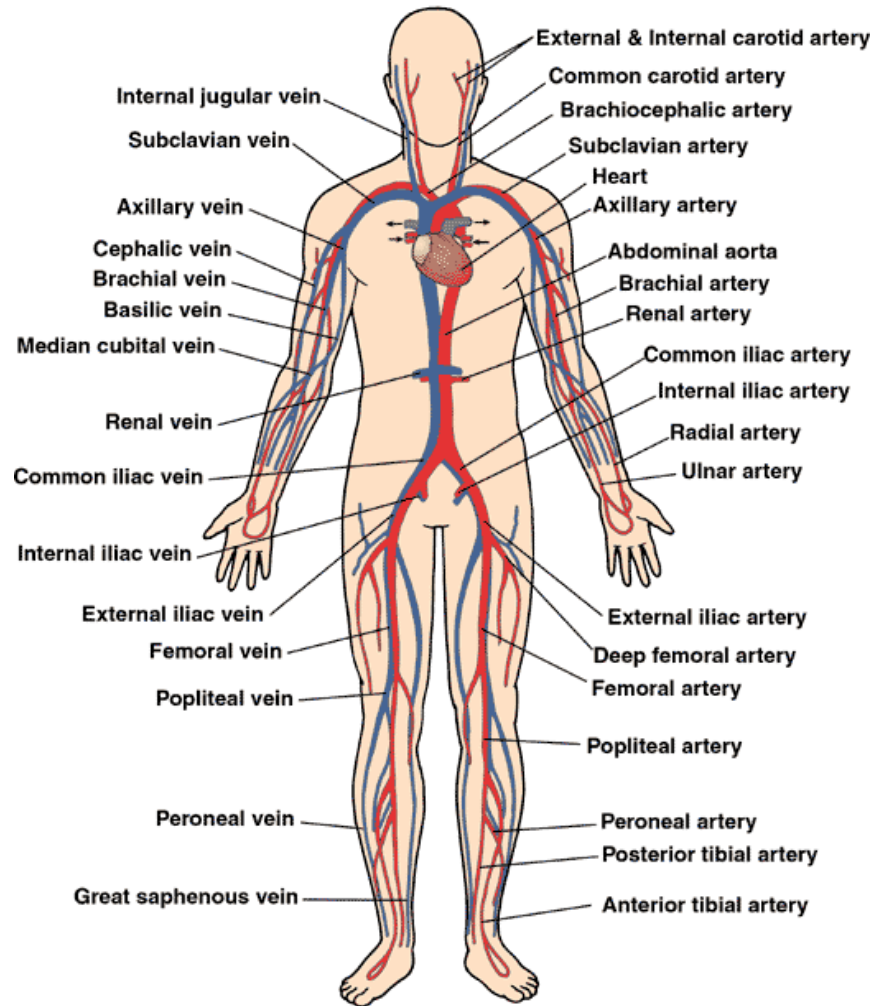


# SBI3U - The Circulatory System

## Introduction and Human Circulatory System



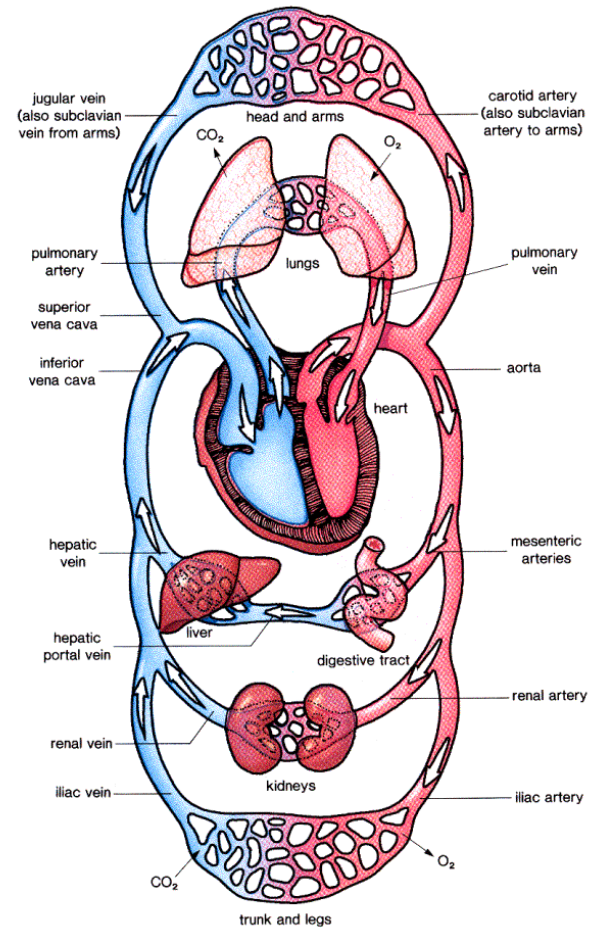
# Fun Facts!

