BCEN CEN - Quiz Questions with Answers

1. Cardiovascular Emergencies

1.

Which laboratory value initially indicates widespread tissue hypoperfusion in shock?

- **Serum lactate greater than 4 mmol/L**
- Serum lactate greater than 6 mmol/L
- Serum lactate greater than 2 mmol/L
- Serum lactate greater than 8 mmol/L

Correct answer: Serum lactate greater than 4 mmol/L

The parameter for widespread tissue perfusion is a serum lactate level greater than 4 mmol/L. There are a number of important laboratory parameters for monitoring patients in shock. These include base deficit, mixed venous saturation levels, and serum lactate levels. In general, high lactate levels correlate with high mortality rates. A high lactate level is a sign of anaerobic metabolism and occurs due to tissue hypoperfusion. Thus, the higher the value, the more hypoperfusion is present. It is also important to note that many laboratories require serum lactate specimens to be transported and stored on ice.

2.

Which of the following management strategies is MOST appropriate for a patient diagnosed with acute viral pericarditis?

Nonsteroidal Anti-Inflammatory Drugs (NSAIDs)

High-dose intravenous antibiotics

Immediate cardiac catheterization

Anticoagulant therapy

Correct answer: Nonsteroidal Anti-Inflammatory Drugs (NSAIDs)

Pericarditis is characterized by sharp, stabbing chest pain that often worsens with deep breathing (pleuritic pain) and lying flat but improves when sitting up and leaning forward. Viral infections are a common cause of pericarditis. The mainstay of treatment for acute viral pericarditis is anti-inflammatory therapy, specifically the use of NSAIDs to reduce pain and inflammation.

High-dose intravenous antibiotics are not indicated for viral pericarditis because a bacterial infection does not cause it. Immediate cardiac catheterization is indicated for conditions like myocardial infarction but not for viral pericarditis, which does not involve coronary artery occlusion. Anticoagulant therapy is primarily used for conditions involving thrombosis risk (such as atrial fibrillation and deep vein thrombosis) and could increase the risk of pericardial bleeding in the context of pericarditis.

3.

Which of the following is the MOST common cause of cardiac tamponade?

Penetrating chest trauma

Blunt chest trauma

Infection

Heart disease

Correct answer: Penetrating chest trauma

Penetrating chest injuries, such as stab wounds, are the leading cause of cardiac tamponade, accounting for 80% to 90% of cases.

Blunt chest trauma, infection, and heart disease may be contributing factors to the development of cardiac tamponade in some situations. The vast majority of cases, however, are due to penetrating chest trauma.

4.

A 73-year-old male patient presents with syncope, and an Electrocardiogram (ECG) reveals a PR interval of 0.40 seconds. Given his symptoms and ECG findings, which intervention is MOST appropriate?

Permanent pacemaker insertion

Continued observation with follow-up

Administration of intravenous epinephrine

Initiation of oral beta-blocker therapy

Correct answer: Permanent pacemaker insertion

Permanent pacemaker insertion is appropriate in this context, as a significantly prolonged PR interval (0.40 seconds) indicates advanced conduction disease likely leading to symptomatic bradycardia.

Observation with follow-up is inadequate given the patient's symptomatic presentation and significant ECG abnormality. IV epinephrine might temporarily increase his heart rate but is not a long-term solution and does not address the underlying conduction issue. Oral beta-blocker therapy would further prolong the PR interval and potentially worsen the patient's symptoms and conduction delay.

5.

If the transducer of a hemodynamic monitoring system is placed too low, what will happen to its readings?

They will be falsely elevated

They will be falsely decreased

The readings will not be affected

No readings will be present

Correct answer: They will be falsely elevated

If the transducer of a hemodynamic monitoring system is placed too low, it will result in falsely elevated pressure readings. This is because the transducer should be level with the phlebostatic axis (approximately at the level of the right atrium) to ensure accurate measurements. When it is positioned below this point, the pressure measured will be higher than the actual pressure.

When the transducer is placed too high, its readings will be too low (falsely decreased). The transducer needs to be leveled and balanced to zero before use, and the patient should be in a supine position.

6.

During the initial assessment of a patient with suspected STEMI, which of the following is the MOST critical intervention?

Performing a 12-lead ECG

Administering supplemental oxygen

Establishing IV access

Providing pain relief

Correct answer: Performing a 12-lead ECG

Performing a 12-lead ECG is the most critical intervention because it provides essential diagnostic information to confirm the presence of a STEMI (ST-Elevation Myocardial Infarction). Identifying the characteristic ST-segment elevation allows healthcare providers to rapidly initiate appropriate treatment protocols, such as reperfusion therapy, which is time-sensitive and can significantly reduce myocardial damage and improve patient outcomes.

While oxygen therapy can be important, it is not the most critical initial intervention unless the patient is hypoxic (SpO_2 < 90%). Recent guidelines suggest that routine oxygen administration to all patients with suspected STEMI is not necessary and may not provide benefit if the patient is not hypoxic. Establishing IV access is important for administering medications and fluids, but it is not as immediately critical as performing a 12-lead ECG. Managing pain is important in the treatment of STEMI, as it can reduce sympathetic stimulation and myocardial oxygen demand. However, it is not the most critical initial intervention.

7.

At which of the following intervals would you expect to see an elevated troponin following infarct?

Three to 12 hours

One to two hours

12 to 24 hours

Ten to 24 hours

Correct answer: Three to 12 hours

Cardiac biomarkers are used as a diagnostic tool in determining the presence of acute myocardial injury, such as in a non-STEMI or STEMI. It is typical for troponin to elevate between three and 12 hours after an infarct. The level peaks between ten and 24 hours after an infarct. Creatinine kinase-MB is another cardiac biomarker used as a diagnostic tool in determining the presence of acute myocardial injury. It elevates between four and 12 hours, then peaks between ten and 24 hours after infarct. Troponin levels remain elevated for up to nine days, while CK-MB levels return to normal within about 72 hours.

8.

An 83-year-old female patient arrives at the emergency department via EMS with apparent tachycardia and dizziness. Twenty minutes after she arrives, you notice a change in her cardiac rhythm, now a narrow complex tachycardia. Further assessment reveals the patient is unresponsive and without a pulse.

This is classified as which of the following types of cardiac arrest?

Pulseless electrical activity

Pulseless ventricular tachycardia

Asystole

Symptomatic bradycardia

Correct answer: Pulseless electrical activity

Pulseless electrical activity, or PEA, refers to a heterogeneous group of organized electrical rhythms that fail to produce effective contraction and a palpable pulse. A PEA arrest is most commonly treated in the same manner as asystole. The most prevalent underlying cause of PEA is hypovolemia.

Pulseless ventricular tachycardia is a serious cardiac rhythm disturbance in which the lower chambers of the heart (the ventricles) beat very rapidly and are unable to pump blood effectively through the body because they are not functioning properly. This condition is characterized by the absence of a detectable pulse, which indicates a severe decrease in cardiac output and signifies a life-threatening situation.

Asystole is a severe form of cardiac arrest characterized by a total lack of electrical activity in the heart. This condition is often referred to as "flatline" because, on an Electrocardiogram (ECG), the heart's electrical tracing shows a flat line without any movement, indicating no electrical activity and consequently no heartbeat. Symptomatic bradycardia is a condition in which the heart rate is slower than normal (typically less than 60 beats per minute). The heart's slower pace fails to provide adequate blood flow to meet the body's needs, which can result in a variety of symptoms and potentially serious complications.

9.

Which of the following is LEAST likely to be a cause of pericarditis?

Recent abdominal surgery

Neoplasm

Idiopathic reasons

Aortic dissection

Correct answer: Recent abdominal surgery

Recent abdominal surgery is unlikely to cause pericarditis unless a surgical complication, such as infection, occurs. Recent thoracic surgery, however, may cause pericarditis.

Pericarditis is most commonly idiopathic or is caused by infections, neoplasms, and conditions like aortic dissection.

10.

A 40-year-old male patient asks you what he can do to reduce his risk of developing Peripheral Vascular Disease (PVD). Which of the following is the BEST response?

"Be sure to maintain a healthy weight."

"You are not at risk of developing peripheral vascular disease until you reach age 60."

"Avoid exposure to heavy metals."

"There is nothing you can do to change your risk of developing peripheral vascular disease."

Correct answer: "Be sure to maintain a healthy weight."

Peripheral Vascular Disease (PVD) encompasses a range of disorders affecting blood vessels outside the heart and brain and is mainly caused by atherosclerosis. This condition involves the accumulation of plaque on the walls of arteries, leading to narrowed arteries and decreased blood flow, particularly to the legs. Among its various risk factors, obesity is significant and modifiable. Lifestyle modifications such as stopping smoking, engaging in regular physical activity, and following a nutritious diet can mitigate the risk of developing PVD.

Typically, PVD manifests later in life, but individuals as young as 40 years old can also be affected. Exposure to heavy metals is not considered a major risk factor for the onset of PVD.

11.

Which of the following BEST describes pulsus paradoxus?

A decrease in systolic blood pressure of at least 10 mmHg during inspiration

A decrease in systolic blood pressure of at least 10 mmHg during expiration

A decrease in diastolic blood pressure of at least 10 mmHg during inspiration

A decrease in diastolic blood pressure of at least 10 mmHg during expiration

---

Correct answer: A decrease in systolic blood pressure of at least 10 mmHg during inspiration

Pulsus paradoxus describes a decrease in systolic blood pressure of at least 10 mmHg during inspiration. This condition is commonly seen in cardiac tamponade and is caused by decreased venous return. Increased intrathoracic pressure associated with inspiration further exacerbates compression of the myocardium.

12.

A 50-year-old male patient arrives at the emergency department with chest pain, and an Electrocardiogram (ECG) shows inverted T waves in leads II, III, and aVF. What should be the NEXT step in his management?

Obtain cardiac biomarkers

Administer magnesium sulfate

Initiate fluid resuscitation

Perform a pericardiocentesis

Correct answer: Obtain cardiac biomarkers

Inverted T waves in the inferior leads (II, III, and aVF) can indicate myocardial ischemia or infarction. You should obtain cardiac biomarkers (like troponin) to confirm the diagnosis of myocardial infarction and assess the extent of cardiac injury. Cardiac biomarkers are essential in diagnosing Acute Coronary Syndromes (ACS), including unstable angina and myocardial infarction, as they provide information about cardiac muscle damage.

Magnesium sulfate is used primarily for treating torsades de pointes and not for initial management of suspected myocardial infarction. Fluid resuscitation is generally reserved for patients in shock or those with significant volume loss, which is not indicated by inverted T waves alone. A pericardiocentesis is indicated in cases of cardiac tamponade, which would present with different clinical signs, such as muffled heart sounds, hypotension, and jugular venous distension.

13.

A 68-year-old male with a history of Ventricular Tachycardia (VT) and Implanted Cardioverter Defibrillator (ICD) placement presents to the emergency department with complaints of his ICD firing three times in the last 24 hours.

Which of the following initial interventions would be MOST appropriate?

