

# Primary Aldosteronism

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# Primary Hyperaldosteronism

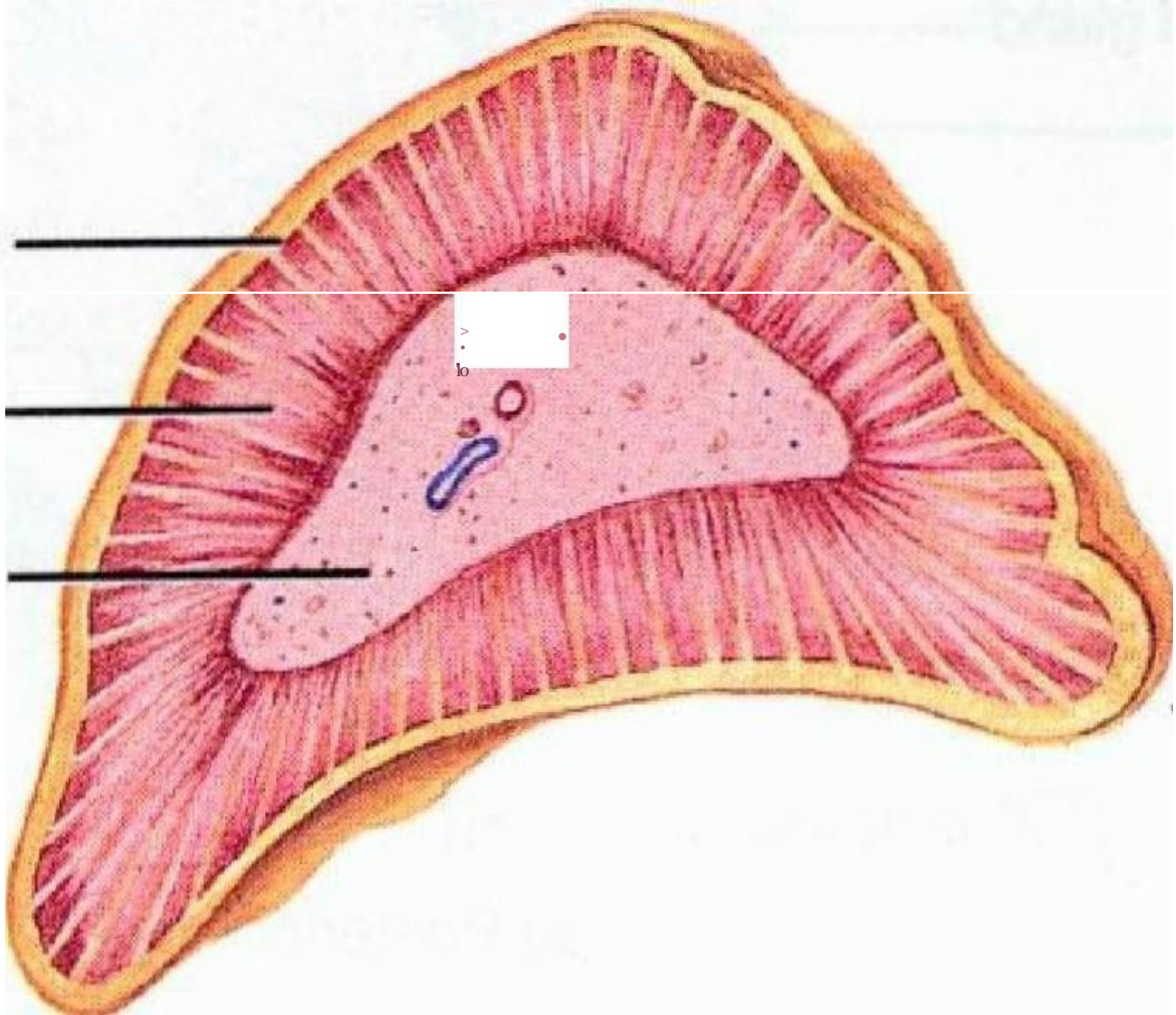
By the end of this section of the lecture, the following points will be identified:

- Knowledge on important causes of primary hyperaldosteronism.
- Describe signs & symptoms of primary hyperaldosteronism.
- Knowledge on how to investigate clinical case of hyperaldosteronism.

