| | | |
|---|---|---|
| 1. | **One of the followings is false about the organic constituent of the plasma:**<br>a) Plasma proteins.<br>b) Lipids.<br>c) Glucose and amino acids.<br>d) Enzymes and hormones<br>e) $Co_2$ and $O_2$. | E |
| 2. | **The type of plasma proteins mainly responsible for plasma osmolality is:**<br>a) Globulin.<br>b) Albumin.<br>c) Fibrinogen.<br>d) Prothrombin.<br>e) Fibrinogen. | B |
| 3. | **The type of plasma protein mainly responsible for plasma viscosity is:**<br>a) Fibrinogen.<br>b) Albumin.<br>c) Haptoglobin.<br>d) Ceruloplasmin.<br>e) Globulin. | A |
| 4. | **The site of formation of γ globulin is:**<br>a) The liver.<br>b) The bone marrow.<br>c) The spleen.<br>d) The lymphatic tissue.<br>e) The lungs. | D |
| 5. | **The plasma protein is responsible for regulation of blood volume and tissue fluid formation because:**<br>a) The capillary wall is relatively impermeable to it.<br>b) Their small molecular size.<br>c) Its colloidal osmotic pressure equals 19 mmHg.<br>d) It is formed mainly of fibrinogen.<br>e) The colloidal osmotic pressure tends to push the fluid portion of plasma at the arterial end of capillaries. | A |
| 6. | **One of the followings about the buffering function of plasma proteins is incorrect:**<br>a) It is responsible for 15% of the buffering power of the blood.<br>b) At pH 7.4 it behaves as a base.<br>c) It has a free acidic (R-COOH) and basic groups (R-NH2) which are easily dissociated.<br>d) It is formed of proteinic acid and Na proteinate.<br>e) An important cause accounting for its buffering function is the dissociation of imidazole group of histidine residues in proteins. | B |

| | | |
|---|---|---|
| 7. | **The amount of plasma proteins (=P.P.) is near to:**<br>a) 10 gm %.<br>b) 7 gm %.<br>c) 1 gm %.<br>d) 30 gm%.<br>e) 12 gm%. | B |
| 8. | **The plasma albumin is specially needed for:**<br>a) Immunity.<br>b) Blood viscosity.<br>c) Production of osmotic pressure.<br>d) Blood coagulation.<br>e) Increase capillary permeability. | C |
| 9. | **The importance of the carrier function of plasma protein is that:**<br>a) It causes rapid loss in urine.<br>b) Makes the miscible lipids immiscible with water.<br>c) It has a small molecular size.<br>d) Is responsible for blood viscosity.<br>e) It acts a reservoir for the carried substance to be used when needed. | E |
| 10. | **All the following are functions of the plasma proteins except:**<br>a) Control of the plasma volume.<br>b) Control of erythropoiesis.<br>c) Transport of hormones.<br>d) Carriage of carbon dioxide.<br>e) Defensive function | B |
| 11. | **Plasma proteins that are involved in coagulation of blood are:**<br>a) Fibrinogen and Albumin.<br>b) Albumin and Globulin.<br>c) Prothrombin and Fibrinogen.<br>d) Prothrombin and Albumin.<br>e) Prothrombin and Globulin. | C |
| 12. | **The plasma gamma globulins are synthesized mainly in the:**<br>(A) Liver.<br>(B) Heart<br>(C) Lungs.<br>(D) Reticuloendothelial system. | D |
| 13. | **All the following are major functions of the plasma except:**<br>(A) Transport of hormones.<br>(B) Transport of $CO_2$.<br>(C) Transport of antibodies.<br>(D) Transport of $O_2$. | D |

| | | |
|---|---|---|
| 14. | **All the following are functions of the plasma proteins except:**<br>(A) Control of the plasma volume.<br>(B) Control of erythropoiesis.<br>(C) Transport of hormones.<br>(D) Carriage of carbon dioxide. | B |
| 15. | **All the following about plasma albumin is true except:**<br>(A) It makes the greatest contribution to the plasma oncotic pressure.<br>(B) It is minimally filtered at the renal glomeruli.<br>(C) It behaves as an anion at the blood pH.<br>(D) It is involved in the production of immunity. | D |
| 16. | **In the plasma:**<br>(A) Water constitutes about 60 % of its total volume.<br>(B) The main cation is sodium at a concentration of 42 mEq /liter.<br>(C) The concentration of plasma proteins is about 7 gm %.<br>(D) The inorganic constituents' concentration is 0.19 %. | C |
| 17. | **The colloidal osmotic pressure of the plasma is:**<br>(A) Mainly caused by the plasma fibrinogen content.<br>(B) Responsible for diffusion of water and solutes out of the capillaries.<br>(C) About 300 milliosmoles /liter.<br>(D) About 1-2 milliosmoles /liter (28 mmHg). | D |
| 18. | **The iron that carried by plasma protein circulate with the blood in the form of:**<br>A. Elemental iron.<br>B. Apo transferrin.<br>C. Transferrin.<br>D. Ferritin.<br>E. Apoferritin. | C |
| 19. | **Which of the following plasma proteins responsible for carry vitamin B12 in the blood?**<br>A. Albumin.<br>B. Ceruloplasmin.<br>C. Transferrin.<br>D. Transcobalamin.<br>E. Transthyretin. | D |

# Blood

Blood is the part of the extracellular fluid that circulates within the cardiovascular system.

## Composition:

| | Plasma | | | Cellular elements |
|---|---|---|---|---|
| % | 55% of blood volume | | | 45% of blood volume |
| Consists of: | 90% | Water | | 1. Red blood cells (RBCs)<br>2. White blood cells (WBCs)<br>3. Platelets |
| | 10% | Solids | | |
| | | 9.1% | **Organic substances**: (plasma proteins, lipids, others) | |
| | | 0.9% | **Inorganic substances**: ($Na^+$, $K^+$, $Cl^-$, $HCO_3$, $PO_4$, $SO_4$) | |

## General functions of blood

### 1 Transport:

The **major transport medium in the body:**

- **Many substances as:** Glucose, $O_2$, $CO_2$.
- **End products of:** Urea, and hormones.

### 2 Defensive:

WBCs provide the main defense mechanisms against a wide variety of micro-organisms through:

a- Phagocytosis.
b- Formation of antibodies.

### 3 Hemostasis:

Stoppage of bleeding from injured blood vessel by platelets and clotting

### 3 Homeostasis:

| | |
|---|---|
| **Def.** | Keeping the composition (pH, electrolytes and water) of the internal environment (ECF) constant. |

# Plasma proteins

## Concentration:

**6- 8 gm**/ 100 ml plasma

## Types:

| 1- *Albumin.* | 2- *Globulins* | 3- *Fibrinogen* | 4- *Prothrombin* |
|---|---|---|---|
| 3.5 - 5.0 gm% | 2-3.5 gm% | 400 mg% | 10 mg% |
| | subdivided into: $\alpha_1$, $\alpha_2$, $\beta_1$, $\beta_2$, $\gamma$. | | |

## Sites of Formation:

| | |
|---|---|
| **Liver:** | Albumin, fibrinogen, prothrombin, and globulins **except the γ globulins** |
| **lymphatic tissues:** | **γ globulins fraction** of the plasma proteins are manufactured in the MCQ plasma cells in the lymphatic tissues. (20-50% of globulins), |

# Functions of Plasma Proteins

## 1 Regulation of blood volume & tissue fluid formation:

### Colloidal osmotic pressure or oncotic pressure.

| | | | |
|---|---|---|---|
| **Definition:** | Pressure tends to pull water into the blood. | | |
| **Produced By:** *MCQ* | **Albumin:** | because it has the greatest concentration. | |
| **Value:** | **28 mmHg** | **19 mmHg** | **9 mmHg** |
| | | by albumin | by the cations (mainly Na) held in plasma by the **Donnan's** effect of proteins. |
| **Function:** | reabsorption of tissue fluid | | |

## 2 Blood coagulation:

| | |
|---|---|
| **Prothrombin & fibrinogen:** *MCQ* | And other clotting factors which are plasma proteins needed for the coagulation of the blood. |

## 3 Blood viscosity:

| | **Blood** | **Plasma** |
|---|---|---|
| **Value:** | 3 times as viscous as water. | 1.5 times as viscous as water. |
| **Cause:** | Red blood cells & plasma proteins. | *MCQ* Fibrinogen mainly $d_2$ **elongated shape of its molecules.** |
| **Importance:** | production of the peripheral resistance → ABP. | |

## 4 Defensive function (Immunity):

| | |
|---|---|
| **Gamma globulins:** | Which are also called antibodies or immunoglobulins are responsible for defending the body against micro-organisms |

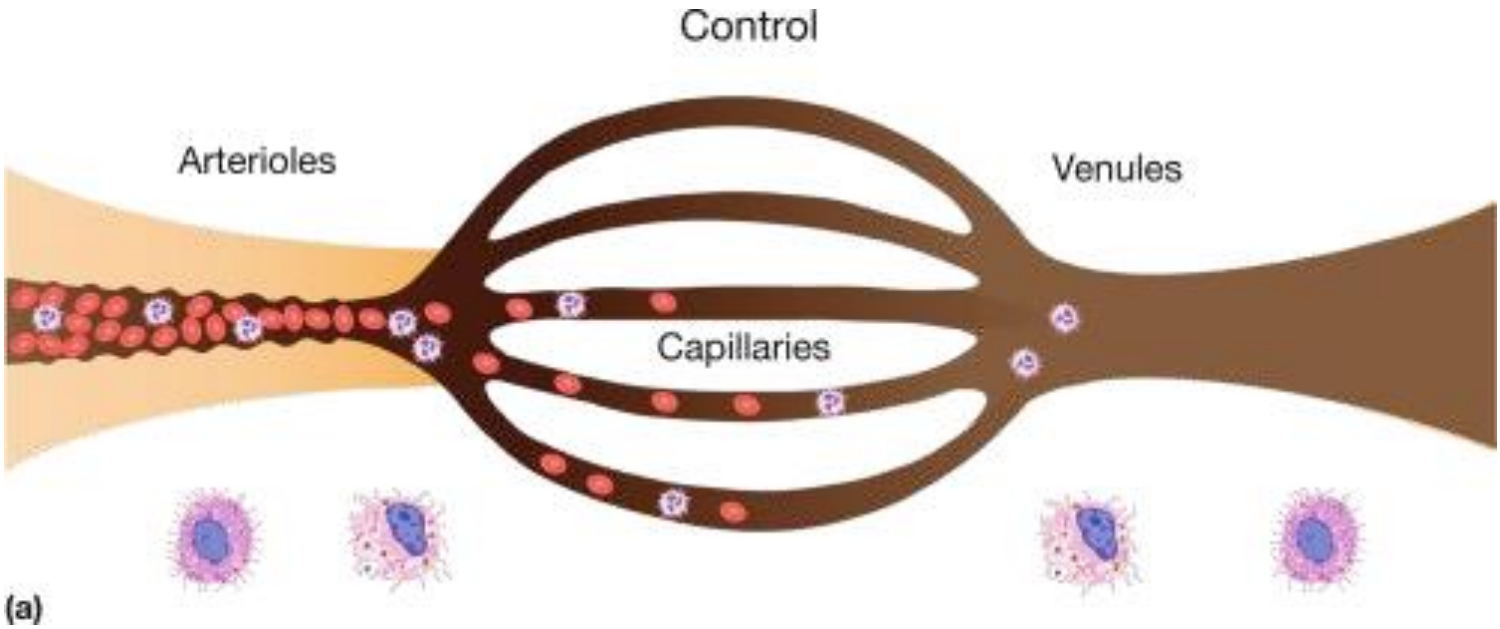
## 5 Buffering action:

| | | | | |
|---|---|---|---|---|
| **Principal:** | Plasma proteins have **free acidic** (R-COOH) and **basic** (R-$NH_2$) groups. | | | |
| **Buffer system:** | At **normal pH of plasma (7.4)** the plasma proteins are *MCQ* negatively charged and act as anions (weak acids), thus combined with bases mainly $Na^+$ , forming the buffer system: | | | |
| | **Weak acid** | | **Strong base (Salt)** | |
| | Proteinic acid | | $Na^+$ proteinate. | |
| | **Addition of alkali:** | NaOH + proteinic acid ↓ Na proteinate + $H_2O$ | **Addition of acid:** | Lactic acid + $Na^+$ proteinate ↓ Na lactate + proteinic acid (weak acid). |

## 6 Control of capillary permeability:

The pores in the capillary walls are closed by the plasma proteins, so limiting their permeability.

Thus, decrease plasma proteins is associated with increased capillary permeability.



# 7 Carrier function:

## Examples:

| | | |
|---|---|---|
| 1- **Albumin:** | ✓ For hormones (thyroxine & steroids).<br>✓ Amino acids, vitamins and fatty acids. | |
| 2- **Globulin:** | **Steroid hormone – binding globulin**.<br>(Carrier protein for steroid hormones in the blood.) | |
| 3- **Transferrin:** | **$\beta_1$ globulin** | transports the iron in the blood. |
| 4- **Transcobalamin:** | carrier for vit. B12. | |

## Importance:

| | |
|---|---|
| 1- **Preventing substances from rapid loss in urine:** | because the plasma proteins are of large molecular size and cannot be easily filtered through the glomeruli. |
| 2- **Provides a reservoir:** *MCQ* | used when needed. |
| 3- **Making lipids miscible with water:** | binding of lipids and free fatty acids with apolipoprotein and albumin make them miscible with water and easily transported through plasma. (watery medium). |

# Red Blood Corpuscles "Erythrocytes" "RBCs"

## Erythrocyte count

| Males MCQ | Females MCQ | Newly born | Children | High altitude |
|---|---|---|---|---|
| **5-5.5** million/mm³ | **4.5-5** million/mm³ | ↑ ↑ **6 -8** million/mm³ | ↓ ↓ **3.5-4.5** million/mm³ | ↑ ↑ 2ry polycythaemia<br>Due to low oxygen in atmosphere |

## Shape

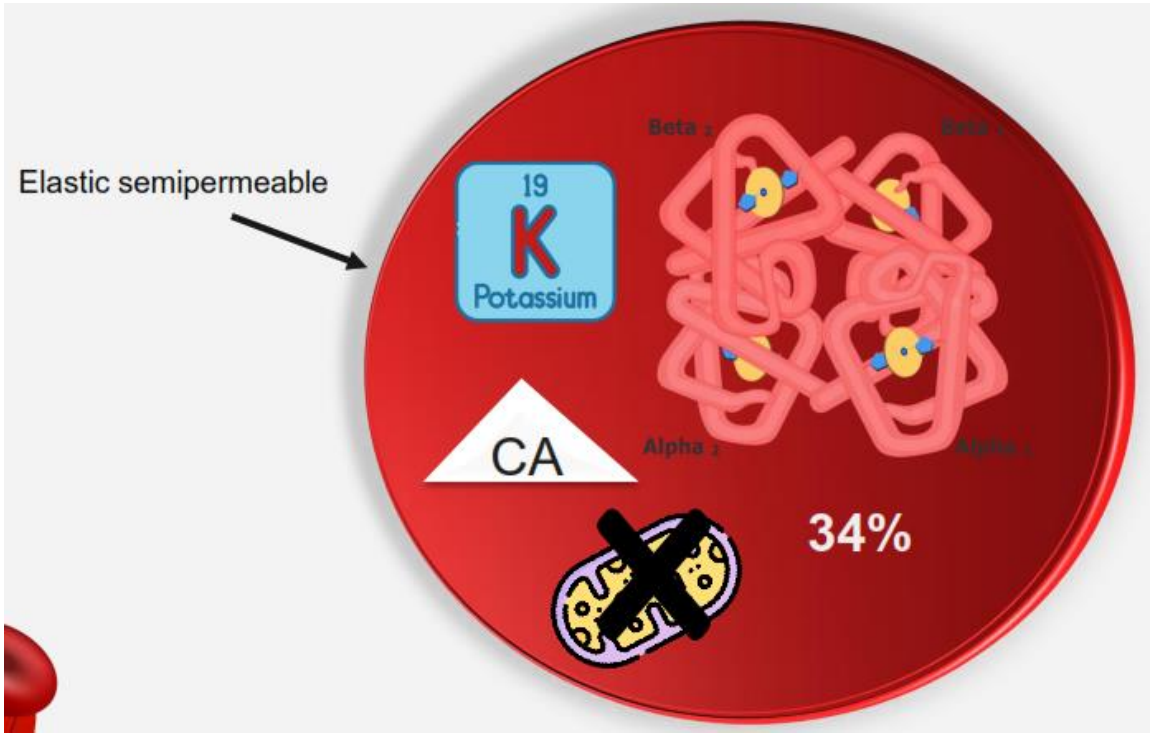
| | |
|---|---|
| **Normal shape:** | • **Circular**<br>• **Biconcave**<br>• **Non-nucleated** "so called corpuscles, not true cells" MCQ |

## Functions of cell membrane "advantage of shape"

| | |
|---|---|
| ***1) larger surface area:*** | - It produces a surface area > a spherical cell of the same volume, **Allows easy diffusion of gases through cell membrane.** |
| ***2) Cell flexibility "Plastic"*** | - It enhances cell flexibility → erythrocytes to be **squeezed** in small capillaries **without rupture.** MCQ |
| ***3) It keeps Hb inside RBCs*** | - prevent its loss in urine. |

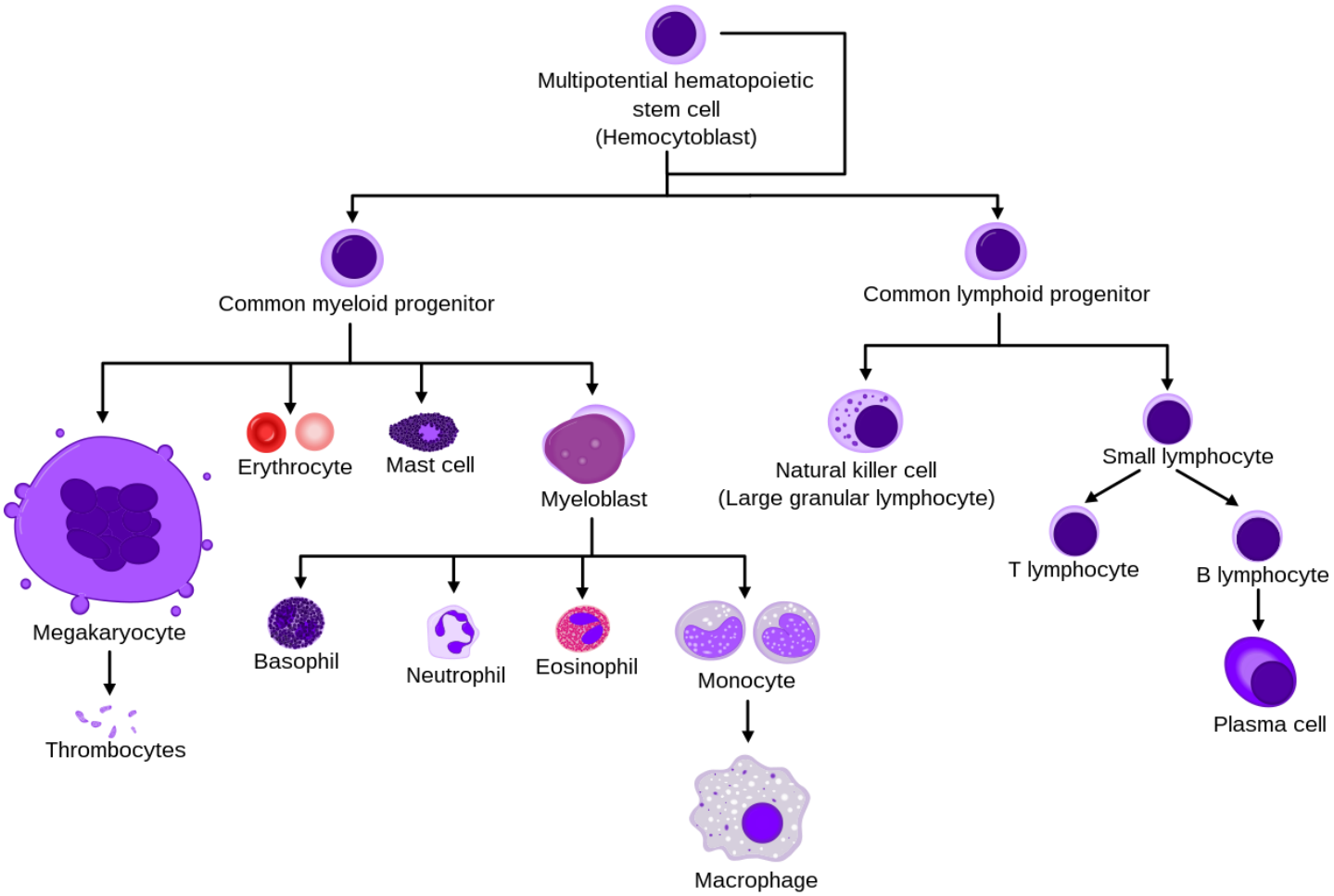
# Structure & Functions

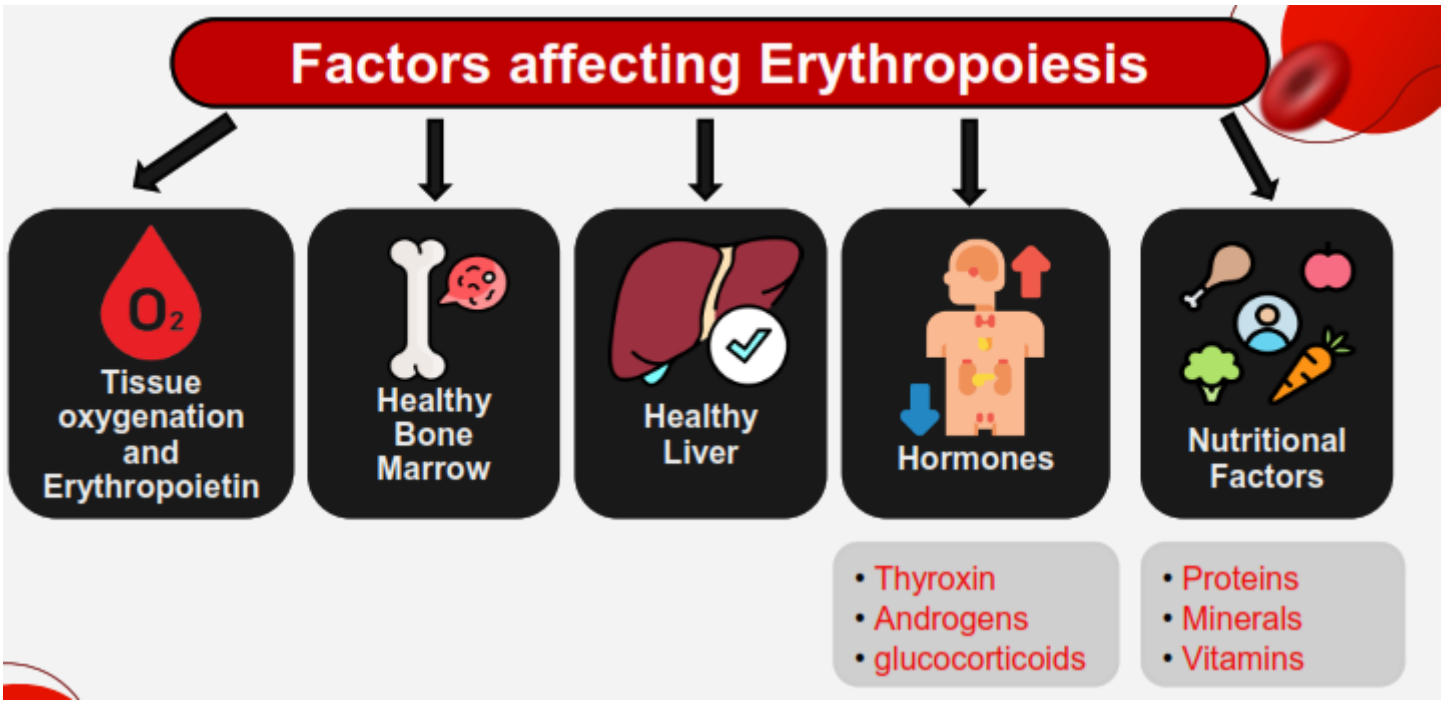
| | Structure: | Function of RBCs: |
|---|---|---|
| **Membrane:** | • Elastic & Semipermeable<br>• Has large surface area | **Functions (Above)** |
| **Hemoglobin:** | Main constituent of erythrocytes (34% of their weight). | 1) Carries oxygen from the lungs to the tissues. (**Major function of RBCs**) *MCQ*<br>2) Transport of $CO_2$ from tissue.<br>3) Excellent acid-base buffer |
| **Carbonic anhydrase enzyme:** *MCQ* | large quantity inside erythrocyte | 4) **Carbon dioxide transport.** |
| **Potassium:** | Chief **intracellular** cation. | 5) RBCs as whole increase blood **viscosity** and peripheral resistance. |
| **No mitochondria:** | **Obtain energy:** From anaerobic glycolysis. | |



