

Adrenal Cortex Gland

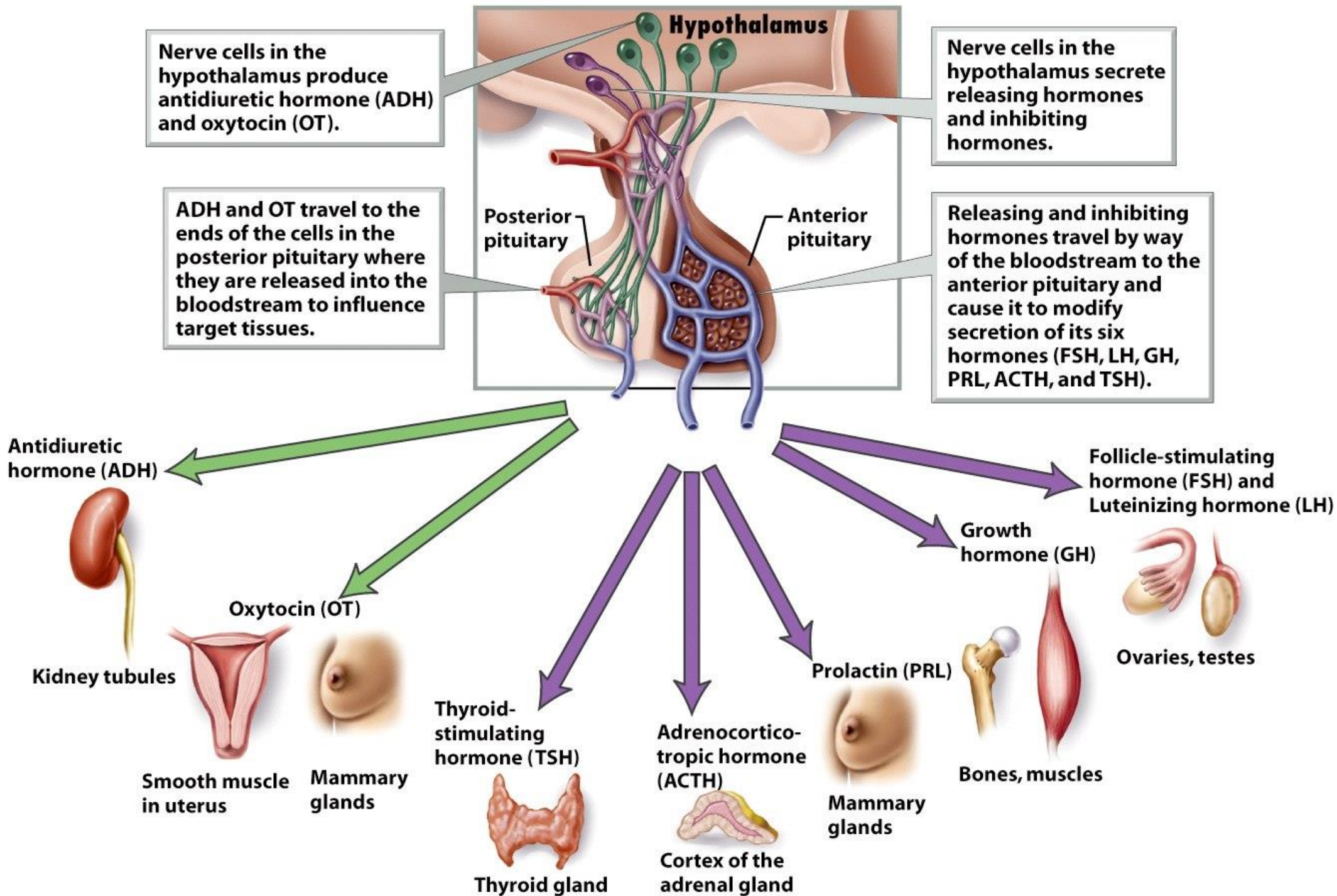


Figure 10-6 