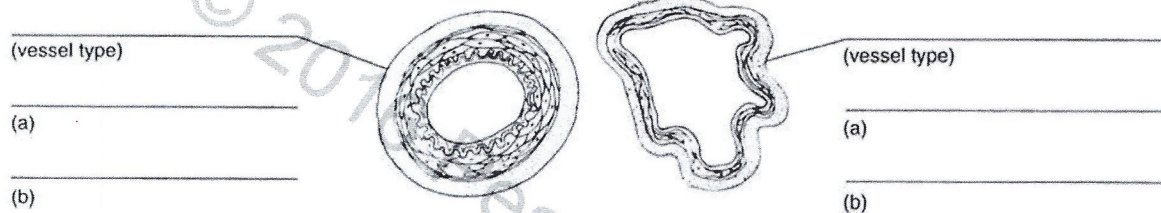


Anatomy of Blood Vessels

Microscopic Structure of the Blood Vessels

1. Cross-sectional views of an artery and of a vein are shown here. Identify each; on the lines to the sides, note the structural details that enabled you to make these identifications:



Now describe each tunic more fully by selecting its characteristics from the key below and placing the appropriate key letters on the answer lines.

Tunica intima _____ Tunica media _____ Tunica externa _____

Key:

- a. innermost tunic
- b. most superficial tunic
- c. thin tunic of capillaries
- d. especially thick in elastic arteries
- e. contains smooth muscle and elastin
- f. has a smooth surface to decrease resistance to blood flow

2. Why are valves present in veins but not in arteries? _____

3. Name two events *occurring within the body* that aid in venous return.

_____ and _____

4. Why are the walls of arteries proportionately thicker than those of the corresponding veins? _____

Major Systemic Arteries and Veins of the Body

5. Use the key on the right to identify the arteries or veins described on the left.

Key: a. anterior tibial

- _____ 1. the arterial system has one of these; the venous system has two
- _____ 2. these arteries supply the myocardium
- _____, _____ 3. two paired arteries serving the brain
- _____ 4. longest vein in the lower limb
- _____ 5. artery on the dorsum of the foot checked after leg surgery
- _____ 6. serves the posterior thigh
- _____ 7. supplies the diaphragm
- _____ 8. formed by the union of the radial and ulnar veins
- _____, _____ 9. two superficial veins of the arm
- _____ 10. artery serving the kidney
- _____ 11. veins draining the liver
- _____ 12. artery that supplies the distal half of the large intestine
- _____ 13. drains the pelvic organs
- _____ 14. what the external iliac artery becomes on entry into the thigh
- _____ 15. major artery serving the arm
- _____ 16. supplies most of the small intestine
- _____ 17. join to form the inferior vena cava
- _____ 18. an arterial trunk that has three major branches, which run to the liver, spleen, and stomach
- _____ 19. major artery serving the tissues external to the skull
- _____, _____, _____ 20. three veins serving the leg
- _____ 21. artery generally used to take the pulse at the wrist

- b. basilic
- c. brachial
- d. brachiocephalic
- e. celiac trunk
- f. cephalic
- g. common carotid
- h. common iliac
- i. coronary
- j. deep artery of the thigh
- k. dorsalis pedis
- l. external carotid
- m. femoral
- n. fibular
- o. great saphenous
- p. hepatic
- q. inferior mesenteric
- r. internal carotid
- s. internal iliac
- t. phrenic
- u. posterior tibial
- v. radial
- w. renal
- x. subclavian
- y. superior mesenteric
- z. vertebral

