

Human Body: Cardiovascular System

The cardiovascular system circulates blood through the body. The heart pumps blood through blood vessels—arteries, capillaries, and veins. As blood flows through these vessels, it delivers oxygen and nutrients to cells while removing carbon dioxide and waste products from them.

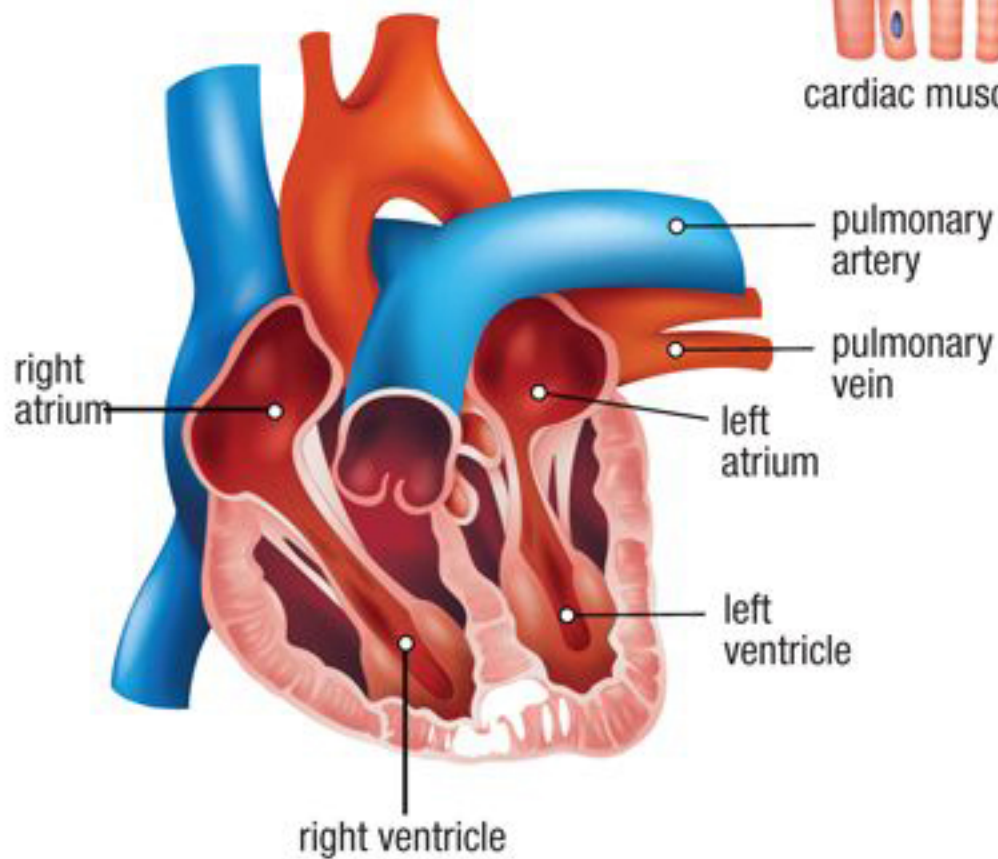
The human heart

The human heart is a muscular pump about the size of a human fist. It has 4 chambers—2 atria and 2 ventricles. It has 4 heart valves. Two are located between the chambers and 2 exit the heart, preventing the backflow of blood.



