



BIOCHEMISTRY

4TH JAN 2019
PAPER SOLVING
KRISHA

Q1 : DESCRIBE BRIEFLY ADRENAL CORTICOIDS ? 14 MARKS

A. Glucocorticoids and mineralocorticoids are **steroid hormones** classically thought to be secreted exclusively by the adrenal glands. However, recent evidence has shown that corticosteroids can also be locally synthesized in various other tissues, including primary lymphoid organs, **intestine, skin, brain, and possibly heart**. Evidence for local synthesis includes detection of steroidogenic enzymes and high local corticosteroid levels, even after adrenalectomy.

Interestingly, local corticosteroid synthesis can be regulated via locally expressed mediators of the hypothalamic-pituitary-adrenal (HPA) axis or renin-angiotensin system (RAS). **In some tissues (e.g., skin), these local control pathways might form miniature analogs of the pathways that regulate adrenal corticosteroid production. Locally synthesized glucocorticoids regulate activation of immune cells, while locally synthesized mineralocorticoids regulate blood volume and pressure**. The physiological importance of extra-adrenal glucocorticoids and mineralocorticoids has been shown, because inhibition of local synthesis has major effects even in adrenal-intact subjects.

CORTICOSTEROIDS ARE STEROID HORMONES produced in the adrenal cortex and are of two types, glucocorticoids and mineralocorticoids. Glucocorticoids, such as corticosterone and cortisol, have numerous effects and can act on nearly all cells in the body.

For example, glucocorticoids regulate metabolic activity, immune function, and behavior .

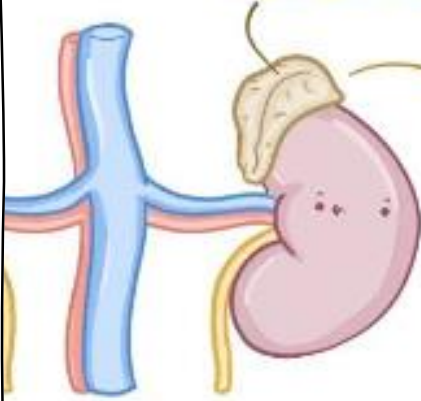
Circulating glucocorticoid levels increase in response to a variety of stressors under control of the hypothalamic-pituitary-adrenal (HPA) axis. Hypothalamic release of corticotropin-releasing hormone (CRH) triggers pituitary release of adrenocorticotrophic hormone (ACTH), which stimulates glucocorticoid production by the zona fasciculata of the adrenals.

The adrenals can secrete cortisol, corticosterone, or both, depending on the species

GLUCOCORTICOIDS

↳ STEROID HORMONES

ADRENAL GLANDS

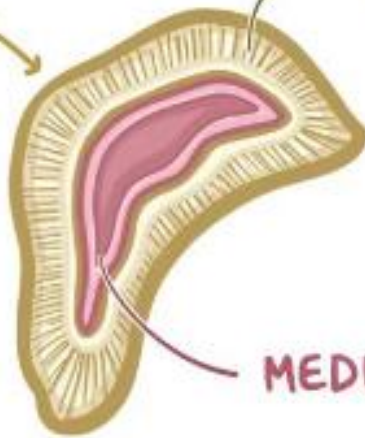


CORTEX

* SECRETES CORTICOSTEROID HORMONES

↳ GLUCOCORTICOIDS

* under control of
adrenocorticotrophic hormone
(ACTH)



MEDULLA

MINERALOCORTICOIDS

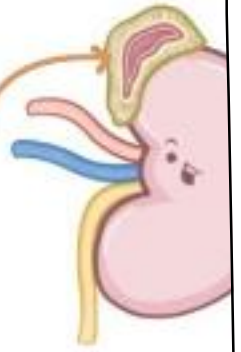
HORMONES REGULATE
 Na^+ REABSORPTION &
 K^+ EXCRETION

STEROID HORMONES produced
by ADRENAL CORTEX

ALDOSTERONE - MAJOR NATURAL MINERALOCORTICOID in HUMANS

MINERALOCORTICOID-
RECEPTOR AGONISTS

MINERALOCORTICOID-
RECEPTOR ANTAGONISTS

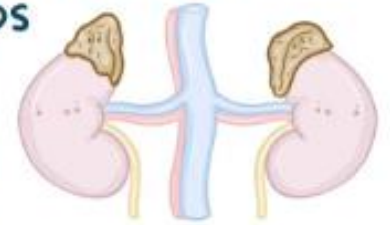
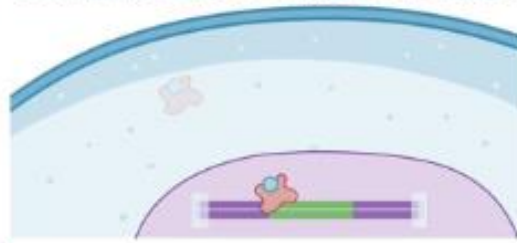


GLUCOCORTICOIDS & MINERALOCORTICOIDS

- * ENDOGENOUS HORMONES PRODUCED by the ADRENAL GLANDS
- * REPLACEMENT THERAPY for IMPAIRED ADRENAL FUNCTION

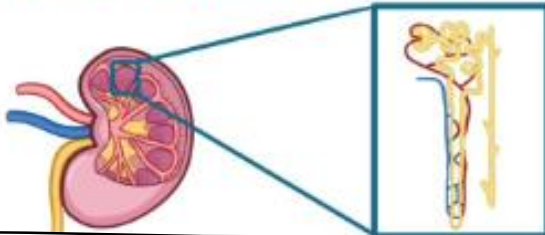
GLUCOCORTICOIDS

- ~ BINDING to INTRACELLULAR GLUCOCORTICOID RECEPTORS that MODIFY EXPRESSION of many DIFFERENT GENES
- ~ INHIBIT RELEASE of PRO-INFLAMMATORY MOLECULES
- ~ PREVENT ACTIVATION of IMMUNE CELLS
- ~ ↑ PRODUCTION of ANTI-INFLAMMATORY MOLECULES



MINERALOCORTICOIDS

- ~ ACT PRIMARILY on INTRACELLULAR MINERALOCORTICOID RECEPTORS in KIDNEY TUBULES
 - ↳ REABSORPTION of SODIUM & WATER
 - ↳ EXCRETION of POTASSIUM & PROTONS



Q2 : DESCRIBE GASTRIC SECRETION ? 14 MARKS

GASTRIC SECRETION

• daily secretion \rightarrow 2.5-3 L/day
 • isotonic with plasma.
 • pH \rightarrow 1-2

COMPOSITION \rightarrow

(i) Electrolytes \rightarrow

- \rightarrow Cations \rightarrow Na^+ , K^+ , H^+ , Mg^{+2}
- \rightarrow Anions \rightarrow Cl^- , HCO_3^- , HPO_4^{+2} , SO_4^{+2}

(ii) Enzymes \rightarrow

- a) Pepsinogen
- b) Rennin
- c) Gelatinase
- d) Gastric Lipase
- e) Lysozyme
- f) urease
- g) Carbonic anhydrase.

