MA112 Lab 2
Critical Thinking Questions
Week 4

Name: Ciara Harmon Date: 10/01/2020

Your answers must be in complete sentences without grammatical error, they must be well thought out, with specifics and details.

1. Why are red blood cells biconcave?
   Erythrocytes have a special shape that gives them the capability to squeeze through small spaces in the capillaries. When erythrocytes are initially produced, they have a nucleus, but as they mature the nucleus is pushed out. When the nucleus is gone the color of the cytoplasm changes from blue to red and the biconcave shape is formed.

2. Why is a WBC differential so important when making differential diagnoses?
   When a provider makes a differential diagnosis, they are trying to determine by a patient's symptoms what the exact diagnosis is. Symptoms can only narrow down the possible diagnosis slightly. Having a WBC differential test will help pinpoint whether there is an infection and where the infection is. For instance, if a "diff" is run and a multitude of eosinophils are found, the body is defending itself from a parasite or a type of fungi.

3. Why are patients who have relatively normal hemoglobin but a low hematocrit given packed cells rather than whole blood?
   Typically, if a patient has low hematocrit levels, they are considered anemic or may have experienced severe blood loss. A patient would receive a blood transfusion of packed RBCs because hematocrit is the percentage of packed RBCs in a volume of blood. If a patient's packed RBC count is low, then packed RBCs is what needs to be given. Plasma is not needed to increase a patient's hematocrit levels.

4. What are the essential features of blood cells used in the differentiation of the cells?
   When a differential cell count test is performed an automated machine counts and analyzes the size of the cell, the internal structures of the cell, and the density of the cell. A differential may also be performed manually with a microscope. These distinct features of the cells are crucial to finding a proper diagnosis.

5. What is the normal shape of a red blood cell? A white blood cell?
   Erythrocytes are a disk shape with a biconcave center. Erythrocytes are seven micrometers in length and two micrometers in depth. White blood cells (leukocytes) are larger than RBCs and vary in size. Leukocytes are round and have a nucleus surrounded by clear cytoplasm. Granular WBCs have tiny, bacteria-fighting granules floating in their cytoplasm. Agranular WBCs do not have granules.

6. Why are capillary punctures used to obtain a blood specimen from geriatric patients?
   Typically, as a person ages their veins become sclerosed or they shrink and become very fragile. It would be easy to puncture through a fragile vein and cause a hematoma or severe bruising. Another factor that comes with age is that the skin becomes thick and leathery making it difficult to palpate veins. Capillary punctures are the safest route when it comes to geriatric patients.

7. Where is the primary site for the production of erythrocytes, granulocytes, and platelets?
   Bone marrow, specifically red bone marrow, is the cite of cell production. At birth, all bone marrow in the body is capable of producing cells. By the time, a person is twenty years old red bone marrow is secluded to the sternum, iliac crest, ribs, and vertebrae.