Thymus Gland, It’s Hormones, Structure, Functions!!

THYMUS GLAND

Thymus is a specialized primary lymphoid organ of the immune system.

It is very important in the maturation of T cells. This is responsible for the immune system.

It is the link between the endocrine system and the immune system.

LOCATION OF THYMUS GLAND

The thymus gland is located just above the heart and posterior to the sternum.

STRUCTURE OF THYMUS GLAND

- The thymus gland is distinguishable into an outer zone called cortex and an inner zone called medulla.
The organ is composed of two types of cell called lymphocytes and reticular cells. The cortex is abundant with immature T cells which migrate to the medulla in order to mature. Other types of cells found in the thymus include small population of neutrophils, eosinophils, macrophages and B-lymphocytes.

**THYMUS HORMONES**

- Thymus produces thymosin which stimulates the development of T cells.
Thymopoetin and thymulin makes it possible to distinguish T lymphocytes and enhances T cell Functions.
Thymic humoral factor (THF) increase immune responses particularly to viruses.

THYMUS GLAND FUNCTIONS

- Thymus provides the environment where the T cells are developed and trained to locate different antigen.
- The function of the thymus is to receive immature T cells that are produces in the red bone marrow and train them into functional, mature T cell that attack only foreign cell.
- T cell first resides within the cortex of thymus where they come in contact with epithelial cells presenting various antigens.
- The immature T cells that respond to the antigens are selected to survive and migrate to the medulla for apoptosis and are cleaned up by macrophages. This process is known as positive selection.
- Several hormone produces by thymus promote the maturation of the T cells prior to their release into the blood stream.
- Then the mature T cells circulate through the body where they recognized and kill pathogens, activate B cells and produce antibody.

This is the general notes on Thymus Gland, It’s Structure and Functions.

Thank you for reading.
Testis (Male Reproductive System), Hormones, Functions, It's Disorders!!

TESTIS (MALE REPRODUCTIVE SYSTEM)

The testes commonly known as the testicles are a pair of ovoid glandular organs that are central to the function of the male reproductive system.

These testes are responsible for the production of sperm cells and testosterone hormone.

LOCATION OF TESTES

Testes are located within the scrotum, which hangs outside the body behind the penis.

ANATOMY OF MALE REPRODUCTIVE SYSTEM

- The testes are important parts of male reproductive system.
They are paired oval organs located in the scrotum.
- Both testes develop in the abdomen.
- Seminiferous tubules-tubular structure where sperms are produced. Spermatogenesis takes place.
- Interstitial cells-present in between seminiferous tubules, which produces male sex hormone testosterone.
- Epididymis-it is the temporary storage side of sperms.
- Sperm ducts-two ducts vas efferens and vas deferens.
- Pair of seminal vesicles, Cowper’s, penis are the accessory glands of male reproductive system.

**FUNCTIONS OF MALE REPRODUCTIVE SYSTEM**

- Testis is the sexual organ that produces sperm.
- Release male sexual hormones, androgens and testosterone. Which cause physical and physiological changes in male.
- Epididymis matures and stores sperms.
- Sperm duct carries sperm from the epididymis to urethra.
- Seminal vesicles, Cowper’s gland and prostate gland produces seminal fluid are collectively called semen.
- Urethra allows the passage of either urine or sperm.
- Penis places sperm inside the body of a female.
- Scrotum keeps testis at the lower temperature (350), which is the optimum temperature for meiosis to occur.
DISORDERS OF TESTIS

TESTICULAR TORSION

- Testicular torsion occurs when a testis is rotated, twisting the spermatic cord.
- It may cut off blood flow to the testicles and surrounding structures.
- As a result permanent damage in testis.

EPIDIDYMITIS

- Inflammation of epididymis.
- Infection is the most common causal factor.
- It can cause severe fever if it make to the whole testicle.
TESTICULAR CANCER

- Testicular cancers are usually discovered as an identical finding of a painless lump or nodule in the scrotum.
- Commonly at age of 20 to 40 years.
- The lump or nodule may be accompanied by a heavy sensation or dull ache in the lower abdomen.
- They do not transilluminate, yet an associated hydrocele may occur.

This is the general notes on Testes, its Hormones Functions and Disorders.

Thank you for reading.
s Disorders !!

OVARY

The ovaries are to small gland located on the uterus of a woman.

