

Study Questions Chapters 1, 2, 3, and 12

Chapter 1

1. Who was Robert Bruce and what did he do? (not the Scottish guy)
2. Why is the ST segment important during a stress test?
3. If a 12-lead EKG is not available, what lead would be most sensitive to detect ST segment depression?
4. What is Bayesian analysis and describe how it is used in stress testing?
5. Does ST segment depression always indicate ischemia?
6. What is the advantage of using a treadmill during stress testing?

Chapter 2

1. What is the ejection fraction? What is a normal value at rest, during exercise?
2. What is a normal SV at rest, during exercise? Give normal resting values for a sedentary person and for an endurance athlete.
3. Why is cardiac output so important during exercise?
4. Name at least 4 events that occur during exercise that act to increase cardiac filling.
5. Which factors control heart rate during exercise? How does HR increase initially? How does HR increase later-on during exercise.
6. Describe the SV response during upright and supine exercise. Why is it different?
7. What hormone increases cardiac contractility during exercise?
8. What do we mean by the “functional capacity” of a cardiac patient? How does exercise training improve functional capacity?
9. How does aerobic training affect the HR and cardiac output during exercise?
10. What intensity, duration, and frequency of aerobic training are required to improve cardiorespiratory fitness?
11. How does aerobic training affect the myocardial oxygen consumption during exercise?
12. Name at least two indices of myocardial oxygen consumption.
13. Compared to skeletal muscle, is myocardial muscle more or less efficient at extracting oxygen from the blood?
14. What do we mean by the systolic and diastolic time intervals? During rest, what takes longer, systole or diastole? What happens during exercise?
15. How does hypoxia and hypocapnia affect coronary blood flow??
16. What is the Conconi point in the HR response to exercise? What might cause this?
17. When is respiration limiting for exercise capacity?

Chapter 3

1. Name some factors that increase myocardial oxygen supply and demand?

2. Describe the major coronary arteries, which areas of the heart they perfuse, and which leads (anterior, lateral, inferior) may be most sensitive to occlusion.
3. Can someone have marked ischemia yet have a normal angiogram?
4. What factors can trigger an ischemic episode?
5. What causes coronary collaterals to grow? Can exercise promote this?
6. Which part of the cardiac wall, epicardium or endocardium, is most susceptible to ischemia? Why?
7. What do we mean by a vasodilatory reserve?
8. Is chest pain always associated with ischemia and ST segment depression?
9. What does ST elevation indicate?
10. If a client begins to experience chest pain, what immediate treatments should come to mind? (Hint: MONA)
11. If a client begins to experience severe chest pain during a stress test, should you immediately stop the test?
12. Why after a clinical stress test might the physician NOT perform an active cool down?
13. When would fibrinolytic treatment (anti-clotting meds) be considered for a patient with chest pain?
14. When would percutaneous coronary artery (PCI) treatment be considered?
15. What EKG changes would indicate that someone is having a myocardial infarction? What EKG changes would indicate that someone has had a myocardial infarction in the past?
16. If you see large Q waves in leads V1 and V2, what does this suggest?
17. Who has the greatest risk for a true positive stress test, someone with upsloping, horizontal, or downsloping ST depression?

Chapter 12: Normal EKG changes with exercise

1. Be able to measure HR and PR, QRS, and QT intervals and amplitudes.
2. Be able to recognize and characterize ST segment changes.
3. Be able to determine if a rhythm is regular or irregular, bradycardic or tachycardic.
4. Identify a condition in young athletes (sloping T wave) often associated with false positive ST depression.
5. What usually happens to the amplitude of the QRS complex near the end of exercise and during recovery?
6. Why might a physician ask a patient to hyperventilate before a stress test?
7. Is depression of the J point, with upsloping ST segment depression reaching the isoelectric line within 0.04 seconds a concern?
8. Why is a prolonged Q-T interval a concern?
9. What is a U wave and what could it mean?