(iii) Mucus \rightarrow

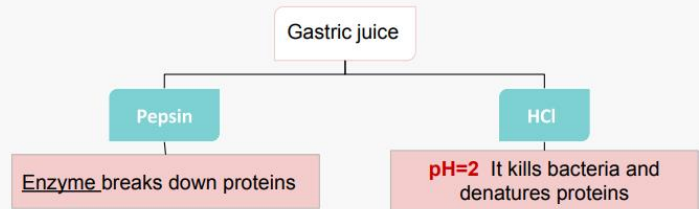
- (i) Intrinsic Factor
- (ii) Water

\rightarrow Soluble Mucus \rightarrow Ab. Pyloric and cardiac tubular glands.
 \rightarrow Viscible Mucus \rightarrow Ab. surface epithelium of gastric mucosa.

Labels in diagram:
 - Surface Mucus cells \rightarrow Mucus, mucopolysaccharide polypeptide (Antibacterial)
 - Parietal cells \rightarrow HCl, Intrinsic factor
 - Mucus neck cells \rightarrow stem cell compartment
 - Endocrine cell \rightarrow Enterochromaffin like cell (ECL) \rightarrow Histamine
 - Chief cells \rightarrow pepsinogen, gastric Lipase
 - G-cells \rightarrow gastrin

GASTRIC JUICE AND FURTHER PROCESS

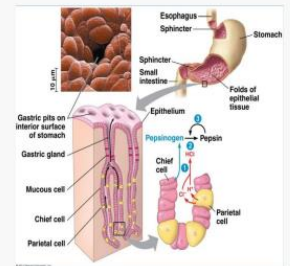
- **Gastric juice:** converts meal to **acidic chyme** (due to the very acidic HCl)
Chyme: murky semi-fluid or paste composed of food that is thoroughly mixed with gastric secretion"



► Gastric secretion :

- ◆ **Gastric glands** empty into the bottom of **gastric pits**, which are numerous openings in the gastric mucosa, **synthesis of all secretions happen inside these glands.**
- ◆ **Glands are composed of 4 functionally different cell types:**
 - Mucous cells (HCO₃&Mucus)
 - Chief cells (releases Pepsinogen)
 - Parietal cells (releases HCl and Intrinsic factor)
 - Enteroendocrine cells (release hormones)
 - Enterochromaffin-like cells (secrete histamine).

Enterochromaffin-like cells are enteroendocrine and neuroendocrine cells also known for their similarity to chromaffin cells secreting histamine, which stimulates G cells to secrete gastrin.
 G Cells: Gastrin (hormone): increases HCl secretion
 D Cells: Somatostatin:decreases HCl secretion



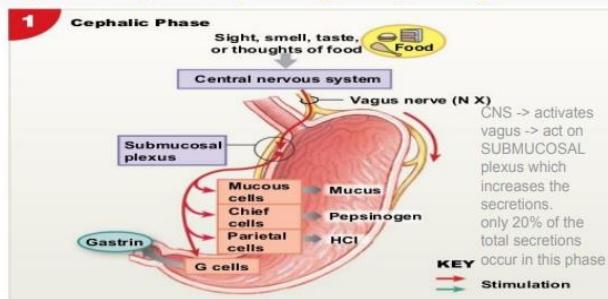
Phases of gastric secretion

(according to the phase in which you are taking in the food)

The videos are from the doctor's slides

1) Cephalic Phase:

Before eating: you are seeing and smelling and tasting, or even just thinking of the food.

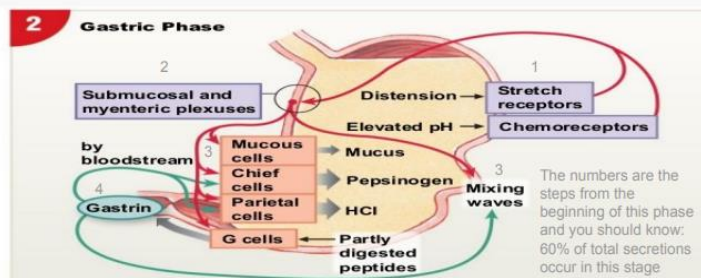


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Guyton corner :

The cephalic phase of gastric secretion occurs even before food enters the stomach, especially while it is being eaten. It results from the sight, smell, thought, or taste of food, and the greater the appetite, the more intense is the stimulation. Neurogenic signals that cause the cephalic phase of gastric secretion originate in the cerebral cortex and in the appetite centers of the amygdala and hypothalamus. They are transmitted through the dorsal motor nuclei of the vagi and thence through the vagus nerves to the stomach. This phase of secretion normally accounts for about 30 percent of the gastric secretion associated with eating a meal

