BIOH122 Session 6
Vascular Regulation

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Module:  Distribution
Title:  Vascular Regulation

Introduction

1. a. How do Mean Arterial Blood Pressure (MABP) and Systemic Vascular Resistance (SVR) factor together to produce the total Cardiac Output (CO)?

b. What systems both influence and regulate MABP and SVR thereby impacting CO?

Primary Factors That Affect Circulation

2. Name the three primary factors that influence circulation.

3. Blood moves from areas of high pressure toward areas of lower pressure. Describe how the right atrial and aortic pressures affect blood movement.


5. Identify and describe three factors that increase SVR.

Vasoconstriction -

Polycythemia or Dehydration -

Vessel Length -
6. Cardiac Output (CO) is a product of heart rate and stroke volume. What three factors influence heart rate and stroke volume?

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Structures and Functions

7. Summarize how each of the following affect blood flow.

Heart - ________________________________________________________________

Arterioles - __________________________________________________________

Veins & Kidneys - _______________________________________________________

8. Explain ventricular importance in maintaining blood pressure. ________________________

________________________________________________________________________

9. a. Describe ventricular activity during each of the following.

Systole - ______________________________________________________________

Diastole - ____________________________________________________________

b. What are normal systolic and diastolic pressures for a resting adult? ______________________

________________________________________________________________________

c. What is the importance of blood vessel elasticity? _________________________

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10. If normal resting blood pressure is 120/80, then why is MABP 93? _________________

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11. Explain how, and why, arterioles and small arteries affect SVR? _________________

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12. How does *vasoconstriction* affect SVR and local blood flow? ________________

13. How does *vasodilation* affect SVR and local blood flow? ________________

14. Define *venous return* of blood. ________________

15. In what way(s) does venous return of blood affect cardiac output? ________________

16. How does increased water reabsorption by the kidneys affect blood volume and venous return? ________________

17. How does decreased water reabsorption by the kidneys affect blood volume and venous return? ________________

18. What is the body’s primary blood reservoir? ________________

19. Define *venous tone*. ________________

20. a. Explain the effect of *venoconstriction*. ________________

b. Explain the effect of *venodilation*. ________________
21. Describe how venous valves and muscular movements affect venous blood flow. 

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22. Explain how breathing contributes to venous blood flow. 

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Neural Regulation of Blood Pressure

23. Generally describe the role of the following receptors relative to blood pressure monitoring. 

__________________________________________________________________________

24. Describe each of the following neural reflexes.

- Baroreceptor Reflexes - ______________________________________________________________________

- Carotid Sinus Reflex - ______________________________________________________________________

- Aortic Reflex - __________________________________________________________________________

25. Describe physiological adjustments in response to dropping MABP.

- Sympathetic Signals - ______________________________________________________________________

- Parasympathetic Signals - __________________________________________________________________
Heart Rate, Contractility, Venous Tone, Cardiac Output - ____________________________

Vasoconstriction - ____________________________

26. Describe physiological adjustments in response to rising MABP.

__________________________________________________________________________

27. How do chemoreceptors in the carotid and aortic bodies contribute to re-establishing homeostasis during hypoxia, acidosis, or hypercapnia?

__________________________________________________________________________

Hormonal Regulation of Blood Pressure

28. Neural regulation of blood pressure is short-term and quick in response. What about hormonal regulation of blood pressure?

__________________________________________________________________________

29. What activates the RAA system? ____________________________

30. Describe the role of each of the following hormones. Name their source, too.

   Renin - ____________________________

   Angiotensinogen - ____________________________

   Angiotensin I - ____________________________

   Angiotensin II - ____________________________

31. How does angiotensin II affect cells in the proximal convoluted tubules in kidney nephrons? ____________
32. a. How does angiotensin II affect target cells in the adrenal cortex?

b. How does this affect cardiac output?

33. How does angiotensin II affect sensations of thirst? How does this contribute to blood pressure homeostasis?

34. What stimulates the release of Anti-Diuretic Hormone (ADH)?

35. Where is ADH produced and secreted?

36. How does ADH affect smooth muscle in arteriole walls?

37. How does ADH affect the kidneys? How does this contribute to blood pressure homeostasis?

38. How does ADH affect sweat glands? How does this contribute to blood pressure homeostasis?

39. What stimulates ANP secretion?

40. How does ANP affect the kidneys and what ultimate affect that that have on blood volume?