Ovaries are a part of the reproductive system needed to reproduce sexually.

OVARIES LOCATION

It is located on each side of the uterus, below and behind the uterine tube.

ANATOMY OF FEMALE REPRODUCTIVE SYSTEM

- The structure of the ovary varies with the species of animals, age, sex and sexual cycle.
- In general it is ovoid in shape and surrounded by connective tissue layer known as tunica albuginea, with a single layer of cuboidal cells, called germinal epithelium.
- The ovary is divided into outer cortex and inner medulla.
The cortex is broad peripheral zone, containing follicles, and corpora lutea and interstitial endocrine cells.
Medulla contains connective tissue, blood vessels and lymph vessels.

HORMONES OF OVARIES

Ovaries secrets estrogen, progesterone, activin and inhibin, relaxin, uterine serpine etc.

FUNCTIONS OF OVARY

- An ovary produces an ovum monthly.
- Produces hormones responsible for the maturation of the graffian follicle, ovulations, menstruation and maintenance of pregnancy in the early weeks of gestations.
- The steroidal hormones are estrogens and progesterone.
- Estrogen is responsible for the appearance of secondary characteristics for females at puberty and for the maturation.
- Progesterone prepares the pregnancy and the mammary glands for lactation.
- Progesterone functions with estrogen by promoting
menstrual cycle changes in the endometrium.

**DISORDERS OF OVARIES**

**CYST ON OVARY**

An ovarian cyst is a fluid filled sac within the ovary. Most women in reproductive age develop small cyst in each month. If present are more likely to be cancer.

**Symptoms**

- Pain in lower abdomen.
- Bloating or swelling of the abdomen.
- Ache of the pelvis, lower back or thighs.
- Pain with nausea and vomiting.

**POLYCYSTIC OVARIES**

Polycystic ovarian syndrome is an endocrine system disorder in women of the reproductive age which results in hormonal imbalance. Due to the hormonal imbalance the follicles in the ovary do not grow properly and form pearl size cyst which against cause hormonal imbalance.
Symptoms

- Male pattern hair loss.
- Acne.
- Upper body muscle mass.
- Dysfunctional uterine.
- Bleeding.
- Infertility.
- Ovarian enlargement.
- Obesity
- Hypercholesterolemia.

OVARIAN CANCER

Ovarian cancer is a cancer that forms in an ovary. The majority of the ovarian cancer arises from the epithelium of the ovary.
Types of ovarian cancer

Epithelial ovarian cancer is the most common form of ovarian cancer. Germ cell and stromal ovarian cancer are much less common.

Epithelial ovarian cancer-derived from the cells on the surface of the ovary. It occurs mainly in adults.

Germ cell ovarian cancer-derived from the egg producing cells within the body of the ovary. These types of cancer affect children and teenage girls.

Stromal ovarian cancer-develops within the cells that hold the ovaries together.

Symptoms

- Bloating.
- Feeling full quickly while eating.
- Pelvic or abdominal pain.
- Urinary urgency or frequency or changes in bowel habits.
- Abnormal vaginal bleeding or discharge.
- Back pain.

This is the general idea about Ovary and Its Hormones,
Pancreas Gland, Hormones, Functions, It’s Disorders!!

PANCREAS

The pancreas is a glandular organ in the digestive system and endocrine system in all vertebrates. It helps break down carbohydrates, proteins and fats.

LOCATION OF PANCREAS

In human it is lying behind the stomach and extending transversely from the spleen to the loop of duodenum.

STRUCTURE OF PANCREAS

- Anatomically pancreas is divided into a head, a body and
- The head is joined to the body of the gland by slightly constricted part neck.
- The body becomes narrow tapering into the tail.
- Pancreas is duplex gland. It has both exocrine and endocrine parts.
- The exocrine portion consists of two ducts.
- This duct carries the pancreatic juice in the duodenum, which contains several digestive enzymes like trypsin, amylase and lipase.

- The **endocrine** part of the pancreas made of small bundles of cells called **islets of Langerhans**.
- Many capillaries run through each islet to carry hormone to the rest of the body.
- There are two main types of cells that make up the islet, alpha cell and beta cell.
FUNCTIONS OF PANCREAS GLAND

1. The pancreas secretes three hormones.
   - Insulin—secreted by beta cell from islets.
   - Glucagon—secreted by alpha cell from islets.
   - Somatostatin—it secreted at several location from the digestive system. Such as delta cell in the pyloric antrum, duodenum, pancreatic islets.

