

Chapter 21 Blood Objectives

Anatomy and Physiology Text and Laboratory Workbook; Davenport, Stephen

1. What are five functions of blood?

Composition of Blood

2. Of whole blood, what percentage range is plasma? What is the function of plasma?
3. What percentage of plasma is proteins? What are the four major groups of proteins, and what is the function of each? Where do most of the plasma proteins originate?
4. What percentage of plasma is "other solutes?" What are three of these solutes and what are they used for (or what are they?)
5. Of whole blood, what percentage range is formed elements? Why do we use "formed elements" instead of "cells?"
6. What percentage of the formed elements are RBCs? What percentage do the platelets and the white blood cells (leukocytes) make up?
7. What is the percentage (differential) for each of the white blood cells?

Hemopoiesis

8. Define hemopoiesis. In the adult where does it occur? What are hemocytoblasts? What types of cells can the off-spring of hemocytoblasts produce?

Red Blood Cells

9. What is the equivalent unit for a microliter? How many RBC are in a microliter for (1) a male and (2) a female?
10. What is a hematocrit? What is the range for (1) a male and (2) a female? Why is the male higher? What are factors which might influence the hematocrit? Does it specifically determine the problem?
11. What is the shape of an RBC? What are three effects that this shape contributes to?
12. What organelles do RBC lack? How does the lack of each organelle influence the function of the RBC?
13. What is the percentage of hemoglobin as an intracellular protein?
14. What single molecule does each of the hemoglobin chains of hemoglobin contain? What is oxyhemoglobin?
15. What percentage of blood oxygen is carried directly by hemoglobin? What is carbamino hemoglobin? What percentage of carbon dioxide is carried in this form?

RBC Life Span

16. About how many days does an RBC live? Why does it have such a "short" life span? About how many RBCs are produced each second?

Hemoglobin Conservation and Recycling

17. What organs are concerned with removing "worn out" RBCs? How does "removal" occur? What produces hemoglobinuria and hematuria?
18. What happens to the globular protein chains of the hemoglobin molecule?
19. What happens to the heme units? What is biliverdin?
34. Describe monocytes. What is their differential percentage range? What are major functions of

converted into? What happens to bilirubin? What cells remove bilirubin from circulation? What happens to most of it? What happens if the bile ducts are blocked? What is jaundice?

20. What happens to iron extracted by the phagocytic cell? What is transferrin?

Red Blood Cell Formation

21. What is erythropoiesis? In the adult, where does it occur? What is a reticulocyte?

Regulation

22. What are several things required for erythropoiesis to proceed normally? What are three factors which may lead to pernicious anemia?
23. What hormone directly stimulates erythropoiesis? Where does erythropoietin (especially) originate? What is hypoxia? What are three events which promote the production of erythropoietin? What are two major effects of erythropoietin?

Blood Typing

24. What determines blood types? What is another name for the "surface antigens" on the RBC?
25. What agglutinogens are associated with each of the blood types and Rh?
26. What are agglutinins? What agglutinins are associated with each of the blood types? What does it mean to have anti-Rh agglutinins "if the person has been sensitized by a previous exposure...."? What is hemolytic disease of the newborn (erythroblastosis fetalis)?
27. What blood types are "universal" and which types are compatible?

White Blood Cells

28. What is another name for "white blood cells?" What are two easy ways to identify leukocytes? What are granulocytes and agranulocytes? What is the normal range for leukocytes in a microliter of blood? Are more leukocytes in circulating blood or in peripheral tissues?
29. What are four characteristics of circulating leukocytes? Define (1) amoeboid movement, (2) diapedesis, (3) chemotaxis and (4) phagocytosis.
30. What is the difference between nonspecific and specific immunity? Which WBC's are involved with (1) non-specific and (2) specific immunity?
31. Describe neutrophils. What is their differential percentage range? Why are neutrophils sometimes called polymorphonuclear (PMNs)? What are major functions of neutrophils.
32. Describe eosinophils. What is their differential percentage range? What are major functions of eosinophils.
33. Describe basophils. What is their differential percentage range? What are major functions of basophils.
- monocytes.
35. Describe lymphocytes. What is their differential

percentage range? What are the three types of lymphocytes and what is each type responsible for? What are major functions of lymphocytes.

Differential Count

36. What is a differential count? Define leukopenia and leukocytosis. Is the (1) differential count or the (2) WBC count - cells per microliter used to determine these conditions?

White Blood Cell Production

37. Where are leukocytes produced? In addition to this site, where else are lymphocytes produced?

Platelets

38. Describe platelets. What is the range in microliters for platelets. Define thrombocytopenia and thrombocytosis. What are three functions of platelets.
39. Where are platelets produced?

Hemostasis

40. What is hemostasis? Arrange the following in sequence: () fibrinolysis, () vascular phase, () clot retraction, () coagulation phase, () platelet phase
41. What produces a local vascular spasm? About how long might the vascular phase last?
42. What produces (starts) the platelet phase? What is platelet aggregation? What does it form?
43. What produces the coagulation phase? What does it involve and what does it produce?
44. What are clotting factors? What are the three pathways of the coagulation phase?
45. What is clot retraction? What are two advantages of clot retraction?
46. What is fibrinolysis? What is the name of the enzyme which digests the fibrin?