

Chapter 21 / Blood Vessels and Hemodynamics
Chapter Study Guide
Tortora and Derrickson

1. > What are the three tunics of a blood vessel? How are the “tunics” different in arteries and veins?
2. Arteries are classified as either elastic, distributing or resistance vessels. What is the function of each vessel? How is the structure related to function?
3. What is an aneurysm? If an aneurysm never ruptures, is the aneurysm still be a serious problem? Hint: CNS
4. > What is the structure of a metarteriole in the capillary model?
5. > What is the structure and function of the precapillary sphincters? How are they regulated?
6. > What is the function of the thoroughfare channel in the capillary model?
7. What are chemoreceptors and baroreceptors? Where are they located? Functions? Explain
8. > In the circulatory system, where are nutrients and waste products exchanged between blood and the interstitial space?
9. > What are the three different types of capillaries? Give examples where you would find each type of capillary?
10. What is the histology of the most common type of capillary?
11. >What is the diameter of a typical capillary? What is the maximum distance between a cell and capillary?
12. How is blood distributed in the body in a resting state? Fig 21.6
13. Why may you want to think of veins as being “blood reservoirs”? Why are veins called “capacitance vessels”?
14. What force in venous vessels throughout the body helps to return blood to the heart?
15. 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?
16. > Where will you find venous valves in the body? (Fig 21.5)
17. > What is the function of the skeletal muscle pump? (Fig 21.9)
18. What condition will occur if the venous valves fail?
19. What is an anastomosis? What is the function of an anastomosis?

20. > What is the difference between systolic and diastolic pressure blood pressure? How is the difference expressed? (Fig 21.8)
21. >What is pulse pressure?
22. 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? Fig 21.8
23. > What three “variables” have the ability to increase or decrease blood pressure?
24. What hormones affect blood pressure? Explain the mechanism: (page 747)
25. Are precapillary sphincters regulated by nerves? Explain
26. > What is the “capillary metabolic theory of autoregulation”? What molecule regulates this mechanism? Significance. Is this a positive or negative feedback mechanism?
27. >What do we call the nuclei in the medulla oblongata that regulates the arterioles?
28. >What are the four different stimuli that send afferent signals to the control center in the medulla oblongata? Fig 21.12
29. > How are nutrients and metabolic waste moved between blood and the interstitial space? Is diffusion the most important mechanism in this process? Explain
30. What is transcytosis?
31. > 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? Fig 21.7
32. > What type of vessels “recovers” excess fluid in the interstitial space Fig 21.7
33. Define edema and explain the three forces that can contribute to this condition:
34. 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? (Fig 21.11)
35. >What is shock?
36. What is the difference between hypovolemic, cardiogenic, vascular, and obstructive shock?
What is anaphylactic shock?
37. >What is syncope? (p751)
38. What factors may increase blood pressure? Fig 21.10
39. > What are the structural differences between the fetal and adult circulatory system?

40. > What is a portal system?

41. > In what vein will you find blood with the highest concentration of nutrients? What is the name of this vein?