

Blood Vessels and Hemodynamics

Chapter Study Guide (C20)

1. What are the three tunics of a blood vessel? Fig 20.2
2. How are the “tunics” in arteries and veins different?
3. What is an aneurysm? If an aneurysm does not rupture, then may it still be a serious problem? Explain (Hint: CNS)
4. What is the structure of a capillary? What occurs at the capillary?
5. Arteries are classified as either conducting (elastic), distributing (muscular), or resistance (small). What is the function of each vessel?
6. What is special about arterioles? Significance?
7. Where is the control center that regulates the muscle contraction in arterioles? What is this phenomena called?
8. What is the structure and function of the three different capillaries? Give example where you can find these capillaries in the human body. Fig 20.7
9. What is a portal system? Fig 20.9
10. What is an anastomosis? Why are these important? There are many in the myocardium!
11. What is the structure of a capillary bed? Define the following function of these structures: arteriole, metarteriole, thoroughfare channel, venule, precapillary sphincter, capillaries.
12. What molecule regulates the precapillary sphincter to allow blood to flow of blood into the capillary bed? What is the name of the theory that describes this phenomena?
13. Are precapillary sphincters regulated by nerves? Explain
14. What are chemoreceptors and baroreceptors? Where are they located? Functions? Fig 20.3
15. In the circulatory system, where are nutrients and waste products exchanged between blood and the interstitial space?
16. What is the diameter of a typical capillary? What is the maximum distance between a cell and the capillary?
17. How is blood distributed in the body in a resting state? When exercising? Fig 20.14
18. Why are veins called “blood reservoirs” or “capacitance vessels”?
19. What venous vessel structure in the arms and legs help to return blood to the heart?

20. What is the skeletal muscle pump? Structure and Function? (Fig 20.19)
21. What condition will occur if the venous valves fail?
22. How does the pressure on the venous side of circulation compare to the arterial side? Where might you find “negative pressure”? (hint – think about gravity and the location of the heart) Why might this be dangerous?
23. What is the difference between systolic and diastolic blood pressure? How is it expressed?
24. What is pulse pressure?
25. Where do you find the greatest pulse pressure? As you get closer to the venous side of the circulation, what happens to the pulse pressure?
26. Is there a pulse pressure in veins? Why is this significant? (Explain)
27. What three “variables” are able to increase or decrease blood pressure?
28. What hormones affect blood pressure?
29. What is the name of the nuclei in the medulla oblongata that regulates the arterioles?
30. At a capillary, two opposing forces move fluid out of the capillary and 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? Fig 20.17
31. What vessels “recover” excess fluid as it accumulates in the interstitial space? (see lecture slide) Why might this happen? What is this condition called?
32. What is the relationship between cross-sectional area and blood velocity across the circulatory system? Where does blood flow the “slowest”? What is the significance?
33. What is shock?
34. What is the difference between hypovolemic, cardiogenic, vascular, and obstructive shock? What is anaphylactic shock?
35. What is syncope?
36. What factors may increase blood pressure?
37. What structural differences are there between the fetal and adult circulatory systems?
38. In what vein will you find blood with the highest concentration of nutrients? What is the name of this vein?