Chapter 8
Circulation and Immunity

8.1 Structures of the Circulatory System
8.2 Blood and Circulation
8.3 The Lymphatic System

Chapter 8 Circulation and Immunity

- The heart and blood vessels collectively called the **cardiovascular system**.
- The mammalian heart is a muscular organ that contains **four chambers** and acts as a double pump.
- There are three circulatory pathways through the body: the pulmonary pathway, the systemic pathway, and the coronary pathway.
- Blood is a tissue made up of plasma, red blood cells, white blood cells, and platelets.

- Blood **transports** material throughout body.
- Blood regulates **temperature** to maintain **homeostasis**.
- The **lymphatic circulatory system** is closely associated with cardiovascular circulatory system.
  - Helps maintain the balance of fluids and is a key component of the immune system.
8.1 Structures of the Circulatory System

In this section, you will:
- **Identify** the major structures of the circulatory system
- **Describe** the structure and function of blood vessels
- **Describe** the action of the heart and the circulation of blood through the body
- **Dissect** and **observe** the structures of a mammalian heart
- **Identify** disorders of the circulatory system and technologies used to treat them
- **Investigate** the relationship between blood pressure, heart rate, and exercise

What might this relate to?

Main functions of the circulatory System

1. **Transports** gases, nutrients, and wastes and hormones
2. **Regulates** internal temperature
3. **Protects** against blood loss and against disease causing microbes

Components of the Circulatory System

1. Heart – pushes blood through the body
2. **Blood vessels** – road ways for the blood to travel
3. **Blood** – carries nutrients, oxygen, carbon dioxide, water and wastes
The Heart

• Located to the **left** of chest
• Size of your fist
• Keeps oxygen rich/poor blood separate
• Walls are made of cardiac tissue – found no where else in the body
• Involuntary contractions
• 4 chambers, two atria (top) and two ventricles (bottom)

Continued…

• The **Atria** receive blood from body or lungs
• The **Ventricles** pump blood to the lungs or to the body
• There is a tick muscular wall between left and right side of heart - **septum**
Flow of Blood – Memorize This!

1. **Right side** receives blood (oxygen poor)
2. Blood enters **vena cavae**
3. Blood is pumped from **right atria** to **right ventricle** through the **tricuspid valve**
4. Blood goes to lungs through **pulmonary semilunar valve** to **pulmonary arteries** (only arteries to carry oxygen poor blood!)
5. Goes to the lungs for **gas exchange**
6. Returns to the **left side** of the heart through the **pulmonary veins** (oxygen rich)
7. **Left atrium** pumps to left ventricle through the **bicuspid**
8. Blood goes to the **aorta** (through the aortic semilunar valve) where it then travels to the body
The Human Heart

Video

- Flow Through The Heart – 7:50min

Valves
**Structure of Blood Vessels**

- **Arteries** — Away from heart
  - Oxygen rich blood, carried to the body
- **Veins** — To the heart
  - Oxygen poor blood carried back to the heart
- Blood moves from arteries to deliver nutrients and remove wastes
- Blood moves into capillaries
- Blood then moves from capillaries to the veins
- Returns to the heart

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**Arteries & Veins**

- **Arteries** (A) and Veins (C) have 3 layers
  - Outer layer is covered in connective tissue mixed with elastic tissue. Middle layer consists of circular bands of elastic tissue and smooth muscle tissue.
  - Inner layer is one cell thick and consists of flat, smooth cells. The shape reduces friction as blood moves.
- Capillaries (B) have one layer that is one cell thick.

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**Lab-Heart Dissection**

- Pg. 272 – 273
- Analysis Question 1-2 & Conclusion a)
- Working in groups of 3-4

- Study Structures of the heart!
- Read Lab