Cardiovascular Practice Quiz

1. When caring for a patient following a cardiac catheterization with coronary angiography, which of the following findings would be of most concern to the nurse?
   a. Swelling at the catheter insertion site
   b. Development of raised wheals on the patient’s trunk
   c. Absence of pedal pulses distal to the insertion site
   d. Patient assessment of pain at the insertion site as 4 on a 10 point scale

   R: An absence of pulses distal to the insertion site indicates that clotting around the site is occluding blood flow to the extremity and is an emergency that requires immediate medical attention. Some swelling and pain at the site are expected, but the site is also monitored for bleeding and a pressure dressing and perhaps a sandbag may be applied. Hives occur as a result of iodine sensitivity and will require treatment, but the priority is the lack of pulses.

2. While obtaining patient histories, the nurse identifies that the patient with the highest risk for CAD is
   a. An African American man, aged 65, with obesity and a BP of 160/85
   b. A white man, aged 54, who is a smoker and has a stressful lifestyle
   c. An Asian woman, aged 45, with a cholesterol level of 240 mg and a BP of 130/75
   d. A white woman, aged 72, with a BP 172/100 and who is physically inactive

   R: The white woman has one unmodifiable risk factor (age) and two major modifiable risk factors (hypertension and physical inactivity). Her gender risk is as high as a man’s because of her age. The white man has one unmodifiable risk factor (gender), one major modifiable risk factor (smoking), and one minor modifiable risk factor (stressful lifestyle). The African American man has an unmodifiable risk factor related to age, one major modifiable risk factor (hypertension), and one minor modifiable risk factor (obesity), but African American men are at less risk for coronary artery disease than are white men of the same age. The Asian woman has only one major modifiable risk factor (hyperlipidemia), and Asians in the United States have fewer MIs than do whites.

3. The nurse suspects stable angina rather than MI pain in the patient who reports chest pain that
   a. Is relieved by nitroglycerin
   b. Is a sensation of squeezing or tightness
   c. Does not radiate to the neck, back, or arms
   d. Is precipitated by physical or emotional stress

   R: One of the primary differences between the pain of angina and the pain of an MI is that angina pain is usually relieved by rest or nitroglycerin, which reduces the oxygen demand of the heart, whereas MI pain is not. Both angina and MI pain can cause a pressure or squeezing sensation, may radiate to the neck, back, arms, fingers, and jaw; and may be precipitated by exertion.
4. A patient admitted to the hospital for evaluation of chest pain has no serum cardiac markers 4 hours after the onset of pain. A noninvasive diagnostic test that can differentiate angina from other types of chest pain is a(n)
   a. ECG
   b. Exercise stress test
   c. Coronary angiogram
   d. Transesophageal echocardiogram

R: An exercise stress test will reveal ECG changes that indicate impaired coronary circulation when the oxygen demand of the heart is increased. A single ECG is not conclusive for CAD, and negative findings do not rule out CAD. Echocardiograms of various types may identify abnormalities of myocardial wall motion under stress but are indirect measures of CAD. Coronary angiograms identify narrowing of the coronary arteries but are invasive exams.

5. A second 12 lead ECG performed on a patient 4 hours after the onset of chest pain reveals ST segment elevation. The nurse recognizes that this finding indicates
   a. Transient ischemia typical of unstable angina
   b. Lack of permanent damage to myocardial cells
   c. Myocardial infarction associated with prolonged and complete coronary thrombosis
   d. Myocardial infarction associated with transient or incomplete coronary artery occlusion

R: A differentiation is made between myocardial infarcts that have ST segment elevations on ECG and those that do not because chest pain accompanied by ST segment elevation is associated with prolonged and complete coronary thrombosis and is treated with reperfusion therapy.