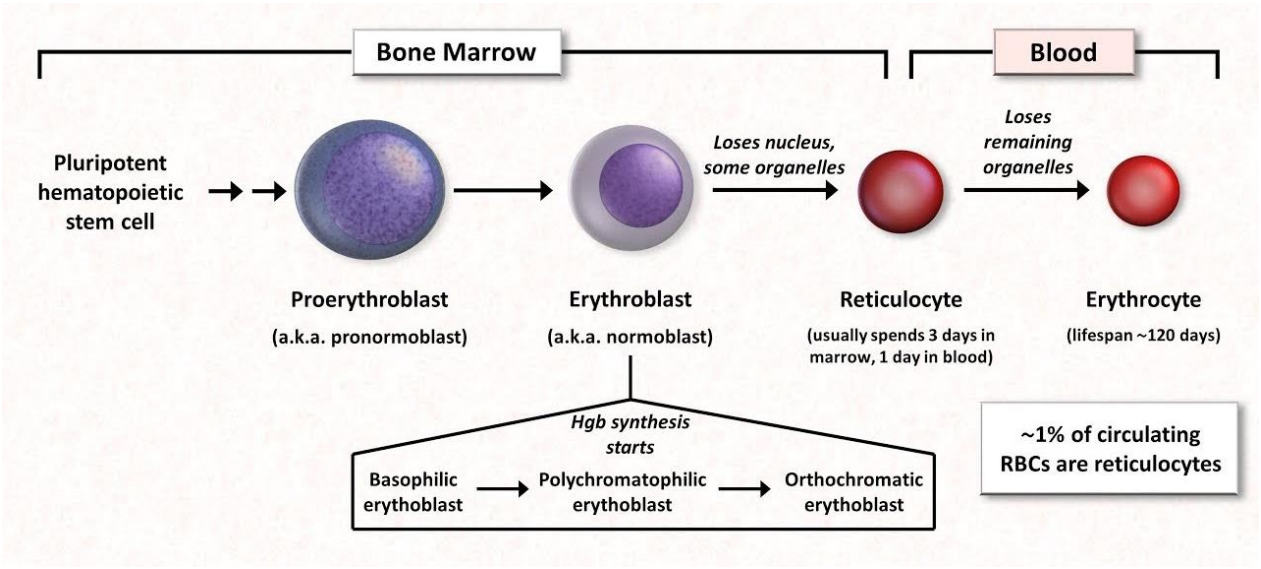
# Hematopoiesis

**Definition**: It is the process of formation of blood cells.



# Erythropoiesis

| | | |
|---|---|---|
| **Def** | The process of new RBC's production. | |
| **Sites** | **In early few weeks:** | **Yolk sac** |
| | **Middle trimester:** | **Liver, spleen, & lymph nodes.** *MCQ* |
| | **last trimester & after birth:** | Red bone marrow (**bone marrow of all bones**). *MCQ* |
| | **After the age of 20 years:** | **Membranous bones only**<br>↳ The bone marrow of all long bones become **fatty**, *MCQ* so only membranous bones, such as the vertebrae, sternum, ribs, & ilia can produce RBCs. |
| **Stages** *MCQ* |  | |
| | **Pluripotent → proerythroblast → erythroblast → reticulocyte → erythrocyte** | |

## Factors Affecting Erythropoiesis

1) **Tissue oxygenation & role of erythropoietin**
2) **Healthy Bone Marrow**
3) **Healthy Liver**
4) **Hormones**
5) **Nutritional Factors**

# 1 Tissue oxygenation & role of erythropoietin

- Any condition that ↓ the quantity of O2 transported to the tissues → ordinarily ↑ the rate of red cell formation "**see below**, causes of hypoxia":

## *Erythropoietin*

| | | | |
|---|---|---|---|
| **Def** | It is a circulating hormone, glycoprotein in nature | | |
| | **Principal factor** that stimulates RBC's production in low oxygen states. | | |
| **Sources (origin)** | **Adult person:** | | **Fetal life:** |
| | 90% *MCQ* | 10% | Almost completely formed by the liver. |
| | in the kidneys. | in the liver. | |

## *Regulation of erythropoietin secretion*

## *Hypoxia*

| | |
|---|---|
| **Main stimulus:** | There is evidence that $O_2$ tension in the kidney is the major factor regulating erythropoiesis. |
| **Causes of hypoxia:** | **1)** High altitudes. *MCQ*<br>**2)** ↑ demand for oxygen → as in athletes.<br>**3)** **Loss of RBC's** → as in hemorrhage. |

## *Effect of erythropoietin in erythropoiesis*

| | |
|---|---|
| **1) Production of proerythroblasts:** | - Stimulate the production of proerythroblasts from hemopoietic stem cells in the bone marrow. |
| **2) Speeds up all stages:** | - It speeds up all the stages of development into erythroblasts then into mature RBC's. *MCQ* |

## 2 Healthy Bone Marrow

| Healthy bone marrow: | Essential for the production of RBC's |
|---|---|
| **Aplastic anemia:** *MCQ* | • Deficiency of all blood cells due to destruction of bone marrow by:<br>1. Irradiation.<br>2. Chemicals.<br>3. Drugs.<br>4. Bacterial toxins. |

## 3 Healthy Liver

❖ **Healthy liver is essential for normal RBC's formation where it is the site of:**

**1)** Formation of globin portion of hemoglobin.

**2)** Formation of 10% of erythropoietin.

**3)** Storage of iron & vitamin $B_{12}$. *MCQ*

## 4 Hormones

❖ **Beside erythropoietin, thyroid** hormones, **androgens** and **glucocorticoids stimulate** erythropoiesis,

↳ As they promote **tissue metabolism** in general.

# 5 Nutritional Factors

| | |
|---|---|
| **Types** | • Nutritional factors important for formation & maturation of the red blood cells are:<br>a) Proteins.<br>b) Minerals (iron – copper – cobalt).<br>c) Vitamins (vitamin B12 – folic acid). |

## *a) Proteins*

❖ Animal proteins (**high biological value proteins**) that are present in **liver**, **kidney** & **muscles** are superior in the production of hemoglobin than other proteins.

## *b) Minerals*

| | |
|---|---|
| ***1. Iron:*** | Important for the formation of Hb. *MCQ* |
| ***2. Copper:*** | Cofactor in Hb synthesis. |
| ***3. Cobalt:*** | Cofactor in Hb synthesis. |

## *C) Vitamins*

All vitamins are needed for erythropoiesis.

# Anemia

## Definition

A **deficiency of hemoglobin**, which can be caused by either decreased number of RBC's or too little hemoglobin in the cells. MCQ

## Types

| 1) Blood loss Anemia | 2) Hemolytic Anemia: | 3) Aplastic: MCQ | 4) Megaloblastic Anemia: MCQ |
|---|---|---|---|
| • Acute blood loss.<br>• Chronic blood loss. | Excessive destruction of RBC's. | Due to lack of functioning bone marrow. | Due to deficiency of either:<br>1- vitamin B12.<br>2- folic acid.<br>3- the intrinsic factor from stomach mucosa. |

| | | |
|---|---|---|
| 1. | **Erythropoietin is essential for:**<br>(A) Leukopoiesis.<br>(B) Formation of prothrombin.<br>(C) Formation of red blood corpuscles.<br>(D) None of the above | C |
| 2. | **Erythropoiesis in adult individuals occurs normally in the:**<br>(A) Liver.<br>(B) Red bone marrow.<br>(C) Yellow bone marrow.<br>(D) Spleen. | B |
| 3. | **Improper maturation of the red blood corpuscles can be caused by:**<br>(A) Vitamin B12 deficiency.<br>(B) Hypoxia.<br>(C) Iron deficiency.<br>(D) Bone marrow aplasia. | A |
| 4. | **The main site of production of erythropoietin is the:**<br>(A) Liver.<br>(B) Bone marrow.<br>(C) Spleen.<br>(D) Kidneys. | D |
| 5. | **Hemolytic anemia may be caused by all the following except:**<br>(A) Iron deficiency.<br>(B) Abnormal hemoglobin.<br>(C) Congenital spherocytosis.<br>(D) Deficiency of G-6-P dehydrogenase. | A |
| 6. | **Polycythemia may occur in all the following conditions except:**<br>(A) Tumors of the kidney.<br>(B) Right to left shunts in the heart.<br>(C) Advanced liver disease.<br>(D) High altitudes. | C |
| 7. | **The intrinsic factor:**<br>(A) Is found in the liver.<br>(B) Is produced by the gastric parietal cells.<br>(C) Is secreted by the terminal ileum.<br>(D) Aids absorption of folic acid. | B |
| 8. | **About the active erythropoietic tissue, all the following is true except:**<br>(A) It is not found in the vertebrae of adults.<br>(B) It is present early in intrauterine life.<br>(C) It occupies the whole bone marrow at birth.<br>(D) It is replaced by fat in the shafts of long bones in healthy adults | A |

| | | |
|---|---|---|
| 9. | **The production of erythrocytes:**<br>(A) Is decreased in high altitudes.<br>(B) Occurs in the spleen in normal adults.<br>(C) Is stimulated by an increase in the arterial $PCO_2$.<br>(D) Is decreased if the stomach loses the ability to produce a normal gastric juice. | **D** |
| 10. | **About erythrocytes:**<br>(A) They contain no enzymes.<br>(B) They are responsible for the major part of blood viscosity.<br>(C) Their life span is about 2 months.<br>(D) Their Hb content carries only $O_2$. | **B** |
| 11. | **Severe depression of the bone marrow may result in:**<br>(A) Microcytic hypochromic anemia.<br>(B) Increased number of granulocytes.<br>(C) Aplastic anemia, leucopenia, and thrombocytopenia.<br>(D) Increased coagulability of the blood. | **C** |
| 12. | **All the following conditions cause anemia except:**<br>(A) Erythroblastosis fetalis.<br>(B) Vitamin B12 deficiency.<br>(C) Hypothyroidism.<br>(D) Living at high altitudes. | **D** |
| 13. | **About the red blood corpuscles one of these is false:**<br>a) It the most abundant of all blood cells.<br>b) It has no nucleus.<br>c) It has a diameter of 7.8 Mm and a volume of 90 to 95 $M^3$.<br>d) Its count is low in newly born infants and more in growing children.<br>**e)** Persons living at high altitudes have greater number of RBC. | **D** |
| 14. | **The biconcave shape of erythrocytes has the following advantage:**<br>a) Produces a small surface area than a spherical cell of the same volume.<br>b) Allows erythrocytes to be squeezed through small capillaries without rupture.<br>c) Results in high tension on the membrane when the volume of the cell changes.<br>d) Allows a small surface area for gas exchange.<br>e) It allows free diffusion of ions. | **B** |
| 15. | **About the structure of erythrocytes, the followings is false:**<br>a) Are surrounded with plastic semipermeable membrane.<br>b) Hemoglobin is the main constituent of the erythrocytes.<br>c) K is the chief intracellular cation.<br>d) It is a nucleated biconcave disc.<br>e) It has no mitochondria. | **D** |

| | | |
|---|---|---|
| 16. | **The major function of RBCs is:**<br>a) Carriage of oxygen from the lungs to the tissues.<br>b) Transport of $Co_2$.<br>c) Hemoglobin is an excellent acid base buffer.<br>d) Increasing blood viscosity and peripheral resistance.<br>e) Storage of iron. | A |
| 17. | **About sites of erythropoiesis:**<br>a) In the 1st trimester of gestation, the nucleated RBCs are produced in the liver.<br>b) In the 2nd trimester of gestation RBCs are produced in the yolk sac.<br>c) In the last trimester and after birth, erythropoiesis is restricted to the membranous bones.<br>d) By the age of 20 years the bone marrow of most long bones becomes fatty.<br>e) After the age of 20 years, Erythropoiesis is restricted to yellow bone marrow. | D |
| 18. | **About the stages of erythropoiesis, which of the following is false:**<br>a) Interleukins are important for the formation of committed stem cells from PHSCs.<br>b) Erythropoietin is not responsible for maturation of erythroblasts to mature RBCs.<br>c) Vit.B12 and folic acid are responsible for differentiation of erythroblasts to normoblast.<br>d) Erythropoietin stimulates the production of proerythroblasts from hemopoietic stem cells in the bone marrow.<br>e) Erythropoietin speeds up all the stages of development in erythroblasts. | B |
| 19. | **Healthy liver is essential for normal RBCs formation because it is the site of:**<br>a) Formation of 90% of erythropoietin.<br>b) Formation of the heme part of hemoglobin.<br>c) Destruction of old RBCs.<br>d) Synthesis of cobalt and androgen.<br>e) Storage of iron and vitamin $B_{12}$. | E |
| 20. | **The production of normal erythrocytes:**<br>a) Is decreased in high altitudes.<br>b) Occurs in the spleen in normal adults.<br>c) Is stimulated by an increase in the arterial $PCO_2$.<br>d) Is decreased if the stomach loses the ability to produce a normal gastric juice.<br>e) Is increased in iron deficiency cases. | D |

| | | |
|---|---|---|
| 1. | **Which of these statements concerning clotting is false?**<br>a) Both extrinsic and intrinsic clotting pathways form prothrombin activator.<br>b) Clots are composed mostly of plasmin.<br>c) Clotting requires vitamin K and calcium ion.<br>d) The extrinsic pathway is stimulated by contact with a damaged blood vessel.<br>e) Thrombin is required for conversion of fibrinogen into fibrin. | B |
| 2. | **Arrange the following events in the order in which they occur during platelet plug formation:**<br>1. **Platelet activation.**<br>2. **Platelet aggregation.**<br>3. **Platelet adhesion.**<br>a) 1,2,3.<br>b) 1,3,2.<br>c) 2,1,3.<br>d) 2,3,1.<br>e) 3,1,2. | E |
| 3. | **normal hemostatic response to vascular damage depends mainly on:**<br>a) The red blood cells.<br>b) Stasis of the blood flow.<br>c) Circulating white blood cells.<br>d) Blood coagulation factors.<br>e) $Mg^{++}$ ions. | D |
| 4. | **Which of the following is the normal count range of platelets / mm3?**<br>a) 500,000 to 600,000.<br>b) 150,000 to 300,000.<br>c) 100,000 to 200,000.<br>d) 550,000 to 650,000.<br>e) 50,000 to 150,000. | B |
| 5. | **Choose the correct order for the steps of hemostasis:**<br>a) Blood coagulation, platelet plug formation, blood vessel spasm.<br>b) Platelets plug formation, blood coagulation, blood vessel spasm.<br>c) Blood vessel spasm, platelet plug formation, blood coagulation.<br>d) Blood vessel spasm, blood coagulation, platelet plug formation.<br>e) Platelet plug formation, blood vessel spasm, blood coagulation. | C |
| 6. | **Which clotting factor is released from damaged tissue, and initiates a chain of clotting events?**<br>a) Prothrombin.<br>b) Thrombin.<br>c) Fibrin.<br>d) Tissue thromboplastin.<br>e) Fibrinogen. | D |

| | | |
|---|---|---|
| 7. | **Which of the following ions is required for conversion of prothrombin into active thrombin?**<br>a) $Ca^{++}$.<br>b) $Fe^{++}$.<br>c) $Mg^{++}$.<br>d) $Mn^{++}$.<br>e) $Cl^{-}$. | A |
| 8. | **Activated platelets release which of the following:**<br>a) Serotonin<br>b) ADP<br>c) Thromboplastin<br>d) Fibrin<br>e) Von wilberand factor. | B |
| 9. | **The conversion of fibrinogen into fibrin promoted by:**<br>a) Factor X.<br>b) Thrombin.<br>c) Prothrombin.<br>d) Platelets.<br>e) Factor IX | B |
| 10. | **---------- are necessary for clot retraction to occur.**<br>a) Red blood cells.<br>b) Lymphocytes.<br>c) Platelets.<br>d) Basophils.<br>e) Monocytes. | C |
| 11. | **Prothrombin level falls in the blood due to lack of:**<br>a. Vitamin B12<br>b. Vitamin K<br>c. Phospholipids<br>d. Platelets<br>e. Sodium | B |
| 12. | **Which chemical initiates the extrinsic phase of clotting?**<br>a) Fibrin<br>b) Prothrombin<br>c) Thromboplastin<br>d) Plasmin<br>e) Christmas factor | C |

| | | |
|---|---|---|
| 13. | **Given these chemicals: 1. Fibrin, 2. Fibrinogen, 3. prothrombin activator 4. Thrombin, 5. tissue factor**<br>**Choose the arrangement that lists the chemicals in the order they are active during clot formation.**<br>a. 1,3,4,2,5<br>b. 2,3,4,5,1<br>c. 3,5,1,4,2<br>d. 4,3,2,5,1<br>e. 5,3,4,2,1 | **E** |
| 14. | **Normal blood clotting requires:**<br>a. Inactivation of heparin<br>b. Inactivation of plasmin<br>c. Inactivation of fibrin<br>d. Calcium ion<br>e. An adequate intake of vitamin C | **D** |
| 15. | **The activation of prothrombin into thrombin is achieved by:**<br>a. Factor Xa<br>b. Factor III<br>c. Factor VIII<br>d. Factor IXa<br>e. Factor XIa | **A** |
| 16. | **Hemorrhagic tendency in obstructive jaundice is due to:**<br>a. Deficiency of platelets<br>b. Increased serum bile salt concentration<br>c. Deficiency of factor VIII<br>d. Lack of factors II, VII, IX and X<br>e. Deficiency of fibrinogen | **D** |
| 17. | **The platelets produce hemostasis by releasing all the following substances except:**<br>(A) ADP.<br>(B) Platelet factor 3 (PL).<br>(C) Thromboxane A2.<br>(D) Thrombopoietin. | **D** |
| 18. | **All the following about coagulation factor VII is true except:**<br>(A) It is synthesized in the liver.<br>(B) It is activated by a tissue factor.<br>(C) It is important for the intrinsic pathway of blood clotting.<br>(D) When activated, it activates factor X. | **C** |

| | | |
|---|---|---|
| **19.** | **About the coagulation mechanism all the following is true except:**<br>(A) Platelet factor 3 is required for both the extrinsic and intrinsic systems.<br>(B) The intrinsic system occurs both in vivo and in vitro.<br>(C) Intravascular thrombosis occurs by the extrinsic system.<br>(D) The intrinsic system utilizes factors VIII, IX, XI and XII. | **C** |
| **20.** | **About intravascular clotting, all the following is true except:**<br>(A) It occurs by the intrinsic system of coagulation.<br>(B) It is induced by a decrease in the blood flow rate.<br>(C) It is related to the clumping of platelets.<br>(D) It does not normally occur because $Ca^{2+}$ is present. | **D** |
| **21.** | **Thrombin is required for activation of all the following except:**<br>(A) Plasminogen.<br>(B) Fibrinogen.<br>(C) Clot retraction.<br>(D) Factor III. | **D** |
| **22.** | **The coagulation process is prolonged in:**<br>a) Anemia.<br>b) Cardiac diseases.<br>c) Liver diseases.<br>d) Purpura.<br>e) Polycythemia. | **C** |
| **23.** | **---------- are necessary for clot retraction to occur.**<br>a) Red blood cells.<br>b) Lymphocytes.<br>c) Platelets.<br>d) Basophils.<br>e) Monocytes. | **C** |
| **24.** | **II, VII, IX and X levels fall in the blood due to lack of**<br>a. Vitamin B12<br>b. Vitamin K<br>c. Vitamin A<br>d. Platelets<br>e. Sodium | **B** |
| **25.** | **Platelet adhesion to injured blood vessel wall is potentiated by**<br>A. ADP<br>B. Thromboxane A2<br>C. Serotonin<br>D. Von-Willedrand factor<br>E. The platelets membrane phospholipid | **D** |

| | | |
|---|---|---|
| 26. | **Salicylates inhibit platelet plug formation through:**<br>A. Inhibiting thromboxane A2<br>B. Increasing thromboxane A2<br>C. Inhibiting glycoprotein<br>D. Increasing ADP<br>E. Inhibiting serotonin | A |
| 27. | **Coagulation factors involved in extrinsic pathway include:**<br>A. II, VII, IX and X<br>B. VII, X and V<br>C. XII, XI, IX and X<br>D. II, V, VII and X<br>E. XII, V, and X | B |
| 28. | **The extrinsic pathway of blood clot formation is:**<br>A. Occurs both in vivo and in vitro<br>B. A slow process that terminates in 3-6 minutes<br>C. A rapid mechanism that is initiated by contact of the blood with traumatized vascular wall<br>D. Involves activation of factors XII and XI<br>E. Involves activation of factors III and V | C |
| 29. | **Conversion of prothrombin to thrombin is mediated through:**<br>A. Fibrinogen<br>B. Plasminogen<br>C. Thromboplastin<br>D. Stable factor<br>E. Prothrombin activator and $Ca^{++}$ | E |
| 30. | **The anti-hemorrhagic vitamin is:**<br>A. Vitamin C<br>B. Vitamin A<br>C. Vitamin K<br>D. Vitamin $B_{12}$<br>E. Vitamin $B_6$ | C |

| | | |
|---|---|---|
| 1. | **Which chemical is involved in the breakdown of a clot (fibrinolysis)?**<br>a) Fibrinogen.<br>b) Antithrombin.<br>c) Plasmin.<br>d) Heparin.<br>e) Platelets factor 3 | C |
| 2. | **Which of these statements concerning clotting is untrue?**<br>a) Both extrinsic & intrinsic clotting pathways form prothrombin activator.<br>b) Clots are composed mostly of plasmin.<br>c) Clotting requires vitamin K and calcium ion.<br>d) The extrinsic pathway is stimulated by contact with a damaged blood vessel.<br>e) Thrombin is required for conversion of fibrinogen into fibrin | B |
| 3. | **Bleeding from a small cut in the skin:**<br>a) Is normally diminished by local vascular spasm.<br>b) Not require platelet plug formation to stop bleeding.<br>c) Is greater from cold skin than warm skin.<br>d) Cease within about 10 min in normal people.<br>e) Cease within about 20 min in normal people. | A |
| 4. | **Which of these statements is false regarding coagulation?**<br>a) Prothrombin activator catalyzes the breakdown of prothrombin to thrombin.<br>b) Thrombin catalyzes the conversion of fibrinogen to fibrin.<br>c) Antithrombin inactivates thrombin.<br>d) Heparin causes fibrinolysis.<br>e) Warfarin and heparin are anticoagulants. | D |
| 5. | **Which of the following is the normal count range of platelets / mm3?**<br>a) 500,000 to 600,000.<br>b) 150,000 to 300,000.<br>c) 100,000 to 200,000.<br>d) 550,000 to 650,000.<br>e) 50,000 to 150,000. | B |
| 6. | **Heparin is secreted by:**<br>a. Kidney<br>b. Blood cells<br>c. Nerve cells<br>d. Liver<br>e. Lung | B |
| 7. | **Maintenance of blood fluidity depends on all the following Except:**<br>a) Smooth vascular endothelium<br>b) The presence of heparin and antithrombin III<br>c) Absence of plasminogen<br>d) Intact fibrinolytic system<br>e) Rapid blood flow rate through the blood vessels | C |

| | | |
|---|---|---|
| 8. | **Which of these statements is NOT true regarding coagulation?**<br>a) Prothrombin activator catalyzes the breakdown of prothrombin to thrombin.<br>b) Thrombin catalyzes the conversion of fibrinogen to fibrin.<br>c) Antithrombin inactivates thrombin.<br>d) Heparin causes fibrinolysis.<br>e) Warfarin and heparin are anticoagulants. | D |
| 9. | **Which of the following is Not always present in the blood?**<br>a) Prothrombin<br>b) Fibrinogen<br>c) Calcium<br>d) Thrombin<br>e) Plasminogen | D |
| 10. | **Which chemical is involved in the breakdown of a clot (fibrinolysis)?**<br>a. Fibrinogen<br>b. Antithrombin<br>c. Plasmin<br>d. Heparin<br>e. Thromboplastine | C |
| 11. | **About protein C, all the following is true except:**<br>(A) Its activator is formed from thrombin by the action of thrombomodulin.<br>(B) It is a natural anticoagulant protein.<br>(C) It activates the inhibitor of TPA.<br>(D) It inactivates both factors V and VIII. | C |
| 12. | **All the following about plasmin is true except:**<br>(A) It is formed from plasminogen by a tissue activator (TPA.<br>(B) It produces fibrinogen degradation products (FDP).<br>(C) It can be inhibited by an antiplasmin.<br>(D) It is responsible for the formation of fibrin. | D |
| 13. | **About the action of anticoagulants, all the following is true except:**<br>(A) Dicumarol interferes with the synthesis of prothrombin in the liver.<br>(B) Oxalates form insoluble salts with $Ca^{2+}$.<br>(C) Citrates and other chelating agents bind $Ca^{2+}$.<br>(D) Heparin blocks the action of antithrombin III. | D |
| 14. | **Heparin is secreted by:**<br>a) Kidney<br>b) Blood cells<br>c) Nerve cells<br>d) Liver<br>e) Lung | B |
| 15. | **Heparin acts as anticoagulant by:**<br>a) Competitive inhibition with vitamin K.<br>b) Precipitation of $Ca^{++}$.<br>c) Chelation of $Ca^{++}$.<br>d) Acts as cofactor for anti-thrombin III.<br>e) De- ionization of $Ca^{++}$. | D |

Level (1)
Sem (2)

5 L.E

# MCQ PHYSIOLOGY HIS

## LECTURE (1)

Dr. M.M

# Written Physio HIS 1

1. Enumerate function of RBCs and HB?
2. Enumerate adavantages of biconcave shape of RBCs ?
3. Mention normal and abnormal types of HB ?
4. As regard erythropiotin: source , nature , function , factor affecting?
5. Role of liver in erythropoisis?
6. Enumerate minerals and hormones needed for erythropoisis?
7. Mention function and Effect of deficiency of vit b12 on blood cells ?
8. Discuss mechanism of absorption of vit B12 ?

