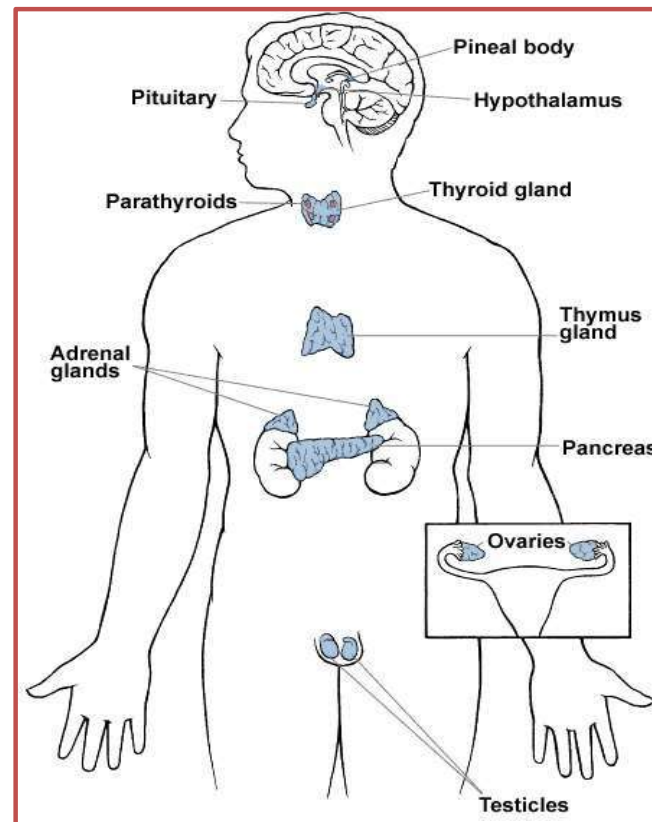


# Parts of the Endocrine System

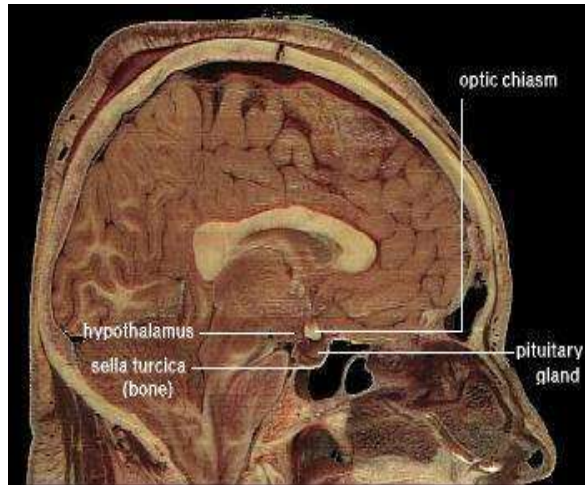
Lecture - 02

# Parts of the Endocrine System

- Hypothalamus
- Pituitary
- Pineal
- Thyroid
- Parathyroid
- Thymus
- Adrenal Glands
- Pancreas
- Testes
- Ovaries



# Hypothalamus



- The hypothalamus is a region in the brain which controls an immense amount of our bodily functions.
- It is located in the middle of the base of the brain and encapsulates the ventricle portion of the third ventricle.
  - The thalamus receives sensory information, relays some to the hypothalamus.
  - Hypothalamus monitors the body for temperature, pH, other conditions.
  - Hypothalamus signals pituitary gland if conditions need to be corrected.

# Pituitary Gland

The pituitary gland, which is located in the center of the skull, just behind the bridge of the nose, is about the size of a pea.

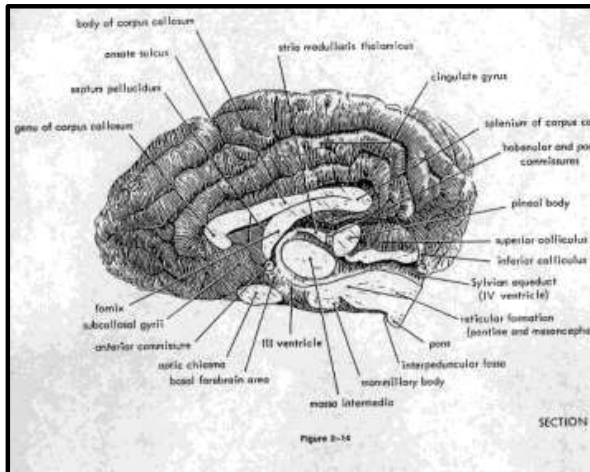
It is an important link between the nervous system and the endocrine system and releases many hormones which affect growth, sexual development, metabolism and the system of reproduction.