6. The nurse explains to the patient who is to undergo a coronary artery bypass graft that the procedure most often involves
   a. Using a synthetic graft as a tube for blood flow from the aorta to a coronary artery distal to an obstruction
   b. Resecting a stenosed coronary artery and inserting a synthetic arterial tube graft to replace the diseased artery
   c. Loosening the internal mammary artery from the chest wall and attaching it to a coronary artery distal to a stenosis
   d. Anastomosing reversed segments of a saphenous vein from the aorta to the coronary artery distal to an obstruction

R: The most common method of coronary artery bypass involves leaving the internal mammary artery attached to its origin from the subclavian artery but dissecting it from the chest wall and anastomosing it distal to an obstruction in a coronary artery. Synthetic grafts are not commonly used.

7. During treatment with tissue plasminogen activator (tPA) for a patient with a ST segment elevation MI, the nurse is most concerned on finding
   a. Oozing of blood from the IV site
8. The nurse recognizes that fibrinolytic therapy for the treatment of a MI has not been successful when the patient
   a. Continues to have chest pain
   b. Develops major GI or GU bleeding during treatment
   c. Has a marked increase in CK enzyme levels within 3 hours of therapy
   d. Develops premature ventricular contractions and ventricular tachycardia during treatment

   R: Indications that the occluded artery is patent, and blood flow to the myocardium is reestablished following thrombolytic therapy include relief of chest pain, return of ST segment to baseline on the ECG, the presence of reperfusion dysrhythmias, and a marked, rapid rise of the CK enzyme within 3 hours of therapy. If chest pain is unchanged, it is an indication that reperfusion has not occurred.

9. A 58 year old patient is in a cardiac rehabilitation program. The nurse teaches the patient to stop exercising if
   a. The HR exceeds 150 beats per minute
   b. Pain or dyspnea occur
   c. The respiratory rate increases to 30 breaths per minute
   d. The HR is 15 beats over the resting heart rate

   R: Any activity or exercise that causes dyspnea and chest pain should be stopped in the patient with CAD. The training target for a healthy 58 year old is 80% of maximum heart rate, or 132 beats per minute. In a patient with CAD undergoing conditioning, the heart rate should not exceed 20 beats/minute over the resting heart rate. HR rather than RR determines the parameters for exercise.

10. The pathophysiologic mechanism that results in the pulmonary edema of left sided heart failure is
   a. Increased right ventricular preload
   b. Increased pulmonary hydrostatic pressure
   c. Impaired alveolar oxygen and carbon dioxide exchange
   d. Increased lymphatic flow of pulmonary extravascular fluid

   R: In left sided heart failure, blood backs up into the pulmonary veins and capillaries. This increased hydrostatic pressure in the vessels causes fluid to move out of the vessels and into the pulmonary interstitial space. When increased lymphatic flow cannot remove enough fluid from the interstitial space, fluid moves into the alveoli, resulting in pulmonary edema and impaired alveolar oxygenation and carbon dioxide exchange.
11. A physical assessment finding that the nurse would expect to be present in the patient with acute left sided heart failure is
   a. **Bubbling crackles and tachycardia**
   b. Hepatosplenomegaly and tachycardia
   c. Peripheral edema and cool, diaphoretic skin
   d. Frothy blood tinged sputum and distended jugular veins

   R: Clinical manifestations of left sided heart failure are those of pulmonary edema, with bubbling crackles; frothy, blood tinged sputum, severe dyspnea, tachypnea, and orthopnea. Severe tachycardia and cool clammy skin are present as the result of stimulation of the SNS. Systemic edema reflected by jugular venous distention, peripheral edema, and hepatosplenomegaly are signs of right sided heart failure.

12. The diagnostic test that is most useful in differentiating the dyspnea related to pulmonary effects of heart failure from the dyspnea of pulmonary disease is
   a. Exercise stress testing
   b. A cardiac catheterization
   c. **B-type natriuretic peptide (bNP) levels**
   d. Serum blood urea nitrogen (BUN) levels

   R: bNP is released from the ventricles in response to ventricular stretch and is a good marker for heart failure. If the bNP is elevated, shortness of breath is due to heart failure. If the bNP is normal, dyspnea is from pulmonary disease.

