

### CIRCULATION OF A RED BLOOD CELL

I am tired. I am a red blood cell that has journeyed through this maze of blood vessels for the past 100 days. I am on my way back to the PUMP factory, carrying with me carbon dioxide thrown out as waste by a muscle cell.

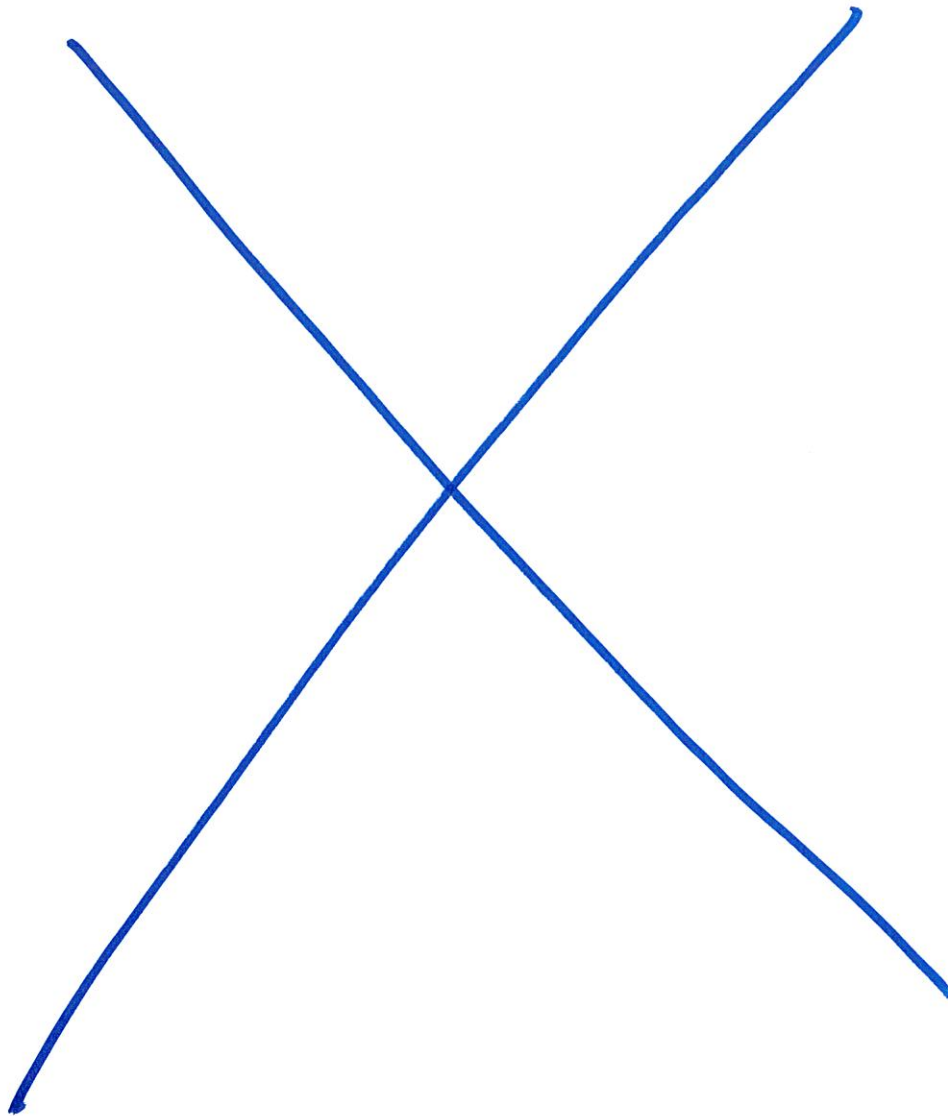
I will be glad to get there to unload this baggage, and then I will pick up oxygen for one of my last trips. The major road from the muscle is called the \_\_\_\_\_, \_\_\_\_\_, which goes to the right upper room or \_\_\_\_\_ at the factory. After getting dumped there, I feel the walls start to vibrate and close around me. I get pushed through a door marked \_\_\_\_\_. I am now in the lower room called the \_\_\_\_\_. Just as I get comfortable I hear that same sound again, and these walls start to move from the other side, pushing me upward through another door, which looks like a half moon. This one is called the \_\_\_\_\_ valve. Now I find myself pushed through the \_\_\_\_\_ tunnel, which goes from the heart to a spongy-looking building complex with lots of wings; this is known as the \_\_\_\_\_ factory.