2. Insulin decreases the amount of glucose or sugar in the blood. Promote glycogenesis.
3. Glucagon promotes glycogenolysis and increases blood sugar levels.
4. Somatostatin reduces the production of insulin and glucagon.
5. Pancreas also release many different enzymes
   - Lipase—which breaks down fats.
   - Amylase—helps in break down carbohydrate.
   - Trypsinogen and chymotripsin—which break down proteins.
   - Erepsin—which digest peptones into amino acid.

PANCREAS DISORDERS

INFLAMMATION

1. Inflammation of the pancreas is known as pancreatitis. Pancreatitis is likely to cause intense pain in the
2. There are two types of pancreatitis. Acute and chronic pancreatitis.

Causes of pancreatitis
- Biliary
- Alcohols.
- Drugs (corticosteroids, HIV drugs, diuretics etc).
- Hypercalcemia.
- Trauma.
- Idiopathic.

Symptoms of pancreatitis
- Upper abdominal pain.
- Nausea.
- Vomiting.
- Indigestion.
- Loss of weight.
PANCREATIC CANCER

1. Pancreatic cancer arises when cells in the pancreas, begin to multiply out of control and form a mass.
2. Pancreatic cancer rarely occurs before the age of 40.
3. There are several types of pancreatic cancer, involving both the endocrine and exocrine tissues.
   - Pancreatic adenocarcinoma—affects the exocrine part of the pancreas.
   - The pancreatic endocrine tumors are rare and have varied various outlooks.
   - Pseudo papillary tumor is a low grade malignant tumor of the pancreas that typically afflicts women.

Symptoms of pancreatic cancer

- Jaundice
- Abdominal and lower back pain.
- Diabetes.
- Weight loss.
- Nausea and vomiting.
- Greasy or light colour stool.
- Changes in urine colour.
- Fatigue and weakness.
- Bloating.

This is the general notes on Pancreas Gland, It’s Hormone, Functions And disorders.
Thank You.

**Adrenal Gland, Hormones, Functions, It’s Disorders!!**

**ADRENAL GLAND**

The adrenal glands are *endocrine glands* that produce a wide variety of hormones.

The adrenal glands are encased in a connective tissue capsule that extends septae into the substance of the gland.

The organ is richly vascularised and capsular blood vessels, nerves and lymphatic penetrate along with the connective tissue septae.

**LOCATION OF ADRENAL GLAND**

Adrenal glands are found on the top of the kidneys and consist of a number of different layers that directly influence the structure and functions of the glands.
STRUCTURE OF ADRENAL GLAND

1. Adrenal glands are located on the top of the kidney.  
2. They are composed of two parts. 
   - Adrenal cortex  
   - Adrenal medulla  

ADRENAL CORTEX

Adrenal cortex is divided into three zones of layers.  

- Zona glomerulosa.  
- Zona fasciculate.  
- Zona reticularis.  

1. Hormones secreted by all three layers called corticoids.  
2. Zona glomerulosa-pyramidal cells are arranged in closely packed. It secrets mineralocorticoids (aldosteron).  
3. Zona fasciculate-polyhedral cells arranged in straight cords. It secrets glucocorticoids (cortisone and cortisol) and androgens.  

ADRENAL MEDULLA

1. Adrenal medulla is the center of each adrenal gland. It is surrounded by adrenal cortex.  
2. Spherical chromaffin cells are modified postganglionic sympathetic neurons.  
3. Chromaffin cells receive direct innervations from sympathetic nervous system.  
4. It produces epinephrine and norepinephrine hormones, which are sympathomimetic.  
5. Acetylcholine increase hormone secretion by adrenal medulla.
FUNCTIONS OF ADRENAL GLAND

ADRENAL CORTEX FUNCTIONS

1. **MINERAL CORticoids**—regulates sodium retention and potassium loss and body fluid.
2. **GLUCOCortiCoids**—acts as anti-inflammatory agents, affect metabolism.
3. **ANDROGen**—it regulates growth and developments of genitalia and puberty.

ADRENAL MEDULLA FUNCTIONS

1. **ADREnalINE (EPINEphrine)**—increase heart rate and blood pressure.
2. **NOR ADREnalINE (NOR EPINEphrine)**—constricts arterioles.