Capsule

Cortex

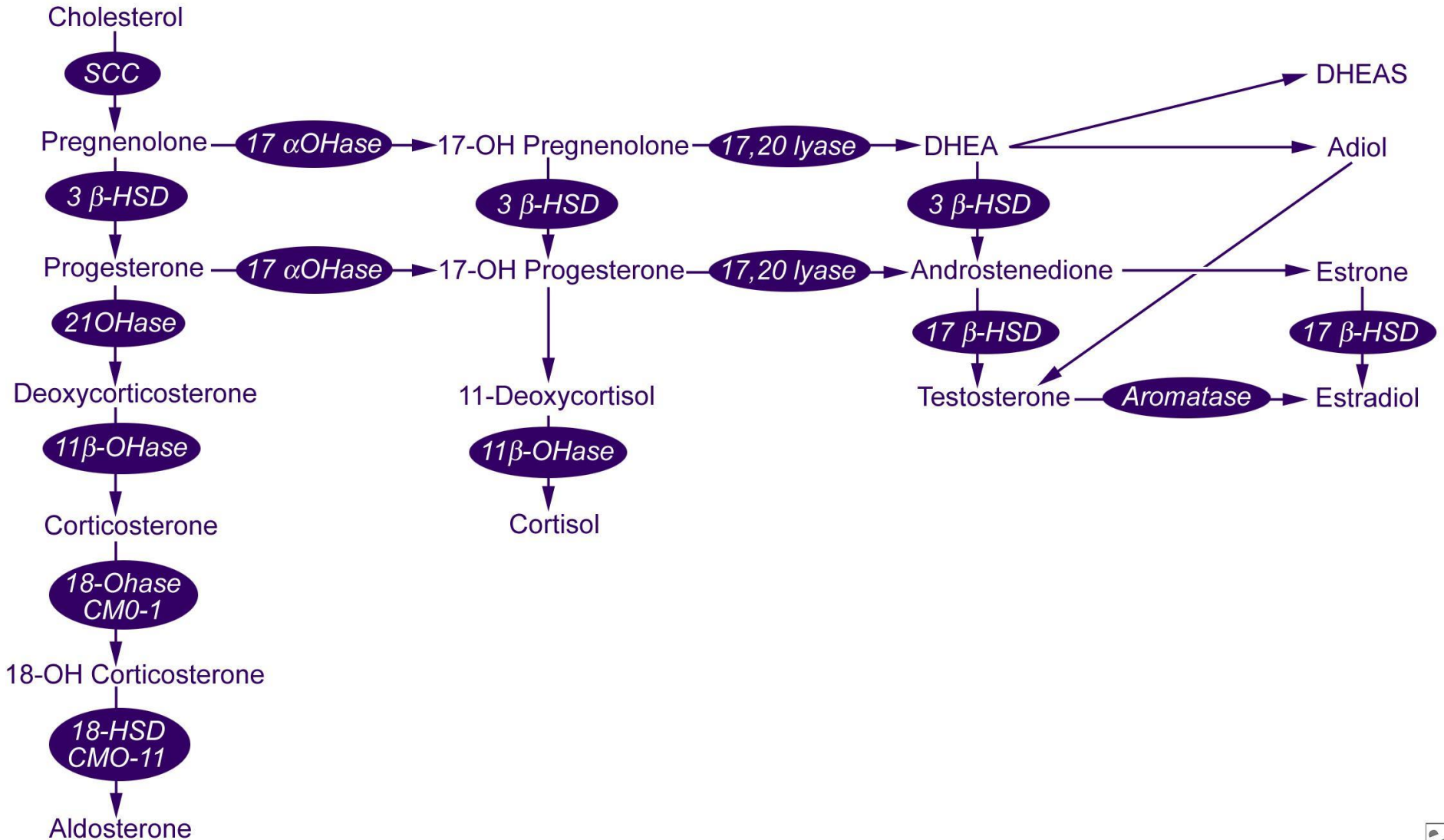
Medulla



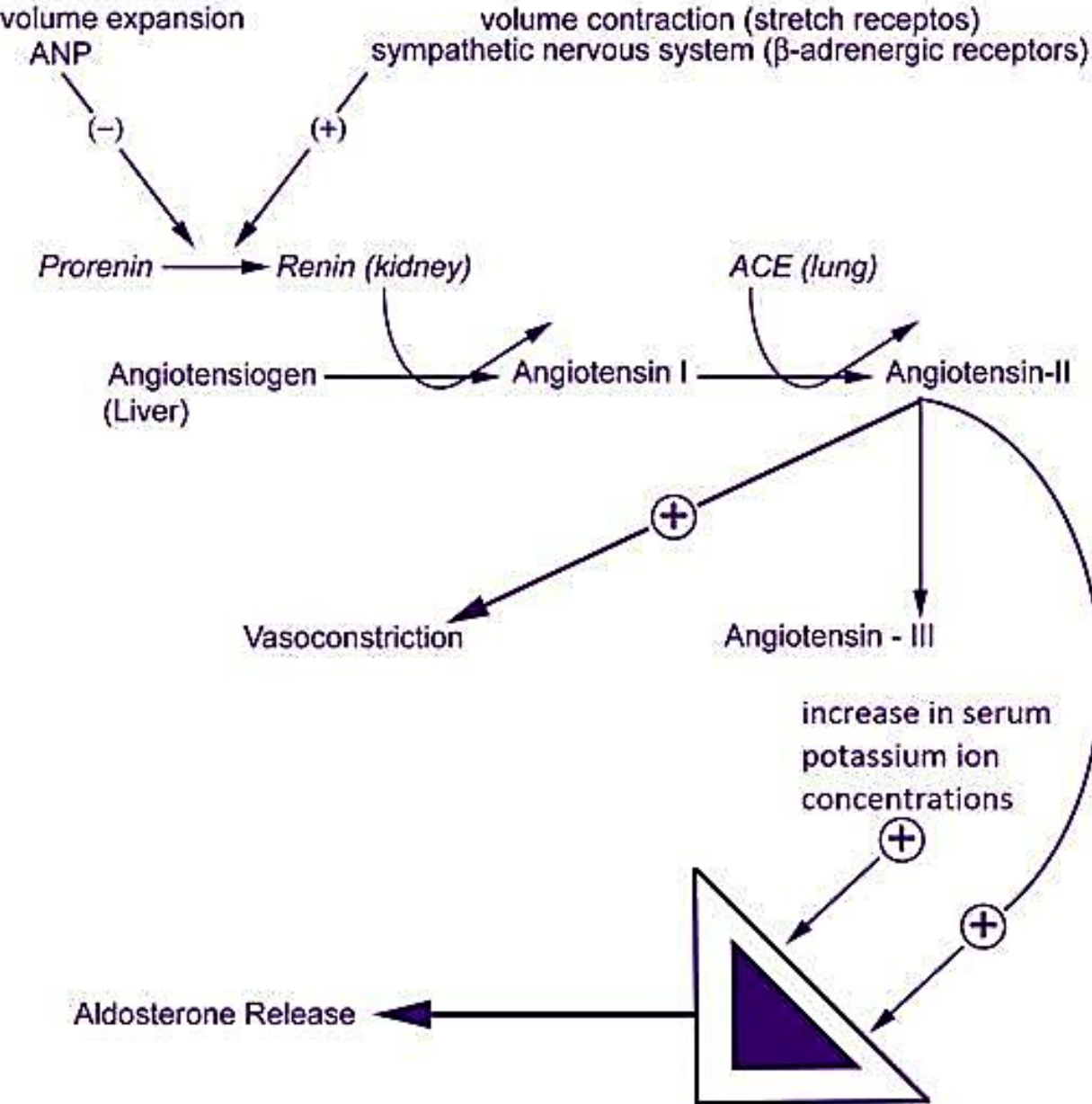
# Aldosterone

- Is a steroid hormone produced exclusively in the zona glomerulosa of the adrenal cortex.
- Is a mineralocorticoid hormone.
- The principal site of action of aldosterone is the distal nephron.
- The principal regulators of aldosterone synthesis & secretion are the renin-angiotensin system.
- In distal tubules, increases reabsorption of sodium & chloride and excretion of potassium & hydrogen ions.
- **Hyperaldosteronism is characterized by excessive secretion of aldosterone, which causes increases in sodium & chloride reabsorption and loss of potassium and hydrogen ions.**