When I arrive I am sent to a small chamber, and there I drop off my \_\_\_\_\_. "Wait," the supervisor calls out. "You have to take this little fellow \_\_\_\_\_ back to the PUMP factory with you." As I leave the buildings, I am pointed in the direction of a maze of four highways also known as the \_\_\_\_\_. I am told that any of those roads will get me back to the PUMP factory.

I choose the least-crowded lane and land back at the PUMP factory on the left side of the building. I am now in the \_\_\_\_\_ chamber. OH! NO! It is happening all over again. The room starts to shake, the walls start closing in, and my little friend Oxy and I are pushed through a door marked \_\_\_\_\_ valve. This one has a funny top to it; it looks like a bishop's \_\_\_\_\_. Now, here I am, in the \_\_\_\_\_, and before you know it the walls are pushing at me again. Up, up, and away through the \_\_\_\_\_ valve. Oxy and I are in a bigger tunnel this time; it is called the \_\_\_\_\_. At the end of this road is a curve with three major arteries coming off it; we will take the road going south, marked \_\_\_\_\_.

This is my route back to the \_\_\_\_\_, taking Oxy along. I am so tired of getting pushed and shoved, I think I will just drop Oxy off and stay there and retire to the recycle plant.

Can you guess the name of the pump? \_\_\_\_\_



**B.** Fill in the blanks to complete the following statements.

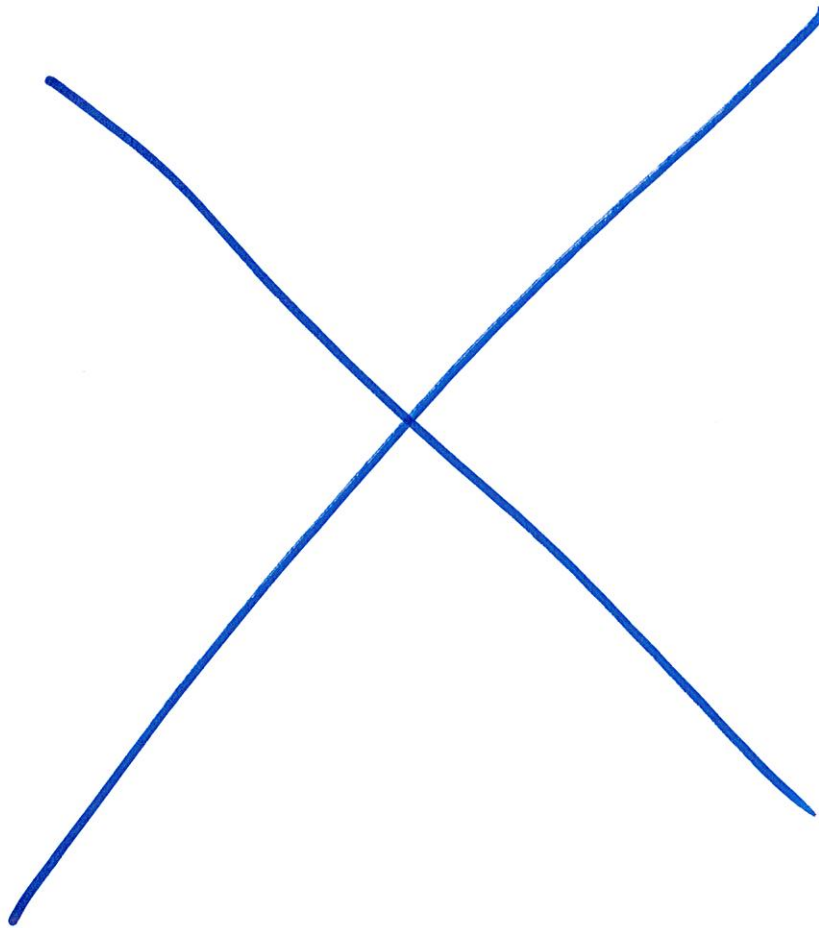
1. After the blood goes through the cardiopulmonary circulation, the blood then goes to the major artery, the \_\_\_\_\_.
2. The first branch is the \_\_\_\_\_ artery, which takes blood to the \_\_\_\_\_. The aorta now forms an arch.
3. The right branch off the aortic arch is the \_\_\_\_\_ artery, which subdivides into the \_\_\_\_\_ artery to the shoulder and the \_\_\_\_\_ artery to the \_\_\_\_\_ and \_\_\_\_\_.
4. The left branch off the aortic arch has two arteries, the left \_\_\_\_\_ artery to the \_\_\_\_\_ and \_\_\_\_\_ and the subclavian artery to the \_\_\_\_\_.

