Arteries:

- Carry blood **away** from the heart (A = away)

- Have **thick walls** that can stand high blood pressure (BP)

- Walls made up of 3 layers

    - Inner layer - smooth to reduce friction

    - Smooth muscle layer - allows arteries to handle high BP

    - Connective tissue layer

- Arteries get smaller and become **arterioles**

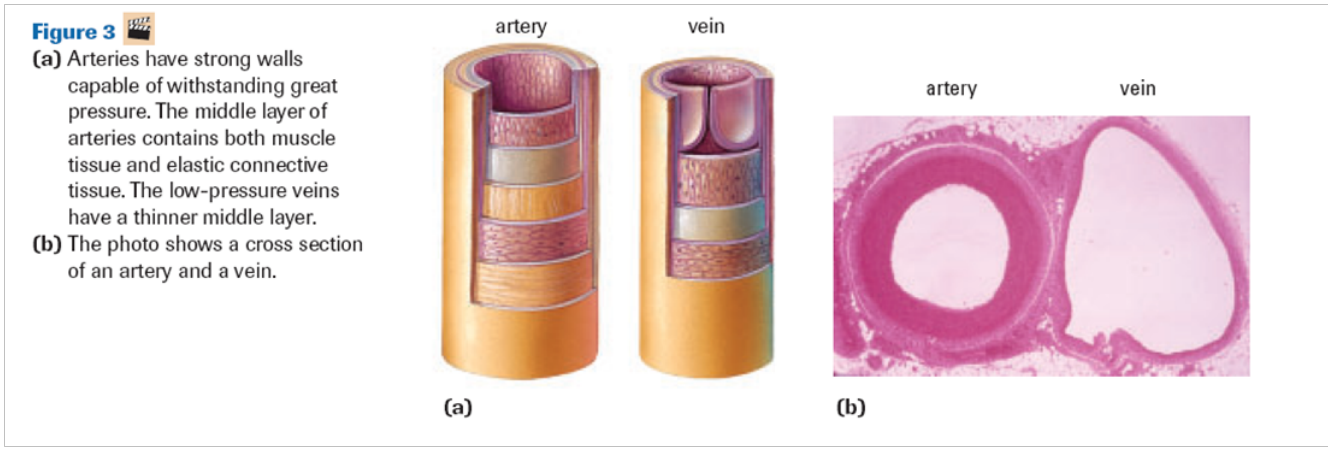


Figure 3
(a) Arteries have strong walls capable of withstanding great pressure. The middle layer of arteries contains both muscle tissue and elastic connective tissue. The low-pressure veins have a thinner middle layer.
(b) The photo shows a cross section of an artery and a vein.

- your **pulse** that you feel in your wrist or neck is the artery expanding as a rush of blood flows through it

- your autonomic nervous system can control the size of your arteries by causing the muscle layer to expand or contract

- **vasodilation** refers to the relaxation of the muscle layer which expands the size of the artery

- **vasoconstriction** refers to the contraction of the muscle layer which decreases the size of the artery

Capillaries

- Arteries branch and get smaller and eventually lead to capillaries

- **Sphincter** muscles control the flow of blood from arterioles into capillaries

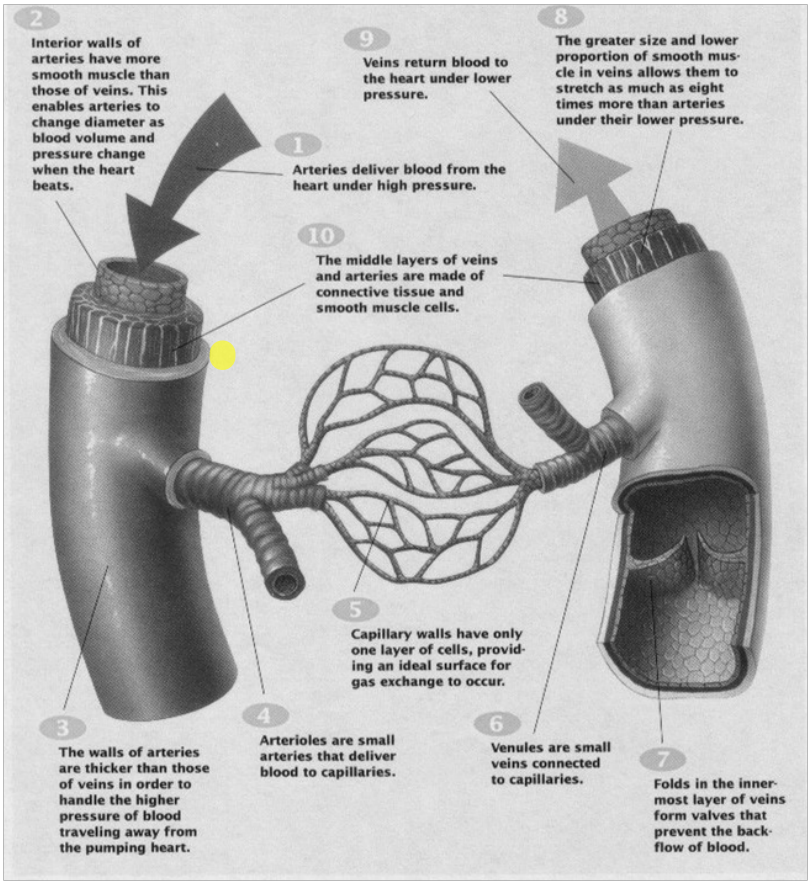
- Capillaries are composed of a single layer of cells

