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Advanced Cardiac Life Support

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QUESTION NO: 1

During management of an adult with suspected opioid-associated respiratory arrest, appropriate actions include:

A. provide effective bag-mask ventilation

B. administer naloxone when opioid overdose is suspected

C. start CPR if the patient is pulseless

D. activate the emergency response system

E. delay ventilation until naloxone has taken effect

ANSWER: A B C D

Explanation:

Opioid-associated emergencies are primarily respiratory emergencies. **Providing effective ventilation with a bag-mask device** is the immediate priority when breathing is absent or inadequate. **Administering naloxone** is appropriate when opioid overdose is suspected, but it should not delay ventilation or CPR. **Starting CPR if the patient is pulseless** is required because cardiac arrest is managed according to the standard adult cardiac-arrest algorithm. **Activating the emergency response system** ensures access to advanced resuscitation resources and transport. Naloxone does not replace high-quality CPR, ventilation, or defibrillation when indicated. See the American Heart Association CPR and ECC Guidelines.

QUESTION NO: 2

FILL BLANK What sizes of masks should you carry for the bag-valve-mask?

A. Infant, child, and adult.

ANSWER: A

Explanation:

Infant, child, and adult. is correct because effective bag-valve-mask ventilation depends on selecting a mask that fits the patient's face and can form a seal over the nose and mouth without covering the eyes or extending beyond the chin. Resuscitation providers may need to ventilate patients across the full age spectrum, so maintaining infant-, child-, and adult-sized masks ensures appropriate equipment is immediately available for each patient population. A properly sized mask supports the two-person bag-mask technique recommended whenever possible: one rescuer maintains the airway and a tight mask seal while the second rescuer delivers ventilations. This approach improves ventilation quality, reduces air leakage, and helps avoid excessive pressure or volume during assisted breathing. The American Heart Association's resuscitation guidance emphasizes effective airway management and appropriate ventilation during CPR, while the American Red Cross describes using bag-valve-mask equipment sized to the patient. See the American Heart Association CPR and ECC Guidelines and the American Red Cross bag-valve-mask resuscitator guidance.

QUESTION NO: 3

ORRECT TEXT T/F: Beta-blockers depress the pumping function of heart muscle.

A. True

ANSWER: A

Explanation:

True is correct. Beta-blockers reduce the effects of catecholamines, such as epinephrine and norepinephrine, at beta-adrenergic receptors. Blocking beta-1 receptors in the heart decreases heart rate, slows atrioventricular-node conduction, and reduces myocardial contractility. The reduction in contractile force is described as a negative inotropic effect, meaning that the heart muscle's pumping function is depressed. This pharmacologic effect can reduce myocardial oxygen demand and is clinically useful in appropriate patients, including many people with coronary artery disease or certain tachyarrhythmias.

In ACLS-relevant assessment, the negative inotropic effect is important because reduced contractility may contribute to hypotension or worsening signs of poor perfusion when cardiac output is already compromised. Clinicians therefore assess blood pressure, heart rate, rhythm, perfusion, and evidence of acute heart failure before administering medications that further slow cardiac activity or decrease contractile strength. Beta-blockade's effects on rate, conduction, and contractility are central to both its therapeutic role and its safety considerations. See the American Heart Association's CPR and ECC Guidelines and the NCBI StatPearls review of beta blockers.

QUESTION NO: 4

High-quality adult chest compressions include:

A. compression rate of 100-120/min

B. compression depth of at least 2 inches (5 cm)

C. complete chest recoil after each compression

D. minimization of interruptions in compressions

E. routine pauses every 30 seconds to check for a pulse

ANSWER: A B C D

Explanation:

High-quality adult CPR requires a compression rate of **100 to 120/min**, a depth of at least **2 inches (5 cm) while avoiding excessive depth greater than 2.4 inches (6 cm)**, complete chest recoil, and minimization of interruptions. Rescuers should avoid leaning on the chest between compressions because incomplete recoil reduces venous return and coronary perfusion. Compression pauses should be kept as short as possible, particularly before and after shock delivery. These measures improve coronary and cerebral perfusion during cardiac arrest. See the American Heart Association CPR and ECC Guidelines.

QUESTION NO: 5

Continuous waveform capnography after endotracheal intubation:

A. confirms tracheal tube placement when persistent waveform CO_2 is present

B. monitors for tube displacement after placement

C. can help assess the quality of CPR during cardiac arrest

D. may show a sudden sustained increase with return of spontaneous circulation

E. eliminates the need to assess chest rise and tube depth

ANSWER: A B C D

Explanation:

Continuous waveform capnography is recommended to **confirm tracheal tube placement** and to **monitor continued placement** during transport and resuscitation. Persistent exhaled carbon dioxide with a waveform supports tracheal placement when there is pulmonary blood flow. During cardiac arrest, $ETCO_2$ also provides information about CPR quality and may provide an early sign of return of spontaneous circulation when there is a sudden sustained rise. Capnography does not replace clinical assessment, including observation of chest rise, auscultation, and evaluation of tube depth. See the American Heart Association ACLS algorithms.