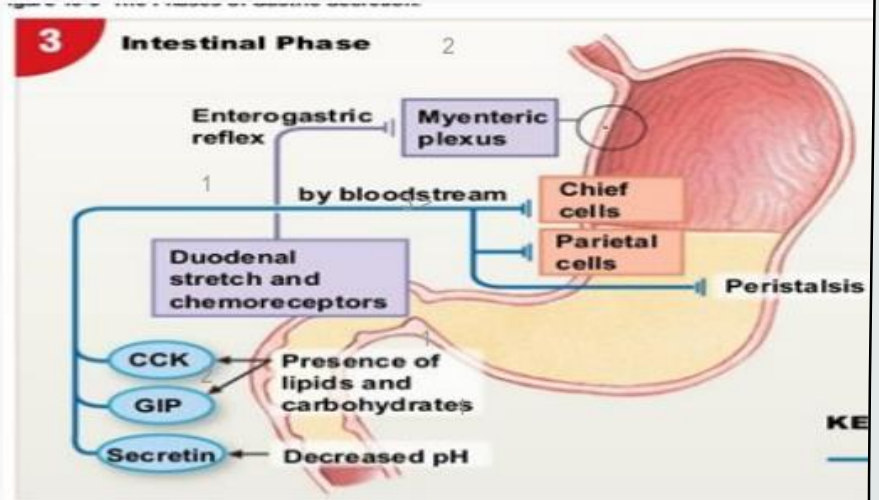
2) Gastric Phase: food is already in the stomach



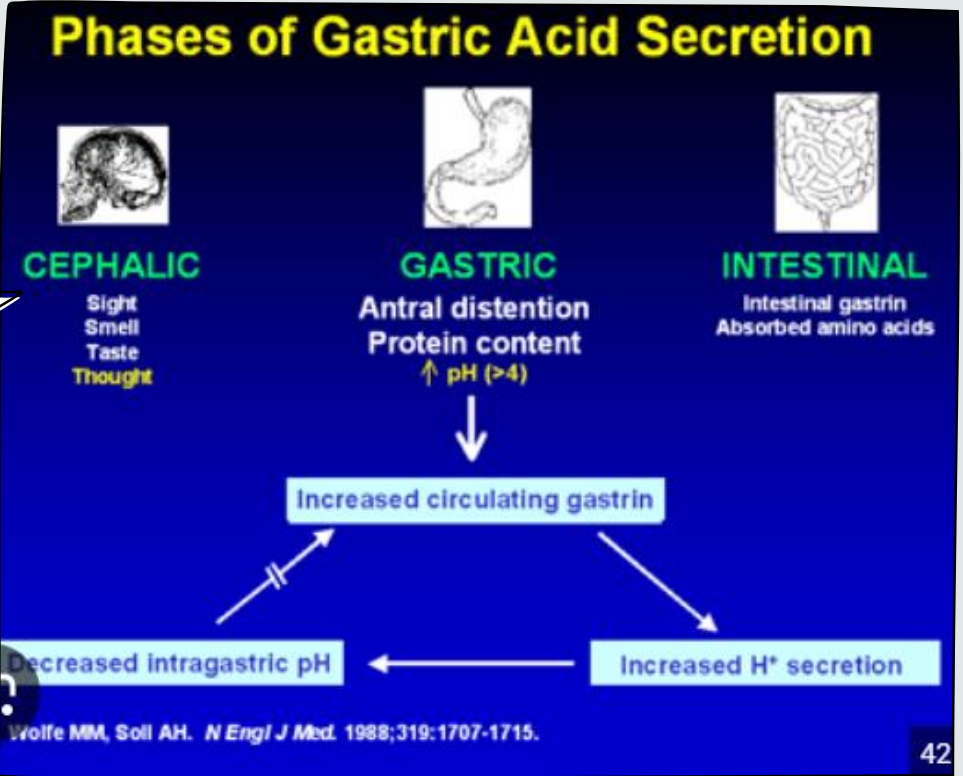
FINAL PHASE

► Phases of gastric secretion (cont.)

3) Intestinal Phase: mainly inhibitory (after digestion) the myenteric plexus contraction. Also called enterogastric reflex.



GASTRIC ACID
SECRETION IN SHORT



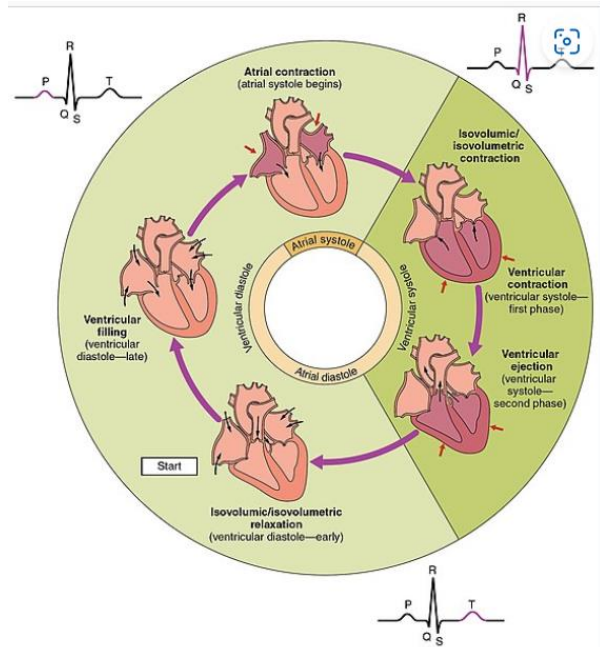
Q :3 DESCRIBE
CARDIAC CYCLE ?
14 MARK

A :

CARDIAC CYCLE

- The sequence of changes in the pressure and blood flow in the CVS in two subsequent cardiac contraction is known as cardiac cycle.
- Maximal Duration \rightarrow 0.8 seconds, at the Heart rate of 75 per min
- Duration of the events \rightarrow
 - a) Cardiac cycle \rightarrow 0.8 sec.
 - b) Atrial systole \rightarrow 0.1 sec
 - c) Atrial diastole \rightarrow 0.7 sec
 - d) Ventricular systole \rightarrow 0.3 sec
 - e) Ventricular diastole \rightarrow 0.5 sec
- Joint Diastole \rightarrow
 - All 4 chambers are relaxed.
 - Filling of blood due to the venous return.
 - As AV valves are open therefore Atrial-ventricular pressure is almost identical.
 - Atrial systole is followed by Ventricular ^{diastole} systole.
 - Ventricular systole is followed by Atrial diastole.
 - Both of the above events occur simultaneously.

CARDIAC CYCLE DIAGRAM



The cycle diagram depicts one heartbeat of the continuously repeating **cardiac cycle**, namely: *ventricular diastole* followed by *ventricular systole*, etc.—while coordinating with *atrial systole* followed by *atrial diastole*, etc. The cycle also correlates to key **electrocardiogram** tracings: the **T wave** (which indicates ventricular diastole); the **P wave** (atrial systole); and the **QRS 'spikes'** complex (ventricular systole)—all shown as color purple-in-black segments.^[1]

Page 1. Introduction

- The cardiac cycle includes all the events related to the flow of blood through the heart during one complete heartbeat.