- Capillaries are the sites of fluid and gas exchange between blood and body cells

- Oxygen diffuses from the blood into the surrounding tissues through the thin walls of the capillaries into the body cells

- B/c they are only one cell thick, capillary beds are easily destroyed

    - High blood pressure or any impact, such as that caused by a punch, can rupture the thin-layered capillary



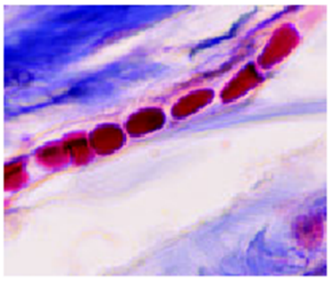


Figure 6
Red blood cells in a capillary. Notice that the capillary is only wide enough for cells to pass through one at a time.

Veins

- Capillaries merge and become progressively larger vessels, called **venules**

- Venules come together into **veins**

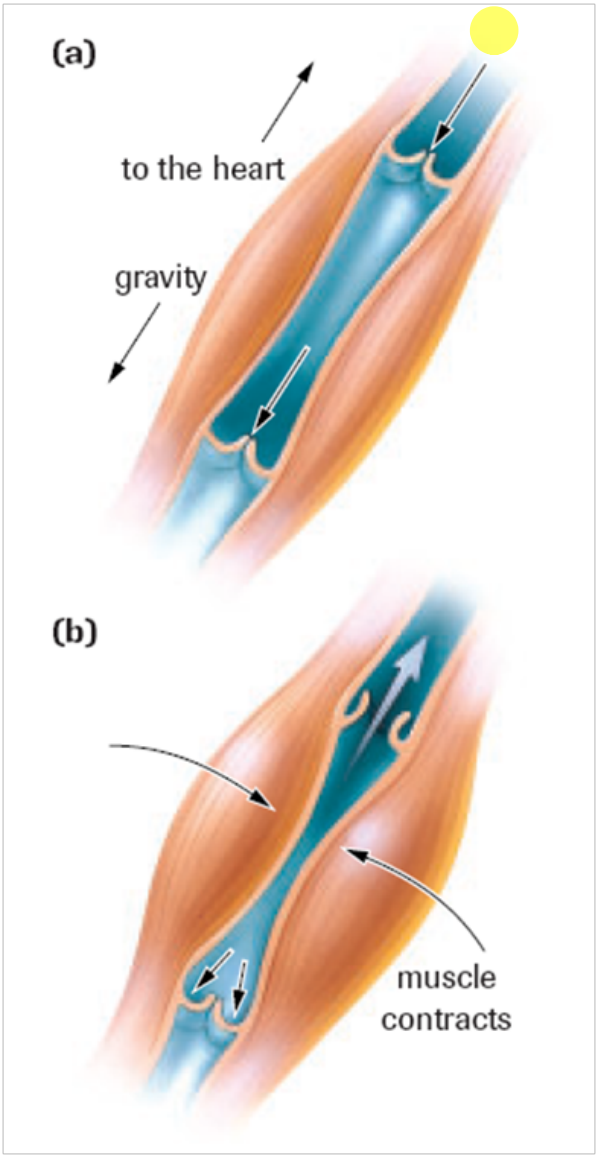
- Veins have thinner walls than arteries

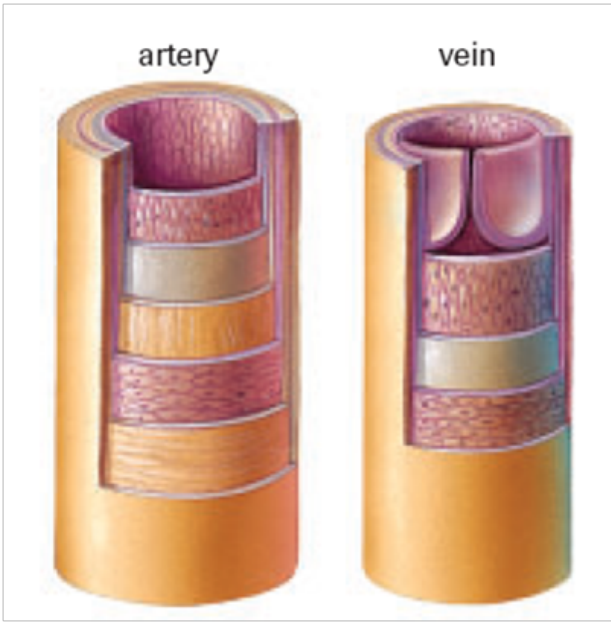
- By the time blood reaches veins, blood pressure is much less than in arteries. This makes it difficult to get blood back to the heart.