QUESTION NO: 6

Intubation with an endotracheal tube:

A. allows adjunctive ventilatory equipment to be used effectively

B. decreases the risk of aspiration

C. is the first priority in ventricular fibrillation

D. if performed improperly may result in only one lung being inflated

ANSWER: A B D

Explanation:

Endotracheal intubation establishes a definitive advanced airway that connects directly to a ventilatory device, allowing oxygen delivery and positive-pressure ventilation to be administered effectively and with controlled tidal volumes. In ACLS, once an advanced airway is in place during cardiac arrest, ventilation can be provided without interrupting continuous chest compressions, using appropriate ventilation timing and confirmation of tube placement. An inflated endotracheal-tube cuff also helps reduce the amount of gastric or oropharyngeal material that can pass into the lower airway. Although it does not make aspiration impossible, it provides more protection than an unprotected airway.

Correct tube depth is essential. If the tube is advanced too far, it may enter a mainstem bronchus—most commonly the right—which can result in ventilation of only one lung. Clinicians should confirm placement with continuous waveform capnography and assess bilateral chest rise and breath sounds; tube depth should be adjusted if findings suggest mainstem placement. These practices support effective ventilation while reducing airway-related complications. See the American Heart Association CPR and ECC Guidelines and the Merck Manual guide to orotracheal intubation.

QUESTION NO: 7

Which statements regarding synchronized cardioversion are correct?

A. the defibrillator should be placed in synchronized mode

B. sedation should be considered whenever feasible

C. the rhythm and patient should be reassessed after each attempt

D. polymorphic ventricular tachycardia should be treated with synchronized cardioversion

ANSWER: A B C

Explanation:

Synchronized cardioversion is used for tachyarrhythmias with a pulse when the rhythm is causing hypotension, altered mental status, signs of shock, ischemic chest discomfort, or acute heart failure. The defibrillator should be placed in **synchronized mode** so the shock is delivered with the R wave. **Sedation should be considered whenever feasible** in an awake patient, but it must not delay treatment of an unstable rhythm. After each cardioversion attempt, the team should **reassess the rhythm and the patient** and increase energy as appropriate if the tachyarrhythmia persists. **Polymorphic ventricular tachycardia** cannot be synchronized reliably and requires unsynchronized high-energy shock treatment. See the American Heart Association Adult Tachyarrhythmia With a Pulse Algorithm.

QUESTION NO: 8

After placement of an endotracheal tube, ventilate:

A. at 10-15 breaths per minute

B. after the 5th compression

C. asynchronously to cardiac compressions

D. with room air

E. at 10 breaths per minute (1 breath every 6 seconds)

ANSWER: C E

Explanation:

After an endotracheal tube is placed during adult cardiac arrest, ventilation should be delivered asynchronously with continuous chest compressions. This means rescuers do not pause compressions to give breaths; instead, one rescuer maintains high-quality compressions at 100–120 per minute while another provides positive-pressure ventilation through the advanced airway. This approach minimizes interruptions in coronary and cerebral perfusion, which is a central priority in ACLS resuscitation.

The appropriate ventilation rate is 1 breath every 6 seconds, or 10 breaths per minute. Each breath should be delivered over about 1 second and produce visible chest rise, while avoiding excessive rate or volume. Ventilation is generally provided with 100% oxygen when available after an advanced airway is in place. The American Heart Association adult cardiac-arrest algorithm specifies continuous compressions and 1 breath every 6 seconds once an advanced airway is established. See the American Heart Association CPR and ECC algorithms and the NCBI review of ACLS airway and ventilation management.

QUESTION NO: 9

FILL BLANK You begin treatment of a patient. Is continuing treatment an implied or formal duty to act?

A. Implied.

ANSWER: A

Explanation:

“Implied.” is correct. When a responder voluntarily begins assessment or treatment, their actions can establish an implied provider-patient relationship and a corresponding duty to continue providing care within their training and scope until care is appropriately transferred, the patient refuses further care, or another qualified provider assumes responsibility. In the resuscitation setting, this principle supports continuity of care: once treatment has started, abruptly stopping without an appropriate handoff may leave the patient without needed assistance. The duty is described as implied because it arises from the responder’s conduct—beginning care—rather than solely from a preexisting legal, contractual, or employment-based obligation to respond. Providers should continue to follow local protocols, work within their level of competence, document care as required, and transfer responsibility clearly when EMS or another qualified clinician takes over. This concept is consistent with ethical emergency-care practice and the importance of continuity and handoff during resuscitation. See the American Heart Association’s CPR and ECC Guidelines and the National EMS Scope of Practice Model from EMS.gov.

QUESTION NO: 10

Reversible causes that should be considered during pulseless electrical activity include:

A. hypoxia

B. hydrogen ion excess (acidosis)

C. hyperkalemia

D. coronary thrombosis

E. sinus tachycardia

ANSWER: A B C D

Explanation:

Hypoxia, hydrogen ion excess (acidosis), hyperkalemia, and coronary thrombosis are among the reversible causes of cardiac arrest described by the ACLS Hs and Ts. PEA is not treated by defibrillation; management requires high-quality CPR, epinephrine, oxygenation and ventilation, and rapid identification of an underlying cause that can be corrected. The other Hs include hypovolemia, hypothermia, and hypo- or hyperkalemia. The Ts include tension pneumothorax, cardiac tamponade, toxins, pulmonary thrombosis, and coronary thrombosis. See the American Heart Association Adult Cardiac Arrest Algorithm.

