

# The Endocrine System & The Urinary System

PACKET #14

# Endocrine System: Overview

- ▶ Acts **with** the **nervous system** to **coordinate and integrate the activity of body cells**
- ▶ Influences **metabolic activities** by means of **hormones** transported in the blood
- ▶ Responses occur more slowly but tend to last longer than those of the nervous system
- ▶ Endocrine glands: **pituitary, thyroid, parathyroid, adrenal, and pineal glands**

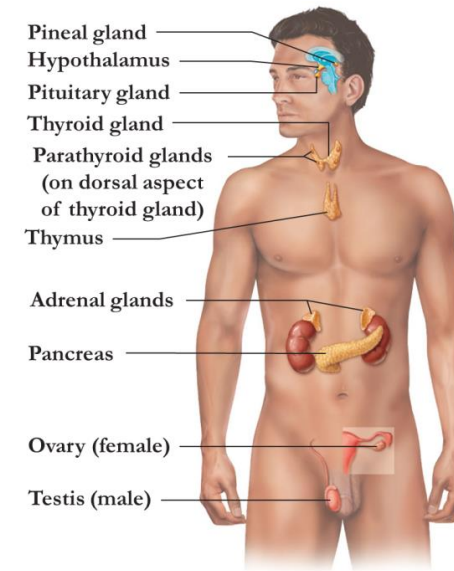


Figure 16.1

# Endocrine System Glands

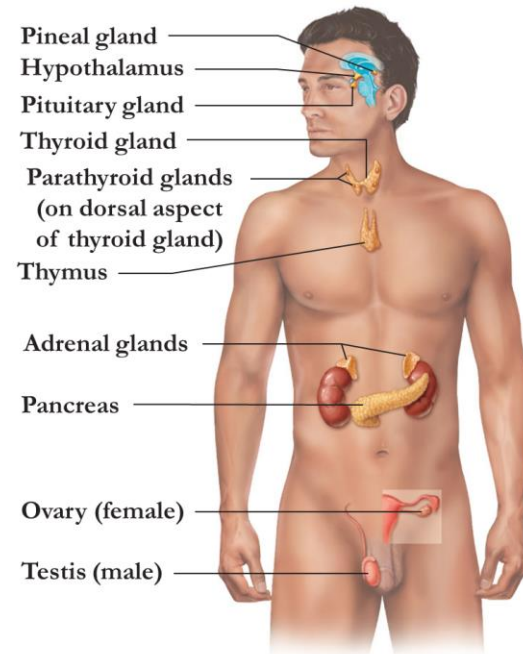


Figure 16.1

# Nervous and Endocrine Systems

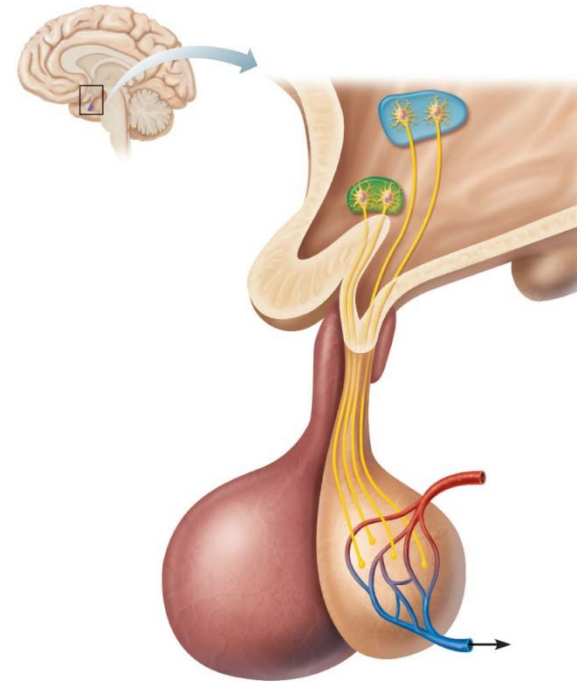
- ▶ Act **together** to coordinate functions of all body systems
- ▶ **Nervous system**
  - ▶ Nerve impulses/ Neurotransmitters
  - ▶ **Faster** responses, briefer effects, acts on specific target
- ▶ **Endocrine system**
  - ▶ **Hormone** – mediator molecule released in 1 part of the body but regulates activity of cells in other parts
  - ▶ **Slower responses, effects last longer, broader influence**

