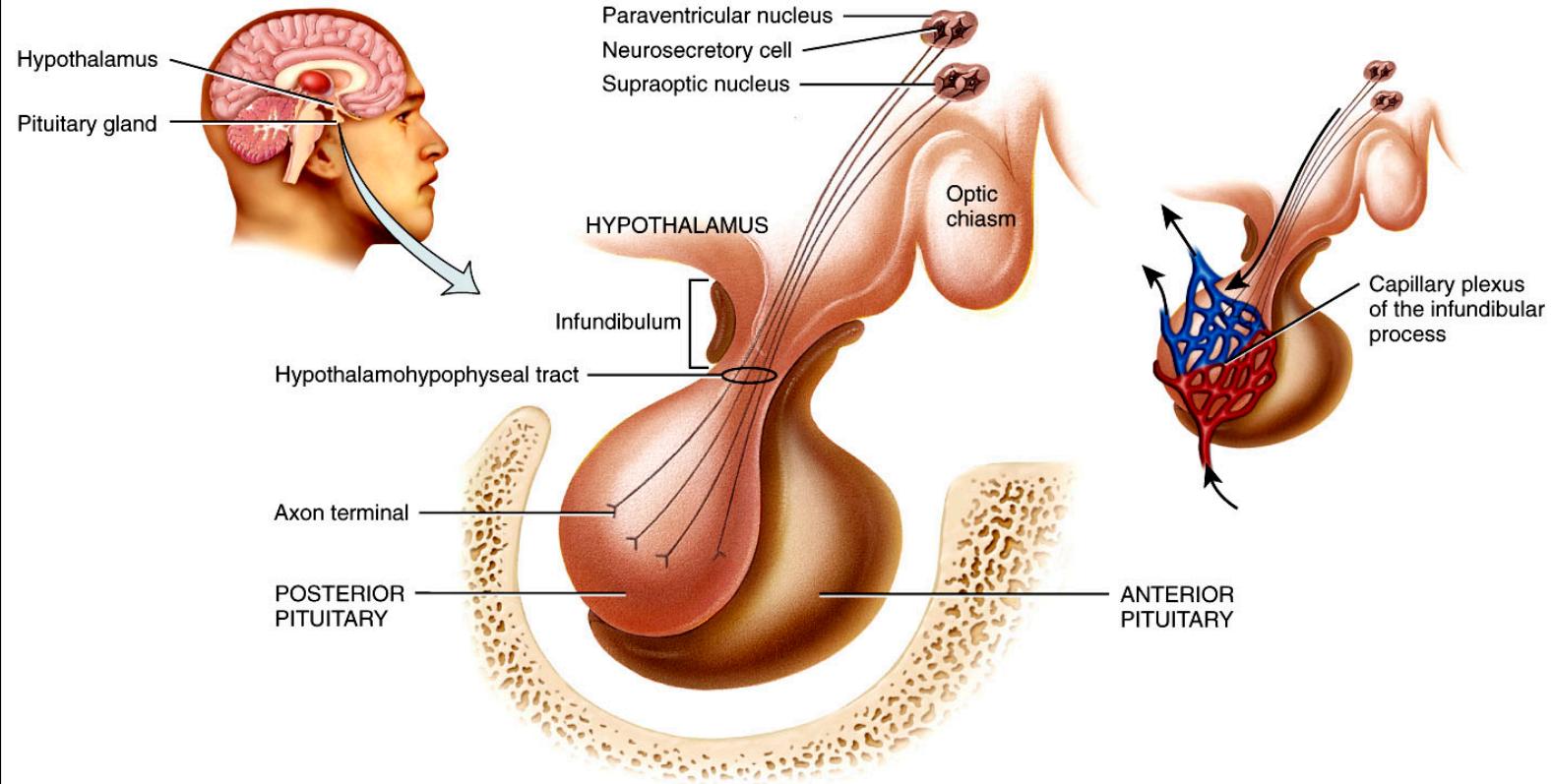
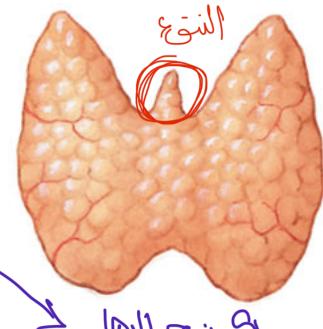


Fig.5: Hypothalamo-hypophyseal tract.

# The Thyroid Gland

الخدة  
الدرقية

Fig.6: The thyroid gland.