QUESTION NO: 11

Following return of spontaneous circulation after cardiac arrest, appropriate initial management includes:

A. titrate oxygen to avoid hypoxemia and hyperoxemia

B. maintain systolic blood pressure at least 90 mm Hg or MAP at least 65 mm Hg

C. obtain a 12-lead ECG

D. consider temperature control if the patient remains unresponsive to verbal commands

E. routinely induce severe hypocapnia

ANSWER: A B C D

Explanation:

Post-cardiac-arrest care should focus on supporting oxygenation, ventilation, hemodynamics, and identifying the cause of the arrest. **Titrating oxygen to avoid hypoxemia while avoiding hyperoxemia, maintaining a systolic blood pressure of at least 90 mm Hg or MAP of at least 65 mm Hg, obtaining a 12-lead ECG, and considering targeted temperature control for patients who remain unresponsive to verbal commands** are appropriate actions. A 12-lead ECG may identify STEMI or another ischemic cause requiring urgent coronary reperfusion. Avoiding fever is also important in comatose post-arrest patients. See the American Heart Association Post-Cardiac Arrest Care Algorithm.

QUESTION NO: 12

FILL BLANK After the child is removed from the water, what is the top priority in near drowning cases?

A. Artificial ventilation.

ANSWER: A

Explanation:

Artificial ventilation is the top priority because drowning causes cardiac arrest primarily through hypoxemia: submersion prevents effective breathing, rapidly depletes oxygen stores, and may progress from respiratory arrest to bradycardia and cardiac arrest. Once the child is safely removed from the water, the rescuer should immediately assess responsiveness and breathing, open the airway, and provide effective rescue breaths or assisted ventilation with oxygen when available. For an unresponsive child who is not breathing normally, pediatric resuscitation begins with ventilation because correcting oxygen deprivation is central to successful resuscitation after drowning. If there is no definite pulse or the pulse is inadequate with signs of poor perfusion, CPR should then be started according to pediatric life-support guidance, while continuing ventilations. High-quality ventilation requires visible chest rise and avoidance of excessive volume or pressure. The American Heart Association notes that resuscitation for drowning should prioritize ventilation and oxygenation, with CPR initiated promptly when indicated. See the American Heart Association CPR and ECC Guidelines and the World Health Organization drowning fact sheet.

QUESTION NO: 13

Dopamine infused at greater than 10 mcg/kg/min will cause:

A. increased myocardial contractility

B. peripheral arterial vasoconstriction

C. renal artery vasoconstriction

D. respiratory depression

ANSWER: A B C

Explanation:

At infusion rates greater than 10 mcg/kg/min, dopamine produces substantial adrenergic stimulation that increases cardiac performance and vascular tone. “Increased myocardial contractility” is correct because dopamine retains cardiac stimulatory effects at these doses, increasing the force of ventricular contraction and potentially increasing cardiac output. “Peripheral arterial vasoconstriction” is also correct because high-dose dopamine strongly increases systemic vascular resistance, which can raise blood pressure in hypotensive patients. At this dose range, vasoconstriction is not limited to nonrenal vascular beds; therefore, “renal artery vasoconstriction” is correct as well. Reduced renal perfusion may occur when intense vasoconstriction is present, so dopamine should not be used with the expectation that it will protect renal function. In ACLS, dopamine is titrated according to the patient’s clinical response, especially blood pressure, perfusion, rhythm, and adverse effects. The American Heart Association includes dopamine infusion among treatments that may be used for symptomatic bradycardia or hypotension when appropriate, while medication labeling describes its dose-dependent cardiac and vascular actions. See the American Heart Association adult bradycardia algorithm and the NCBI StatPearls review of dopamine.

QUESTION NO: 14

In a patient with suspected acute coronary syndrome, aspirin:

A. should be given early if no contraindication exists

B. is commonly given as 162-325 mg chewed

C. inhibits platelet aggregation

D. should be withheld in active bleeding

E. is contraindicated solely because the patient is older than 75 years

ANSWER: A B C D

Explanation:

Should be given early when there is no allergy or active bleeding, is administered in a chewable dose of 162 to 325 mg, and inhibits platelet aggregation. Aspirin reduces platelet-mediated thrombus formation and is a key early therapy for suspected acute coronary syndrome. Chewing a non-enteric-coated preparation promotes more rapid absorption. Aspirin should be withheld when there is a true aspirin allergy, active bleeding, or another clear contraindication. It does not replace the need for ECG evaluation, reperfusion planning, or other ACS-directed treatment. See the ACC/AHA Guideline for Acute Coronary Syndromes.

QUESTION NO: 15

You arrive on-scene and find a 56-year-old diabetic woman complaining of chest discomfort. She is pale and diaphoretic, complaining of lightheadedness. Her blood pressure is 80/60 mmHg. The cardiac monitor documents the rhythm above. She is receiving oxygen at 4 L/min by nasal cannula, and an IV has been established. Transcutaneous pacing has been requested but is not yet available. Your next order is

A. Give morphine sulfate 4 mg IV

B. Start dopamine at 2 to 10 ug/kg per minute

C. Give atropine 0.5 mg IV

D. Give atropine 1 mg IV

E. Give nitroglycerin 0.4 mg SL

ANSWER: D

Explanation:

Give atropine 1 mg IV is the appropriate immediate order for symptomatic bradycardia causing poor perfusion. This patient has clear signs of cardiopulmonary compromise: hypotension, diaphoresis, pallor, and lightheadedness in the setting of a slow rhythm. In the adult ACLS bradycardia algorithm, atropine is the initial medication for acute symptomatic bradycardia while definitive pacing is being arranged. The current recommended adult dose is 1 mg IV bolus. It may be repeated every 3 to 5 minutes as needed, to a maximum total dose of 3 mg.