13. A patient with chronic heart failure is treated with hydrochlorothiazide, digoxin, and lisinopril. To prevent the risk of digitalis toxicity with these drugs, it is most important that the nurse monitor the patient’s
   a. HR
   b. BP
   c. **Potassium levels**
   d. GI function

   R: Hypokalemia is one of the most common causes of digitalis toxicity. When a patient is receiving potassium losing diuretics, such as hydrochlorothiazide and furosemide, it is essential to monitor the potassium level.

14. A 2400 mg sodium diet is prescribed for the patient with chronic heart failure. The nurse recognizes that additional teaching is necessary when the patient states
   a. I should limit my milk intake to 2 cups a day
   b. I can eat fresh fruits and vegetables without worrying about sodium levels
   c. **I can eat most foods as long as I do not add salt when cooking or at the table**
   d. I need to read the labels on prepared foods and medicines for their sodium content
R:  All foods that are high in sodium should be eliminated in a 2400 mg sodium diet, in addition to the elimination of salt during cooking.

15. The nurse determines that the treatment of heart failure has been successful when the patient experiences
   a. Weight loss and diuresis
   b. Warm skin and less fatigue
   c. Clear lung sounds and decreased heart rate
   d. Absence of chest pain and improved LOC

R:  Successful treatment of heart failure is indicated by an absence of symptoms of pulmonary edema and hypoxemia, such as clear lung sounds and a normal heart rate. Weight loss and diuresis, warm skin, less fatigue, and improved LOC may occur without resolution of the pulmonary symptoms.

16. A patient with heart failure has tachypnea, severe dyspnea, and a SpO2 of 84%. The nurse identifies a nursing diagnosis of impaired gas exchange related to increased preload and mechanical failure. An appropriate nursing intervention for this diagnosis is
   a. Assist the patient to cough and deep breath every 2 hours
   b. Assess intake and output every 8 hours and weigh daily
   c. Encourage to alternate rest and activity to reduce cardiac workload
   d. Place the patient in a high Fowler’s position with the legs horizontal

R:  A high fowler’s position increases the thoracic capacity, improving ventilation, and sitting with the legs horizontal will decrease venous return. Coughing and deep breathing will not clear the lungs of pulmonary edema. I & O and daily weight should be done to monitor the effects of treatment, but do not directly address impaired gas exchange. During periods of acute dyspnea, rest is necessary to decrease oxygen demand.

17. During hemodynamic monitoring, the nurse finds that the patient has a decreased CO with unchanged pulmonary artery wedge pressures, HR, and SVR. The nurse identifies that the patient has a decrease in
   a. SV
   b. Preload
   c. Afterload
   d. Contractility

R:  CO is dependent on the heart rate and stroke volume, and stroke volume is determined by preload, afterload and contractility. If CO is decreased and heart rate is unchanged, stroke volume is the variable factor. If the preload determined by the pulmonary artery wedge pressure and the afterload determined by the SVR are unchanged, the factor that must be changed is the contractility of the myocardium.

18. Before taking hemodynamic measurements, the monitoring equipment must be referenced by
a. Confirming that when pressure in the system is zero, the equipment reads zero
b. **Positioning the stopcock nearest the transducer level with the phlebostatic axis**
c. Placing the transducer on the left side of the chest at the fourth intercostal space
d. Placing the patient in a left lateral position with the transducer level with the mattress top

R: Referencing hemodynamic monitoring equipment means positioning the monitoring equipment so that the zero reference point is at the vertical level of the left atrium of the heart. The port of the stopcock nearest the transducer is placed at the phlebostatic axis, the external landmark for the left atrium.