ADRENAL GLAND DISORDERS

ADRENAL TUMORS

Hypersecretion of cortisol causes include a tumor of the adrenal gland or a tumor that secrets ACTH, which is turns stimulates the secretion of cortisol.

Adrenal tumors are commonly found as incidentalomas. Unexpected tumors are found in medical imaging and in most
case they are benign adenomas. Adrenal carcinomas are very rare. Adrenal cancer is the presence of malignant adrenal tumors and includes neuroblastoma, adrenocortical carcinoma.

Characterized by breakdown of muscle proteins and redistribution of body fat. Resulting in spindly arms and legs accompanied by rounded ‘moon face’ ‘buffalo hump’.

**ADRENAL ADENOMA**

Adrenal adenoma is the benign tumor of the glandular type (adenoma) in the adrenal gland. Sometimes it does not secrete hormones. Some secrets cortisol (causes Cushing’s syndrome), aldosterone (causes Conn’s syndrome), androgens (causes hyperandrogenism).
ADRENAL GLAND SYMPTOMS

1. Obesity.
2. Adrenal fatigue.
3. Facial puffiness.
4. Diabetes.
5. Facial hair in women.
6. High blood pressure.
7. Muscle weakness.
8. Tiredness.
9. Aches and pains, particularly back pain.
10. Periods may become irregular or stop in women.
11. Lack of sex drive.

This is the general notes on Adrenal Glands and It’s Structure, Functions and Disorders.

Thank you for reading.

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Thyroid Gland, Hormones, Functions, It’s Disorders !

THYROID GLAND

The largest pure endocrine gland (15-25 gm).

Consists of two lateral lobes connected by a median tissue mass called the isthmus.

Isthmus usually overlies the region from the 2\textsuperscript{nd} to 4\textsuperscript{th} tracheal
cartilage.

**LOCATION OF THYROID GLAND**

The gland is located immediately below the larynx and anterior to the upper part of the trachea.

![Thyroid gland diagram]

**STRUCTURE OF THYROID GLAND**

1. Thyroid gland is a butterfly shaped organ and is composed of two cones like lobe or wings connected by a tissue called isthmus.

![Thyroid gland structure diagram]

1. Situated at the anterior side of the neck and around the larynx and trachea.
2. The thyroid gland is covered by a thin fibrous sheath, the capsule glandulate thyreoideae, composed of an
internal and external layer.

3. It starts cranially at the oblique line on the thyroid cartilage and extends to approximately the 5\textsuperscript{th} or 6\textsuperscript{th} tracheal ring.

4. There is a third lobe is present called the pyramidal lobe. It is conical shaped and extends from the upper part of the isthmus.

5. Between the capsule and the posterior lobe, there are on each side two parathyroid glands present.

\[\begin{array}{c}
\text{Hyoid Bone} \\
\text{Cricothyroid Ligament} \\
\text{Thyroid Cartilage} \\
\text{Cricoid Cartilage} \\
\text{Thyroid Gland} \\
\text{Pyramidal Lobe} \\
\text{Right Lobe} \\
\text{Isthmus} \\
\text{Left Lobe} \\
\text{Trachea}
\end{array}\]

**THYROID GLANDS HORMONES**

Thyroid glands secrets three hormones.

1. Thyroxin or T4.
2. Tri-idothyronine or T3.

T3 and T4 is the main hormone secreted by thyroid gland secreted by follicular cells.

Produced by parafollicular cells.

**FUNCTION OF THYROID GLAND**

1. Thyroid is the most important gland in our body. It is necessary to handle the body metabolism.
2. Functions in our body regulated with the help of thyroid hormones. Thyroid produces hormones these hormones are...
entered into blood stream through all cell.
3. Thyroid produce thyroid stimulating hormone (TSH) with the help of pituitary gland.
4. Thyroid hormones also helpful to brain and muscle development.
5. Thyroid individually produces two main hormones T3 and T4.
6. Thyroid hormones regulate the body glucose metabolism.
7. Increase protein synthesis.
8. Increase oxygen consumption (blood pressure, heart rate).
9. Regulates growth and tissue differentiation
   - Digestion
   - Reproduction
   - Bone growth.
   - Muscle tone.
   - Development of nerve cells.