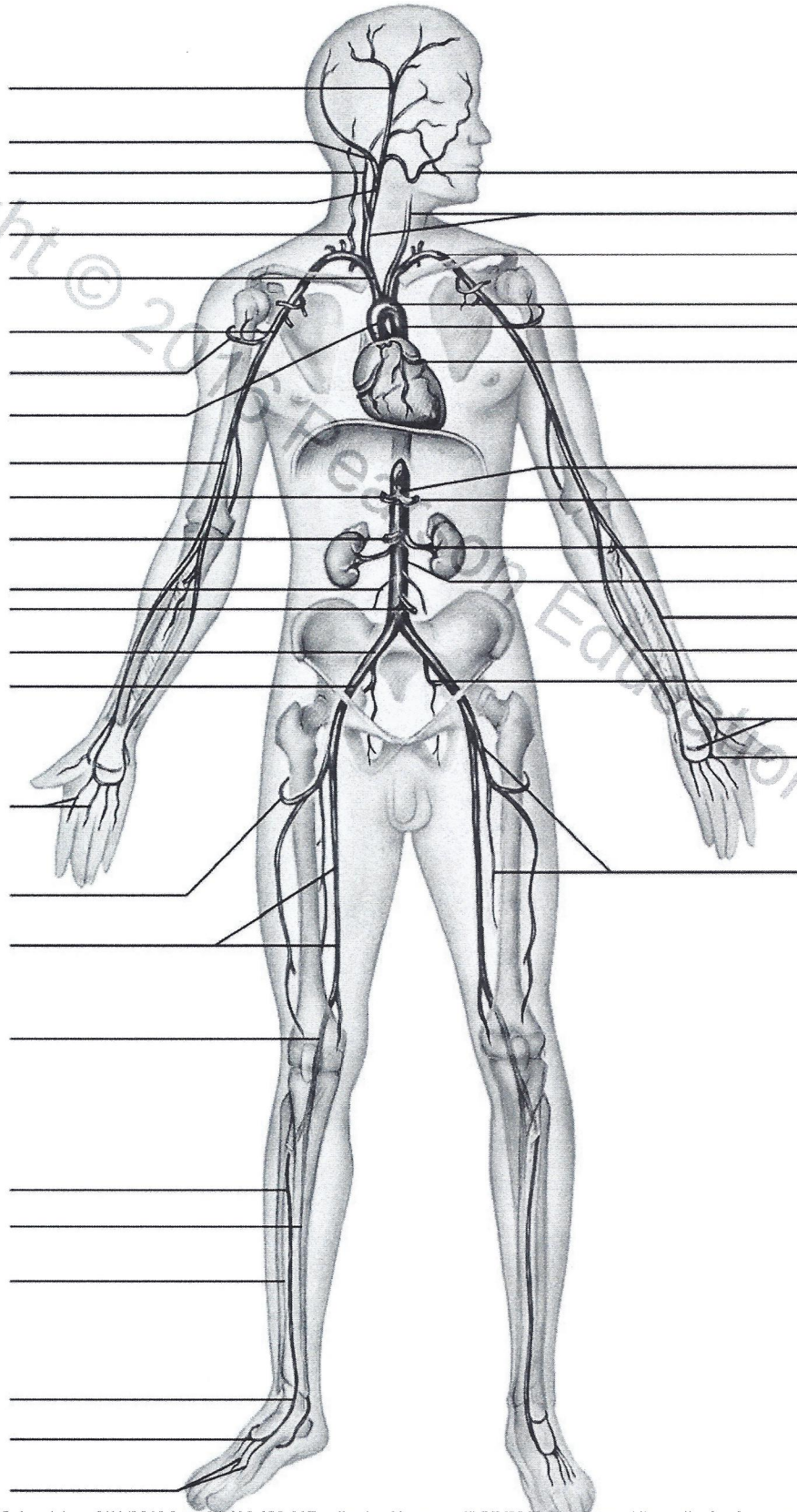
6. What is the function of the cerebral arterial circle (circle of Willis)?

