

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ
(وَفَوْقَ كُلِّ ذِي عِلْمٍ عَالِمٌ)



HLS Physiology | MID

Past papers



Reviewed by : NST member 1
NST member 2

Q1: If you know that each gram of hemoglobin can be maximally saturated with 1.34 ml oxygen in humans, how much oxygen would be needed in a normal male?

- A. 21 ml/dl
- B. 27 ml/dl
- C. 83 ml/dl
- D. 15 ml/dl

Answer: a

(in a normal male ≈ 16 g/dL Hb $\rightarrow 16 \times 1.34 \approx 21$)

Q2. In which of the following cases is there low erythropoietin?

- A. Haemolytic anaemia
- B. Nephrotic syndrome
- C. Newborn baby
- D. high testosterone

Answer: b

I think this is more of a patho question

Q3: Which of the following is least likely to be a function of plasma proteins:

- A. Carrying oxygen
- B. Clot formation
- C. Body defense mechanism
- D. Bind insoluble substances

Q4:One of the following appears after 3 days of acute bleeding:

- A. Proerythroblasts
- B. Reticulocytes
- C. Platelets

Q5: In patients with end-stage renal disease who develop anemia with a hematocrit of 25%, which of the following best explains the cause?

- A. Liver EPO accounts for only 10% of normal EPO
- B. Released urea will destroy precursor RBC in bone marrow
- C. Decreased oxygen due to kidney damage

Q6: What function do vitamin B12 and folic acid perform that is critical to hematopoiesis?

- A. Support porphyrin production
- B. Serve as cofactors for iron uptake
- C. Support differentiation toward proerythroblasts
- D. Support production of thymidine triphosphate

Q7:Amal, a patient complaining of extreme fatigue and shortness of breath on exertion that has gradually worsened during the past 2 weeks. Physical examination reveals a well-nourished woman who appears comfortable but somewhat short of breath. Her vital signs include a pulse of 120, a respiratory rate of 20, and blood pressure of 120/70. When she stands up, her pulse increases to 150 and her blood pressure falls to 80/50. Her hematologic values are as follows :Hb, 7 g/dl ; Hct, 20% ;RBC count, 2million/ μ l ;and platelet count, 400,000/ μ l. On a peripheral smear, her RBCs are microcytic and hypochromic. What is your diagnosis?

- A. Aplastic anemia
- B. Renal failure
- C. Iron deficiency anemia
- D. Sickle cell anemia
- E. Megaloblastic anemia

Q8:Erythropoietin is increased in this condition:

- A. High Hematocrit
- B. High hemoglobin
- C. High O₂
- D. High blood volume
- E. Heart Failure

Q9: Which of the following statements most describe why RBC's are efficient in carrying oxygen:

1. Contains hemoglobin
2. Have no nucleus
3. Have many mitochondria needed to produce ATP
4. Biconcave shape
5. 4 oxygen molecules are carried by hemoglobin

- A. 1, 3, 4
- B. 2, 4, 5
- C. 1, 2, 4, 5
- D. 1, 2, 3, 5
- E. 1, 2, 3, 4, 5

Q10: What is the approximate life span of circulating erythrocyte?

- A. 4 months
- B. 120 weeks
- C. 20 day
- D. 14-28 days

Q11: Choose the correct statement regarding the changes occurring during Erythropoiesis?

- A. Specific granules appear in cytoplasm
- B. Nucleus disappears
- C. Cytoplasm changes to basophilic
- D. Cells maintain their capacity for mitosis
- E. Size of cells increases

Answer: B

Q12: Which of the following cells increase in level during parasitic infections ?

- A) Neutrophils
- B) Basophils
- C) Eosinophils
- D) Lymphocytes
- E) Monocytes

Q13: Which of the following is false :

- A. neutrophils phagocytic activity is enhanced by the presence of complement
- B. absence of barr body in neutrophils and other body cells indicate true male (XY)
- C. Neutrophils are called cells of chronic inflammation

Q14: Which of the following statements regarding leukocytes are correct

1. They move out to the tissues by a process called emigration
2. Neutrophils and macrophages are required in phagocytosis
3. Inflammatory cells are attracted by bacterial molecules and inflamed tissue by a process called chemotaxis
4. Leukopenia is an increase in the number of WBC's in the circulation

- A. 1 and 2 only
- B. 4, 3, 2
- C. 3, 2, 1
- D. 4, 3, 2, 1
- E. 3 and 4 only

Q15: A differential cell count of a blood smear from a patient with a parasitic infection is likely to reveal an increase in :

- A. Eosinophil
- B. Basophil
- C. Neutrophil
- D. T Lymphocyte

Q16: Wrong statement:

- A) Neutrophils circulate for hours in blood after maturation
- B) Neutrophils circulate for days in blood after maturation

Q17: Which of the following is correct about monocytes?