The "hypothalamus" is a tiny cluster of brain cells just above the pituitary gland, which transmits messages from the body to the brain.

The pituitary gland has two distinct parts, the anterior and the posterior lobes, each of which releases different hormones which affect bone growth and regulate activity in other glands. This gland was once believed to be the main controlling gland of the body, but we now know that, important as it is, it is subservient to a master gland called the hypothalamus, which is the needed link between the pituitary gland and the brain.

This "master gland" is really a way station between the body and the brain and sorts out messages going to and from the brain. It responds to the body through the pituitary gland, which is suspended just below it. It sometimes replies by nerve impulses and sometimes with needed hormones. The pituitary gland then makes hormones of its own in answer to the body's needs.

# Pineal Gland

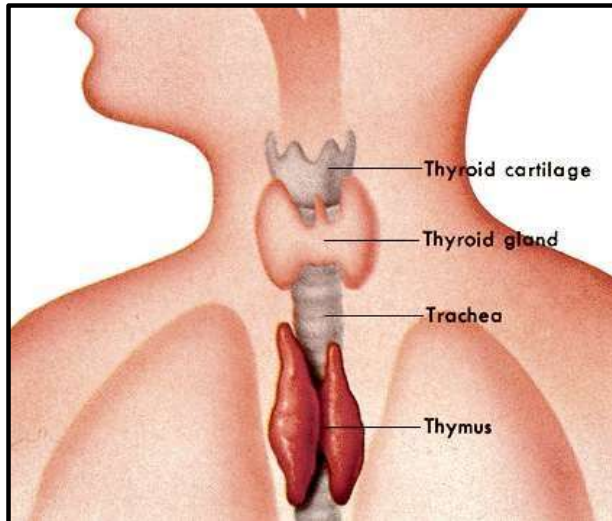


The pineal gland was called the "third eye" by ancient people. It was thought to have mystical powers. The pineal does contain a complete map of the visual field of the eyes, and it plays several significant roles in human functioning.

It is the center for the production of the hormone melatonin. It regulates daily body rhythms, most notably the day/night cycle, prevents jet lag, is implicated in seasonal affective disorder, coordinates fertility, and allows for deep restful sleep patterns.

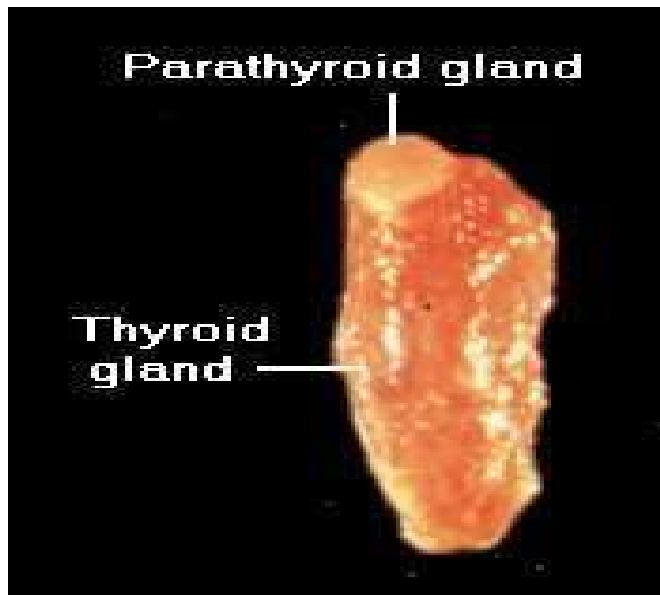
The pineal gland or in its Latin and anatomical name "epiphysis cerebri", is a tiny bean-size brain organ or "gland" which is connected to the brain and nervous systems through a complex network of bidirectional links. the "pineal master gland" acts as a true "director of the hormonal orchestra" in the course of growth, puberty, fertility and aging.