# MCQ Physio HIS 1

| | |
|---|---|
| **1. The major function of RBCs is:**<br>a) Carriage of oxygen from the lungs to the tissues.<br>b) Transport of Co2.<br>c) Haemoglobin is an excellent acid base buffer.<br>d) Increasing blood viscosity and peripheral resistance.<br>e) Storage of iron. | A |
| **2. All the following substances are essential for the normal development of RBCs, except:**<br>a) Folic acid.<br>b) Ascorbic acid.<br>c) Nicotinic acid.<br>d) Vitamin B12.<br>e) Iron | C |

| | |
|---|---|
| **3. What is the normal HB level in infant:**<br>a) 10-11 gm/dl<br>b) 12-16 gm/dl<br>c) 14-18 gm/dl<br>d) 18 gm/dl<br>e) 25 gm/dl | **D** |
| **4. The biconcave shape of erythrocytes has the following advantage:**<br>a) Produces a small surface area than a spherical cell of the same volume.<br>b) Allows erythrocytes to be squeezed through small capillaries without rupture.<br>c) Results in high tension on the membrane when the volume of the cell changes.<br>d) Allows a small surface area for gas exchange.<br>e) It allows free diffusion of ions. | **B** |
| **5. About the structure of erythrocytes the followings is false:**<br>a) Are surrounded with plastic semipermeable membrane.<br>b) Haemoglobin is the main constituent of the erythrocytes.<br>c) K is the chief intracellular cation.<br>d) It is a nucleated biconcave disc.<br>e) It has no mitochondria. | **D** |
| **6. About sites of erythropoiesis:**<br>a) In the 1st trimester of gestation the nucleated RBCs are produced in liver.<br>b) In the 2nd trimester of gestation RBCs are produced in the yolk sac.<br>c) In the last trimester and after birth, the erythropoiesis is restricted to the membranous bones.<br>d) By the age of 20 years , bone marrow of most long bones becomes fatty.<br>e) After age of 20 years, Erythropoiesis is restricted to yellow bone marrow. | **D** |

| | |
|---|---|
| **7. About the stages of erythropoiesis; which of the following is False:**<br>a) Interleukins are important for the formation of commited stem cells from PHSCs.<br>b) Erythropoietin is responsible for maturation of erythroblasts to mature RBCs.<br>c) Vit.B12 and folic acid are responsible for differentiation of erythroblasts to normoblast.<br>d) Erythropoietin stimulates the production of proerythroblasts from hemopoietic stem cells in the bone marrow.<br>e) Erythropoietin speed up all the stages of development in erythroblasts. | **B** |
| **8. Healthy liver is essential for normal RBCs formation because it is the site of:**<br>a) Formation of 90% of erythropoietin.<br>b) Formation of the heme part of hemoglobin.<br>c) Destruction of old RBCs.<br>d) Synthesis of cobalt and androgen.<br>e) Storage of iron and vitamin B12. | **E** |
| **9. Main site of erythropoiesis in middle age?**<br>a) red bone marrow<br>b) amniotic cavity<br>c) yolk sac<br>d) lymph node<br>e) lung | **A** |
| **10. About the red blood corpuscles one of these is false:**<br>a) It the most abundant of all blood cells.<br>b) It has no nucleus.<br>c) It has a diameter of 7.8 um and a volume of 90 to 95 u3.<br>d) Its count is low in newly born infants and more in growing children.<br>e) Persons living at high altitudes have greater number of RBC. | **D** |

| | |
|---|---|
| **11. Mechanism of blood elements production is called:**<br>a) Hemopoiesis.<br>b) Hemostasis.<br>c) Homeostasis.<br>d) Erythropoiesis.<br>e) Leukopoiesis. | **A** |
| **12. Erythropiosis is:**<br>a) Formation of RBCs<br>b) Formation of WBCs<br>c) Formation of platelets.<br>d) All the above are correct. | **A** |
| **13. Concerning the RBC:**<br>a) It has a diameter of about 3.5 µm.<br>b) It has a biconcave shape.<br>c) It produced by the liver and spleen only.<br>d) Its normal number is 5 – 6 X 106 / cm.<br>e) Its life spans is 120 months. | **B** |
| **14. Concerning RBCs which of the following is not true:**<br>a) They do not have a nucleus.<br>b) Their normal count is about 5 millions / mm3.<br>c) They are about 45% of the total blood volume.<br>d) They contain over 80 grams of Hb per 100 ml of blood. | **D** |
| **15. Which of the following statements about RBCs is correct:**<br>a) Have antibodies on their membrane surface.<br>b) Their count in women is 10 million / cubic mm.<br>c) Their life span is 6 months.<br>d) Have antigen on their membrane surface. | **D** |

| | |
|---|---|
| **16. Which of the following is NOT true concerning RBCs:**<br>a) They are biconcave non nucleated cells.<br>b) RBC count is about 4.5 million / Cmm in normal female.<br>c) They form the vast majority of blood cells.<br>d) They contain over 30 pg of hemoglobin / 100 ml of blood.<br>e) None of the above is true. | **D** |
| **17. Erythropoietin hormone:**<br>a) Is secreted mainly by the liver.<br>b) Is secreted mainly by the pancreas.<br>c) Stimulates RBCs formation.<br>d) Stimulates WBCs formation.<br>e) Leads to sever anemia. | **C** |
| **18. Which of the following is the main stimulus for erythropoiesis:**<br>a) Thyroid hormones.<br>b) Hypoxia.<br>c) High protein diet.<br>d) Growth hormone.<br>e) Both a & d are correct. | **B** |
| **19. Iron is transported in the blood as:**<br>a) Free iron.<br>b) Ferritin.<br>c) Transferrin.<br>d) Apotransferrin. | **C** |
| **20. The main cause of megaloblastic anemia is:**<br>a) Iron deficiency.<br>b) Destruction of bone marrow.<br>c) Acute blood loss.<br>d) RBCs Hemolysis. E) Vit B 12 deficiency. | **E** |

| | |
|---|---|
| ***21. The intrinsic factor (IF) is important for:***<br>*a) Absorption of vitamin K.*<br>*b) Absorption of vitamin B12 at the terminal ileum.*<br>*c) Absorption of iron.*<br>*d) Blood coagulation.*<br>*e) Both a & b are correct.* | **B** |
| ***22. Site of vit B12 absorption :***<br>*a) stomach*<br>*b) terminal ileum.*<br>*c) colon*<br>*d) sweat gland* | **B** |
| ***23. In adult person, the blood cell hemolysis occurs in:***<br>*a) Liver.*<br>*b) Spleen.*<br>*c) Bone.*<br>*d) None of the above is correct.* | **B** |
| ***24. Life span of RBCs is :***<br>*a) 30 day*<br>*b) 120 day*<br>*c) 150 day*<br>*d) None of the above is correct.* | **B** |
| ***25. The high number of red blood cells in newly born infant is due to:***<br>*A- Menstruation.*<br>*B- Androgen hormone.*<br>*C- Estrogen hormone.*<br>*D- Intra-uterine oxygen lacks.* | **D** |

| | |
|---|---|
| **26. Aging red blood cells are fragmented and trapped in the:**<br>a) intestines<br>b) liver<br>c) spleen.<br>d) kidneys | C |
| **27. What is the primary function of red blood cells (RBCs) in the human body?**<br>a) Blood clotting<br>b) Oxygen transport<br>c) Immune response<br>d) Nutrient absorption | B |
| **28. Erythrocytes:**<br>a. contain no enzymes.<br>b. are responsible for blood viscosity.<br>c. have life span about 2 months.<br>d. hemoglobin can't help in CO2 carriage.<br>e. have large amount of mitochondria. | B |
| **29. Erythropiesis in fetus takes place:**<br>A) Bone marrow of all bones<br>B) bone marrow of long bone<br>C) liver and spleen<br>D) bone marrow of membranous bones | C |
| **30. RBCs concentration of cells in the male's body:**<br>A) 4.6 million/mm3<br>B) 5.5 million/mm3<br>C) 5.2 million /mm3<br>D) 4.8 million /mm3 | C |

| | |
|---|---|
| **31. Which organ stores B12 & iron:**<br>A) Kidney<br>B) pancreas<br>C) liver<br>D) small intestine | **C** |
| **32. What RBC enzyme facilitates transport of carbon dioxide ($CO_2$)?**<br>A) Myeloperoxidase<br>B) Carbonic anhydrase<br>C) Superoxide dismutase<br>D) Globin reductase | **B** |
| **33. During the second trimester of pregnancy, where is the predominant site of RBC production?**<br>A) Yolk sac<br>B) Bone marrow<br>C) Lymph nodes<br>D) Liver | **D** |
| **34. The intrinsic factor:**<br>a) Is found in the liver.<br>b) Is produced by the gastric parietal cells.<br>c) Is secreted by the terminal ileum.<br>d) Aids absorption of folic acid. | **B** |
| **35. How many polypeptide chains present inside globin?**<br>a. Two.<br>b. Three.<br>c. Four.<br>d. Five.<br>e. Six. | **C** |

| | |
|---|---|
| **36. Stomach plays important role in erythropoiesis because it:**<br>A. Helps absorption of folic acid.<br>B. Helps absorption of B12 and iron.<br>C. Secretes erythropoietin.<br>D. Forms globin part of hemoglobin. | **B** |
| **37. Vitamin B12:**<br>A. Deficiency produces bleeding tendency.<br>B. Needs gastric HCl for its absorption.<br>C. Is absorbed from the upper part of the small intestine.<br>D. Is needed for nuclear maturation and cell division. | **D** |
| **38. Regarding the number of red blood cells (RBCs), which of the following sentences is correct?**<br>a. Its number increases in anemia or oligocythemia<br>b. Polycythemia means decrease in their number.<br>c. Normal count in males 5-5.5 million /mm.<br>d. Normal count in females 6-6.5 million /mm.<br>e. It increases in hemorrhage | **C** |
| **39. The fetal hemoglobin (Hb F) structure consists of 4 polypeptide chains:**<br>a. 2 alpha and 2 beta polypeptide chains.<br>b. 2 alpha and 2 delta polypeptide chains.<br>c. 2 alpha and 2 gamma polypeptide chains.<br>d. 2 alpha and 2 theta polypeptide chains.<br>e. 2 alpha and 2 kabba polypeptide chains. | **C** |
| **40. In adult male, the average hemoglobin is:**<br>A.12 gm %<br>b) 14 gm %<br>C.16 gm % d) 18 gm % | **C** |

| | |
|---|---|
| **41. Megaloblastic anemia can be caused by:**<br>a. Folic acid deficiency.<br>b. Iron deficiency.<br>c. Chronic renal failure.<br>d. Living at high altitude.<br>e. Glucose 6 phosphate dehydrogenase deficiency. | A |
| **42. Persons living in high altitudes have greater number of:**<br>A. RBCs.<br>B. WBCs.<br>C. Platelets.<br>D. Plasma proteins. | A |
| **43. What is the purpose of the biconcave shape of red blood cells?**<br>a) Facilitate oxygen binding<br>b) Increase surface area for nutrient absorption<br>c) Enhance flexibility for navigating narrow capillaries<br>d) Aid in blood clotting | C |
| **44. One of the following is needed for maturation of RBCs:**<br>A. Vitamin C and B6<br>B. Zink and cobalt<br>C. Vitamin B12 and folic acid<br>D. Vitamin D and E. | C |
| **45. Blood viscosity is maintained by:**<br>A. RBCS<br>B. WBCS<br>C. Platelets.<br>D. Monocytes. | A |

| | |
|---|---|
| **46. In adults, erythropoietin is mainly formed by:**<br>A. Liver.<br>B. Spleen<br>C. Bone marrow.<br>D. Kidney. | **D** |
| **47. Which hormone regulates the production of red blood cells in the bone marrow?**<br>a) Insulin<br>b) Estrogen<br>c) Testosterone<br>d) Erythropoietin | **D** |
| **48. Erythropoietin hormone is stimulated by:**<br>A. Increased oxygen demand as athletes.<br>B. Increased CO2 production.<br>C. Iron intake.<br>D. Vitamin B12 and folic acid intake. | **A** |
| **49. Which blood component is responsible for carrying carbon dioxide back to the lungs for exhalation?**<br>a) Red blood cells<br>b) White blood cells<br>c) Platelets<br>d) Plasma | **A** |
| **50. Deficiency of vitamin B12 and folic acid leads to:**<br>A. Aplastic anemia.<br>B. Megaloplastic anemia.<br>C. Haemolytic anemia.<br>D. Blood loss anemia. | **B** |

| | |
|---|---|
| **. Erythropoiesis means:**<br>A. Decreased number of RBCs.<br>B. Formation of new RBCs.<br>C. Abnormal increase in RBCs number.<br>D. Formation of new monocytes. | **B** |
| **52. The protein responsible for iron transport in plasma is:**<br>a. α1-antitrypsin<br>b. Ferritin<br>c. Apo-transferrin<br>d. Apo-ferritin<br>e. Ceruloplasmin | **C** |
| **53. By the age of 7 months, the primary site of haematopoiesis in a fetus is:**<br>a. Thymus<br>b. Liver<br>c. Spleen<br>d. Reticuloendothelial system<br>e. Red marrow | **E** |
| **54. The most abundant cells of the blood are:**<br>a. Platelets<br>b. Erythrocytes<br>c. Granulocytes<br>d. Leukocytes<br>e. Reticuloendothelial cells | **B** |
| **55. Beta Thalassemia is associated with:**<br>a) An increase in alpha chain synthesis of hemoglobin molecule.<br>b) A decrease in beta chain synthesis.<br>c) An increase in beta chain synthesis.<br>d) An increase in alpha and beta chain synthesis.<br>e) More fetal hemoglobin. | **B** |

| | |
|---|---|
| **56. Erythropoietin:**<br>a) May decrease the life span of RBCs.<br>b) is not released on breakdown of RBCs.<br>c) May stimulate the stem cells.<br>d) Is formed mainly in liver.<br>e) Is lipid in nature. | **C** |
| **57. Regarding Erythropoietin & erythropoiesis:**<br>a. It is formed mainly in liver & partly in kidneys<br>b. Hypoxia can stimulate erythropoiesis in the absence of erythropoietin<br>c. Relief from hypoxia inhibits erythropoietin induced erythropoiesis<br>d. Erythropoietin mainly stimulates production of hematopoietic stem cells<br>e. Erythropoietin is over stimulated in patients with renal disease | **C** |
| **58. Erythrocytes:**<br>A. Synthesize and release erythropoietin.<br>B. Have a higher concentration of potassium than is in plasma.<br>C. Have an abundant supply of mitochondria.<br>D. Have a multilobed nucleus. | **B** |
| **59. Vitamin B12:**<br>A. Deficiency produces normocytic anemia.<br>B. Needs gastric HCl for its absorption.<br>C. Is absorbed from the upper part of the small intestine.<br>D. Is needed for nuclear maturation and cell division. | **D** |
| **60. Long term hypoxia may serve as a growth inducer of the following blood cells:**<br>a. Basophils<br>b. Monocytes<br>c. Macrophages<br>d. Red blood cells<br>e. Platelets | **D** |

| | |
|---|---|
| **. RBCs:**<br>A. Have a central nucleus.<br>B. Have a phagocytic function.<br>C. Its wall is flexible plastic.<br>D. Contain myoglobin protein. | C |
| **62. The synthesis and release of erythropoietin is increased in a person who goes to live at high altitude because:**<br>A. Cardiac output is increased.<br>B. Hematocrit is increased.<br>C. Partial pressure of oxygen is less.<br>D. Alveolar ventilation rate is increased. | C |
| **63. A 36-old man with end stage kidney disease has anemia (deficiency of RBCs). Which of the following is the most appropriate therapy?**<br>A. Erythropoietin.<br>B. Iron.<br>C. Folic acid.<br>D. Vitamin B12. | A |
| **64. Red blood corpuscles are:**<br>A. Biconcave flexible round corpuscles.<br>B. Life span 7-11 days<br>C. Is produced by bone marrow in fetus.<br>D. Responsible for homeostasis. | A |
| **65. Erythropoiesis:**<br>A. Occurs in the liver during the first 5 years of life.<br>B. Above 20 occurs in the bone marrow of all bones.<br>C. Is affected by vitamin K deficiency.<br>D. Is stimulated at high altitude. | D |

**Mansoura University**
**Faculty of Medicine**

Level 1, Semester 2
Time allowed: 60 minutes

CVS & IBL
Continuous Assessment

**جامعة المنصورة**
**كلية الطب**

April, 28th 2021
Total marks: 62.5 marks

**Choose a Single Best Correct Answer:**

**1. Megaloblastic anemia can be caused by:**
a. Folic acid deficiency.
b. Iron deficiency.
c. Chronic renal failure.
d. Living at high altitude.
e. Glucose 6 phosphate dehydrogenase deficiency.

**2. Which of the following clotting factor is released from damaged tissue, and initiates a chain of clotting events?**
a. Fibrin.
b. Fibrinogen.
c. Prothrombin.
d. Thrombin.
e. Tissue thromboplastin

**3. A condition of heredity deficiency of coagulation is called:**
a. Anemia.
b. Hemophilia.
c. Hemolysis.
d. Leukemia.
e. Polycythemia

**4. The normal hemoglobin content for adult females is:**
a. 6-8 gm/dl
b. 8-10 gm/dl
c. 12-14 gm/dl
d. 14-18 gm/dl
e. 16-18 gm dl

**5. Purpura is caused by deficiency of:**
a. Factor VIII
b. Factor XI
c. Platelets
d. Prothrombin
e. Vitamin K

**6. In obstructive jaundice, the hemorrhagic tendency is due to:**

a. deficiency of platelets
b. increased serum bile salt concentration
c. deficiency of factor VIII
d. lack of factors II, VII, IX and X
e. deficiency of fibrinogen

**7. Which factor activates the conversion of prothrombin to thrombin?**

a. Factor Xa
b. Factor III
c. Factor VIII
d. Factor IXa
e. Factor Xia

**8. Which of the following initiates the extrinsic phase of clotting?**

a. Fibrin
b. Prothrombin
c. Christmas factor
d. Plasmin
e. Thromboplastin

**9. Erythropoietin is essential for:**

a. leukopoiesis.
b. formation of prothrombin.
c. formation of red blood corpuscles.
d. thrombopoeisis
e. breakdown of red blood cells

Level (1)
Sem (2)

5 L.E

# MCQ PHYSIOLOGY HIS

## LECTURE (1)

Dr. M.M

# Written Physio HIS 1

1. Enumerate function of RBCs and HB?
2. Enumerate adavantages of biconcave shape of RBCs ?
3. Mention normal and abnormal types of HB ?
4. As regard erythropiotin: source , nature , function , factor affecting?
5. Role of liver in erythropoisis?
6. Enumerate minerals and hormones needed for erythropoisis?
7. Mention function and Effect of deficiency of vit b12 on blood cells ?
8. Discuss mechanism of absorption of vit B12 ?

# MCQ Physio HIS 1

| | |
|---|---|
| **1. The major function of RBCs is:**<br>a) Carriage of oxygen from the lungs to the tissues.<br>b) Transport of Co2.<br>c) Haemoglobin is an excellent acid base buffer.<br>d) Increasing blood viscosity and peripheral resistance.<br>e) Storage of iron. | A |
| **2. All the following substances are essential for the normal development of RBCs, except:**<br>a) Folic acid.<br>b) Ascorbic acid.<br>c) Nicotinic acid.<br>d) Vitamin B12.<br>e) Iron | C |

| | |
|---|---|
| **3. What is the normal HB level in infant:**<br>a) 10-11 gm/dl<br>b) 12-16 gm/dl<br>c) 14-18 gm/dl<br>d) 18 gm/dl<br>e) 25 gm/dl | **D** |
| **4. The biconcave shape of erythrocytes has the following advantage:**<br>a) Produces a small surface area than a spherical cell of the same volume.<br>b) Allows erythrocytes to be squeezed through small capillaries without rupture.<br>c) Results in high tension on the membrane when the volume of the cell changes.<br>d) Allows a small surface area for gas exchange.<br>e) It allows free diffusion of ions. | **B** |
| **5. About the structure of erythrocytes the followings is false:**<br>a) Are surrounded with plastic semipermeable membrane.<br>b) Haemoglobin is the main constituent of the erythrocytes.<br>c) K is the chief intracellular cation.<br>d) It is a nucleated biconcave disc.<br>e) It has no mitochondria. | **D** |
| **6. About sites of erythropoiesis:**<br>a) In the 1st trimester of gestation the nucleated RBCs are produced in liver.<br>b) In the 2nd trimester of gestation RBCs are produced in the yolk sac.<br>c) In the last trimester and after birth, the erythropoiesis is restricted to the membranous bones.<br>d) By the age of 20 years , bone marrow of most long bones becomes fatty.<br>e) After age of 20 years, Erythropoiesis is restricted to yellow bone marrow. | **D** |

| | |
|---|---|
| **7. About the stages of erythropoiesis; which of the following is False:**<br>a) Interleukins are important for the formation of commited stem cells from PHSCs.<br>b) Erythropoietin is responsible for maturation of erythroblasts to mature RBCs.<br>c) Vit.B12 and folic acid are responsible for differentiation of erythroblasts to normoblast.<br>d) Erythropoietin stimulates the production of proerythroblasts from hemopoietic stem cells in the bone marrow.<br>e) Erythropoietin speed up all the stages of development in erythroblasts. | **B** |
| **8. Healthy liver is essential for normal RBCs formation because it is the site of:**<br>a) Formation of 90% of erythropoietin.<br>b) Formation of the heme part of hemoglobin.<br>c) Destruction of old RBCs.<br>d) Synthesis of cobalt and androgen.<br>e) Storage of iron and vitamin B12. | **E** |
| **9. Main site of erythropoiesis in middle age?**<br>a) red bone marrow<br>b) amniotic cavity<br>c) yolk sac<br>d) lymph node<br>e) lung | **A** |
| **10. About the red blood corpuscles one of these is false:**<br>a) It the most abundant of all blood cells.<br>b) It has no nucleus.<br>c) It has a diameter of 7.8 um and a volume of 90 to 95 u3.<br>d) Its count is low in newly born infants and more in growing children.<br>e) Persons living at high altitudes have greater number of RBC. | **D** |

