

Anatomy and Physiology Tip

Blood & Blood-Forming Organs

In an effort to aid Health Information Management Coding Professionals with ICD-10 readiness, the following anatomy and physiology tip is provided with an educational intent.

The blood is considered to be a fluid connective tissue because it consists of cells suspended in a fibrous matrix. Blood cells are formed by a process called hematopoiesis. Blood is circulated by the heart through the vascular system (veins/arteries), carrying oxygen and nutrients to and waste materials away from all body tissues. The average person has about 5 liters (more than a gallon) of blood in their body.

1. Leukocytes or White Blood Cells (WBC): There are five different types of leukocytes which fall into two main groups, either Granulocytes or Agranulocytes. Changes in the leukocytes can indicate that a specific type of condition or disease is beginning or is present.

1. Granulocytes:

Neutrophils - which make up 60-70% of WBCs

Eosinophils - which make up 4-6% of WBCs

Basophils – which make up 1% of WBCs

2. Agranulocytes:

Lymphocytes - which make up 20-25% of WBCs

Monocytes - which make up 3-8% of WBCs

2. Erythrocytes, or red blood cells (RBCs): The primary function of the erythrocytes is to carry oxygen from the lungs to body tissues, and pick up carbon dioxide from the tissues and offload it in the lungs. The key to differentiating anemia types is understanding erythrocytes. When you read or hear “iron-deficiency anemia”, this means not having enough iron or ‘heme’ in the RBCs.

3. Plasma: Plasma is the fluid component of the blood in which blood cells are suspended. Plasma contains glucose and other nutrients.

4. Thrombocytes or Platelets: The platelets originate from cells known as megakaryocytes, which are found in the bone marrow.

Platelets help prevent fluid loss by initiating the blood to clot. The condition of thrombocytopenia is having an abnormally low number of platelets in the blood.

5. Bone Marrow: Bone marrow is a soft, fatty, vascular tissue filling the cavities of bones, (long bones) having a stroma of reticular fibers and cells. The marrow contains blood-forming (hematopoietic) cells, megakaryocytes, fat cells, fluid, fibrous tissue and blood vessels. Leukemia is a type of neoplastic disease that is in the bone marrow.

6. Spleen: The spleen acts as a primary blood filter. The spleen also plays important roles in regard to erythrocytes and the immune system.

7. Blood Cells produce Myeloid and Lymphatic Tissue: The myeloid and lymphatic tissue help the body’s immune system to protect it from bacteria and other foreign entities . The lymphatic system contains large numbers of lymphocyte cells.

References: The Merck Manual; Dorland’s Medical Dictionary

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