

Al-Mamoun university collage

Physiology

Medical lab Tech

Second stage

Ass.lec Dhuha Ali Abass

2023/2024

Lecture 6

Blood vessel

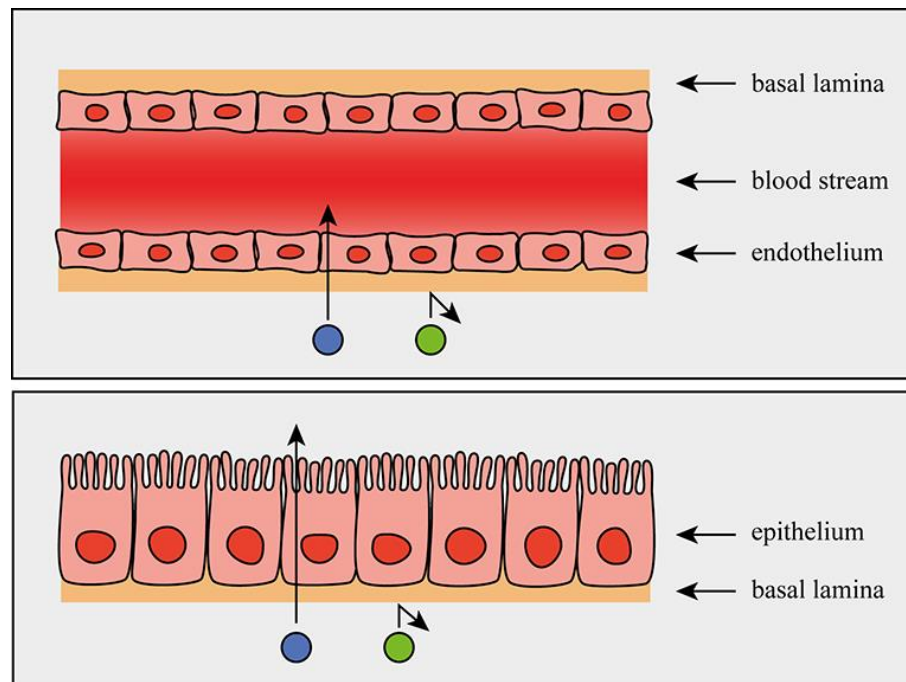
The systemic and pulmonary circulations each consist of a closed system of vessels. These vascular loops each are made up of different blood vessel types that begin and end with the heart. Three major types of vessels are **arteries, capillary and veins.**

Arteries and veins are composed of three tunics

- Tunica interna
- Tunica media
- Tunica externa

Lumen: Central blood containing space surrounded by tunics.

Capillaries are composed of endothelium with basal lamina.



Tunics:

Tunica interna (tunica intima):

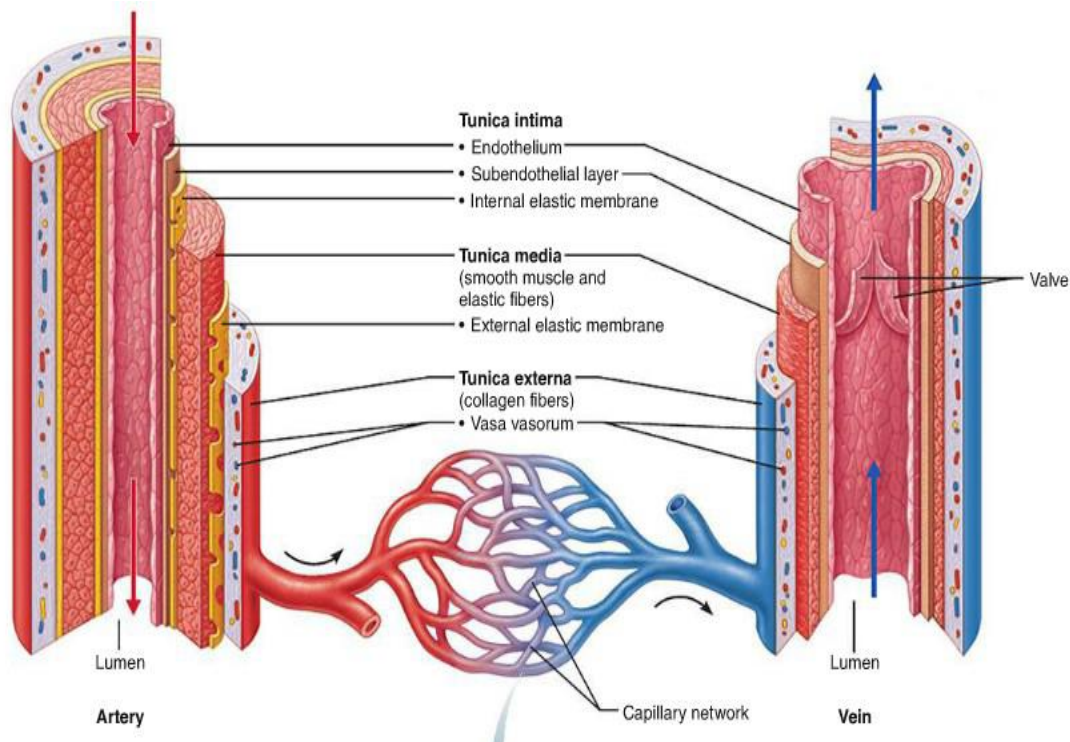
Endothelia layer that lines the lumen of all vessels. In vessels large than 1 mm . plays an important role in regulating blood pressure, vessel growth and movement of substances into and out of vessels.