| | |
|---|---|
| **11. Mechanism of blood elements production is called:**<br>a) Hemopoiesis.<br>b) Hemostasis.<br>c) Homeostasis.<br>d) Erythropoiesis.<br>e) Leukopoiesis. | **A** |
| **12. Erythropiosis is:**<br>a) Formation of RBCs<br>b) Formation of WBCs<br>c) Formation of platelets.<br>d) All the above are correct. | **A** |
| **13. Concerning the RBC:**<br>a) It has a diameter of about 3.5 µm.<br>b) It has a biconcave shape.<br>c) It produced by the liver and spleen only.<br>d) Its normal number is 5 – 6 X 106 / cm.<br>e) Its life spans is 120 months. | **B** |
| **14. Concerning RBCs which of the following is not true:**<br>a) They do not have a nucleus.<br>b) Their normal count is about 5 millions / mm3.<br>c) They are about 45% of the total blood volume.<br>d) They contain over 80 grams of Hb per 100 ml of blood. | **D** |
| **15. Which of the following statements about RBCs is correct:**<br>a) Have antibodies on their membrane surface.<br>b) Their count in women is 10 million / cubic mm.<br>c) Their life span is 6 months.<br>d) Have antigen on their membrane surface. | **D** |

| | |
|---|---|
| **16. Which of the following is NOT true concerning RBCs:**<br>a) They are biconcave non nucleated cells.<br>b) RBC count is about 4.5 million / Cmm in normal female.<br>c) They form the vast majority of blood cells.<br>d) They contain over 30 pg of hemoglobin / 100 ml of blood.<br>e) None of the above is true. | **D** |
| **17. Erythropoietin hormone:**<br>a) Is secreted mainly by the liver.<br>b) Is secreted mainly by the pancreas.<br>c) Stimulates RBCs formation.<br>d) Stimulates WBCs formation.<br>e) Leads to sever anemia. | **C** |
| **18. Which of the following is the main stimulus for erythropoiesis:**<br>a) Thyroid hormones.<br>b) Hypoxia.<br>c) High protein diet.<br>d) Growth hormone.<br>e) Both a & d are correct. | **B** |
| **19. Iron is transported in the blood as:**<br>a) Free iron.<br>b) Ferritin.<br>c) Transferrin.<br>d) Apotransferrin. | **C** |
| **20. The main cause of megaloblastic anemia is:**<br>a) Iron deficiency.<br>b) Destruction of bone marrow.<br>c) Acute blood loss.<br>d) RBCs Hemolysis. E) Vit B 12 deficiency. | **E** |

| | |
|---|---|
| ***21. The intrinsic factor (IF) is important for:***<br>*a) Absorption of vitamin K.*<br>*b) Absorption of vitamin B12 at the terminal ileum.*<br>*c) Absorption of iron.*<br>*d) Blood coagulation.*<br>*e) Both a & b are correct.* | **B** |
| ***22. Site of vit B12 absorption :***<br>*a) stomach*<br>*b) terminal ileum.*<br>*c) colon*<br>*d) sweat gland* | **B** |
| ***23. In adult person, the blood cell hemolysis occurs in:***<br>*a) Liver.*<br>*b) Spleen.*<br>*c) Bone.*<br>*d) None of the above is correct.* | **B** |
| ***24. Life span of RBCs is :***<br>*a) 30 day*<br>*b) 120 day*<br>*c) 150 day*<br>*d) None of the above is correct.* | **B** |
| ***25. The high number of red blood cells in newly born infant is due to:***<br>*A- Menstruation.*<br>*B- Androgen hormone.*<br>*C- Estrogen hormone.*<br>*D- Intra-uterine oxygen lacks.* | **D** |

| | |
|---|---|
| **26. Aging red blood cells are fragmented and trapped in the:**<br>a) intestines<br>b) liver<br>c) spleen.<br>d) kidneys | C |
| **27. What is the primary function of red blood cells (RBCs) in the human body?**<br>a) Blood clotting<br>b) Oxygen transport<br>c) Immune response<br>d) Nutrient absorption | B |
| **28. Erythrocytes:**<br>a. contain no enzymes.<br>b. are responsible for blood viscosity.<br>c. have life span about 2 months.<br>d. hemoglobin can't help in CO2 carriage.<br>e. have large amount of mitochondria. | B |
| **29. Erythropiesis in fetus takes place:**<br>A) Bone marrow of all bones<br>B) bone marrow of long bone<br>C) liver and spleen<br>D) bone marrow of membranous bones | C |
| **30. RBCs concentration of cells in the male's body:**<br>A) 4.6 million/mm3<br>B) 5.5 million/mm3<br>C) 5.2 million /mm3<br>D) 4.8 million /mm3 | C |

| | |
|---|---|
| **31. Which organ stores B12 & iron:**<br>A) Kidney<br>B) pancreas<br>C) liver<br>D) small intestine | **C** |
| **32. What RBC enzyme facilitates transport of carbon dioxide ($CO_2$)?**<br>A) Myeloperoxidase<br>B) Carbonic anhydrase<br>C) Superoxide dismutase<br>D) Globin reductase | **B** |
| **33. During the second trimester of pregnancy, where is the predominant site of RBC production?**<br>A) Yolk sac<br>B) Bone marrow<br>C) Lymph nodes<br>D) Liver | **D** |
| **34. The intrinsic factor:**<br>a) Is found in the liver.<br>b) Is produced by the gastric parietal cells.<br>c) Is secreted by the terminal ileum.<br>d) Aids absorption of folic acid. | **B** |
| **35. How many polypeptide chains present inside globin?**<br>a. Two.<br>b. Three.<br>c. Four.<br>d. Five.<br>e. Six. | **C** |

| | |
|---|---|
| **36. Stomach plays important role in erythropoiesis because it:**<br>A. Helps absorption of folic acid.<br>B. Helps absorption of B12 and iron.<br>C. Secretes erythropoietin.<br>D. Forms globin part of hemoglobin. | **B** |
| **37. Vitamin B12:**<br>A. Deficiency produces bleeding tendency.<br>B. Needs gastric HCl for its absorption.<br>C. Is absorbed from the upper part of the small intestine.<br>D. Is needed for nuclear maturation and cell division. | **D** |
| **38. Regarding the number of red blood cells (RBCs), which of the following sentences is correct?**<br>a. Its number increases in anemia or oligocythemia<br>b. Polycythemia means decrease in their number.<br>c. Normal count in males 5-5.5 million /mm.<br>d. Normal count in females 6-6.5 million /mm.<br>e. It increases in hemorrhage | **C** |
| **39. The fetal hemoglobin (Hb F) structure consists of 4 polypeptide chains:**<br>a. 2 alpha and 2 beta polypeptide chains.<br>b. 2 alpha and 2 delta polypeptide chains.<br>c. 2 alpha and 2 gamma polypeptide chains.<br>d. 2 alpha and 2 theta polypeptide chains.<br>e. 2 alpha and 2 kabba polypeptide chains. | **C** |
| **40. In adult male, the average hemoglobin is:**<br>A.12 gm %<br>b) 14 gm %<br>C.16 gm % d) 18 gm % | **C** |

| | |
|---|---|
| **41. Megaloblastic anemia can be caused by:**<br>a. Folic acid deficiency.<br>b. Iron deficiency.<br>c. Chronic renal failure.<br>d. Living at high altitude.<br>e. Glucose 6 phosphate dehydrogenase deficiency. | A |
| **42. Persons living in high altitudes have greater number of:**<br>A. RBCs.<br>B. WBCs.<br>C. Platelets.<br>D. Plasma proteins. | A |
| **43. What is the purpose of the biconcave shape of red blood cells?**<br>a) Facilitate oxygen binding<br>b) Increase surface area for nutrient absorption<br>c) Enhance flexibility for navigating narrow capillaries<br>d) Aid in blood clotting | C |
| **44. One of the following is needed for maturation of RBCs:**<br>A. Vitamin C and B6<br>B. Zink and cobalt<br>C. Vitamin B12 and folic acid<br>D. Vitamin D and E. | C |
| **45. Blood viscosity is maintained by:**<br>A. RBCS<br>B. WBCS<br>C. Platelets.<br>D. Monocytes. | A |

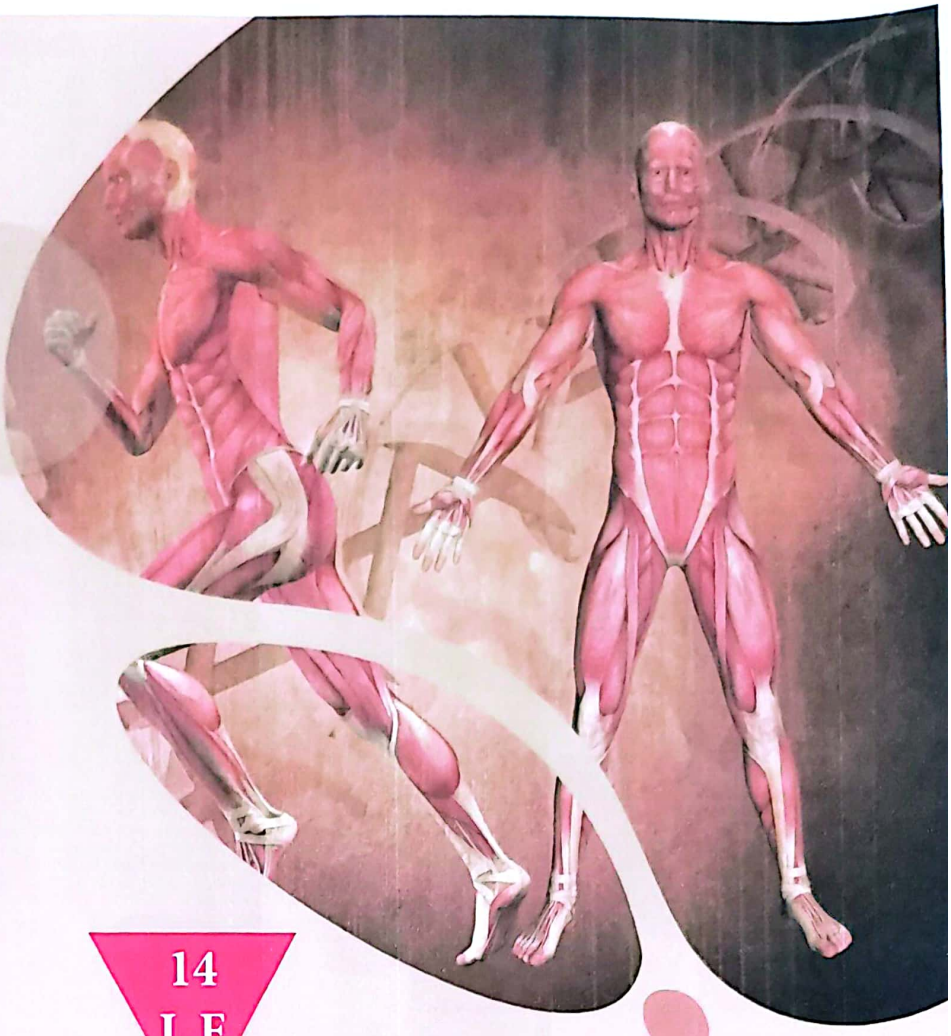
| | |
|---|---|
| **46. In adults, erythropoietin is mainly formed by:**<br>A. Liver.<br>B. Spleen<br>C. Bone marrow.<br>D. Kidney. | **D** |
| **47. Which hormone regulates the production of red blood cells in the bone marrow?**<br>a) Insulin<br>b) Estrogen<br>c) Testosterone<br>d) Erythropoietin | **D** |
| **48. Erythropoietin hormone is stimulated by:**<br>A. Increased oxygen demand as athletes.<br>B. Increased CO2 production.<br>C. Iron intake.<br>D. Vitamin B12 and folic acid intake. | **A** |
| **49. Which blood component is responsible for carrying carbon dioxide back to the lungs for exhalation?**<br>a) Red blood cells<br>b) White blood cells<br>c) Platelets<br>d) Plasma | **A** |
| **50. Deficiency of vitamin B12 and folic acid leads to:**<br>A. Aplastic anemia.<br>B. Megaloplastic anemia.<br>C. Haemolytic anemia.<br>D. Blood loss anemia. | **B** |

| | |
|---|---|
| **. Erythropoiesis means:**<br>A. Decreased number of RBCs.<br>B. Formation of new RBCs.<br>C. Abnormal increase in RBCs number.<br>D. Formation of new monocytes. | **B** |
| **52. The protein responsible for iron transport in plasma is:**<br>a. α1-antitrypsin<br>b. Ferritin<br>c. Apo-transferrin<br>d. Apo-ferritin<br>e. Ceruloplasmin | **C** |
| **53. By the age of 7 months, the primary site of haematopoiesis in a fetus is:**<br>a. Thymus<br>b. Liver<br>c. Spleen<br>d. Reticuloendothelial system<br>e. Red marrow | **E** |
| **54. The most abundant cells of the blood are:**<br>a. Platelets<br>b. Erythrocytes<br>c. Granulocytes<br>d. Leukocytes<br>e. Reticuloendothelial cells | **B** |
| **55. Beta Thalassemia is associated with:**<br>a) An increase in alpha chain synthesis of hemoglobin molecule.<br>b) A decrease in beta chain synthesis.<br>c) An increase in beta chain synthesis.<br>d) An increase in alpha and beta chain synthesis.<br>e) More fetal hemoglobin. | **B** |

| | |
|---|---|
| **56. Erythropoietin:**<br>a) May decrease the life span of RBCs.<br>b) is not released on breakdown of RBCs.<br>c) May stimulate the stem cells.<br>d) Is formed mainly in liver.<br>e) Is lipid in nature. | **C** |
| **57. Regarding Erythropoietin & erythropoiesis:**<br>a. It is formed mainly in liver & partly in kidneys<br>b. Hypoxia can stimulate erythropoiesis in the absence of erythropoietin<br>c. Relief from hypoxia inhibits erythropoietin induced erythropoiesis<br>d. Erythropoietin mainly stimulates production of hematopoietic stem cells<br>e. Erythropoietin is over stimulated in patients with renal disease | **C** |
| **58. Erythrocytes:**<br>A. Synthesize and release erythropoietin.<br>B. Have a higher concentration of potassium than is in plasma.<br>C. Have an abundant supply of mitochondria.<br>D. Have a multilobed nucleus. | **B** |
| **59. Vitamin B12:**<br>A. Deficiency produces normocytic anemia.<br>B. Needs gastric HCl for its absorption.<br>C. Is absorbed from the upper part of the small intestine.<br>D. Is needed for nuclear maturation and cell division. | **D** |
| **60. Long term hypoxia may serve as a growth inducer of the following blood cells:**<br>a. Basophils<br>b. Monocytes<br>c. Macrophages<br>d. Red blood cells<br>e. Platelets | **D** |

| | |
|---|---|
| **. RBCs:**<br>A. Have a central nucleus.<br>B. Have a phagocytic function.<br>C. Its wall is flexible plastic.<br>D. Contain myoglobin protein. | C |
| **62. The synthesis and release of erythropoietin is increased in a person who goes to live at high altitude because:**<br>A. Cardiac output is increased.<br>B. Hematocrit is increased.<br>C. Partial pressure of oxygen is less.<br>D. Alveolar ventilation rate is increased. | C |
| **63. A 36-old man with end stage kidney disease has anemia (deficiency of RBCs). Which of the following is the most appropriate therapy?**<br>A. Erythropoietin.<br>B. Iron.<br>C. Folic acid.<br>D. Vitamin B12. | A |
| **64. Red blood corpuscles are:**<br>A. Biconcave flexible round corpuscles.<br>B. Life span 7-11 days<br>C. Is produced by bone marrow in fetus.<br>D. Responsible for homeostasis. | A |
| **65. Erythropoiesis:**<br>A. Occurs in the liver during the first 5 years of life.<br>B. Above 20 occurs in the bone marrow of all bones.<br>C. Is affected by vitamin K deficiency.<br>D. Is stimulated at high altitude. | D |

Level (1)
Sem (2)



14
L.E

# PHYSIOLOGY
# HIS

## LECTURE (2)

Dr. M.M

# White Blood Cells & Reticuloendothelial system

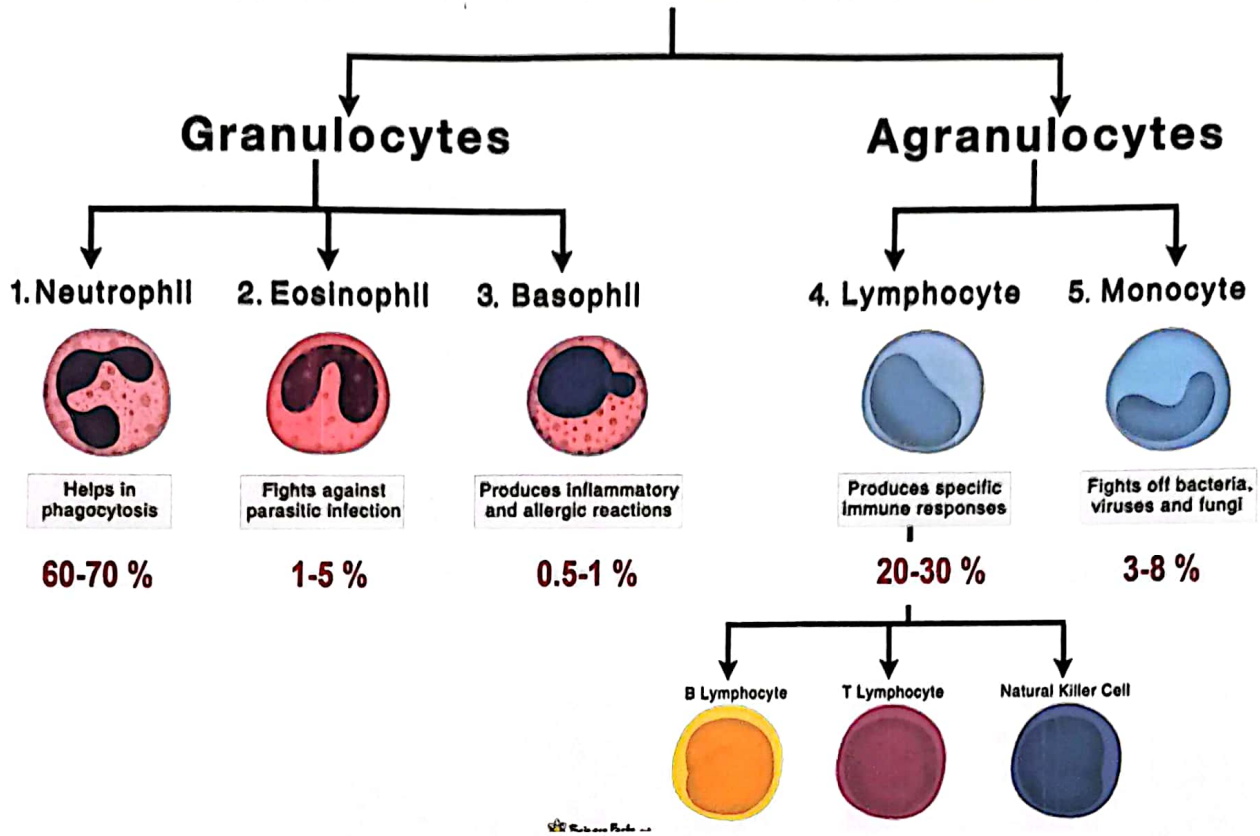
## White Blood Cells (Leucocytes)

- **Nature and Count:**
  - They are the **mobile units** of the body's protective system.
  - In adult human ranges from **4000-11000/mm³.** MCQ

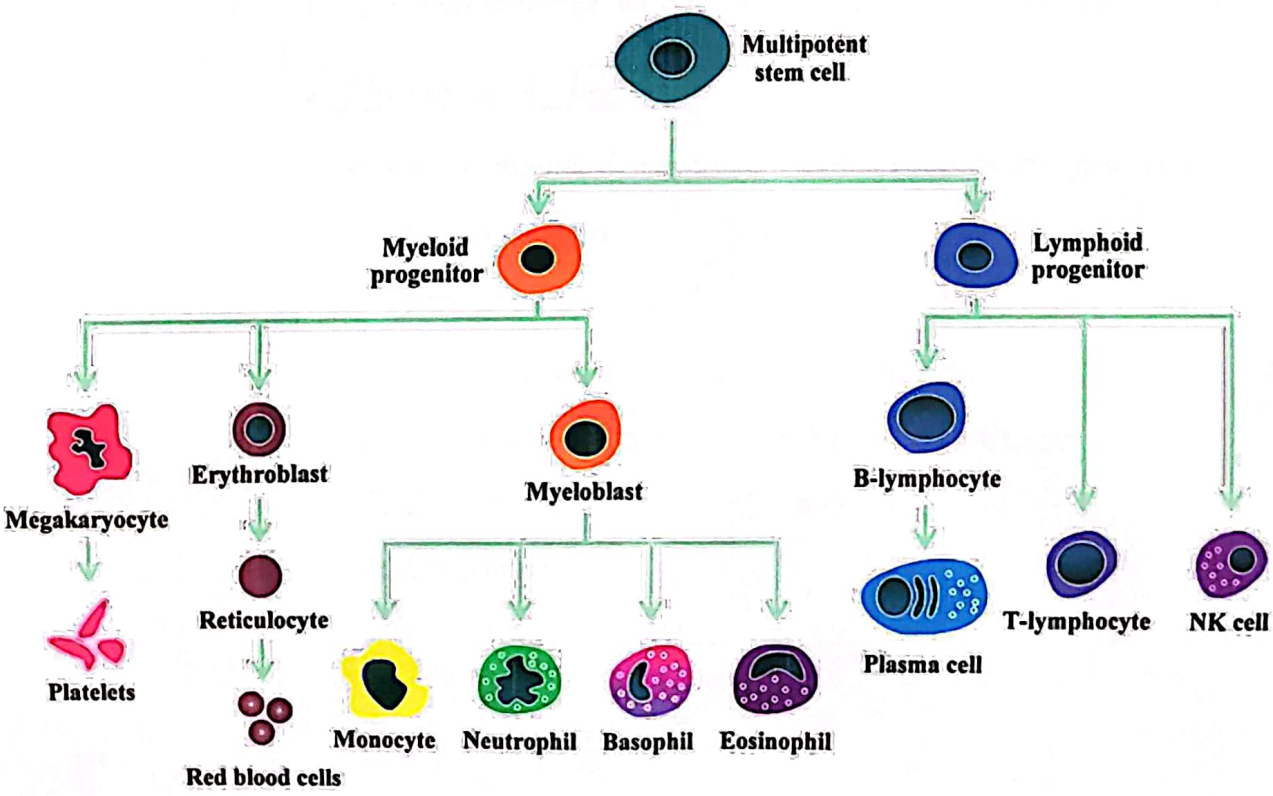
- **Types of leucocytes:**

| | Granular leucocytes | Agranular leucocytes |
|---|---|---|
| **Percentage** | • **Neutrophils:** about **60-70%** of total leucocytes. MCQ<br>• **Eosinophils:** about **1- 5%** of total leucocytes.<br>• **Basophils:** about **0.0-1%** of the total leucocytes. | • **Lymphocytes:** about **20-30%** of the total leucocytes.<br>• **Monocytes:** about **3-8%** of the total leucocytes. |
| **Granules** | • **Neutrophils:** Contain neutrophillic granules that stain with both **acidic and basic** dyes.<br>• **Eosinophils:** Contain granules that stain with **acidic** dyes.<br>• **Basophils:** Contain granules that stain with **basic** dyes. | **No granules** in their cytoplasm |
| **Site of formation:** | • They are formed in the **bone marrow.** | • **Lymphocytes:** Lymphoid tissue.<br>• **Monocytes:** Bone marrow |
| **Life span:** | • **4-5 days.** | • **Months or even years** depending on body's need for these cells. |

# TYPES OF WHITE BLOOD CELLS




- ***WBCs progenitors:***

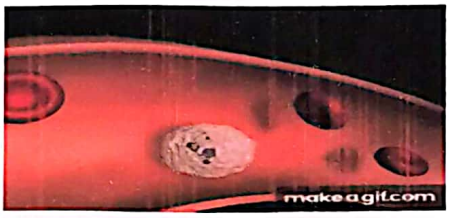
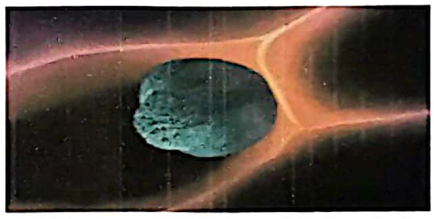
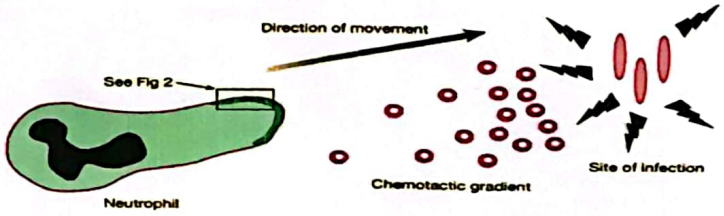


