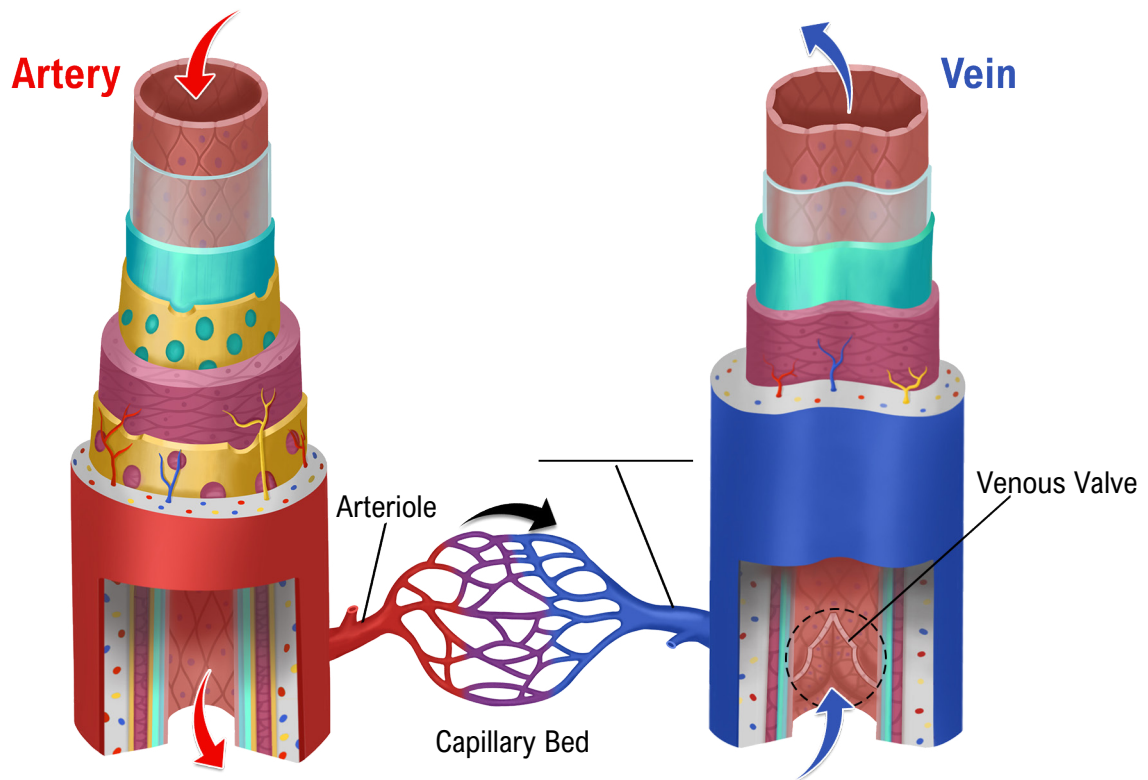


## TOPIC: VEINS

### Introduction To Veins

- ◆ Recall: **Veins** are blood vessels that carry blood \_\_\_\_\_ the heart.
  - Have all 3 tunics but tend to have \_\_\_\_\_ walls & \_\_\_\_\_ lumens compared to arteries.
  - Tunica \_\_\_\_\_ is generally the *thickest* tunic in veins.
  - Average blood pressure is *lower*, so some veins have *venous* \_\_\_\_\_ preventing backflow of blood.
- ◆ **Venules:** \_\_\_\_\_ veins that collect blood from capillaries & converge to form larger veins.



### **EXAMPLE**

Which of the following statements about veins and venules is true?

- a) There are significantly more venules than veins in the body.
- b) Venules have a smaller diameter than veins.
- c) Venules always converge into veins.
- d) All of the above are true.

## TOPIC: VEINS

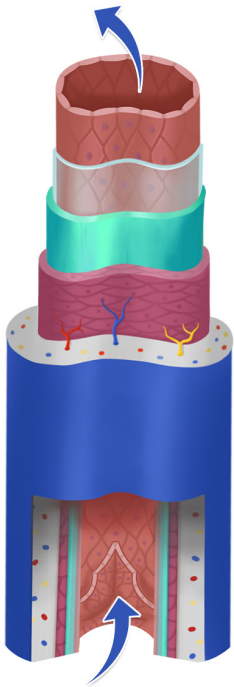
### PRACTICE

A major difference between venules and arterioles is that:

- a) The smallest arterioles consist of only one layer (tunic), while the smallest venules have all 3 layers (tunics).
- b) Some arterioles make direct contact with capillaries, but no venules do.
- c) Arteries deliver blood to capillaries while venules collect blood from capillaries.
- d) Arteries collect blood from capillaries while venules deliver blood to capillaries.

### Arteries vs. Veins

Here is a comparison table showing the key differences between arteries & veins:

|  | Arteries                                                 | Veins                                                 |  |
|------------------------------------------------------------------------------------|----------------------------------------------------------|-------------------------------------------------------|--------------------------------------------------------------------------------------|
|                                                                                    | Carry blood _____ from heart                             | Carry blood towards the heart                         |                                                                                      |
|                                                                                    | Carry Oxygenated Blood (except for Pulmonary Arteries)   | Carry Deoxygenated Blood (except for Pulmonary Veins) |                                                                                      |
|                                                                                    | Usually Brighter Red                                     | Usually Darker Red or Purple                          |                                                                                      |
|                                                                                    | Thick wall, contains higher proportion of _____          | Thin wall, contains less muscle & elastin             |                                                                                      |
|                                                                                    | May have internal/external elastic laminae               | Always lack internal/external elastic laminae         |                                                                                      |
|                                                                                    | Narrower lumen                                           | _____ lumen                                           |                                                                                      |
|                                                                                    | Does not have valves                                     | May have venous valves to prevent _____ flow          |                                                                                      |
|                                                                                    | _____ blood pressure (receive blood directly from heart) | _____ blood pressure (deliver blood back to heart)    |                                                                                      |

## **TOPIC: VEINS**

### **EXAMPLE**

Arteries need to have \_\_\_\_\_ walls than veins to prevent \_\_\_\_\_ under high pressure.

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- |                       |                       |
|-----------------------|-----------------------|
| a) Thinner; backflow. | c) Thicker; backflow. |
| b) Thinner; collapse. | d) Thicker; collapse. |

### **PRACTICE**

Which of the following is *not* a reason that veins need valves to prevent backflow, but arteries do not?

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- a) Arteries have thicker walls than veins, providing a natural resistance to backflow.
- b) Veins require valves to prevent gravity from causing backflow when blood is transported up to the heart.
- c) Arteries have higher blood pressure, reducing the likelihood of backflow when they transport blood upward.
- d) All of the above are correct reasons for veins requiring valves.

### **PRACTICE**

Which of the following statements regarding arteries and veins is true?

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- a) Arteries have less smooth muscle than veins.
- b) Arteries always carry oxygenated blood, while veins always carry deoxygenated blood.
- c) At any given time, there is more blood in the veins than in the arteries.
- d) There tends to be a lower blood pressure in arteries than in veins.