

ENDOCRINE SYSTEM



Endocrine System

The endocrine system is composed of several endocrine glands.

What are Glands?

Glands are organs in our body which excrete a liquid substance having some different chemicals. This liquid is called secretion of the gland.

Glands are of two types -

Exocrine Glands

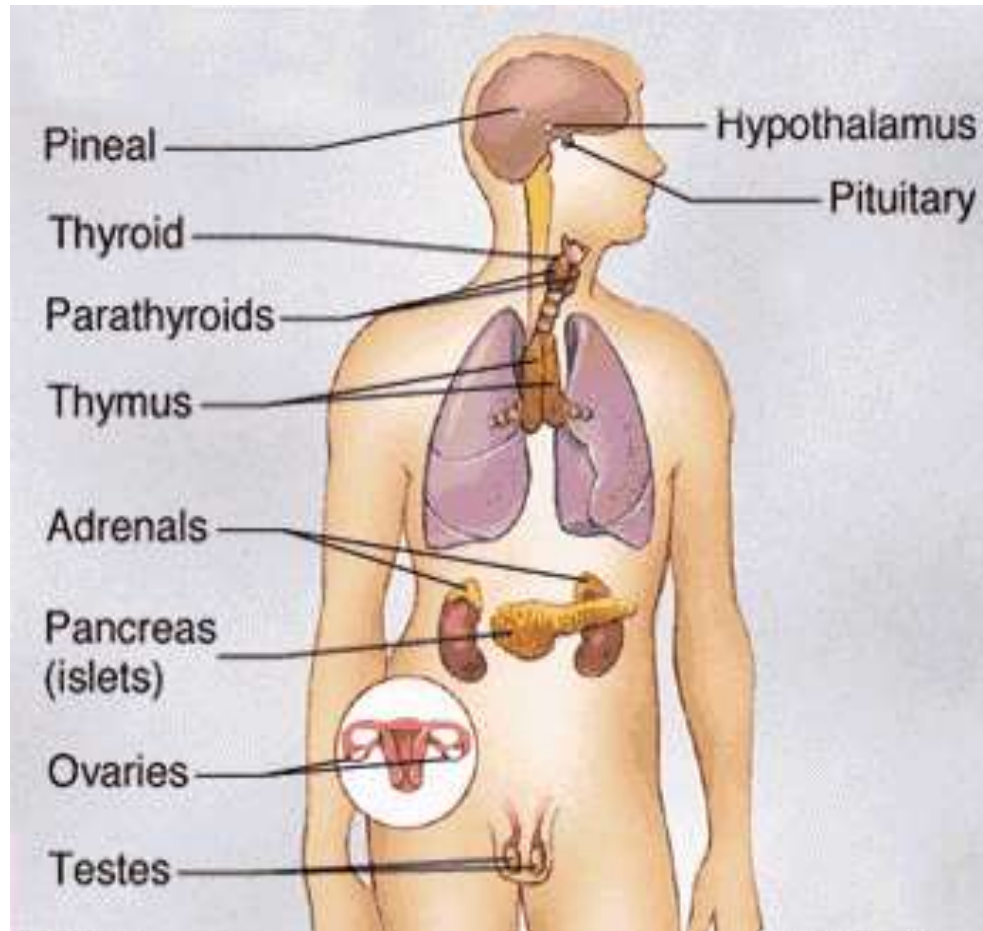
Glands that have ducts are called **exocrine glands**. The secretions of exocrine glands reach their target by traveling through a duct (tube). Some examples of exocrine glands are sweat glands and salivary glands.

Endocrine Glands

The endocrine glands do not have ducts to carry their product to a surface. They are called ductless glands.

Hormones are the chemical substances produced by endocrine glands. These glands secrete their hormones directly into the blood vessels. Blood carries the secretion to different parts.

Thus **Endocrine System** is the system of endocrine glands in our body which secretes chemical substances called “**Hormones**”. This system controls various activities of our body for example growth of body.



ENDOCRINE GLANDS IN BODY

Endocrine Gland	Hormone	Location	Function
Pineal Gland	Melatonin	Close to centre of brain	Regulates sleep cycle
Hypothalamus	Secrete many hormones	Below mid brain	-Controls pituitary gland. -Controls secretion of many other glands.
Pituitary Gland	Secrete many hormones for ex. Growth hormones, thyroid stimulating hormone etc.	Below hypothalamus in brain	-Growth hormones stimulate growth of muscles, bones. -Regulates secretion of many other glands.
Thyroid Gland	Thyroxine (Iodine is necessary for secretion of thyroxine).	Around wind pipe in neck	-Regulates metabolism of carbohydrates, fats & proteins.
Parathyroid Gland	Parathormone	On thyroid gland	Regulates the level of calcium & phosphate in body.

Thymus Gland	Thymus hormone	In upper part of chest between lungs.	Plays important role in development of immune system.
Adrenal Gland	Adrenaline	On top of kidneys.	-Secretes in small amount all the time. -But sometimes for extra energy, more adrenaline hormone is secreted by it. -It prepares the body for emergency situations, excitement and anger.
Pancreas	Insulin	Below stomach	Regulates the amount of sugar in blood.
Testes (in males)	Testosterone	In scrotum	Sperm production, development of sex organs during puberty.
Ovary (in females)	Oestrogen & Progesterone	In the pelvis	Egg production, development of sex organs during puberty.