Atropine decreases vagal influence on the sinoatrial and atrioventricular nodes, which can increase the heart rate and improve cardiac output and blood pressure when the bradycardia is responsive to vagal blockade. Because transcutaneous pacing has already been requested but is not immediately available, administering atropine promptly provides guideline-supported pharmacologic treatment during that interval. The team should continue close monitoring, reassess blood pressure, mental status, and perfusion after administration, and proceed with pacing without delay if the patient does not improve or the rhythm is unlikely to respond. See the American Heart Association's [Adult Bradycardia With a Pulse Algorithm] and its [CPR and ECC Guidelines].

QUESTION NO: 16

In rescuing a near drowning victim, the rescuer should:

A. compress the chest to drain water from breathing passages.

B. assure their own safety.

C. stabilize the cervical spine if a diving accident.

D. start rescue breathing.

ANSWER: B C D

Explanation:

Rescuer safety must come first: a victim in the water may be panicked, and unsafe entry or contact can rapidly create an additional victim. The rescuer should use the safest feasible method of reaching and removing the person, while activating emergency response resources as appropriate. “Assure their own safety” therefore reflects the essential first priority in any drowning rescue.

“Stabilize the cervical spine if a diving accident” is appropriate because diving incidents can involve head or neck trauma. Spinal motion restriction should be applied when a traumatic mechanism or physical findings suggest cervical-spine injury, while avoiding unnecessary delays in lifesaving airway and breathing care.

“Start rescue breathing” is also correct because drowning is primarily an oxygen-deprivation event. Once it can be done safely, prompt ventilation is a critical intervention; after removal from the water, the rescuer should assess breathing and provide rescue breaths, CPR, and defibrillation as indicated. Current resuscitation guidance emphasizes rapid oxygenation and ventilation alongside standard basic and advanced life-support measures. See the American Heart Association CPR and ECC Guidelines and the American Red Cross drowning guidance.

QUESTION NO: 17

Endotracheal intubation complications include:

Vocal cord injury, dental damage, esophageal intubation, and right main bronchus intubation.

In a patient refractory to atropine, when is external pacing indicated?

A. pulseless electrical activity

B. agonal rhythm

C. symptomatic bradycardia

D. symptomatic ventricular fibrillation

ANSWER: C

Explanation:

External pacing is indicated for **symptomatic bradycardia** when atropine is ineffective, particularly when the slow heart rate is causing cardiopulmonary compromise. In the ACLS adult bradycardia algorithm, clinically important compromise includes hypotension, acutely altered mental status, signs of shock, ischemic chest discomfort, or acute heart failure. Transcutaneous pacing provides temporary electrical stimulation through chest-wall pads to produce myocardial depolarization and an adequate perfusing rate while the team evaluates and treats the underlying cause or prepares more definitive management, such as expert consultation and transvenous pacing when appropriate.

Effective pacing requires both electrical and mechanical capture. Clinicians should confirm electrical capture on the monitor and then verify a corresponding pulse and improved perfusion. Because transcutaneous pacing can be painful in an awake patient, analgesia and/or sedation should be considered when this can be done without delaying urgent treatment. The American Heart Association bradycardia pathway identifies transcutaneous pacing as an appropriate next intervention after atropine when instability persists. See the American Heart Association ACLS algorithms and the NCBI review of transcutaneous cardiac pacing.

QUESTION NO: 18

If no contraindications exist, thrombolytic therapy should be given to patients with:

A. chest pain for 4 hours with clear ST elevation > 1 mm in two adjacent leads

B. presentation within 12 hours after symptom onset

C. 6 hours of chest pain and left bundle branch block meeting STEMI-equivalent criteria

D. 6 hours of chest pain, ST elevation, and age greater than 75 years

ANSWER: A C D

Explanation:

Fibrinolytic (thrombolytic) therapy is a reperfusion treatment for eligible patients with acute ST-elevation myocardial infarction when primary percutaneous coronary intervention cannot be delivered within the recommended time frame. Chest pain for 4 hours with clear ST elevation greater than 1 mm in two adjacent leads identifies an acute STEMI pattern within the usual treatment window, making reperfusion with a fibrinolytic appropriate when there are no contraindications. Similarly, 6 hours of ischemic chest pain with a left bundle branch block meeting STEMI-equivalent criteria represents an occlusive myocardial infarction pattern requiring urgent reperfusion. The bundle branch block must be interpreted using appropriate STEMI-equivalent ECG criteria rather than treated as diagnostic in isolation. A patient with 6 hours of chest pain and ST elevation remains within the early window in which myocardial salvage is expected; age greater than 75 years increases bleeding risk but does not itself exclude fibrinolysis. In older adults, clinicians should assess the individual benefit-risk balance and use the age-appropriate fibrinolytic regimen when indicated. Current STEMI guidance emphasizes rapid reperfusion and supports fibrinolysis for eligible patients when timely PCI is unavailable. See the European Society of Cardiology STEMI guideline and the ACC/AHA STEMI guideline summary.