- No cell in your body is further than two cells away from a blood vessel.
- If you laid all of your arteries, veins and capillaries end-to-end, they would circle the Earth twice.
- Your heart is size of a fist, weighs approximately 300g and beats an average of 100,000 times a day.
- During the average lifetime, your heart pumps enough blood to fill two large ocean tankers!

# Introduction

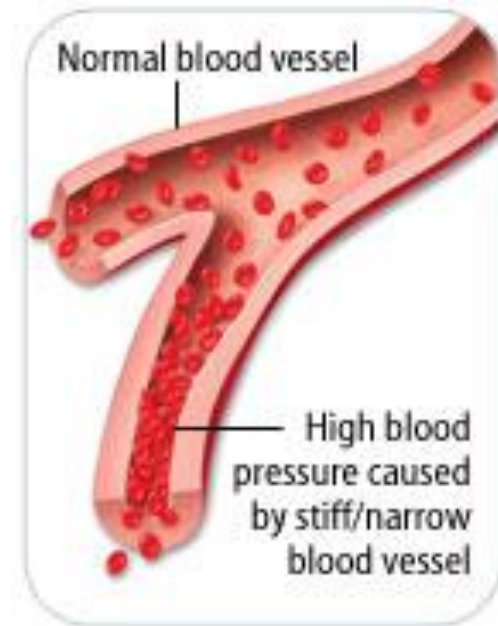
- The circulatory (or cardiovascular) system has several functions:

1. Transportation of **O<sub>2</sub>**, **CO<sub>2</sub>**, **wastes**, **nutrients**, and **hormones**
2. Maintain body **temperature**
3. Maintain body **fluid levels**



# Parts of the Mammalian Circulatory System

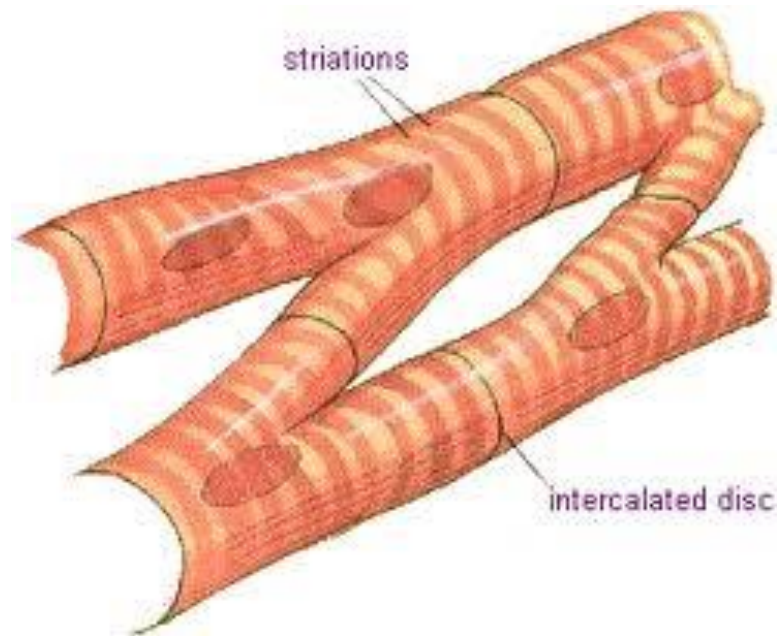
1. The **Heart**: a muscular organ that continuously pumps blood through the body, generating blood flow.
2. The **Blood Vessels**: a system of hollow tubes through which the blood moves.
3. The **Blood**: The fluid that transports nutrients,  $O_2$ ,  $CO_2$  and many other materials throughout the body.



