Class Time: 9:30 Team (Table) No. 18 Trio Letter (A, B, or C): B Recorder: Lindsey

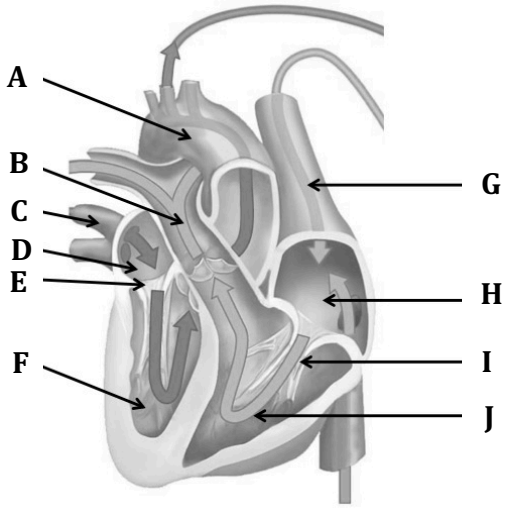
ALA – CARDIOVASCULAR SYSTEM

Please work on this **in trios**. Add your answers to this file (please keep it as a Word file if possible—convert to PDF if you are unable to save as a Word file. **Mac user? Please do NOT submit ALAs as a "Pages" file**.), **save to desktop or some other location**, then attach when submitting your assignment through Blackboard **(be sure you submit this assignment ONLY when you are asked to do so during class)**. Only one person **per trio** should submit. All team members should write a copy of your answers so you have them to study from (or the recorder might email the completed file to other members of your trio). You may use your book, internet, or any other resources you wish to answer these questions. Be sure to ask Dr. C or one of the teaching assistants if you need help!

PLEASE COMPLETE THE "IN CLASS FOR CARDIOVASCULAR ALA" SURVEY *AFTER* YOUR TRIO COMPLETES THIS ALA!!! YOU MUST COMPLETE THIS SURVEY BEFORE LEAVING CLASS TO RECEIVE CREDIT FOR THIS ASSIGNMENT.

Human heart anatomy. Identify each of the labeled vessels, chambers, and valves below.

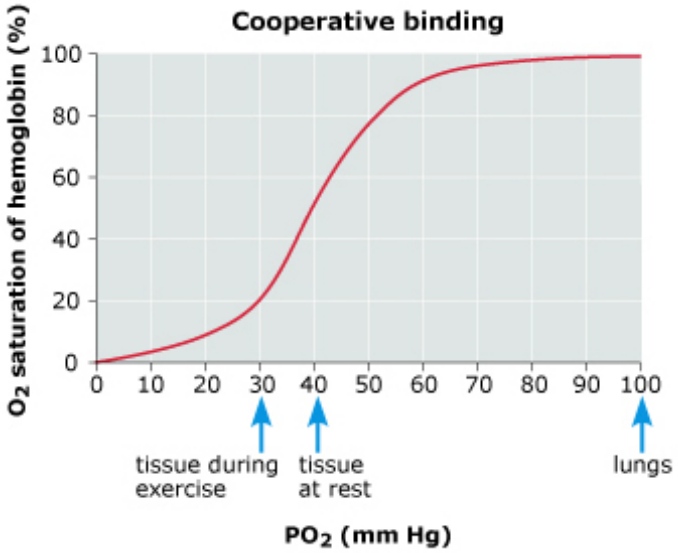
1. A = Aorta
2. B = Pulmonary Artery
3. C = Pulmonary Vein
4. D = Left Atrium
5. E = Bicuspid Valve
6. F = Left Ventricle
7. G = Vena Cava
8. H = Right Atrium
9. I = Tricuspid Valve
10. J = Right Ventricle



11. Does "B" above carry oxygenated or deoxygenated blood? Oxygenated
12. Does "C" above carry oxygenated or deoxygenated blood? Deoxygenated

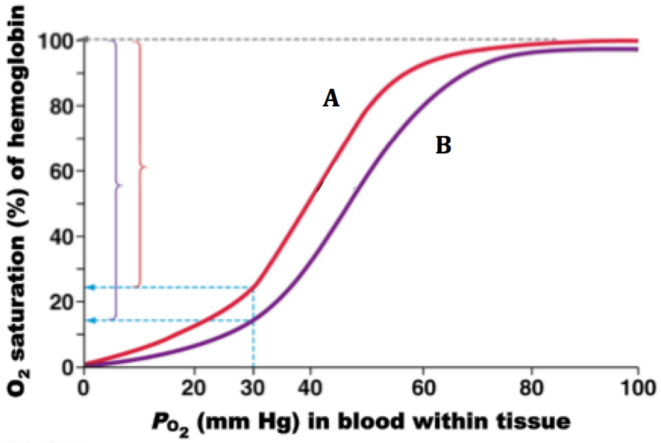
How does hemoglobin "know" whether to pick up oxygen or release oxygen?
The diagram below illustrates the behavior of hemoglobin under different partial pressures of oxygen. The percent of hemoglobin saturated with oxygen (Y-axis) is shown as a function of the partial pressure of oxygen (X-axis). Note the relative partial pressures of oxygen in lungs and muscles (tissues) at rest and during exercise are indicated by blue arrows.

