

What is Adrenal Gland Anatomy?

Worksheet

The adrenal cortex has three zones producing mineralocorticoids, glucocorticoids, and androgens, while the adrenal medulla contains chromaffin cells that release epinephrine and norepinephrine under sympathetic stimulation.

Questions

1. Which adrenal cortex zone produces cortisol?

- A) Zona glomerulosa
- B) Zona fasciculata
- C) Zona reticularis
- D) Medulla

2. What hormone does the adrenal medulla mainly release during stress?

- A) Aldosterone
- B) Cortisol
- C) Epinephrine
- D) Testosterone

3. Which zone regulates sodium and potassium balance?

- A) Zona glomerulosa
- B) Zona fasciculata
- C) Zona reticularis
- D) Medulla

4. The adrenal medulla develops from which embryonic tissue?

- A) Endoderm
- B) Mesoderm
- C) Neural crest
- D) Surface ectoderm

5. Adrenal glands sit atop each kidney; combined weight is about 8-10 g. What proportion of that mass is cortex vs medulla?

6. Zona glomerulosa produces aldosterone, which regulates sodium reabsorption. Roughly what percentage of filtered sodium does aldosterone-modulated reabsorption affect in the distal nephron?

7. During acute stress, the medulla secretes epinephrine and norepinephrine in roughly a 4:1 ratio. If total catecholamine output is 100 units, how much is epinephrine?

8. Define: What are the three zones of the adrenal cortex?

9. Define: What does the adrenal medulla secrete?

10. Define: What embryonic tissue forms the adrenal medulla?

Answer Key

1. B) Zona fasciculata - The zona fasciculata, the middle cortical layer, produces glucocorticoids like cortisol.
2. C) Epinephrine - The medulla's chromaffin cells release epinephrine (and norepinephrine) for the acute stress response.
3. A) Zona glomerulosa - The zona glomerulosa produces aldosterone, a mineralocorticoid controlling Na⁺/K⁺ balance.
4. C) Neural crest - Neural crest cells give rise to the medulla's chromaffin cells, unlike the mesoderm-derived cortex.
5. Cortex makes up ~80-90% of gland mass Medulla makes up ~10-20% Cortex produces steroid hormones, medulla produces catecholamines
6. Aldosterone acts on ~2-3% of filtered Na⁺ in the distal tubule and collecting duct This fine-tunes the final sodium balance Even a small percentage significantly affects blood volume and pressure over time
7. Ratio epinephrine:norepinephrine 80:20 (4:1) 100 units 0.8 = 80 units epinephrine 100 units 0.2 = 20 units norepinephrine
8. Zona glomerulosa (aldosterone), zona fasciculata (cortisol), zona reticularis (androgens) - remember 'GFR: salt, sugar, sex'.
9. Epinephrine and norepinephrine, released in response to sympathetic nervous system activation.
10. Neural crest tissue - the medulla is essentially a specialized sympathetic ganglion.

Bounlu

All cards, step-by-step solutions and an AI tutor are in the Notek app.
Promy turns exam dates into automatic reminders.