# Thymus



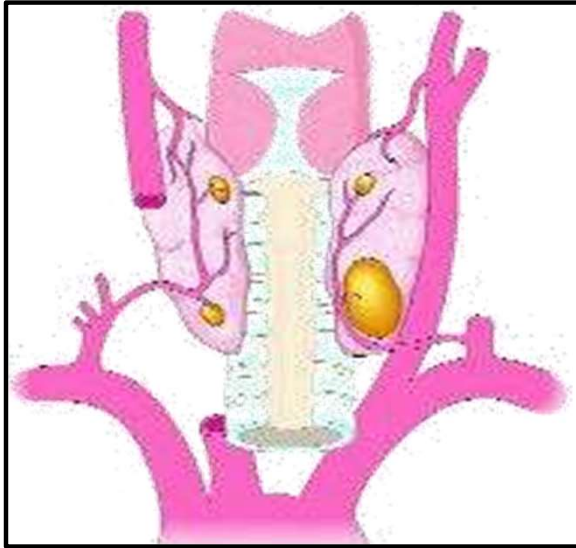
The thymus is a gland that forms part of the immune system. It is situated in the upper part of the chest, behind the breastbone, and is made up of two lobes that join in front of the trachea. Each lobe is made of lymphoid tissue, consisting of tightly packed white blood cells and fat.

The thymus enlarges from about the 12th week of gestation until puberty, when it begins to shrink. Its function is to transform lymphocytes (white blood cells developed in the bone marrow) into T-cells (cells developed in the thymus). These cells are then transported to various lymph glands, where they play an important part in fighting infections and disease. Swelling of lymph glands and fever are a signal that immune cells are multiplying to fight off invaders of the body: bacteria, fungi, viruses or parasites.



## Thyroid Gland

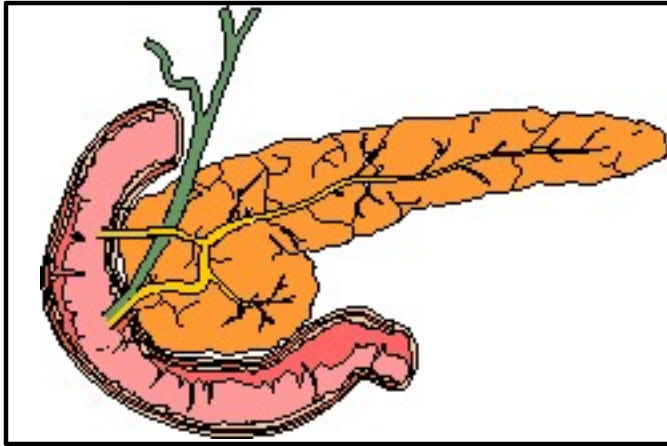
The thyroid gland is shaped like a butterfly and usually weighs less than one ounce. The thyroid cartilage covers the larynx and produces the prominence on the neck known as the "Adam's Apple". The thyroid gland controls the rate at which the body produces energy from nutrients. If the body does not get enough iodine, the thyroid gland cannot produce a proper amount of hormones for this conversion process. The result can be a goiter, an enlargement of the thyroid gland. In some parts of the world, iodine is so scarce that most of the population have goiters.



## Parathyroid Glands

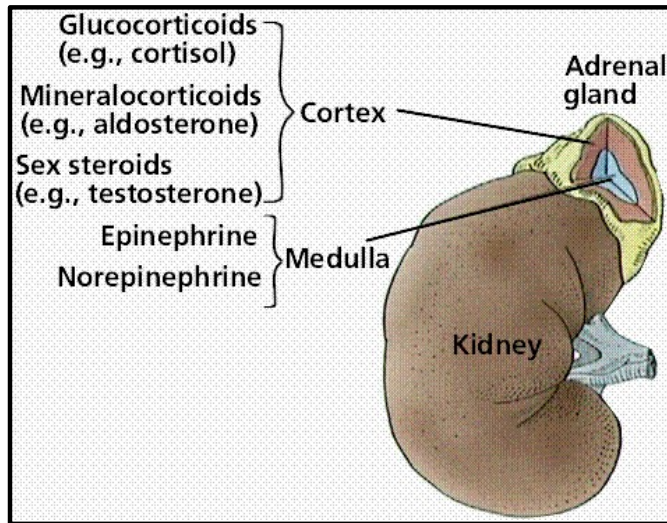
There are four parathyroid glands, which are located behind the thyroid. The sole purpose of the gland is to regulate the calcium level in our bodies within a very narrow range in which our muscular and nervous systems can function properly.