Tape a magnet over the ICD to prevent firing and monitor with external defibrillation pads in place

Instruct the patient to call the device representative

Recommend the patient be transcutaneously paced

Place external defibrillation pads a minimum of 5 cm from the ICD

Correct answer: Tape a magnet over the ICD to prevent firing and monitor with external defibrillation pads in place

ICDs are the standard of care for many cardiovascular conditions, including Long QT Syndrome (LQTS), ventricular dysrhythmias, and advanced heart failure or cardiomyopathy, for which it is needed for ventricular resynchronization.

One of the most common reasons patients visit an emergency department for their ICD is firing of the device. It is important to determine whether firing was appropriate to terminate a dysrhythmia or it was inappropriate because it was caused by a malfunction or low battery.

The most appropriate initial interventions include taping a magnet over the ICD to prevent firing and monitoring with external defibrillation pads in place. The pads should be placed about 10 cm from the ICD to reduce the risk of damaging the device. You should also obtain the patient's ICD information card and then contact the device representative to request an interrogation of the ICD and obtain rhythm/shock history. If the patient was symptomatic upon arrival, it would be appropriate to manage chest pain as you would in any other patient with ischemic chest pain.

Transcutaneous pacing is not the most appropriate initial intervention unless further identification of a rhythm warrants it.

14.

Which of the following Electrocardiographic (ECG) findings is MOST characteristic of acute pericarditis?

Widespread ST-segment elevation

Deep Q waves in leads II, III, and aVF

ST-segment depression in the anterior leads

Peaked T waves in the anterior leads

Correct answer: Widespread ST-segment elevation

Widespread ST-segment elevations that are concave upward across multiple leads are characteristic of acute pericarditis. This differs from the ECG findings in Acute Myocardial Infarction (AMI), which typically presents with ST elevations that are more localized to the area of the heart that is affected. Deep Q waves suggest old myocardial infarction, ST-segment depression may indicate ischemia, and peaked T waves can be seen in hyperkalemia.

15.

A 66-year-old female patient with a history of hypertension and recent chest trauma presents with severe chest pain radiating to the back. Her blood pressure is 190/100 mm Hg, and she has a significant pulse deficit in the right radial artery.

Which of the following diagnostic tests is MOST likely to confirm the diagnosis of acute aortic dissection?

Chest Computed Tomography (CT)

Electrocardiogram (ECG)

Chest radiography

Echocardiogram

Correct answer: Chest Computed Tomography (CT)

Acute aortic dissection is a critical condition characterized by a tear in the inner layer of the aorta, the major artery emanating from the heart. This tear permits blood to flow between the layers of the aorta's wall, leading to separation (dissection) of the layers. If the blood-filled channel breaks through the outer wall of the aorta, it often results in a fatal outcome.

Chest CT (with or without angiography) is the gold standard for diagnosing acute aortic dissection. It provides detailed images of the aorta, allowing visualization of the dissection flap and the extent of the dissection.

ECG is important to rule out other causes of chest pain, such as myocardial infarction, but it cannot diagnose an aortic dissection. A chest x-ray might show a widened mediastinum, which can suggest an aortic dissection, but it is not definitive. It is more useful as a preliminary test. Echocardiogram, particularly transesophageal echocardiography, can be used to visualize the aorta, but it is less commonly used as the initial diagnostic test.

16.

Which of the following heart sounds would the nurse anticipate in a patient with infective endocarditis?

Murmur

Normal heart sounds

Gallop

Click

Correct answer: Murmur

Infective endocarditis is a condition in which the inner lining of the heart's chambers and valves, known as the endocardium, becomes infected. This happens when bacteria, fungi, or other microorganisms enter the bloodstream and adhere to damaged heart tissues.

When evaluating a patient with endocarditis, a murmur is typically heard because of the valvular insufficiency associated with the infection. Normal heart sounds are unlikely unless the infection is extremely mild. Gallops and clicks are generally not heard with endocarditis.

17.

When performing Cardiopulmonary Resuscitation (CPR) on a patient in cardiac arrest, what is the maximum amount of time that should be spent checking for a pulse between compressions?

Ten seconds

15 seconds

Five seconds

Three seconds

Correct answer: Ten seconds

The nurse should feel for a pulse for at least five seconds but should not interrupt CPR for longer than ten seconds to check for a pulse. If no pulse is detected after five to ten seconds, begin another round of 30 chest compressions.

18.

Which of the following is a sign of right-sided heart failure?

Jugular venous distension

Pulmonary edema

Crackles

Shortness of breath

Correct answer: Jugular venous distension

Heart failure occurs when the heart can't pump blood sufficiently, leading to insufficient oxygen supply to the body's tissues. It manifests in two forms: systolic, in which the heart fails to pump efficiently, and diastolic, in which the heart struggles to fill with blood properly. This condition can impact the left ventricle, causing congestion in the pulmonary veins, or the right ventricle, leading to systemic circulatory congestion. Symptoms associated with right-sided heart failure are peripheral edema, distended jugular veins, abdominal swelling due to fluid accumulation (ascites), and nausea.

Symptoms of left sided heart failure include shortness of breath, dyspnea, crackles, and pulmonary edema.

19.

Which of the following medications is considered first-line treatment for a patient diagnosed with acute pericarditis?

Anti-inflammatory medications

Calcium channel blockers

Beta-blockers

Anticoagulants

Correct answer: Anti-inflammatory medications

Nonsteroidal Anti-Inflammatory Drugs (NSAIDs) are the cornerstone of treatment for acute pericarditis because they effectively reduce the inflammation of the pericardium, which is the primary cause of clinical symptoms such as chest pain. By reducing inflammation, NSAIDs alleviate pain and decrease the potential for complications related to ongoing inflammation, such as the formation of adhesions or effusion.

Calcium channel blockers are primarily used to treat hypertension and cardiac conditions that involve the regulation of calcium ions, such as arrhythmias and some forms of angina. They do not have a primary role in reducing or treating the inflammation associated with pericarditis, which is the fundamental pathological process in this condition. Beta-blockers are used to manage various cardiac issues, including hypertension, some arrhythmias, and ischemic heart disease, by slowing the heart rate and reducing cardiac workload. Like calcium channel blockers, they do not address the inflammation of the pericardium in pericarditis. Anticoagulants are used to prevent blood clot formation, a crucial treatment in conditions like atrial fibrillation, deep vein thrombosis, and pulmonary embolism. In the context of pericarditis, using anticoagulants can be risky without a specific indication as they could increase the risk of bleeding into the pericardial space, especially if there is any pericardial damage. They do not address the inflammation and are not indicated as a routine treatment for acute pericarditis unless there are other coexisting conditions that warrant their use.

20.

What is the MOST common initial treatment for a patient with acute decompensated heart failure?

Loop diuretics

Beta-blockers

ACE inhibitors

Calcium channel blockers

Correct answer: Loop diuretics

Loop diuretics, such as furosemide (Lasix), are often the first line of treatment to quickly reduce fluid overload in patients with acute decompensated heart failure. By promoting diuresis, they help decrease preload (by causing an almost immediate venous dilation) and alleviate symptoms of pulmonary congestion.

Beta-blockers are essential for managing chronic heart failure but are not typically used as initial treatment in acute decompensated heart failure due to their negative inotropic effects. ACE inhibitors are important in the long-term management of heart failure because they reduce afterload and prevent remodeling, but they are not the immediate treatment choice in acute cases. Calcium channel blockers are generally not used in acute decompensated heart failure due to their negative inotropic effects and potential to exacerbate heart failure.

21.

How should the nurse manage blood pressure in a patient with suspected acute aortic dissection?

There is no evidence-based blood pressure target

Keep it as low as possible

Maintain systolic blood pressure between 140 and 160 mmHg

Maintain a MAP of 70 mmHg or lower

Correct answer: There is no evidence-based blood pressure target

Medical management of acute aortic dissection is based on clinical judgment. There is not an evidence-based blood pressure target. It is important to reduce stress on the aortic aneurysm while optimizing perfusion. Intravenous beta-blockers can be used to manage blood pressure and reduce the force of the heart's contractions. Nitroglycerin and nitroprusside cause vasodilation, leading to both decreased blood pressure and afterload.

Hypotension and hypertension should both be avoided. However, of the two, hypotension is generally considered preferable. Management should include systolic blood pressure, not MAP, as systolic blood pressure represents the maximum pressure on the aortic wall.

22.

What is the MOST common risk factor for acute aortic dissection?

Familial history

Atherosclerosis

Cocaine use

Bicuspid aortic valve

Correct answer: Familial history

This life-threatening condition is a result of a tear in the intimal layer of the aorta, allowing blood flow to enter the aortic media. As blood surges through the tear, propelled by the pulsatile flow and high pressures within the aorta, the inner and middle layers of the aorta dissect. Pressures within this blood-filled channel can compress the true aortic lumen and reduce blood flow through aortic branch vessels. If the blood-filled channel ruptures through the outside aortic wall, aortic dissection is often fatal.

Hypertension and/or immediate familial history are the most common risk factors, followed by atherosclerosis. Bicuspid aortic valve and cocaine use are also risk factors for this emergent condition. Most often, the patient experiences sudden severe chest or upper back pain, described as a tearing, ripping or shearing sensation that radiates to the neck or down the back.

23.

A patient presents with sudden severe chest pain, hypotension, and jugular venous distension following a recent myocardial infarction. Which diagnosis should be highly suspected?

Myocardial rupture

Pulmonary embolism

Aortic dissection

Tension pneumothorax

Correct answer: Myocardial rupture

Myocardial rupture should be highly suspected in a patient presenting with sudden severe chest pain, hypotension, and jugular venous distension following a recent myocardial infarction. Myocardial rupture is a catastrophic complication of myocardial infarction, occurring when the heart muscle tears. The presentation includes sudden chest pain, hemodynamic instability, and signs of cardiac tamponade (such as jugular venous distension), which result from the rupture leading to blood leaking into the pericardial sac and compressing the heart.

Although pulmonary embolism can cause sudden severe chest pain and hypotension, it is less likely in the context of a recent myocardial infarction. Jugular venous distension can occur with massive pulmonary embolism, but it is not as strongly associated with the specific post-myocardial infarction scenario presented. Aortic dissection also presents with sudden severe chest pain and can cause hypotension. However, it is less associated with jugular venous distension and is not directly related to the recent myocardial infarction. The pain in aortic dissection is often described as tearing and radiates to the back, which differentiates it from myocardial rupture. Tension pneumothorax can present with sudden severe chest pain, hypotension, and jugular venous distension. However, this condition is usually associated with absent breath sounds on the affected side and with tracheal deviation, which are not mentioned in the scenario. Additionally, tension pneumothorax is less likely than myocardial rupture to occur after a recent myocardial infarction.

24.

A 72-year-old male patient on warfarin therapy for a previous Deep Vein Thrombosis (DVT) presents with signs of a new DVT. What is the MOST appropriate next step in management?