19. In preparing the patient for insertion of a pulmonary artery catheter, the nurse
   a. Obtains informed consent
   b. Places the patient in a high Fowler’s position
   c. **Ensures that the patient has continuous ECG monitoring**
   d. Performs an Allen test to confirm adequate ulnar circulation

R: During the insertion of a pulmonary artery catheter, it is necessary to monitor the ECG continuously because of risk for dysrhythmias, particularly when the catheter reaches the right ventricle. The health care provider is responsible for obtaining informed consent. The patient should be in a supine position for catheter insertion. The Allen test is done prior to the insertion of a radial arterial line.

20. A patient in the ICU with hemodynamic monitoring has the following values: BP 90/68; HR 124; PAWP 22; CO 3.2 L/min; CVP (RAP) 14; pulmonary artery pressure 38/20. Calculate the following measurements
   a. MAP **75**
   b. PAP **26**
   c. SV **25.8**
   d. SVR **1625**

21. The nurse observes a PAWP waveform on the monitor when the balloon of the catheter is deflated. The nurse recognizes that
   a. The patient is at risk for embolism because of occlusion of the catheter with a thrombus
   b. The patient is developing pulmonary edema that has increased the pulmonary artery pressure
   c. The patient is at risk for an air embolism because the injected air cannot be withdrawn into the syringe
   d. **The catheter must be immediately repositioned to prevent pulmonary infarction or pulmonary artery rupture**

R: When a pulmonary artery pressure tracing indicates a wedged waveform when the balloon is deflated, this indicates that the catheter has advanced and has become spontaneously wedged. If the catheter is not repositioned immediately, a pulmonary infarction or a rupture of the pulmonary artery may occur.

22. The use of the intra-aortic balloon pump (IABP) would be indicated for the patient with
a. An insufficient aortic valve  
b. A dissecting aortic aneurysm  
c. Accelerating or crescendo angina  
d. Generalized peripheral vascular disease

R: The counterpulsation of the IABP increases diastolic arterial pressure, forcing blood back into the coronary arteries and main branches of the aortic arch, increasing coronary artery perfusion pressure and blood flow to the myocardium. The IABP also causes a drop in aortic pressure just before systole, decreasing afterload and myocardial oxygen consumption. These make the IABP valuable in treating unstable angina, acute myocardial infarction, and a variety of surgical heart situations. Its use is contraindicated in incomplete aortic valves, dissecting aortic aneurysms, and generalized peripheral vascular disease.

23. To prevent arterial trauma during the use of the IABP, the nurse should  
a. Reposition the patient every 2 hours  
b. Check the site for bleeding every hour  
c. Prevent hip flexion of the cannulated leg  
d. Cover the insertion site with an occlusive dressing

R: Because the IABP is inserted into the femoral artery and advanced to the descending thoracic aorta, compromised distal extremity circulation is common, and requires that the cannulated extremity be extended at all times. The other interventions may be done, but they do not prevent arterial trauma.

24. The nurse prepares a patient for insertion of a pulmonary artery catheter. Preprocedural teaching for this client will include which of the following statements?  
a. The catheter will assist in directly monitoring your arterial pressure  
b. The catheter will provide information about your cardiac output  
c. The catheter will provide information about your left ventricular function  
d. The catheter will provide information about your cardiac index

R: A pulmonary artery catheter will provide information about the left ventricular function. The catheter does not directly determine the cardiac output or index. It does not measure the arterial pressure.

25. The nurse suspects the patient is in cardiogenic shock based upon which of the following findings?  
a. Decreased or muffled heart sounds  
b. Cardiac index >2.2 L/min/m2  
c. Bounding pulses  
d. Cardiac output of 5 L/min

R: Cardiogenic shock is caused by a decrease in the pumping ability of the myocardium. The decrease can be caused by a weakened myocardium or restriction of the myocardium by blood or
fluid. Decreased or muffled heart sounds would be indicative of fluid restricting the pericardial sac, causing the heart to beat ineffectively.