Endocrine System Glands
Objectives

- Describe the functions and locations of the major endocrine glands
Hypothalamus
The hypothalamus makes hormones that control the pituitary gland. In addition, it makes hormones that are stored in the pituitary gland.

Pituitary gland
The pituitary gland produces hormones that regulate many of the other endocrine glands.

Parathyroid glands
These four glands release parathyroid hormone, which regulates the level of calcium in the blood.

Thymus
During childhood, the thymus releases thymosin, which stimulates T cell development and proper immune response.

Adrenal glands
The adrenal glands release epinephrine and norepinephrine, which help the body respond to stress.

Pineal gland
The pineal gland releases melatonin, which is involved in rhythmic activities, such as daily sleep-wake cycles.

Thyroid
The thyroid produces thyroxine, which regulates metabolism throughout the body.

Pancreas
The pancreas produces insulin and glucagon, which regulate the level of glucose in the blood.

Ovary
Ovaries produce estrogen and progesterone. Estrogen is required for the development of female secondary sex characteristics and for the development of eggs. Progesterone prepares the uterus for a fertilized egg.

Testis
The testes produce testosterone, which is responsible for sperm production and the development of male secondary sex characteristics.
Pituitary Gland

- Bean-shaped structure located at the base of the skull
- Secretes 9 hormones that directly regulate many body functions
- Works with the hypothalamus to control the actions of other endocrine glands
- Controls growth
Hypothalamus

- Part of the brain and attached to the pituitary gland
- Controls the secretions of the pituitary gland
- Interactions between the nervous system and the endocrine system take place in the hypothalamus
Thyroid Gland

• Located at the base of the neck and wraps around the upper part of the trachea
• Major role is regulating the body’s metabolism
• Also helps maintain heart rate, blood pressure, and body temp.
Parathyroid Glands

- Located on the back surface of the thyroid gland
- Works with the thyroid gland to maintain normal calcium levels in the blood
Adrenal Glands

- Two pyramid structures located on top of the kidneys
- Release hormones that help the body prepare for and deal with stress
- Regulate carbohydrate and protein metabolism
Pancreas

- Located next to the stomach
- Endocrine function
  - Produces insulin and glucagon, which helps to keep the level of glucose in the blood stable
  - Insulin stimulates cells in the liver and muscles to remove sugar from the blood and store it as glycogen or fat
  - Glucagon stimulates the liver to break down glycogen and release glucose back into the blood
- Also releases fatty acids from stored fats
- Exocrine function
  - Produces enzymes and sodium bicarbonate which helps in food digestion
Thymus

- Located beneath the sternum and between the lungs
- Produces T-cells (a type of white blood cell)
Pineal Gland

- Located at the base of the brain
- Regulates sleep patterns
Gonads

- Located in the lower abdomen
- **Ovaries**
  - Female gonads
  - Produces the female sex hormones estrogen and progesterone
    - Responsible for egg production and female physical characteristics
- **Testes**
  - Male gonads
  - Produce the male hormone testosterone
    - Responsible for sperm production and male physical characteristics
Notes Review

• Describe the functions and locations of the major endocrine glands

• Pituitary Gland
  – Location: base of the skull
  – Function(s): regulates many body functions; works with the hypothalamus to control the endocrine system; controls growth

• Hypothalamus
  – Location: part of the brain attached to the pituitary gland
  – Function(s): controls the secretions of the pituitary gland
Notes Review

• Thyroid Gland
  – Location: at the base of the throat wrapped around the upper part of the trachea
  – Function(s): regulates the body’s metabolism

• Parathyroid Gland
  – Location: back surface of the thyroid gland
  – Function(s): works with thalamus to maintain normal calcium levels in the blood

• Adrenal Glands
  – Location: on top of the kidneys
  – Function(s): release hormones that help the body prepare for and deal with stress
Notes Review

- **Pancreas**
  - Location: next to the stomach
  - Function(s): maintains stable levels of glucose in the blood

- **Thymus**
  - Location: behind the sternum in between the lungs
  - Function(s): produces t-cells

- **Pineal Gland**
  - Location: base of the brain
  - Function(s): regulates sleep patterns
Notes Review

- Gonads
  - Location: lower abdomen
  - Function(s): produce gametes and secrete sex hormones