



**Fundamental Critical Care Support, Sixth Edition  
Pre-Test**

**Instructions:**

- Please print your name on the Pre-Test Answer Sheet.
  - Read each question carefully.
  - Select the best answer to each question.
  - Place the letter of your answer (A, B, C, or D) next to that question number on the Answer Sheet.
1. Which of the following parameters may be a late sign of cardiovascular disturbance signaling failure of the compensatory mechanisms?
    - A. Tachycardia
    - B. Bradycardia
    - C. Hypotension
    - D. Hypertension
  2. Investigative tests should be based on the patient's history and physical examination as well as on previous tests. Which of the following is one of the most important indicators of critical illness?
    - A. Respiratory acidosis
    - B. Metabolic acidosis
    - C. Elevated creatinine
    - D. Hyponatremia
  3. A 22-year-old man is brought to the emergency room after falling from a horse. He is awaiting transfer to another facility. He has a chest contusion and a non-displaced femur fracture. He is in spinal motion restriction with a cervical collar and long backboard. He has worsening respiratory distress and hypoxemia requiring endotracheal intubation. Which of the following modifications of the manual assisted ventilation technique is appropriate?
    - A. Place an oral airway one size larger than usual.
    - B. Add additional downward pressure on the face mask once it is sealed.
    - C. Use a jaw thrust technique in place of neck extension.
    - D. Increase the tidal volume with each manual assisted breath.
  4. Which of the following anatomic features is most likely to contribute to difficulty in maintaining a patent airway in a supine patient?
    - A. Edentulous mandible
    - B. Posteriorly displaced tongue
    - C. Deviated nasal septum
    - D. Anteriorly displaced thyroid cartilage

5. An elderly patient is on the medical ward for respiratory distress. Which of the following is correct regarding airway assessment?
- A. Laryngeal displacement toward the chest during inspiration occurs only with upper airway obstruction
  - B. Chest rise with inspiration indicates an adequate tidal volume
  - C. Unilateral absent breath sounds on auscultation is a tension pneumothorax
  - D. Complete airway obstruction is likely when chest retraction and movement is present, but there are no breath sounds
6. An 82-year-old man who awoke with chest pain in the morning is being evaluated in the emergency department. He is alert and oriented. Shortly after being placed on a cardiac monitor in normal sinus rhythm with ST segment elevations, he becomes unresponsive and develops ventricular fibrillation. Which of the following initial interventions is most appropriate for this patient?
- A. Do not initiate treatment because, due to his age, he probably has a do-not-resuscitate order on file.
  - B. Attempt to contact the family before treating to discuss the level of intervention.
  - C. Start cardiopulmonary resuscitation while preparing to defibrillate.
  - D. Start bag-mask-valve ventilation while preparing to intubate.
7. Which of the following is the purpose of cardiopulmonary resuscitation?
- A. To reverse symptomatic bradycardia in an ICU patient who is on multiple vasoactive infusions
  - B. To reverse sudden cardiac death in a patient who is in the palliative care unit
  - C. To prolong the life of a patient who has a do-not-resuscitate order on file to allow time for family to arrive
  - D. To reverse sudden, unexpected death from a reversible disease process or iatrogenic complications
8. A 75-year-old man with a long history of smoking, chronic lung disease, and treatment noncompliance is brought to the emergency department by his daughter. He has had progressive dyspnea. He is awake, alert, and in moderate distress, with the use of accessory muscles during inspiration and expiration and a respiratory rate of 30 breaths/min. There are audible expiratory wheezes. Which of the following pharmacologic treatments should be initiated?
- A. Inhaled beta<sub>2</sub>-agonist
  - B. Aerosolized racemic epinephrine
  - C. Transtracheal lidocaine
  - D. *N*-acetylcysteine
9. A 65-year-old woman is admitted with pulmonary edema due to acute diastolic left ventricular failure. She is alert and oriented but has a respiratory rate of 30 breaths/min and a room air SpO<sub>2</sub> of 88%. On examination, she has 4 cm jugular venous distention and end-inspiratory crackles in her lung fields bilaterally. Room air arterial blood gas analysis shows: pH 7.28, PCO<sub>2</sub> 48 mm Hg, and PO<sub>2</sub> 58 mm Hg. Along with diuresis and antihypertensive therapy, she is placed on bilevel noninvasive ventilation with an inspiratory positive airway pressure (IPAP) of 12 cm H<sub>2</sub>O and an expiratory positive airway pressure (EPAP) of 8 cm H<sub>2</sub>O delivered via full face mask with FIO<sub>2</sub> 0.5. Two hours after initiating noninvasive positive pressure ventilation (NPPV), the bedside nurse calls the physician to reassess the patient. The patient is now agitated and fails to follow commands. SpO<sub>2</sub> is now 85%. Repeat arterial blood gas analysis shows: pH 7.23, PCO<sub>2</sub> 54 mm Hg, and PO<sub>2</sub> 65 mm Hg. Which of the following is the most appropriate next step in this patient's management?
- A. Continue current NPPV settings for another two hours
  - B. Increase IPAP to 28 cm H<sub>2</sub>O
  - C. Intubate and initiate invasive ventilation
  - D. Administer sedation with an opioid and a benzodiazepine