cardiac muscle

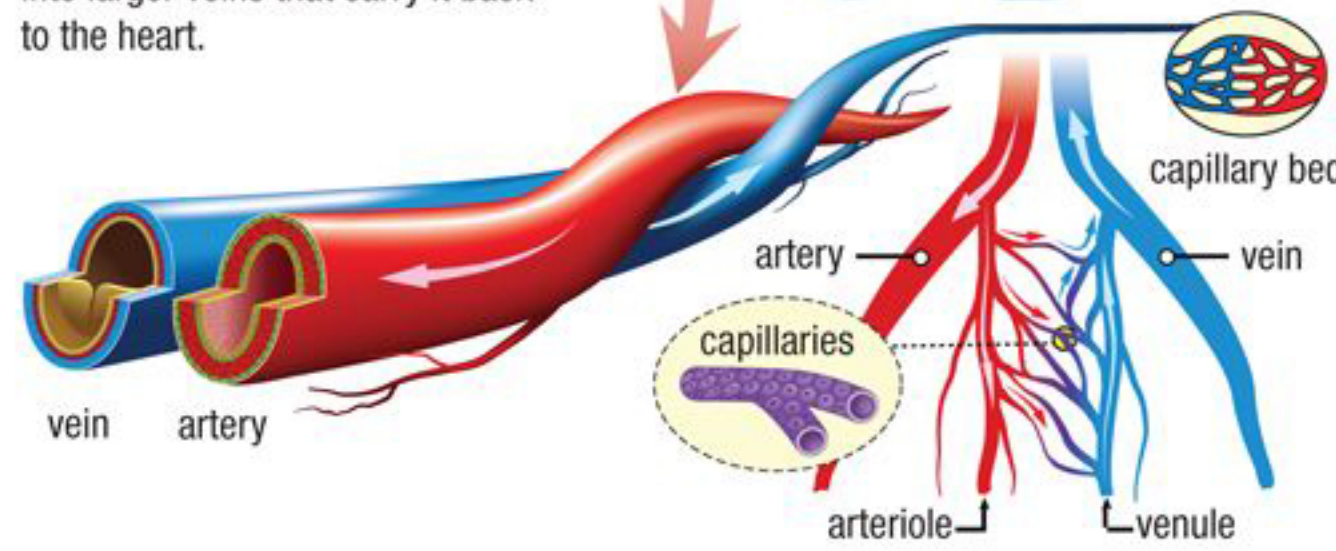
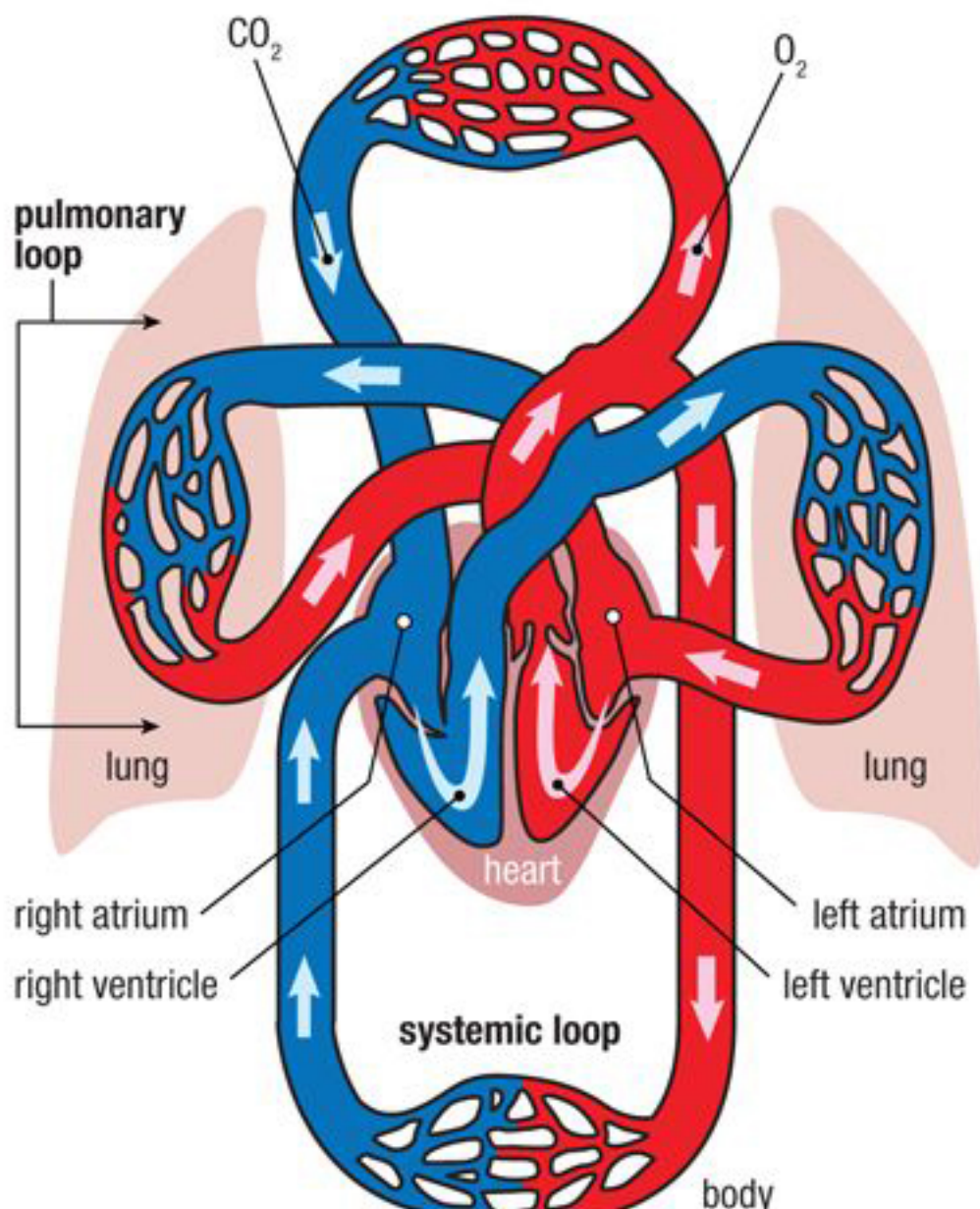
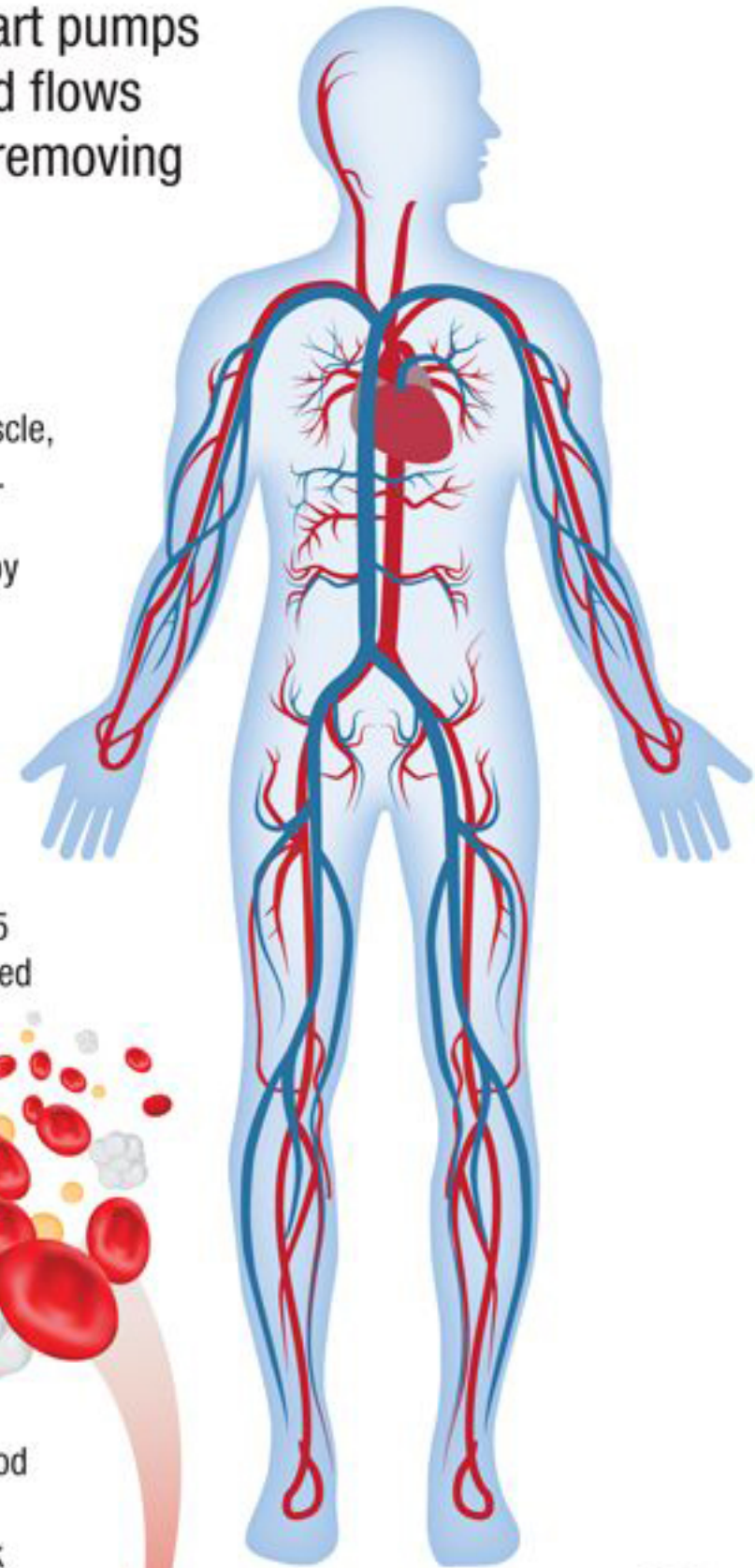
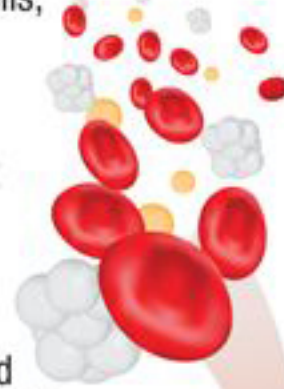
The heart consists of cardiac muscle, a striated and involuntary muscle. Individual cardiac muscle cells (cardiomyocytes) are connected by intercalated discs that coordinate synchronized muscle contraction.



Blood composition

The human body contains about 5 liters of blood. Blood consists of red blood cells, white blood cells, platelets, and plasma.

Arteries carry oxygenated blood away from the heart to arterioles and then to capillaries. Capillary walls are thin—only a single cell thick—allowing O_2 and nutrients to enter tissues while waste products are removed. Blood then travels through venules and into larger veins that carry it back to the heart.



The 2 circulation loops

Pulmonary

The right side of the heart pumps oxygen-deficient blood to the lungs where it releases CO_2 and becomes oxygenated. This blood then returns to the heart.

Pathway: right atrium → right ventricle → lungs → left atrium

Systemic

The left side of the heart pumps oxygenated blood to body tissues where it delivers O_2 and picks up CO_2 and other waste products. This deoxygenated blood then travels back to the heart where it begins the pulmonary loop.

Pathway: left atrium → left ventricle → body → right atrium