Order a venous duplex ultrasound

Increase the warfarin dosage

Switch to a Direct Oral Anticoagulant (DOAC)

Administer Low Molecular Weight Heparin (LMWH)

Correct answer: Order a venous duplex ultrasound

Venous-doppler sonography will confirm the presence of a new DVT and is the most appropriate next step in management before making any changes to the treatment plan.

Increasing the warfarin dosage should not be done without confirming the diagnosis and considering other potential causes of the symptoms. Switching to a DOAC could be considered, but it should be based on a confirmed diagnosis and a comprehensive review of the patient's medical history and current status, including an ultrasound. Administering LMWH could be an option for immediate anticoagulation, but confirming the diagnosis with imaging is essential first.

25.

A patient expresses concern that they will develop endocarditis. Which of the following recommendations is MOST likely to reduce the risk of endocarditis in the future?

Stop using heroin

Avoid going to the dentist

Stop smoking

Stop using marijuana

Correct answer: Stop using heroin

Intravenous (IV) drug abuse is a significant risk factor for endocarditis, and heroin is a drug that is almost always used intravenously. Stopping heroin use would decrease the risk of developing infective endocarditis.

While dental procedures do increase the risk of endocarditis, avoiding going to the dentist increases the risk of tooth decay and infection, which can lead to endocarditis. Rather, when going to the dentist, precautions should be taken to reduce the risk of endocarditis. Marijuana is not an IV drug, so stopping marijuana is unlikely to reduce the risk of endocarditis.

26.

Which finding is LEAST expected in a patient who has been diagnosed with Deep Vein Thrombosis (DVT)?

Hyperglycemia

Swelling distal to the location of pain

Mild elevation in temperature

Deep muscle tenderness

Correct answer: Hyperglycemia

Deep Vein Thrombosis (DVT) occurs when a blood clot, also known as a thrombus, develops in the deep veins of the body, often in the legs. This condition may lead to symptoms such as swelling or pain in the leg, although it can sometimes present without any noticeable symptoms. DVT is a critical condition due to the risk of the blood clot dislodging and traveling to the lungs, where it can obstruct blood circulation (known as pulmonary embolism), posing a severe, potentially fatal risk.

Symptoms of DVT include:

- *Swelling in the leg that is impacted, occasionally in both legs*
- *Leg pain that typically originates in the calf, characterized by cramping or aching*
- *Red or discolored skin on the affected leg*
- *A sensation of warmth in the affected leg*

Hyperglycemia is not associated with the development of DVT.

27.

The nurse is administering nitroprusside (Nipride) to a patient who is experiencing a hypertensive emergency. Which consideration is incorrect for administering this medication?

Titration should be rapid to slow the progression of end-organ damage

An arterial line will probably be indicated

The onset of the medication will be very rapid

The blood pressure should not be reduced by more than 25% in the first two hours

---

Correct answer: Titration should be rapid to slow the progression of end-organ damage

Because the effects of nitroprusside have such a rapid onset, it should be titrated slowly to avoid dropping blood pressure too quickly. An arterial line will likely be indicated to track blood pressure changes in real time. It is important to avoid reducing blood pressure by more than 25% in the first two hours to avoid complications that can occur with rapid reductions in blood pressure.

28.

Which of the following symptoms is LEAST likely to be expected in a patient who develops pericarditis?

Chest pain with a gradual onset

Chest pain unrelieved by rest or nitroglycerin

Friction rub present with auscultation

Tachypnea

Correct answer: Chest pain with a gradual onset

Chest pain is common with pericarditis but generally has a rapid onset, not a gradual onset. The pain may be dull or sharp and is often pleuritic in nature. Pericardial chest pain is exacerbated by activity, lying supine, and inspiration. It is alleviated by sitting upright and leaning forward but is unrelieved by rest or nitroglycerin. A pericardial friction rub present with auscultation and tachypnea are both expected symptoms of pericarditis.

29.

For a patient who remains comatose, what is the MAIN goal of therapeutic hypothermia following cardiopulmonary arrest?

Preserve neurologic function

Preserve cardiac function

Preserve pulmonary function

Preserve metabolic function

Correct answer: Preserve neurologic function

Goals of care following resuscitation from cardiopulmonary arrest are focused on minimizing brain injury and preserving neurologic function. Therapeutic hypothermia, or Targeted Temperature Management (TTM), is the only therapy that has shown improvements in neurologic recovery for patients who have sustained a cardiopulmonary arrest but remain comatose. It involves cooling the entire body to temperatures between 32°C and 36°C for at least 24 hours. TTM requires close supervision and monitoring.

30.

In assessing a patient with a suspected hypertensive emergency, which of the following diagnostic tests is crucial to evaluate for end-organ damage?

Serum Blood Urea Nitrogen (BUN) and creatinine levels

Complete Blood Count (CBC)

Chest radiography

Electrolyte panel

Correct answer: Serum Blood Urea Nitrogen (BUN) and creatinine levels

While all these diagnostic tests can be valuable in the comprehensive evaluation of a patient with a hypertensive emergency, serum creatinine and BUN levels are particularly important for assessing kidney function and potential renal damage, a common form of end-organ damage in hypertensive emergencies.

A CBC might be used to identify concurrent issues but doesn't directly assess end-organ damage. A chest radiograph is important for assessing cardiac and pulmonary status but may not directly indicate renal damage. An electrolyte panel can show secondary effects of renal impairment but is less direct than measuring creatinine and BUN levels.

31.

Of the following, which is NOT an appropriate recommendation for transcutaneous pacing?

Apply pacing electrodes posterior-posterior

Set pacemaker rate at 70 beats per minute

Slowly increase milliamperes (mA) until electrical capture occurs

Use the lowest number of milliamperes (mA) that maintains capture

---

Correct answer: Apply pacing electrodes posterior-posterior

Transcutaneous Pacing (TCP) is a noninvasive method that uses external electrodes to deliver electrical impulses through the chest wall to the heart. These impulses simulate the heart's natural pacemaker and help maintain an adequate heart rate and rhythm until a more permanent solution can be implemented or the underlying condition resolves.

To initiate TCP, there are a number of important steps to be followed. Pacing electrodes should be placed anterior-posterior or anterior-anterior. The pacemaker should be set at a rate of 70 beats per minute. The number of milliamperes (mA) should be slowly increased until electrical capture is obtained, using the lowest number necessary to maintain capture.

32.

A 68-year-old male patient presents to the emergency department with severe chest pain, hypotension, and cool, clammy skin. He has a history of myocardial infarction and currently shows signs of pulmonary edema.

Based on these clinical findings, which of the following BEST describes the pathophysiology underlying his condition?

Cardiogenic shock occurs when the heart fails to pump blood effectively, leading to decreased cardiac output and inadequate tissue perfusion despite adequate intravascular volume.

Hypovolemic shock occurs due to significant blood loss, resulting in decreased circulating blood volume and inadequate tissue perfusion.

Anaphylactic shock occurs when a severe allergic reaction causes widespread vasodilation and increased capillary permeability, leading to inadequate tissue perfusion.

Neurogenic shock occurs when a spinal cord injury causes loss of sympathetic tone and results in decreased vascular resistance and inadequate tissue perfusion.

Correct answer: Cardiogenic shock occurs when the heart fails to pump blood effectively, leading to decreased cardiac output and inadequate tissue perfusion despite adequate intravascular volume.

Cardiogenic shock occurs when a patient's heart is not pumping blood effectively. It can also result from myocardial pump failure, decreased cardiac output, and inadequate tissue perfusion in the presence of adequate intravascular volume. Common etiologies of cardiogenic shock include myocardial infarction, blunt trauma, sustained cardiac dysrhythmias, end-stage cardiomyopathy, and valve dysfunction.

33.

Beck's triad is a collection of three medical signs that present with acute cardiac tamponade. What are the components of Beck's triad?

Hypotension, jugular venous distension, and muffled heart sounds

Hypotension, jugular venous distension, and bradycardia

Hypertension, jugular venous distension, and muffled heart sounds

Hypertension, bradycardia, and muffled heart sounds

Correct answer: Hypotension, jugular venous distension, and muffled heart sounds

Cardiac tamponade is the collection of fluid (blood or blood clots) in the pericardial sac (surrounding sac of the heart) that compresses the heart, limiting ventricular filling and decreasing cardiac output. It is a medical emergency and can be fatal if not treated immediately. It is usually caused by a ruptured aortic aneurysm or penetrating chest injury (gunshot or stab wound). Beck's triad includes the standard diagnostic features of cardiac tamponade: hypotension, distended neck veins, and muffled or distant heart sounds. Narrow pulse pressure might also be observed.

Bradycardia is not a component of Beck's triad. It can occur in severe cases of cardiac tamponade but is not one of the primary signs. Hypertension is not a typical component of Beck's triad and is usually not associated with cardiac tamponade.

34.

A patient presents to the emergency department with blurred vision, headache, and epistaxis.

Which intervention is MOST important?

Measuring blood pressure

Ordering a head CT

Stopping the bleeding

Taking a temperature

Correct answer: Measuring blood pressure

Measuring the patient's blood pressure is the most important because it directly addresses the potential underlying cause of the symptoms (hypertensive emergency) and guides further immediate management steps.

Ordering a head CT is important to rule out intracranial causes of headache and blurred vision, but it is not the first step. While managing the epistaxis is necessary, it is not the most critical intervention in the context of a potential hypertensive emergency. Measurement of the patient's temperature is a routine assessment but is not immediately relevant to the presented symptoms.

35.

Anxiety, fear, and confusion can be signs of which of the following clinical manifestations of shock?

Hypoxia

Metabolic disturbances

Cardiac dysrhythmia

Pain

Correct answer: Hypoxia

Diminished delivery of oxygen to tissues, known as hypoxia, signifies a clinical sign of shock. Initial symptoms of hypoxia can manifest as anxiety and restlessness. As shock advances to more severe stages, individuals may experience confusion, stupor, and eventually a loss of consciousness. Monitoring a patient's mental state and level of consciousness is crucial for healthcare workers to administer appropriate supportive care for hypoxia.

Shock-induced metabolic disturbances arise as a consequence of reduced oxygen and nutrient supply to tissues, diminished blood circulation, and impaired elimination of metabolic waste. Cardiac depression may lead to dysrhythmias as a secondary complication in cases of uncompensated shock. Shock can dull the sensation of pain.

36.

What is the BEST biomarker for cardiac injury?

- **Troponin**
- Creatinine Kinase (CK)
- Lactate Dehydrogenase (LDH)
- Myoglobin

Correct answer: Troponin

Troponin is the most commonly used biomarker for diagnosing acute myocardial infarction due to its high specificity and sensitivity to cardiac injury. It enters the bloodstream soon after a heart attack and remains for days after all other biomarkers return to normal levels.

Myoglobin is an early marker of muscle injury, including heart muscle, but it is not as specific as troponin. CK, especially CK-MB, is used to diagnose myocardial infarction, but it is less specific than troponin. LDH is a nonspecific marker of tissue damage and is not commonly used for diagnosing myocardial infarction.