Tunica media:

Smooth muscle and elastic fiber layer regulated by nervous system , control vasoconstriction and vasodilation of vessels

Tunica externa (tunica adventitia)

Collage fibers that protect and reinforce vessels .



The important blood vessels in the systemic circulation, going from arterial to venous systems:

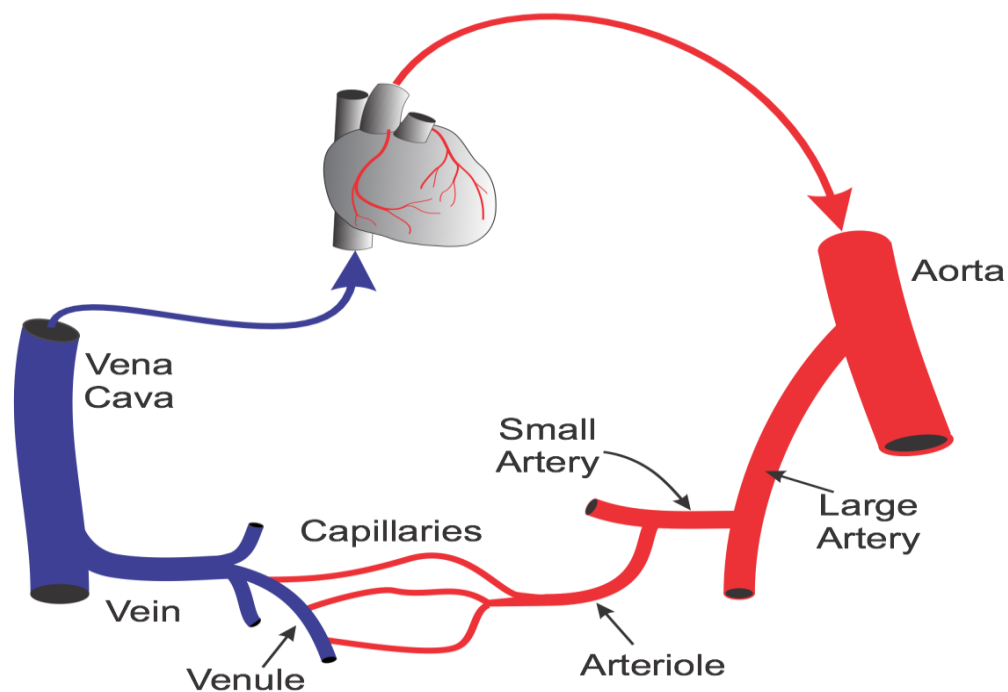
1. Arteries: Thick walled (3 layers), elastic vessels for high pressure blood.

2. Arterioles: Resistance vessels large changes in diameter adjusting blood flow.

3. Capillaries: Thinnest walled, smallest diameter vessels for exchange.

4. Venules: Drains capillaries, has endothelium and some vascular smooth muscle.

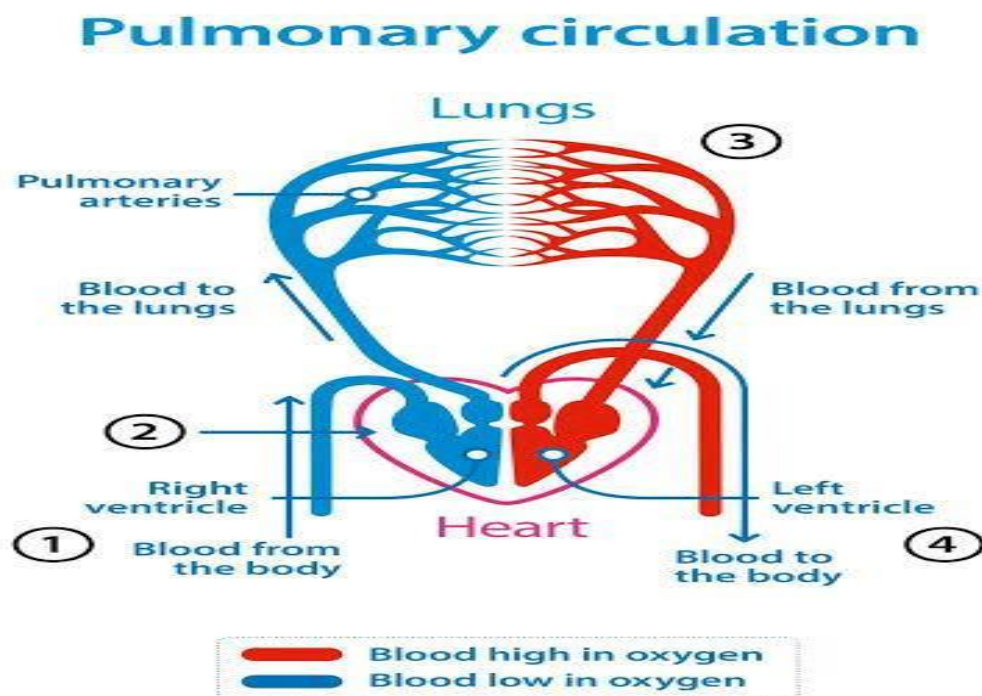
5. Veins: Thinner walled (3 layers), large diameter vessels for returning blood (as a volume) back to heart with low pressure.