Page 2. Goals

- To list the phases of the cardiac cycle in consecutive order.
- To recognize that the pressure changes determine valve action and direction of blood flow through the heart.
- To relate an ECG and heart sounds to events of the cardiac cycle.

Page 3. Heart Valves

- During the cardiac cycle, heart valves open and close in response to differences in blood pressure on their two sides.
- The Heart Valves:
 - Pulmonary semilunar valve
 - Aortic Semilunar Valve
 - Left AV valve or Bicuspid valve or Mitral valve
 - Right AV valve or Tricuspid valve

Page 4. Overview of Cardiac Cycle

- Phases of the Cardiac Cycle
 1. Ventricular Filling - Occurs during mid to late diastole.
 2. Ventricular Systole - Includes isovolumetric contraction and ventricular ejection.
 3. Isovolumetric Relaxation - Occurs during early diastole.

Page 5. Ventricular Filling: Passive

- Occurs during mid to late diastole, when the heart chambers are relaxed.
- Blood flows passively into the atria, through open AV valves, and into the ventricles, where the pressure is lower.

Page 6. Ventricular Filling: Atrial Contraction

- Atria contract, forcing the remaining blood into the ventricles.
- Blood flows through both sides of the heart at the same time.

Page 7. Ventricular Systole: Contraction

- Isovolumetric contraction: Ventricles contract and intraventricular pressure rises, closing the AV valves. Briefly, ventricles are completely closed chambers.

Page 8. Ventricular Systole: Ejection

- Ventricular ejection: Rising ventricular pressure forces semilunar valves open. Blood is ejected from the heart into the aorta and pulmonary trunk.

Page 9. Isovolumetric Relaxation

- Ventricles relax and ventricular pressure drops. Blood backflows, closing semilunar valves. Ventricles are totally closed off again.

Page 10. Atrial Filling

- Meanwhile, the atria have been filling with blood. When atrial pressure exceeds ventricular pressure, AV valves open and ventricular filling, phase 1 begins again.

Page 11. Ventricular and Atrial Contraction

- Although we have been highlighting the flow of blood on the right side of the heart, remember that both atria contract at the same time and both ventricles contract at the same time.

Page 12. Control of Blood Flow by Pressure

- Pressure changes reflect the alternating contraction and relaxation of the heart.

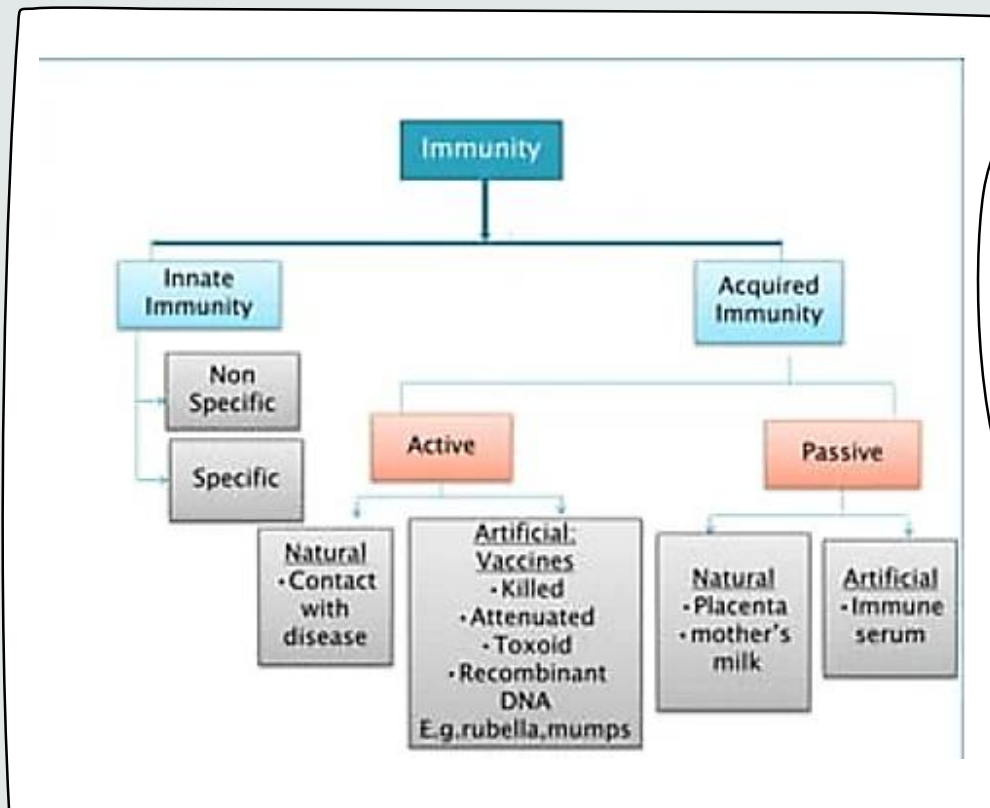
THEORY

PART 2 : WRITE
SHORT NOTES ON
A)

IMMUNITY

Introduction

- Immunity is the ability of the body to protect against all types of foreign bodies like bacteria, virus, toxic substances etc. which enter the body.
- As it protects us from disease it is also called **disease resistance**.
- Lack of immunity is known as susceptibility.
- Immunity is done by immune system which is a complex network of lymphoid organs such as **bone marrow, thymus, spleen** etc.



