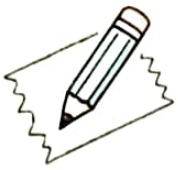


Prodigy Educlasses

Class - VIII

ICSE

Topic: Endocrine System



• What is Endocrine System? ←

- The Endocrine System is a system of ****ductless glands**** in our body that produces and releases hormones directly into the bloodstream.
- It helps to control and coordinate body activities like growth, metabolism, mood, and development.
- It works slowly but has long-lasting effects.



• Ductless Glands •

- Also called ****endocrine glands**** because they do not have ducts.
- They secrete ****hormones**** directly into the blood.
- Examples:
 -  **Thyroid Gland** - near the neck, controls metabolism 
 - **Pituitary Gland** - pea-sized, at the base of brain, called "Master Gland"
 - **Adrenal Glands** - sit on top of kidneys, make adrenaline 
 - **Pancreas (Islets of Langerhans)** - regulates blood sugar 



• Hormones are Chemical Messengers

- Hormones are chemical substances made by endocrine glands.
- They act as ****messengers**** that travel through the blood.
- Example: Insulin helps lower blood sugar.

• Difference between Endocrine and Exocrine •

Feature	Endocrine Glands	Exocrine Glands
Ducts	+ **Ductless** (no ducts) +	+ **Have ducts** +
Secretion	**Hormones** secreted into blood	**Enzymes / Sweat / Saliva** secreted through ducts
Transport	**Through bloodstream** to target organs far away	**Through ducts** to nearby area
Examples	• Thyroid, Pituitary, Adrenal	• Salivary gland, Sweat gland,  sweat gland

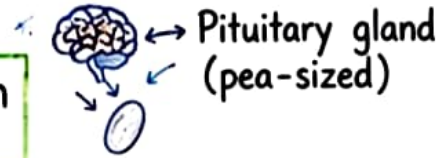
+ * Remember: Endocrine = Ductless & Hormones → go via blood ♥ ♥ +

★ Pituitary Gland — the MASTER GLAND ✨👑

- Location:
- Located at the base of the brain, just below the hypothalamus
 - Sits in a small bony cavity called the pituitary fossa / sella turcica

Hormones: 🌿

- Growth Hormone (GH) — highlighted in "also called Somatotropin"



- Stimulates growth of bones, muscles & body tissues

- ✨ Functions:
- Controls overall growth of the body — height, bone growth
 - Called the "Master Gland" because it controls other endocrine glands like thyroid, adrenal, etc.



→ Regulates other glands → master controller! ✨

Key Point! GH = Growth Hormone → too little = dwarfism, too much = gigantism

☾ ✨ Pineal Gland ✨🌰

- Location:
- Located deep in the brain, near the center between the two hemispheres
 - Part of the epithalamus, small pinecone-shaped gland 🌰

Hormones: • Melatonin — hormone produced by pineal gland ✨☾ ✨

- Functions:
- Regulates sleep-wake cycle (circadian rhythm / body clock) ✨
 - Helps in maintaining sleep and wakefulness — active at night, slows in daytime

Fun Fact: Pineal gland is sometimes called the "third eye" due to its light-sensitive role & location! 👁️ ✨ ✨

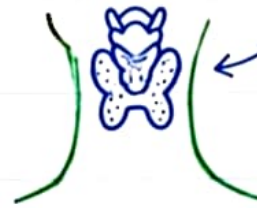
- ★ Summary:
- Pituitary gland controls growth & other glands (Master Gland) ✓
 - Pineal gland controls sleep via melatonin ✓

* Remember for exam:
• Pituitary = growth + master, ✨
• Pineal = sleep/melatonin ✨

Endocrine System — Thyroid Gland & Parathyroid



→ Thyroid butterfly shaped



← Thyroid gland

Location in Neck:

- Located in the neck, just below the larynx (voice box)
- Wraps around the trachea (windpipe), like a butterfly

Hormones Released:

- Thyroxine (T₄) • T₄ contains 4 atoms of iodine
- Triiodothyronine (T₃) — contains 3 atoms of iodine
T₃ • more active

Iodine — Why is it Important?

- Iodine is needed to make T₃ & T₄ hormones
- Found in iodised salt, seafood, dairy, eggs
- Iodine Deficiency → Goitre



Goitre:

- Swelling of thyroid gland in the neck
- Neck appears swollen • Caused due to less iodine in diet

Functions of Thyroid Hormones:

- Regulates metabolism → controls how body uses energy
- Controls growth & development in children
- Maintains body temperature
- Affects heart rate & digestion
- Four tiny glands located behind the thyroid
- Secretes PTH (Parathyroid hormone)
- Function: Regulates calcium level in blood
- Keeps calcium balanced for strong bones & teeth

Key Point: Thyroid → Metabolism | Parathyroid → Calcium balance



Remember!

Note: We get iodine from our diet!



Topic: Pancreas & Adrenal Glands



Islets of Langerhans

• Pancreas — Islets of Langerhans

Location: • Lies behind the stomach, near the small intestine & duodenum.

• Hormones of Pancreas:

1. Insulin (from Beta cells, β -cells)

• **LOWERS** — Secreted when blood sugar is HIGH $\rightarrow$ helps cells absorb blood glucose $\rightarrow$ lowers blood glucose level.

2. Glucagon (from Alpha cells, α -cells)

• **↑** — Secreted when blood sugar is LOW $\rightarrow$ converts stored glycogen to glucose $\rightarrow$ raises blood glucose level.

Functions of Insulin & Glucagon:

- ✓ Maintain homeostasis of blood glucose level ~ balance
- ✓ Work antagonistically — opposite actions keep sugar steady

• Adrenal Glands



Located on top of each kidney

• Hormone: Adrenaline (also called Epinephrine)

- Secreted from adrenal medulla (inner part)
- Function: Prepares body for "Fight or Flight" response
 - $\rightarrow$ Increases heart rate & breathing
 - $\rightarrow$ Raises blood pressure
 - $\rightarrow$ Provides sudden burst of energy

Diabetes

- Caused by deficiency or no insulin production
 - $\rightarrow$ Leads to high blood sugar level (hyperglycemia)
- Type 1 Diabetes $\rightarrow$ Pancreas cannot produce insulin
 - $\rightarrow$ requires insulin injections
- Symptoms: Frequent urination, thirst, tiredness, weight loss

Key Point:

• Insulin $\downarrow$ blood sugar — | Glucagon $\uparrow$ blood sugar | Adrenaline = stress response

* Remember: Endocrine glands secrete hormones directly into blood $\rightarrow$ regulate body functions *