## Functions of Leucocytes:

### I) Granular-Leucocytes

### A) Neutrophils

- They are the **first line of defense** against organisms. **MCQ**
- Their main function is **phagocytosis** and **destruction** of the invading bacteria.
- **The neutrophils reach the site of infection and perform their functions through the following:**

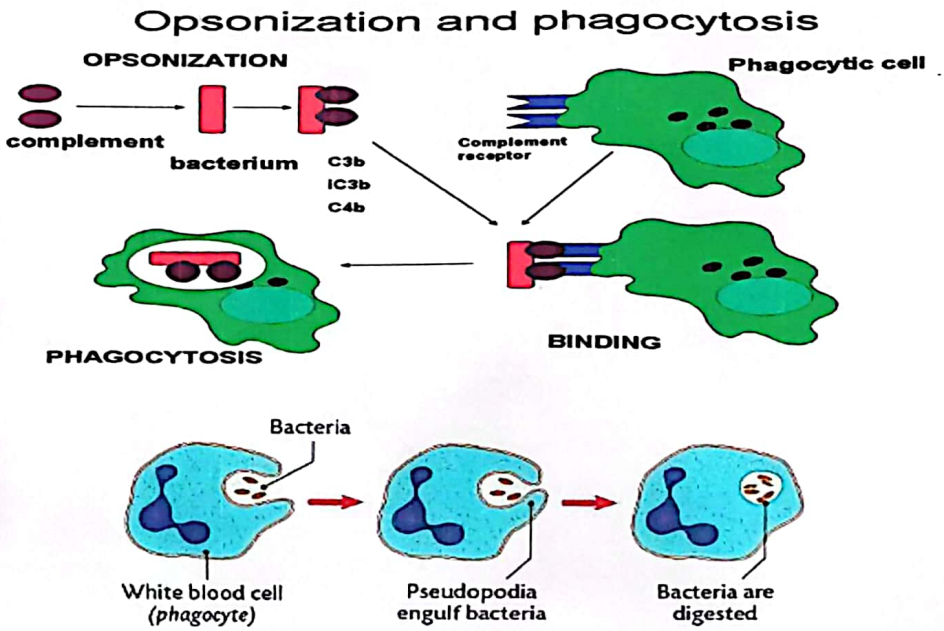
| | |
|---|---|
| **a) Margination:** | • **Sticking** of WBC's to capillary wall. |
| **b) Diapedesis:** | • Neutrophils **squeeze** themselves through the capillaries to the tissue spaces.<br>   |
| **c) Amoeboid movement:** | • By which neutrophils can **reach the site** of infection. **MCQ** |
| **d) Chemotaxis:** | • **Chemotactic factors:**<br>➢ Many chemical substances **attract the neutrophil** to the inflamed tissue<br>➢ **They include: MCQ**<br>1. Some of the bacterial or viral toxins.<br>2. Breakdown products of the inflamed tissues<br>3. Several components of the complement.<br>4. Leucotriens.<br>  |

## e) Phagocytosis:

- **Def:**
  - *Is the **ingestion of bacteria** by endocytosis.*
  - *A neutrophil can usually phagocytize **3 to 20 bacteria** before the neutrophil itself becomes inactivated and dies.*

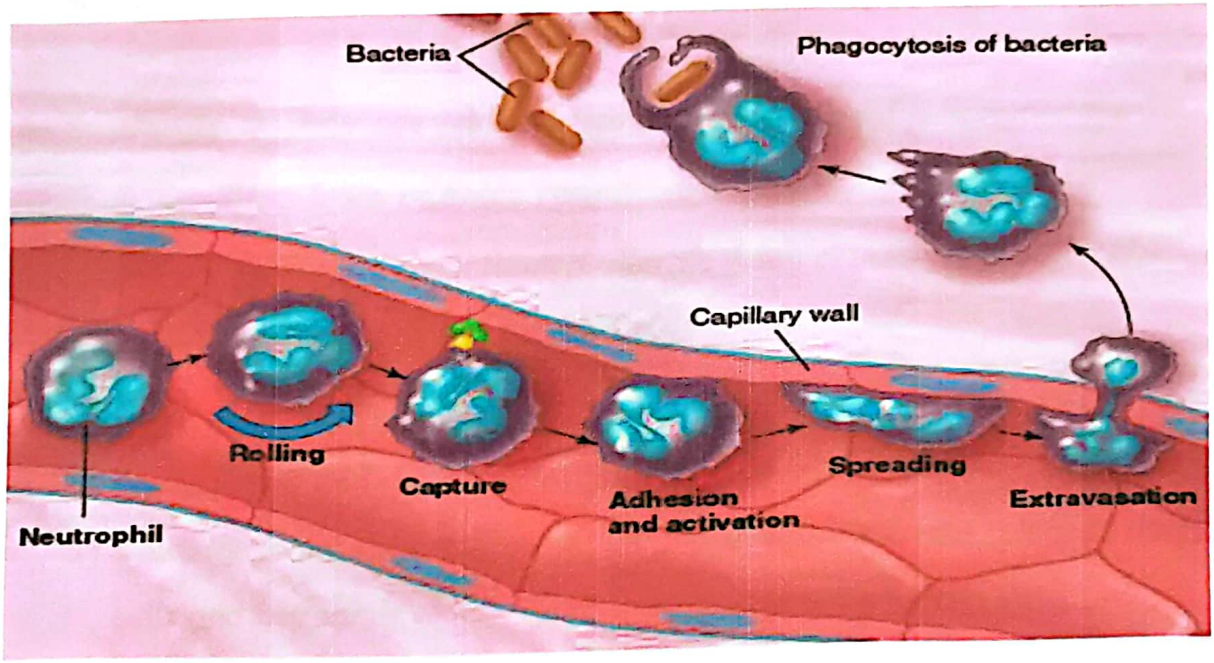
- **Facilitated by:**
  - *Antibodies and the **C3** molecules of the complement cascade.*
  - *They **adhere** to the bacterial membranes.*
  - *The antibody molecule also combines with **C3** molecules that attach themselves to receptors on the phagocyte membrane, thus initiating **phagocytosis.***
  - *This selection & phagocytosis process called **opsonization.***

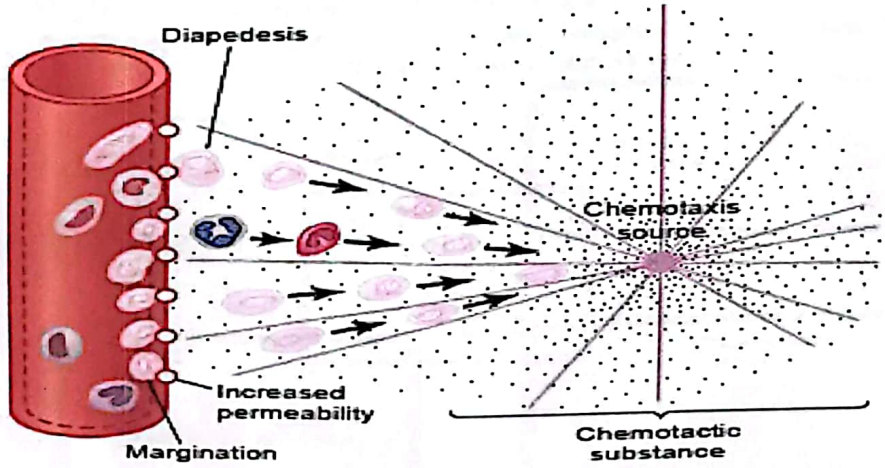
  - *Neutrophil after attaching to the particle to be phagocytized, projects **pseudopodia** in all directions around the particle forming the **phagocytic vesicle or phagosome.***



**f) after Phagocytosis:**

- ***foreign particle can be killed and destroyed by:***
  1. ***Lysosomal proteolytic enzymes.***
  2. ***Bactericidal agents*** *formed inside the neutrophils e.g.*
     - ***a) Oxidizing agents*** *[superoxide (O2), hydrogen peroxide (H2O2), and hydroxyl ions (OH-)].*
     - ***b) Hypochlorite****, that result from the reaction between H2O2 and chloride by* ***myelo-peroxidase****, one of the lysosomal enzymes.* **MCQ**

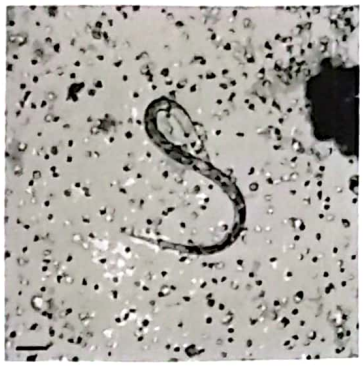


## B) Eosinophils MCQ

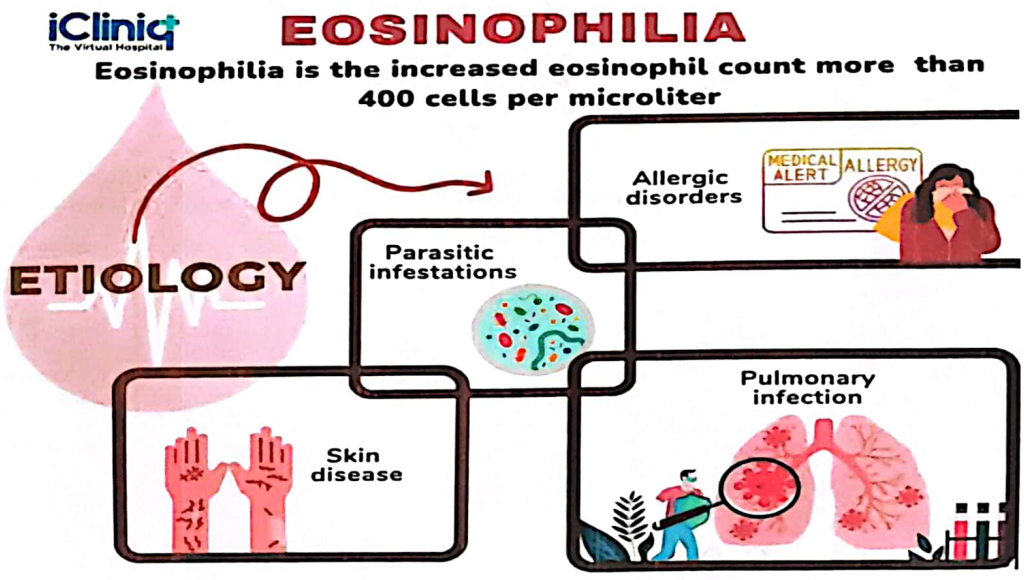
- ***Anti-bacterial:***
  - ➢ *They are **weak phagocytes** and show chemotaxis.*

**White blood cells attacking a parasite**



- ***Anti-parasitic infections e.g. Schistosomiasis by releasing :***
  - ***a) hydrolytic** enzymes*
  - ***b) highly reactive forms of O2** that are lethal.*
  - *c) highly larvacidal polypeptide called (**major basic protein**).*

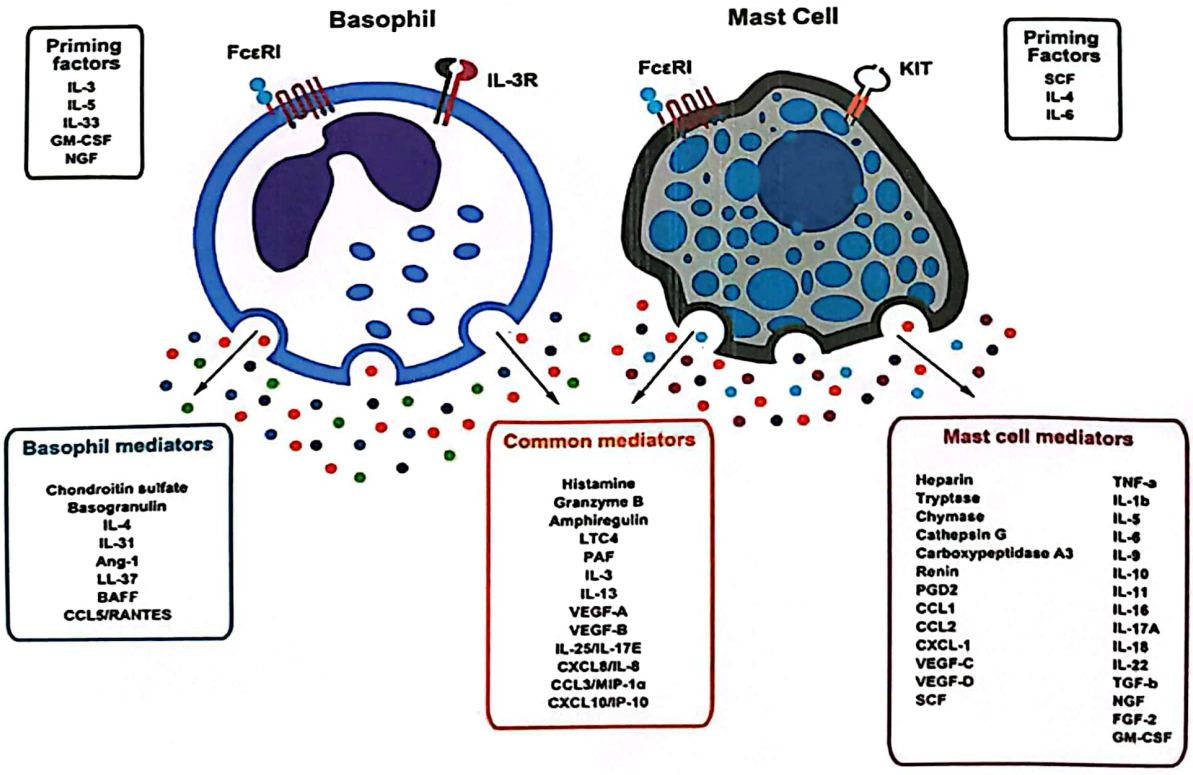
- ***Anti-allergic = They prevent the spread of the local inflammatory process resulting from allergic reactions:***
  - ➢ *They migrate toward the inflamed allergic tissue attracted by **eosinophil chemotactic factor** released by mast cells and basophils*
  - ➢ ***The eosinophils are believed to:***
    - *1) **Phagocytize** and destroy **allergen-antibody complexes;***
    - *2) **Detoxify** some of the **inflammation-producing substances** released by mast cells and basophils.*



## C) Basophils (together with mast cell) MCQ

- They release **heparin** into the blood, a substance that can prevent blood coagulation.

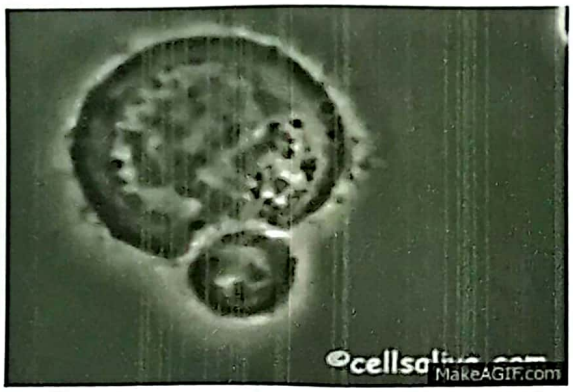
- They release **histamine and other inflammatory mediators** during allergic conditions:
  - Specific antigen binds to its specific antibody of the **IgE** type resulting in formation of **antigen antibody complex** which bind to receptor on mast cell and basophil
  - **This causes the mast cell or basophil to rupture & release large quantities of:**
    - Histamine
    - Serotonin
    - Slow reacting substances of anaphylaxis
    - A number of lysozomal enzymes
    - Bradykinin
    - Heparin
  - **These in turn cause** allergic manifestations.

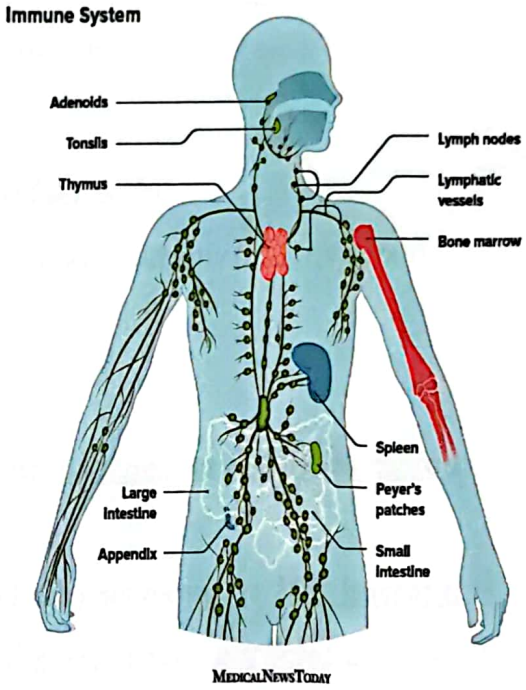


## II) Non-Granular Leucocytes:

### A) Lymphocytes

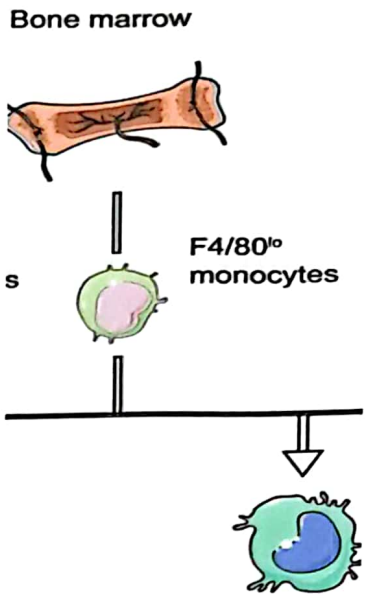
- *They are formed mainly in the **lymph nodes, thymus, and spleen.***
- *They enter the blood stream via **lymphatics.***
- ***Types and functions of lymphocytes:***
  - *Play a role in **immune system** (will be discussed later).*



## B) Monocytes

- When they enter the blood stream from the bone marrow, they are immature cells and circulate for about **72 hours.**




- They then enter the tissue and within **8 hours** , they swell, increase in size, and develop large numbers of lysosomes, and become **tissue macrophages** which are the main constituent of the reticulo-endothelial cells.

- **Like neutrophils**, they move to the sites of infection by diapedesis, amoeboid movement and chemotaxis, but much slower than neutrophils.

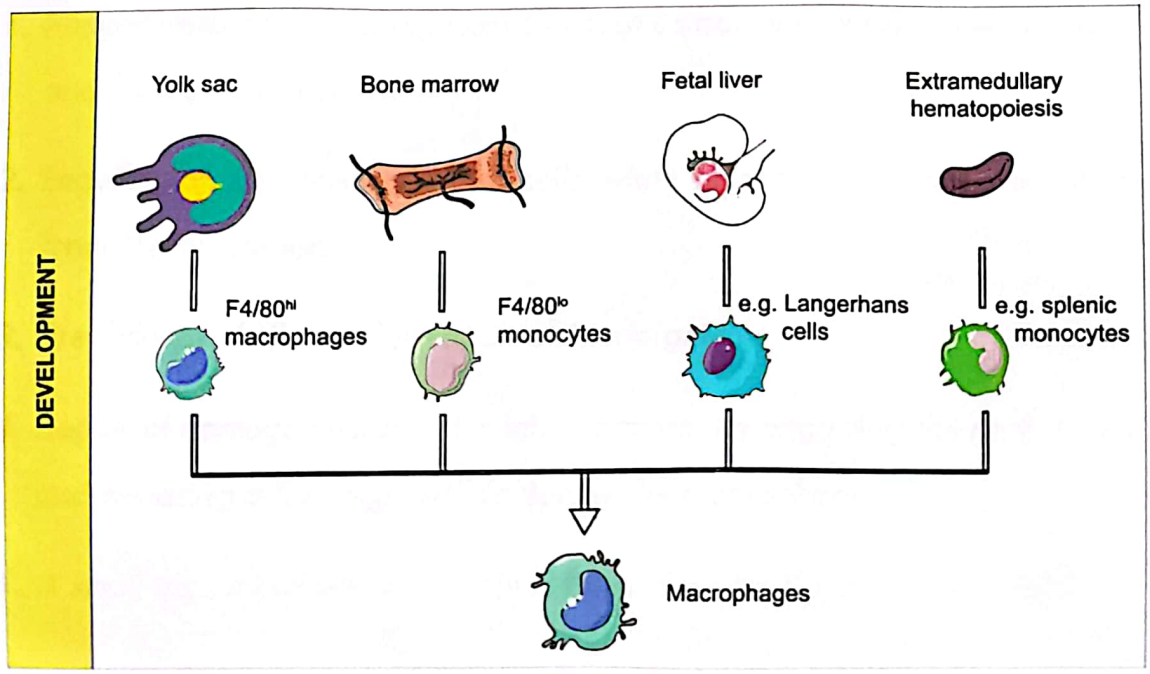
- **They phagocytize and kill bacteria by similar mechanisms but much more powerfully than neutrophils where:**
  1) Macrophages are capable of phagocytizing as many as **100 bacteria**
  2) Macrophages have the ability to engulf **much larger particles** even whole red blood cells or occasionally parasites as malaria
  3) Also after digesting particles, can extrude the residual products and often **survive and function for many more months.**

# Tissue Macrophage System (Reticulo-endothelial System)

- **This system consists of:**
  1. Monocytes.
  2. Mobile macrophages.
  3. Fixed tissue macrophages.
  4. A few specialized endothelial cells in the bone marrow, spleen & lymph nodes.

