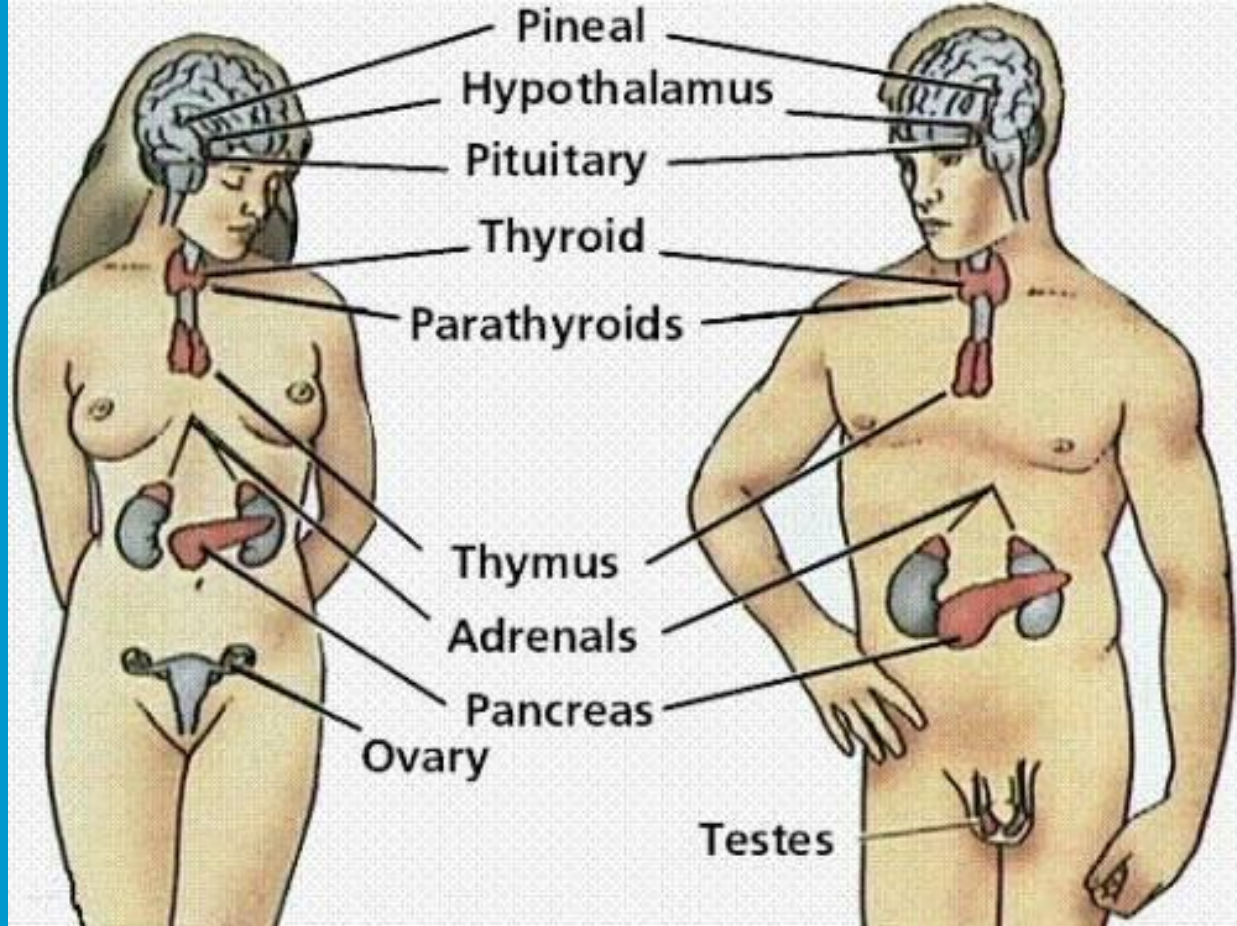




# ENDOCRINE SYSTEM

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**The Endocrine System** is the collection of glands that produce hormones that regulate metabolism, growth and development, tissue function, sexual function, reproduction, sleep, and mood.



# Structures and Functions

**Parathyroid gland:** produces PTH (Parathyroid Hormone)

Adrenal glands: produces Cortisol, which responds to stress and regulates metabolism, and Aldosterone, which controls blood pressure.