## Pancreas

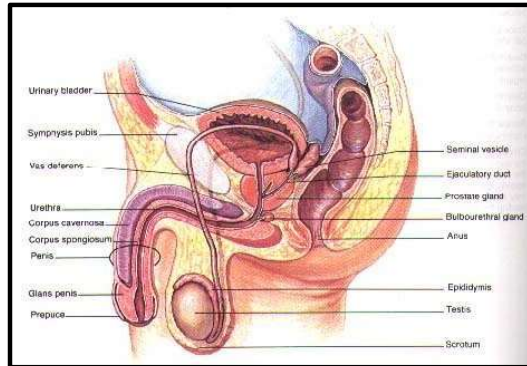
The Pancreas has two main functions: to produce pancreatic endocrine hormones, which help regulate many aspects of our metabolism, and to produce pancreatic digestive enzymes.



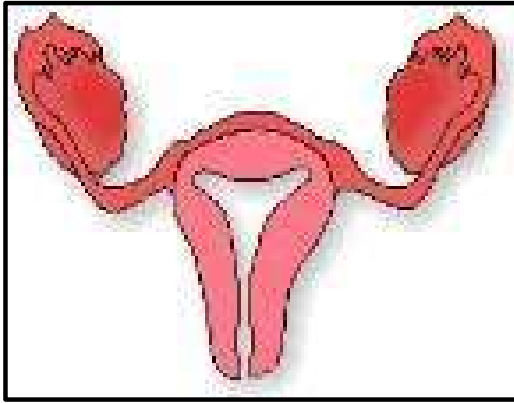
## Adrenal Gland

The adrenal glands are found on top of both of the kidneys. The center of the adrenal consists of the medulla which produces epinephrine and nor epinephrine.

# Testes



The scrotum is a sac that hangs under the penis and holds the testes. It is divided internally into two halves by a membrane; each half containing a testis. It has an outer layer of thin, wrinkled skin over a layer of tissue which contains muscle. The testicle lies inside the scrotum and produces as many as 12 trillion sperm in a male's lifetime, about 400 million of which are ejaculated in one average intercourse. Each sperm takes about seventy-two days to mature and its maturity is overseen by a complex interaction of hormones. The scrotum has a built-in thermostat, which keeps the sperm at the correct temperature. It may be surprising that the testicles should lie in such a vulnerable place, outside the body, but it is too hot inside. The sperm production needs a temperature which is three to five degrees below body temperature. If it becomes too cool on the outside, the scrotum will contract to bring the testes closer the body for warmth.



## Ovaries

The ovaries produce a female hormone, called estrogen, and store female sex cells, or “ova.”

# Endocrine Hormones

Gland	Hormones	Functions
Thyroid	Thyroxine	Regulates metabolism
	Calcitonin	Inhibits release of calcium from the bones
Parathyroid's	Parathyroid hormone	Stimulates the release of calcium from the bones.
Islet cells (in the pancreas)	Insulin	Decreases blood sugar by promoting uptake of glucose by cells.
	Glucagon	Increases blood sugar by stimulating breakdown of glycogen in the liver.
Testes	Testosterone	Regulates sperm cell production and secondary sex characteristics.
Ovaries	Estrogen	Stimulates egg maturation, controls secondary sex characteristics.
	Progesterone	Prepares the uterus to receive a fertilized egg.
Adrenal cortex	Epinephrine	Stimulates “fight or flight” response.
Adrenal medulla	Glucocorticoids	Part of stress response, increase blood glucose levels and decrease immune response.
	Aldosterone	Regulates sodium content in the blood.
	Testosterone (in both sexes)	Adult body form (greater muscle mass), libido.
Pineal gland	Melatonin	Sleep cycles, reproductive cycles in many mammals.