- **The tissue macrophages are of 2 types:**

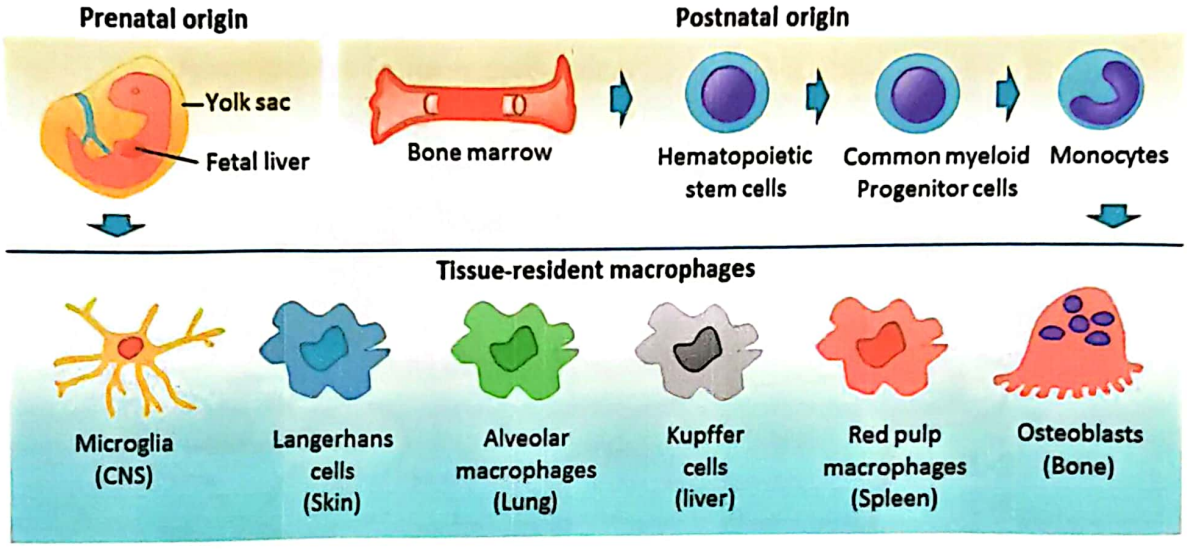
| | |
|---|---|
| **1- Mobile macrophages:** | • They are capable of **wandering** through the tissue all the time. |
| **2- Fixed macrophages** | • They are the **monocytes** that enter the tissues and after becoming **macrophages**, they become attached to the tissues and remain attached for **months or even years** unless they are needed by the body.<br>• However, these fixed tissue macrophages, **when stimulated** they can leave their attachment sites and become **mobile macrophages** that respond to chemotaxis. |



## The tissue macrophages:

- **Known by different names in the various body tissues e.g.**
  - The **Kupffer cells in** the liver
  - **Alveolar macrophages** in the lungs
  - **Microglia** in the brain
  - **Histocytes** in the skin and subcutaneous tissues
  - **Reticular cells** in the lymph nodes, spleen and bone marrow.

a




## Functions of the tissue macrophage system:

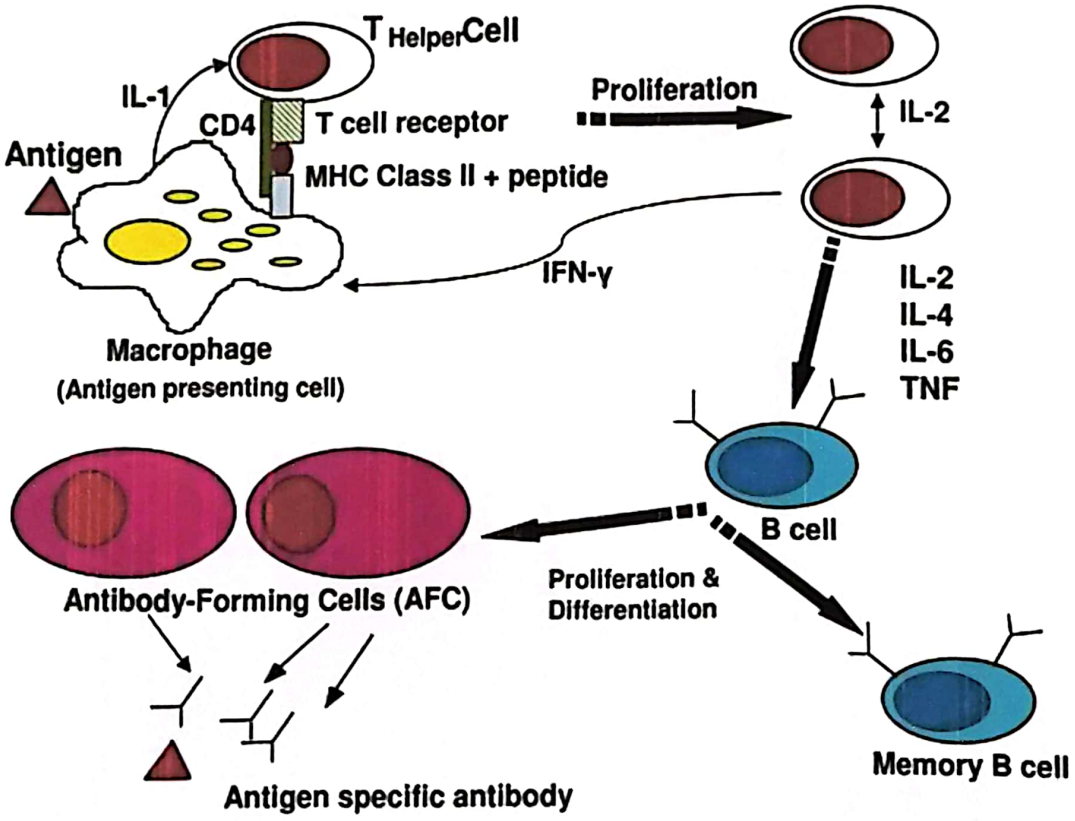
1. **Phagocytosis** of any foreign antigen such as bacteria, viruses, dead tissues and foreign particles.
2. **Engulfing** of old blood cells (red cells, white cells, platelets) removing them from the circulation.
3. **Breakdown of Hb** and formation of bile pigments.
4. **Repair of damaged tissue** after inflammation, by engulfing the necrotic tissue and releasing **a tissue-growth factor** by the macrophages.
5. A small amount of **erythropoietin** is formed by the Kupffer cells. **MCQ**

6. ***They help in the production of antibodies by B-lymphocytes:***

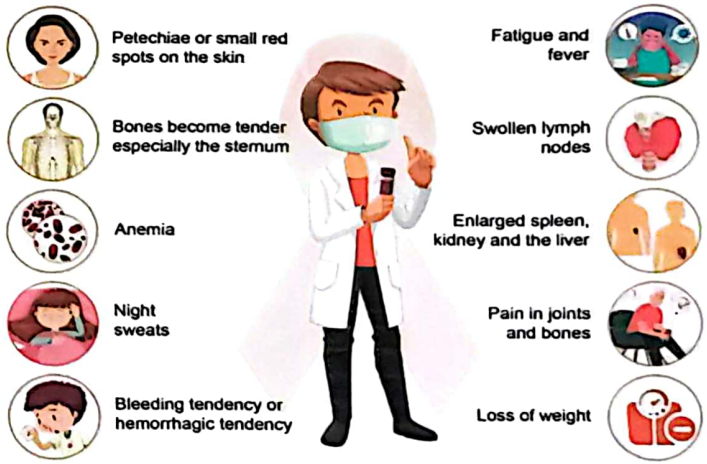
- *The antibody formation needs interaction between the macrophages, helper T-cells and B-lymphocyte.* ***How?***

  1) *Upon entry of* ***a foreign antigen*** *into the body, the macrophages phagocytize it, digest it, and present its* ***antigenic part*** *to* ***B lymphocyte*** *that differentiate to form* ***plasma cells*** *which form* ***specific antibodies.***

  2) *The macrophages in addition secretes* ***interleucin-1*** *that promotes growth of the* ***helper-T lymphocytes*** *which by its turn activates* ***the B-lymphocytes*** *to form* ***antibodies.***



- **Pathologic variation in leucocytic count:** **MCQ**

| | Def: | Causes |
|---|---|---|
| **Leucopenia:** | • Diminished WBCs count **below 4000 cell/mm3.** | • enteric fever & acute viral infections. |
| **Leucocytosis:** | • Increase number of WBCs **> 11000** cell/mm3. | • **Occurs in any condition with tissue destruction as:**<br>➢ Tissue inflammation with pus formation.<br>➢ Cardiac infarction.<br>➢ **It may occur physiologically** in pregnancy, after cold bath, exercise and following meals. |
| **Agranulocytosis:** | • bone marrow stops production of white cells leaving the body **unprotected** against bacteria & other agents.<br>• It is a rapidly **fatal disease.** | • **drug toxicity or gamma irradiation.** |
| **Leukemia:** | • **Malignant disease** of the bone marrow → uncontrolled production of abnormal WBCs.<br>• The leukemic cells are usually **non-functional.**<br>• They utilize the nutrients needed by other tissues → **severe wasting** |  |

Level (1)
Sem (2)

5
L.E

# MCQ PHYSIOLOGY HIS

## LECTURE (4)

Dr. M.M

# MCQ HIS 4

| | |
|---|---|
| **1) For someone having coronary thrombosis (blockage of coronary artery by blood clot), which of these chemicals is most effective to inject :**<br>a) Histamine<br>b) Thrombin<br>c) Thromboxane<br>d) Streptokinase<br>e) Prostaglandins | **D** |
| **2) Dicumarol act as anti coagulant by :**<br>a) Precipitation of ca<br>b) Inhibition of vit K action<br>c) Inhibition of thrombin<br>d) Prevention of activation of factor 1X<br>e) Prevention of activation 11V | **B** |
| **3) Maintenance of blood fluidity depends on all except :**<br>a) Smooth intact vascular endothelium<br>b) Presence of heparin and antithrombin 3<br>c) Absence of plasminogen<br>d) Presence of thrombodulin<br>e) Intact fibrinolytic system | **C** |
| **4) What can dissolve blood clot :**<br>a) Heparin<br>b) Plasminogen<br>c) Plasmin<br>d) Dicumarol<br>e) Thrombin | **C** |

| | |
|---|---|
| **5) Which chemical involved in fibrinolysis :**<br>a) Fibrinogen<br>b) Antithrombin<br>c) Plasmin<br>d) Heparin<br>e) Thromboplastine | **C** |
| **6) About the action of anticoagulants all the following is true except:**<br>a) Dicumarol interferes with the synthesis of prothrombin in the liver.<br>b) Oxalates form insoluble salts with Ca<br>c) Citrates and other chelating agents bind Ca<br>d) Heparin blocks the action of antithrombin III. | **D** |
| **7) The hemorrhagic tendency in obstructive jaundice is due to:**<br>a) Deficiency of platelets.<br>b) Increased serum bile salt concentration.<br>c) Deficiency of factor VIII.<br>d) Lack of factors II, VII, IX and X. | **D** |
| **8) The treatment of patients suffering increased tendency of blood clotting is:**<br>(A) Strict bed rest.<br>(B) I.V. heparin followed by vitamin K antagonists (e.g. dicumarol)<br>(C) I.V. administration of sodium citrate.<br>(D) Increasing the rate of erythropoiesis. | **B** |
| **9) The haemostatic disorder in obstructive jaundice is:**<br>A. Due to deficiency of factor IV.<br>B. Secondary to lack of platelets.<br>C. Characterized by a longer bleeding time than normal.<br>D. Characterized by a longer coagulation time than normal due to decreased vitamin K reabsorption. | **D** |

| | |
|---|---|
| **10) Blood coagulation can be delayed by all the following except:**<br>(A) Deficiency of prothrombin.<br>(B) Deficiency of factor IX.<br>(C) Heparin.<br>(D) Serotonin. | **D** |
| **11) The coagulation time is normal in:**<br>A. Hemophilia<br>B. Sever liver disease<br>C. Purpura<br>D. Prolonged obstructive jaundice<br>E. Decrease clotting factor IX in serum. | **C** |
| **12) The anticoagulant which acts BOTH in-vivo and in vitro is:**<br>A. Heparin<br>B. Oxalate<br>C. Citrate<br>D. Dicumarole<br>E. Aspirin | **A** |
| **13) A patient with bleeding tendency may have:**<br>A. Anemia<br>B. Leucocytosis<br>C. Leucopenia<br>D. Polycythemia<br>E. Thrombocytopenia | **E** |
| **14) About protein C, all the following is true except:**<br>a) Its activator is formed from thrombin by the action of thrombomodulin.<br>b) It is a neutral anticoagulant protein.<br>c) It activates the inhibitor of TPA.<br>d) It inactivates both factors 5 and 8. | **C** |

| | |
|---|---|
| **15) Heparin acts as an anticoagulant by:**<br>A. Precipitation of Ca2+.<br>B. Inhibition of vitamin K action.<br>C. Activation of anti-thrombin III.<br>D. Activation of factor IX.<br>E. Activation of thrombin. | **C** |
| **16) About protein C, all the following is true except:**<br>a) It is not involved in blood viscosity.<br>b) Its activator is formed from thrombin by the action of thrombomodulin.<br>c) It is a natural anticoagulant protein.<br>d) It activates the inhibitor of TPA.<br>e) It inactivates both factors 5 and 8. | **D** |
| **17) Thrombin is required for activation of all of the following, except:**<br>a) Plasminogen.<br>b) Fibrinogen.<br>c) Factor III.<br>d) Factor XIII. | **C** |
| **18) About the action of anticoagulants, all the following is true except:**<br>a) Dicumarol interferes with the synthesis of prothrombin in the liver.<br>b) Oxalates form insoluble salts with Ca++.<br>c) Citrates and other chelating agents bind Ca<br>d) Heparin blocks the action of antithrombin III. | **D** |
| **19) Plasminogen activators include the following except:**<br>a- T-PA<br>b- Streptokinase<br>c- Urokinase<br>d- Factor X | **D** |

| | |
|---|---|
| **20) All the following about plasmin is true except:**<br>*(A) It is formed from plasminogen by a tissue activator (TPA).*<br>*(B) It produces fibrinogen degradation products (FDP).*<br>*(C) It can be inhibited by an antiplasmin.*<br>*(D) It is responsible for the formation of fibrin.* | **D** |
| **21) Purpura is caused by deficiency of:**<br>*(A) Factor VIII.*<br>*(B) Prothrombin.*<br>*(C) Vitamin K.*<br>*(D) Platelets.* | **D** |
| **22) Prolongation of the bleeding time occurs in case of:**<br>*(A) Decreased plasma fibrinogen.*<br>*(B) Decreased platelet count.*<br>*(C) Hemophilia.*<br>*(D) Factor X deficiency.* | **B** |
| **23) The clotting time is prolonged in all the following conditions except:**<br>*(A) Haemophilia.*<br>*(B) Hypoprothrombinaemia.*<br>*(C) Excessive liver damage.*<br>*(D) Hypercholesterolaemia.* | **D** |
| **24) What condition leads to a deficiency in factor IX that can be corrected by an intravenous injection of vitamin K?**<br>*a) Classic hemophilia*<br>*b) Hepatitis B*<br>*c) Bile duct obstruction*<br>*d) Genetic deficiency in antithrombin III* | **C** |

**25) Why d**
a) Vita

| | |
|---|---|
| ***25) Why do some malnourished patients bleed excessively when injured?***<br>*a) Vitamin K deficiency*<br>*b) Platelet sequestration by fatty liver*<br>*c) Serum bilirubin raises neutralizing thrombin*<br>*d) Low serum-protein levels cause factor XIII problems* | **A** |
| ***26) Which chemical is involved in the breakdown of a clot (fibrinolysis)?***<br>*a) Fibrinogen.*<br>*b) Antithrombin.*<br>*c) Plasmin.*<br>*d) Heparin.*<br>*e) Thrombin* | **C** |
| ***27) Which of these statements is true regarding coagulation?***<br>*a) Prothrombin activator catalyzes the breakdown of fibrinogen to fibrin.*<br>*b) Thrombin catalyzes the conversion of fibrinogen to fibrin.*<br>*c) Antithrombin activates thrombin.*<br>*d) Heparin causes fibrinolysis.*<br>*e) Warfarin is in-vitro anticoagulants.* | **B** |
| ***28) Prolongation of bleeding time occurs in:***<br>*a) Hemophilia A.*<br>*b) Hemophilia C.*<br>*c) Thrombocytopenic purpura*<br>*d) Decreased plasma fibrinogen.*<br>*e) Hypercholesterolaemia.* | **C** |

| | |
|---|---|
| ***29) Heparin acts as anticoagulant by:***<br>a) Competitive inhibition with vitamin K.<br>b) Precipitation of Ca++.<br>c) Chelation of Ca++.<br>d) Acts as cofactor for anti-thrombin III.<br>e) De- ionization of Ca++. | **D** |
| ***30) The coagulation time is prolonged in:***<br>a) Anemia.<br>b) Cardiac diseases.<br>c) Liver diseases.<br>d) Purpura.<br>e) Polycythemia. | **C** |
| ***31) Heparin is secreted by;***<br>a) Kidney<br>b) Blood cells<br>c) Nerve cells<br>d) Liver<br>e) Lung | **B** |
| ***32) Hemorrhagic tendency in obstructive jaundice is due to:***<br>a. Deficiency of platelets<br>b. Increased serum bile salt concentration<br>c. Deficiency of factor VIII<br>d. Lack of factors II, VII, IX and X<br>e. Deficiency of fibrinogen | **D** |

| | |
|---|---|
| **33) Which of the following is correct:**<br>a) Megaloblastic anemia is caused by hemorrhage.<br>b) Skin resistance is part of the acquired immunity.<br>c) Vaccination improves (strengthen) the innate immunity.<br>d) In fibrinolysis plasminogen has to be activated into plasmin.<br>e) Megaloblastic anemia is caused by failure of bone marrow function. | **D** |
| **34) Which of the following is correct:**<br>a) WBCs count in adult male is 5 millions per cubic mm.<br>b) Normal Hb concentration in females is 10 grams %.<br>c) In polycythemia the hematocrit decreases.<br>d) Antithrombin III is an anticoagulant.<br>e) Basophils secrete (release) histamine, heparin, and serotonin. | **D** |
| **35) Which of the following is correct:**<br>a) Protein C is a clotting factor.<br>b) Fibrin threads are soluble.<br>c) Plasma cells originates from T-lymphocytes.<br>d) Immunoglobulins are produced by T-lymphocytes.<br>e) The clotting factor prothrombin is a plasma protein. | **E** |
| **36) Which of the following statements about blood is correct:**<br>a) In leukemia the count of WBCs decreased.<br>b) T lymphocytes exhibit (show) chemotaxis.<br>c) Vit K is required for the synthesis of some clotting factors.<br>d) Normal value of Hb in men is 20 – 22 gm / 100ml.<br>e) The primary immune response is more potent than the secondary immune response. | **C** |

| | |
|---|---|
| **37) Thrombocytopenia purpura caused by:**<br>a) Deficiency of vit K.<br>b) Increased number of platelets above normal.<br>c) Decreased number of platelets below normal.<br>d) Only a & b are correct. | C |
| **38) Blood coagulation is inhibited by:**<br>a) Vitamin K.<br>b) Ca++.<br>c) Heparin.<br>d) Thrombin.<br>e) Tissue factor (TF). | C |
| **39) Intravascular clotting is prevented by:**<br>a) Circulating thrombin.<br>b) Circulating fibrinolysin.<br>c) A layer of positively charged proteins lining the vessels.<br>d) All of the above are correct. | B |
| **40) Antithrombin III:**<br>a) Is a beta globulin.<br>b) Is secreted by the mast cells.<br>c) Stimulating clotting mechanisms.<br>d) Causes clotting retraction.<br>e) Heparin increases its activity. | E |
| **41) Anti-clotting factors include all the following EXCEPT:**<br>a) Heparin.<br>b) Thrombin.<br>c) Oxalates.<br>d) EDTA.<br>e) Collection of blood in a silicon coated tube. | B |

| | |
|---|---|
| **42) Heparin:**<br>a) Acts inside and not outside the body.<br>b) Can be taken orally.<br>c) Has rapid onset of action.<br>d) Has a long duration of action.<br>e) Acts by competitive inhibition with vitamin K in the liver. | **C** |
| **43) It is correct to say that heparin is:**<br>a) Secreted by eosinophils.<br>b) Used in vitro to prevent blood clot.<br>c) Coagulant factor.<br>d) Secreted by plasma cells. | **B** |
| **44) The coagulation time is normal in:**<br>A. Hemophilia<br>B. Sever liver disease<br>C. Purpura<br>D. Prolonged obstructive jaundice<br>E. Decrease clotting factor IX in serum. | **C** |
| **45) The anticoagulant which acts BOTH in-vivo and in vitro is:**<br>A. Heparin<br>B. Oxalate<br>C. Citrate<br>D. Dicumarole<br>E. Aspirin | **A** |
| **46) Thrombin is required for activation of all of the following, except:**<br>a) Plasminogen.<br>b) Fibrinogen.<br>c) Factor III.<br>d) Factor XIII. | **C** |

| | |
|---|---|
| **47) A patient with bleeding tendency may have:**<br>A. Anemia<br>B. Leucocytosis<br>C. Leucopenia<br>D. Polycythemia<br>E. Thrombocytopenia | **E** |
| **48) Heparin acts as an anticoagulant by:**<br>A. Precipitation of Ca2+.<br>B. Inhibition of vitamin K action.<br>C. Activation of anti-thrombin III.<br>D. Activation of factor IX.<br>E. Activation of thrombin. | **C** |
| **49) Which of the following would be appropriate therapy for recent acute myocardial infraction?**<br>a) Heparin.<br>b) Warfarin.<br>c) Aspirin.<br>d) Tissue plasminogen activator.<br>e) Heparin and dicumaroul at the same time. | **D** |
| **50) Which of the following chemicals digests fibrin threads?**<br>A) Christmas factor<br>B) Fibrin stabilizing factor<br>C) Plasmin<br>D) Platelets F3<br>E) Stuart prewar factor | **C** |

| | |
|---|---|
| **51) Which agent is not effective as an in vitro anticoagulant?**<br>A) Heparin<br>B) Warfarin (Coumadin)<br>C) Ethylenediamine tetraacetic acid (EDTA)<br>D) Sodium citrate | **B** |
| **52) Which of the following would best explain a prolonged bleeding time test?**<br>A) Hemophilia A B) Hemophilia B<br>C) Thrombocytopenia D) Coumadin use | **C** |
| **53) Which of the following is appropriate therapy for a massive pulmonary embolism?**<br>A) Heparin B) Warfarin<br>C) Aspirin D) Tissue plasminogen activator | **D** |
| **54) What is the primary mechanism by which heparin prevents blood coagulation?**<br>A) Antithrombin III activation<br>B) Binding and inhibition of tissue factor<br>C) Binding available calcium<br>D) Inhibition of platelet-activating factor | **A** |
| **55) A 55-year-old man who has been undergoing stable and successful anticoagulation with warfarin for recur- rent deep vein thrombosis is treated for pneumonia, and 8 days later he presents with lower intestinal bleeding. His prothrombin time is quite prolonged. What is the appropriate therapy?**<br>A) Treatment with tissue plasminogen activator<br>B) Infusion of calcium citrate<br>C) Treatment with fresh frozen plasma and vitamin K<br>D) Rapid infusion of protamine | **C** |

**1. What is the normal hemoglobin level in infant?**

A) 10-11 gm/dl.
B) 12-16 gm/dl.
C) 14-18 gm/dl.
D) 18 gm/dl.
E) 25 gm/dl.

**2. Which chemical of the following is essential for initiation of extrinsic pathway in clot formation?**

A) Fibrinogen
B) Plasminogen
C) Prekalkrein
D) Prothrombin
E) Thromboplastin

**3. What is the normal life span of platelets?**

a. 1-2 days
b. 8-12 days
c. 30-35 days
d. 1-2 months
e. 8-12 months

**4. A deficiency of which of the following factors causes Hemophilia?**

a. Factor III.
b. Factor V.
c. Factor VII.
d. Factor VIII.
e. Factor X.

**5. Which chemical produces vasoconstriction of injured blood vessel?**

a. Fibrin stabilizing factor
b. Plasmin
c. Platelets F3
d. Stuart prewar factor
e. Thromboxane A2

**6. Regarding the number of red blood cells (RBCs), which of the following sentences is correct?**

a. Its number increases in anemia or oligocythemia
b. Polycythemia means decrease in their number.
c. Normal count in males 5-5.5 million /mm.
d. Normal count in females 6-6.5 million /mm.
e. It increases in hemorrhage

**7. Erythropoiesis is the process of development of:**

a. Basophils.
b. Eosinophils.
c. Lymphocytes.
d. Monocytes.
e. Red blood cells

**8. Megaloblastic anemia can be caused by:**

a. Folic acid deficiency.
b. Iron deficiency.
c. Chronic renal failure.
d. Living at high altitude.
e. Glucose 6 phosphate dehydrogenase deficiency.

