



The cardiovascular system

cardiovascular system :is the transport system of the body by which food, oxygen, water and all other essentials are carried to the tissue cells and their waste products are carried away: It consists of three parts:

1. ***The blood***, which is the fluid in which materials are carried to and from the tissue
2. ***The heart***, which is the driving force which propels the blood
3. ***The blood vessels***, the routes by which the blood travels to and through the tissues and back to the heart.

Blood is a viscous (thick) fluid that varies in color from bright to dark red, depending on how much oxygen it is carrying. Its quantity differs with the size of the person; the average adult male, weighing 70 kg has about 5-6 litres of blood.

Main function for blood:

- 1-Supplying oxygen to cells and tissues.
- 2- Regulating acidity (pH) levels and body temperature.

Heart : It is a four-chambered muscular organ which pumps blood through the blood vessels of the circulatory system.

Four Chambers on either side of the heart are two chambers, one a receiving chamber (atrium) and the other a pumping chamber (ventricle):

1. **The right atrium** is a thin-walled chamber that receives the blood returning from the body tissues. This blood, which is low in oxygen, is carried in the veins, the blood vessels leading to the heart from the body tissues.

Lab 1.....2nd year



Ph.D. : Walaa Salih Hassan
lecurer.Waleed Khalid

2. The right ventricle pumps the venous blood received from the right atrium and sends it to the lungs.
3. The left atrium receives blood high in oxygen content as it returns from the lungs.
4. The left ventricle, which has the thickest walls of all, pumps, oxygenated blood to all parts of the body. This blood goes through the arteries, the vessels that take blood from the heart to the tissues.

The Heart Valves: The human heart contain four type of valves:

a- Two atrioventricular valves (AV) between atria and ventricles:

- ♣ **Tricuspid valves** : allows blood flowing one way from right atrium to right ventricle.
- ♣ **Mitral valve**: allows blood flowing one way from left atria to left ventricles. is to prevent backflow of blood into the atria during ventricular contraction.

The function of AV valves is to prevent backflow of blood into the atria during ventricular contraction.

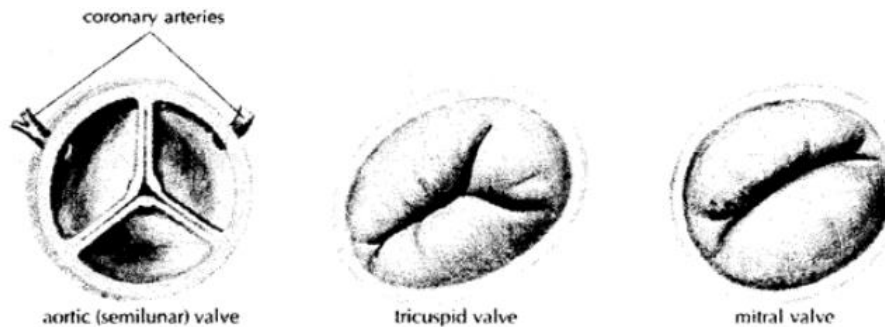


Figure 9-4. Valves of the heart, seen from above, in the closed position (From Memmler and Wood: The Human Body in Health and Disease, ed 6, Philadelphia, 1987, J. B. Lippincott co.)



Two semilunar valves:

- **Aortic valve:** allows blood flowing one way from left ventricle to aorta (transport oxygenated blood to the body).
- **Pulmonary valve:** allows blood flowing one way from right ventricle to pulmonary artery (Transport deoxygenated blood to lung)

B- Arteries : The arteries are the blood vessels that deliver oxygen-rich blood from the heart to the tissues of the body.

Coronary arteries also aid the heart in pumping blood. Arteries carry oxygenated blood away from the heart to the tissues, except for pulmonary arteries, which carry blood to the lungs for oxygenation (usually veins carry deoxygenated blood to the heart but the pulmonary veins carry oxygenated blood as well as.

C- Veins : are blood vessels that carry blood toward the heart.

Function :

- ♣ They are responsible for returning deoxygenated blood back to the heart after arteries carry blood out.
- ♣ The vena cava is the largest vein in the body. Veins have much thinner walls than arteries.

D- Capillaries : are tiny blood vessels connecting arteries to veins. These blood vessels carry oxygen and nutrients to individual cells throughout the body.

Function: They bring nutrients and oxygen to tissues and remove waste product.



Department of Anesthesia Techniques
Title of the lab1: - body temperture



Ph.D. : Walaa Salih Hassan
lecurer.Waleed Khalid

	Artery	Vein
DEFINITION	An artery is a type of blood vessel that carries blood away from the heart	A vein is another type of blood vessel that carries blood towards the heart
MAIN FUNCTION	Carry oxygenated blood away from the heart	Carry deoxygenated blood towards the heart
TYPES OF BLOOD TRANSPORTED	Oxygenated	Deoxygenated
WALL OF THE VESSEL	Wall is thicker and more elastic compared to walls of veins	Wall is thinner and less elastic
LOCATION	Deep-seated	More superficial
LUMEN	Lumen is narrow	Lumen is wide
PRESENCE OF VALVES	Don't have valves	Have valves to prevent backflow
BLOOD PRESSURE	High	Low
AFTER DEATH	Become empty	Contains blood



Ph.D. : Walaa Salih Hassan
 lecurer.Waleed Khalid

A-Pulmonary Circulation B-Systemic Circulation

Pulmonary circulation	Systemic circulation
(i) This involves circulation of blood between the heart and the lungs.	(i) This involves circulation of blood between the heart and body organs (except lungs).
(ii) It is the function of the right side of the heart.	(ii) It is the function of the left side of the heart.
(iii) It carries deoxygenated blood to the lungs to receive oxygen.	(iii) It carries oxygenated blood to the body organs.
(iv) It begins on the rightventricle and ends on left auricle.	(iv) It starts at left ventricle and ends at the right auricle.
(v) It returns oxygenated blood back to the heart.	(v) It returns deoxygenated blood back to the heart.
(vi) Blood flows as: Right ventricle ↓ Deoxygenated blood Lungs ↓ oxygenated blood Left auricle	(vi) Blood flows as: left ventricle ↓ oxygenated blood Body organs ↓ Deoxygenated blood Right auricle

The Work of the Heart

The blood is squeezed through the chambers by a contraction of heart muscle beginning in the thin-walled upper chambers, the atria, followed by a contraction of



Department of Anesthesia Techniques
Title of the lab1: - body temperture



Ph.D. : Walaa Salih Hassan
lecurer.Waleed Khalid

the thick muscle of the lower chambers, the ventricles. **This active phase is called systole, and in each case it is followed by a resting period known as diastole.** This sequence of heart relaxation and contraction is called the cardiac cycle. **Each cycle takes an average of 0.8 seconds.**

Cardiac muscle tissue has several unique properties. One of these is the interconnection of the muscle fibers. The fibers are **interwoven so the stimulation that causes the contraction of one fiber results in the contraction of the whole group.**