QUESTION NO: 19

FILL BLANK

T/F: A poor result after resuscitation is evidence of negligence.

A. False.

ANSWER: A

Explanation:

False. A poor outcome after a resuscitation attempt, by itself, is not evidence of negligence. Cardiac arrest has a high risk of death and neurologic injury even when responders provide prompt, high-quality, guideline-based CPR, defibrillation when indicated, airway support, medications, and post–cardiac arrest care. The patient's underlying condition, the cause and duration of arrest, whether the arrest was witnessed, time to CPR and defibrillation, and return of spontaneous circulation all substantially affect the outcome.

Negligence is a legal determination that generally requires evidence that a clinician owed a duty of care, failed to meet the applicable standard of care, and that this breach caused harm. Therefore, evaluating care after a poor resuscitation outcome requires review of the circumstances and the actions taken, including documentation and adherence to accepted resuscitation practices; the outcome alone does not establish a breach of duty. The American Heart Association emphasizes that survival depends on the full Chain of Survival, including early recognition, immediate high-quality CPR, rapid defibrillation, advanced resuscitation, and post–cardiac arrest care. See the American Heart Association CPR and ECC Guidelines and the NCBI overview of medical negligence.

QUESTION NO: 20

FILL BLANK How can you protect yourself from the legal consequences of patient refusal?

A. Ensure that you document fully and accurately.

ANSWER: A

Explanation:

Ensure that you document fully and accurately. When a patient with decision-making capacity refuses assessment, treatment, transport, or further care, thorough documentation is the key professional and legal safeguard. The record should objectively describe the patient's condition and mental status; the capacity assessment; the care, risks, benefits, and alternatives explained; the patient's demonstrated understanding; and the specific service or intervention refused. It should also record that appropriate return precautions were provided, including when and how to seek emergency help, and that the patient was encouraged to obtain follow-up care. If local policy permits, documentation should include witness information and the patient's signature on a refusal form; a patient's refusal to sign should itself be documented.

Accurate charting does more than create a legal record: it demonstrates that the refusal was informed and that the clinician continued to act in the patient's best interests while respecting autonomy. Documentation must be timely, factual, and free of judgmental language. This approach aligns with the ethical principle that a capable patient may decline recommended care after receiving sufficient information to make an informed decision. See the discussion of informed refusal and capacity in StatPearls: Refusal of Care and the American Heart Association's Ethics Guidelines.

QUESTION NO: 21

FILL BLANK What procedure should be used to open an airway in an unconscious child?

A. Jaw thrust.

B. Head tilt–chin lift maneuver.

ANSWER: B

Explanation:

For an unconscious child without a suspected cervical-spine injury, use the **head tilt–chin lift maneuver** to open the airway. Place one hand on the child's forehead and gently tilt the head back while lifting the bony part of the chin forward with the fingers of the other hand. This moves the tongue away from the back of the throat, a common cause of airway obstruction in an unresponsive child, and helps establish an open airway for assessment of breathing and delivery of rescue breaths when indicated. The head should be positioned carefully and not excessively extended; pediatric airway anatomy generally requires a neutral to slightly extended position rather than the greater extension often used in adults. This maneuver is the standard initial method for airway opening in basic life support when trauma is not suspected. The American Heart Association's pediatric life-support guidance describes opening the airway with a head tilt–chin lift before giving breaths. See the American Heart Association CPR and ECC Guidelines and the American Red Cross child and baby CPR guidance.

QUESTION NO: 22

FILL BLANK

When giving a patient epinephrine via the endotracheal tube, the proper dose should be 2–2.5 times the recommended IV dose. How much normal saline should be used?

A. 5–10 mL of normal saline.

ANSWER: A

Explanation:

The appropriate dilution is **5–10 mL of normal saline**. When vascular access is not yet available during resuscitation and epinephrine is administered through an endotracheal tube, the drug is given at a higher dose than the standard intravenous or intraosseous dose because pulmonary absorption is less predictable. Diluting the medication in 5–10 mL of normal saline helps distribute the drug through the endotracheal tube and into the lower airways, supporting absorption across the pulmonary circulation. The dose should then be followed by positive-pressure ventilations to facilitate delivery into the lungs.

Current resuscitation practice prioritizes rapid intravenous or intraosseous access because those routes provide more reliable drug delivery. However, when the endotracheal route is being used, 5–10 mL is the accepted dilution range; therefore, 10 mL falls within that range. This recommendation is consistent with American Heart Association guidance describing endotracheal drug administration when IV or IO access is unavailable. See the American Heart Association CPR and ECC Guidelines and the NCBI StatPearls review of ACLS.

QUESTION NO: 23

FILL BLANK What artery is compressed when you take a blood pressure on the upper arm?