# Endocrine System: Overview

- ▶ Some organs produce both hormones and exocrine products (e.g., pancreas and gonads)
- ▶ The hypothalamus has both neural and endocrine functions
- ▶ Other tissues and organs that produce hormones include adipose cells, thymus, cells in the walls of the small intestine, stomach, kidneys, and heart

# The Pituitary Gland and Hypothalamus

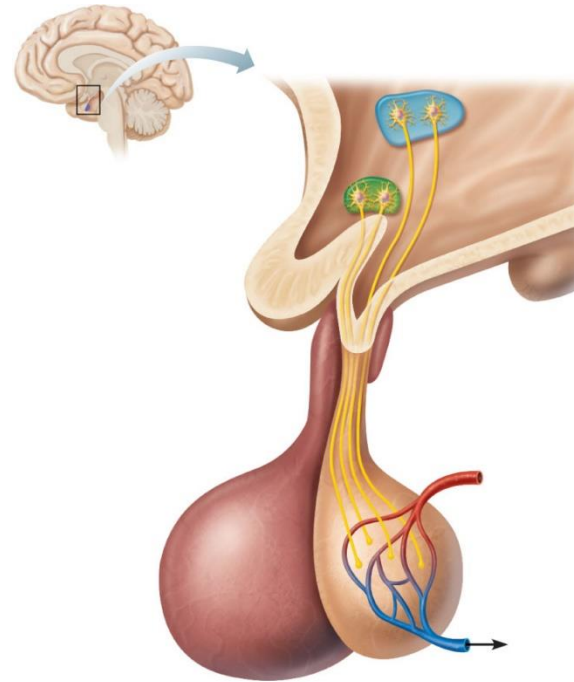
- ▶ When investigating the urinary system, one must recognize the relationship between the pituitary gland and the hypothalamus.
- ▶ The pituitary gland (hypophysis) has two major lobes
  1. Posterior pituitary (lobe):
    - ▶ Pituicytes (glial-like supporting cells) and nerve fibers
  2. Anterior pituitary (lobe)  
(adenohypophysis)
    - ▶ Glandular tissue



# Pituitary-Hypothalamic Relationships

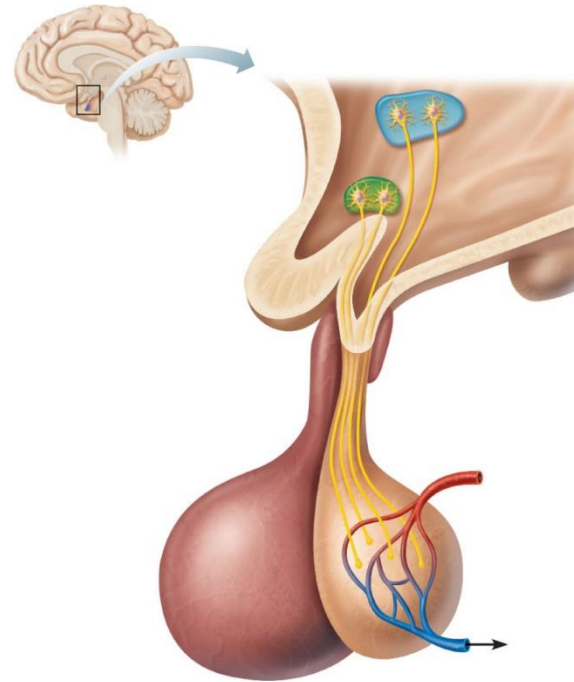
## ▶ Posterior lobe

- ▶ A downgrowth of hypothalamic neural tissue
- ▶ Neural connection to the hypothalamus (hypothalamic-hypophyseal tract)
- ▶ Nuclei of the hypothalamus synthesize the neurohormones oxytocin and antidiuretic hormone (ADH)
- ▶ Neurohormones are **transported to the posterior pituitary**