Biology of Humans, 2/e
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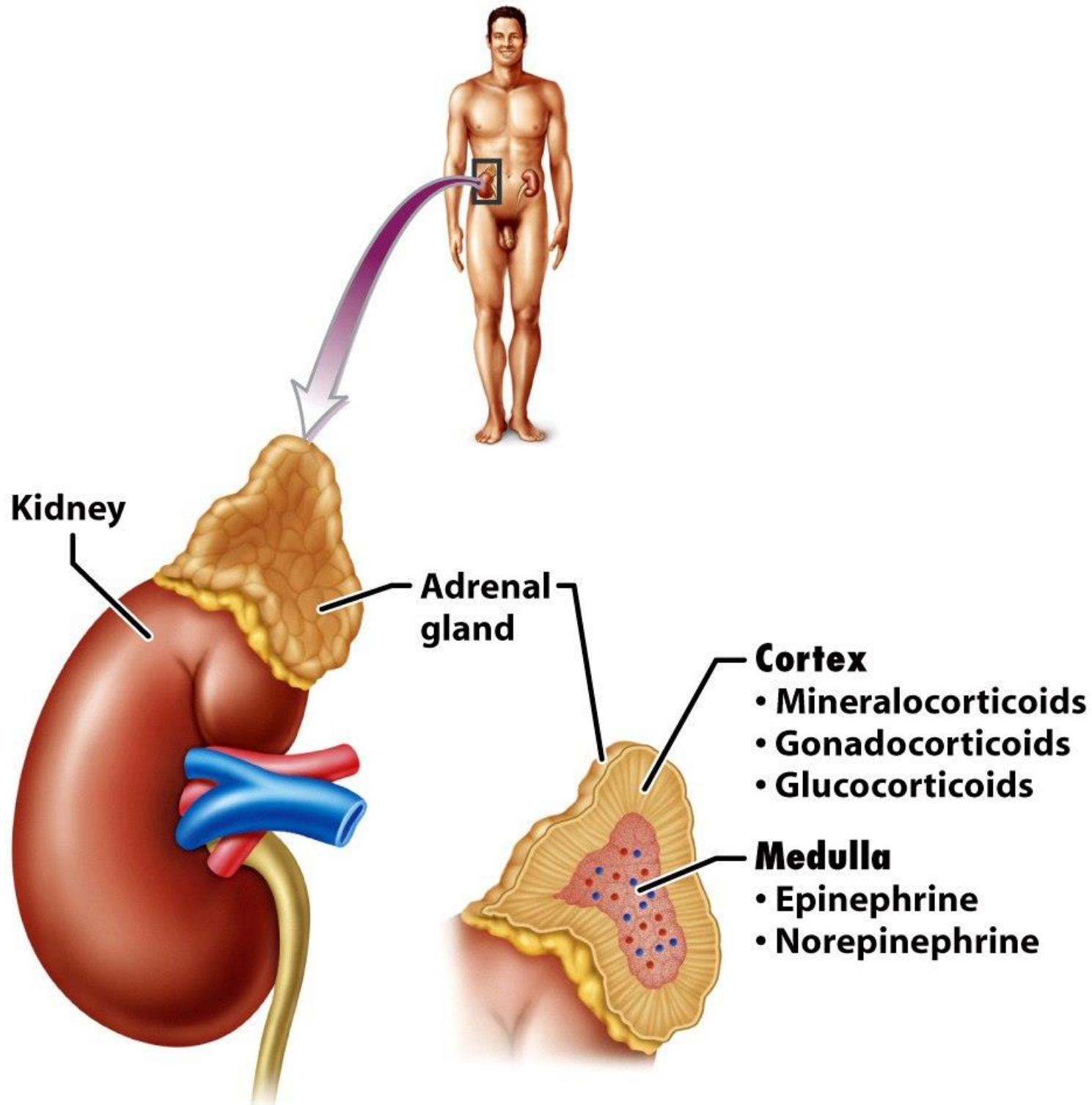
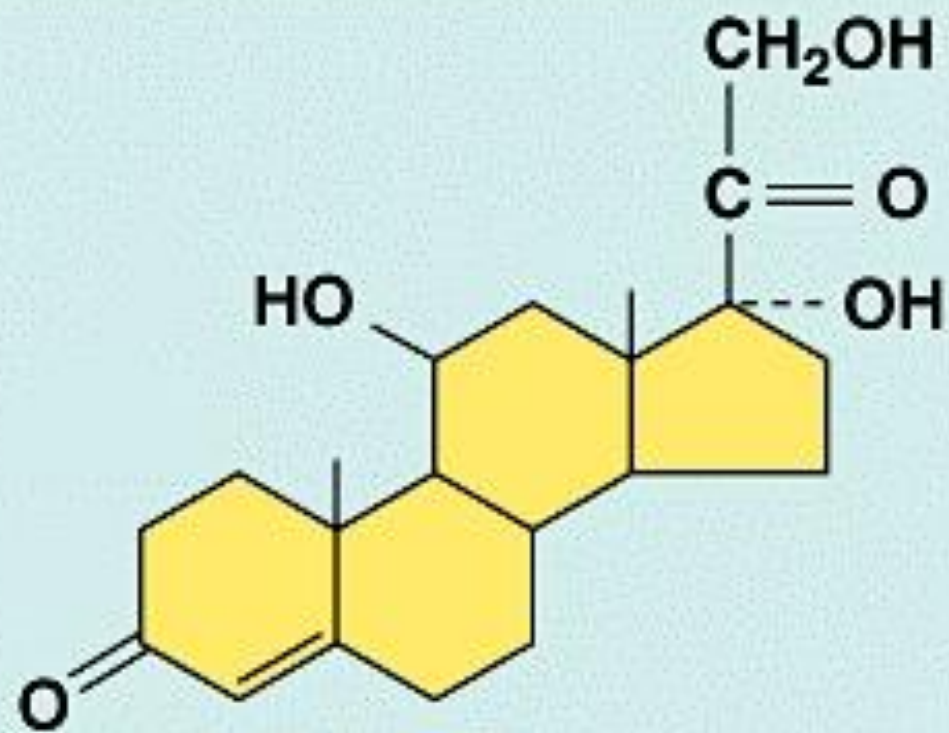