# Human Heart Anatomy

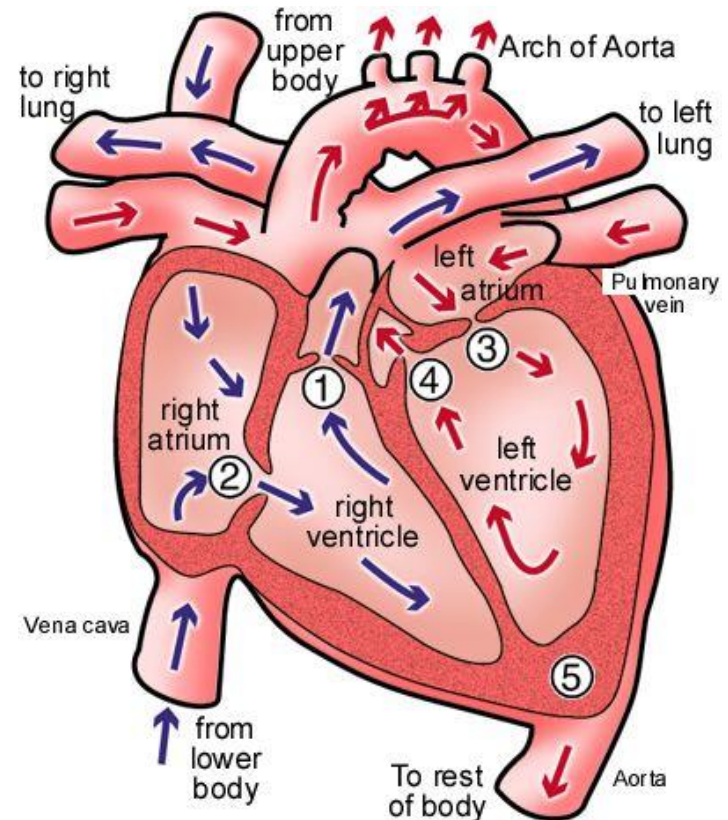
- Located slightly to the left of the middle of the chest.
- The walls of the heart are made of a unique type of muscle called **cardiac muscle**.

Cardiac muscle cells are arranged in a network that allows the heart to contract and relax rhythmically and involuntarily without becoming fatigued.



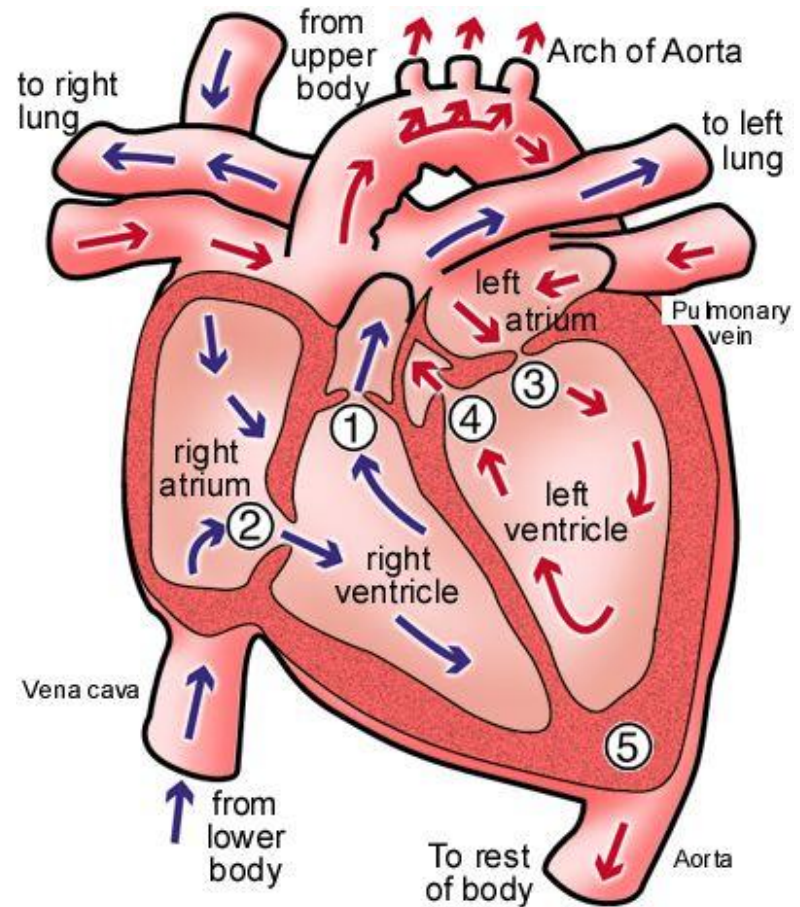
# Human Heart Anatomy

- Has four chambers
  - **Atria:** the two top chambers that fill with blood returning from the body or the lungs (singular atrium).
  - **Ventricles:** two bottom chambers that receive blood from the atria and pump it out to the body or the lungs.