37.

A 65-year-old patient with a history of chronic heart failure presents with acute shortness of breath, fatigue, and peripheral edema. The patient's vital signs include a blood pressure of 150/90 mmHg, heart rate of 110 bpm, respiratory rate of 28 breaths per minute, and oxygen saturation of 88% on room air.

Which of the following diagnostic procedures is LEAST relevant for assessing this patient's condition?

Abdominal ultrasound

Electrocardiogram (ECG)

Chest x-ray

Echocardiogram

Correct answer: Abdominal ultrasound

While chest x-ray, echocardiogram, and ECG are directly relevant and critical for assessing acute heart failure exacerbation by providing information about heart structure, function, and potential complications, an abdominal ultrasound is not typically used for this purpose. The abdominal ultrasound is more relevant for assessing abdominal organs and detecting issues unrelated to acute heart failure exacerbation.

38.

Which of the following is NOT a potential effect of supraventricular tachycardia on coronary perfusion?

Increases ventricular filling

Decreases diastolic time

Decreases cardiac output

Increases heart rate

Correct answer: Increases ventricular filling

Supraventricular Tachycardia (SVT) is a dysrhythmia related to the decreased diastolic time resulting from tachycardia. The decreased diastole limits filling time of the ventricles, therefore decreasing cardiac output.

SVT is characterized by an increased heart rate, between 150 and 300 beats per minute. Because of the significant increase in heart rate and decreased cardiac output, patients may be highly symptomatic.

39.

Which of the following is LEAST likely to cause a hypertensive emergency?

Gestational diabetes

Alcohol withdrawal

Hyperaldosteronism

Glomerulonephritis

Correct answer: Gestational diabetes

A hypertensive emergency is a severe and acute medical condition characterized by severely high blood pressure that can lead to organ damage or life-threatening complications. Unlike hypertensive urgency, in which elevated blood pressure may not result in immediate organ damage, a hypertensive emergency is associated with actual or imminent organ damage and requires immediate medical attention.

Gestational diabetes is not typically a cause of hypertensive crisis. Preeclampsia, eclampsia, and postpartum hypertension are the obstetrical conditions best known for causing hypertensive emergencies. Hyperaldosteronism, alcohol withdrawal, and glomerulonephritis are all possible causes of hypertensive emergencies.

40.

If the fluid in the pericardial space accumulates rapidly, how much fluid could cause cardiac tamponade?

100–150 mL

<50 mL

10–25 mL

500–575 mL

Correct answer: 100–150 mL

Cardiac tamponade occurs when blood or clots gather in the pericardial sac and exert pressure on the heart, which restricts its ability to fill properly, subsequently reducing cardiac output. Accumulation of 100–150 mL of fluid in the pericardial cavity is enough to lead to this condition.

Typically, the pericardial space holds less than 50 mL of fluid. It can accommodate a larger amount of fluid without causing cardiac tamponade if the accumulation occurs gradually (or slowly).

41.

A 65-year-old patient presents to the emergency department with unilateral leg swelling, redness, and pain after a long-haul flight. You are concerned about the presence of Deep Vein Thrombosis (DVT).

Which of the following tests will BEST determine whether DVT is present?

Doppler sonography

Arterial sonography

D-dimer assay

Physical examination

Correct answer: Doppler sonography

Venous ultrasound (Doppler sonography) allows for visualization of the venous blood vessels and measurement of the blood flow within the vessels. Arterial sonography, which assesses arterial blood flow, is not suitable for detecting DVTs, as they occur in the venous system. The D-dimer test measures fibrin degradation products, which can indicate the presence of a blood clot but cannot specifically diagnose DVT. Physical examination can suggest the possibility of a DVT but cannot definitively diagnose it.

42.

Which of the following is LEAST likely to be a sign of cerebrovascular impairment associated with a hypertensive emergency?

Orthostatic dizziness

Headache

Confusion

Seizures

Correct answer: Orthostatic dizziness

A hypertensive emergency is a severe and potentially life-threatening condition characterized by extremely high blood pressure (typically systolic blood pressure greater than 180 mmHg and/or diastolic blood pressure greater than 120 mmHg) accompanied by evidence of acute or ongoing target organ damage. This condition requires immediate medical intervention to prevent serious complications.

Orthostatic dizziness is associated with hypotension, not hypertension. Signs of cerebrovascular impairment associated with a hypertensive emergency include headache, confusion, seizures, altered level of consciousness, drowsiness, stupor, or coma.

43.

Which of the following vessels does NOT supply the right atrium?

Four pulmonary veins

Superior vena cava

Coronary sinus

Thebesian veins

Correct answer: Four pulmonary veins

The four pulmonary veins supply the left atrium, not the right atrium.

These are the inflow tracts for the right atrium:

- *Thebesian veins*
- *Superior vena cava*
- *Inferior vena cava*
- *Coronary sinus*

The atria and the ventricles are the two types of cardiac chambers.

44.

A 55-year-old male patient presents to the emergency department with complaints of leg pain and cramping after walking short distances. Upon further evaluation, the patient is diagnosed with Peripheral Vascular Disease (PVD). You are discussing modifiable and nonmodifiable risk factors with the patient to help manage and mitigate the progression of his condition.

Which of the following identified factors is NOT modifiable by the patient to reduce the risk of PVD?

Male gender

Hyperlipidemia

Smoking

Hypertension

Correct answer: Male gender

Male gender is a nonmodifiable risk factor for developing PVD, meaning it cannot be changed by the patient. In contrast, hyperlipidemia, smoking, and hypertension are modifiable risk factors that can be managed through lifestyle changes or medical interventions.

45.

A 72-year-old male presents to the emergency department with an abrupt onset of chest pain radiating to his left arm, accompanied by diaphoresis and nausea. His history is significant for diabetes and hypertension. His vital signs are BP 153/98 mmHg, heart rate 118 bpm, respirations 20 per minute, and oxygen saturation 95% on room air. An Electrocardiogram (ECG) was obtained, and the results are pending.

Based on his presenting symptoms, what is your MOST appropriate initial action?

Administer sublingual nitroglycerin

Prepare the patient for immediate coronary angiography

Administer high-flow oxygen

Obtain a detailed history of the patient's chest pain

Correct answer: Administer sublingual nitroglycerin

In patients presenting with symptoms suggestive of Acute Coronary Syndrome (ACS), such as chest pain radiating to the arm along with nausea and diaphoresis, the administration of sublingual nitroglycerin can help relieve ischemic chest pain (unless contraindicated). Nitroglycerin helps dilate the coronary arteries and improve blood flow to the heart muscle.

While coronary angiography might be necessary for this patient eventually, it is not the first step. Initial management should focus on stabilizing the patient, assessing vital signs, providing symptomatic treatment, and obtaining an ECG. High-flow oxygen was traditionally administered to all patients with chest pain, but current guidelines recommend oxygen therapy only for patients with hypoxemia (O_2 sat <94%). Over-oxygenation can cause vasoconstriction and reduce coronary artery blood flow, so it's not indicated unless the patient is hypoxic.

While a detailed history is important, it should not take precedence over initiating treatment to relieve ischemic pain and prevent further myocardial damage. Immediate management and stabilization are paramount, and detailed history can be obtained concurrently or after initial stabilization measures.

46.

You are participating in efforts to resuscitate a 73-year-old male patient who presents to the emergency department in cardiopulmonary arrest. He was intubated in the field with an endotracheal tube, but you are unable to obtain circulatory access.

How will you administer drugs?

Administer epinephrine via endotracheal tube

Administer epinephrine via sublingual route

Do not administer drugs until Intravenous (IV) or Intraosseous (IO) access is obtained

Assist the physician with central line insertion to administer drugs

---

Correct answer: Administer epinephrine via endotracheal tube

Epinephrine increases cerebral and coronary blood flow during CPR. It also increases heart rate, conduction, and contractility. If IV or IO access cannot be obtained, epinephrine may be administered via endotracheal tube. While this route is not preferred due to unpredictable drug absorption, it is a last resort in the absence of circulatory access.

Epinephrine is not typically administered sublingually in emergency situations, especially during resuscitation efforts.

47.

Which of the following BEST describes a positive chronotropic cardiac effect?

Increased heart rate

Decreased heart rate

Increased strength of heart contraction

Decreased strength of heart contraction

Correct answer: Increased heart rate

The categories of cardiac medications encompass chronotropic, inotropic, and dromotropic drugs. These can produce either a positive effect, which enhances their specific target function, or a negative effect, which diminishes it. An example of a positive chronotropic cardiac effect is an increased heart rate, and atropine is an example of a medication that elicits this response.

A decreased heart rate is a negative chronotropic effect. Increased strength of heart contraction is a positive inotropic effect. Decreased strength of heart contraction is a negative inotropic effect.

48.

Which of the following is NOT an example of what an Electrocardiograph (ECG) detects?

Systemic artery pressure

Toxicity

Electrolyte imbalances

Conduction defects

Correct answer: Systemic artery pressure

The systemic artery pressure is measured by a hemodynamic monitoring system, not an ECG.

An ECG is used to detect the following: toxicity, drug effects, rhythm disturbances, electrolyte imbalances, and conduction defects. An ECG measures and records the heart's electrical activity by measuring the electrical potential at the skin's surface.

49.

Which of the following electrolyte imbalances is LEAST likely to cause a cardiac rhythm disturbance?

Hypophosphatemia

Hyperkalemia

Hypercalcemia

Hyponatremia

Correct answer: Hypophosphatemia

Electrolyte imbalances can significantly impact cardiac rhythm. Hyperkalemia and hypercalcemia are well known for causing rhythm disturbances. While hyponatremia can affect cardiac function, it is less commonly associated with direct rhythm disturbances than hyperkalemia and hypercalcemia.

Hypophosphatemia, on the other hand, is more commonly related to muscle weakness and respiratory issues than to cardiac rhythm abnormalities.

50.

A 72-year-old patient with a history of hypertension is brought to the emergency department with chest pain, dyspnea, and a blood pressure of 200/110 mmHg. An Electrocardiogram (ECG) indicates no acute changes.

Considering the patient's clinical symptoms and blood pressure, what is the MOST appropriate next step in management?

Begin intravenous nitroprusside infusion and monitor blood pressure closely

Administer sublingual nitroglycerin for chest pain

Start an intravenous beta-blocker to rapidly lower blood pressure

Initiate oral antihypertensive therapy and recheck blood pressure in one hour

---

Correct answer: Begin intravenous nitroprusside infusion and monitor blood pressure closely

In a hypertensive emergency, the key is to lower the blood pressure in a controlled manner to reduce the risk of end-organ damage while ensuring that the decrease is not so rapid as to compromise organ perfusion. The choice of antihypertensive agent and the method of administration are critical to safely managing the patient's condition. Nitroprusside, a potent vasodilator, can be titrated carefully to achieve a prompt but controlled reduction in blood pressure appropriate for managing hypertensive emergencies while avoiding rapid drops in pressure that could lead to ischemia.

