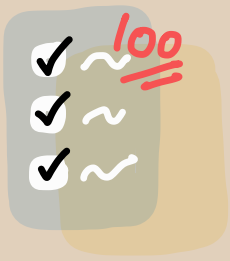


Testbank physiology
“Guyton”
Midterm -HLS

By:Yara Al kousheh

1. A 40-year-old woman visits the clinic complaining of fatigue. She had recently been treated for an infec- tion. Her laboratory values are as follows: red blood cell (RBC) count, 1.8 × 106/μl; hemoglobin (Hb), 5.2 g/dl; hematocrit (Hct), 15; white blood cell (WBC) count, 7.6 × 103/μl; platelet count, 320,000/μl; mean corpuscular volume (MCV), 92 fL; and reticulocyte count, 24%. What is the most likely explanation for this presentation?

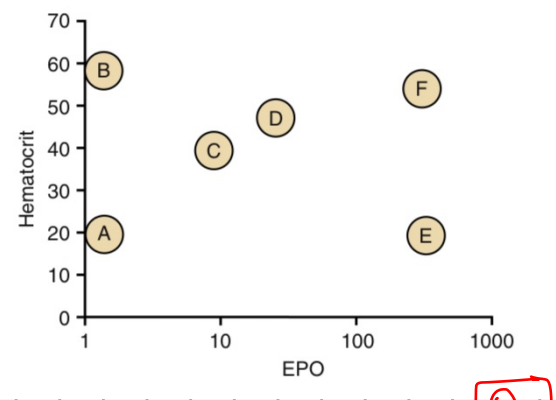
A) Aplastic anemia
B) Hemolytic anemia
C) Hereditary spherocytosis
D) B12 deficiency

B

2. WhatRBCenzymefacilitatestransportofcarbondiox- ide (CO_2)?
A) Myeloperoxidase
B) Carbonic anhydrase
C) Superoxide dismutase
D) Globin reductase

B

Questions 3–6
Which points in the figure below most closely define the following conditions? Normal erythropoietin (EPO) levels are approximately 10.



3. Olympic marathoner
4. Aplastic anemia
5. End-stage renal disease
6. Polycythemia vera

D
E
A
B

7. How many oxygen atoms can be transported by each hemoglobin molecule?
A)2
B)4
C)8
D)16

C

8. During the second trimester of pregnancy, where is the predominant site of RBC production?
A) Yolk sac
B) Bone marrow
C) Lymph nodes
D) Liver

D

9. 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 terminal differentiation of erythroid and myeloid cells
D) Support production of thymidine triphosphate

D

10. A 62-year-old man complains of headaches, visual dif- ficulties, and chest pains. Physical examination reveals a red complexion and a large spleen. His complete blood cell count (CBC) is as follows: Hct, 58%; WBC, 13,300/µl; and platelets, 600,000/µl. His arterial oxygen saturation is 97% on room air. Which treatment would you recommend?
A) Chemotherapy
B) Phlebotomy
C) Iron supplement
D) Inhaled oxygen therapy

C

11. A 38-year-old healthy woman comes to you for a routine visit. She has spent the past 2 months hiking through the Himalayas and climbed to the base camp of Mount Everest. Which results would you expect to see on her CBC?

	Hematocrit	RBC count	WBC count	MCV
A)	↑	↑	↑	↑
B)	↑	↑	↔	↑
C)	↑	↑	↔	↔
D)	↑	↔	↔	↔
E)	↔	↑	↑	↔
F)	↑	↔	↑	↑
G)	↔	↑	↔	↑

C

12. A 34-year-old man with schizophrenia has had chronic fatigue for 6 months. He has a good appetite but has re- fused to eat vegetables for 1 year because he hears voic- es saying that vegetables are poisoned. His physical and neurological examinations are normal. His hemoglobin level is 9.1 g/dl, his leukocyte count is 10,000/µl3, and his MCV is 122. What is the most likely diagnosis?

A) Acute blood loss
B) Sickle cell anemia
C) Aplastic anemia
D) Hemolytic anemia
E) Folic acid deficiency

F

13. What immunologic signal causes mast cells to release their granular contents (e.g., heparin, histamine, brady- kinin, serotonin, and leukotrienes)?

A) Release of interleukin (IL)-1 by macrophages
B) Cross-linking of cell surface–bound immunoglob-
ulin E (IgE) by antigen
C) Binding of antigen-antibody complexes to immu-
noglobulin G (IgG) receptors
D) Binding of tissue factor to surface glycoproteins

B

14.A 24-year-old African American man comes to the emergency department 3 hours after the onset of se- vere back and chest pain. These problems started while he was skiing. He lives in Los Angeles and had a pre- vious episode of these symptoms 5 years ago while visiting Wyoming. He is in obvious pain. Laboratory studies show the following values: Hemoglobin = 11 g/dl Leukocyte count = 22,000/µl3 Reticulocyte count = 25%

What is this patient's diagnosis?

