Be able to complete the following in preparation for the 4th exam. This is just a guide, review the PowerPoint and read the textbook. This is a dynamic guide, meaning it will be modified regularly as needed.

Chapter 13
1. Recognize how reflexes may be classified (Table 13-1)
2. Compare somatic monosynaptic and polysynaptic reflexes. Give an example for each reflex.
3. Compare autonomic reflexes with somatic. Note how brain may be involved or not.
4. Define proprioceptor.
5. Explain the function and location of muscle spindles and GTO’s.
6. Differentiate between extrafusal and intrafusal fibers.
7. Describe the role of the basal nuclei in voluntary motor control and how relates to Parkinsonism.
8. Explain what causes tetanus, the agent and the toxin. How it works and how it is treated and how prevented.

Chapter 14
1. Be able to list materials that are transported through the CVS. Note if going to or from a particular region (Table 14-1).
2. Distinguish between systemic and pulmonary circuits.
3. Define artery and vein.
4. Note how pressure effects blood flow.
5. List how blood pressure may be influenced in the body.
6. Explain Flow $\alpha \Delta P$.
7. Explain and give the relationship between blood flow and resistance.
8. Compare flow rate and velocity of flow for blood.
9. Identify the following heart components:
   - right atrium
   - right ventricle
   - left atrium
   - left ventricle
   - bicuspid valve
   - tricuspid valve
   - semilunar valves
   - aorta
   - pulmonary trunk
   - SVC
   - IVC
   - Pulmonary arteries
   - Pulmonary veins
   - myocardium
10. Trace blood through the chambers and valves in order from entrance to exit.
11. Compare cardiac muscle excitation with skeletal muscle, especially noting the role of the ions involved and refractory period.
12. Compare autorhythmic and contractile cells of the heart.
13. Explain what a “funny” channels are, and why funny?
14. List, in order the path of the electrical conducting system of the heart. Include the following:
   - SA node
   - Internodal pathways
   - AV node
   - AV bundle
   - Bundle of His
   - R bundle branch
   - L bundle branch
   - Purkinje fibers
   - Intercalated disks
15. Define fibrillation compare atrial and ventricular fibrillation.
16. Explain heart block, what causes and how treated.
17. What is the function of Einthoven’s triangle?

18. Draw and label an ECG, include:

- P wave
- QRS complex
- T wave
- PR interval
- QT interval
- PR segment
- ST segment

19. Correlate the ECG and electrical events in the cardiac cycle.

20. Correlate the ECG and the mechanical events in the cardiac cycle.

21. Identify the following conditions from an ECG. See text and this link:
http://www.gwc.maricopa.edu/class/bio202/cyberheart/ekggzr0.htm and/or

- 3rd degree heart block
- atrial fibrillation
- ventricular fibrillation
- hypercalcemia
- hyperkalemia

22. Explain what LQTS is how one gets, symptoms and treatments.

23. From a figure like 14-25, identify the EDV, ESV, stroke volume and pressure in the ventricle.

24. Describe a murmur, it’s common cause the sound.

25. Be able to place heart sounds in a Wiggers diagram.

26. Compare CO with HR and SV.

27. Explain how autonomic NTs alter heart rate, give an PNS and SNS example.

28. What does Starling's Law state.

29. Name three ways venous return is affected.

30. See running problem on MI, note how Creatine Kinase, troponin where used.

31. Explain why isotonic saline and aspirin may have helped. What was the role of beta blockers, and how was his ECG altered.