While nitroglycerin is beneficial for chest pain, it may not be sufficient to manage a hypertensive emergency, especially without addressing the high blood pressure aggressively. Beta-blockers must be used cautiously. Rapid lowering of blood pressure with beta-blockers without a vasodilator can lead to a paradoxical increase in blood pressure due to unopposed alpha-adrenergic effects. In a hypertensive emergency, waiting an hour to recheck blood pressure after oral medication is inappropriate due to the urgent need to reduce blood pressure and prevent organ damage.

51.

You are attending to a 71-year-old female patient who suddenly collapses in the emergency department waiting room. Her vital signs are absent, and the monitor shows ventricular fibrillation.

Which intervention should be performed FIRST?

Defibrillate the patient

Initiate Cardiopulmonary Resuscitation (CPR)

Administer epinephrine

Establish an advanced airway

Correct answer: Defibrillate the patient

For a patient in ventricular fibrillation, immediate defibrillation is the priority because it is the only effective method of terminating this rhythm and potentially restoring spontaneous circulation. The goal is to deliver the shock as quickly as possible.

Initiating CPR is important and should be done immediately after defibrillation if the initial shock is unsuccessful. Administration of epinephrine is part of the Advanced Cardiac Life Support (ACLS) algorithm, typically after initial defibrillation and CPR have been attempted. Establishing an advanced airway is also part of ACLS, but it is not the first priority in the initial management of ventricular fibrillation.

52.

What is the appropriate ratio of compressions to ventilations in an adult during CPR?

30:2

15:2

30:1

15:1

Correct answer: 30:2

The American Heart Association emphasizes the need for quality chest compressions in managing cardiopulmonary arrest, which includes pushing hard and fast, ensuring complete release of chest pressure between compressions, and minimizing interruptions.

Until an advanced airway is placed, compressions and ventilations should be given at a ratio of 30:2 (two ventilations after each cycle of 30 chest compressions). Following placement of an airway, ventilations should be given at a rate of eight to ten per minute (one ventilation every five or six seconds) with continuous, uninterrupted chest compressions.

53.

Which of the following interventions is NOT appropriate for managing supraventricular tachycardia?

Transcutaneous pacing

IV adenosine

Synchronized cardioversion

Vagal maneuver

Correct answer: Transcutaneous pacing

Supraventricular Tachycardia (SVT) is a rapid heart rhythm that originates above the ventricles. An ECG typically reveals a ventricular rate between 150 and 300 beats per minute as well as a narrow QRS complex. Patients with excessive heart rates have the potential to develop significant decreases in cardiac output and be highly symptomatic.

Therapeutic interventions include vagal maneuver, IV adenosine, IV diltiazem or beta blocker, and synchronized cardioversion. Transcutaneous pacing is not effective for treating or "breaking" SVT.

54.

What term describes the first stage of shock?

Compensated

Decompensated

Refractory

Profound

Correct answer: Compensated

Shock progresses through three phases: compensated, decompensated, and refractory (irreversible). The compensatory stage is characterized by the activation of the sympathetic nervous system. In this initial phase, the body actively attempts to counteract and manage the effects of reduced blood flow. This period involves the activation of various bodily responses aimed at sustaining sufficient blood perfusion to critical organs, notably the brain and heart, despite the underlying conditions such as hemorrhage, infection, or cardiac issues.

Hypoperfusion is the clinical manifestation of the decompensated, or progressive, stage of shock. Profound hypoperfusion and evidence of MODS is the clinical manifestation of the refractory, or irreversible, stage of shock.

55.

Sinus tachycardia is a rhythm that can be caused by stress, fear, anger, pain, or anxiety. If a patient's sinus tachycardia is caused by anxiety, with what should it be treated?

Anxiolytics

Analgesics

Antidysrhythmics

Fluids

Correct answer: Anxiolytics

A patient who suffers from sinus tachycardia caused by anxiety should be treated with anxiolytics. An anxiolytic is a medication or other intervention that inhibits anxiety. This effect is in contrast to anxiogenic agents, which increase anxiety. Treating sinus tachycardia involves treating the underlying cause.

Analgesics are used to treat pain. Antidysrhythmics are used to treat abnormal cardiac conduction. Fluids are used to treat hypovolemia.

56.

Which of the following is NOT a common etiologic factor of left ventricular failure?

Myocardial contusion

Cardiomyopathy

Uncontrolled hypertension

Valvular dysfunction

Correct answer: Myocardial contusion

Myocardial contusion is not a common etiologic factor for left ventricular failure; however, it is an etiologic factor for right ventricular failure.

The etiologic factors for left ventricular failure include:

- *Acute Coronary Syndrome (ACS), particularly with ischemia or necrotic damage to the ventricles*
- *Uncontrolled hypertension*
- *Cardiomyopathies*
- *Valvular dysfunction*
- *Cardiac infections, such as myocarditis or endocarditis*
- *Noncompliance with medications and diet*

57.

Which of the following is NOT a common drug used during resuscitation in cardiopulmonary arrest?

Dobutamine

Epinephrine

Lidocaine

Amiodarone

Correct answer: Dobutamine

The drugs most commonly used during resuscitation for cardiopulmonary arrest are epinephrine, lidocaine, and amiodarone. These drugs are administered either intravenously or intraosseously, depending on the type of access that has been obtained. For patients experiencing refractory ventricular fibrillation or pulseless ventricular tachycardia who do not respond to high-quality CPR, defibrillation, epinephrine, and antiarrhythmic drugs, esmolol can be an option to consider.

Dobutamine has not been clinically shown to improve cardiopulmonary arrest outcomes.

58.

Which of the following conditions can lead to obstructive shock?

Tension pneumothorax

Congestive Heart Failure (CHF)

Pneumonia

Anaphylaxis

Correct answer: Tension pneumothorax

Obstructive shock is caused by obstruction of the great vessels of the heart. Mechanical obstruction of the vessels leads to impaired filling of the heart with blood. Any condition that fills the thoracic cavity with fluid, tissue, or air can lead to obstructive shock.

Pericardiac tamponade, pulmonary embolism, and tension pneumothorax are three of the most common causes of obstructive shock.

CHF can lead to cardiogenic shock. Pneumonia can lead to septic shock. Anaphylaxis can lead to anaphylactic shock (a type of distributive shock).

59.

The nurse takes a patient's blood pressure in the emergency room and finds that it is 143/91. Which of the following does the nurse recognize is correct?

No determination can be made that the patient has hypertension

The patient is prehypertensive

The patient has stage 1 hypertension

The patient has stage 2 hypertension

Correct answer: No determination can be made that the patient has hypertension

Two separate blood pressure readings must be taken four hours apart to diagnose hypertension. An isolated reading is not sufficient. If a similar reading were obtained the second time, the patient would be considered to have stage 2 hypertension due to having a systolic blood pressure over 140. An isolated reading, however, is often high for a patient in the hospital due to the stress of the setting and circumstances.

60.

A 72-year-old male patient with chronic renal failure presents with a serum potassium level of 6.5 mEq/L. Based on this information, which of the following ECG changes would you expect to observe?

Widened QRS complex

Inverted T waves

ST segment depression

QT prolongation

Correct answer: Widened QRS complex

Hyperkalemia, defined as a serum potassium level greater than 5 mEq/L, is commonly caused by chronic renal failure, acidosis, drugs, and cell death associated with injuries. ECG changes in hyperkalemia can include tall, tented T waves; a widened QRS complex; a prolonged PR interval; ventricular fibrillation; and asystole.

61.

A 52-year-old female patient with morbid obesity presents to the emergency department with swelling and pain in her right leg. She asks if her obesity puts her at a higher risk of developing Deep Vein Thrombosis (DVT).

Which of the following will you tell the patient is TRUE regarding the risk of DVT in this population?

The risk of DVT is substantially higher, approximately 6.2 times, in this population

The risk of DVT is significantly higher, around 10%–15%, in this population

The risk of DVT is not significantly higher in this population

The risk of DVT is slightly higher in this population, but the exact percentage varies

---

Correct answer: The risk of DVT is substantially higher, approximately 6.2 times, in this population

According to recent studies, the risk of Venous Thromboembolism (VTE), which includes DVT, increases significantly in patients with morbid obesity. The risk is approximately 6.2 times higher in this population compared to those with a healthy BMI.

62.

A 68-year-old male patient with a heart rate of 48 beats per minute and blood pressure of 90/55 mmHg presents with confusion and fatigue.

Which intervention is MOST appropriate for initial management of this patient's symptomatic bradycardia?

Administer intravenous atropine

Initiate defibrillation

Perform synchronized cardioversion

Administer intravenous epinephrine

Correct answer: Administer intravenous atropine

Administering IV atropine is the first-line treatment for symptomatic bradycardia as it can increase the heart rate by blocking vagal influences on the heart.

Defibrillation is not indicated for bradycardia; it is used for life-threatening arrhythmias like ventricular fibrillation or pulseless ventricular tachycardia. Synchronized cardioversion is used for certain tachyarrhythmias and is not appropriate for bradycardia management. IV epinephrine can be considered if atropine is ineffective, but it is not the initial treatment.

63.

Profound hypoperfusion and evidence of multiple organ dysfunction are the clinical presentations for which of the following stages of shock?

Refractory

Progressive

Compensatory

Initial

Correct answer: Refractory

The refractory stage of shock, also known as the irreversible stage, is the final and most severe stage of shock. During this stage, the body's compensatory mechanisms have failed, and there is widespread cellular death and organ failure. Despite aggressive treatment, the tissues and organs do not receive adequate oxygen. The prolonged lack of oxygen leads to cellular death and organ dysfunction.

The progressive, or uncompensated, stage of shock presents with hypoperfusion. Hypotension is a key assessment finding in this stage. The clinical presentation of the compensatory stage of shock is sympathetic nervous system stimulation. There are no clinical indications for the initial stage of shock.

64.

A patient who is in shock-refractory ventricular fibrillation after cardiac arrest should be given which of the following antiarrhythmic medications?

Amiodarone

Propranolol

Diltiazem

Lidocaine

Correct answer: Amiodarone

Amiodarone is a potent antiarrhythmic medication primarily used to treat various types of serious heart rhythm disturbances, or arrhythmias, such as pulseless Ventricular Tachycardia (VT), Ventricular Fibrillation (VF), and certain instances of Atrial Fibrillation (AF). Its effectiveness stems from its ability to prolong the action potential and refractory period of the cardiac tissue, which helps to stabilize the heart's rhythm. Amiodarone is the preferred treatment for shock-refractory VF and pulseless VT.

Propranolol is a beta-blocker used to manage a variety of cardiovascular conditions by slowing down the heart rate, reducing the demand on the heart, and lowering blood pressure. Diltiazem is a calcium-channel blocker used to manage hypertension, angina pectoris, and certain types of cardiac arrhythmias. Lidocaine is used in emergency settings to treat acute ventricular arrhythmias, especially after a heart attack or during cardiac surgery or catheterization. It may also be given after cardiac arrest but is not preferred over amiodarone.