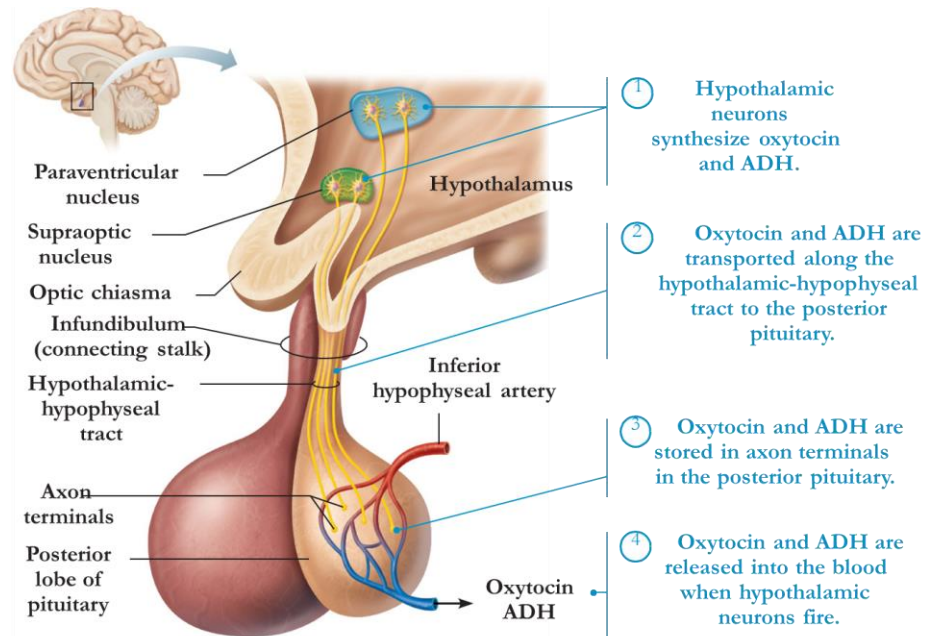
# Pituitary-Hypothalamic Relationships

- ▶ Anterior Lobe:
  - ▶ Carries releasing and inhibiting hormones to the anterior pituitary to regulate hormone secretion





