

## READING NOTES CHAPTER 14: BLOOD

Name \_\_\_\_\_  
Period \_\_\_\_ Due date \_\_\_\_\_

### **Introduction (p. 526)**

Blood signifies life, for it contains the structures necessary to transport \_\_\_\_\_, \_\_\_\_\_, wastes, and \_\_\_\_\_. It, along with the heart and blood vessels form the \_\_\_\_\_ system and link the body's internal and external environments.

Recall that blood is a type of \_\_\_\_\_ tissue that contains cells that are suspended in a liquid matrix. Blood volume varies based on many factors, but an average-sized adult has about \_\_\_\_\_ liters of blood.

If allowed to settle, the various cells within a blood sample will settle based on density. One can speed up the process by **centrifuging** – or spinning at a rapid rate – the sample of blood to obtain a rough estimate of percentages present within the sample. This is called a **hematocrit**. Most blood samples are about \_\_\_\_\_% red blood cells, \_\_\_\_\_% plasma, and that leaves a normal percentage of \_\_\_\_\_% for white blood cells and platelets. If it turns out that there is an elevated percentage of white blood cells, that indicates that the person's immune system is fighting something. Then the question becomes what that thing may be.

### **Blood cell origins (p. 527)**

Blood cells originate in \_\_\_\_\_ bone marrow from \_\_\_\_\_ stem cells, which literally translates into “blood forming”. The process is somewhat complicated, but these stem cells are exposed to several different growth factors and many different types of blood cells are developed, including cells that are controlled by the immune system. **A comprehensive chart with the end products is found on page 528.**

### **White blood cells (p. 534)**

White blood cells, or \_\_\_\_\_, protect against disease. There are 5 types of cells that normally exist to do this, and they fall under two main classes: \_\_\_\_\_ (which have cells containing a granular cytoplasm) and \_\_\_\_\_ (cells that lack cytoplasmic granules). For each of the 5 types of cells, note the **appearance of the nucleus**, their **primary functions** as to how they protect, and their normally-occurring **% abundance** in a blood sample:

**Neutrophil**

**Basophil**

**Monocyte**

**Eosinophil**

**Lymphocyte**

### Blood groups and transfusions (pages 545 – 549)

The first concept to understand about blood is that of **antigens** and **antibodies**. The clumping of red blood cells when testing (we will do this in lab!) is the result of a transfusion reaction called \_\_\_\_\_. Antibodies are called this because they are \_\_\_\_\_ specific antigens. Although all of our cells have many different antigens, only a few types cause serious transfusion reactions – these antigens that are present determine our blood types. These include the antigens of the \_\_\_\_\_ group and those of the \_\_\_\_\_ group. Simply put, if you have that antigen present on your blood cells, you are that blood type. It also means that your antibodies will fight other antigens that may come in contact with your blood. Fill in the table below with the information that applies to the following blood types (you will need to reference tables 14.12 and 14.13):

Blood Type	Has antigen:	Has antibody:	May donate to:	May receive from:
<b>A</b>				
<b>B</b>				
<b>AB</b>				
<b>O</b>				

### Electrocardiogram (ECG) (p. 570)

An ECG is a recording of the \_\_\_\_\_ changes in the muscle of the heart. To record an ECG, \_\_\_\_\_ are placed on the skin and this allows an instrument to monitor the weak electrical changes. A normal pattern includes several deflections, called \_\_\_\_\_.

The first deflection is called a **P wave**, which indicates a depolarization of atrial fibers that will lead to \_\_\_\_\_ of the \_\_\_\_\_.

The second event leaves a mark called the **QRS complex**, which indicates a depolarization of the ventricular fibers just prior to the \_\_\_\_\_ of the \_\_\_\_\_ walls.

The last event is called a **T wave**, which signals the repolarization of the \_\_\_\_\_, which ends the ECG pattern.

### Blood pressure (pages 582-584)

Blood pressure is the \_\_\_\_\_ the blood exerts against the inner walls of the blood vessels, just like how tire pressure is monitored. When ventricles contract, the pressure in the arteries sharply \_\_\_\_\_. This is called the \_\_\_\_\_ pressure. (That is the pressure of the blood as it is being sent out to the body). When the ventricles relax, the pressure of the arteries \_\_\_\_\_ and this is called the \_\_\_\_\_ pressure. (In truth, what is being monitored is the pressure of the blood in the veins as it returns to the heart).

**Read the clinical application on page 584 on how to measure blood pressure!**