65.

Which of the following medications is BEST for the management of acute heart failure exacerbation?

Furosemide (Lasix)

Metoprolol (Lopressor)

Lisinopril (Zestril)

Clopidogrel (Plavix)

Correct answer: Furosemide (Lasix)

Management of the patient with acute heart failure exacerbation should include reducing symptoms and congestion due to fluid overload as well as restoring baseline cardiac function. A loop diuretic, such as furosemide, causes nearly immediate venous dilation followed by diuresis within 10 minutes of intravenous administration. This medication is appropriate for managing the patient with acute decompensated heart failure.

Metoprolol, lisinopril, and clopidogrel are not therapeutic interventions for acute heart failure exacerbation.

66.

A 67-year-old male patient presents to the emergency department with chest pain radiating to his left arm. He appears diaphoretic and anxious. His vital signs are blood pressure 85/60 mmHg, heart rate 115 bpm, respiratory rate 20 breaths per minute, and oxygen saturation 94% on room air. The physician considers administering nitroglycerin.

Nitroglycerin would be contraindicated in which of the following?

Systolic blood pressure less than 90 mmHg

Systolic blood pressure greater than 90 mmHg

Diastolic blood pressure greater than 50 mmHg

Systolic blood pressure less than 100 mmHg

Correct answer: Systolic blood pressure less than 90 mmHg

Nitroglycerin dilates the venous vessels to decrease preload. Because it is a potent vasodilator, it is contraindicated for use in patients who have low blood pressure or hypotension, as this can inadvertently decrease coronary perfusion and worsen ischemia. Hypotension is generally considered a systolic blood pressure less than 90 mmHg or a diastolic blood pressure less than 60 mmHg.

67.

Which of the following is the MOST appropriate initial medication for the management of a hypertensive emergency with evidence of acute left ventricular failure?

Sodium nitroprusside

Nifedipine

Nitroglycerin

Furosemide

Correct answer: Sodium nitroprusside

Sodium nitroprusside is a potent vasodilator that acts on both arteries and veins. It rapidly reduces blood pressure and decreases afterload, which is beneficial in acute left ventricular failure as it reduces the heart's workload. Its effects are immediate, and the dose can be easily titrated to achieve the desired blood pressure control, making it ideal for acute settings.

Nifedipine is a calcium channel blocker that primarily acts as a vasodilator on arterioles. While it can effectively lower blood pressure, it is not typically recommended in acute heart failure settings because it may cause reflex tachycardia and does not offer venous dilation, which can be critical for reducing cardiac preload. Additionally, its use can be associated with significant hemodynamic fluctuations and potentially dangerous side effects, like myocardial ischemia.

Nitroglycerin primarily acts as a venodilator and is useful in managing ischemic heart conditions like angina. While it does help reduce preload and can slightly reduce afterload, it is not as effective as sodium nitroprusside in rapidly controlling severe blood pressure elevations. Moreover, if used alone, it may not provide adequate arterial dilation to manage a hypertensive crisis where rapid, controlled reduction of both preload and afterload is necessary.

Furosemide is a loop diuretic used mainly to reduce blood volume through increased urine production, which can help in conditions of fluid overload. However, its use as an initial treatment in hypertensive emergencies can be problematic because its effect on lowering blood pressure is indirect and slower in onset. It primarily helps by reducing preload but does not offer the immediate blood pressure control needed in acute hypertensive emergencies, nor does it provide any afterload reduction.

68.

What is the first-line treatment for a patient in Ventricular Fibrillation (VF)?

Defibrillation

Administration of epinephrine

Synchronized cardioversion

Administration of amiodarone

Correct answer: Defibrillation

Defibrillation is the treatment of choice for Ventricular Fibrillation (VF). VF is a life-threatening arrhythmia characterized by rapid, erratic electrical impulses that cause the heart to quiver instead of pumping blood effectively. Immediate defibrillation delivers an electrical shock to the heart, which can terminate the chaotic electrical activity and allow the heart to reestablish an effective rhythm.

While epinephrine is an important medication used during cardiac arrest to improve coronary and cerebral perfusion, it is not the initial treatment for VF. Epinephrine is typically administered after the second defibrillation attempt and initiation of CPR to enhance the effectiveness of subsequent defibrillations. Synchronized cardioversion is used for treating tachyarrhythmias such as atrial fibrillation or supraventricular tachycardia, in which the heart rhythm is fast but still organized. In contrast, VF is characterized by a completely disorganized rhythm for which synchronized cardioversion is ineffective. Amiodarone is an antiarrhythmic medication that can be used to stabilize the heart rhythm after defibrillation has been attempted. It is often administered if VF persists after the second defibrillation attempt or to prevent recurrence of VF, but it is not the first-line treatment.

69.

Which of the following factors LEAST distinguishes acute bacterial endocarditis from subacute bacterial endocarditis?

The presence of dysrhythmias

The disease severity

The speed of onset

The virulence of the causative organisms

Correct answer: The presence of dysrhythmias

Acute and subacute bacterial endocarditis are two forms of infective endocarditis, a serious infection of the inner lining of the heart chambers and valves (endocardium). The distinction between acute and subacute bacterial endocarditis lies primarily in the rapidity of symptom onset, the causative organisms involved, and the overall severity of the symptoms. Both types require prompt medical treatment to reduce the risk of serious complications.

Acute bacterial endocarditis has a very rapid onset with severe symptoms developing quickly, often within days to a few weeks. It is most commonly caused by aggressive, highly virulent bacteria, such as Staphylococcus aureus. These bacteria can attack healthy heart valves. Acute bacterial endocarditis tends to be more destructive, with a higher risk of complications.

Subacute bacterial endocarditis typically has a more indolent course, with symptoms developing gradually over weeks to months. It is often caused by less virulent bacteria, such as certain strains of Streptococci, which usually affect individuals with preexisting heart conditions or abnormal valves. The symptoms of subacute bacterial endocarditis are usually less severe and may include low-grade fever, fatigue, weight loss, and muscle aches. Signs of endocarditis, such as Janeway lesions, Osler nodes, and Roth spots, may be more common in subacute cases.

The presence of dysrhythmias does not distinguish between the two types of endocarditis.

70.

Which of the following are possible causes of hypertensive emergency?

Cocaine use

Hemorrhagic shock

Congestive Heart Failure (CHF)

Correct answer: Cocaine use

A hypertensive emergency presents with elevated blood pressure and evidence of impending or progressive organ damage. No particular blood pressure level defines a hypertensive crisis; symptoms determine identification.

Cocaine or amphetamine use is a possible cause of a hypertensive emergency. Symptoms include headache, altered consciousness or confusion, chest pain, hematuria, epistaxis, and blurred vision.

CHF is primarily a condition in which the heart is unable to pump blood effectively, leading to fluid buildup in the lungs and other parts of the body. It is often a consequence of chronic hypertension but is not typically a direct cause of hypertensive emergencies. In hemorrhagic shock, the body's compensatory mechanisms focus on maintaining blood flow to vital organs despite the loss of blood volume, which typically does not involve elevating blood pressure to levels seen in hypertensive emergencies.

71.

Hypotension, hypothermia, dysrhythmias, and tachypnea are objective clinical presentations for which stage of shock?

Progressive

Irreversible

Compensatory

Refractory

Correct answer: Progressive

In progressive shock, the body initially tries to compensate by redirecting blood flow to vital organs and increasing the heart rate. If the underlying cause is not corrected, compensatory mechanisms fail, leading to impaired tissue perfusion and oxygenation. This results in cellular dysfunction and can lead to multiple organ failure. Hypotension is a key assessment finding in uncompensated (progressive) shock.

Symptoms of shock may initially include:

- *Tachycardia*
- *Tachypnea*
- *Hypotension*
- *Cold, clammy skin*
- *Rapid, shallow breathing*
- *Altered mental state (confusion or lethargy)*
- *Decreased urine output*
- *Dysrhythmias*

Tachycardia, blood pressure changes, and tachypnea are objective clinical presentations for the compensatory stage of shock. The irreversible stage is synonymous with the refractory stage of shock, which is characterized by Multiorgan Dysfunction Syndrome (MODS) and inevitable death.

72.

Which of the following types of angina is related to coronary artery spasm?

Prinzmetal's angina

Wellens Syndrome

Crescendo angina

Preinfarction angina

Correct answer: Prinzmetal's angina

Prinzmetal's angina, also known as variant angina, is an unstable type of angina linked to coronary artery spasms. It is rare and typically affects younger individuals. Typical angina is usually triggered by physical activity or emotional stress, but Prinzmetal's angina often occurs when a person is at rest, frequently during nighttime or early morning hours. The pain is due to spasms in the coronary arteries, which supply blood to the heart muscle. Medications, including calcium channel blockers and nitrates, are commonly used to manage these spasms.

Wellens syndrome is characterized by angina associated with severe narrowing of the proximal coronary arteries. Crescendo angina and preinfarction angina are both types of angina that indicate the worsening of coronary artery disease.

73.

A 62-year-old male patient presents with confusion, nausea, and a blood pressure of 240/130 mmHg. Laboratory results show elevated creatinine levels. Which condition is MOST likely causing his symptoms?

Hypertensive encephalopathy with renal impairment

Hyperthyroidism

Pheochromocytoma

Acute coronary syndrome

Correct answer: Hypertensive encephalopathy with renal impairment

Hypertensive encephalopathy with renal impairment is characterized by extremely high blood pressure leading to neurological symptoms and kidney damage, as indicated by elevated creatinine levels.

Hyperthyroidism can cause high blood pressure and confusion but is less likely to present with the combination of severe hypertension and renal impairment.

Pheochromocytoma can cause episodic hypertension and nausea but does not typically present with persistent severe hypertension and renal impairment.

Acute coronary syndrome may present with high blood pressure and nausea but is less likely to cause confusion and elevated creatinine without other specific cardiac symptoms.

74.

Which ECG change is MOST indicative of an evolving myocardial infarction?

ST-segment elevation

QRS complex widening

T-wave inversion

PR interval prolongation

Correct answer: ST-segment elevation

ST-segment elevation is the hallmark of an acute Myocardial Infarction (MI), indicating acute injury to the myocardial tissue. It reflects full-thickness damage to the heart muscle and is critical for diagnosing a STEMI (ST-elevation myocardial infarction).

QRS complex widening typically indicates conduction abnormalities, such as bundle branch block or ventricular tachycardia but is not specifically indicative of an acute MI. While T-wave inversion can indicate myocardial ischemia (reduced blood flow to the heart) and is a sign of an evolving issue, it is not as specific as ST-segment elevation for diagnosing an acute MI. PR interval prolongation is usually associated with Atrioventricular (AV) block (a type of heart block) and is not indicative of an acute MI.

75.

Which of the following is a common, often reversible, cause of cardiopulmonary arrest?