10. An 18-year-old, 55-kg (121-lb) woman has just been intubated for an acute asthma attack. She has been sedated and paralyzed in order to facilitate ventilation. Arterial blood gas analysis immediately before intubation revealed: pH 7.08, PCO<sub>2</sub> 75 mm Hg, and PO<sub>2</sub> 63 mm Hg on FIO<sub>2</sub> 0.4. On bagging, diffuse high-pitched wheezes are heard.

Which of the following is the most appropriate initial ventilator mode for this patient?

- A. Continuous positive airway pressure
- B. Pressure support ventilation
- C. Assist control volume ventilation
- D. Assist control pressure ventilation

11. A 56-year-old man presents to the emergency department with a three-day history of fever, shaking chills, cough, and sputum production. He was previously in good health and takes only amlodipine for a history of hypertension. In the emergency department, his heart rate is 130 beats/min, respiratory rate 32 breaths/min, blood pressure 80/40 mm Hg, temperature 38.8°C (102°F), and oxygen saturation 92% on 6 liters of oxygen by nasal cannula. Pulmonary examination demonstrates crackles and bronchial breath sounds in both lower lobes. A chest radiograph shows multilobar consolidations. Although awake and alert, he appears visibly distressed and has marked accessory muscle use. Apart from antibiotics and resuscitation for sepsis, which of the following is the next best step for management of his respiratory failure?

- A. Trial of noninvasive mechanical ventilation by face mask
- B. Intubation and initiation of invasive mechanical ventilation
- C. Switch to high-flow oxygen therapy
- D. Trial of noninvasive mechanical ventilation by helmet

12. A 56-year-old man is admitted to the ICU for pneumonia. He is intubated, with the following settings: assist control, tidal volume 550 mL, respiratory rate 12 breaths/min, positive end-expiratory pressure 5 cm H<sub>2</sub>O, FIO<sub>2</sub> 1.0. Vital signs are: temperature 38.7°C (101.6°F), heart rate 122 beats/min, respiratory rate 20 breaths/min, blood pressure (BP) 88/46 mmHg, SpO<sub>2</sub> 97%. A central venous line and arterial line have been placed. He has been started on broad-spectrum antibiotics. Which of the following is a clinical indicator that he would benefit from further fluid resuscitation?

- A. Heart rate persistently greater than 90 beats/min
- B. Passive leg raise resulting in at least 20% increase in systolic BP
- C. Urine output of less than 0.5 mL/kg/hour
- D. Systolic BP less than 90 mm Hg

13. A 75-year-old man with a history of hypertension is evaluated in the emergency department for nausea, vomiting, and abdominal pain. He is lethargic but can answer questions appropriately. His pulse is 130 beats/min, blood pressure 70/30 mm Hg, and respiratory rate 28 breaths/min. On physical examination, he is noted to have dry mucous membranes, poor capillary refill, and a distended abdomen with rebound tenderness. Arterial blood gas analysis reveals: pH 7.32, PCO<sub>2</sub> 28 mmHg, PO<sub>2</sub> 74 mm Hg, bicarbonate 13 mmol/L. Serum lactate is 8.0 mEq/L. Which of the following findings has been shown to correlate with a worse prognosis in a patient with this clinical picture?
- A. Hypotension
  - B. Acidemia on blood gas analysis
  - C. Elevated serum lactic acid
  - D. Tachypnea
14. A 65-year-old man is septic, with perforated diverticulitis. He undergoes emergent colectomy with creation of a colostomy. Multiple areas of purulence are identified in the peritoneal cavity. Postoperatively, he continues to be febrile and hypotensive. Chest radiograph is clear. Central venous pressure is 18 mm Hg, and hemoglobin is 13 g/dL. Which of the following vasoactive drugs is most appropriate to administer next?
- A. Epinephrine
  - B. Phenylephrine
  - C. Norepinephrine
  - D. Dobutamine
15. A 76-year-old woman with a history of congestive heart failure and hypertension is admitted with altered mental status and mild upper respiratory symptoms. According to family, her mental status has been gradually declining over the past three to four days. Because of generalized weakness and upper respiratory symptoms, she has had a limited amount of food and drink for the past 72 hours. Her home medications include metoprolol, lisinopril, and furosemide. Her family states that she has been compliant with these medications. On physical examination, vital signs are: heart rate 118 beats/min, blood pressure 96/53 mm Hg, respiratory rate 14 breaths/min, and oxygen saturation 98% on room air. Other findings included dry mucous membranes, poor skin turgor, and the absence of jugular venous distention. Pulmonary examination is clear on auscultation. She opens her eyes to voice, but mumbles incomprehensible sounds and has generalized weakness. She has a two-minute tonic-clonic seizure in the emergency department, which resolves without intervention. Pertinent laboratory results are: sodium 110 mEq/L, potassium 4.5 mEq/L, chloride 80 mEq/L, bicarbonate 26 meq/L, blood urea nitrogen 57 mg/dl, creatinine 1.2 mg/dL, and glucose 89 mg/dL. Which of the following is the most appropriate next step in management?
- A. Free water restriction
  - B. Hypertonic (3%) saline 100 mL x 1 for rapid early correction, with goal serum sodium of 118 mEq/L in 24 hours
  - C. Normal saline bolus, 1 L over 10 minutes, and repeat for goal serum sodium of 128 mEq/L in 24 hours
  - D. Oral tolvaptan, 15 mg x 1



