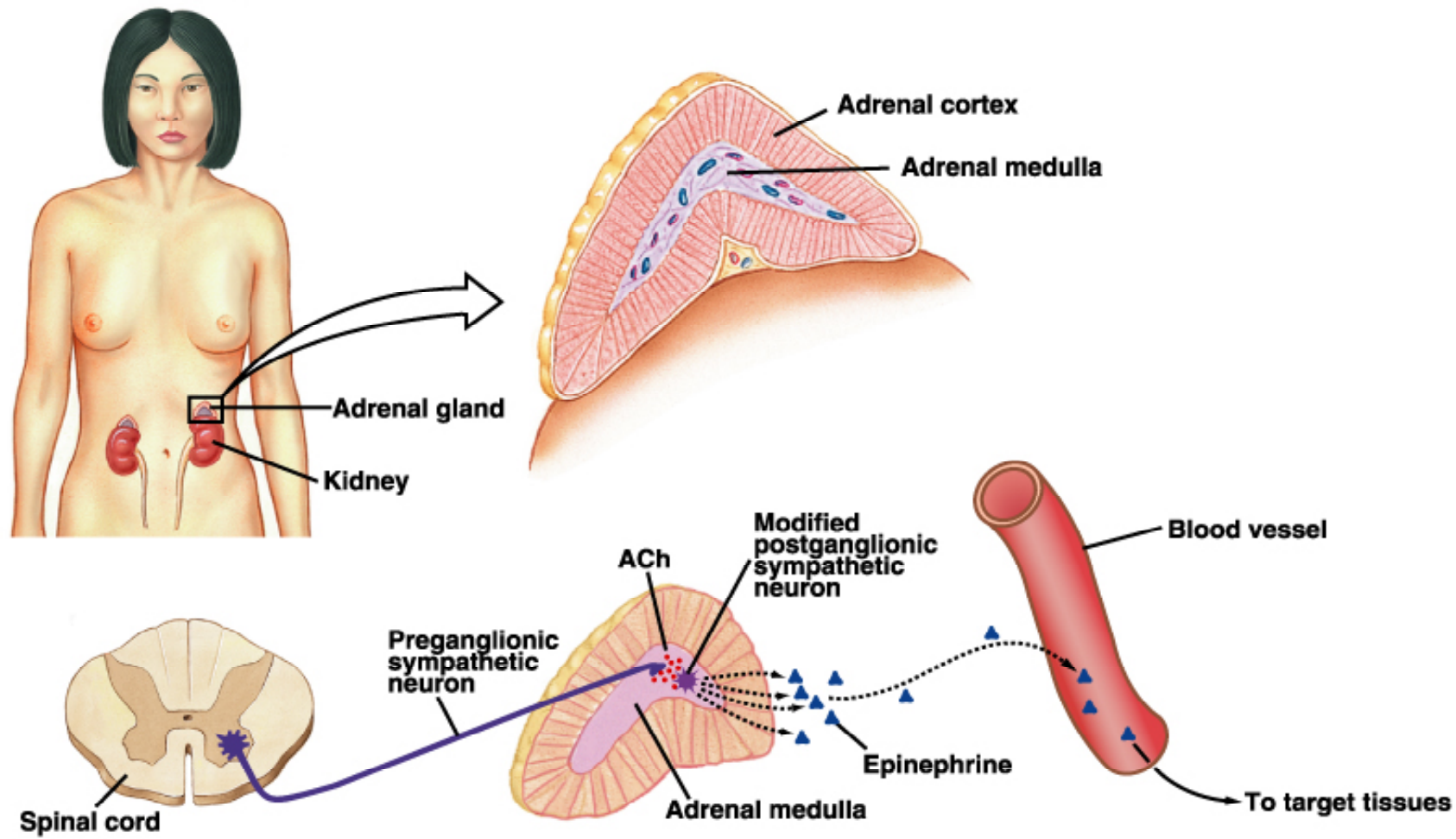


PHYSIOLOGY OF ADRENAL MEDULLA

Dr. Eman El Eter

A case study?

“Rollie Hendrix,” a 35-year-old husband and father of three children, has been experiencing headaches and palpitations of increasing frequency and severity over the past six months. In addition, he has had periods of intense anxiety and panic attacks.