CLASSIFICATION

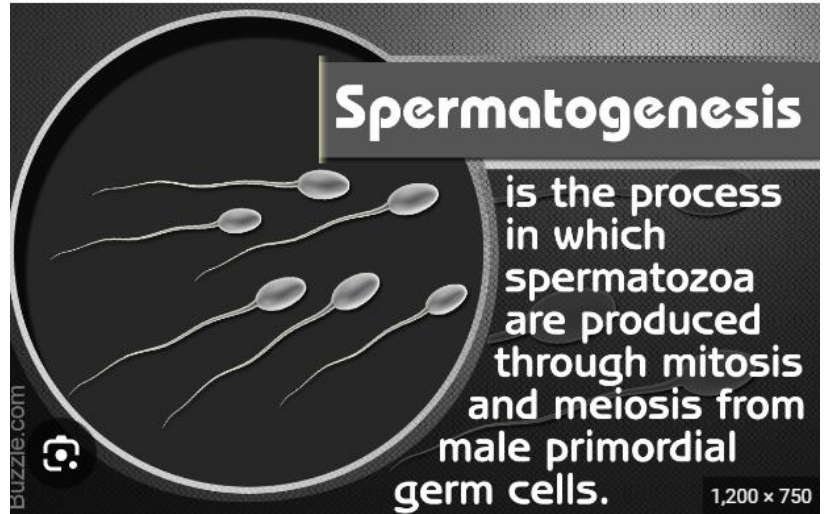
B) COCHLEA

WHAT IS COCHLEA ?

- The inner ear is contained in the petrous apex of the temporal bone, and is encased in a bony structure called the osseous or bony labyrinth
- The labyrinth consists of three continuous sections:
 1. Vestibule-
 2. Cochlea-
 3. Semicircular canals-



C.SPERMATOGENESIS



SPERMATOOA PRODUCTION

WHAT IS SPERMATOGENESIS

- The process of formation of sperm is called spermatogenesis. The seminiferous tubules are lined by germinal epithelium consists largely of cuboidal primary or primordial germ cell and contains certain tall somatic cells called Sertoli cells. Spermatogenesis also include process of formation of spermatids and spermatozoa.



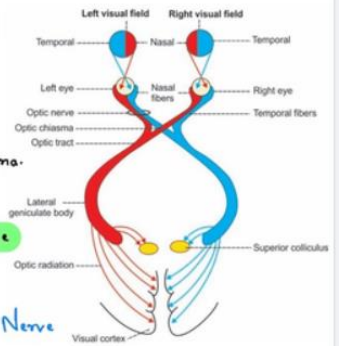
SN ON VISUAL PATHWAY

Visual Pathway

Introduction :

- Visual pathway or optic pathway is the nervous pathway that transmits impulses from Retina to Visual Center in Cerebral Cortex.
- The light rays from Temporal [Outer] half of Visual field fall upon the nasal part of Corresponding Retina & Vice Versa.
- Rods and Cones are Visual Receptors and fibers from visual receptors synapse with dendrites of bipolar cells.

- **FIRST** Order Neurons = Bipolar cells in Retina.
- **SECOND** Order Neurons = Ganglionic cells
- **THIRD** Order Neurons = Lateral geniculate body → Visual Cortex.



Connections of Visual Receptors to Optic Nerve

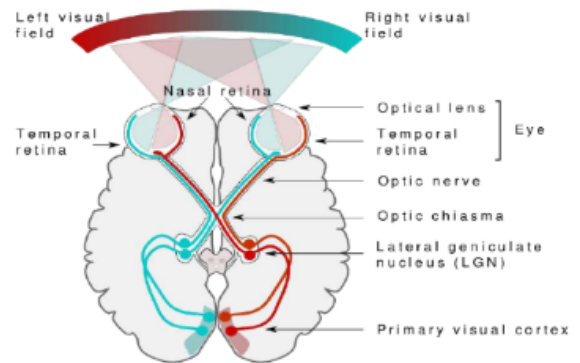
MAJOR COMPONENTS

VISUAL PATHWAY

Visual stimuli from our surroundings are processed by an intricate system of interconnecting neurons, which begins with the optic nerve in the eye up to the visual processing center in our forebrain called the visual cortex. All the information travels in the form of nerve impulses that are triggered by photosensitive chemical reactions occurring in the retina. Several separate and parallel pathways code its processing at multiple sites in the nervous system. Disruption in these pathways and their clinical manifestations offers crucial diagnostics for an underlying disease.

STRUCTURE

The visual system consists of two primary parallel pathways: an optic pathway and a pupillary reflex pathway.



WRITE 1 SENTENCE
FOR RENAL
FUNCTION TEST :

► Renal function test gives information about following parameters:

1. Renal Blood flow
2. Renal tubular function
3. Glomerular filtration
4. Urinary outflow

OSMOSIS 1 LINER

:

Osmosis is the spontaneous net movement of solvent molecules through a partially permeable membrane into a region of higher solute concentration, in the direction that tends to equalize the solute concentrations on the two sides.

Osmosis provides the primary means by which water is transported into and out of cells

Difference in concentration between solutions on either side of semi permeable membrane called

Osmotic gradient



- **Vital capacity (VC)**

- Maximum volume one can exchange in a respiratory cycle
- Sum of inspiratory reserve volume, tidal volume, and expiratory reserve volume
 - $IRV + TV + ERV$

VITAL CAPACITY ONE LINER

CHLORIDE SHIFT ONE LINER

Chloride shift/Hamburger phenomenon:

The greater proportion (70%) of carbon dioxide is transported in the form of bicarbonates.

The CO_2 reacted with the water of the cytoplasm in the presence of enzyme carbonic anhydrase to form carbonic acid.

The carbonic acid (H_2CO_3) is a weak acid, which undergoes partial dissociation to yield hydrogen ion (H^+) and bicarbonate ion (HCO_3^-).

The given reaction mostly occur inside RBCs, because the enzyme carbonic anhydrase is abundant there.

MYXOEDEMA

Myxoedema

Myxoedema is a condition marked by thickening and swelling of the skin caused by insufficient production of thyroid hormones by the thyroid gland. The function of thyroid hormones is to regulate your metabolism. Myxoedema is associated with other symptoms of underactive thyroid, also called hypothyroidism, including lethargy, weight gain, fatigue, depression, and cold sensitivity, among others.



FUNCTIONS OF HYPOTHALAMUS

What is the hypothalamus?

The hypothalamus is a small region of the brain. It's located at the base of the brain, near the [pituitary gland](#).

While it's very small, the hypothalamus plays a crucial role in many important functions, including:

- releasing hormones
- [regulating body temperature](#)
- maintaining daily physiological cycles
- controlling appetite
- managing of sexual behavior
- regulating emotional responses

QRS COMPLEX :

The QRS complex is the combination of three of the graphical deflections seen on a typical electrocardiogram. It is usually the central and most visually obvious part of the tracing. It corresponds to the depolarization of the right and left ventricles of the heart and contraction of the large ventricular muscles.