- A. They are phagocytic cells
- B. They increase dramatically in parasitic infections
- C. They are responsible for allergic reactions

Answer: A

Q18: Which of the following is wrong about neutrophils?

- A. it has its own specific granules
- B. it lives for several hours only and stores glycogen
- C. it has polymorphic nucleus throughout its life
- D. measuring neutrophils from blood represents all neutrophils in our body

Q19:One of the following appears after 3 days of acute bleeding:

- A. Proerythroblasts
- B. Reticulocytes
- C. Platelets

Answer: B

Q20:One of the following hemoglobin components is not reused:

- A. Amino acids
- B. Globin
- C. Alpha and beta polypeptides
- D. Iron
- E. Porphyrin

Q21: Macrophages secrete the following to stimulate bone marrow production of monocytes and granulocytes:

- A. IL-1, TNF, M-CSF, G-CSF
- B. Histamine & Heparin
- C. Serotonin and Bradykinin

Q22: A phagocyte that can ingest up to 100 bacteria and extrude digestion products and survive and function for many months:

- A) Neutrophils
- B) Macrophages
- C) Basophils
- D) Eosinophils
- E) Lymphocytes

Hint: ehT main two phagocytic cells are mentioned, think about the big eater cell

Answer: B

Q23: Which of the following is considered the correct match:

- A) 1st defense line - Bone marrow monocytes migration
- B) 2nd defense line - neutrophil margination
- C) Selectins & ICAM-1 - neutrophilic membrane surface proteins
- E) Platelets perform chemotaxis

Hint: esnefed fo enil tsrfi ehT .esnefed fo senil s'ydob eht tuoba knihT
suocum dna niks ekil) sreirrab lacimehc dna lacisyhp fo stsisnoc
yrotammaflni eht sevlovni esnefed fo enil dnoce eht elihw ,(senarbm
esnopser

Answer: B

Q25:Regarding red blood cells parameters, which of the following is wrong:

- a. Haemoglobin remains the same level throughout life
- b. Iron deficiency anaemia is microcytic hypochromic anaemia
- c. Aplastic anaemia is a non-hemolytic anaemia

Hint: latef morf lactinedi yats notiartnecnoc nibolgomeh seoD
?doohtluda hguorht yaw eht lla efil

Q26:wrong statement regarding iron metabolism in haemolysis:

- a. Iron is eliminated through the GI system
- b. Biliverdin is excreted via bile

Hint: hguorht rehtie detanimile yllacipytt si nori taht rebmemeR
.selamef ni elcyc laurtsnem eht aiv ro gniiddehs llec

Q27: The wrong statement regarding
WBCs: Answer: Phagocytosis is a random process

Hint: sixatomehc aiv yllanoticerid stegrat esahc sllec enummi rehtew tuoba knihT
.ecnahc erup yb meht otni pmub tsuj ro

Q28: What causes erythema (redness) in inflammation:

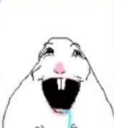
- a. Increased vascular permeability
- b. Relaxation of vessels ' smooth muscle
- c. Pressure on nerve endings

Hint: doolb fo retemaid eht ot snepah tahw tuoba knihT
taht esuac dna wofl doolb esaercni ot (notialidosav) slessev
.roloc der

Answer: B ,
A causes edema

Q29: Choose the wrong statement: Answer:
Neutrophils can phagocytose a complete RBC

Hint: Neutrophils can phagocytose a complete RBC



Q1: A baby is injected with a strong antigen during the third trimester to 6 months after birth what is mostly likely to happen?

- A) Specific clones of T lymphocyte will recognize the antigen and reside in a lymphoid organ
- B) Specific clones of B lymphocyte will recognize the antigen and reside in a lymphoid organ
- C) Specific clones of both T and B lymphocyte will recognize the antigen and reside in a lymphoid organ
- D) No specific clones will recognize the antigen
- E) Hypersensitivity reaction will develop

Hint: antibodies at birth are almost zero and are produced within 2 to 8 months after birth

Q2: A patient aged 10 years old comes with decreased immunoglobulins and he has abnormal acute or delayed sensitivity skin reactions, what is most likely to be affected:

- **A) Helper T cells**
- B) Cytotoxic T cells
- C) B cells
- D) Plasma cells

Hint: htoB spleh taht llec rotartsehcro retsam eht fo knihT
snilubolgonummi ecudorp sllec-B

Answer: A

Q3:Chronic allograft rejection results primarily from the action of what effector cell type?