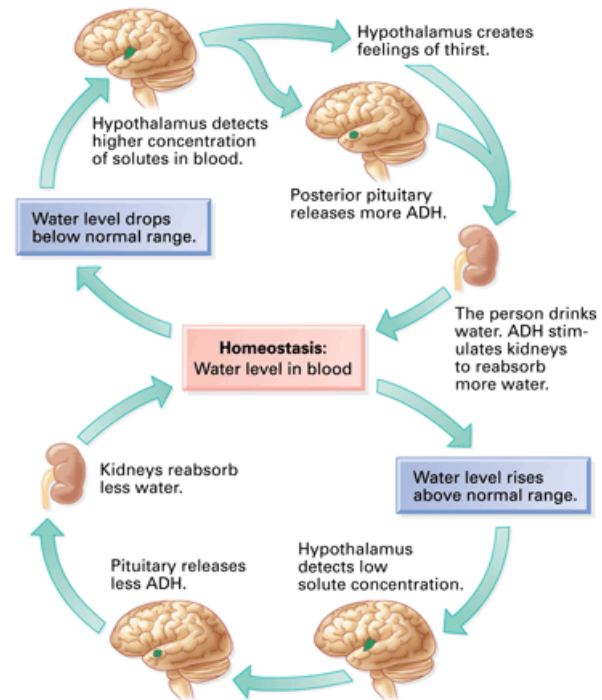
# The Pituitary Gland and Hypothalamus



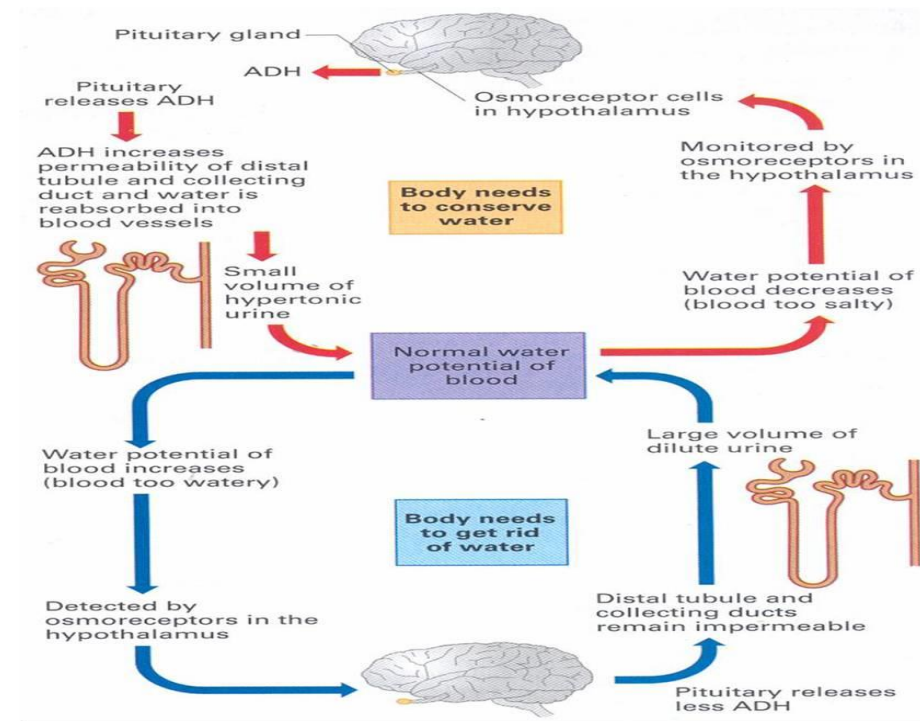
(a) Relationship between the posterior pituitary and the hypothalamus