Figure 10-17 Biology of Humans, 2/e
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Cortisol
(a glucocorticoid)

Adrenal Cortex: Secretion of Cortisol

- Mediated through hypothalamus (CRH) and pituitary hormone (ACTH)
- See feedback workshop
- Stress is a major stimulus for cortisol release

Adrenal Cortex: Action of Cortisol

- Synthetic (drug) version: Prednisone
- Catabolic/starvation-like effects on metabolism
 - Bkdn proteins and fat; converts them to glucose
- Suppresses Immune System
 - Anti-inflammatory effects (helps with stress?)

Behavioral Effects

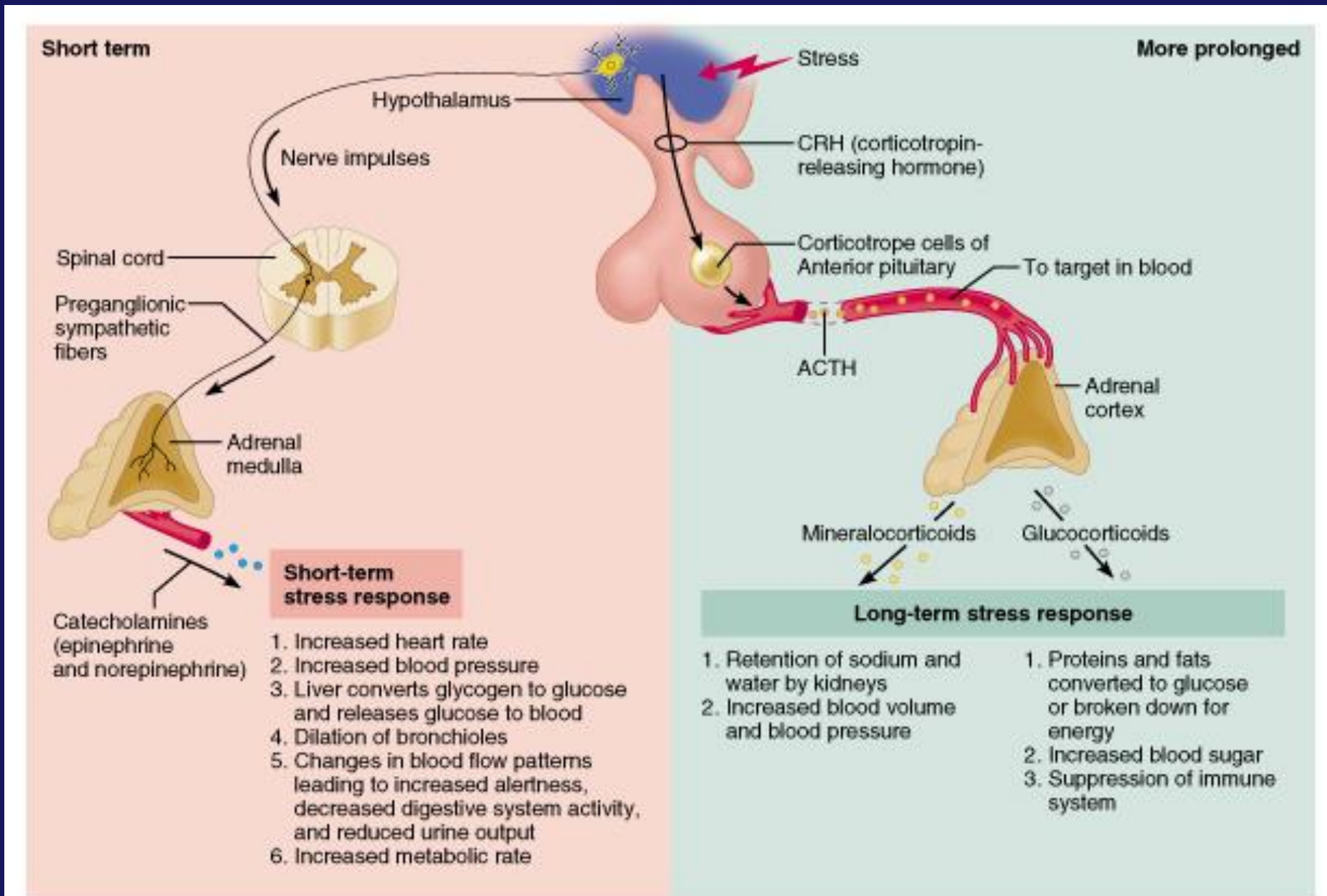
- Cortisol reduces
 - Social anxiety
 - Phobias
- Cortisol alters mood



Adrenal Glands: Cortex

- Adrenal cortex
 - Mineralocorticoids: aldosterone
 - Homeostasis of Na⁺, K⁺, water, blood pressure

Effect of Stress on Adrenal Gland



Glucocorticoids (e.g., cortisol) (Choose all that are correct)

- A. Are secreted from the adrenal cortex
- B. Are secreted in response to stress
- C. Have anti-inflammatory activity



Disorders of the Adrenal Glands

- Addison's Disease: cortisol deficiency
 - Failure of adrenal cortex
 - JF Kennedy
- Cushing's Syndrome: excessive secretion of glucocorticoids (cortisol)
 - Excessive glucose prodn. from protein
 - Salt and water retention

Cushing's Syndrome



Deposition of Abdominal Fat

Connective Tissue

Inhibition of collagen formation leads to stretch marks on skin (striae), and rupturing of small blood vessels (bruising)



Symptoms of Hypercortisolism (Cushing's)