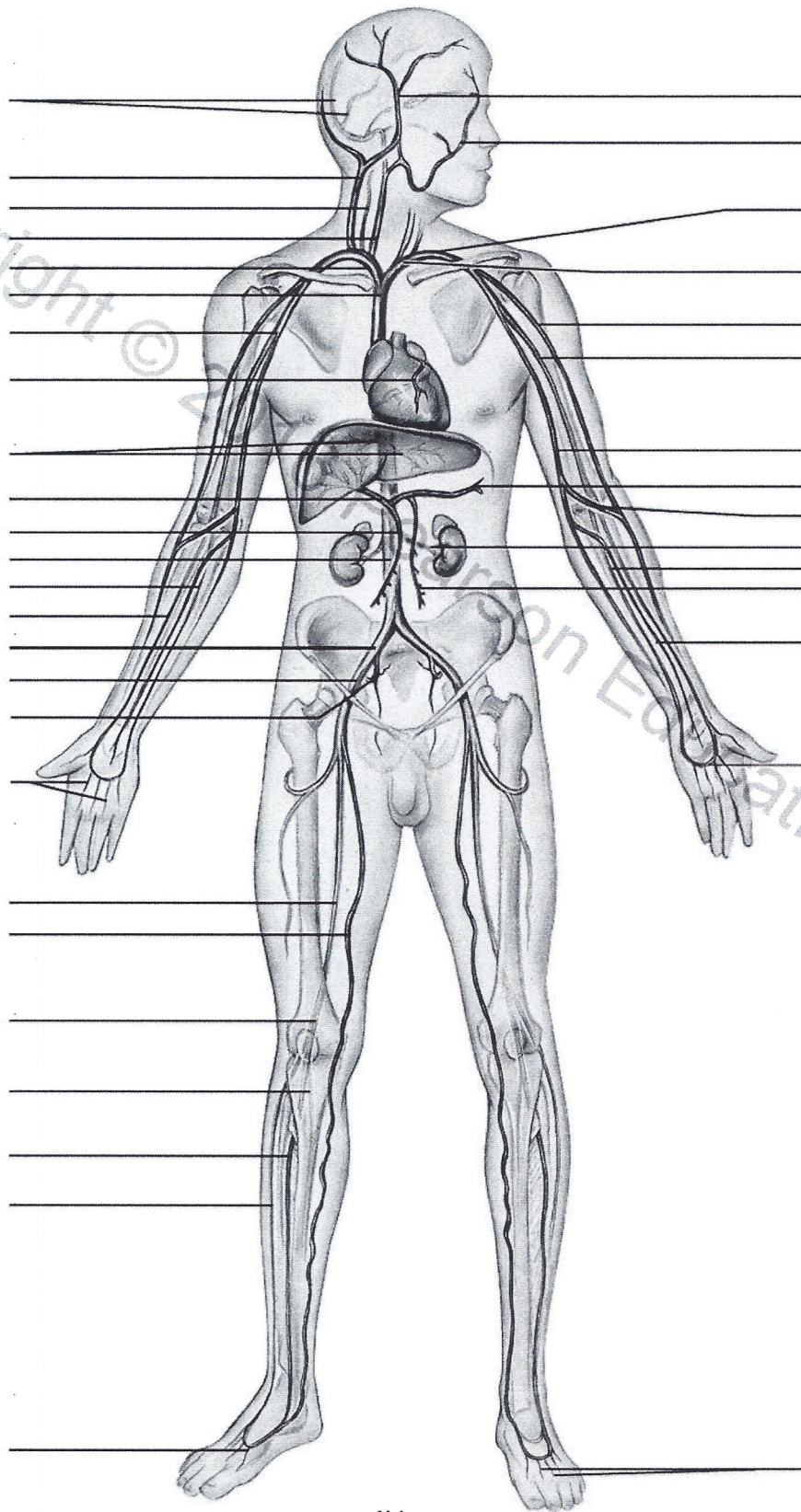
7. The anterior and middle cerebral arteries arise from the _____ artery.

They serve the _____ of the brain.

8. Trace the pathway of a drop of blood from the aorta to the left occipital lobe of the brain, noting all structures through which it flows. _____

9. The human arterial and venous systems are diagrammed on this page and the next. Identify all indicated blood vessels.





Veins

10. Trace the blood flow for each of the following situations.

a. from the capillary beds of the left thumb to the capillary beds of the right thumb: _____

b. from the mitral valve to the tricuspid valve by way of the great toe: _____

Pulmonary Circulation

11. Trace the pathway of a carbon dioxide gas molecule in the blood from the inferior vena cava until it leaves the bloodstream. Name all structures (vessels, heart chambers, and others) passed through en route.

12. Trace the pathway of oxygen gas molecules from an alveolus of the lung to the right ventricle of the heart. Name all structures through which it passes. Circle the areas of gas exchange. _____

13. Most arteries of the adult body carry oxygen-rich blood, and the veins carry carbon dioxide-rich blood.

How does this differ in the pulmonary arteries and veins? _____

14. How do the arteries of the pulmonary circulation differ structurally from the systemic arteries? What condition is indicated by this anatomical difference? _____

Hepatic Portal Circulation

15. What is the source of blood in the hepatic portal system? _____
16. Why is this blood carried to the liver before it enters the systemic circulation? _____
17. The hepatic portal vein is formed by the union of (a) _____, which drains the _____, _____, and (b) _____, which drains the _____ and _____. The _____ vein, which drains the lesser curvature of the stomach, empties directly into the hepatic portal vein.
18. Trace the flow of a drop of blood from the small intestine to the right atrium of the heart, noting all structures encountered or passed through on the way. _____

Fetal Circulation

19. For each of the following structures, first indicate its function in the fetus; and then note its fate (what happens to it or what it is converted to after birth). Circle the blood vessel that carries the most oxygen-rich blood.

Structure	Function in fetus	Fate
Umbilical artery		
Umbilical vein		
Ductus venosus		
Ductus arteriosus		
Foramen ovale		

20. What organ serves as a respiratory/digestive/excretory organ for the fetus? _____

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