

BIO 172
Study Guide Chapter 20
Blood Vessels

1. What are the three tunics of a blood vessel? How do these “tunics” differ in arteries and veins?
2. Arteries are classified as conducting, distributing or resistance vessels.
 - a. What is the function of each type of vessel?
 - b. How is the function of each vessel type suggested by the vessels structure?
3. What is an aneurysm? If an aneurysm never ruptures, is the aneurysm still be a serious problem that can alter the normal physiologic condition?
4. What is the function of a metarteriole? What is the mechanism? Do metarterioles have a “continuous” tunic media?
5. What are chemoreceptors and baroreceptors? Where are they located? Where do the signals from these receptors go?
6. In the circulatory system, where are nutrients and waste products exchanged between the blood and the extracellular space? What is the histology of this vessel? What is the diameter of this vessel?
7. What are the three types of capillaries? How is the function of each capillary suggested by the capillary structure?
8. What is a pedicyte?
9. How is blood distributed in the body when you are in a resting state? How much blood is in muscle capillaries when you are in a resting state?
10. Why are veins called “capacitance vessels”? What type of veins has “venous valves”? Where in the body would you not expect to find venous valves? What is the function of a “skeletal muscle pump”? What is the condition called when the venous valves fail?
11. What is a portal system? Give three examples where you have portal systems in the human body:
12. What is an anastomosis? What is the function of an anastomosis?
13. How do you determine the pulse pressure? Where do you find the greatest pulse pressure? Is there a pulse pressure in veins? (Explain) As you get closer to the venous side of the circulation, what happens to the pulse pressure? Why is this significant?
14. How is peripheral resistance affected by blood viscosity, and the length and radius of a blood vessel? What is the relationship between resistance and either an increase or decrease in any of the variables?

15. What is the “metabolic theory of autoregulation”? What vessels are affected by this mechanism? Is this a positive or negative feedback mechanism?
16. Blood platelets and perivascular tissue secrete vasoactive chemicals in response to trauma, inflammation, and/or exercise which causes local vasodilation. List three vasoactive chemicals involved in this mechanism:
17. Endothelial cells also secrete vasoactive chemicals. List these chemicals and indicate if they are either vasodilators or vasoconstrictors:
18. What type of efferent nerve fibers which originate in the medulla oblongata, innervate the resistance arterioles? What do we call the nuclei in the medulla oblongata that regulate the resistance arterioles? What are the three different stimuli that send afferent signals to the control center in the medulla oblongata?
19. Are precapillary sphincters regulated by nerves?
20. What four hormones affect blood pressure? Explain the mechanism:
21. What are the three different “paths” used by chemicals to pass through a capillary?
22. Diffusion is the most important mechanism across a capillary. What lipid soluble substances are able to diffuse through the capillary plasma membrane? What hydrophobic substances must diffuse through either intercellular clefts or fenestrations?
23. What is transcytosis?
24. At a capillary, two opposing forces move fluid out then back into the capillary. What are these forces called? What is the net volume exchange between the proximal and distal end of the capillary? What type of vessels “recovers” the volume?
25. Define edema and explain the three forces that can contribute to this condition:
26. What are the five forces that move the venous blood back to the heart?
27. Why are neurosurgeons concerned about air embolisms when operating near the cerebral dural sinuses?
28. What is circulatory shock? What are the two general categories of circulatory shock? Into what category would you put anaphylactic shock?
29. Explain the responses to circulatory shock in terms of either a negative or positive feedback mechanism?