Hypovolemia

Hypoglycemia

Hypocalcemia

Hypotension

Correct answer: Hypovolemia

*Reversible causes of cardiopulmonary arrest must be identified and treated early on. The most common reversible causes of cardiopulmonary arrest are known as "H's and T's." The H's consist of hypoxia, **hypovolemia**, hydrogen ion (acidosis), hypothermia, and hypokalemia/hyperkalemia. The T's consist of toxins (including drug overdose), tamponade, tension pneumothorax, and both coronary and pulmonary thrombosis.*

Hypoglycemia, hypocalcemia, and hypotension do not commonly lead to cardiopulmonary arrest.

76.

Which of the following is MOST correct regarding endocarditis in a pediatric patient?

Endocarditis typically affects only pediatric patients with congenital heart abnormalities

Endocarditis typically affects pediatric patients, not adult patients

Endocarditis is exclusively an adult disease

Endocarditis typically affects only pediatric patients who are IV drug users

---

Correct answer: Endocarditis typically affects only pediatric patients with congenital heart abnormalities

Endocarditis is quite uncommon in pediatric patients and typically affects them only when they have congenital heart abnormalities. Pediatric IV drug users are relatively rare, as most pediatric drug users are generally still experimenting with less intense drugs prior to adulthood.

77.

In the case of a suspected ruptured abdominal aortic aneurysm, which of the following interventions should be prioritized?

Prepare the patient for immediate surgical intervention

Administer intravenous antibiotics

Initiate aggressive intravenous fluid resuscitation

Obtain a detailed medical history to find the cause

Correct answer: Prepare the patient for immediate surgical intervention

A ruptured aortic aneurysm is a life-threatening emergency. In the context of a suspected ruptured Abdominal Aortic Aneurysm (AAA), the most critical and life-saving intervention is immediate surgical repair. A ruptured AAA can lead to massive internal bleeding, which is rapidly fatal if not treated surgically. Preparing the patient for surgery, including arranging for an operating room, notifying the surgical team, and ensuring that the patient is ready for transport, is the highest priority.

Antibiotics are important in the treatment of infections but do not address the immediate life-threatening hemorrhage associated with a ruptured AAA. While fluid resuscitation is important to maintain blood pressure and perfusion in a patient with hemorrhagic shock, it should be done cautiously in the context of a ruptured AAA. Overly aggressive fluid administration can increase blood pressure and exacerbate bleeding. Fluid resuscitation should not delay the definitive treatment, which is surgical intervention. Obtaining a detailed medical history is important in many clinical situations but is not the priority in the acute management of a ruptured AAA. A brief, focused history relevant to the immediate situation may be taken, but it should not delay the necessary surgical intervention.

78.

When assessing a patient who has been stabbed in the chest, the nurse recognizes which of the following statements about Beck's triad is TRUE?

Beck's triad is present in only a small portion of patients who have cardiac tamponade

Beck's triad is always present with cardiac tamponade

Beck's triad consists of high blood pressure, jugular vein distension, and muffled heart sounds

Beck's triad must be coupled with other symptoms to indicate cardiac tamponade

---

Correct answer: Beck's triad is present in only a small portion of patients who have cardiac tamponade

While Beck's triad is often a good indicator that cardiac tamponade is present, it is present in only about one-third of patients who actually have cardiac tamponade. Beck's triad by itself is a good indicator that cardiac tamponade is present but often occurs in patients who do not have cardiac tamponade. It does not have to be coupled with other symptoms to indicate cardiac tamponade.

Beck's triad consists of low blood pressure, distended neck veins, and diminished heart sounds. Other signs and symptoms include chest pain, rapid heartbeat, tachypnea and dyspnea, altered mental status, and pulsus paradoxus.

79.

Which of the following tests would the nurse LEAST expect to be ordered for a patient who has a hypertensive emergency?

Coronary angiogram

Urinalysis

Chest radiograph

CT of the head

Correct answer: Coronary angiogram

A coronary angiogram would be ordered for a patient with a hypertensive emergency only if they had suspected myocardial ischemia; however, an EKG would routinely be anticipated to evaluate for this condition. A urinalysis would be ordered to evaluate for potential renovascular impairment. A chest radiograph would show left ventricular enlargement, and a head CT would be ordered to rule out intracranial bleeding.

80.

A 57-year-old female patient with known pericarditis presents with worsening chest pain and dyspnea. Her vital signs are blood pressure 90/60 mmHg, heart rate 120 beats per minute, respiratory rate 28 breaths per minute, and oxygen saturation 87% on room air. Jugular venous distension is noted.

What is the MOST appropriate next step in management?

Prepare for a pericardiocentesis

Administer high-dose corticosteroids intravenously

Initiate broad-spectrum antibiotic therapy

Increase intravenous fluid rate

Correct answer: Prepare for a pericardiocentesis

Performing pericardiocentesis is the most appropriate next step, as this patient is showing signs of cardiac tamponade, a life-threatening complication of pericarditis in which fluid accumulation in the pericardium compresses the heart.

High-dose corticosteroids are used to treat severe inflammation, not tamponade. Broad-spectrum antibiotics are used to treat bacterial infections, not viral or inflammatory conditions. Increasing the intravenous fluid rate might temporarily help with blood pressure but does not address the underlying issue of fluid accumulation around the heart.

81.

Which of the following is LEAST likely to be a risk factor for infective endocarditis?

Multiple IV access sites

Body piercing

IV drug use

Prosthetic heart valves

Correct answer: Multiple IV access sites

Infective endocarditis is a serious infection impacting the heart's inner lining and valves (endocardium). It typically arises when bacteria or fungi from elsewhere in the body (i.e., the mouth) enter the bloodstream and attach to the heart's compromised regions. Without prompt and appropriate treatment, this condition can severely harm the heart valves and precipitate critical complications.

The presence of multiple Intravenous (IV) access points does not notably heighten the risk of developing infective endocarditis. However, an elevated risk is associated with IV sites that remain in place for extended durations. Factors such as body piercings, the use of intravenous drugs, and the presence of artificial heart valves all heighten susceptibility to infective endocarditis.

82.

A 59-year-old man collapses at home. Upon arrival, paramedics find him in cardiac arrest. The AED is attached, and it advises no shock.

What is the MOST likely underlying rhythm?

Asystole

Pulseless Electrical Activity (PEA)

Ventricular Fibrillation (VF)

Supraventricular Tachycardia (SVT)

Correct answer: Asystole

When an Automated External Defibrillator (AED) advises no shock, the most likely underlying rhythm is asystole. Asystole is a non-shockable rhythm, indicating the absence of electrical activity in the heart, and has a very poor prognosis.

PEA is another non-shockable rhythm in which there is electrical activity but no effective cardiac output. However, AEDs are designed to detect rhythms like asystole and VF primarily, so asystole is more likely in this scenario. VF is a shockable rhythm and would prompt the AED to advise a shock. SVT is not typically associated with cardiac arrest and is not a rhythm that would commonly be detected by an AED in this context.

83.

Which of the following cardiac conditions is MOST likely to occur if a patient presents with a penetrating chest wound?

Cardiac tamponade

Myocardial contusion

Myocardial infarction

Open pneumothorax

Correct answer: Cardiac tamponade

Cardiac tamponade is a serious medical condition in which fluid accumulates in the pericardial sac, increasing pressure in the pericardium, which restricts the heart's ability to expand, fill, and effectively pump blood. This can significantly reduce cardiac output and, if left untreated, can be life-threatening. Cardiac tamponade is commonly associated with penetrating chest trauma, such as stab wounds (up to 90% of cases).

Myocardial contusion is more common with blunt chest trauma, not penetrating chest trauma. Myocardial infarction is unlikely to be a primary injury from penetrating chest trauma. Open pneumothorax is very likely with penetrating chest trauma but is a pulmonary condition, not a cardiac condition.

84.

Which of the following findings is LEAST concerning in a patient whose blood pressure is 210/120?

Increased urinary output

Presence of an S3 and S4 heart sound

Confusion

Epistaxis

Correct answer: Increased urinary output

Decreased urinary output or hematuria can indicate that a hypertensive crisis is causing renovascular impairment. Increased urinary output, however, is not a sign of renovascular danger. Presence of an S3 and S4 heart sound can indicate cardiovascular compromise. Confusion can indicate cerebrovascular impairment. Epistaxis is also a serious sign in the presence of a hypertensive crisis.

85.

A 62-year-old male patient presents to the emergency department with complaints of a sudden change in his chest pain, now occurring at rest and waking him up in the middle of the night the last three nights.

You suspect which of the following conditions?

Unstable angina

Acute myocardial infarction

Angina pectoris

Pericarditis

Correct answer: Unstable angina

If a patient experiences mild chest pain that lasts for only a few minutes after exercising, angina pectoris is most likely the cause. Ischemic chest pain becomes unpredictable, more intense, and more difficult to relieve. Unstable angina, however, may occur at rest, even awakening the patient from sleep. It occurs more frequently and is longer than the patient's usual angina.

If acute myocardial infarction is the cause of chest pain, a patient has most likely experienced a lifestyle change and will experience chest pain for 30 minutes to two hours.

If pericarditis is the cause of chest pain, a patient may have had cardiac surgery, an infection, or lupus erythematosus and will experience mild to severe pain for days.

86.

Which of the following types of Acute Coronary Syndrome (ACS) is associated with NEGATIVE creatinine kinase and troponin tests?

Unstable angina

STEMI

Acute heart failure

Non-STEMI

Correct answer: Unstable angina

Acute Coronary Syndrome (ACS) refers to the clinical presentations that cause cardiac ischemia. The three different types of ACS are unstable angina, non-STEMI, and STEMI. Unstable angina is distinguishable from a myocardial infarction in that the cardiac biomarkers troponin and creatinine kinase are negative.

Acute heart failure is not a type of acute coronary syndrome.

87.

While treating geriatric patients in the emergency department, it is important to consider physiologic cardiovascular changes related to age. Of the following, which accurately describes these changes?

Decreased blood vessel compliance

Increased baroreceptor sensitivity

Increased inotropic response to stimulation

Increased chronotropic response to stimulation

Correct answer: Decreased blood vessel compliance

Geriatric patients are considered a vulnerable patient population. Age-related physiologic changes affect all organ systems and have important implications for managing and treating geriatric patients in the emergency department.

With respect to the cardiovascular system, the following occurs:

- *Decreased blood vessel compliance*
- *Decreased inotropic response to stimulation*
- *Decreased chronotropic response to stimulation*
- *Decreased baroreceptor sensitivity*

Additionally, an elderly patient's heart has decreased ventricular compliance and a prolonged rate of relaxation.

88.

Of the following interventions, which is PRIORITY for managing a patient with acute coronary syndrome?

Have the patient chew and swallow a non-enteric-coated aspirin

On arrival, administer morphine sulfate 2 mg IV for chest pain

Have the patient swallow an enteric-coated aspirin

On arrival, start the patient on a continuous nitroglycerin drip

---

Correct answer: Have the patient chew and swallow a non-enteric-coated aspirin

Acute Coronary Syndrome (ACS) refers to the clinical presentations of acute myocardial syndrome. It consists of unstable angina, non-STEMI (non-ST-elevation MI), and STEMI (ST-elevation MI). Management is directed at preventing further ischemia and restoring myocardial function.

