Tikrit University

College of Nursing

Basic Nursing Sciences

First Year - 2023-2024

Anatomy

First stage

(عنوان المحاضرة)

Cardiovascular system

by:

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Cardiovascular System :

The cardiovascular system consists of the heart, blood vessels, and blood. Its primary function is to transport nutrients and oxygen-rich blood to all parts of the body and to carry deoxygenated blood back to the lungs. The heart works as a pump that pushes blood to the organs, tissues, and cells of the body.

Blood is carried from heart to the rest of body through a complex network of arteries, arterioles, and capillaries. Blood is returned to your heart through venules and veins. If all the vessels of this network were laid end to end, they would extend for about 60,000 miles (more than 96,500 kilometers), which is far enough to circle the planet Earth more than twice.

The one-way system carries blood to all parts of body. This process of blood flow within body is called circulation. Arteries carry oxygen-rich blood away from heart, and veins carry oxygen-poor blood back to heart. In pulmonary circulation, though, the roles are switched. It is the pulmonary artery that brings oxygen-poor blood into lungs and the pulmonary vein that brings oxygen-rich blood back to heart. In the diagram, the vessels that carry oxygen-rich blood are colored red, and the vessels that carry oxygen-poor blood are colored blue.

Location & size:

✓ The size of the heart is approximately the size of a person's fist.

✓ The heart is located within the bony thorax(thoracic cage).

✓ Its apex is directed towards the left hip and rests on the diaphragm at the end of the fifth intercostals space.

✓ The base of the heart is directed towards the right shoulder and lies beneath the second rib.

The cardiovascular system consists of the heart, blood vessels, and blood. Its primary function is to transport nutrients and oxygen-rich blood to all parts of the body and to carry deoxygenated blood back to the lungs. Abnormalities or injuries to any or all parts of the cardiovascular system can result in serious health complications.

Common conditions that can affect the cardiovascular system include coronary artery disease, heart attack, high blood pressure, and stroke. This article explores the cardiovascular system, including its components and their functions.

We also outline some common cardiovascular system diseases and their associated treatments.

Components of the cardiovascular system:

The cardiovascular system Trusted Source is the system responsible for delivering blood to different parts of the body.

It consists of the following organs and tissues:

- The heart: A muscular pump that forces blood around the body.
- A closed system of blood vessels:

These vessels include:

a) Arteries: Vessels that carry blood away from the heart.

b) Veins: Vessels that bring blood back to the heart.

c) Capillaries: Tiny vessels that branch off from arteries to deliver blood to all body tissues.

There are two blood circulatory systems in the body. The first is the systemic circulatory system. This is the main blood circulatory system that transports blood to the organs, tissues, and cells throughout the body. The second is the pulmonary circulatory system. This circulatory system moves blood between the heart and lungs.

It is where oxygen enters the blood and carbon dioxide leaves the blood. Covering and wall : The heart is surrounded and covered by its own cavity, the pericardial cavity (peri, around + cardio, heart).

Covering :

The pericardium is the double layer membrane that surrounds the heart.

1. Parietal pericardium, which is fibrous pericardium, (outer layer).

2. Visceral pericardium : which the inner layer of the heart consist of flat epithelial cells called the serous pericardium..

Between the parietal and visceral pericardial membranes is serous fluid, which prevents friction as the heart beats and allows the heart to beat easily.

Walls of the heart:

The heart walls are composed of three layers:

1. Epicardium (outer layer)

2. Myocardium (middle layer), which is actually contract.

3. Endocardium (inner layer), it's a thin layer that lines the heart chambers.

Chambers and associated Great walls:

The heart has four chambers or cavities.

1. Two atria (auricles).

2. Two ventricles. o The superior atria(upper) are primarily the receiving chambers.

o The inferior ventricles(lower) are discharging chambers.

o The left ventricle forms its apex. Valves : The heart has four valves, which allow blood to flow in only one direction and prevent back flow into the atria when the ventricles contract.

A. Atrio - ventricular valves:

1. Bicuspid valve : (mitral valve) separates the left atrium from the left ventricle.

2. Tricuspid valve : separates the right atrium from the right ventricles.

Function :

Prevent backflow into the atria when the ventricles are contracting.

B. Semi lunar valves:

1. Aortic valve : separates the left ventricle from the aorta.

2. Pulmonary valve : separates the right ventricle from the pulmonary artery (trunk).

Function:

Prevent backflow into a ventricle when the heart is relaxed.

Coronary circulation (Cardiac) :

The heart receives about 5% of the body's blood supply. The heart receives the oxygenated blood & is nourished by the right and left coronary arteries . The coronary arteries branch from

the ascending aorta and encircle the heart like a crown. Blood flow to the myocardium occurs during the relaxation phase, this is the opposite of every other part of the body.

1.Right coronary artery supplies:

lateral wall & posterior wall of the right ventricle. Inferior wall of the left ventricle.

2. The left coronary divides into :

a. .Left circumflex artery.

b. left anterior descending artery(LAD).

a. Circumflex artery supply:

(i) The left atrium

(ii) The posterior & lateral wall of the left ventricle.

b. LAD supply:

(i) The antero-lateral wall of the left ventricle.

(ii) The interventricular septum.

(iii) The anterior wall of the right ventricle.

Systemic circulation:

(from left ventricle to right atrium). Systemic circulation which carries oxygenated blood away from the heart to the body, and returns deoxygenated blood back to the heart. In systemic circulation the blood leaves the heart, through the left ventricle ➔ to aorta ➔ to smaller arteries ➔ to arterioles ➔ and finally capillaries, oxygen in the blood diffuses into the cell.. Waste and carbon dioxide diffuse out of the cell into the blood which then moves to venious side, and then to the inferior and superior vena cava, through which the blood re-enters the heart at the right atrium.