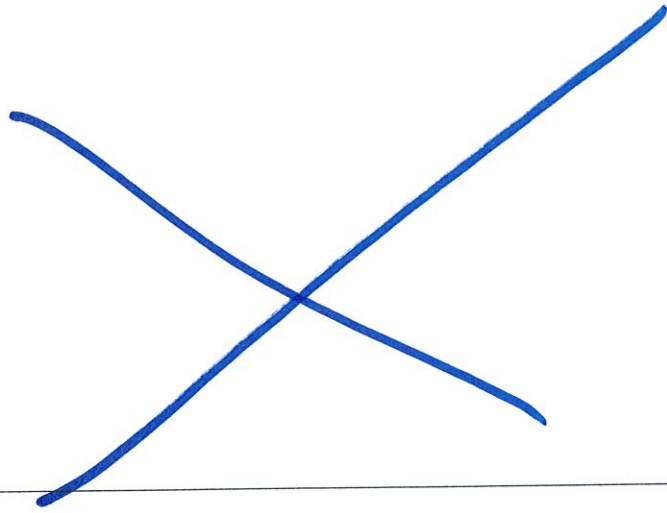
5. The arch turns downward and is called the descending aorta with the following arteries coming off as branches: the \_\_\_\_\_ artery to the chest cavity and the celiac artery to the \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_.

**C.** Multiple choice. Circle the best answer.

- The pulmonary artery carries deoxygenated blood from the
  - right atrium to the lungs.
  - right ventricle to the lungs.
  - lungs to the left atrium.
  - left ventricle to all parts of the body.
- The outer layer of the arteries is the
  - tunica adventitia.
  - tunica media.
  - tunica interna.
  - tunica intima.
- The ability of the arteries to withstand a sudden large increase in pressure is accomplished by the
  - elasticity of the smooth muscles.
  - muscle cells arranged in a circular pattern.
  - smooth lining of the tunica interna.
  - tunica media.
- The arteries' ability to dilate and constrict is accomplished by
  - elasticity of the smooth muscles.
  - muscle cells arranged in a circular pattern.
  - smooth lining of tunica interna.
  - tunica externa.
- The capillaries are branches of the
  - metarterioles.
  - metavenuoles.
  - arterioles.
  - venules.
- The thinnest of the capillary walls allows
  - only oxygen out of the capillary.
  - only metabolic wastes out of the capillary.
  - only nitrogenous material out of the capillary.
  - only oxygen, metabolic wastes, nitrogenous and carbon dioxide out of the capillary.
- Blood flow through the capillaries is controlled by the
  - smooth muscles of adventitia.
  - precapillary sphincters.
  - circular muscles in the media.
  - skeletal muscles.