13. In lungs- what % of hemoglobin is saturated with O_2? 100%
14. Muscles (tissues) at rest- what % of hemoglobin is saturated with O_2? 40%
15. What percentage of O_2 is **released** to muscles (tissues) at rest? 50%
16. What percentage of O_2 is **released** to muscles (tissues) during exercise? 30%



How does the behavior of hemoglobin change in response to pH and temperature (Bohr shift)?
Like most proteins, the structure and activity of hemoglobin can change in response to changes in pH and temperature. Strenuous exercise can result in a slight increase in body temperature and a slight decrease in blood pH. The graph below illustrates two oxygen dissociation curves- one for hemoglobin in tissues during strenuous exercise (i.e., lower pH or higher temperature) and one for hemoglobin in tissues at rest (i.e., normal temperature and pH).

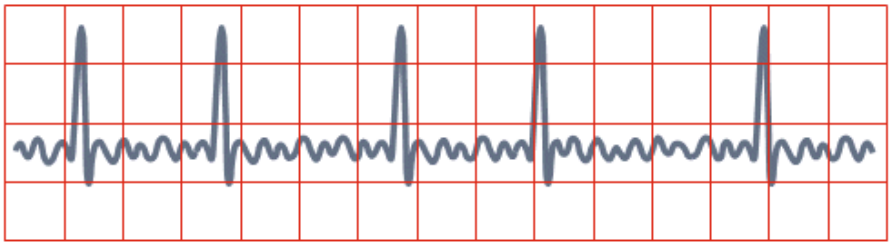
17. Under which condition, "A" or "B", does hemoglobin release more oxygen under any given partial pressure of oxygen? B
18. Which curve represents the activity of hemoglobin in tissues during exercise? B



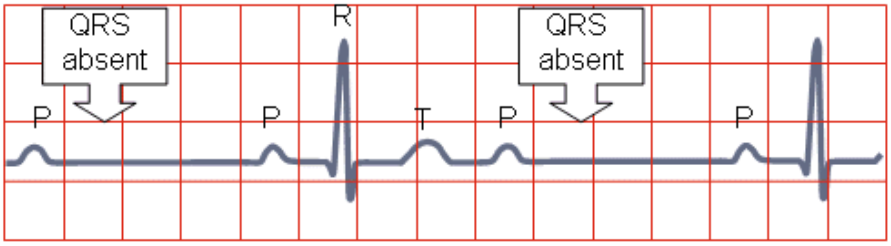
Interpreting electrocardiograms (ECGs):
A few common heart problems are listed below. For each ECG that follows, indicate which heart problem is likely responsible for the ECG.

Potential Heart Problems:

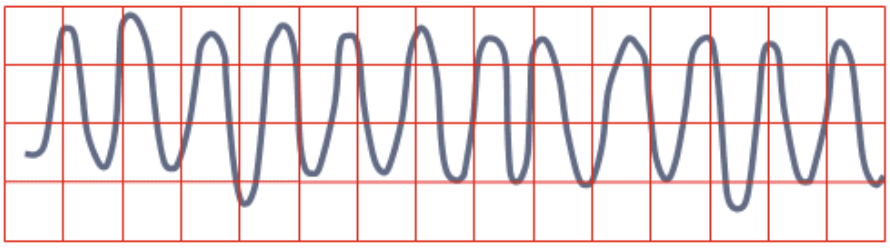
a. Atrial fibrillation
b. Ventricular fibrillation
c. AV node block
d. Mitral valve (bicuspid valve) prolapse
e. SA node block
f. Heart murmur



19. Heart problem? Atrial Fibrillation



20. Heart problem? AV Node Block



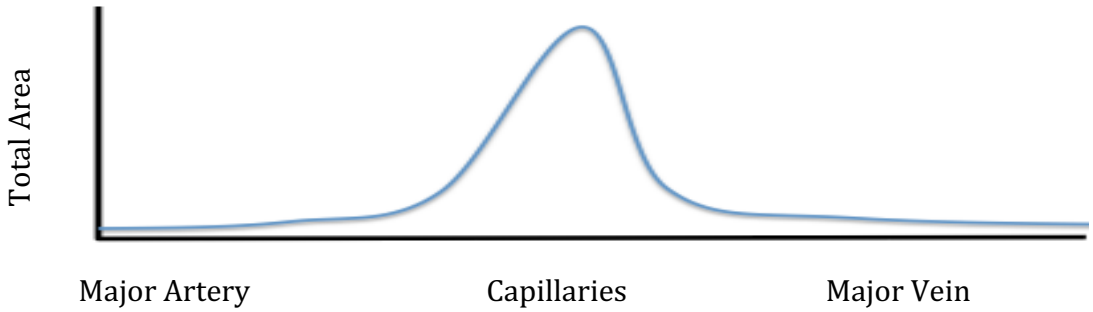
21. Heart problem? Ventricular Fibrillation

Relationship between total cross-sectional area, velocity, and blood pressure:
The diagram below illustrates total cross-sectional surface area of blood vessels as blood flows from major arteries (e.g., aorta or pulmonary artery), through capillaries, and eventually to major veins (e.g., vena cava or pulmonary vein).