SMELL ONE LINER

An odor or odour is caused by one or more volatilized chemical compounds that are generally found in low concentrations that humans and many animals can perceive via their sense of smell. An odor is also called a "smell" or a "scent", which can refer to either a pleasant or an unpleasant odor.

BIOCHEMISTRY PAPER

Q 3 : ENNEMERATE BIOCHEMICAL
FUNCTIONS OF CALCIUM. REGULATION OF
BLOOD CALCIUM LEVEL.

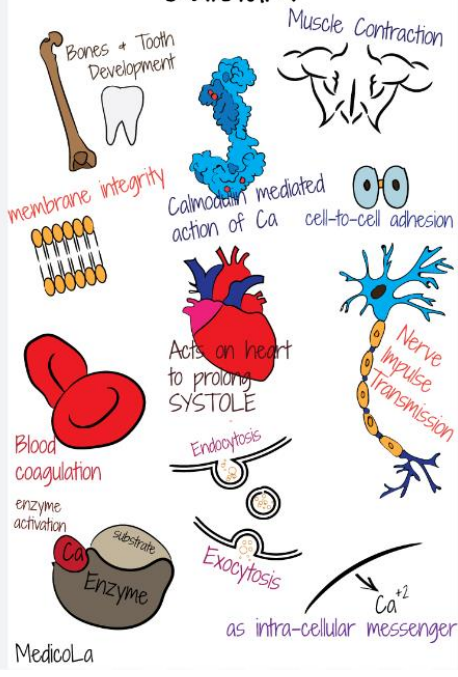
Calcium – **Biochemical Functions**

- (i) **Development of bones and teeth:** Calcium, along with phosphate, is required for the formation (of Hydroxyapatite) and physical **strength of skeletal tissue** I.e. bones and teeth.
- (ii) **Muscle contraction:** Ca^{2+} promotes muscle contraction.

2. **Muscle contraction** : Ca^{2+} interacts with troponin C to trigger muscle contraction. Calcium also activates ATPase, increases the interaction between actin and myosin.
3. **Blood coagulation** : Several reactions in the cascade of blood clotting process are dependent on Ca^{2+} (factor IV).
4. **Nerve transmission**: Ca^{2+} is necessary for the transmission of nerve impulse.
5. **Membrane integrity and permeability** : Ca^{2+} influences the membrane structure and transport of water and several ions across it.

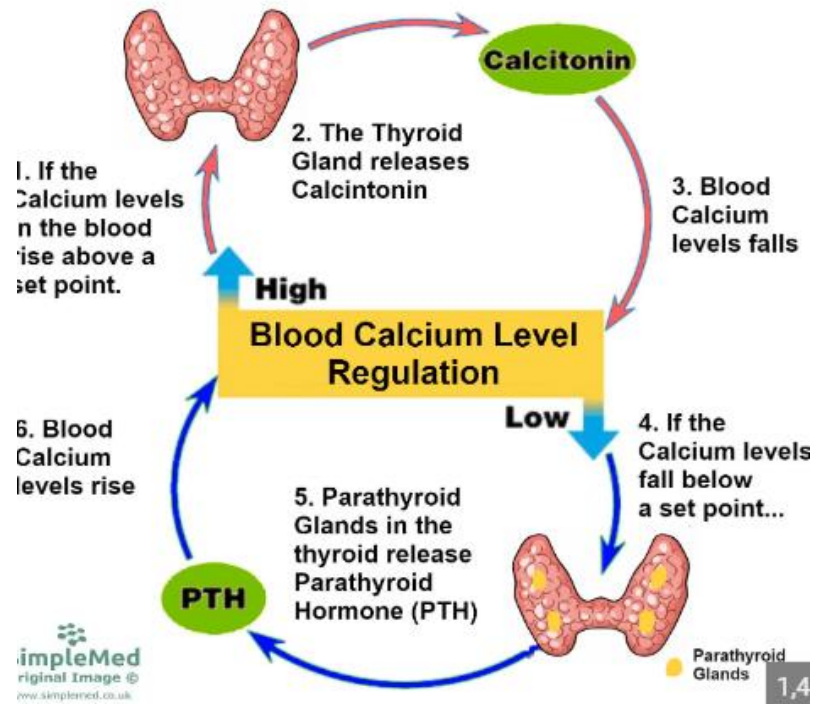
PART 2

Calcium




DIAGRAM

REGULATION OF BLOOD CALCIUM



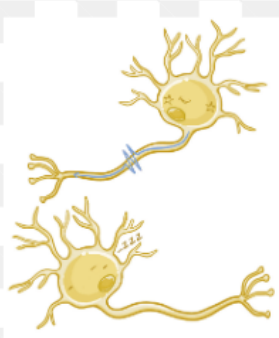
DEFICIENCY OF CALCIUM



NOTES HYPERCALCEMIA & HYPOCALCEMIA

GENERALLY, WHAT ARE THEY?

PATHOLOGY & CAUSES	DIAGNOSIS
<ul style="list-style-type: none">• Calcium concentrations in the blood falling outside of the normal reference range• Hypocalcemia: < 8.5mg/dL• Hypercalcemia: > 10.5mg/dL	LAB RESULTS <ul style="list-style-type: none">• Blood calcium levels• Determination of underlying cause (blood tests for levels of)<ul style="list-style-type: none">• Parathyroid hormone, vitamin D, albumin, phosphorus, magnesium
SIGNS & SYMPTOMS <ul style="list-style-type: none">• Variations that are mild, or slow in onset, usually asymptomatic• Hypercalcemia → less excitable neurons and associated symptoms across multiple systems• Hypocalcemia → more excitable neurons and associated symptoms across multiple systems	OTHER DIAGNOSTICS ECG <ul style="list-style-type: none">• Identify associated organ dysfunction
	TREATMENT
	MEDICATIONS Hypercalcemia <ul style="list-style-type: none">• Lower blood calcium levels<ul style="list-style-type: none">• Rehydrate, loop diuretics, glucocorticoids, bisphosphonates or calcitonin, dialysis Hypocalcemia <ul style="list-style-type: none">• Raise calcium levels<ul style="list-style-type: none">• Calcium gluconate• Vitamin D supplementation



The diagram illustrates a neuron with a cell body and several branching processes. The neuron is shown in a state of hyperexcitability, indicated by a blue lightning bolt symbol striking the cell body. This represents the increased neuronal excitability associated with hypocalcemia.