THYROID DISORDERS

Around one on 20 people will experience some form of thyroid dysfunctions in their lifetime.

Thyroid disease occurs when the thyroid gland does not supply the proper amount of hormones needed by the body.

Common problem include over activity (hyperthyroidism) and under activity (hypothyroidism) of the thyroid gland.

Thyroid disorders can range from a small harmless goiter (enlarged thyroid), that need no treatment to life threatening cancer.

HYPERTHYROIDISM

Hyperthyroidism, or overactive thyroid, is defined as an overproduction of the thyroid hormones T3 and T4.
**Symptoms**

- Rapid heart rate.
- Goiter.
- Weight loss.
- Fatigue.
- Trouble breathing.
- Eye complaints.
- Leg swelling.
- Weakness.

**HYPOTHYROIDISM**

Hypothyroidism is the underproduction of thyroid hormones (T3 and T4).

**Symptoms**

- Weakness.
- Dry or coarse skin.
- Fatigue.
- Swelling of eye lids.
- Hair loss.
- Weight gain.
- Slow heart rate.
- Menstrual problem.

**THYROIDITIES**

Thyroiditis is an inflammation of the thyroid that may be associated with abnormal thyroid function such as
hyperthyroidism. If thyroidities occurred then the production of thyroid hormones levels may decreased this inflammation can cause the thyroid problems.

**THYROID CANCER**

In most case thyroid cancer present as a painless mass in the neck. It is very unusual for thyroid cancers to present with symptoms, unless they have been neglected. One may be able to feel a hard nodule in the neck.

Surgery, radiation and hormone treatments may be used to treat thyroid cancer.

This is the general notes on Thyroid Gland and It’s Hormones, Functions and Disorders.

Thank you for reading.

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**Pituitary Gland, Hormones, Functions, It’s**
Disorders !!

PITUITARY GLAND

In vertebrate anatomy the pituitary gland is an endocrine gland.

Small cherry shaped double structure attached by a stalk to the base of the brain.

It is considered to be the ‘master gland’.

LOCATION OF PITUITARY GLAND

Located at the base of the brain just behind of the eyes and it sits in a tiny bony space called sella turcica.

STRUCTURE OF PITUITARY GLAND

1. The pituitary gland weighs about 0.5 to 1 g.
2. The pituitary gland consists of two lobes, the anterior lobe (adenohypophysis) and the posterior lobe (neurohypophysis). each release specific hormone under the direction of the hypothalamus.

ANTERIOR PITUITARY

- The anterior pituitary consists of multiple parts. Pars distalis, pars tuberalis, pars intermedia.
• Pars distalis comprises majority of the anterior pituitary and is where the bulk of pituitary hormone production occurs.
• Pars tuberalis forms a sheath extending up from the pars distalis wrapping around the pituitary stalk.
• Pars intermedia sits between the pars distalis and posterior pituitary and is often very small in size.

POSTERIOR PITUITARY

• The posterior pituitary consists mainly of neuronal projection (axons) extending from the supraoptic and paraventricular nuclei of the hypothalamus.
• These axons release peptide hormones into the capillaries of the hypophyseal circulation.

3. The gland is connected to a region of the brain called hypothalamus by the pituitary stalk. Directly above the pituitary gland and in front of the pituitary stalk are the crossing fibers of the optic nerve, called the optic chiasm.

4. On each side of the pituitary gland is cavernous sinus. Through each cavernous sinus runs a carotid artery that carries blood to the brain and important nerves that control eye movements.
PITUITARY GLAND HORMONES

The pituitary, a pea-sized gland at the base of the brain, produces a number of hormones, each of which affects a specific part of the body (a target organ or tissue). Because the pituitary controls the functions of most other endocrine glands.

The pituitary hormones are given below in a chart:

![Pituitary Hormones Chart]

FUNCTIONS OF PITUITARY GLAND

Each lobe of the pituitary gland produces certain hormones.

ANTERIOR LOBE

2. Prolactin: To stimulate milk production after giving
blood.

3. **Adrenocorticotropic hormone (ACTH):** Stimulate the adrenal glands, secretion of glucocorticoids.

4. **Thyroid stimulating hormone (TSH):** To stimulates the thyroid hormone secretion.

5. **Follicle stimulating hormone (FSH):** To stimulate the ovaries and testis. Control the regulation of hormones in regulation of hormones in reproduction.