- To solve this problem, veins have **one-way valves** that force blood to keep moving along

- The valves open in one direction, steering blood toward the heart. They do not allow blood to flow back in the other direction

- **Skeletal** muscles also help squeeze veins and push blood along them





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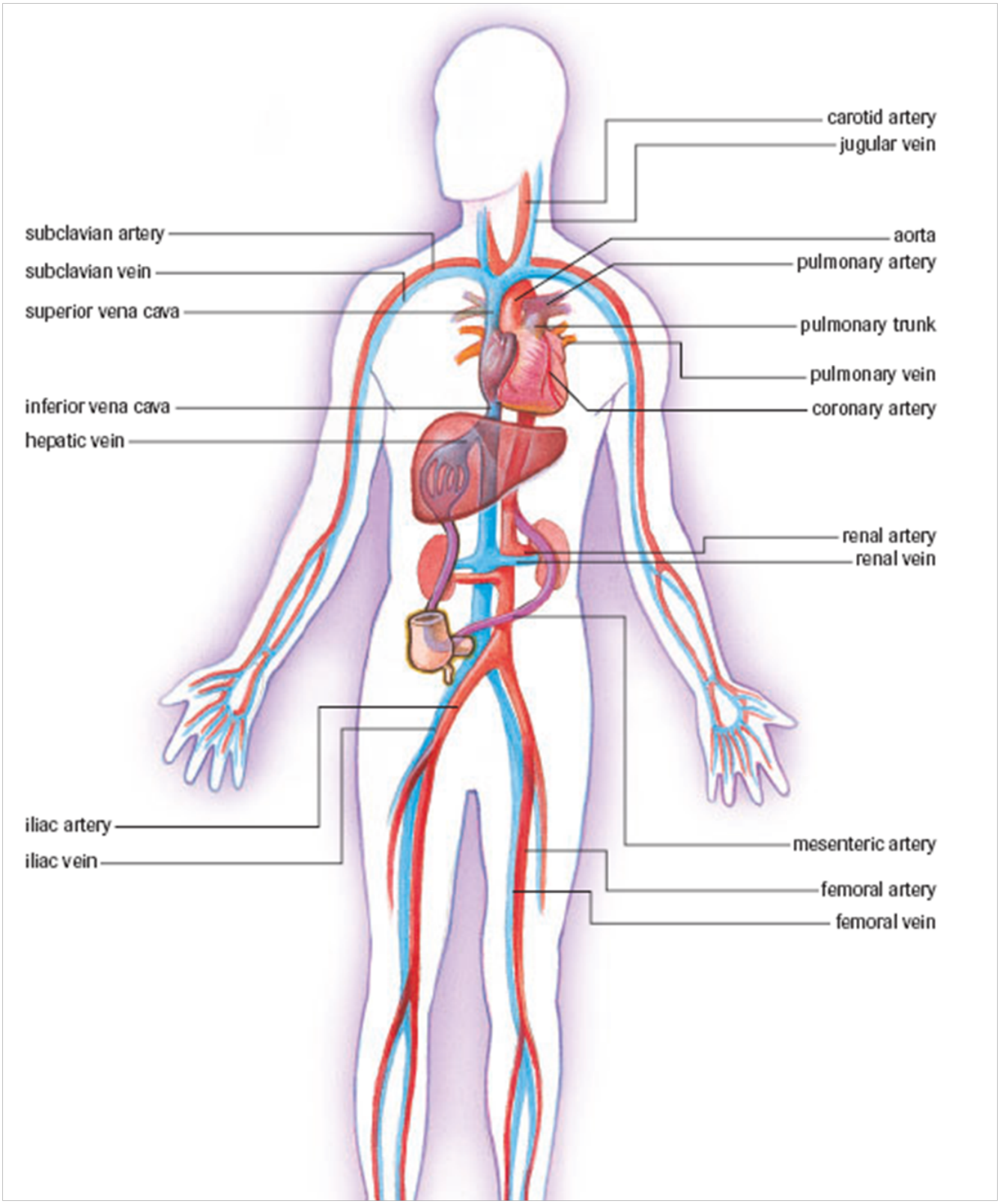

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