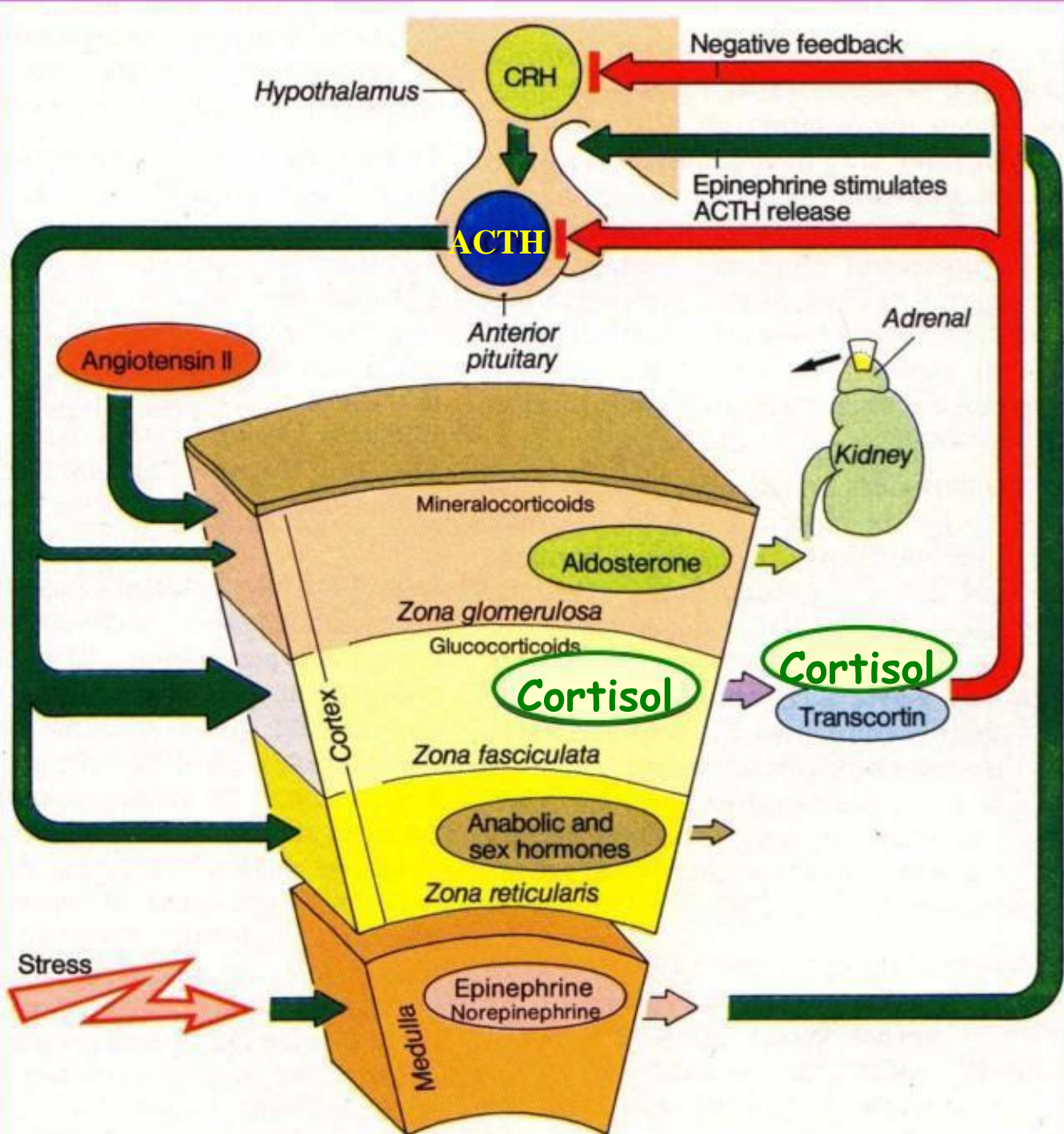
# Steroid Biosynthetic Pathway



# Physiologic Regulation of the Renin-Angiotensin-Aldosterone Axis







- Aldosterone is essential in the homeostasis of circulating blood volume & serum potassium concentration.
- Aldosterone secretion is stimulated by depletion in blood volume detected by stretch receptors & by an increase in serum potassium ion concentrations.
- In contrast, it is suppressed by hypervolemia & hypokalemia.



Primary  
Hyperaldosteronism  
Conn's Syndrome

# Conn's Syndrome

- The term primary hyperaldosteronism (or primary aldosteronism) refers to a renin-independent increase in the secretion of aldosterone.
- It was first described in 1955 by J. W. Conn in a patient who had an Aldosterone-producing adenoma.
- Is characterized by increased Aldosterone secretion from the adrenal glands.
- This condition is principally a disease of adulthood, with its peak incidence in the fourth to sixth decades of life.

# Cause of Hyperaldosteronism

Aldosterone-producing adenoma : Conn's disease	65-70%
Idiopathic bilateral adrenal hyperplasia	30%
Adrenal carcinoma	< 1%

# Clinical Presentations

- Primary hyperaldosteronism may be asymptomatic, particularly in its early stages.
- When symptoms are present, they may be related to hypertension (if severe), hypokalemia, or both.
- Hypertension results from hypervolemia secondary to sodium chloride retention.
- The spectrum of hypertension-related symptoms includes the following:
  - Headache.
  - Facial flushing.
