

Adrenal (Suprarenal) Glands

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Note: this teamwork is involving both the anatomy and embryology parts of the lecture, which were covered by the corresponding teams.

Adrenal glands

The suprarenal (adrenal) gland is a component of the hypothalamic-pituitary-suprarenal axis that is responsible for coordinating stress response and metabolism

They are yellowish retroperitoneal organs that lie on the upper poles of the kidneys,
At the level of the last thoracic vertebra (T12).
Each gland has an outer yellow cortex and an inner dark brown medulla.

The suprarenal gland is enclosed within the renal fascia with the kidney but in a separate compartment, that allow the two organs to be separated easily during surgery.
It is separated from the kidney by the perirenal fat

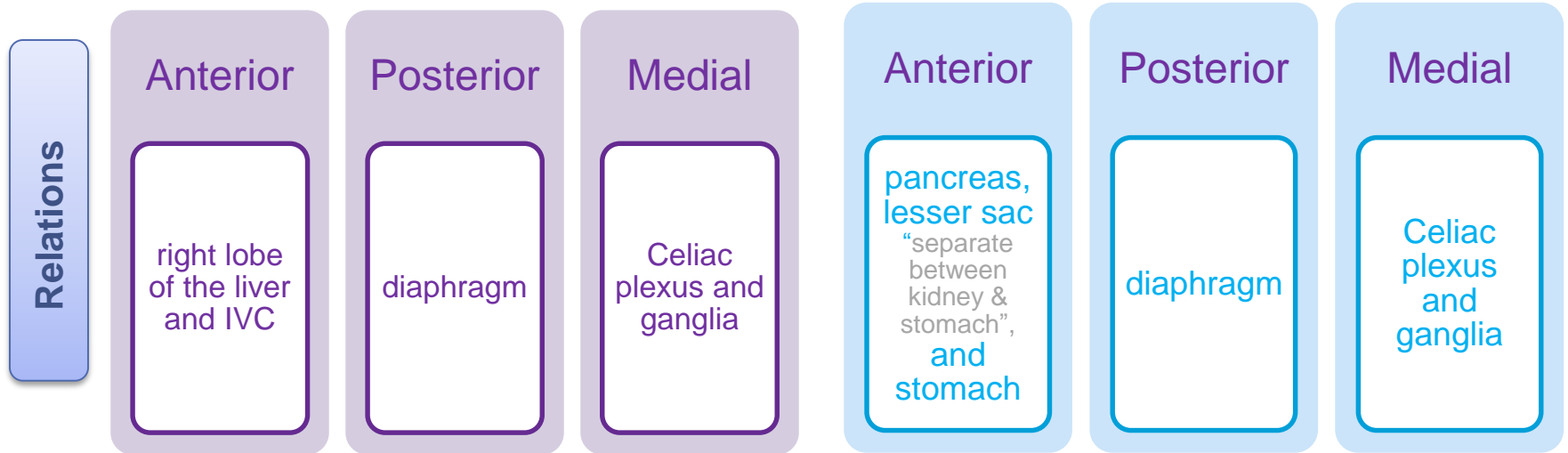
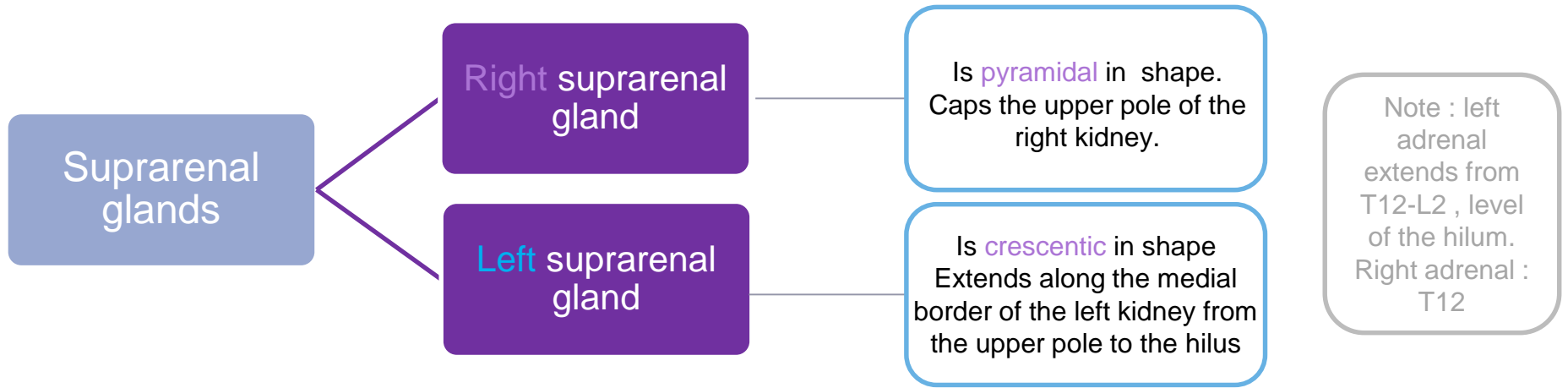
Functions