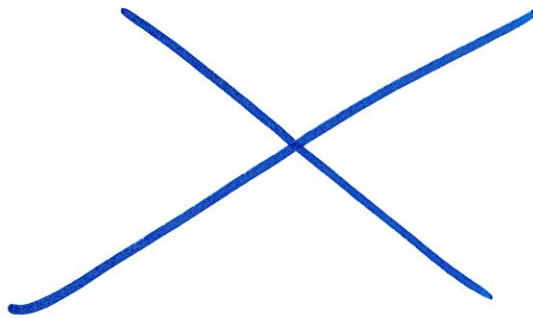
8. The major structural difference between arteries and veins is that in the veins, the
  - a. walls are thicker.
  - b. valves are present.
  - c. walls are the same, valves are present.
  - d. walls are thinner, valves are present.
9. The contractions of skeletal muscle
  - a. help capillaries circulate blood.
  - b. assist in venous return.
  - c. assist in arterial distribution.
  - d. do not have a role in circulation.
10. All of the following activities assist in the circulation of blood except
  - a. walking for thirty minutes.
  - b. running for five minutes.
  - c. sitting at a computer.
  - d. gardening.



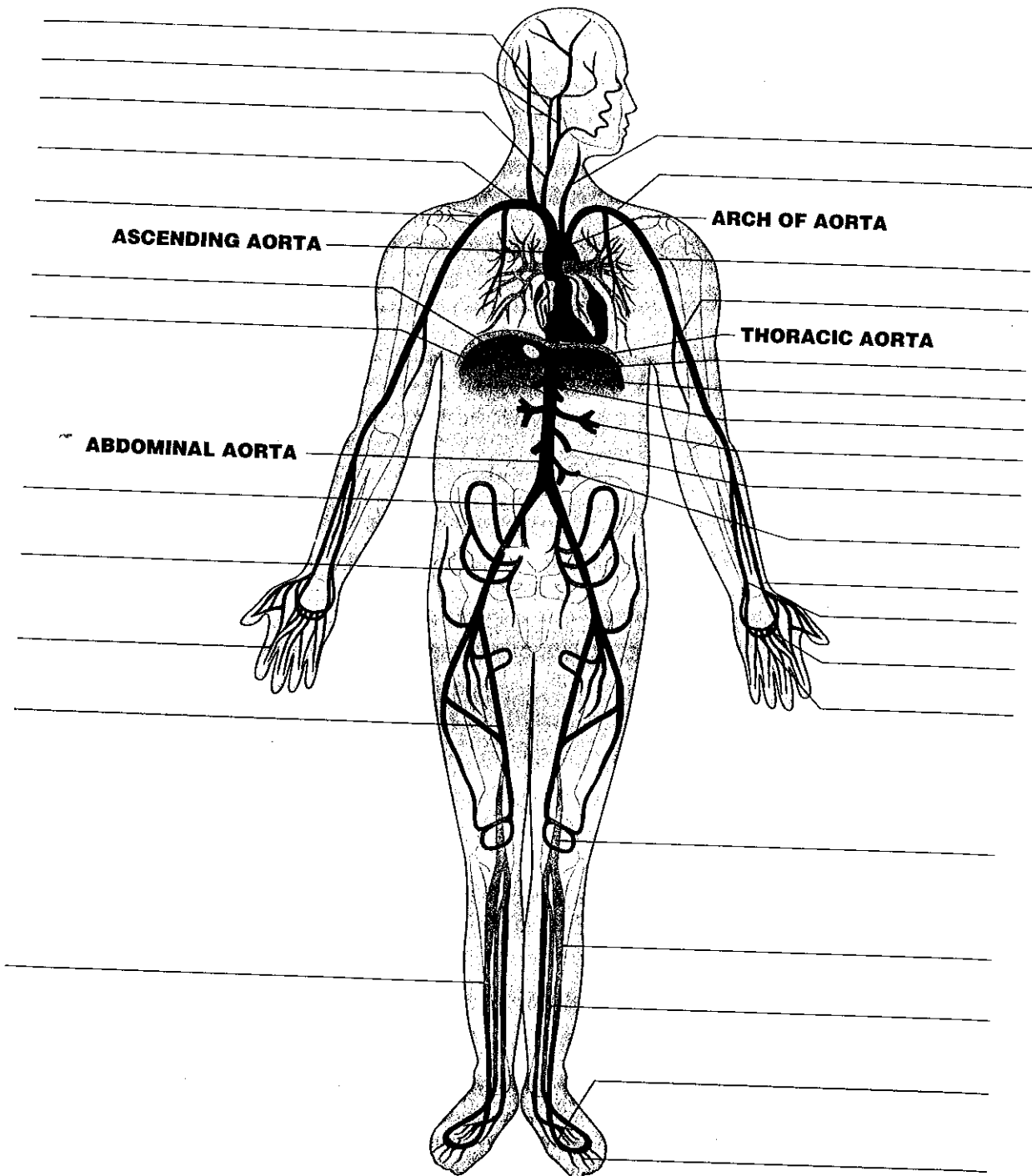


L. Match the disorder in Column A with the explanation in Column B