HYPERCALCEMIA

Calcium – Deficiency Diseases

- The **symptoms** of hypercalcemia include:
 - Lethary,
 - Muscle weakness,
 - Loss of appetite,
 - Constipation,
 - Nausea,
 - Increased myocardial contractility and
 - Susceptibility to fractures.

Hormones Involved in Regulation of blood glucose

- **DECREASE** Blood Glucose

- Insulin
- Somatostatin



- **INCREASE** Blood Glucose

- Glucagon
- Epinephrine
- Cortisol
- ACTH
- Growth Hormone
- Thyroxine

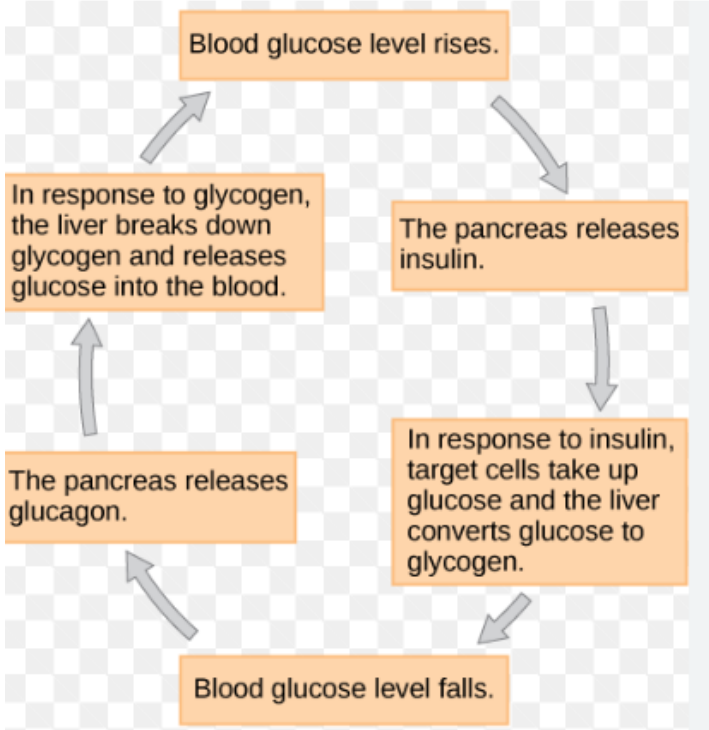


SHORT NOTES :

1.ROLE OF HARMONES IN REGULATION OF BLOOD GLUCOSE LEVELS :

A.

BLOOD GLUCOSE LEVELS :



Functions of tRNA

- Help in the recognition of *Aminoacyl tRNA synthetase* enzyme
- Picks up specific amino acid from cytoplasm and carries to site of protein synthesis
- Attaches itself to ribosome in accordance with sequence specified by mRNA
- Transmits amino acid to polypeptide chain
- **Participate in non protein synthetic processes such as a primer during reverse transcription in retrovirus life cycles**

FUNCTIONS

PEM PROTEIN ENERGY MALNUTRITION

Protein Energy Malnutrition (PEM)

* Definition → Range of conditions arising from lack of calories & protein in child below 5 years of age.

* Classification →

- (i) Kwashiorkor → Edema ⊕ nt, deficiency of prot. & calorie
- (ii) Marasmus → Edema ⊖ nt, deficiency of calories in all the
- (iii) Marasmic Kwashiorkor → features of both marasmus & kwashiorkor.

* Criteria for classification of PEM

- (i) Weight/Height ratio
- (ii) Mid upper arm circumference (MUAC)

* Serum assessment :- (Kwashiorkor)

Albumin level → 0.5 to 2 gm/dl

A/G ratio → reversed

* Why is there Edema in Kwashiorkor?

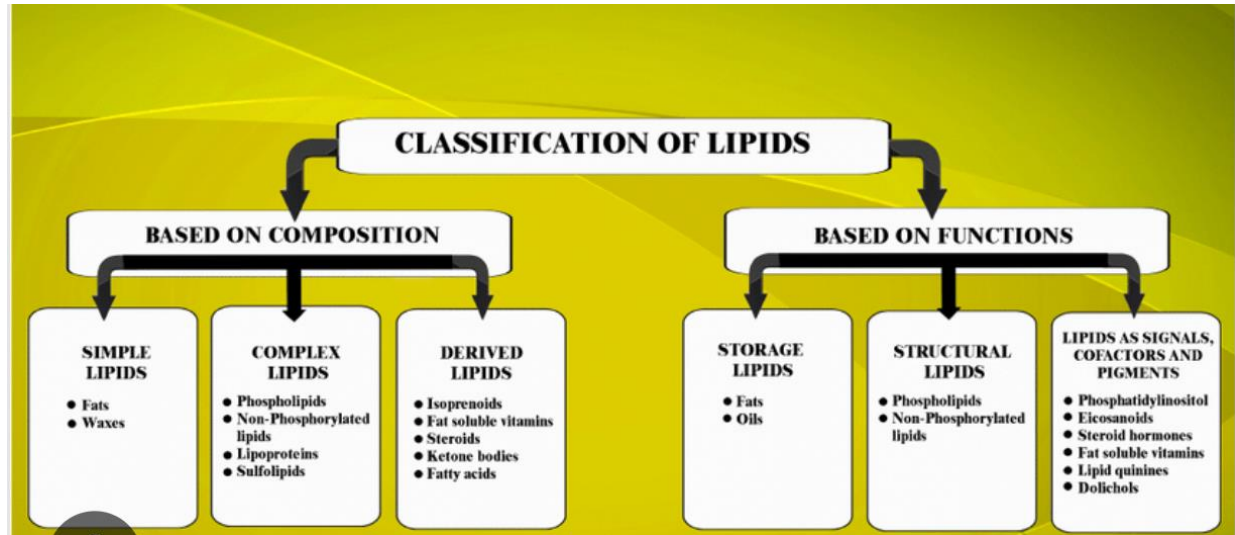
Because of decrease in albumin. (< 2 gm/dl)

↓
causes dec. in Oncotic pressure

↓
causes retention of fluid in interstitial space

↓
causing Edema.