secretes hormones that include:
Mineral corticoids, which are concerned with the control of fluid and electrolyte balance
Glucocorticoids, which are concerned with the control of the metabolism of carbohydrates, fats, and proteins
Small amounts of Sex hormones, which probably play a role in the prepubertal development of the sex organs.

Cortex

secretes the catecholamine's epinephrine and norepinephrine

Medulla



blood supply	Venous Drainage	Nerve Supply	Lymph Drainage
<p>The arteries supplying each gland are three in number:</p> <ul style="list-style-type: none"> -Superior suprarenal from inferior phrenic artery <i>from abdominal aorta</i> -Middle suprarenal from abdominal aorta -Inferior suprarenal from renal artery. 	<p>A single vein emerges from the hilum of each gland and drains into the inferior vena cava on the right side and the left renal vein on the left side. Note : left renal vein receive both left suprarenal vein & left gonadal</p>	<p>Preganglionic sympathetic fibers derived from the splanchnic nerves supply the glands. Most of the nerves end in the medulla of the gland .</p> <p>Only sympathetic</p>	<p>The lymph drains into the lateral aortic lymph nodes. Or para aortic lymph nodes</p>

MCQs

1. Suprarenal gland lies at the level of ?

- A. T8
- B. T10
- C. T12
- D. L2

2. The anterolateral relation of the RIGHT suprarenal gland is ?

- A. inferior vena cava
- B. liver
- C. pancreas
- D. stomach

3. The autonomic nervous type of the adrenal gland is?

- A. Sympathetic only
- B. Parasympathetic only
- C. Sympathetic & parasympathetic

4. Superior suprarenal artery branch of ?

- A. abdominal aorta
- B. inferior phrenic artery
- C. renal artery
- D. celiac trunk

5. Which one of the following veins drain DIRECTLY into the inferior vena cava??

- A. right suprarenal vein.
- B. left suprarenal vein.

6. Which one of the following statements is true about the Adrenal gland ?

- A. each gland supply by **one** artery & drain into **one** vein.
- B. each gland supply by **two** arteries & drain into **one** vein.
- C. each gland supply by **three** arteries & drain into **three** veins.
- D. each gland supply by **three** arteries & drain into **one** vein.

THANK YOU FOR CHECKING OUR
WORK GOOD LUCK DOCTORS

Key Answers :

- 1-C
- 2-B
- 3-A
- 4-B
- 5-A
- 6-D



Done by :

لولو الداعج

MCQ's by:

433 Anatomy teamwork

For any question, correction or suggestion, don't hesitate to contact us on:

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learnt Adrenal anatomy?

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histology?

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adrenals were created when u
were an embryo?

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#Development of Adrenal gland

	Cortex	Medulla
Origin	Mesoderm	Ectoderm
Develop from	from the Celomic epithelium (<u>Mesothelium</u>) of the posterior abdominal wall	develops from the neural crest cells (pheochromocytes).
Start's at	6 th week, by aggregation of the mesenchymal cells, between <u>dorsal mesentery</u> and <u>developing gonads</u> .	It forms a mass medial to the fetal cortex.