Chapter 15

1. Define Essential hypertension, give numbers, outcomes and treatments.

2. Define vasovagal syncope.

3. Define perfusion.

4. List several substances transported through the blood, note which way they are being carried.

5. Define, elastic artery, muscular artery, arteriole, capillary, venule and vein.

6. Explain how blood pressure changes through the above vessels.

7. Explain what the primary determinant of velocity of blood if flow rate is constant.

8. Define elastic recoil, note how influences blood pressure in arteries and MAP.

9. Define and give symptoms of hypertension and hypotension.

10. Explain how a sphygmomanometer works, note Korotkoff sounds.

11. Explain why blood goes from arteries to veins.

12. High peripheral resistance causes higher blood pressure, give rapid and slower responses to this situation.

13. Define shock, give causes and outcomes.

14. How is arteriolar resistance influenced, give examples.

15. Explain the role of NE and sympathetic on α receptors on arterioles controls diamet.

16. Where are the areas of greatest cardiac output.

17. What is a precapillary sphincter, and where found.
18. Compare continuous and fenestrated capillaries, note generally where found.
19. Compare velocity of blood flow with cross-sectional area vessels.
20. Explain where and why absorption and filtration occur at capillaries.
22. Give the functions or roles of lymphatic system.
23. Define Edema, give causes.
24. Give the cause for Ascites and elephantiasis.
25. Define baroreceptor.
26. Explain the baroreceptor reflex for blood pressure.
27. Explain what the orthostatic hypotension response is.
28. Give CVD risk factors, note if controllable or not.
29. Compare HDL and LDL.
30. Define atherosclerosis and arteriosclerosis.

Chapter 16
1. Give the components of blood, including the composition of plasma and cell types.
2. Identify and give functions of all formed elements, platelets, RBCs, granulocytes and agranulocytes.
3. Name a cytokine involved in hematopoiesis, give it’s function as well.
4. Define hematocrit and give normal ranges.
5. Explain special characteristics of RBCs.
6. Explain how RBCs are recycled (iron homeostasis).
7. List a few types of anemia and the etiology.
8. Define Jaundice and give causes.
9. How was Rasputin and what was his relationship to the Romanoffs.
11. Give an overview of hemostasis mechanisms.
12. Compare intrinsic and extrinsic clotting pathways (not all the steps just the initiation.)
13. Explain how fibrinolysis occurs and how plaminogen, tPA, warfarin, aspirin and streptokinases affect the process.
14. What is blood doping and give some indicators of blood doping.

Chapter 17
List the functions of the respiratory system.
1. Distinguish between external and internal respiration.
2. List and describe factors influencing air flow to and from lungs.
3. Identify the major components of the respiratory system, list in order from environment to alveoli.
5. Explain what “conditioning” air refers to. (not air conditioning)
6. Name the cell types of alveoli and their functions.
7. Give pulmonary circulation noting oxygenation.
8. Describe how Dalton’s and Boyles’s Laws influence breathing.
9. List what normal $P_{O_2}$ and $P_{CO_2}$ are in the atmosphere and alveoli.
10. Be able to identify the following lung volumes and capacities from a spirometry tracing:
11. Give the relationship between pressure and resistance in airflow.
12. Determine the partial pressure of an atmospheric gas at sea level.
13. $P_{atm} \times \%$ of gas in atmosphere
14. Explain what $P_1V_1 = P_2V_2$ refers to.
15. Diagram the anatomy of the respiratory system and identify the role each structure plays in external respiration (Creates a pressure change? Site of gas exchange? Etc.).
16. Diagram the alveolar and intrapleural pressure changes that occur during inspiration and expiration.
17. Explain the significance of intrapleural pressure and use the example of pneumothorax to contrast normal intrapleural conditions.
18. Name the muscles involved in normal and forced inspiration and expiration.
19. Compare and contrast compliance and elastance in respiratory physiology. Give examples of disease states that arise from changes in compliance and/or elastance.
20. Explain the cause and effect of a Pneumothorax.
21. Explain the role of surfactants in respiratory physiology.
22. Diagram the factors affecting airway resistance and highlight the local and reflex control mechanisms involved with variable resistance (bronchodilation and bronchoconstriction).
23. Define anatomic dead space and diagram how it affects ventilation.
24. Explain why gas composition in the alveoli remains relatively constant during normal breathing, and demonstrate how it might change during other breathing patterns.
25. Diagram the mechanisms by which ventilation and alveolar blood flow are matched.
26. Describe the causes of key diseases and conditions that can affect respiratory function.
   Asbestosis  emphysema  Asthma
   nRDS  COPD
27. Compare the route of air in human respiratory system and that of birds.
28. Define the following:
   Apnea  Eupnea  Hypoventilation
   Dyspnea  Hyperpnea  Tachypnea
29. Give normal ventilation rates and pulmonary ventilation.
30. Give the relationship between alveolar ventilation and $P_{O_2}$ and $P_{CO_2}$. 