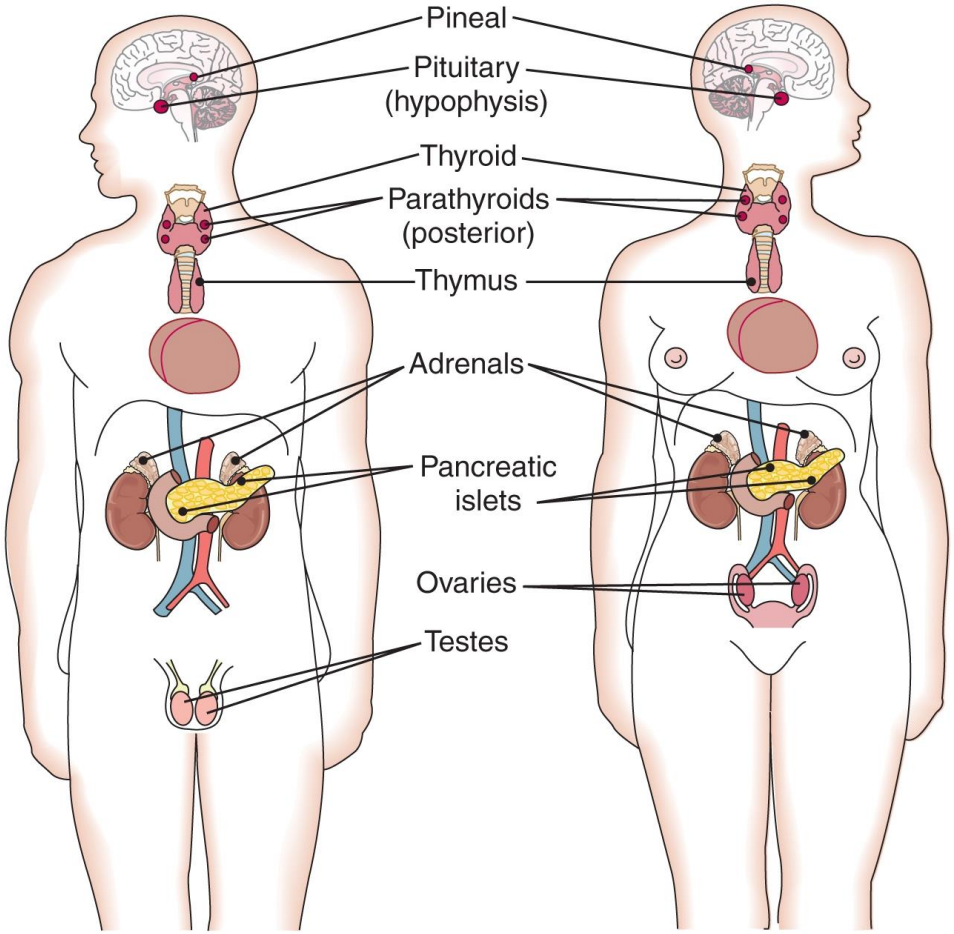
Endocrine System

Week 5

Endocrine System

- Glands



Endocrine System

- **Endocrine glands** with **Nervous System**

  to maintain *homeostasis*

- Hormones
  - Chemical messengers that have specific effects on certain cells
  - Only certain tissues respond to a specific hormone
  - **Target tissue:** tissue that is influenced by certain hormone
  - Cells in target tissue have receptors specific to hormone

Endocrine System

- Endocrine Glands secrete hormones directly into blood stream
  - Make about 2 dozen hormones
  - Control production via negative feedback
  - **Pituitary gland in the brain**
    - Master gland
    - Releases hormones that affect other glands
    - Controlled by hypothalamus

Effects of Aging

- Decrease in hormone production & secretion
- Alteration in hormone metabolism
- Development of Type 2 diabetes due to decreased insulin secretion
- Decreased thyroid hormone production, leading to:
  - Fatigue
  - Dry skin
  - Forgetfulness

Common Diseases/Conditions

- All are conditions of too much (hyper) or too little (hypo)
- Thyroid
- Pancreas (Diabetes)
- Adrenals
- Pituitary
- Ovaries
- Testes

Thyroid Gland

- Shaped like a butterfly.
- Located in the throat; wrapped around the larynx
- Regulates calcium levels and body metabolism

Hypothyroid

- 1. Fatigue
- 2. Weight gain or inability to lose weight
- 3. Constipation
- 4. Dry hair, dry skin
- 5. Depressed mood
- 6. Sensitivity to cold
- 7. Shorter, lighter or missed menstrual periods

Hyperthyroid

- 1. Bowel disturbances: diarrhea
- 2. Thinning hair
- 3. Sensitivity to heat
- 4. Irritability
- 5. dramatic, unexplained weight loss
- 6. Heavier or longer menstrual periods

Treatment

- Hypothyroid: Daily intake of synthetic thyroid hormone.
  - Usually life-long
  - Periodic blood tests to determine dosage
- Hyperthyroid: depends on severity
  - Radioactive iodine
  - Anti-thyroid medications
  - Surgery

Pancreas

- Feather-shaped located behind the stomach
- Islets of Langerhans
  - Produce insulin
  - Produce glucagon

- Diabetes: results from insulin deficiency

Diabetes

- Diabetes means you have too much glucose in your blood and not enough in your cells.
- This can lead to serious health consequences.
- Type 1 diabetes typically appears during childhood or adolescence.
- Type 2 diabetes, can develop at any age, though it's more common in people older than 40.

Diabetes Symptoms

- Increased thirst
- Frequent urination
- Extreme hunger
- Unexplained weight loss
- Presence of ketones in the urine (ketones are a byproduct of the breakdown of muscle and fat that happens when there's not enough available insulin)
- Fatigue
- Irritability
- Blurred vision
- Slow-healing sores
- Frequent infections, such as gums or skin infections and vaginal infections

How insulin works

- Insulin is a hormone that comes the pancreas
- The pancreas secretes insulin into the bloodstream.
- The insulin circulates, making it possible for sugar to enter your cells.
- When sugar enters the cells the amount of sugar in your bloodstream drops.
- As your blood sugar level drops, so does the secretion of insulin from your pancreas.

The Cells of the Body Need Glucose

- Glucose — a sugar — is a source of energy for the cells that make up muscles and other tissues.
- Glucose comes from two major sources: food and your liver.
- Sugar is absorbed into the bloodstream, where it enters cells only with the help of insulin.
- Your liver stores and makes glucose.
- When your glucose levels are low, such as when you haven't eaten in a while, the liver breaks down stored glycogen into glucose to keep your glucose level within a normal range.

Long-term Complications

- Cardiovascular Disease
- Nerve Damage **(neuropathy)**
- Kidney Disease **(nephropathy)**
- Eye Disease **(retinopathy)**
- Foot Problems (unhealed sores)
- Hearing Impairment

Quick Check

- 1. Endocrine glands secrete hormones directly into _____.
- 2. Disorders are almost always due to _____ or _____ hormone secretion.
- 3. The thyroid gland regulates body _____.
- 4. A Type I diabetic requires daily injections of _____.