6. **Luteinizing hormone (LH):** To stimulate the ovaries and testis. Control the reproductive functions.

7. **Melanocyte stimulating hormone:** Stimulate the production and release of melanin by melanocyte in skin and hair.

**POSTERIOR LOBE**

1. Antidiuretic hormone (ADH): To increase the absorption of water into the blood by kidneys.

2. Oxytocin: To contract the uterus during child birth and stimulate milk production.

**PITUITARY DISORDERS**

There are some common and some rare pituitary disorder.
Common pituitary disorders

- Pituitary Tumors
- Growth Hormone Deficiency
- Hypopituitarism
- Empty Sella Syndrome

Rare pituitary disorders

- Acromegaly and gigantism.
- Cushing’s disease.
- Diabetes insipidus.
- Nelson’s syndrome.
- Kallman’s syndrome.

PITUITARY TUMOR

- The most common problem of pituitary is the development of a tumor.
- It may be hormone secreting or non hormone secreting.
- Most are benign. May cause visual disturbances and headaches as they grow and comprises surrounding tissues.
- Often results in excessive amounts of the pituitary hormones and decreases in other.

Pituitary tumor symptoms

Blood vessel and the optic nerves are in close proximity to the pituitary gland. Pressure from a pituitary gland caused headaches, visual disturbance and loss of vision, fatigue, weakness and seizures, as well as a host of signs and symptoms related to diminished hormone production.

PITUITARY ADENOMA

Pituitary adenoma is an abnormal growth in the pituitary gland.
Pituitary adenoma symptoms

- Loss of peripheral vision, blurry vision.
- Fronto orbital headache.

PITUITARY APOPLEXY

Apoplexy refers to infraction of the pituitary gland due to either haemorrhage or ischaemia.

Causes

- Spontaneous haemorrhage.
- Anticoagulant therapy.
- Head trauma.
- Radiation therapy.
- Pituitary function testing.

This is the general notes on Pituitary gland, Hormones of Pituitary Glands, Functions and Disorder of Pituitary Glands.

Thank you for reading.

Introduction of Hormones, It’s Types, Functions !!

HORMONES

The meaning of ‘hormone’ in Greek is known as ‘to excite or set into motion’.

Hormones are chemical messenger that are secreted directly into the blood, which carries them to organs and tissues of the body to exert their functions.
Hormones are used to communicate between organs and tissues to physiological regulation and behavioural activities. Such as digestion, respiration, metabolism, reproduction, excretion etc.

**CHARACTERISTICS OF HORMONES**

1. Not secreted at uniform rate.
2. Exert their effects in biocatalytic amount.
3. Turnover is varied and usually rapid.
4. Exert multiple actions.
5. Exhibit high degree of specificity.
6. Different tissue may respond differently to a given hormone.

**CLASSIFICATION OF HORMONES**

Hormones which are not only proteins but also having diverse structure, can be classified according to their:

1. Site of synthesis.
2. Chemical nature.
3. Location of receptors.
4. Nature of their signals and water solubility.

**ACCORDING OF SITE OF SYNTHESIS**

- **Endocrine hormones**

  They are synthesized by one gland and transported via blood stream to the target cells.

  Example: Growth hormones, Glucagon.

- **Paracrine hormones**

  They are synthesized near their target tissues. These hormones
are rapidly catabolised before disseminating away.
Example: Kinin.

- **Autocrine hormones**

These hormones effect the cells which synthesized them.
Example: Acetyl Col, Histamine.

**ACCORDING TO THEIR CHEMICAL NATURE**

- **Protein hormones**

These hormones are formed of
Large polypeptides. Such as, insulin, parathyroid hormones etc.

Small polypeptides. Such as, Antidiuretic Hormones (ADH),
Adrenocorticotrophic Hormones (ACTH) etc.

Glycoprotein hormone. Such as, Follicle stimulating hormones (FSH).

- **Amino acid hormones**

These hormones are derives from amino acids.

Example: Thyroid hormone, **Catecholamine** (epinephrine and nor epinephrine), thyroxin.

- **Steroid hormones**

These hormones are derived from cholesterol.

Example: Testosterone, Progesterone, Estrogen etc.
ACCORDING TO THEIR LOCATION OF RECEPTOR

- **Group 1 hormones**

  Binds to intracellular receptor, to form receptor complex, mediate biochemical functions. Mostly lipophilic in nature.