A. The brachial artery.

ANSWER: A

Explanation:

The brachial artery is compressed when blood pressure is measured with a cuff placed around the upper arm. This artery travels along the medial aspect of the upper arm and is the standard site used for auscultatory blood-pressure measurement. As the cuff is inflated, it applies circumferential pressure to the arm; when cuff pressure exceeds arterial pressure, blood flow through the brachial artery is temporarily occluded. During controlled cuff deflation, blood flow resumes intermittently and produces the Korotkoff sounds heard with a stethoscope positioned over the brachial artery at the antecubital fossa. The pressure at which these sounds first appear corresponds to systolic blood pressure, while their disappearance is used to identify diastolic blood pressure in most adults. Correct cuff placement and use of an appropriately sized cuff are important because the measurement depends on effective compression of this artery. The American Heart Association's scientific statement on blood-pressure measurement describes positioning the cuff on the upper arm and placing the stethoscope over the brachial artery. See the American Heart Association blood pressure measurement guidance and the NCBI StatPearls review of blood pressure measurement.

QUESTION NO: 24

FILL BLANK Describe the function of the left atrium.

A. The left atrium receives blood from the pulmonary veins located in the lungs and pumps oxygenated blood to the left ventricle.

ANSWER: A

Explanation:

The left atrium receives oxygen-rich blood returning from the lungs through the pulmonary veins. This blood has just undergone gas exchange in the pulmonary circulation, where it picked up oxygen. The left atrium acts as a collecting chamber and, during atrial contraction, contributes to filling the left ventricle through the mitral valve. The left ventricle then generates the pressure needed to pump this oxygenated blood through the aortic valve into the systemic circulation, delivering oxygen to body tissues.

Thus, "The left atrium receives blood from the pulmonary veins located in the lungs and pumps oxygenated blood to the left ventricle" accurately describes the chamber's core role in normal blood flow. In ACLS, understanding this pathway supports interpretation of cardiac anatomy, circulation, and the clinical consequences of impaired cardiac pumping or rhythm disturbances. The American Heart Association describes circulation as the movement of oxygenated blood from the lungs through the left side of the heart to the body; additional anatomy details are available from the American Heart Association and the NCBI Bookshelf overview of cardiac anatomy.

QUESTION NO: 25

FILL BLANK What type of drug is propranolol?

A. A beta-blocker.

ANSWER: A

Explanation:

Propranolol is a beta-blocker, specifically a nonselective beta-adrenergic receptor antagonist. It blocks both β1 receptors, which are primarily associated with cardiac effects, and β2 receptors, which are found in tissues including bronchial and vascular smooth muscle. By reducing beta-adrenergic stimulation, propranolol decreases heart rate, myocardial contractility, and blood pressure. These effects explain its use in conditions such as hypertension, certain tachyarrhythmias, angina, migraine prevention, essential tremor, and selected symptoms of anxiety. In ACLS-related clinical assessment, recognizing propranolol as a beta-blocker is important because beta-blockade can contribute to bradycardia, hypotension, and slowed atrioventricular nodal conduction. The medication's nonselective activity is also clinically relevant in patients with reactive airway disease, since β2 blockade may promote bronchospasm. The U.S. National Library of Medicine's drug information identifies propranolol as belonging to the class of medications called beta blockers. Drug labeling likewise describes its beta-adrenergic receptor-blocking activity. See MedlinePlus: Propranolol and DailyMed: Propranolol hydrochloride.

QUESTION NO: 26

Appropriate management of a patient with suspected acute coronary syndrome includes:

A. obtain a 12-lead ECG within 10 minutes

B. place the patient on cardiac monitoring

C. give aspirin if no contraindication exists

D. give nitroglycerin if blood pressure is adequate and no contraindication exists

E. give oxygen routinely despite normal oxygen saturation and no respiratory distress

ANSWER: A B C D

Explanation:

Initial acute coronary syndrome care focuses on early recognition, monitoring, and treatment of ischemia while preparing for definitive reperfusion when indicated. **A 12-lead ECG within 10 minutes of arrival** helps identify STEMI or ischemic changes. **Cardiac monitoring** is appropriate because ischemia can precipitate life-threatening dysrhythmias. **Aspirin** should be given promptly to patients without allergy or another contraindication because it inhibits platelet activation. **Nitroglycerin** may be used for persistent ischemic chest discomfort when blood pressure is adequate and contraindications are absent. Oxygen should be used for hypoxemia, respiratory distress, or other clinical indications; routine oxygen in a patient with normal oxygen saturation is not recommended. See the ACC/AHA Guideline for Acute Coronary Syndromes.

QUESTION NO: 27

A patient with a regular monomorphic wide-complex tachycardia has a pulse but is hypotensive and confused. What is the immediate treatment?

A. synchronized cardioversion

B. vagal maneuvers

C. adenosine 6 mg rapid IV push

D. continuous observation

ANSWER: A

Explanation:

Synchronized cardioversion is the immediate treatment for unstable tachycardia with a pulse. Hypotension and altered mental status indicate that the tachyarrhythmia is causing cardiopulmonary compromise. Synchronization times the electrical shock to the R wave and reduces the risk of delivering a shock during ventricular repolarization. Sedation should be provided whenever feasible, but it must not delay cardioversion in an unstable patient. If synchronization cannot be achieved and the patient becomes pulseless, manage the rhythm as pulseless ventricular tachycardia with unsynchronized defibrillation and CPR. See the American Heart Association Adult Tachyarrhythmia With a Pulse Algorithm.