- A butterfly-shaped gland located inferior to larynx

- Formed of: هي عبارة عن 2 lobes

1. ويستمد من عنده Two lobes (right and left) that extend from the thyroid cartilage to the level of 5th tracheal cartilage. They're related to the: أقصى ما وصل

- Common carotid artery and internal jugular vein

واليجء إلى بالرعن اسفل External and recurrent laryngeal nerves

2. ويعبر عن مساره Isthmus: a mass of thyroid tissue that connects the two lobes..

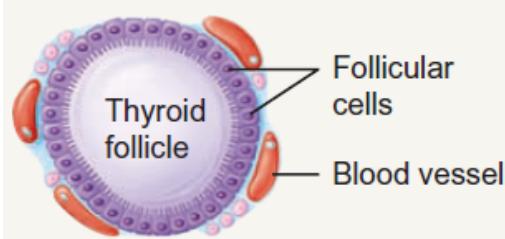
3. الستو والي فالح ل فوق اذن العودة A Pyramidal lobe may sometimes be present extending superiorly from the isthmus.

- The gland is highly vascular. It's supplied by the superior and inferior thyroid arteries. فيهما كثير من الشرايين ومن هنام الوعاء  Thyroid Gland

وتحاطئ بـ capsule

## Histology of the thyroid gland

Thyroid follicles (Sawol Particles in right)



- The follicles are lined by epithelial cells (the *follicular cells*) that range from squamous to columnar according to activity (the more active cells are larger). <sup>thyroid lumen opens to the cavity</sup> ②
- Within each follicle there is a lumen into which the thyroid hormones are secreted. <sup>secretion into the lumen</sup>

*The thyroid gland is unique in that it's the only endocrine gland in the body that stores its hormones outside the cells.*

- Between the follicles, there's another type of cell, called the **parafollicular or C-cells**, that secrete the hormone calcitonin.

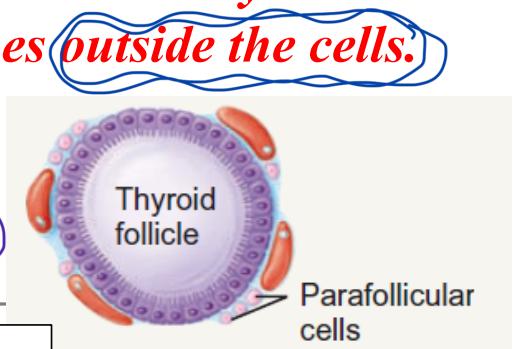


Fig.7: Thyroid follicles and the C-cells.

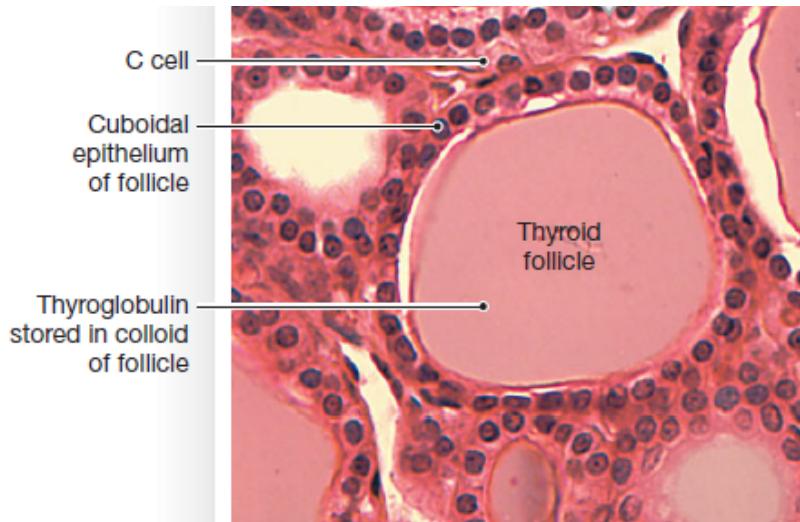


Fig.8: Histology of the thyroid gland.

- The thyroid hormones include: *الهرمونات التي تفرزها الغدة الدرقية*
  - ① Tri-iodothyronin (T3) *الهرمون*
  - ② Tetra-iodothyronin (T4) = thyroxin *الهرمون*
- Both of these hormones affect the body metabolism *تحفيزها بالهرمونات*
- Both of these hormones are controlled by TSH from the pituitary gland and by feedback mechanism.

# The Parathyroid Gland

4 Embedded عباره عن يحيى موسى

- Four glands Embedded in the posterior aspect of the lobes of the thyroid gland. Each one is surrounded by its own capsule.

■ Has two types of cells:

1. Chief (Principal) cells: secrete the Parathyroid Hormone (PTH) = البروتوكول (parathormone) that regulates level of calcium and phosphate in blood.

2. Oxyphil cells ?!

- Blood calcium level directly controls secretion of both calcitonin and PTH.