Figure 16.5a

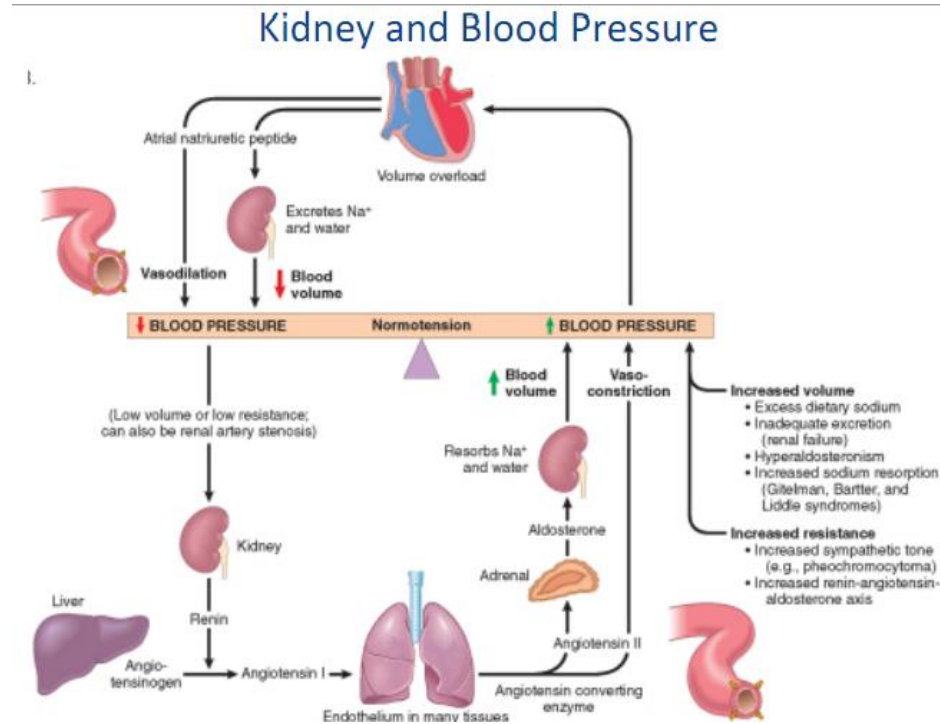
# Homeostasis, ADH & Water I



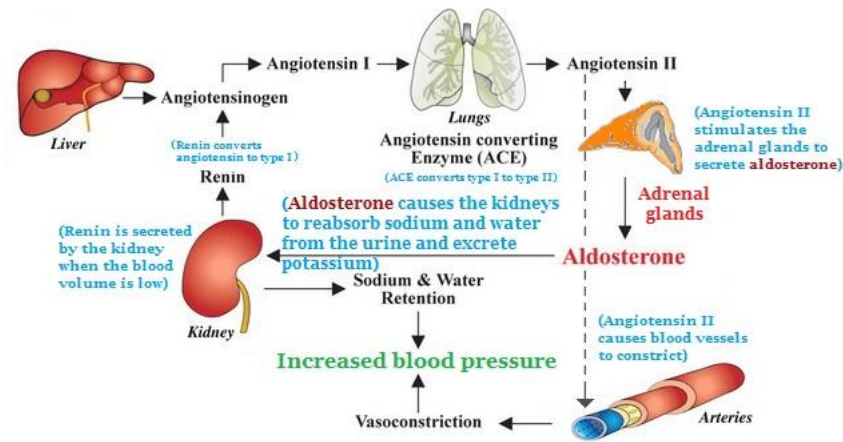
# Homeostasis, ADH & Water II



# Homeostasis, $\text{Na}^+$ , Renin & Aldosterone I

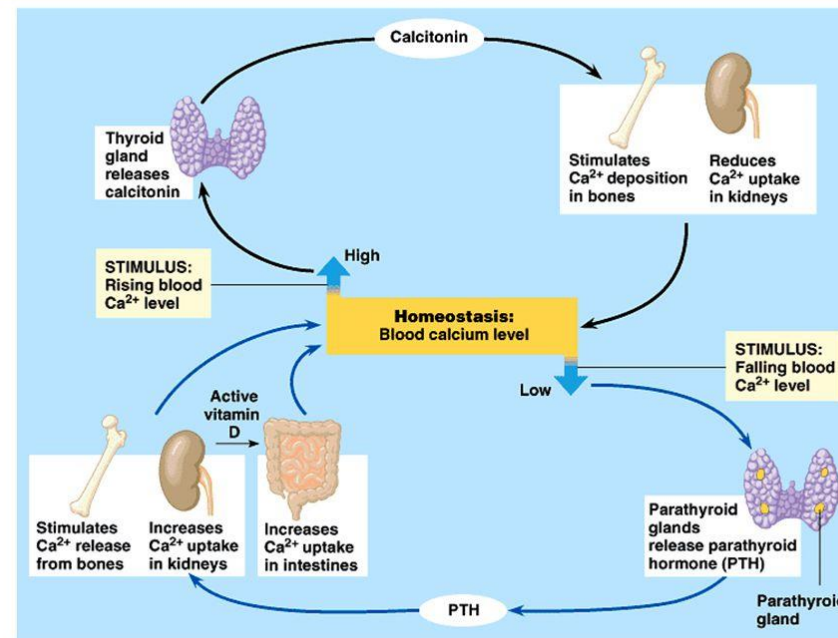


# Homeostasis, $\text{Na}^+$ , Renin & Aldosterone II



# Homeostasis, $\text{Ca}^{2+}$ & PTH

Hormonal control of calcium homeostasis in mammals



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# More Later...

- ▶ More to come later in the course on the endocrine system...

# Review

Sunday,  
February 26,