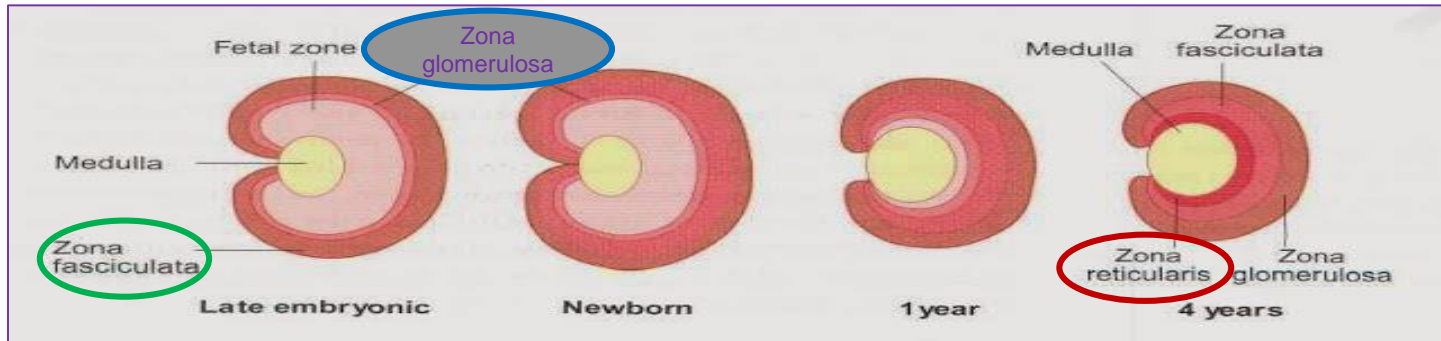
➤ Permanent cortex:

A second wave mesenchymal cells arise from the mesothelium, enclose the fetal cortex forms a thinner (permanent) cortex.

So, the adrenal gland at the end has 2 cortices inner (fetal) and outer (permanent) . Both are **mesodermal in origin**.

- Differentiation of the characteristic suprarenal cortical zones begins during the **late fetal period**.

- **Zona glomerulosa**
 - **Zona fasciculata**
- Present at birth
- **Zona reticularis**
- Is not recognizable until the **end of 3rd year**

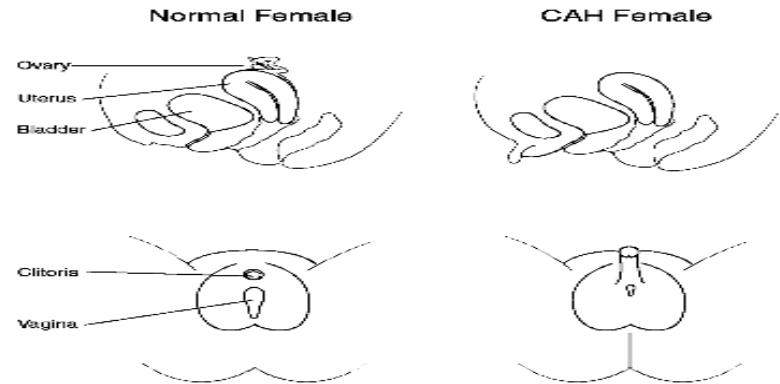


#Clinical notes:

- ✓ The suprarenal gland is separate from the kidney but enclosed within the renal fascia.
- ✓ The suprarenal gland of the **fetus is 10-20 times larger than the adult glands** relative to the body weight, and are large compared with the kidneys. This is because of the extensive size of the fetal cortex. The medulla remains relatively small until after birth.
- ✓ The suprarenal glands rapidly become smaller during the first **2-3 weeks after birth**, due to the **rapid regression of the fetal cortex**.
- ✓ Its involution* is largely completed in the **first year of life**. During the process of involution, **the cortex is friable and susceptible to trauma at birth leading to severe hemorrhage**.

➤ Congenital adrenal hyperplasia (CAH):

- An abnormal increase in the cortical cells results in excessive androgen production; during the **fetal period**.
- **In females** ♀, it may lead to musculization of external genitalia and enlargement of clitoris.
- **In males** ♂, it may remain undetected in early infancy.
- Later in childhood, in **both sexes**, androgen excess may lead to rapid growth and accelerated skeletal maturation.



*involution (يضمحل): The shrinkage of an organ.

MCQs

1. The origin of medulla is:

- a. Ectoderm
- b. Mesoderm
- c. Endoderm

2. The cortex develops from:

- a. Neural crest
- b. Pheochromocytes
- c. Celomic epithelium

3. Which of the following cannot be recognized at birth:

- a. Zona Glomerulosa
- b. Zona Reticularis
- c. Zona Fasciculata

3. Which of the following statements is true regarding the adrenal gland

- a. Fetus adrenal gland is smaller than the adult
- b. It's not enclosed by any fascia
- c. It becomes rapidly smaller during the first week's after birth



Done by:
Embryology teamwork

Key answers

- 1. (a)
- 2. (c)
- 3. (b)
- 4. (c)