QUESTION NO: 28

FILL BLANK Expansion of circulating fluid volume with normal saline is recommended in all cardiac arrests.

A. False.

ANSWER: A

Explanation:

False. In adult cardiac arrest, routine expansion of circulating volume with normal saline is not recommended for every patient. High-quality CPR, early defibrillation when indicated, airway and ventilation management, vascular access, and administration of appropriate medications are the core components of resuscitation. IV or IO fluids should instead be considered when the clinical situation suggests hypovolemia or another reversible cause for which volume replacement is appropriate. Examples may include suspected hemorrhage, significant dehydration, or fluid loss associated with conditions such as anaphylaxis. Giving a fluid bolus without an indication does not treat the usual causes of cardiac arrest and can distract from time-sensitive, evidence-based resuscitation actions. During management, clinicians should evaluate potentially reversible causes—the ACLS "Hs and Ts"—and tailor treatment to the suspected cause rather than applying normal-saline volume expansion universally. The American Heart Association's adult cardiac arrest algorithm emphasizes identifying and treating reversible causes while continuing high-quality CPR and rhythm-specific care. See the American Heart Association adult cardiac arrest algorithms and the NCBI StatPearls review of ACLS for further guidance.

QUESTION NO: 29

FILL BLANK What type of ventilatory device is contraindicated in children?

A. Oxygen-powered ventilation devices.

ANSWER: A

Explanation:

Oxygen-powered ventilation devices are contraindicated in children because these devices can deliver gas at high pressure and make it difficult to precisely control the delivered pressure and volume. A child's lungs and airways are smaller and more susceptible to pressure-related injury; excessive ventilation pressure may cause gastric inflation, regurgitation, aspiration, or pulmonary barotrauma. Pediatric ventilation should therefore be delivered with equipment that permits careful, observable control of ventilation, such as a bag-mask device with an appropriately sized mask and, when appropriate, a pressure-relief valve. Rescuers should provide only enough volume to produce visible chest rise and avoid excessive rate or force. This approach supports adequate oxygenation and ventilation while minimizing the risk of harm from overinflation. The American Heart Association's resuscitation guidance emphasizes age-appropriate ventilation and avoidance of excessive ventilation during pediatric resuscitation. See the American Heart Association CPR and ECC Guidelines and the American Red Cross child and baby CPR guidance.

QUESTION NO: 30

FILL BLANK Should the pulse be checked between shocks in a patient that displays persistent VF/VT?

A. No. Resume CPR immediately after each defibrillation, starting with chest compressions; do not check a pulse between shocks.

ANSWER: A

Explanation:

No. In persistent ventricular fibrillation or pulseless ventricular tachycardia, the priority following every defibrillation attempt is to resume high-quality CPR immediately, beginning with chest compressions. This minimizes the interruption in coronary and cerebral perfusion caused by pausing compressions. A pulse check immediately after a shock is not recommended because it delays CPR and is unlikely to provide a reliable or useful result in this setting.

Rhythm assessment is performed after approximately 2 minutes of CPR, not between individual shocks. If that rhythm check shows an organized rhythm, the team may then check for a pulse, taking no more than 10 seconds. If VF/VT remains present, deliver the next indicated shock and immediately restart CPR. This shock–CPR cycle is the core ACLS approach for a shockable cardiac-arrest rhythm and helps preserve blood flow while defibrillation and medications are used to achieve return of spontaneous circulation. See the American Heart Association's ACLS cardiac-arrest algorithms and its CPR and ECC Guidelines.

QUESTION NO: 31

Which of the following patients require intubation?

A. conscious with a suspected stroke

B. unconscious with no gag reflex

C. normotensive with third degree heart block

D. cardiac arrest after three unsuccessful countershocks

ANSWER: B D

Explanation:

An unconscious patient with no gag reflex requires definitive airway protection because loss of protective upper-airway reflexes substantially increases the risk of airway obstruction and aspiration. Endotracheal intubation secures the airway, permits controlled ventilation and oxygenation, and protects against gastric contents entering the lungs when performed by a trained clinician. In cardiac arrest after three unsuccessful countershocks, airway management and ventilation are essential components of ongoing resuscitation. An advanced airway, including endotracheal intubation, is appropriate when it can be placed by an experienced provider without meaningful interruption of high-quality chest compressions. Once an advanced airway is in place, continuous compressions are provided with ventilation at one breath every 6 seconds. The resuscitation team should prioritize effective bag-mask ventilation until intubation is feasible and should use waveform capnography to confirm and continuously monitor endotracheal tube placement. These actions align with the adult cardiac arrest algorithm and ACLS emphasis on maintaining oxygenation, ventilation, and uninterrupted perfusion during refractory shockable arrest. See the American Heart Association adult cardiac arrest algorithms and the AHA CPR and ECC Guidelines.

