Cardiovascular System Exam Study Sheet

Heart

1. Distinguish between the 3 Layers of the heart and identify the layers of the pericardium.
   a. What are the layers composed of?
   b. Are the right and left sides different in structure?
   c. Which 3 layers make up the pericardium?

2. Be able to identify, locate and give the functions of the heart chambers, septa, valves and the major vessels that enter and leave the heart.

3. Autorhythmic vs. Contractile cells
   a. What structures are composed of autorhythmic cells and where are they located? Where do we find contractile cells?
   b. What ions are involved in the depolarization and repolarization of these cells and what type of channel do they use (passive, voltage gated, intercalated discs)?

4. Cardiac output
   a. How do you calculate cardiac output?
   b. What factors can affect CO and do they increase or decrease it?

5. Blood flow through the heart and through the coronary vessels
   a. Be able to track blood flow through the chambers of the heart and what vessels it uses.
   b. Be able to track blood flow through the coronary vessels. What 2 forces affect whether blood is flowing through these vessels or if it has stopped?
      Where do the coronary veins empty into?

6. Autonomic NS control of the heart
   a. What receptors monitor blood pressure, chemical levels or stretch in the right atrium?
   b. What nerves do they use to let the medulla oblongata know?
   c. How do they communicate whether factors are increasing or decreasing?
   d. Do they stimulate the acceleratory or inhibitory center to dominate the heart?
   e. What nerves do we use to increase or decrease heart rate?
      Neurotransmitter? Receptor? Ion Channel?

7. Factors that increase and decrease heart rate
   a. How do blood pressure, chemical levels, increased venous return, ion levels, adrenaline affect heart rate?

8. The electrical activity of the heart in relation to an EKG reading
a. What does each deflection represent electrically and mechanically?
b. Terms and abnormalities related to the heart such as bradycardia, tachycardia and fibrillation.
c. What might we use to correct some of these abnormalities?

**Vessels**

1. Vessel structure and function
   a. What layers make up each type of vessel?
   b. Which ones have more elastic tissue? Valves? Larger lumens? Blood away from the heart?

2. How do the blood vessels assist the heart in stabilizing blood pressure and blood gases via changes in vessel diameter?
   a. How does high blood pressure affect not only the heart rate but also the blood vessels? Low blood pressure? High carbon dioxide? Low carbon dioxide?

3. Parasympathetic vs. Sympathetic control of vessels
   a. Which system controls most blood vessels?
   b. What are the fibers called that supply the vessels?
   c. How do they alter diameter?

4. Autoregulation of arterioles (myogenic vs. metabolic)
   a. What affect does increasing metabolic waste have on arterioles? Stretch (High blood pressure) on an arteriole wall? Cold? Vessel damage?
   b. How is autoregulation different than sympathetic regulation?

5. Starling’s law of the capillaries (HP vs. OP)
   a. Understand what generates each of the types of hydrostatic and osmotic pressures?
   b. Do they move fluid into or out of the capillary?
   c. Be able to calculate Net filtration pressure to determine if the fluid moves in or out.
   d. How would certain factors such as high blood pressure or dehydration affect movement of the fluid?

6. Types of edema and causes (cardiac, inflammatory, hypoproteinemia, pulmonary)

7. Patterns of circulation
   a. Know the pathways of circulation for pulmonary vs. systemic, coronary, cerebral, hepatic portal, and fetal systems.

9. Things that increase or decrease blood pressure
   a. Understand how certain hormones can affect blood pressure (ADH, aldosterone, angiotensin II, ANF).
b. How would changing blood volume or blood viscosity affect BP?

c. If cardiac output increases or decreases, how would it affect BP?

d. How does changing vessel diameter (peripheral resistance) affect BP?
   How about vessel length? Elasticity?

10. Review any cardiovascular abnormalities we had time to discuss (definitions, causes, treatments).

11. Be able to define LDL’s and HDL’s and understand their role in atherosclerosis.

12. Understand what occurs when the body goes into shock.