

# Blood Vessels

The vascular system consists of a network of blood vessels that carry blood throughout the body. As the path of the blood moves further from the heart, the vessels get smaller in size. The four main blood vessels are as follows:

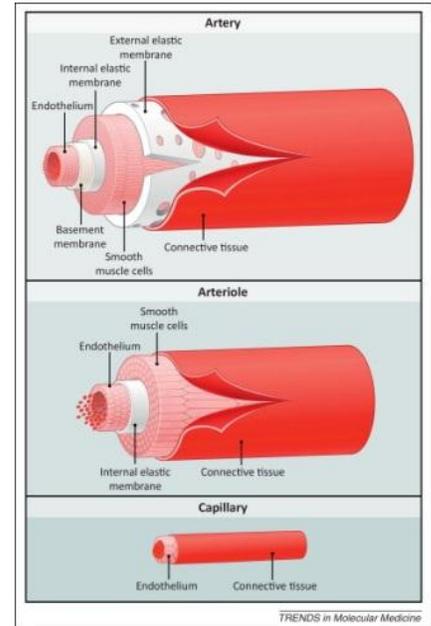
## 1. Arteries

- Thick muscular, elastic and contractile walls
- Carry blood under pressure **away** from the heart
- Location where blood pressure is measured
- E.g. Carotid, brachial, femoral, radial, etc.

## 2. Arterioles

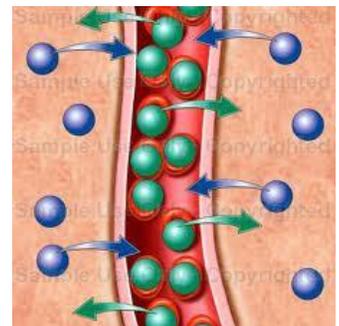
- Smaller than arteries, but still contain thick walls
- Assist in regulation of blood distribution (chemical and nerves)
- Lined by rings of smooth muscle
  - **Vasoconstrict** = smaller = contraction
  - **Vasodilate** = bigger = relaxation

Example: During exercise, the arterioles that supply blood to the involved muscles would be open (dilate) by local chemical changes to increase the blood flow. At the same time, the arteriole that supply blood to the intestine would constrict, reducing the blood flow to this organ.



## 3. Capillaries

- Walls are 1 cell thick and 1 cell in diameter (the smallest of the vessels in the body).
- The main function of the cardiovascular system is called **Gas Exchange**:
  - The area where blood releases oxygen  $O_2$  and picks up carbon dioxide  $CO_2$  through a process called diffusion. (concentration levels)



## 4. Veins

- Have thin walls and limited elasticity and contractility
- Carry blood back to the heart under low pressure against gravity, and become larger as they move away from the capillaries.
- Veins can dilate and contract in order to ensure enough blood returns to the heart.

## A processes that ensure the return of blood to the heart

a. **Skeletal Pump:** With each contraction of the skeletal muscle, blood is pushed back toward the heart. The one way valves ensure that the blood does not return against the flow.

- **Varicose valves** assist with this process veins get larger as they progress towards the heart (largest = vena cava)
- **Varicose Veins** is the weakening of the vein walls as they lose their elasticity veins become longer and wider and valve cusps separate

