

Chapter 12 Blood

Blood Composition:

Blood, a type of _____ tissue, is a complex mixture of what three things?

Functions: What are the functions of blood?

Blood Cells:

The blood includes what three types of cells?

A blood _____ is normally _____% cells and _____% plasma.

RBC = erythrocyte: Red blood cells (erythrocytes) are biconcave disks that contain one-third oxygen-carrying _____ by volume.

When oxygen combines with hemoglobin bright red _____ results.

Deoxygenated blood (_____) is darker.

Red blood cells discard their _____ during development and so cannot reproduce or produce proteins.

RBC counts: What is a typical RBC count for males? For females?

RBC production: In the embryo and fetus, red blood cell production occurs in the yolk sac, _____, and spleen; After birth, it occurs in the red _____.

The average life span of a red blood cell is _____.

Control: The total number of red blood cells remains relatively constant due to a negative feedback mechanism utilizing the hormone _____ which is released from the kidneys and liver in response to the detection of low _____ levels.

Dietary Factors Affecting Red Blood Cell Production: Vitamins ____ and _____ acid are needed for DNA synthesis, so they are necessary for the reproduction of all body cells, especially in hematopoietic tissue.

_____ is needed for hemoglobin synthesis. A deficiency in red blood cells or quantity of hemoglobin results in a disorder called _____.

Destruction of Red Blood Cells: With age, red blood cells become increasingly fragile and are damaged by passing through _____.

Macrophages in the _____ and _____ phagocytize damaged red blood cells.

Hemoglobin from the decomposed red blood cells is converted into _____ and _____.

What happens to the heme and iron?

WBC = leukocyte: WBC's are formed from _____ in response to hormones when needed.

Five types of white blood cells are in circulating blood and are distinguished by size, granular appearance of the cytoplasm, shape of the nucleus, and staining characteristics. Name these five types of leukocytes.

What is the basic function of the white blood cells?

WBC counts: A _____ white blood cell count can help pinpoint the nature of an illness, indicating whether it is caused by bacteria or viruses.

This white blood cell count lists the percentages of the types of leukocytes in a blood sample.

_____ occurs after an infection when excess numbers of leukocytes are present.

_____ (too few WBC's) occurs from a variety of conditions, including AIDS.

Granulocytes: Why is this group called granulocytes?

Neutrophils: Neutrophils have _____-staining fine cytoplasmic granules and a _____-lobed nucleus; They comprise what percentage of leukocytes?

What is their function?

What does diapedesis mean?

Eosinophils: Eosinophils have coarse granules that stain deep blue, a _____-lobed nucleus, and make up only _____% of circulating leukocytes.

What are their functions?

Basophils: Basophils have fewer granules that stain _____; They account for fewer than _____% of leukocytes.

Basophils produce chemicals, what are the functions of these chemicals?

How do they help fight pathogens?

Agranulocytes: Why are they called agranulocytes?

Monocytes: Monocytes are the _____ blood cells, have _____-shaped nuclei. What percentage of circulating leukocytes do they comprise?

What is the function of the monocytes?

Lymphocytes: Lymphocytes are long-lived, have a large, _____ nucleus, and account for _____% of circulating leukocytes.

What is their function?

Platelets = thrombocytes: Blood platelets are fragments of big cells called _____.

Platelets help repair damaged blood vessels by _____ to their broken edges.

Normal counts vary from _____ to _____ platelets per mm^3 .

Plasma:

Plasma is the clear, straw-colored fluid portion of the blood. Plasma is mostly _____ but contains a variety of substances.

What are plasma's functions?

Plasma proteins: The plasma proteins are the most abundant dissolved substances in the plasma.

Briefly describe the functions of the following plasma proteins.

albumin:

globulin:

clotting proteins:

hormones:

Other Plasma Components: Nutrients and Gases. What are the two most important blood gases?

The plasma nutrients include amino acids, monosaccharides, nucleotides, and lipids. Types of lipoproteins include HDL, LDL, VLDL, and chylomicrons. Nonprotein Nitrogenous Substances generally include amino acids, urea, and uric acid. What are they from? Plasma electrolytes are absorbed by the intestine or are by-products of cellular metabolism. They include sodium, potassium, calcium, magnesium, chloride, bicarbonate, phosphate, and sulfate ions.

Hemostasis:

Hemostasis refers to the _____

Following injury to a vessel, three steps occur in hemostasis: blood vessel spasm, platelet plug formation, and blood coagulation

Trauma ----> Cutting a blood vessel causes the muscle in its walls to contract in a reflex, or engage in _____. This reflex lasts only a few minutes, but it lasts long enough to initiate the second and third steps of hemostasis.

Spasm of injured vessel ----> platelet plug ----> Platelets stick to the exposed edges of _____ blood vessels, forming a _____ with spiny processes protruding from their membranes. A platelet plug is most effective on a small vessel.

Platelets release a factor leading to the third step of hemostasis.

Coagulation: Blood coagulation is the most effective means of hemostasis. It is very complex and uses clotting factors.

Damaged tissues release a chemical called tissue _____, which activates the first in a series of factors leading to the production of _____ activator. This activator converts inactive _____ in the plasma into _____. This in turn, catalyzes a reaction that converts soluble _____ into netlike _____ causing the blood cells to catch in the net.

Once a blood clot forms, it promotes still more clotting through a _____ feedback system. What happens after the clot forms?

A clot that forms abnormally in a vessel is a _____; if it dislodges, it is an _____.

What is hemophilia?

Blood Groups and Transfusions

After mixed success with transfusions, scientists determined that blood was of different types and only certain combinations were compatible. Clumping of red blood cells following transfusion is called _____.

This clumping is due to the interaction of proteins on the surfaces of red blood cells called _____ with certain proteins called _____ carried in the plasma.

Blood types: A, B, AB, O: What is an antigen? What is an antibody?

Type A has what type of antigens and antibodies?

Type B has

Type AB has

Type O has

RH Blood Types: The Rh factor was named after the _____ monkey.

If the Rh factor surface protein is present on red blood cells, the blood is Rh _____;

If not, it is Rh _____.

There are no corresponding antibodies in the plasma unless a person with Rh-negative blood is transfused with Rh- positive blood; the person will then develop antibodies for the Rh factor.

_____ develops in Rh-positive fetuses of Rh-negative mothers but can now be prevented.