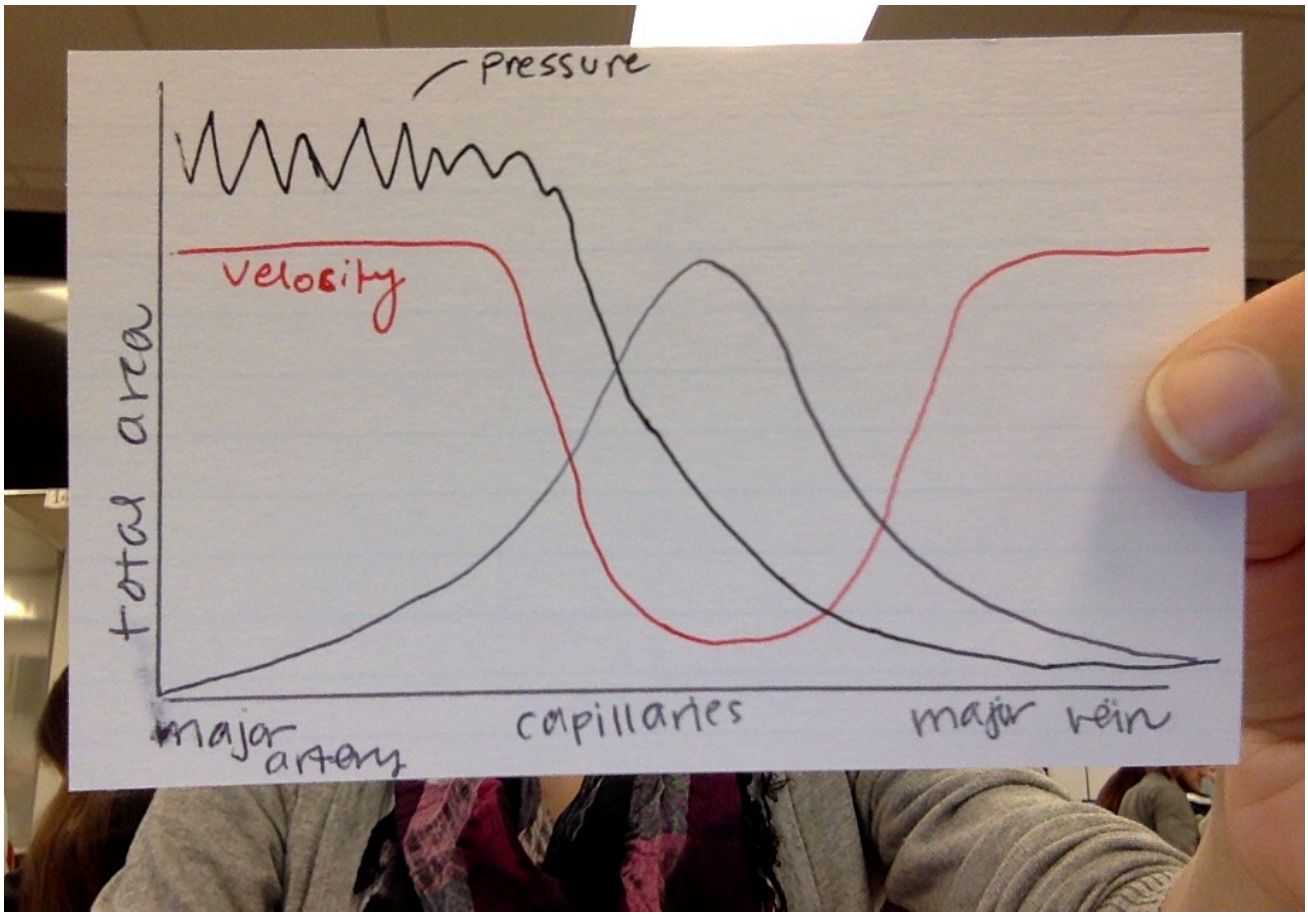
22. Make a sketch similar to the one below (use the same axes). On that sketch, draw curves that indicate **velocity** and **blood pressure** as blood flows from arteries to veins. Take a picture of your sketch and insert it at the end of this assignment. You may also use the drawing feature of Word if you wish.

23. Based on your sketch, how would you describe the pressure and velocity of blood as it moves through capillaries? The pressure decreases and doesn't increase again after passing the capillaries while the Velocity slows and then increases leaving the capillaries.

24. Explain why these characteristics are important for "capillary exchange" The blood pressure forces the blood out forcefully (at high velocity) and then decreases, allowing the blood to reenter quickly again. There is a lull between the exit and entry of blood, indicated by the velocity curve.



If it is easier for you to simply draw curves using the drawing feature of Word, feel free to do so. Use black for the blood pressure and red for the velocity. Otherwise, insert your image below.



Major Artery Capillaries Major Vein

DON'T FORGET: COMPLETE THE "IN CLASS FOR CARDIOVASCULAR ALA" SURVEY *AFTER* YOUR TRIO COMPLETES THIS ALA!!!