The **circulatory system** is a complex network responsible for transporting blood, nutrients, oxygen, carbon dioxide, hormones, and waste products throughout the body. It ensures that every cell receives the necessary substances for survival and functions efficiently, while also aiding in maintaining homeostasis.

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Components of the Circulatory System:

1. **Heart**:

    1. The central pump of the circulatory system.
    2. Divided into four chambers: two atria and two ventricles.
    3. Pumps oxygenated blood into systemic circulation and deoxygenated blood into pulmonary circulation.

2. **Blood Vessels**:

    1. **Arteries**: Carry oxygen-rich blood away from the heart (except the pulmonary artery, which carries deoxygenated blood to the lungs).
    2. **Veins**: Carry deoxygenated blood back to the heart (except the pulmonary vein, which carries oxygenated blood from the lungs to the heart).
    3. **Capillaries**: Microscopic vessels where the exchange of oxygen, carbon dioxide, nutrients, and waste occurs between blood and tissues.

3. **Blood**:

    1. Consists of:
        1. **Red Blood Cells (RBCs)**: Transport oxygen and carbon dioxide.
        2. **White Blood Cells (WBCs)**: Part of the immune system, defending against infections.
        3. **Platelets**: Help in blood clotting.
        4. **Plasma**: The liquid portion of blood that carries nutrients, hormones, and waste products.

4. **Lymphatic System** (Associated with Circulation):

    1. Transports lymph, a fluid containing immune cells and waste, and helps in maintaining fluid balance.

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Types of Circulation:

1. **Systemic Circulation**:

    1. Delivers oxygen-rich blood from the heart to the rest of the body and returns oxygen-poor blood to the heart.

2. **Pulmonary Circulation**:

    1. Carries deoxygenated blood from the heart to the lungs for oxygenation and brings oxygenated blood back to the heart.

3. **Coronary Circulation**:

1. Supplies the heart muscle (myocardium) itself with oxygenated blood.

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Functions of the Circulatory System:

1. **Transportation**:

   1. Delivers oxygen and nutrients to tissues.
   2. Removes carbon dioxide and metabolic waste.
   3. Circulates hormones and other signaling molecules.

2. **Regulation**:

   1. Maintains body temperature and pH balance.
   2. Regulates fluid and electrolyte levels.

3. **Protection**:

   1. Aids in immune defense by transporting white blood cells and antibodies.
   2. Facilitates clotting mechanisms to prevent excessive blood loss.

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Common Disorders of the Circulatory System:

1. **Cardiovascular Diseases**:

   1. **Atherosclerosis**: Build-up of plaque in arteries, leading to reduced blood flow.
   2. **Hypertension**: High blood pressure, straining the heart and vessels.
   3. **Heart Attack (Myocardial Infarction)**: Blockage of blood flow to the heart muscle.
   4. **Stroke**: Interruption of blood supply to the brain.

2. **Blood Disorders**:

   1. **Anemia**: Low levels of red blood cells or hemoglobin.
   2. **Hemophilia**: Impaired blood clotting.
   3. **Leukemia**: Cancer of white blood cells.

3. **Vascular Disorders**:

   1. **Varicose Veins**: Enlarged, twisted veins due to valve failure.
   2. **Deep Vein Thrombosis (DVT)**: Blood clot formation in deep veins.

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Importance of a Healthy Circulatory System:

Maintaining circulatory health is vital for overall well-being. Lifestyle choices such as regular exercise, a balanced diet, avoiding smoking, and managing stress are crucial for preventing circulatory system disorders and promoting longevity.