1. Pituitary Gland is known as the master gland because it controls all other endocrine glands.

Pituitary gland is itself controlled by HYPOTHALAMUS.

2. Oversecretion or Hyposecretion of growth hormone leads to GIGANTISM.

Undersecretion or Hyposecretion of growth hormone leads to DWARFISM.

3. **Pancreas** is known as **mixed gland** because it is both exocrine and endocrine in nature. It secretes both pancreatic juice as well as INSULIN and GLUCAGON HORMONE.

4. Deficiency of **Iodine** in diet can lead to **GOITRE**. The symptom is swollen neck. This is why himalyan people suffer from goitre due to the deficiency of Iodine in their diet. Iodine is essential for the secretion of thyroxine hormone.

ADRENAL GLAND

- ❖ Occurs in pair above each kidney.
- ❖ It decreases in size with age.
- ❖ Secretes the hormone adrenaline which helps in flight and fight response.
- ❖ Also secretes nor adrenaline

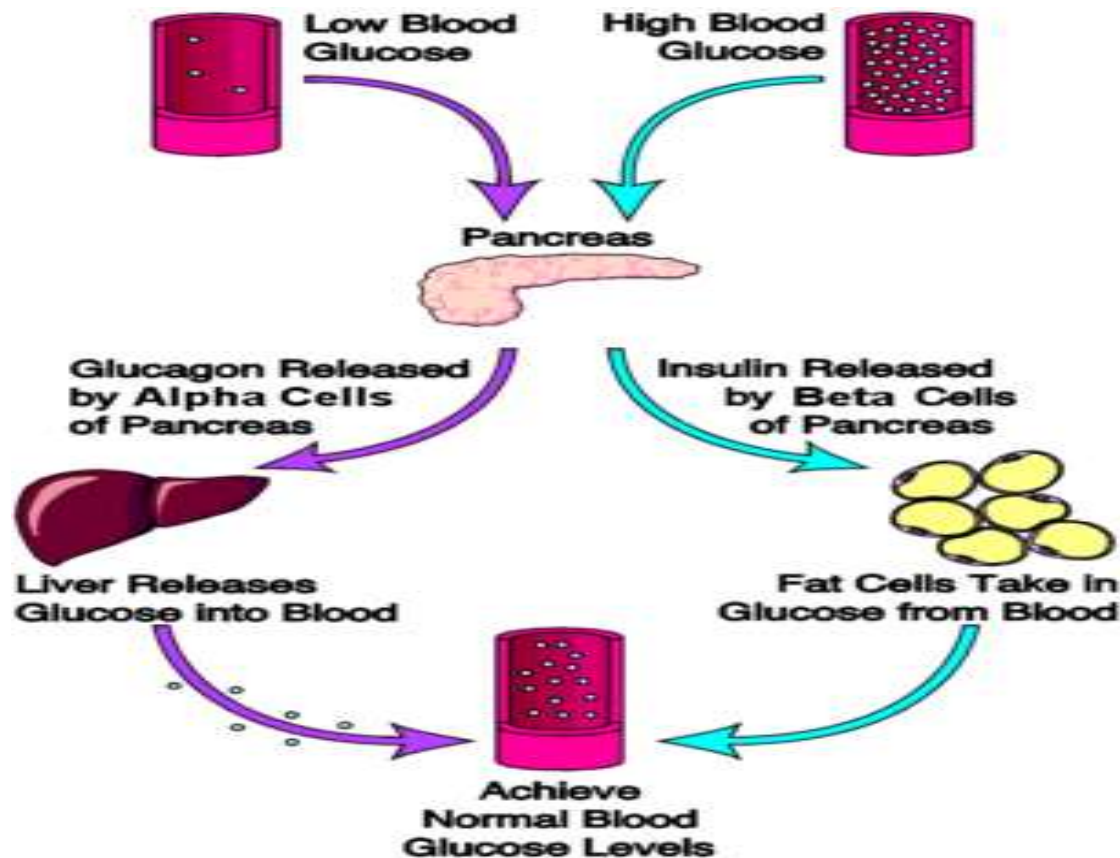
FUNCTIONS OF AN ADRENALINE:

Key actions of **adrenaline** include increasing the heart rate, increasing blood pressure, expanding the air passages of the lungs, enlarging the pupil in the eye (see photo), redistributing blood to the muscles and altering the body's metabolism, so as to maximise blood glucose **levels** (primarily for the brain). This is why it is known as an EMERGENCY hormone or "FLIGHT or FIGHT" hormone because it prepares the body to meet an emergency situations.

Feedback Mechanism

Feedback mechanism takes care that right amount of hormones are secreted by glands.

REGULATION OF BLOOD GLUCOSE BY PANCREAS GLAND



1. Need for Endocrine System

- Nervous system is not very efficient in controlling large number of organs at the same time for a particular job. In such situations endocrine system is better.
- Nervous system is not meant for sending continuous messages for long time periods. But endocrine system can easily send continuous chemical messages in slow and steady manner. So endocrine system is better for controlling slow processes such as body growth.
- **Nervous System Vs Endocrine System**

Nervous System	Endocrine System
1. Messages are in form of impulses over nerves.	Messages are in form of chemicals through blood.
1. Messages travel fast.	Messages travel slow.
1. Messages have short term effect.	Messages have long term effect.

**Thank
You**

