

## Heart and Its Structure, The Importance of the Circulatory System in the Human Body

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**Abstract:** The circulatory system is an important part of our body and the heart is the main organ of this system. This article provides an overview of the circulatory system and the structure of the heart.

**Key points:** heart, coronary arteries, epicardium, Aortic valve, atrioventricular, systole, diastole.

**Materials and methods:** The heart is an important organ with a muscular structure, and we can describe it as a pump that ensures that blood reaches all the tissues in the body. Its location in the body lies in the middle of the chest, between the lungs, on the left side. Although the size of the heart varies according to age and body size, the size of a healthy heart in an adult is slightly larger than the fist. from one hand. A healthy heart beats about 100,000 times a day and works non-stop. The main function of the heart is to transport deoxygenated blood (dirty blood) from the body to the lungs and return oxygenated blood (clean blood) from the lungs to the body.

The heart consists of 3 layers; These layers are the outermost epicardium, the middle myocardium and the innermost endocardium.

Epicardium and endocardium consist of thin layers. The myocardium is the main layer of the heart and consists of cardiac muscle fibers. The heart is surrounded on the outside by a 2-layered membrane called the pericardium and is located in a fluid-filled space called the pericardial space. The pericardium is a structure that produces serous fluid to prevent friction between the heart and its surrounding organs. The pericardium holds the heart in place and provides space for the heart to expand during its pumping action.

The heart itself has a system. It is a structure consisting of 4 chambers and 4 valves, vascular system and conduction system. There are 2 cameras at the top and 2 at the bottom. The upper chambers are called atria and the lower chambers are called ventricles. While the atrium receives dirty blood from different parts of the body, the ventricles return the purified blood to the body tissues. There is a muscular wall that separates the left and right sides of the heart. The name of this wall is the septum.

**Research result.** The heart has 4 valves. Two of the valves (mitral and tricuspid valves) are involved in the exchange of blood between the chambers of the heart, and the other two (pulmonary and aortic valves) are involved in the exchange of blood between the body and the heart.

**Aortic valve:** Allows oxygen-rich blood to pass from the left ventricle to the aorta, the largest artery in the body. Thus, blood is transferred to the body using the aorta.

**Mitral valve:** Allows oxygen-rich blood from the lungs to pass from the left atrium to the left ventricle.

Tricuspid valve: Allows oxygen-poor blood to pass through the body from the right atrium to the right ventricle.

Pulmonary valve: allows blood from the right ventricle to pass through the pulmonary arteries and reach the lungs.

Coronary arteries. The vessels that carry blood to the body are called arteries, and the vessels that return blood from the body to the heart are called veins. The largest artery in the body is the Aorta. The starting point of the aorta is the left ventricle. Oxygen-rich blood from the left ventricle is distributed to the body through the aorta. Thus, the nutritional and oxygen needs of body tissues are met. Heart tissue also needs nutrients and oxygen. It is supplied with nutrition and oxygen by the coronary arteries, which emerge from the aorta.

There are 3 main coronary arteries in the heart. Coronary arteries exit from two openings in the aorta to the right and left. The vein going to the left divides into two branches: anterior and lateral. Thousands of vascular branches from the main coronary arteries spread like a network within the heart muscle. The diameter of the main coronary arteries is usually 1-3 mm, the vessel wall is very thin. Cardiac conduction system. The heart itself has an electrical system. This system consists of nodes and transmission sets. Thanks to the messages generated by this system, the heart muscle is stimulated, contracts and relaxes.

The electrical signal begins in the sinoatrial (SA) node, located above the right atrium. The electrical signal from here travels through the muscle fibers of the atrium, excites it, and from there passes to the atrioventricular (AV) node. Here, after a very short wait, it stimulates the ventricles. This ensures a continuous heartbeat. Heartbeats that occur one after the other form a cycle.

The cardiac cycle is divided into two phases: systole and diastole.

During systole, the ventricles contract and push blood into the veins. During diastole, the ventricles relax and receive blood from the atria.

**Conclusions.** A healthy heart is the key to a healthy life. Lifestyle choices like eating healthy, exercising regularly, and managing stress can not only have a positive effect on your heart, but also on your health, leading to a healthier life. Remember, a healthy heart opens the door to a healthy life.

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