- A. Activated macrophages
- B. Helper T lymphocytes
- C. Cytotoxic T lymphocytes
- D. Dendritic cells

Allograft cells may express MHC class I molecules that differ from those of the recipient

Q4: What will occur after presentation of antigen by a macrophage?

- A) Direct generation of antibodies
- B) Activation of cytotoxic T cells
- C) Increase in phagocytosis
- D) Activation of helper T cells

Hint: T helper cell just deals with APCs

Q5:CD4 is a marker of which of the following

- A. B cells
- B. Cytotoxic T cells
- C. Helper T cells
- D. An activated macrophage
- E. A neutrophil precursor

Hint: T helper is called also CD4+ cell

Q6: Which of the following is true about helper T cells?

- A. They are activated by the presentation of antigen by an infected cell
- B. They require the presence of a competent B-cell system
- C. They destroy bacteria by phagocytosis
- D. They are activated by the presentation of antigen by macrophage or dendritic cells

Hint: T helper cell just deals with APCs

Q7: What is the function of IL-2 in the immune response

- A) Binds to and presents antigen
- B) Stimulates proliferation of T cells
- C) Kills virus-infected cells
- D) Is required for an anaphylactic response

Q8: Which of the following applies to cytotoxic T cells

- A. They require the presence of a competent B-lymphocyte system
- B. They require the presence of a competent suppressor T-lymphocyte system
- C. They are activated by the presentation of antigen by an infected cell
- D. They destroy bacteria by initiating macrophage phagocytosis

Q9: Presentation of antigen on major histocompatibility complex (MHC)-I by a cell will result in which of the following?

- A. Generation of antibodies
- B. Activation of cytotoxic T cells
- C. Increase in phagocytosis
- D. Release of histamine by mast cells

Hint: T cytotoxic cell deals with MHC-1

Answer: B

Q10: Which of the following statements best describes the role of MHC molecules in antigen presentation?

- A. They allow B cells to recognize intact antigens.
- B. They enable T cells to recognize free-floating antigens.
- C. They present antigen fragments to T cell receptors for recognition.
- D. They directly destroy infected cells.

Q11: Which of the following cytokines is primarily involved in the stimulation of cytotoxic T cells?

- A. IL-1
- B. IL-2
- C. IL-4
- D. IL-6

Answer: B

Q12: Failure of immunologic tolerance can lead to which of the following conditions?

- A. Rheumatic fever and Myasthenia gravis
- B. Common cold and influenza
- C. Leukemia and leukopenia
- D. Anaphylaxis and asthma

Hint: think about autoimmune diseases

Q13: Failure to delete self-reactive T cell clones during thymic selection most directly leads to:

- A. Loss of cytokine signaling
- B. Autoimmunity
- C. Immunodeficiency
- D. Hypersensitivity type I

Hint: if cell isn't competent, it will attack our cells!

رسالة من الفريق العلمي:

التقوى زاد القلوب

اتَّقِ اللَّهَ فِي السِّرِّ وَالْعَلَنِ، واجعل بينك وبين معصيته حاجزًا من خشية الله ومحبتته. تذكّر أن الله يراك وإن لم يرك أحد، ويعلم ما تخفيه القلوب. قال الله تعالى: ﴿إِنَّ اللَّهَ مَعَ الَّذِينَ اتَّقَوْا وَالَّذِينَ هُمْ مُحْسِنُونَ﴾ [النحل: 128].

فالتقوى ليست كلمات تُقال، بل عملٌ صالح، وقلبٌ يخشى الله، ونفسٌ تجاهد هواها ابتغاء مرضاته. جعلنا الله وإياكم من المتقين.

سُورَةُ التَّوْبَةِ

أَفَمَنْ أَسَّسَ بُنْيَانَهُ

عَلَى تَقْوَى مِنَ اللَّهِ وَرِضْوَانٍ خَيْرٌ أَمْ مَنْ أَسَّسَ بُنْيَانَهُ

عَلَى شَفَا جُرْفٍ هَارٍ فَأَنهَارُ بِهِ فِي نَارِ جَهَنَّمَ وَاللَّهُ لَا يَهْدِي

الْقَوْمَ الظَّالِمِينَ ﴿١٩﴾

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Corrections from previous versions:

Versions	Slide # and Place of Error	Before Correction	After Correction
V0 → V1			
V1 → V2			