**9. Which of the following clotting factor is released from damaged tissue, and initiates a chain of clotting events?**

a. Fibrin.
b. Fibrinogen.
c. Prothrombin.
d. Thrombin.
e. Tissue thromboplastin

**10. A condition of heredity deficiency of coagulation is called:**

a. Anemia.
b. Hemophilia.
c. Hemolysis.
d. Leukemia.
e. Polycythemia

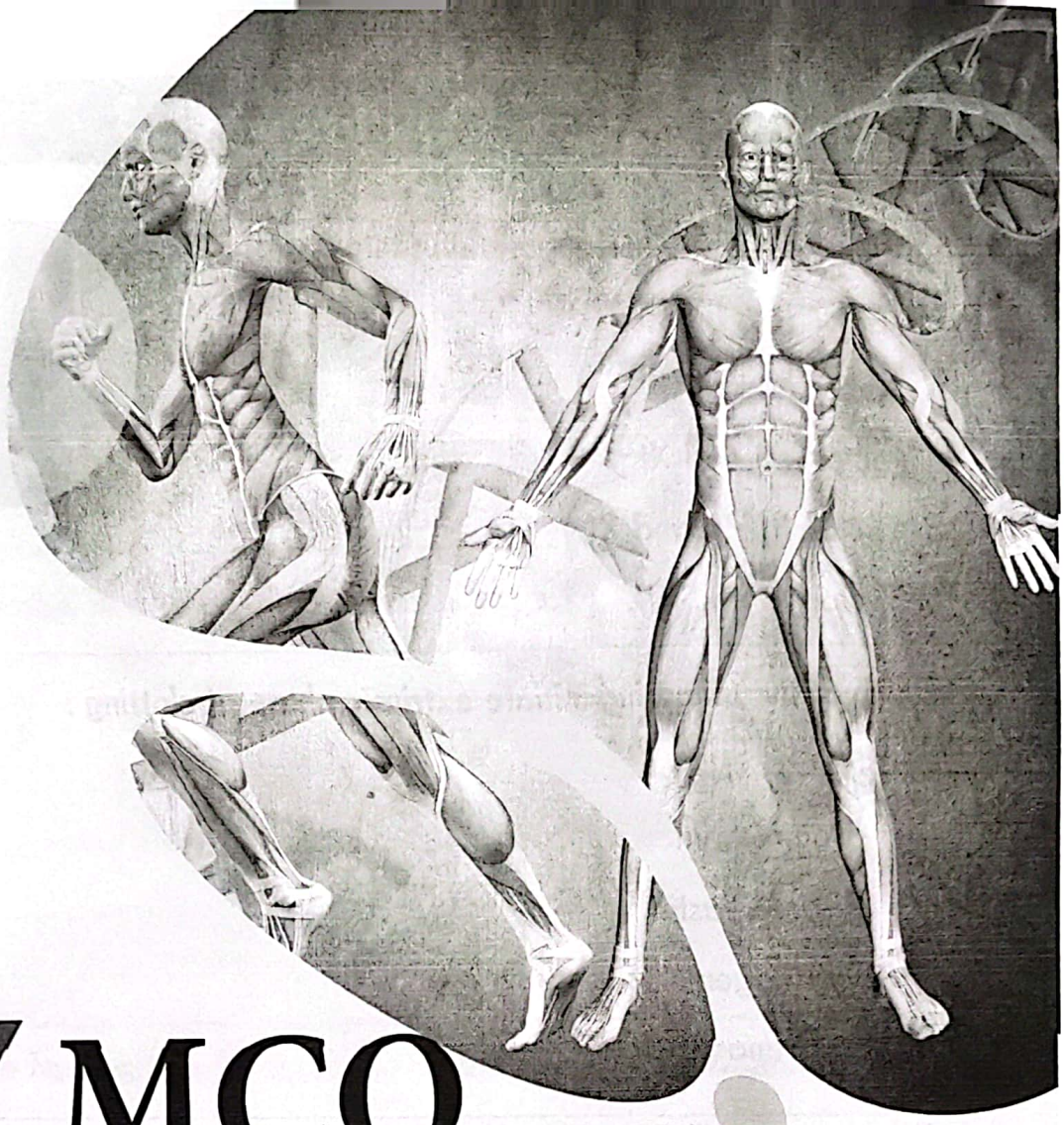
**11. The normal hemoglobin content for adult females is:**

a. 6-8 gm/dl
b. 8-10 gm/dl
c. 12-14 gm/dl
d. 14-18 gm/dl
e. 16-18 gm dl

**12. Purpura is caused by deficiency of:**

a. Factor VIII
b. Factor XI
c. Platelets
d. Prothrombin
e. Vitamin K

Level (1)
Sem (2)



7
L.E

# MCQ PHYSIOLOGY HIS

## LECTURE (3)

Dr. M.M

# MCQ Physio HIS 3

| | |
|---|---|
| **1. Vitamin K dependent coagulation factors are:**<br>a. Factor II, VII and X.<br>b. Factor X and XI.<br>c. Factor VII and XI.<br>d. Factor II, VII and XI.<br>e. Factor XI and XII. | **A** |
| **2. Which of the following initiate extrinsic phase of clotting :**<br>a) Fibrin<br>b) Prothrombin<br>c) Thromoplastin<br>d) Fibrinogen<br>e) Christmas factor | **C** |
| **3. What convert fibrinogen to fibrin :**<br>a) Prothrombin<br>b) Thrombin<br>c) Thromboplastin<br>d) HMW kininogen<br>e) Calcium | **B** |
| **4. Which of the following factor is released from damaged tissue , and initiate a chain of clotting events :**<br>a) Prothromin<br>b) Thrombin<br>c) Fibrin<br>d) Tissue thromoplastin<br>e) Fibrinogen | **D** |

| | |
|---|---|
| **5. Prothrombin level falls in blood due to lack of :**<br>a) Vit b12<br>b) Vit k<br>c) Phospholipid<br>d) Platelet<br>e) Sodium | **B** |
| **6. Activation of prothrombin into thrombin achieved by :**<br>a) Factor Xa<br>b) Factor 111<br>c) Factor V111<br>d) Factor 1Xa<br>e) Factor X1a | **A** |
| **7. The platelets produce haemostasis by releasing all the following substances except:**<br>a) ADP.<br>b) Platelet factor 3<br>c) Thromboxane A2.<br>d) Thrombopoietin. | **D** |
| **8. Concerning platelets, all the following is true except:**<br>a) Their membranes contain phospholipids that are involved in blood clotting<br>b) They release 5-hydroxytryptamine and thromboxane A2.<br>c) Their aggregation is inhibited by both thrombin and the Von Willebrand factor<br>d) They are concerned with formation of the primary haemostatic plug. | **C** |

| | |
|---|---|
| **9. A 2-year-old boy bruises easily and has previously had bleeding gums. The maternal grandfather has a bleeding disorder. His physical examination shows several small bruises on the legs. Of which coagulation factor would you suspect this patient to be deficient?**<br>a) Prothrombin activator<br>b) Factor II<br>c) Factor VIII<br>d) Factor X | **C** |
| **10. What is proper pathway for extrinsic clotting pathway?**<br>a) Contact of blood with collagen, formation of prothrombin activator, conversion of prothrombin into thrombin, conversion of fibrinogen into fibrin threads<br>b) Tissue trauma, formation of prothrombin activator, conversion of prothrombin into thrombin, conversion of fibrinogen into fibrin threads<br>c) Activation of platelets, formation of prothrombin activator, conversion of prothrombin into thrombin, conversion of fibrinogen into fibrin threads<br>d) Trauma to the blood, formation of prothrombin activator, conversion of prothrombin into thrombin, conversion of fibrinogen into fibrin threads | **B** |
| **11. Which of these statements concerning clotting is false?**<br>a) Both extrinsic and intrinsic clotting pathways form prothrombin activator.<br>b) Clots are composed mostly of plasmin.<br>c) Clotting requires vitamin K and calcium ion.<br>d) The extrinsic pathway is stimulated by contact with a damaged blood vessel.<br>e) Thrombin is required for conversion of fibrinogen into fibrin. | **B** |

| | |
|---|---|
| **12. The coagulation pathway that begins with tissue thromboplastin is:**<br>a) extrinsic pathway<br>b) intrinsic pathway<br>c) common pathway<br>d) fibrin stabilization | **A** |
| **13. Arrange the following events in the order in which they occur during platelet plug formation:**<br>**1. Platelet activation.**<br>**2. Platelet aggregation.**<br>**3. Platelet adhesion.**<br>a) 1,2,3.<br>b) 1,3,2.<br>c) 2,1,3.<br>d) 2,3,1.<br>e) 3,1,2. | **E** |
| **14. The normal hemostatic response to vascular damage depends mainly on**<br>a) The red blood cells.<br>b) Stasis of the blood flow.<br>c) Circulating white blood cells.<br>d) Blood coagulation factors.<br>e) Mg++ ions. | **D** |
| **15. Which of the following is the normal count range of platelets/mm3?**<br>a) 500,000 to 600,000.<br>b) 150,000 to 300,000.<br>c) 100,000 to 200,000.<br>d) 550,000 to 650,000.<br>e) 50,000 to 150,000. | **B** |

| | |
|---|---|
| **16. Choose the correct order for the steps of hemostasis:**<br>a) Blood coagulation, platelet plug formation, blood vessel spasm.<br>b) Platelets plug formation, blood coagulation, blood vessel spasm.<br>c) Blood vessel spasm, platelet plug formation, blood coagulation.<br>d) Blood vessel spasm, blood coagulation, platelet plug formation.<br>e) Platelet plug formation, blood vessel spasm, blood coagulation. | **C** |
| **17. Heredity deficiency of coagulation is referred to as:**<br>a) Anemia.<br>b) Hemophilia.<br>c) Hemolysis.<br>d) Leukemia.<br>e) Polycythemia | **B** |
| **18. Which of the following ions is required for conversion of prothrombin into active thrombin?**<br>a) Ca++.<br>b) Fe++.<br>c) Mg++.<br>d) Mn++.<br>e) Cl-. | **A** |
| **19. Activated platelets release which of the following:**<br>a) Serotonin<br>b) ADP<br>c) Thromboplastin<br>d) Fibrin<br>e) Von wilberand factor. | **B** |

**20. Hemophi**
a) Factor

| | |
|---|---|
| **20. Hemophilia is mainly caused by deficiency of:**<br>a) Factor VII.<br>b) Factor VIII.<br>c) Factor V.<br>d) Factor X.<br>e) Factor III. | **B** |
| **21. ..... are necessary for clot retraction to occur.**<br>a) Red blood cells.<br>b) Lymphocytes.<br>c) Platelets.<br>d) Basophils.<br>e) Monocytes. | **C** |
| **22. Given these chemicals:**<br>**1. Fibrin,**<br>**2. Fibrinogen,**<br>**3. prothrombin activation**<br>**4. Thrombin,**<br>**5. tissue factor**<br>**Choose the arrangement that lists the chemicals in the order they are active during clot formation.**<br>a. 1,3,4,2,5<br>b. 2,3,4,51<br>c. 3,5,1,4,2<br>d. 4,3,2,5,1<br>e. 5,3,4,2,1 | **E** |

| | |
|---|---|
| **23. Normal blood clotting requires:**<br>a. Inactivation of heparin<br>b. Inactivation of plasmin<br>c. Inactivation of fibrin<br>d. Calcium ion<br>e. An adequate intake of vitamin C | **D** |
| **24. Hemorrhagic tendency in obstructive jaundice is due to:**<br>a. Deficiency of platelets<br>b. Increased serum bile salt concentration<br>c. Deficiency of factor VIII<br>d. Lack of factors II, VII, IX and X<br>e. Deficiency of fibrinogen | **D** |
| **25. Concerning platelets, all are true EXCEPT:**<br>a) Their number is 250,000 to 500,000 / mm3 of blood.<br>b) Are produced in the bone marrow.<br>c) They are nucleated cells.<br>d) Are essential for retraction of blood clot.<br>e) A decrease in their number produces an increase in bleeding time. | **C** |
| **26. Which of the following is a function of platelets:**<br>a) Release of heparin.<br>b) Formation of antibodies.<br>c) Destroying bacteria.<br>d) Formation of plug.<br>e) Formation of hemoglobin. | **D** |

| | |
|---|---|
| **27. Blood platelets functions include the following EXCEPT:**<br>a) Releasing factors cause vasoconstriction.<br>b) Releasing factors enhance blood coagulation.<br>c) Stimulation of fibrinolysis.<br>d) Formation of plug. | **C** |
| **28. Most important function of platelets is to bring about:**<br>a) Hemolysis.<br>b) Homeostasis.<br>c) Hemopoiesis.<br>d) Hemostasis. | **D** |
| **29. Concerning the platelets:**<br>a) Its cytoplasm contains dense granules.<br>b) It has a biconcave shape.<br>c) Its normal number is 5 – 6 X 106 / mm3.<br>d) It releases heparin.<br>e) It is a nucleated cells. | **A** |
| **30. Which of the following is NOT IMPORTANT for hemostasis:**<br>a) Formation of platelet plug.<br>b) Vasoconstriction.<br>c) Formation of clot.<br>d) Activation of anticoagulant factors. | **D** |
| **31. Platelet adhesion depends mainly on:**<br>a) Thromboxane A2.<br>b) ADP.<br>c) Von willibrand factor.<br>d) Thrombothenin.<br>e) Platelet factor 3 (PF3). | **C** |

| | |
|---|---|
| **32. Intrinsic mechanism of blood clotting starts by activation of:**<br>a) Factor IX.<br>b) Factor X.<br>c) Factor XI.<br>d) Factor XII.<br>e) Factor XIII. | **D** |
| **33. The extrinsic pathway of blood coagulation is characterized by the following EXCEPT:**<br>a) It is responsible for clotting of escaped blood to tissue.<br>b) It takes only 20 seconds.<br>c) It is stimulated by tissue factor.<br>d) It requires factor VIII. | **D** |
| **34. The final step in the clotting of blood is the conversion of:**<br>a) Prothrombin to thrombin.<br>b) Prothrombin activator to thrombin.<br>c) Fibrin to fibrinogen.<br>d) Fibrinogen to fibrin. | **D** |
| **35. Activation of factor X is stimulated by:**<br>a) Active factor VIII.<br>b) Tissue thromboplastin.<br>c) Calcium.<br>d) All of the above. | **D** |
| **36. Factor VII (stable factor) to be activated needs:**<br>a) Factor XIII.<br>b) Fibrin.<br>c) Factor V.<br>d) Factor X.<br>e) Tissue factor (factor III) (TF). | **E** |

| | |
|---|---|
| **37. Factor VII activation needs:**<br>a) Tissue factor.<br>b) Fibrin.<br>c) Factor (II).<br>d) Factor (XII).<br>e) Factor | **A** |
| **38. The intrinsic pathway is characterized by the following EXCEPT:**<br>a) Slow reaction in few minutes.<br>b) Needs factor VII.<br>c) Needs factors XII, XI, IX, VIII.<br>d) Large clot. | **B** |
| **39. Which of the following is normally circulating in the plasma:**<br>a) Prothrombin.<br>b) Fibrin.<br>c) Plasmin.<br>d) Thrombin.<br>e) Prothrombinase (prothrombin activator). | **A** |
| **40. Vitamin K is essential for synthesis of:**<br>a) Erythrocytes.<br>b) Leukocytes.<br>c) Platelets.<br>d) Hemoglobin.<br>e) Clotting factors VII, XI, and X. | **E** |
| **41. Citrate is a useful anticoagulant because of its ability to:**<br>a) Buffer basic groups of coagulation factors.<br>b) Bind factor XII.<br>c) Bind vitamin K.<br>d) Deionizes chelate calcium. | **D** |

| | |
|---|---|
| **42. Hemophilia:**<br>a) *Is a hypercoagulable disorder.*<br>b) *The A type is due to factor X deficiency.*<br>c) *More common in males.*<br>d) *Is associated with prolonged bleeding time.*<br>e) *Is associated with normal clotting time* | **C** |
| **43. A classic hemophilia is a deficiency of:**<br>a) *Aantihemophilic A factor.*<br>b) *Antihemophilic B factor.*<br>c) *Antihemophilic C factor.*<br>d) *Platelet number.*<br>e) *Vitamin K.* | **A** |
| **44. Which of the following combinations of substances present in plasma causes the production of clot:**<br>a) *Prothrombin, factor V, factor VIII, platelet factor.*<br>b) *Prothrombin, tissue factor, Ca++, factor V.*<br>c) *Thrombin and fibrinogen.*<br>d) *Factor V, VIII, platelet factor, Ca++, fibrinogen.* | **B** |
| **45. The following are present in circulating blood EXCEPT:**<br>a) *Prothrombin.*<br>b) *Fibrinogen.*<br>c) *Thrombin.*<br>d) *Globulin.* | **C** |
| **46. All the following about coagulation factor VII is true except:**<br>a) *It is synthesized in the liver.*<br>b) *It is activated by a tissue.*<br>c) *It is important for the intrinsic pathway of blood clotting.*<br>d) *When activated, it activates factor X.* | **C** |

| | |
|---|---|
| **47. It is correct to say that:**<br>a) Prothrombinaze (prothrombin activator) converts prothrombin into thrombin.<br>b) Thrombin converts plasminogen into plasmin.<br>c) Platelets secrete clotting factor III.<br>d) Heparin is a coagulant factor.<br>e) Basophils are phagocytic cells. | **A** |
| **48. The coagulation pathway that begin with tissue thromboplastin is:**<br>A. Extrinsic pathway<br>B. Intrinsic pathway<br>C. Common pathway<br>D. Fibrin stabilization<br>E. None of the above | **A** |
| **49. About intravascular clotting, all the following is true except:**<br>a) It occurs by intrinsic system of coagulation.<br>b) It is induced by a decrease in the blood flow rate.<br>c) It related to the clumping of platelets.<br>d) It occurs with accumulation of lipid in arterial walls.<br>e) It does not normally occur because Ca++ is present. | **E** |
| **50. The haemostatic disorder in obstructive jaundice is:**<br>a) Due to deficiency of factor IV.<br>b) Caused by insufficient pancreatic secretion.<br>c) Secondary to lack of platelets.<br>d) Characterized by a longer bleeding time than normal.<br>e) Characterized by a longer coagulation time than normal. | **E** |

| | |
|---|---|
| **51. What is the normal life span of platelets?**<br>a. 1-2 days<br>b. 8-12 days<br>c. 30-35 days<br>d. 1-2 months<br>e. 8-12 months | **B** |
| **52. Which chemical produces vasoconstriction of injured blood vessel?**<br>a. Fibrin stabilizing factor<br>b. Plasmin<br>c. Platelets F3<br>d. Stuart prewar factor<br>e. Thromboxane A2 | **E** |
| **53. In obstructive jaundice, the hemorrhagic tendency is due to:**<br>a. deficiency of platelets.<br>b. increased serum bile salt concentration<br>c. deficiency of factor VIII<br>d. lack of factors II, VII, IX and X<br>e. deficiency of fibrinogen | **D** |
| **54. What would most likely be used for prophylaxis of an ischemic heart attack?**<br>A) Heparin<br>B) Warfarin<br>C) Aspirin<br>D) Streptokinase | **C** |
| **55. The coagulation time is prolonged in:**<br>(A) Haemophilia.<br>(B) Anaemia.<br>(C) Polycythemia.<br>(D) Purpura. | **A** |

| | |
|---|---|
| **6. Platelet adhesion is potentiated by which of the following?**<br>A) ADP<br>B) Fibrin stabilizing factor<br>C) Thromboxane A2<br>D) Tissue factor<br>E) Von Willebrand factor | **E** |
| **57. Which factor potentiates (increases) platelet adhesion?**<br>a) ADP.<br>b) Fibrin stabilizing factor.<br>c) Thromboxane A2.<br>d) Tissue factor.<br>e) Von Willebrand factor. | **E** |
| **58. The haemostatic disorder in obstructive jaundice is:**<br>A. Due to deficiency of factor IV.<br>B. Secondary to lack of platelets.<br>C. Characterized by a longer bleeding time than normal.<br>D. Characterized by a longer coagulation time than normal due to decreased vitamin K reabsorption. | **D** |
| **59. The final reaction in the formation of blood clot:**<br>A. The formation of prothrombin activator.<br>B. Thrombin converts fibrinogen to fibrin.<br>C. Prothrombin activator converts prothrombin to thrombin.<br>D. Platelets aggregation. | **B** |
| **60. Extrinsic pathway of blood clotting:**<br>A. Starts by activation of factor XII.<br>B. Needs tissue thromboplastin.<br>C. Can occur in a test tube.<br>D. Doesn't need Ca++. | **B** |

| | |
|---|---|
| **61. Intrinsic pathway of blood clotting, start by activation of:**<br>A. Factor IX.<br>B. Factor X.<br>C. Factor XI.<br>D. Factor XII. | **D** |
| **62. Platelets:**<br>A- Are nucleated cells and form the major number of blood cells.<br>B- Form adhesion and aggregation at site of injury.<br>C- Are actively phagocytic cells.<br>D- Have high amount of hemoglobin. | **B** |
| **63. In blood coagulation:**<br>A- Factor XII is the initial factor in the extrinsic pathway.<br>B- Factor VII is the initial factor in the extrinsic pathway.<br>C- Fibrinogen is needed for both intrinsic and extrinsic pathways.<br>D- Vitamin K deficiency decreases fibrinogen content of blood. | **B** |
| **64. In the Intrinsic pathway of blood coagulation:**<br>A- Longer than the extrinsic pathway (4-8 minutes).<br>B- Need factor VII<br>C- Can occurs In Vivo only.<br>D- Enough RBCs are needed to be completed | **A** |
| **65. Vasoconstriction of the injured blood vessels occurs due to:**<br>A- Local vasoconstrictive factors released mainly from the platelets.<br>B- Decrease in the blood volume.<br>C- Increase in the platelets count.<br>D- Accumulation of coagulation factors in the injured area. | **A** |

| | |
|---|---|
| **66. Hemostasis:**<br>A- Occurs mainly if blood vessels are dilated.<br>B- Means stoppage of bleeding.<br>C- Means keeping internal environment of body constant.<br>D- Is accelerated in hemophilia and purpura. | **B** |
| **67. Platelets:**<br>A- Count 5 million/mm3<br>B- Have no Granules.<br>C- Formed in the liver.<br>D- Life span 7-12 days | **D** |
| **68. Blood coagulation is:**<br>A- Conversion of soluble fibrinogen into insoluble fibrin.<br>B- Adhesion of the platelets to the site of blood vessels injury.<br>C- Under the control of WBCs.<br>D- Can occurs inside the body only. | **A** |
| **69. Regarding blood platelets:**<br>A. They are formed in the liver.<br>B. Are more numerous than RBCs.<br>C. Needed for hemostasis.<br>D. Number decreases after splenectomy. | **C** |
| **70. The correct sequence of activation of extrinsic pathway of blood coagulation is:**<br>A. Tissue thromboplastin activates factor VIII.<br>B. Calcium ions activates factor VII.<br>C. Tissue thromboplastin activates factor VII.<br>D. Tissue thromboplastin activates factor IX. | **C** |

| | |
|---|---|
| **71. Factor VII:**<br>A. Isn't a factor in the coagulation cascade.<br>B. Initiates the process of coagulation with tissue thromboplastin.<br>C. Is vitamin K independent.<br>D. Is produced by platelets. | **B** |
| **72. The intrinsic pathway of blood coagulation:**<br>A. Is activated by a tissue factor.<br>B. Cannot occur in a test tube.<br>C. Is activated by exposed collagen.<br>D. Is more rapid than extrinsic pathway. | **C** |
| **73. The extrinsic pathway of blood coagulation is triggered by:**<br>A. Factor XII.<br>B. Tissue factor.<br>C. Collagen.<br>D. - Ve charge of the test tube. | **B** |
| **74. The extrinsic pathway of blood coagulation:**<br>A. Is rapid; it lasts after 4-8 minutes.<br>B. Tissue factor activates factor VII which in turn activates factor X.<br>C. Triggered by exposed collagen.<br>D. Activated factor VII by this pathway will activate factor VIII directly. | **B** |
| **75. Contact of the blood with sub-endothelial collagen produces:**<br>A. Inhibition of platelets.<br>B. Activation of factor VII.<br>C. Activation of factor XII.<br>D. Activation of factor IX. | **C** |