A) Acute blood loss
B) Sickle cell anemia
C) Anemia of chronic disease
D) End-stage renal disease

B

15. After a person is placed in an atmosphere with low oxygen, how long does it take for increased numbers of reticulocytes to develop?
A) 6 hours
B) 12 hours
C) 3 days
D) 5 days
E) 2 weeks

C

16. A patient presents to your office complaining of ex- treme fatigue and shortness of breath on exertion that has gradually worsened during the past 2 weeks. Phys- ical 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, 2 × 106/µl; and platelet count, 400,000/µl. 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

C

17. Which phagocytes can extrude digestion products and continue to survive and function for many months?
A) Neutrophils
B) Basophils
C) Macrophages
D) Eosinophils

C

18. During an inflammatory response, what is the correct order of cellular events?
A) Filtration of monocytes from blood, increased pro- duction of neutrophils, activation of tissue macro- phages, infiltration of neutrophils from the blood
B) Activation of tissue macrophages, infiltration of neu- trophils from the blood, infiltration of monocytes from blood, increased production of neutrophils
C) Increased production of neutrophils, activation of tissue macrophages, infiltration of neutrophils from the blood, infiltration of monocytes from blood
D) Infiltration of neutrophils from the blood, activation of tissue macrophages, infiltration of monocytes from blood, increased production of neutrophils

B

19. A 45-year-old man presents to the emergency depart- ment with a 2-week history of diarrhea that has got- ten progressively worse during the past several days. He has minimal urine output and is admitted to the hospital for dehydration. His stool specimen is positive for parasitic eggs. Which type of WBC would have an elevated number?
A) Eosinophils
B) Neutrophils
C) T lymphocytes
D) B lymphocytes
E) Monocytes

A

23. A 65-year-old alcoholic experienced chest pain and cough with an expectoration of sputum. A blood sam- ple revealed that his WBC count was 21,000/µl. What is the origin of these WBCs?
A) Pulmonary alveoli
B) Bronchioles
C) Bronchi
D) Trachea
E) Bone marrow

E

26. Which cell type migrates into inflammatory sites to clean up necrotic tissue and direct tissue remodeling?
A) Neutrophil
B) Macrophage
C) Dendritic cell
D) Eosinophil

B

27. A 3-year-old child who has had frequent ear infec- tions is found to have reduced immunoglobulin levels and is unresponsive to vaccination with tetanus tox- oid. However, the child has normal skin test reactiv- ity (delayed redness and induration) to a common environmental antigen. Which cell lineage is not functioning normally?
A) Macrophages
B) Helper T cells
C) Cytotoxic T cells
D) B cells

D

28. Patients with human immunodeficiency virus (HIV) exhibit abnormal functioning of which of the following mechanisms?
A) Antibody production only
B) T cell–mediated cytotoxicity only
C) Degranulation of appropriately stimulated mast cells
D) Both antibody production and T cell–mediated cytotoxicity

D

29. What is the term for binding of IgG and complement to an invading microbe to facilitate recognition?
A) Chemokinesis
B) Opsonization
C) Phagolysosome fusion
D) Signal transduction

B

30. 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

B

31. Which of the following applies to patients with ac- quired immunodeficiency virus (AIDS)?
A) Able to generate a normal antibody response
B) Increased helper T cells
C) Increased secretion of interleukins
D) Decrease in helper T cells

D

32. Fluid exudation into the tissue in an acute inflamma- tory reaction is due to which of the following?
A) Decreased blood pressure
B) Decreased protein in the interstitium
C) Obstruction of the lymph vessels
D) Increased clotting factors
E) Increased vascular permeability

E

33. What will occur after presentation of antigen by a mac- rophage?
A) Direct generation of antibodies
B) Activation of cytotoxic T cells
C) Increase in phagocytosis
D) Activation of helper T cells

D

34. 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

C

36. Which of the following is true about helper T cells?
A) They are activated by the presentation of antigen by an infected cell
B) TheyrequirethepresenceofacompetentB-cellsystem
C) They destroy bacteria by phagocytosis
D) They are activated by the presentation of antigen by macrophage or dendritic cells

D

37. 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 suppres- sor T-lymphocyte system
C) They are activated by the presentation of antigen by an infected cell
D) They destroy bacteria by initiating macrophage phagocytosis

C

38. A 9-year-old girl has nasal discharge and itching of the eyes in the spring every year. An allergist performs a skin test using a mixture of grass pollens. Within a few minutes the girl exhibits a focal redness and swelling at the test site. This response is most likely due to
A) Antigen–antibody complexes being formed in blood vessels in the skin
B) Activation of neutrophils due to injected antigens
C) Activation of CD4 helper cells and the resultant generation of specific antibodies
D) Activation of cytotoxic T lymphocytes to destroy antigens

A

52. A2-year-oldboybleedsexcessivelyfromminorinjuries and has previously had bleeding gums. The maternal grandfather has a bleeding disorder. The child's physical examination shows slight tenderness of his knee with fluid accumulation in the knee joint. You suspect this patient is deficient in which coagulation factor?
A) Prothrombin activator
B) Factor II
C) Factor VIII
D) Factor X

C

53. A patient has a congenital deficiency in factor XIII (fibrin-stabilizing factor). What would analysis of his blood reveal?
A) Prolonged prothrombin time
B) Prolonged whole blood clotting time
C) Prolonged partial thromboplastin time
D) Easily breakable clot

D

57. Which coagulation pathway begins with tissue throm- boplastin?
A) Extrinsic pathway
B) Intrinsic pathway
C) Common pathway
D) Fibrin stabilization

A

59. Which of the following would best explain a prolonged bleeding time test?
A) Hemophilia A
B) Hemophilia B
C) Thrombocytopenia
D) Coumadin use

C

61. What is the primary mechanism by which heparin pre- vents blood coagulation?
A) Antithrombin III activation
B) Binding and inhibition of tissue factor
C) Binding available calcium
D) Inhibition of platelet-activating factor

A