  - If hypertension is severe, weakness, visual impairment, impaired consciousness, and seizures (hypertensive encephalopathy).
- Symptoms of hypokalemia include the following:
  - Constipation
  - Polyuria and polydipsia (because of impaired renal concentrating ability)
  - Weakness.
  - If the serum potassium is low enough, muscle weakness, transient paralysis and arrhythmia.
  - Paresthesia.

# Workup for primary aldosteronism

- The presence of hypertension, hypokalemia, or both necessitate decision to screen.
- Diagnostic investigations include:
  - Hyponatremia & hyperchloremia.
  - Hypokalemia with metabolic alkalosis.
  - High serum aldosterone, with low Plasma Renin Activity.
  - Aldosterone-to-renin ratio is sensitive means of differentiating primary from secondary causes of hyperaldosteronism.
    - Most authors recommend ratio of 20-40 confirms diagnosis.
  - Computed Tomography of adrenal gland.
  - Adrenal Venous Sampling is the criterion standard test to differentiate unilateral from bilateral disease in patients with PA; however, it requires considerable skill.



# Hyperaldosteronism Treatment & Management

- Surgical excision of the affected adrenal gland is recommended for all patients with hyperaldosteronism who have a proven aldosterone-producing adenoma/ carcinoma.
- Spironolactone is the most effective drug for controlling the effects of hyperaldosteronism.
- It is a nonselective, competitive mineralocorticoid receptor antagonist that is structurally similar to progesterone and metabolized in the liver to active metabolites.



## unilateral Aldosterone-Producing Adenoma



Tx : Unilateral adrenalectomy