**Pancreas:** converts food to fuel. Its purpose in the endocrine system is to regulate blood sugar.

**Testicles:** produces testosterone which maintains the health of the male reproductive system.

# Structures and Functions

**Pituitary Gland:** helps regulate functions of other glands and causes pituitary hormone production. Two lobes (anterior and posterior)

**Ovaries:** Maintains the health of the female reproductive system. Two main hormones (estrogen which allows women to develop and progesterone which prepares uterus for pregnancy)

**Thyroid gland:** Regulates metabolism. Two main hormones (T3 and T4 which serve the same purpose)

# Structures and Functions

- Two other types of glands;

## 1) **Endocrine Glands**

- \*do not have a duct system

- \*release hormones directly into the blood

## 2) **Exocrine Glands**

- \*contain ducts

- \*ducts are tubes leading from a gland to its target organ

# Team Work

- All of the structures within this system work together by integrating body activities and at the same time ensuring the composition of the body fluids bathing the constituent cells, remains constant.
- This is done through homeostasis; and homeostasis is the tendency of a system to maintain internal stability.
- Endocrine glands have a rich blood supply through which hormones travel to reach their target organs.

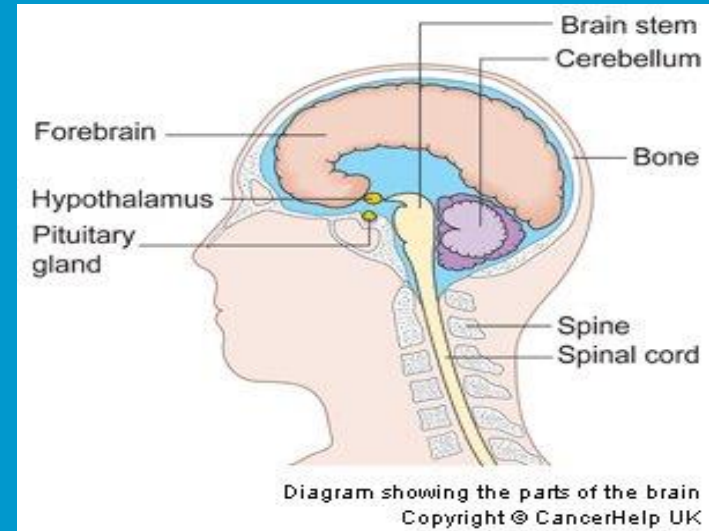
# Evolution

- Endocrine glands evolved in the animal kingdom as separate, hormone secreting structures.
- Some endocrine glands are derived from nerve cells that migrated during evolution from the nervous system to various locations in the body.

# Relationship with nervous system

Neural control centers in the brain control endocrine glands. The hypothalamus (main control) sends messages to the pituitary gland which, as a result releases hormones to regulate bodily functions.

The Nervous and Endocrine Systems are so closely related that they are called,  
**“The NeuroEndocrine System”**





# Positive and Negative Feedback

- **Positive**: the original stimulus is promoted rather than regulated. For instance, in childbirth, the hormone oxytocin stimulates and enhances labor contractions.

\*Positive Feedback is rarely used to maintain homeostatic functions

- **Negative**: regulation of the blood calcium level; parathyroid glands secrete hormone, which regulates the blood calcium

# Potential Diseases

**Hypoglycemia:** a disease that occurs when an organism has too much insulin. This generally occurs in diabetes patients who have taken too much insulin. This is also known as low blood sugar or low blood glucose.



# Treatments

- **Hypoglycemia:**

- \*delivery of a source of easily absorbed sugar

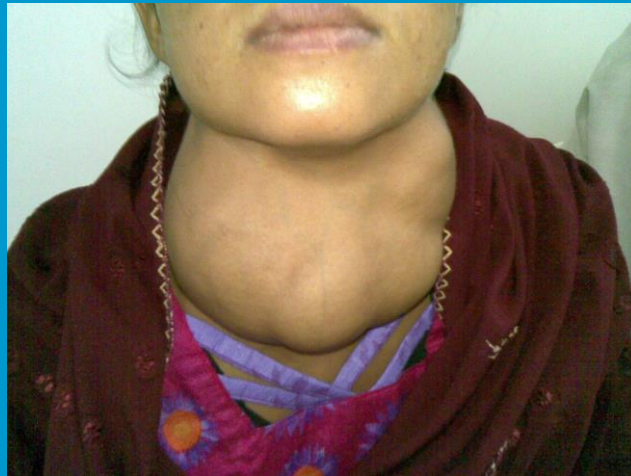
- \*regular soft drink

- \*hard candy



# Potential Diseases

**Hypothyroidism:** Pituitary gland produces TSH which is carried to the thyroid where it cannot effectively make or secrete the thyroid hormone.



# Treatments

- **Hypothyroidism:**

\*Synthroid oral or Nizoral



# Potential Diseases

**Goiters:** a bulge in the neck sometimes caused by iodine deficiency.



# Treatments

- **Goiters:**

\*Ambien oral or Metformin oral



# Sources

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