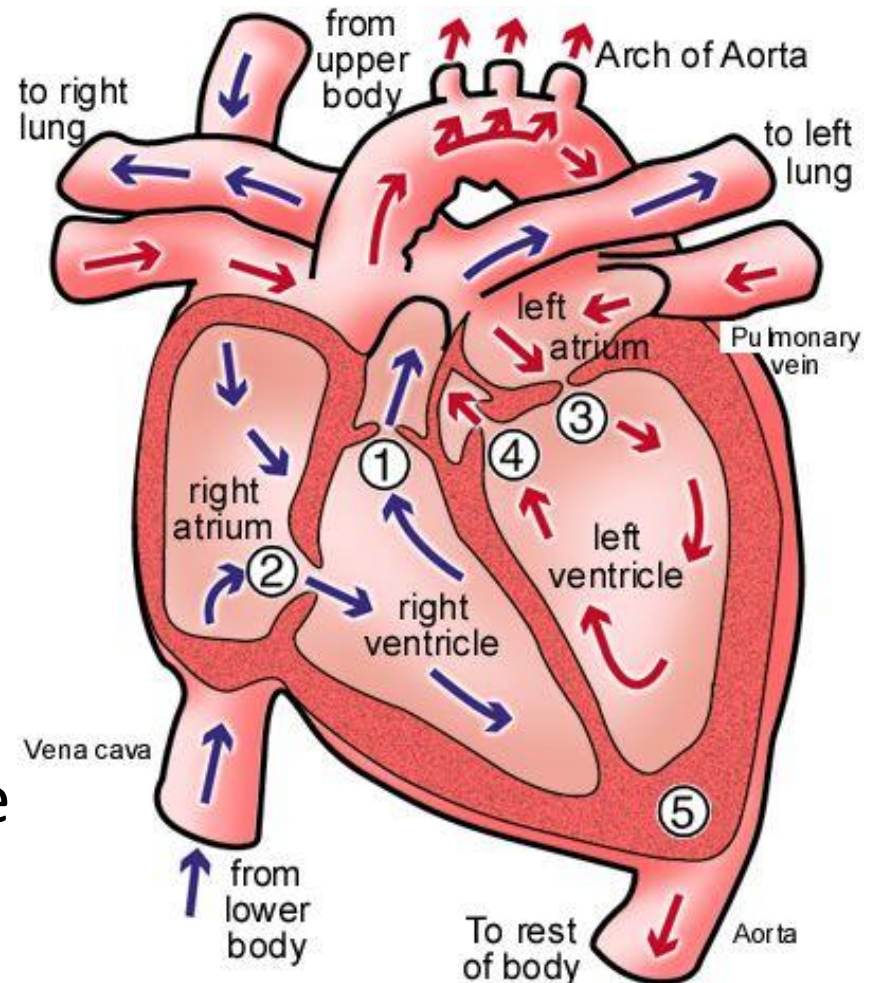
# Blood Flow in the Heart

- The **vena cavae** bring oxygen-poor blood from the body to the **right atrium**.
  - The oxygen-poor blood flows from the right atrium into the **right ventricle**.
  - The right ventricle pumps the oxygen-poor blood to the lungs through the **pulmonary arteries**.
- The oxygen-rich blood flows from the **left atrium** into the **left ventricle**.
  - The left ventricle pumps the oxygen-rich blood to the rest of the body through the **aorta**.



# Blood Flow in the Heart

- The **pulmonary veins** bring oxygen-rich blood from the lungs back to the heart through the **left atrium**.
- Oxygen-rich blood flows from the **left atrium** to the left ventricle.
- The **left ventricle** pumps the oxygen-rich blood to the body through the **aorta**.





# Heartbeat “lub-DUB”

- **Valves** prevent the blood from flowing backwards.
- The “lub” sound is caused by the closing of the **atrioventricular (AV) valves** as blood is pumped from the atria to the ventricles.
- The “DUB” sound is caused by **semilunar valves**, as blood is pumped from the ventricles into the arteries