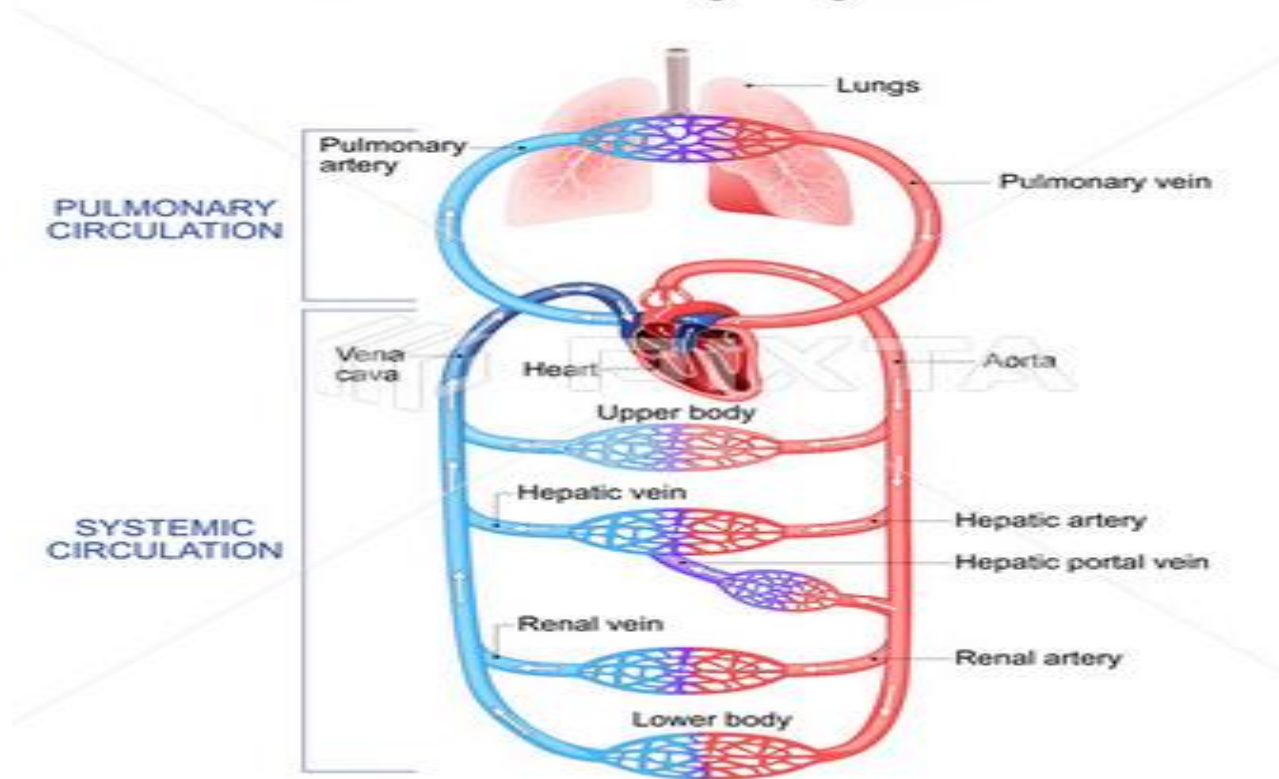
Circulatory pathways :

The vascular system has two distinct circulations:

- **Pulmonary circulation:** short loop that runs from the **heart** to the lungs and back to the **heart**
- **Systemic circulation :** routes through a long loop to all parts of the body and returns to the heart



Circulatory system



Blood pressure,

Arterial blood pressure consists of several distinct components—systolic and diastolic pressures, pulse pressure, and mean arterial pressure. The systemic arterial blood pressure in the normal healthy young adult is 110–120 mmHg **systolic** and 70–80 mmHg **diastolic**. The systolic pressure indicates the arterial pressure resulting from the ejection of blood during ventricular contraction, whereas the diastolic pressure represents the arterial pressure of blood during ventricular relaxation. These values change with age, being lower in infants and children than in adults.

Blood pressure is affected by several factors :

- 1. Peripheral resistance**
- 2. Vessel elasticity**
- 3. Blood volume**
- 4. Cardiac output**

Peripheral resistance:

One of the main factors that affect blood pressure is Peripheral resistance. Blood cells and plasma encounter resistance when they contact blood vessel walls. If resistance when they contact blood vessel walls. If resistance increases, then more pressure is needed to keep blood moving. Three main source of peripheral resistance:

- Blood vessel diameter**
- Blood viscosity**
- Total vessels length**