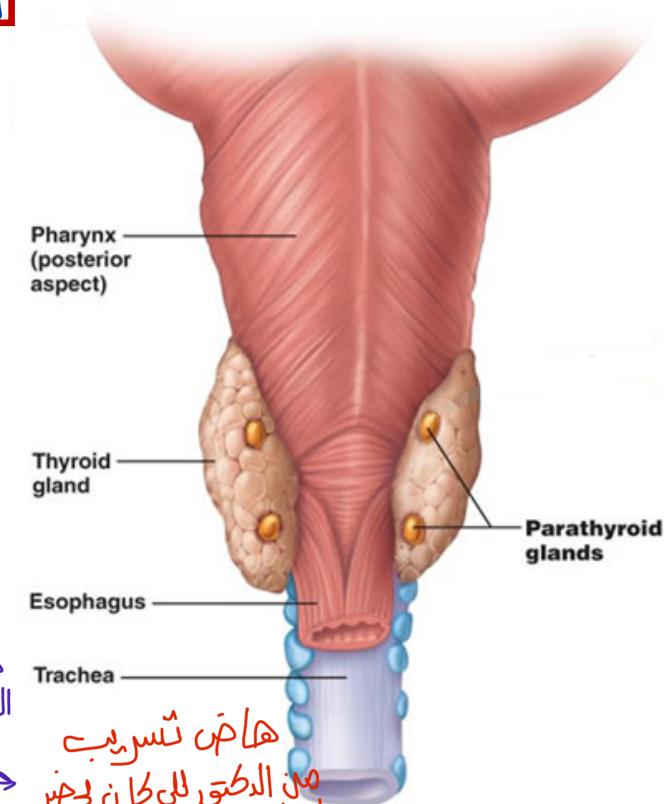


Fig.9: Position of the parathyroid gland.



الدكتور قال إلى سجل ما يقل المعلومة فتحاصل على نسخة .

مقلب يسخر هالمتسا ، أنا يومها حضرت فرح أكتبها عنثاني بس آجي ادرس ، هنن عشان سواد

عنون حجم يعني المهم ، الـ Oxyphil cells هم عباره عن ↴

# Inactive cheif cells

طب ليه يتولوا الـ cells إلى cheif cells ، مع التهر كل ما لا واحدر كبر يتحول الـ إلى cheif cells

لش وظيفتها هي ما بتقرز ولد اللي ولا أي هرمون ، مالها القررة أهمل

تسريحكم سؤال مش تروحوا

تخلطوا فيه بالفاسد

# The Adrenal (Suprarenal) Glands

- Two yellowish glands located on the upper poles of the two kidneys.
- The right gland is pyramidal in shape, whereas the left is crescentic in shape.
- Each gland is surrounded by a capsule and composed of two anatomically and functionally distinct regions:
  - 1. Outer yellow **cortex** divided into the *zona glomerulosa*, *zona fasciculata* and *zona reticularis*.
  - 2. Inner brown **medulla**: a modified sympathetic ganglion that synthesizes and secretes the hormones epinephrine and norepinephrine.

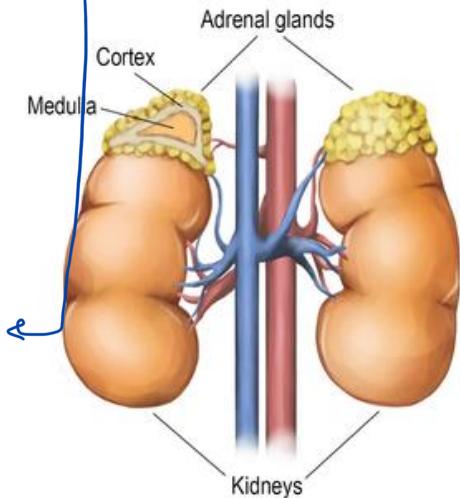


Fig.10: The suprarenal glands.

الجزء الباقي هو Endocrine function  
الجزء الداخلي هو cortex  
الجزء المحيط بال cortex medulla

Endocrine function

Endocrine function

الجزء المحيط بال cortex medulla

Fig.11: The histology of the suprarenal glands.

	Arrangement of cells	Release
Capsule	Capsule	افزان
Adrenal cortex	<p>Zona glomerulosa</p> <p>Like spheres جزيئات</p> <p>Zona fasciculata</p> <p>Straight cords جزيئات</p> <p>Zona reticularis</p> <p>Branching cords</p>	<p>Mineralocorticoids التي تفرز الـ Aldosterone</p> <p> glucocorticoids التي تفرز الـ hydrocortisone</p> <p>Androgens</p>
Adrenal medulla	Adrenal medulla	<p>من عالي الستيروئون Testosterone</p> <p>فينها سميت بذلك هانقليون</p>