- **Group 2 hormones**

  Binds to cell surface receptors and stimulate the release of secondary messenger which in turn perform biochemical functions. Thus, hormones itself the first messenger.

ACCORDING TO THEIR WATER SOLUBILITY

- **The water soluble hormone**

  The water soluble hormones are the catecholamine (epinephrine and norepinephrin) and peptide or protein hormones.

- **The lipid soluble hormone**

  The lipid soluble hormone includes thyroid hormones, steroid hormones and vitamin D3.
FUNCTIONS OF HORMONES

Hormones exert their effects on specific locations in the body called target tissues (this could be a whole organ or just a few cells). Their effects are long term, controlling functions such as growth, metabolism, homeostasis, maturity and the balance of chemicals in the body.

FUNCTION IN HUMAN BODY

- Endocrine system are consists of a number of glands that secretes hormones.
- Hormones are the chemical messenger produce by the endocrine gland.
- Although the hormones travel in the blood of the body, they affect and influence only the specific target cell.
- Once the hormones binds to its target cell, the hormone cause the cell to respond in the specific manner.

This is the general notes on Hormone and their Types, Functions.

Thank You.
Introduction of Endocrinology, Endocrine System!!

ENDOCRINOLOGY

The term ‘endocrine’ refers to the internal secretion of biologically active substances.

Endocrinology was defined as that branch of biological science that is concerned with endocrine system.

ENDOCRINE SYSTEM

Endocrine system is the collection of glands located throughout the body that produce the hormones and releases them into the blood stream, where they can produce their specific action at their target cells and tissues.

CHARACTERISTICS OF ENDOCRINE SYSTEM

1. Produce hormones
   - Secretes into intestinal spaces.
   - Enters circulatory system.
   - Acts on target tissue at another site.

2. Regulate activities of body structures
3. Responses slower and longer duration than nervous system.

ENDOCRINE GLANDS

- The endocrine glands are the organs of the Endocrine system.
- Endocrine glands are ductless.
• They secrete their products directly into the bloodstream.
• They located overall our body.

**SOME ENDOCRINE GLANDS AND THEIR REGULATION**

1. **PITUITARY**: ‘Master glands’ that regulates all other endocrine glands and also release growth hormones.
2. **THYROID**: Regulates metabolism, body heat.
3. **PARATHYROID**: Use calcium and phosphorus.
4. **HYPOTHALAMUS**: Links nervous system to endocrine system.
5. **ADRENAL**: Response in emergency or stressful situation, metabolism, blood pressure, salt balance.
6. **PANCREAS**: Regulate blood sugar.
7. **OVARIES**: Helps on production of eggs, female characteristics.
8. **TESTIS**: Helps on production of sperm, male characteristics.
9. **THYMUS**: Parts of the immune system.

**TARGET CELL**

• Hormone only works on certain, called target cells.
• The [target cells](#) have special receptors that recognize
the hormones and allow them to influence that cell.

**ENDOCRINE HORMONES**

Endocrine hormones are produced by endocrine glands. It may affect a wide array of target cells to produce multiple effects.

**TYPES OF ENDOCRINE HORMONES**

There are two types of endocrine hormones.

1. Peptides (small proteins)
2. Steroid (lipids)

**PEPTIDE HORMONES**

- Peptide hormones do not enter the cell directly. These hormones bind to receptor proteins in the cell membrane.
- When the hormones bind with the receptor protein, a secondary messenger molecule initiates the cell response.
- Because peptide hormones are water soluble, they often produce fast responses.
STEROID HORMONES

- Steroid hormones enter through the cell membrane and bind to receptors inside of the target cell.
- These hormones may directly stimulate transcription of genes to make certain proteins.

Because steroids work by triggering gene activity, the response is slower than peptide hormones.
FUNCTIONS OF ENDOCRINE SYSTEM

1. The endocrine system helps to control and integrate:
   - Reproduction.
   - Growth.
   - Development.
   - Defense against stress.
   - Water, electrolyte and nutrient balance.
   - Energy balance.
   - Cellular metabolism.

2. The endocrine system helps to maintain body homeostasis by coordinating and regulating the activities of cells, tissues, organs and system throughout the body.

This is the Introduction of Endocrinology and Endocrine System.

Thank you for reading.