LIPID CLASSIFICATION AND BIOCHEMICAL FUNCTIONS SN



17.1 Biological Functions of Lipids

- As an **energy source**, lipids provide 9 kcal of energy per gram
- Triglycerides provide **energy storage** in adipocytes
- Phosphoglycerides, sphingolipids, and steroids are **structural components** of cell membranes
- Steroid **hormones** are critical intercellular messengers
- Lipid-soluble **vitamins** (A, E, D, K)
- Dietary fat acts as a **carrier of lipid-soluble vitamins** into cells of small intestine
- Provide **shock absorption** and **insulation**

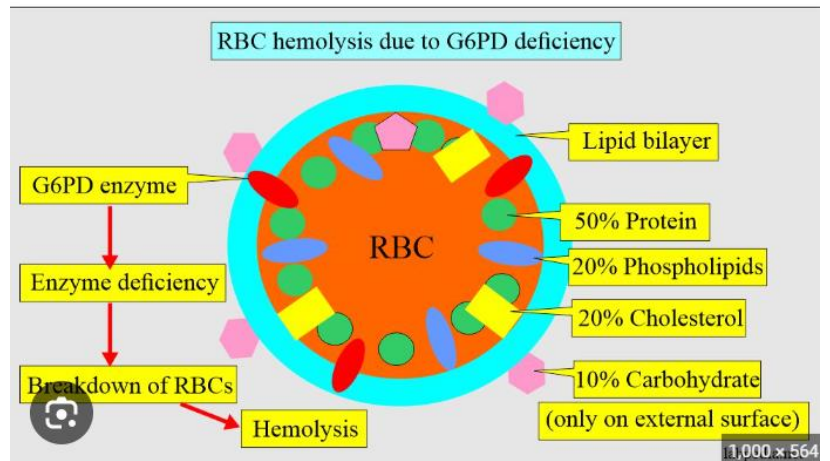
1 ▶

LIPID FUNCTIONS

ONE LINER : WHY
FLUORIDE IS USED AS A
PRESERVATIVE IN BLOOD
SAMPLE FOR GLUCOSE
ESTIMATION :

- For glucose estimation from any material, blood is collect in fluoride containing vial.
- Fluoride inhibit glycolysis by inhibiting enolase enzyme.
- In CSF, bacteria & other cells are also present so analysed immediately.
- For glucose estimation from urine, add 5ml glacial acetic acid as preservative to inhibit bacterial growth.

WHY G6PD
DEFICIENCY CAUSES
HEMOLYSIS ?



WHY ZWITTER IONS HAVE NO MOBILITY IN ELECTRICAL FLUIDS?

“A zwitterion is a molecule that has both positive and negative regions of charge.” In the solid state, amino acids exist as dipolar ions called zwitterions. While discussing whether a substance is zwitterionic or not, the [pH range](#) in which the information is required must be specified (because a sufficiently alkaline solution will change the zwitterion to an anion, and a sufficiently acid solution will change it to a cation).

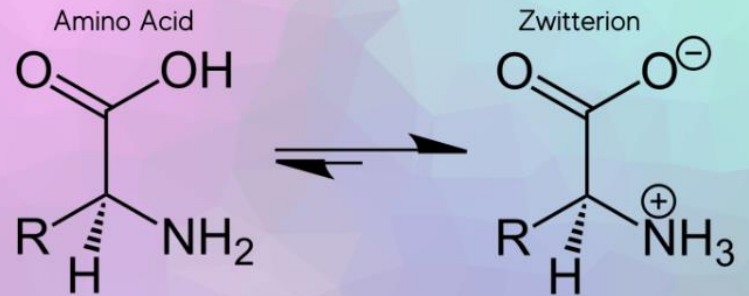
Some key **Characteristics of Zwitterion** are;

- They can be formed from compounds like ampholytes which contain both acid and base groups in their molecules.
- In this type of ion, the charged atoms are usually held together by one or more [covalent bonds](#).
- Zwitterionic compounds have stable, separated unit electrical charges on atoms.
- These compounds contain quaternary ammonium cations.

NO MOBILITY
REASON AND
DIAGRAM

Zwitterion

A zwitterion is a molecule with a net neutral charge that has positive and negative charged functional groups.



HIGH HDL LEVELS DECREASES THE RISK FOR CORONARY DISEASE

HDL's cardiovascular protective effect has conventionally been attributed to its important role in the transportation of excess cholesterol from the peripheral tissues to the liver, the process also known as reverse cholesterol transport

SCURVY

A condition caused by a severe lack of vitamin C in the diet.

Vitamin C is found in citrus fruits and vegetables. Scurvy results from a deficiency of vitamin C in the diet.

Symptoms may not occur for a few months after a person's dietary intake of vitamin C drops too low. Bruising, bleeding gums, weakness, fatigue and rash are among scurvy symptoms.

Treatment involves taking vitamin C supplements and eating citrus fruits, potatoes, broccoli and strawberries.

ALLOPURINOL

Allopurinol is used to prevent or lower high uric acid levels in the blood. It is also used to prevent or lower excess uric acid levels caused by cancer medicines or in patients with kidney stones. A high uric acid level can cause gout or gouty arthritis (joint pain and inflammation).

LACTOSE DEFICIENCY - MILK INTOLERANCE

Lactose intolerance occurs when your small intestine doesn't produce enough of an enzyme (lactase) to digest milk sugar (lactose). Normally, lactase turns milk sugar into two simple sugars — glucose and galactose — which are absorbed into the bloodstream through the intestinal lining.

WHY LEAD INHIBITS HAEME SYNTHESIS ?

One of the mechanisms of lead induced anemia is, specifically, inhibition of heme synthesis. Lead inhibits three enzymes in the heme biosynthesis pathway- δ -aminolevulinic acid dehydratase (ALAD), coporphyrinogen oxidase, and ferrochelatase- but its effects on ALAD are the most profound.