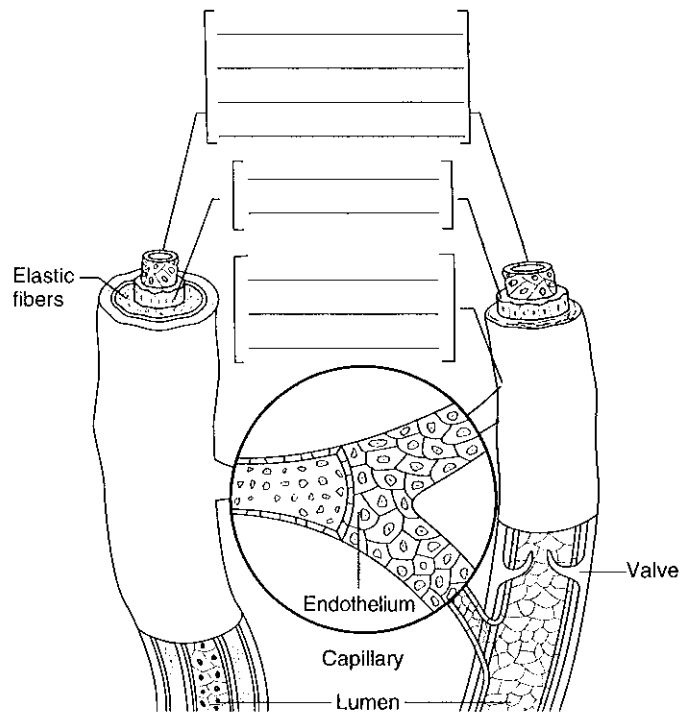
Column A	Column B
_____ 1. aneurysm	a. cramping in buttocks while walking
_____ 2. phlebitis	b. bleeding in blood vessels in brain
_____ 3. hemorrhoids	c. fatty buildup in artery
_____ 4. cerebral hemorrhage	d. ballooning of an artery
_____ 5. varicose veins	e. inflammation of veins
_____ 6. embolism	f. bluish discoloration in skin
_____ 7. peripheral vascular disease (PVD)	g. death of body tissue
_____ 8. claudication	h. traveling blood clot
_____ 9. cyanosis	i. varicose veins in the walls of the rectum
_____ 10. gangrene	j. swollen veins
	k. loss of elasticity
	l. blockage of artery in legs



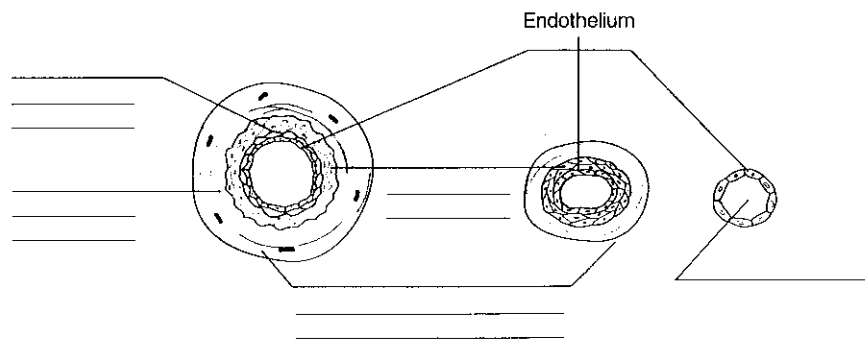
E. Label the arteries in the following diagram.



