

BIO 172 Study Guide
Chapter 21 / Blood Vessels and Hemodynamics
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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 conducting, distributing or resistance vessels:
 - a) What is the function of each vessel?
 - b) 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 function of a metarteriole in the capillary model?
5. What is the structure and function of the precapillary sphincters? Regulated?
6. What is the function of the thoroughfare channel in the capillary model?
7. What are chemoreceptors and baroreceptors? Where are they located? What is the efferent outcome? Explain
8. In the circulatory system, where are nutrients and waste products exchanged between blood and the interstitial space?
9. What are the three types of capillaries?
10. What is the structure - function relationship of each capillary type? Know tissue examples for each type.
11. What is the histology of a typical capillary? What is the diameter of a typical capillary? What is the maximum distance between cell and capillary?
12. How is blood distributed in the body in a resting state? Fig 21.6
13. Why are veins called “blood reservoirs”?
14. Why are veins called “capacitance vessels”?
15. What is the major force in the venous vessels throughout the body which returns blood to the heart? How does the pressure on the venous side of circulation compare to the arterial side? Where might you find “negative pressure? (hint gravity) Why might this be dangerous?
16. Where will you find venous valves in the body? What is the function of the skeletal muscle pump?
17. What condition will occur if the venous valves fail?

18. What is a portal system? Give three examples where you have a portal system in the human body:
19. In what portal system will you find blood high in nutrients? Explain
20. What is an anastomosis? What is the function of an anastomosis?
21. What is the difference between systolic and diastolic pressure blood pressure? How is the difference expressed?
22. What is 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? Fig 21.8
23. What will happen to blood pressure in you increase blood volume?
24. What hormones affect blood pressure? Explain the mechanism: (page 747)
25. Why will an increase in cardiac output, stroke volume and peripheral resistance all increase blood pressure?
26. Are precapillary sphincters regulated by nerves? Explain
27. What is the “metabolic theory of autoregulation” of capillary networks? What is the structure regulated by this mechanism? Is this a positive or negative feedback mechanism?
28. What do we call the nuclei in the medulla oblongata regulating the arterioles?
29. What are the three different stimuli that send afferent signals to the control center in the medulla oblongata? Fig 21.12
30. How are nutrients and metabolic waste moved between blood and the interstitial space? Is diffusion the most important mechanism in this process? Explain
31. What is transcytosis?
32. 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
33. What type of vessels “recovers” excess fluid in the interstitial space Fig 21.7
34. Define edema and explain the three forces that can contribute to this condition:
35. What is the relationship between cross-sectional area and blood velocity across the circulatory system? What is the significance? Fig 21.11
36. What is shock? P750
37. What is the difference between hypovolemic, cardiogenic, vascular, and obstructive shock? P750 What type of shock is anaphylactic shock?

38. Is the responses to hypovolemic shock a negative or positive feedback mechanism?
39. What is syncope?
40. What type of factors may increase blood pressure? Fig 21.10
41. How is the circulatory system different in the fetus and adult?