QUESTION NO: 32

Ventricular fibrillation:

A. may be mimicked by artifact on the monitor

B. may produce a peripheral pulse

C. produces no cardiac output

D. treated with early defibrillation

ANSWER: A C D

Explanation:

Ventricular fibrillation is a chaotic, disorganized ventricular rhythm that produces no coordinated ventricular contraction. Therefore, **produces no cardiac output** is correct: the patient has no effective circulation and should be treated as being in cardiac arrest. The rhythm tracing must also be interpreted in the clinical context. **may be mimicked by artifact on the monitor** is correct because movement, poor electrode contact, electrical interference, or patient shivering can create an irregular waveform that resembles ventricular fibrillation. The resuscitation team should rapidly check the patient, leads, and rhythm while avoiding an unnecessary delay in treatment when true cardiac arrest is present.

treated with early defibrillation is correct because ventricular fibrillation is a shockable cardiac-arrest rhythm. Prompt unsynchronized defibrillation is the key rhythm-specific intervention, accompanied by high-quality CPR and standard ACLS care. Early shock delivery improves the likelihood of successful defibrillation, particularly when paired with minimal interruptions in chest compressions. The American Heart Association's adult cardiac-arrest algorithm identifies ventricular fibrillation as a shockable rhythm and directs defibrillation as soon as a defibrillator is available. See the American Heart Association adult cardiac arrest algorithms and the NCBI review of ventricular fibrillation.

QUESTION NO: 33

FILL BLANK When is it medically and legally acceptable to terminate CPR?

A. When the cardiovascular system has failed to respond to reasonable BLS and ACLS efforts.

ANSWER: A

Explanation:

When the cardiovascular system has failed to respond to reasonable BLS and ACLS efforts is the appropriate completion. Resuscitation is intended to restore spontaneous circulation and achieve a survivable outcome. When appropriately performed basic and advanced life-support measures have not produced a response, continued CPR may be considered medically futile, provided the decision follows the applicable termination-of-resuscitation protocol, local regulations, and the authority and scope of practice of the resuscitation team. “Reasonable” efforts means care consistent with current resuscitation standards, including high-quality CPR, rhythm assessment and defibrillation when indicated, ventilation and oxygenation, vascular or intraosseous access, appropriate medications, and evaluation of reversible causes. The decision must also account for relevant clinical context, such as a valid advance directive or do-not-resuscitate order, and should be documented according to organizational and EMS policy. The American Heart Association emphasizes that termination decisions require ethical judgment and should be guided by validated termination rules and local systems of care, rather than an arbitrary duration of CPR alone. See the American Heart Association ethical issues guidance and its adult BLS and ACLS guidelines.

QUESTION NO: 34

During cardiac arrest, acidosis:

A. is usually both metabolic and respiratory

B. should be treated with increased ventilation

C. should generally be treated with sodium bicarbonate

D. usually resolves once perfusion is restored

ANSWER: A B D

Explanation:

During cardiac arrest, acidosis is usually both metabolic and respiratory. Absent or severely reduced circulation causes tissue hypoxia and anaerobic metabolism, producing lactate and hydrogen ions that create metabolic acidosis. At the same time, inadequate alveolar ventilation prevents normal carbon dioxide elimination; retained carbon dioxide contributes a respiratory acidosis. The immediate priority is high-quality CPR to provide blood flow and oxygen delivery, combined with appropriate ventilation to support carbon dioxide clearance. Thus, acidosis should be treated with increased ventilation in the sense of providing effective, guideline-consistent ventilation while minimizing interruptions in compressions and avoiding excessive ventilation. Once spontaneous circulation and adequate tissue perfusion are restored, oxygen delivery improves, lactate production falls, and carbon dioxide can again be cleared by the lungs. Consequently, the acidosis usually resolves as perfusion is restored, although post-arrest assessment may identify patients who need additional targeted management. ACLS guidance emphasizes correction of the underlying low-flow state through effective resuscitation and return of spontaneous circulation rather than attempting to normalize laboratory values during arrest. See the American Heart Association’s CPR and ECC Guidelines and the NCBI overview of lactic acidosis.

QUESTION NO: 35

What is the evaluation and treatment for a patient with pulseless electrical activity? CPR, rapid fluid challenge, oxygen, check breath sounds bilaterally, and give epinephrine.

The three most treatable causes of pulseless electrical activity are:

A. massive pulmonary embolism

B. cardiac tamponade

C. hypovolemia

D. tension pneumothorax

E. massive myocardial infarction

ANSWER: B C D

Explanation:

Cardiac tamponade, hypovolemia, and tension pneumothorax are the three especially actionable reversible causes emphasized in this scenario because each can be identified rapidly during high-quality CPR and treated with an immediate, targeted intervention. Cardiac tamponade obstructs cardiac filling; prompt pericardial drainage can restore effective circulation. Hypovolemia reduces venous return and preload, so rapid volume replacement—while controlling the source of fluid or blood loss—is essential. Tension pneumothorax produces obstructive shock by increasing intrathoracic pressure and impairing venous return; immediate chest decompression is the life-saving treatment. These diagnoses align directly with the stated bedside evaluation: a rapid fluid challenge addresses suspected volume loss, and checking bilateral breath sounds helps identify a possible tension pneumothorax. In PEA, teams must continue high-quality CPR, provide oxygenation and ventilation, administer epinephrine according to the ACLS cardiac-arrest algorithm, and actively search for reversible causes rather than treating the electrical rhythm alone. The American Heart Association lists hypovolemia, tension pneumothorax, and cardiac tamponade among the reversible “Hs and Ts” to evaluate during cardiac arrest. See the American Heart Association ACLS algorithms and Merck Manual overview of cardiac arrest.