**F.** Label the diagram of the different types of blood vessels and their layers. Color the arteries red, the veins blue and the capillaries yellow.

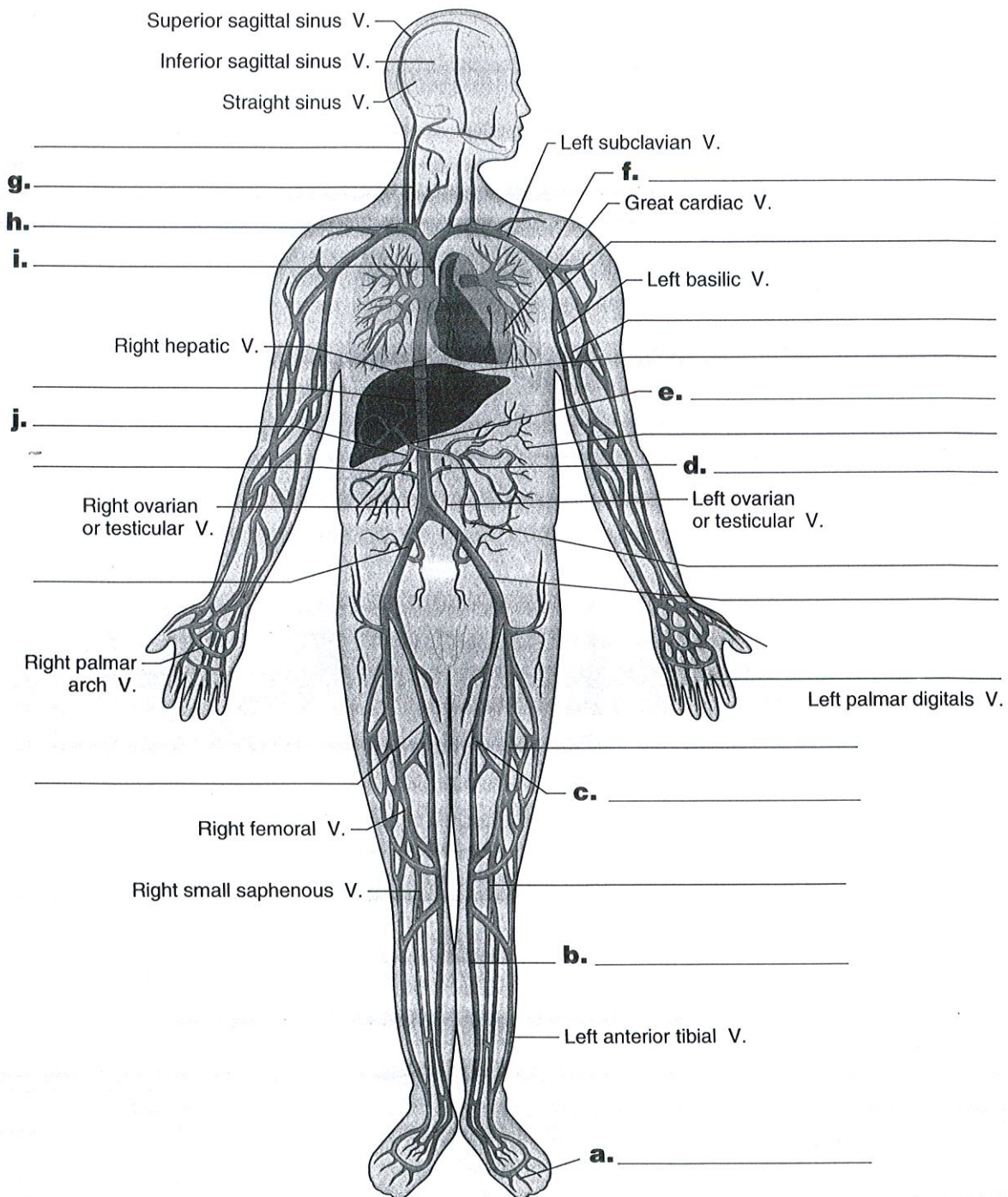


(A) Types of blood vessels and their general structure



(B) Cross section of blood vessels

**G.** Label the veins in the following diagram.

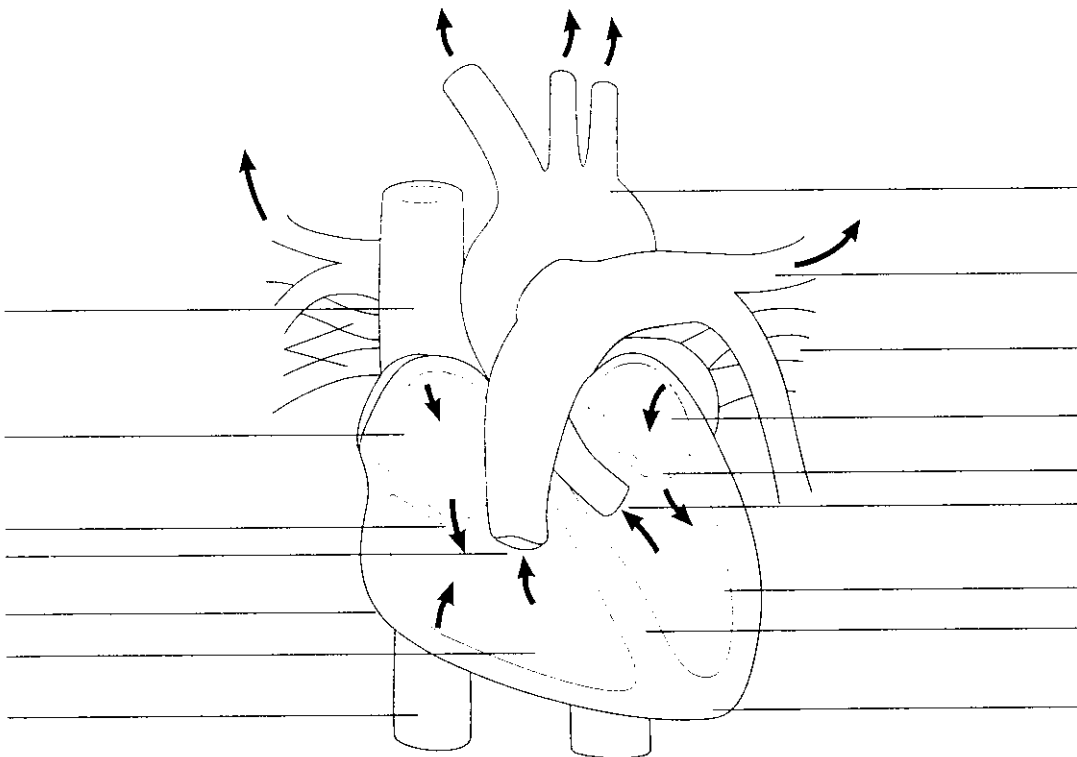


**H.** Using the labels from the previous diagram, match the correct letter with each statement.

- \_\_\_\_\_ 1. Affected in varicose veins
- \_\_\_\_\_ 2. Furthest branch in feet
- \_\_\_\_\_ 3. Largest vein in body
- \_\_\_\_\_ 4. From the kidney



11. Label the entire heart. Color the structures blue or red according to the type of blood they carry or hold.



**E.** Circulation. Use the words in the list to complete the following story on circulation.

inferior vena cava  
 right atrium  
 tricuspid valve  
 lung  
 oxygen  
 left atrium  
 mitre  
 aortic semilunar  
 descending aorta

right ventricle  
 pulmonary semilunar valve  
 pulmonary artery  
 carbon dioxide  
 pulmonary veins  
 bicuspid valve  
 left ventricle  
 aorta  
 liver