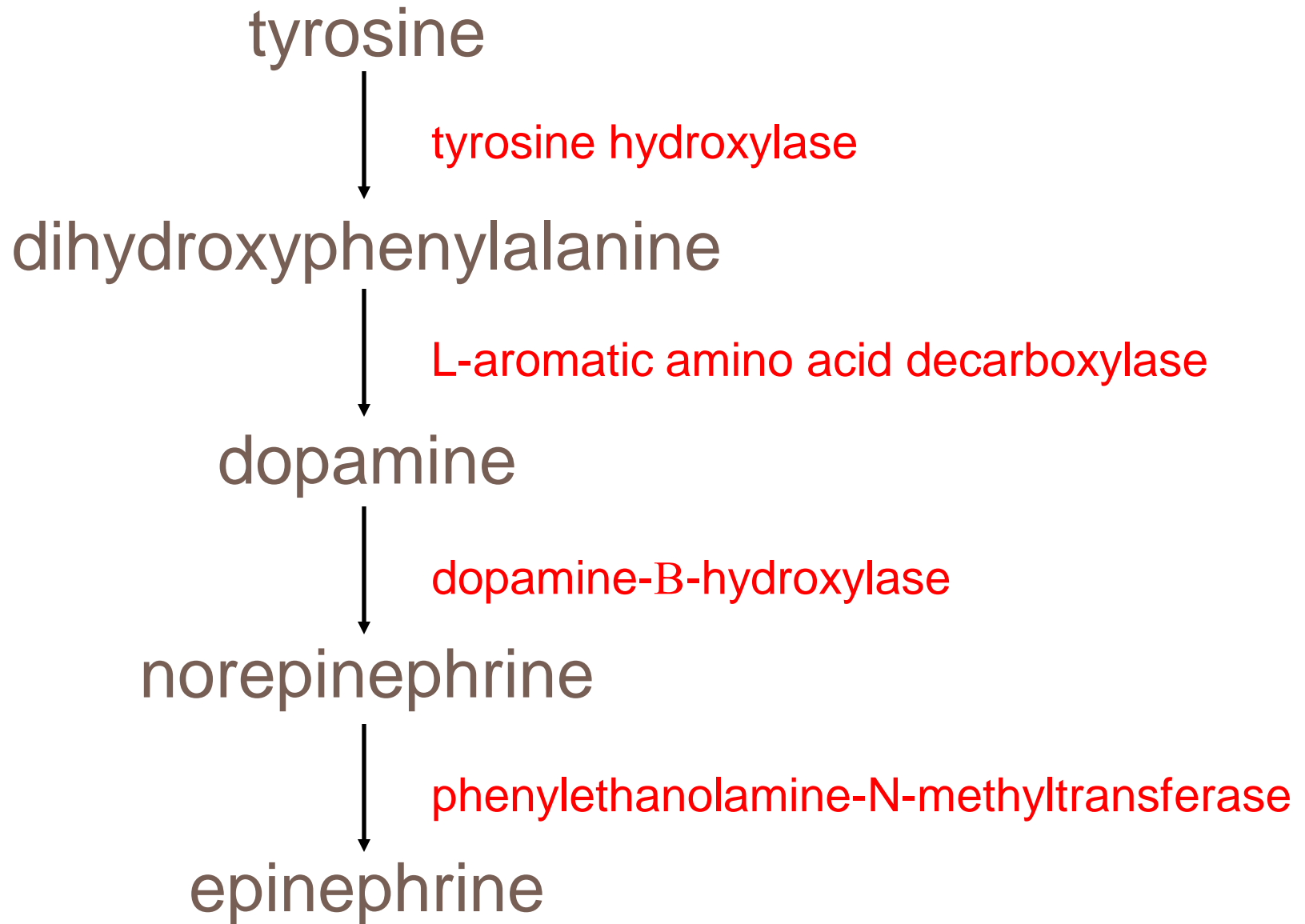


Hormones of the Adrenal Medulla

- Adrenaline (epinephrine)
- Noradrenaline (norepinephrine)

- 80% of released catecholamines are epinephrine.
- Hormones are secreted and stored in the adrenal medulla and released in response to appropriate stimuli.

Catecholamine Synthesis



Mechanism of Action

- Receptor mediated – adrenergic receptors
- Peripheral effects are dependent upon the type and ratio of receptors in target tissues

Receptor	α	β
Norepinephrine	+++++	++
Epinephrine	++++	++++

Relative effects of epinephrine and norepinephrine on α and β adrenergic receptors.

Guyton

Differences between Epinephrine and Norepinephrine

- Epinephrine \gg norepinephrine – in terms of cardiac stimulation leading to greater cardiac output (β stimulation).
- Epinephrine $<$ norepinephrine – in terms of constriction of blood vessels – leading to increased peripheral resistance – increased arterial pressure.
- Epinephrine \gg norepinephrine – in terms of increasing metabolism Epi = 5-10 x Norepi. = 100% normal

Effects of Epinephrine

- Metabolism
 - Glycogenolysis in liver and skeletal muscle:
 - can lead to hyperglycemia
 - Mobilization of free fatty acids
 - Increase metabolic rate
 - O_2 consumption increases

Effects of Epinephrine

•Cardiovascular

- ↑ Heart rate & cardiac contractility
- ↑ BP

Respiration:

- ↑ Oxygen consumption & respiratory rate

Pheochromocytoma

- A catecholamine-secreting tumor of chromaffin cells of the adrenal medulla

adrenal pheochromocytoma (90%)

Extra-adrenal pheochromocytoma

Signs and Symptoms of Pheochromocytoma

- resistant hypertension (95%)

- headache

- sweating

- palpitations

- chest pain

- anxiety

- glucose intolerance

- increased metabolic rate



classic triad

Diagnosis and Treatment

- Diagnosed by high plasma catecholamines and increased metabolites [VMA] in urine
- Treatment is surgical resection