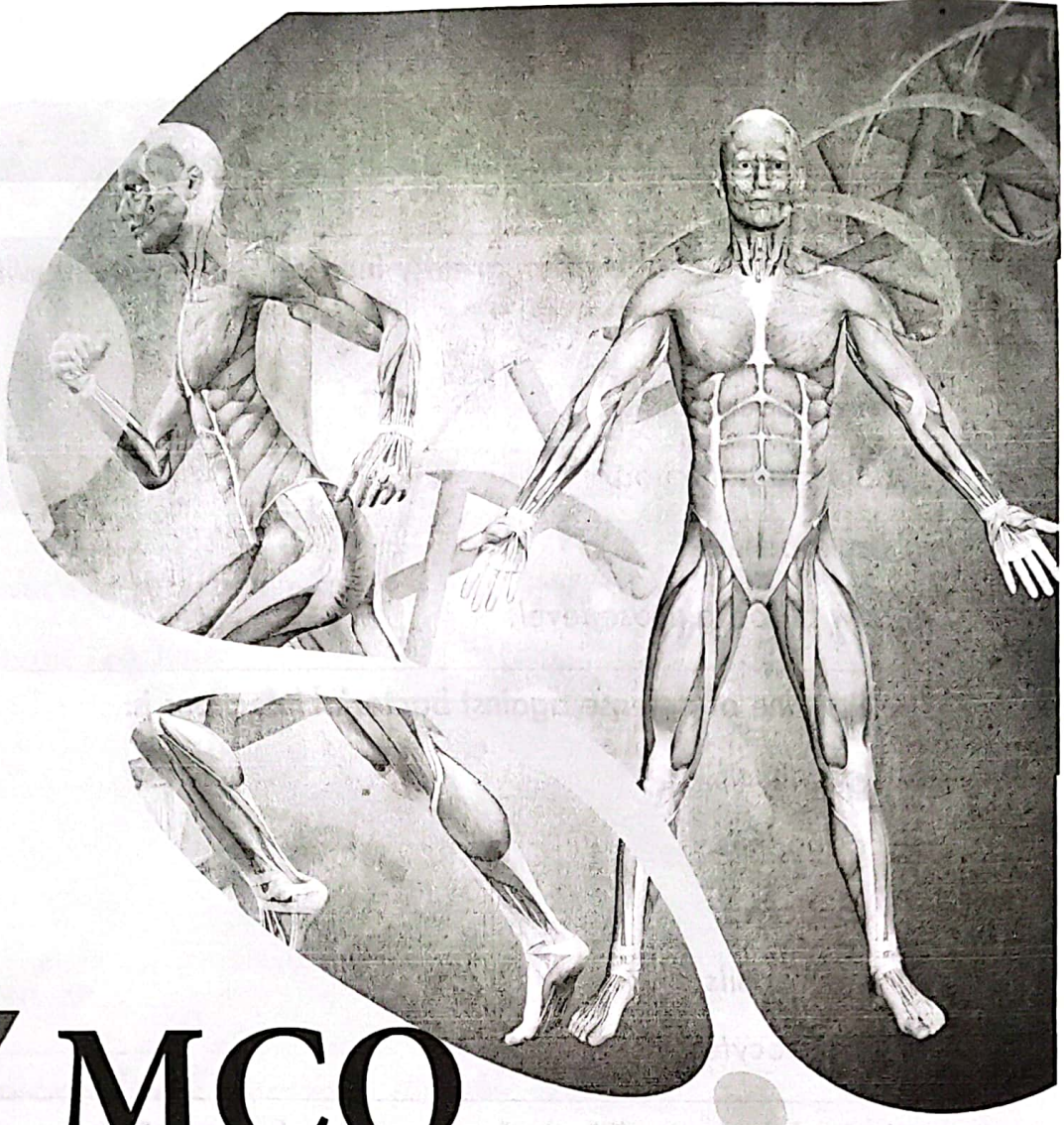
| | |
|---|---|
| **76. Which of the following conditions is associated with a depression of coagulation process and excessive bleeding after surgery?**<br>A. Gastrointestinal disease.<br>B. Heart disease.<br>C. Kidney disease.<br>D. Liver disease. | **D** |
| **77. Ghazala was diagnosed as a case of classic hemophilia. The best possibility is that:**<br>a. One of her X chromosomes code for deficiency of Factor VIII<br>b. Her mother was a hemophilia carrier<br>c. Her autosomes carry the mutant gene for hemophilia<br>d. She is suffering from von Willebrand's disease<br>e. Her father had hemophilia & mother was a hemophilia carrier | **E** |
| **78. Factor VIII is synthesized in:**<br>a. Endothelium.<br>b. Hepatocytes.<br>c. Kupffer cells.<br>d. Histiocytes.<br>e. Platelets. | **B** |
| **79. In haemostasis, which molecule polymerises to become the insoluble blood clot?**<br>A. factor X<br>B. thrombin<br>C. fibrin<br>D. plasmin | **C** |

| | |
|---|---|
| **80. What substance is produced by the first step in the blood clotting (coagulation) process?**<br>A. thrombin<br>B. prothrombin<br>C. factor X<br>D. prothrombinase | **D** |
| **81. In blood clotting, what activates "factor X"**<br>A. prothrombinase<br>B. thrombin<br>C. the extrinsic pathway<br>D. tissue plasminogen activator | **C** |
| **82. What substance is the product of the second step in the blood clotting process?**<br>A. thrombin<br>B. prothrombin<br>C. prothrombin activator<br>D. fibrin | **A** |
| **83. The role of platelets in blood clotting includes all of the following EXCEPT one. Which one?**<br>A. to form a plug in the hole of the damaged blood vessel<br>B. to convert prothrombin to thrombin<br>C. to release chemicals to attract other platelets<br>D. to adhere to exposed collagen fibres in damaged bl vessels | **B** |
| **84. All the following about coagulation factor VII is true except:**<br>a) It is synthesized in the liver<br>b) It is activated by a tissue factor.<br>c) It is important for the intrinsic pathway of blood clotting.<br>d) When activated, it activates factor X. | **C** |

| | |
|---|---|
| **85. About the coagulation mechanism all the following is true except:**<br>a) Platelet factor 3 is required for both the extrinsic and intrinsic systems.<br>b) The intrinsic system occurs both in vivo and in vitro<br>c) Intravascular thrombosis occurs by the extrinsic system.<br>d) The intrinsic system utilizes factors VIII, IX, XI and XII. | C |
| **86. Reduction of the serum Ca level in vivo:**<br>a) Does not affect blood coagulation.<br>b) Does not affect the neuromuscular excitability.<br>c) Leads to muscle relaxation.<br>d) Prolongs the bleeding time. | A |
| **87. About intravascular clotting, all following is true except:**<br>a) It occurs by the intrinsic system of coagulation.<br>b) It is induced by a decrease in the blood flow rate.<br>c) It is related to the clumping of platelets.<br>d) It does not normally occur because Ca is present. | D |
| **88. A female carrier of haemophilia married to a haemophilic male may produce any of the following except:**<br>a) A normal daughter<br>b) A normal son<br>c) A haemophilic daughter.<br>d) A carrier daughter. | A |
| **89. A reduction of the blood level of coagulation factor VIII:**<br>a) Increases the bleeding time beyond the normal range.<br>b) Is a hereditary disease due to an abnormal gene on the Y chromosome.<br>c) Causes prolongation of the clotting time.<br>d) is commonly associated with petechial haemorrhages in the skin. | C |

| | |
|---|---|
| **90. About bleeding from small skin cut all following is true except:**<br>a) *It ceases within about 4 minutes in normal people.*<br>b) *it is prolonged if factor VIII is deficient.*<br>c) *It is normally diminished by local vascular spasm.*<br>d) *Its stoppage depends on the platelet count in the blood.* | **B** |
| **91. Which of the following is the first step in hemostasis?**<br>a) *Platelet activation*<br>b) *Coagulation cascade*<br>c) *Vasoconstriction*<br>d) *Platelet aggregation* | **C** |
| **92. The process of clot retraction involves the:**<br>a) *Formation of a fibrin meshwork*<br>b) *Conversion of fibrinogen to fibrin*<br>c) *Contraction of platelets within the clot*<br>d) *Dissolution of the clot* | **C** |

Level (1)
Sem (2)



6
L.E

# MCQ PHYSIOLOGY HIS

## LECTURE (2)

Dr. M.M

# MCQ physio HIS 2

| | |
|---|---|
| **1. The neurophil count is often greatly increased in a patient with:**<br>a) Anemia.<br>b) Thrombocytopenia.<br>c) Bacterial infection.<br>d) Leukopenia.<br>e) Low blood glucose level. | **C** |
| **2. The first line of defense against bacterial infections is:**<br>a) Basophils.<br>b) Eosinophils.<br>c) Monocytes.<br>d) Neutrophils.<br>e) Lymphocytes. | **D** |
| **3. Which of these conditions often causes leukocytosis?**<br>a) Leukopenia.<br>b) Thrombocytopenia.<br>c) Erythropoiesis.<br>d) Anemia.<br>e) Leukemia | **E** |
| **4. Which leukocyte's main function is phagocytosis?**<br>a) Basophils.<br>b) Lymphocytes.<br>c) Mast cells.<br>d) Neutrophils.<br>e) Eosinophils. | **D** |

| | |
|---|---|
| ***5. ..... are the smallest leukocytes, some produce antibodies:***<br>*a) Basophils.*<br>*b) Eosinophils.*<br>*c) Lymphocytes.*<br>*d) Monocytes.*<br>*e) Neutrophils* | **C** |
| ***6. These leukocytes produce heparin and histamine, they play a role in inflammatory and allergic reactions:***<br>*a) Basophils.*<br>*b) Eosinophils.*<br>*c) Lymphocytes.*<br>*d) Monocytes.*<br>*e) Neutrophils.* | **A** |
| ***7. Leukocytes that is associated with allergies or parasitic infections:***<br>*a) Basophils.*<br>*b) Eosinophils.*<br>*c) Lymphocytes.*<br>*d) Monocytes.*<br>*e) Neutrophils.* | **B** |
| ***8. ..... are phagocytic cells and make up the largest percentage of leukocytes***<br>*a) Basophils.*<br>*b) Eosinophils.*<br>*c) Lymphocytes.*<br>*d) Monocytes.*<br>*e) Neutrophils.* | **E** |

| | |
|---|---|
| **9. Which of the following is the function of white blood cells?**<br>a) *Transport oxygen.*<br>b) *Maintain homeostasis.*<br>c) *Defend against infection.*<br>d) *Produce hemoglobin.*<br>e) *Regulation of blood volume and tissue fluid formation.* | **C** |
| ***10. Which of White blood cell give immunoglobulin (antibodies) :***<br>a) *B-lymphocyte.*<br>b) *Neutrophil.*<br>c) *Basophile.*<br>d) *Monocyte.*<br>e) *T-lymphocyte.* | **A** |
| ***11. The largest cells in the blood that leave the bloodstream to become macrophages are the:***<br>a) *Eosinophils.*<br>b) *Monocytes.*<br>c) *Basophils.*<br>d) *Neutrophils.*<br>e) *Lymphocytes.* | **B** |
| ***12. A person with eosinophilia, increase numbers of eosinophils, is most likely suffering from:***<br>a) *Anemia.*<br>b) *Allergies or internal parasites.*<br>c) *Diabetes.*<br>d) *Bacterial infection.*<br>e) *Viral infection.* | **B** |

| | |
|---|---|
| ***13. Name of cell that produce erythropiotin in liver is :***<br>*a) histocyte*<br>*b) reticular cell*<br>*c) kupffer cell*<br>*b) microglia* | **C** |
| ***14. Which of the following indicates a normal white blood cell count?***<br>*a) 150,000 to 300,000/mm3.*<br>*b) 2000 to 3000/mm3.*<br>*c) 4000 to 11000/mm3.*<br>*d) 15000 to 20000/mm3.*<br>*e) 20000 to 40000/mm3.* | **C** |
| ***15. An increase in the number of white blood cells is called:***<br>*a) Anemia.*<br>*b) Leukopenia.*<br>*c) Leukocytosis.*<br>*d) Agranulocytosis.*<br>*e) Polycythemia.* | **C** |
| ***16. Name of condition through which bone marrow dails to produce WBCs leaving body unprotected against infection is***<br>*a) Anemia*<br>*b) Leukopenia.*<br>*c) Leukocytosis.*<br>*d) Agranulocytosis.*<br>*e) Polycythemia.* | **D** |

| | |
|---|---|
| **17. Which white blood count may indicate an infection in the body?**<br>a) 30000/mm3.<br>c) 5000/mm3.<br>b) 10000/mm3.<br>d) 4000/mm3.<br>e) 9000/mm3. | **A** |
| **18. Heparin is secreted by:**<br>a) Kidney.<br>b) Blood cells.<br>c) Nerve cells.<br>d) Liver.<br>e) Lung. | **B** |
| **19. The first line of defense against bacterial infection is:**<br>a) Basophils.<br>b) Eosinophils.<br>c) Monocytes.<br>d) Neutrophils.<br>e) Lymphocytes. | **D** |
| **20. The reticuloendothelial system performs all the following functions except:**<br>a) Formation of blood cells.<br>b) Repair of injured tissues.<br>c) Destruction of old blood cells.<br>d) synthesis of haemoglobin. | **D** |
| **21. Violent antigen-antibody reactions occur due to release of:**<br>a) Histamine.<br>b) Serotonin.<br>c) Acetyl choline.<br>d) Catecholamine. | **A** |

| | |
|---|---|
| ***22. The enzyme in neutrophils that kills the ingested bacteria is:***<br>*a) Carbonic anhydrase.*<br>*b) Peroxidase.*<br>*c) Histaminase.*<br>*d) G-6-P dehydrogenase.* | **B** |
| ***23. Microphages are characterized by all the following except:***<br>*a) They are the most numerous white blood cells.*<br>*b) They are actively phagocytic.*<br>*c) They contain many lysosomal granules.*<br>*d) They can produce immunoglobulins.* | **D** |
| ***24. The B-lymphocytes:***<br>*a) Produce lymphokines.*<br>*b) Are the precursors of the NK cells.*<br>*c) Cause cell mediated immunity.*<br>*d) Are the precursors of the plasma cells.* | **D** |
| ***25. The neutrophil granulocytes:***<br>*a) Are immotile so they cannot leave the blood stream.*<br>*b) Are the least numerous leukocytes in the blood.*<br>*c) Contain lysosomes and oxidizing agents.*<br>*d) Have a life span of about 120 days.* | **C** |
| ***26. Immunoglobulins are produced by the:***<br>*a) Granulocytes.*<br>*b) Monocytes.*<br>*c) Erythrocytes.*<br>*d) Plasma cells.*<br>*c) Liver cells.* | **D** |

| | |
|---|---|
| **27. What are the largest leucocytes?**<br>A) Eosinophils.<br>B) Lymphocytes.<br>C) Monocytes.<br>D) Neutrophils.<br>E) Reticulocytes. | **C** |
| **28. 0-70% of WBCs is formed of:**<br>A. Lymphocytes.<br>B. Monocytes.<br>C. Basophiles.<br>D. Neutrophils. | **D** |
| **29. The average life span for granulocytes is:**<br>A. 4-5 days.<br>B. 12-14 days.<br>C. 4-5 weeks.<br>D. 120 days. | **A** |
| **30. One of the following is a function of monocytes:**<br>A. Liberation of heparin.<br>B. Can phagocytose up to 100 bacteria.<br>C. Liberation of histamine during allergy.<br>D. Protection of the body against parasitic infection | **B** |
| **31. Uncontrolled production of WBCs (very high number) is:**<br>A. Leukocytosis.<br>B. Lymphocytosis.<br>C. Leukemia.<br>D. Leukopenia. | **C** |

| | |
|---|---|
| **32. A condition in which bone marrow has little WBCs production is:**<br>A. Agranulocytosis.<br>B. Leukocytosis<br>C. Leukemia.<br>D. Leukopenia. | **D** |
| **33. The function of basophiles is:**<br>A. Protection against parasitic infection.<br>B. Powerful phagocytic cell.<br>C. Liberation of heparin.<br>D. phagocytose up to 100 bacteria. | **C** |
| **34. The most abundant of leukocytes are the:**<br>a) Neutrophils.<br>b) Eosinophils.<br>c) Basophils.<br>d) Monocytes.<br>e) Lymphocytes. | **A** |
| **35. Which of the following is CORRECT concerning the eosinophilic granulocytes:**<br>a) They produce antibodies.<br>b) They contain heparin.<br>c) They are weak phagocytic cells.<br>d) They have no nuclei.<br>e) They are attracted to a site of tissue damage by chemical agents secreted by this tissue. | **C** |
| **36. Monocytes:**<br>a) Are active in blood.<br>b) Are also called microphages.<br>c) Release heparin.<br>d) Become active when entering the tissues. | **D** |

| | |
|---|---|
| **37. Which of the following is an example of a tissue macrophage?**<br>a) Kupffer cells in the liver<br>b) Red blood cells in the bloodstream<br>c) Platelets in the bone marrow<br>d) Osteocytes in the bone | **A** |
| **38. Which type of tissue macrophage is found in the central nervous system?**<br>a) Microglia<br>b) Alveolar macrophages<br>c) Kupffer cells<br>d) Langerhans cells | **A** |
| **39. Which of the following is not a function of tissue macrophages?**<br>a) Phagocytosis of foreign substances<br>b) Antigen presentation<br>c) Production of antibodies<br>d) Tissue repair and remodeling | **C** |
| **40. Tissue macrophages are derived from which type of precursor cells?**<br>a) Neutrophils<br>b) Eosinophils<br>c) Monocytes<br>d) Basophils | **C** |
| **41. Which of the following is an example of a tissue macrophage?**<br>a) Alveolar macrophages in the lungs<br>b) Neutrophils in the bloodstream<br>c) Basophils in allergic reactions<br>d) Eosinophils in parasitic infections | **A** |

| | |
|---|---|
| **42. Which of the following is an antimicrobial substance released by neutrophils during phagocytosis?**<br>a) Interleukin-2<br>b) superoxide and hydrogen peroxide<br>c) Interferon-gamma<br>d) Tumor necrosis factor-alpha | **B** |
| **43. Which of the following is an example of an opsonin?**<br>a) Interferon<br>b) Lysozyme<br>c) Complement protein C3b<br>d) Histamine | **C** |
| **44. Opsonization is the process of:**<br>a) Engulfing pathogens by neutrophils<br>b) Coating pathogens with opsonins to enhance their recognition by neutrophils<br>c) Destroying pathogens through the release of toxic substances<br>d) Activating neutrophils to initiate phagocytosis | **B** |
| **45. Opsonins are molecules that:**<br>a) Are secreted by neutrophils to kill pathogens<br>b) Attach to pathogens to facilitate their recognition and uptake by neutrophils<br>c) Block the phagocytic receptors on neutrophils<br>d) Inhibit the release of inflammatory mediators by neutrophils | **B** |
| **46. Phagocytosis is a function of:**<br>a) B lymphocytes.<br>b) T-helper cells.<br>c) Neutrophils.<br>d) Basophils.<br>e) Platelets. | **C** |

| | |
|---|---|
| **47. Phagocytosis is the main function of:**<br>a) *B-lymphocytes.*<br>b) *T-helper cells.*<br>c) *Monocytes.*<br>d) *Basophils.*<br>e) *Platelets.* | **C** |
| **48. Which of the following statements is CORRECT concerning the basophilic granulocytes:**<br>a) *They produce antibodies.*<br>b) *They contain heparin.*<br>c) *They are phagocytic WBCs.*<br>d) *They have no nuclei.*<br>e) *They are attracted to a site of tissue damage by chemical agents.* | **B** |
| **49. Which of the following statements about monocytes is correct:**<br>a) *It is converted into macrophages in an inflamed tissue.*<br>b) *It is more active in the blood than in the attacked tissue.*<br>c) *It is produced in the adult by the liver.*<br>d) *It does not accumulate outside the circulation in an area of inflammation.*<br>e) *It is classified as granulocytes.* | **A** |
| **50. About the white blood cells, all the following are true EXCEPT:**<br>a) *B & T lymphocytes are concerned with humoral and cellular immunity.*<br>b) *Eosinophils increase in allergic conditions and parasitic infections.*<br>c) *Basophils contain heparin and histamine.*<br>d) *Neutrophils are the least abundant leukocytes.* | **D** |

| | |
|---|---|
| **51. Leucopenia is characterized by deficiency of:**<br>a) WBC number.<br>b) Hemoglobin value.<br>c) Protein C.<br>d) Platelets number.<br>e) Vitamin B12. | A |
| **52. Leucopenia is characterized by:**<br>a) A decrease in platelet number less than 100,000.<br>b) A decrease in RBC number less than 2 million.<br>c) A decrease in WBC number less than 4000.<br>d) Uncontrolled production of WBCs. | C |
| **53. Antibodies are:**<br>a) Produced by plasma cells.<br>b) Produced by basophils.<br>c) Produced by T lymphocytes.<br>d) Responsible for humoral and cellular immunities.<br>e) Non specific, each antibody attacks several kinds of antigens. | A |
| **54. The immunoglobulin responsible for allergic disorders is:**<br>a) IgA.<br>b) IgD.<br>c) IgG.<br>d) IgM.<br>e) IgE. | E |
| **55. Which are the two most common types of white blood cells?**<br>A. neutrophils and lymphocytes<br>B. erythrocytes and neutrophils<br>C. neutrophils and eosinophils<br>D. monocytes and lymphocytes | A |

61. Asin knee

| | |
|---|---|
| **56. Which blood cell fits the following description: multi- lobed nucleus, inconspicuous cytoplasmic granules, most common type of blood cell except for red blood cells?**<br>A. neutrophil<br>B. eosinophil<br>C. basophil<br>D. lymphocyte | **A** |
| **57. If a blood sample is taken for DNA testing, which of the following would be examined?**<br>A. leucocytes<br>B. erythrocytes<br>C. thrombocytes<br>D. plasma proteins | **A** |
| **58. Which is the LEAST common type of white blood cell?**<br>A. lymphocyte<br>B. basophil<br>C. thrombocyte<br>D. neutrophil | **B** |
| **59. Which of the following WBCs have the longest life span?**<br>A. Neutrophils<br>B. Eosinophils<br>C. Basophils<br>D. Monocytes | **D** |
| **60. Which of the WBCs is similar to mast cells in its function?**<br>A. Neutrophil<br>B. Basophil<br>C. Eosinophil<br>D. Monocyte | **B** |

| | |
|---|---|
| ***61. Asim, a 5 years old boy falls from his bicycle and receives a cut over the knee. His tissue macrophages & fibroblasts will move to the site of injury for repair by:***<br>*a. Ciliary movement*<br>*b. Ameboid movement*<br>*c. Chemotaxis*<br>*d. Margination*<br>*e. Whip-like movement* | **B** |
| ***62. A 45-years old man presents to the emergency with a 2-week history of diarrhea that has worsened progressively over the last several days. He has minimal urine output and is admitted to the hospital to get rehydrated. His stool specimen is positive for parasitic eggs. Which type of White Blood Cells would be elevated in number?***<br>*a. Eosinophils*<br>*b. Neutrophils*<br>*c. T lymphocytes*<br>*d. B lymphocytes*<br>*e. Monocytes* | **A** |
| ***63. Very young & very old patients are more likely to develop uncontrolled leukocytosis which may be indicative of:***<br>*a. Physiological jaundice*<br>*b. Haemolytic disease*<br>*c. Aplastic anemia*<br>*d. Leukemia*<br>*e. Bleeding disorder* | **D** |

| | |
|---|---|
| **64. A young boy was brought to hospital emergency with complaint of acute pain in right iliac fossa. On history, examination & clinical investigation, he was diagnosed to have acute appendicitis. His TLC (per microlit.) is likely to be:**<br>a. 4,000<br>b. 6,000<br>c. 8,000<br>d. 10,000<br>e. 14,000 | **E** |
| **65. Regarding Opsonization:**<br>a. It involves breakdown of antibodies<br>b. It means neutralization of antigen by antibody<br>c. Antigen gets attached directly to the phagocyte receptor<br>d. Antibody makes a bridge between antigen & receptor<br>e. The antigen is surrounded by edges of cell membrane | **D** |
| **66. The mechanism of action of the following substance involves chemotaxis:**<br>a. Bacterial & viral toxins<br>b. Fungal & parasitic toxins.<br>c. Regenerative products of inflamed tissues<br>d. Plasma clotting enzymes<br>e. Reaction Products caused by inflammation. | **A** |
| **67. Which of the following is correct concerning B-lymphocytes?**<br>A. They are responsible for cellular immunity.<br>B. They differentiate into plasma cells that secrete gamma globulin or antibodies.<br>C. They are microphages that attack and destroy invading bacteria and viruses.<br>D. They can squeeze through the pores of the blood capillaries by diapedesis. | **B** |

| | |
|---|---|
| **68. Which of these cells are macrophages?**<br>A. Neutrophils.<br>B. Eosinophils.<br>C. Basophils.<br>D. Monocytes. | **D** |
| **69. The neutrophil:**<br>A. Are immotile so they cannot leave the blood stream.<br>B. Are the least numerous leucocytes in the blood.<br>C. Have a life span of about 120 days.<br>D. Contains granules containing myeloperoxidase enzyme. | **D** |
| **70. The most important functional process that neutrophils and monocytes carry out is:**<br>A. Coagulation.<br>B. Antibody formation.<br>C. Phagocytosis.<br>D. Heparin secretion | **C** |
| **71. What immunologic signal causes mast cells to release their granular contents (e.g., heparin, histamine, brady- kinin, serotonin, and leukotrienes)?**<br>A) Release of interleukin (IL)-1 by macrophages<br>B) Cross-linking of cell surface-bound immunoglobulin E (IgE) by antigen<br>C) Binding of antigen-antibody complexes to immunoglobulin G (IgG) receptors<br>D) Binding of tissue factor to surface glycoproteins | **B** |
| **72. Which phagocytes can extrude digestion products and continue to survive and function for many months?**<br>A) Neutrophils<br>B) Basophils<br>C) Macrophages.<br>D) Eosinophils | **C** |

| | |
|---|---|
| **73. A 65-year-old alcoholic experienced chest pain and cough with an expectoration of sputum. A blood sample revealed that his WBC count was 21,000/µl. What is the origin of these WBCs?**<br>A) Pulmonary alveoli<br>B) Bronchioles:<br>C) Bronchi<br>D) Trachea<br>E) Bone marrow | **E** |
| **74. Which cell type migrates into inflammatory sites to clean up necrotic tissue and direct tissue remodeling?**<br>A) Neutrophil<br>B) Macrophage<br>C) Dendritic cell<br>D) Eosinophil | **B** |
| **75. What is the term for binding of IgG and complement 3 to an invading microbe to facilitate recognition?**<br>A) Chemokinesis.<br>B) Opsonization<br>C) Phagolysosome fusion<br>D) Signal transduction | **B** |
| **76. What will occur after presentation of antigen by a macrophage?**<br>A) Direct generation of antibodies<br>B) Activation of cytotoxic T cells<br>C) Increase in phagocytosis<br>D) Activation of helper T cells | **D** |

| | |
|---|---|
| 17. **Which of the following is true about helper T cells?**<br>A) They are activated by the presentation of antigen by an infected cell<br>B) They require the presence of a competent B-cell system<br>C) They destroy bacteria by phagocytosis<br>D) They are activated by the presentation of antigen by macrophage or dendritic cells | **D** |