Cushing's Syndrome



red cheeks

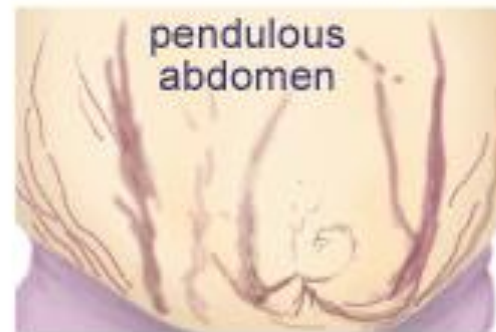
moon face

Osteoporosis;
compressed
(codfish)
vertebrae

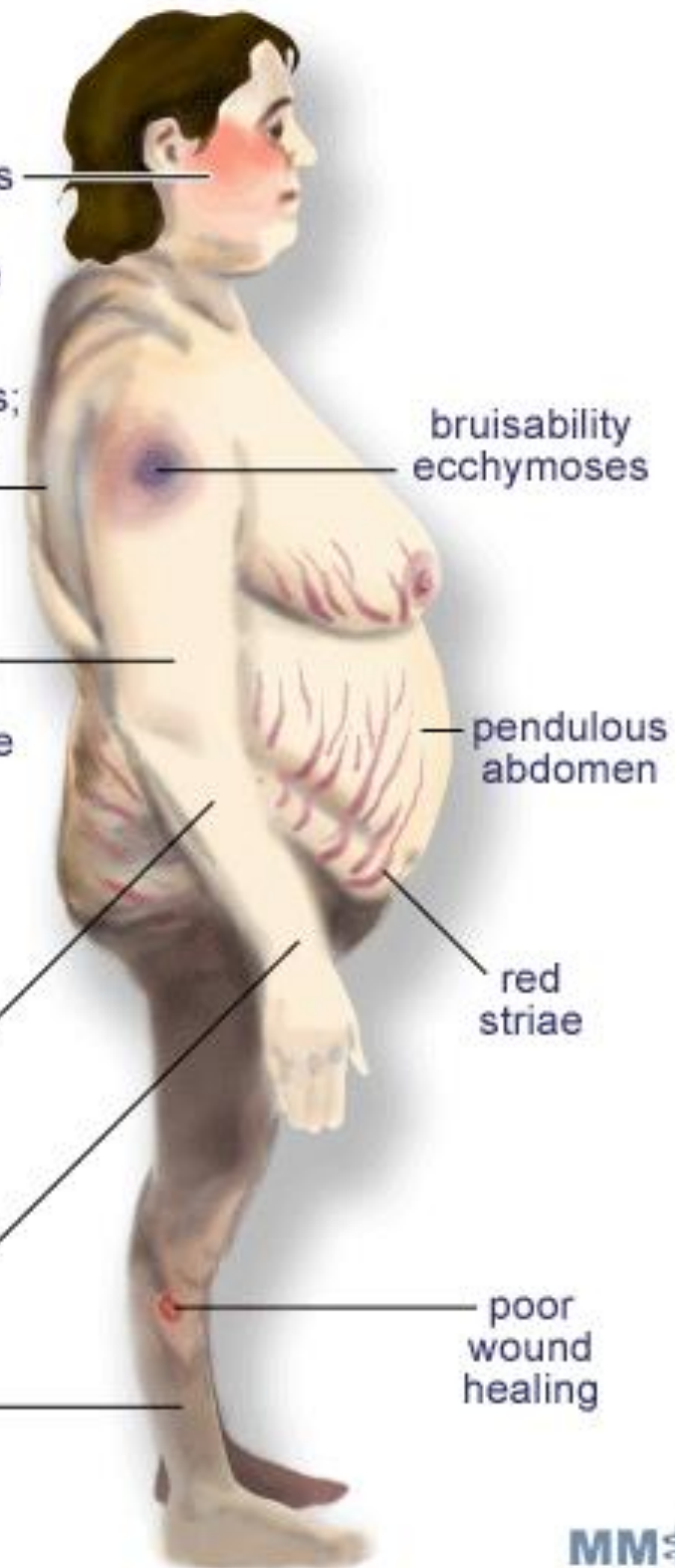
Excessive Cortisol



fat pads
(buffalo
hump)



pendulous
abdomen



high
blood
pressure

bruisability
ecchymoses

pendulous
abdomen

thin
skin

red
striae

thin
arms
and
legs

poor
wound
healing

Hypercortisolism, a.k.a Cushing's Disease

- Can also result from prescription use of glucocorticoids
 - Prednisone
 - Used to treat asthma, rheumatoid arthritis, lupus (autoimmune disease), inflammatory diseases, immunosuppression after organ transplantation



**Patient diagnosed with
Cushing's syndrome**



Same patient after treatment

Before and After



Effects of Cushing's Syndrome.



before



After 2 years of
treatment

Cushing's Syndrome



(a) Before Cushing's



(b) During the disease

Buffalo Hump

- Caused by unique fat deposition patterns of excessive glucocorticoids



Before and After



Before and After



Hypercortisolism

Jerry Lewis

- Before and after taking
glucocorticoids (prednisone)
for an autoimmune disorder



True/False

- Excess glucocorticoids can cause abnormal deposition of fat tissue



Glucocorticoid hormones (e.g., cortisol):

- A. Have anti-inflammatory effects
- B. Are secreted during and provide resistance to stress
- C. Have catabolic/starvation like effects on the body
- D. Are secreted by the adrenal cortex