For a patient meeting ACS criteria, it is most appropriate to have the patient chew and swallow a 325 mg non-enteric-coated aspirin. Administering a non-enteric-coated aspirin and ensuring the patient chews the pill will provide the most rapid rate of absorption.

Enteric-coated aspirin does not ensure rapid absorption. While morphine may be given, the ACS treatment algorithm recommends that chest pain first be treated with nitroglycerin sublingual or spray. Therefore, morphine administration upon arrival would not be appropriate. If chest pain does not resolve with nitro, then morphine may be considered. A nitroglycerin drip would not be appropriate on arrival. It is recommended that nitroglycerin be given in sublingual or spray routes in single doses, then repeated as needed if the patient's blood pressure tolerates it.

89.

A 60-year-old male patient presents with chronic leg pain, skin changes, and ulcerations on his lower extremities. Which of the following descriptions BEST explains the underlying pathology of his condition?

Impaired arterial blood flow leading to tissue ischemia and necrosis

Excessive venous pressure causing vein dilation and fluid leakage

Inflammatory response to a bacterial infection

Autoimmune attack on the peripheral nervous system

Correct answer: Impaired arterial blood flow leading to tissue ischemia and necrosis

Peripheral Vascular Disease (PVD), also known as Peripheral Artery Disease (PAD), is a condition characterized by the narrowing or blockage of blood vessels outside the heart and brain. This condition primarily affects the arteries and veins that supply the arms and legs, leading to reduced blood flow, which reduces oxygen delivery to tissues. This in turn leads to ischemia and potentially necrosis, which explains the chronic leg pain, skin changes, and ulcerations.

Excessive venous pressure causing vein dilation and fluid leakage is associated with chronic venous insufficiency, not PVD. An inflammatory response to a bacterial infection is characteristic of cellulitis. Autoimmune attack on the peripheral nervous system describes conditions such as Guillain-Barré syndrome, which do not present with the described symptoms of chronic leg pain, skin changes, and ulcerations.

90.

Pulmonary edema is often apparent in which type of heart condition?

Left-sided heart failure

Right-sided heart failure

Obstructive shock

Acute Coronary Syndrome (ACS)

Correct answer: Left-sided heart failure

Heart failure is the result of inadequate cardiac output and oxygen delivery to the tissues. It can be caused by an inability of the heart to pump effectively (systolic failure) or by an inability of the heart to fill adequately (diastolic failure). Heart failure can primarily affect the left ventricle (pulmonary congestion and respiratory symptoms), or the right ventricle (circulatory congestion).

A patient with left-sided heart failure often has sudden pulmonary edema with shortness of breath and dyspnea. In addition, there is often an S3 heart sound with crackles heard upon auscultation.

Right-sided heart failure presents with peripheral edema, jugular venous distension, ascites, and nausea. ACS refers to the clinical presentation of acute Myocardial Ischemia (MI), including chest pain, a sense of impending doom, and tachycardia. The clinical presentation of obstructive shock can vary based on the underlying cause but generally includes signs of poor tissue perfusion such as cool, clammy skin; rapid and shallow breathing; confusion or loss of consciousness; and low urine output.

91.

Torsades de Pointes (TdP) is a cardiac dysrhythmia frequently associated with which of the following electrolyte abnormalities?

Hypomagnesemia

Hypokalemia

Hypermagnesemia

Hyperkalemia

Correct answer: Hypomagnesemia

Torsades de Pointes (TdP) is a type of cardiac dysrhythmia presenting as polymorphic ventricular tachycardia. It is distinguished by a gradual change in the amplitude and a twisting pattern of the QRS complexes around the isoelectric line. This condition is often linked to low magnesium levels, or hypomagnesemia. Although TdP can be paroxysmal and self-resolving, sustained episodes require treatment with IV magnesium and close rhythm monitoring.

92.

Which of the following dysrhythmias is considered a bradycardic rhythm?

Mobitz type II block

Wolff-Parkinson-White syndrome

Long QT syndrome

Monomorphic VT

Correct answer: Mobitz type II block

There are a number of bradycardic dysrhythmias, or bradyarrhythmias. They include sinus bradycardia, sinus node dysfunction (sick sinus syndrome), Mobitz type II block, complete heart block. Frequently, a pacemaker is required to maintain adequate heart rate and perfusion with heart block.

Wolff-Parkinson-White syndrome and monomorphic VT are tachyarrhythmias, while long QT syndrome is a type of ventricular dysrhythmia.

93.

A 66-year-old male patient presents to the emergency department with chest pain radiating to his left arm. His ECG shows ST-segment elevation in leads II, III, and aVF.

What is the MOST likely diagnosis?

Inferior myocardial infarction

Anterior myocardial infarction

Lateral myocardial infarction

Posterior myocardial infarction

Correct answer: Inferior myocardial infarction

ST-segment elevation in leads II, III, and aVF on an ECG typically indicates an inferior myocardial infarction (the inferior surface of the left ventricle), which is most often due to occlusion of the right coronary artery.

An anterior myocardial infarction typically presents with ST-segment elevation in the precordial leads, such as V1 to V4. These leads reflect the anterior part of the heart, which is supplied by the Left Anterior Descending (LAD) artery. A lateral myocardial infarction typically shows ST-segment elevation in the lateral leads, such as I, aVL, V5, and V6. These leads correspond to the lateral wall of the heart, which is supplied by the left circumflex artery or a diagonal branch of the LAD. A posterior myocardial infarction usually presents with ST-segment depression in the anterior leads (V1 to V4) as reciprocal changes, and it may show ST-segment elevation in the posterior leads (V7 to V9) if those leads are used. The posterior wall of the heart is usually supplied by the posterior descending artery, which can arise from the right coronary artery or the left circumflex artery.

94.

When attempting to maximize cardiac output and improve tissue perfusion of a cardiogenic shock patient, what type of medication would you give to increase contractility?

Inotropes

Diuretics

Arterial vasodilators

Antidysrhythmics

Correct answer: Inotropes

When attempting to maximize cardiac output and improve tissue perfusion of a cardiogenic shock patient, inotropes would be given to improve contractility. Examples of positive inotropic vasodilating agents are dobutamine and milrinone.

Diuretics are given to decrease preload, and arterial vasodilators are given to decrease afterload, but only if there are no contraindications. Antidysrhythmics are given to control heart rate.

Intra-Aortic Balloon Pumps (IABPs) are an additional method of improving contractility and coronary artery perfusion.

95.

Which heart sound is referred to as the atrial gallop?

S4

S2

S3

S1

Correct answer: S4

The S4 heart sound, referred to as the atrial gallop, occurs just before the S1 heart sound. It is linked to atrial contraction and increased resistance to ventricular filling, often suggesting conditions such as left ventricular hypertrophy, myocardial ischemia, or a stiff ventricle.

The rhythm of the S1–S3 heart sounds, known as the ventricular gallop, may resemble the word "Ken-tuc-ky," with each sound corresponding to a syllable. The S1 heart sound is most prominent at the apex of the heart, while the S2 heart sound is most prominent at the base.

96.

What condition is characterized by the collection of blood or blood clots in the pericardial sac?

Cardiac tamponade

Hemothorax

Pericarditis

Cardiac thrombosis

Correct answer: Cardiac tamponade

Cardiac tamponade is characterized by the collection of blood or blood clots in the pericardial sac, which exerts pressure on the heart and decreases cardiac output. As little as 100–150 mL of blood in the pericardial sac can have a detrimental effect on cardiac output. The leading cause of cardiac tamponade is penetrating chest trauma, such as stab wound injuries.

Hemothorax is the collection of blood in the pleural space, usually as a result of blunt or penetrating trauma. Pericarditis is inflammation in the pericardial sac. Cardiac thrombosis is the formation of a blood clot inside a vessel in the heart.

97.

During a football game, a 19-year-old athlete collapses suddenly after a severe blow to the chest. The patient is pulseless and unresponsive. Which of the following is the MOST appropriate immediate action?

Initiate Cardiopulmonary Resuscitation (CPR) and prepare for Automated External Defibrillator (AED) use

Administer intravenous fluids aggressively to counter suspected internal bleeding

Perform immediate thoracotomy to explore potential cardiac injury

Stabilize the cervical spine and transport to a trauma center without delay

---

Correct answer: Initiate Cardiopulmonary Resuscitation (CPR) and prepare for Automated External Defibrillator (AED) use

Understanding the mechanism of injury, recognizing the signs and symptoms, and providing immediate and appropriate management are crucial in the acute care setting, particularly in cardiovascular trauma. In the case of sudden collapse and pulselessness following a chest impact, commotio cordis—a lethal disruption of heart rhythm due to a blunt, non-penetrating blow—should be considered. Immediate CPR and readiness to use an AED are crucial for survival.

While internal bleeding might be a concern, the immediate life-threatening issue in a pulseless and unresponsive patient is cardiac arrest, necessitating prompt CPR and defibrillation rather than fluid administration. Emergency thoracotomy is a procedure performed in very specific trauma cases in a hospital setting and is not the immediate step to be taken in a case of sudden cardiac arrest. While cervical spine stabilization and prompt transportation are important in trauma care, they do not address the immediate life-threatening situation of cardiac arrest, in which immediate CPR and defibrillation are essential.

98.

Which of the following is NOT a clinical indication of left ventricular failure?

Jugular venous distension

Crackles

Shortness of breath

S3 heart sound

Correct answer: Jugular venous distension

Jugular venous distension is a clinical indication of right ventricular failure, not left ventricular failure.

The clinical indications of left ventricular failure include:

- *Shortness of breath*
- *Dyspnea*
- *S3 heart sound*
- *Crackles*
- *Pulmonary edema*

The clinical indications of right ventricular heart failure include:

- *Peripheral edema*
- *Jugular venous distension*
- *Ascites*
- *Nausea related to congestion of abdominal organs*

99.

Which of the following is LEAST expected in a patient who has a venous thromboembolism?

Pain that comes and goes

Pain that is worse while walking

Pain described as aching or throbbing

Pain that is localized to the point of occlusion

Correct answer: Pain that comes and goes

Pain associated with venous thromboembolism will be constant, not intermittent. Pain associated with a venous thromboembolism is likely to be provoked by walking, likely to be aching or throbbing in nature, and will generally be localized to the point of occlusion.

100.

Which of the following is LEAST likely to differentiate between pericarditis and Myocardial Infarction (MI)?

Slightly elevated troponin

ST depression

Presence of a friction rub

Change in chest pain with nitroglycerin administration

Correct answer: Slightly elevated troponin

A slightly elevated troponin level could be present in both pericarditis and MI. An ST depression would indicate that an MI is present, as only an MI causes this. Both pericarditis and MI, however, may cause ST segment elevation. The presence of a friction rub is likely only with pericarditis. Improvement in chest pain with nitroglycerin administration indicates that an MI is present, as this change is unlikely to occur in a patient with pericarditis.