16. While fighting a house fire, a 38-year-old man fell 10 feet through a burning roof into an actively burning bedroom. On arrival at the emergency department two hours later, he has abdominal pain. His focused assessment with sonography in trauma (FAST) examination shows fluid between his spleen and left kidney. His voice is hoarse, and he has carbonaceous sputum. He has blistering burns on his face and insensate burns over his anterior chest, abdomen, and his entire left upper extremity circumferentially. His respiratory rate is 24-28 breaths/min, pulse 108 beats/min, blood pressure 131/73 mm Hg, and oxygen saturation as measured by pulse oximetry 98% on 2 liters nasal cannula. His estimated weight is 75 kg (165 lb). Which of the following is the most appropriate next intervention for this patient?
- A. Endotracheal intubation with in-line stabilization for cervical spine protection and 100% oxygen for probable carbon monoxide poisoning
  - B. Ringer lactated solution, 4,500 mL during the next 16 hours, titrating to urine output of 0.5/kg/hr
  - C. CT of chest, abdomen, and pelvis to further assess traumatic injuries
  - D. Emergent escharotomy of the left upper extremity to avoid compartment syndrome
17. A 72-year-old woman with a history of hypertension, type 2 diabetes mellitus, and smoking develops sudden-onset severe chest pain associated with difficulty breathing and diaphoresis. Her vital signs on arrival in the emergency department are: blood pressure 165/92 mm Hg, heart rate 101 beats/min, respiratory rate 29 breaths/min, and oxygen saturation as measured by pulse oximetry 96% on room air. Which of the following ECG findings is the most significant indicator for immediate reperfusion in this patient?
- A. ST segment depression
  - B. ST segment elevation
  - C. T wave inversions
  - D. Peaked T waves
18. A 45-year-old man is admitted to the hospital with fever, altered mental status, and swelling and redness in the upper thigh and scrotal area of four days' duration. He has a history of poorly controlled diabetes and chronic renal insufficiency. On examination, he is lethargic. Vital signs are: heart rate 79 beats/min, blood pressure 90/40 mm Hg, respiratory rate 33 breaths/min, SpO<sub>2</sub> 88%, and temperature 39°C (102.2°F). The right thigh has erythema and cutaneous gangrene. Air is felt by palpation of the soft tissue. Laboratory test results include a white blood cell count of 31,000/μL with 15% bands, hemoglobin 11.5 g/dL, glucose 520 mg/dL, sodium 150 meq/L, potassium 4 meq/L, creatinine 2.5 mg/dL (baseline 2.2 mg/dL), and lactate 4.5 meq/L. IV fluids are started for aggressive resuscitation, and he is intubated. Blood cultures are obtained. Which of the following is the most appropriate strategy in this patient's management?
- A. Antibiotic therapy should be initiated immediately and surgical debridement delayed for 24 to 48 hours until he is more hemodynamically stable.
  - B. Urgent surgical consultation should be obtained, and antibiotics should include beta-lactam/beta-lactamase inhibitor, clindamycin, and vancomycin.
  - C. Antibiotics should include beta-lactam/beta-lactamase inhibitor and the antifungal agent caspofungin.
  - D. Surgical debridement should be done only after there is radiographic evidence of soft tissue infection and gangrene.

19. A 75-year-old man with alcoholic cirrhosis develops upper gastrointestinal bleeding on postoperative day two following total knee arthroplasty. He has been started on a proton pump inhibitor infusion. Four months ago, he underwent endoscopic banding of esophageal varices. Which of the following is the best medication to add to his regimen until more definitive endoscopy can be performed?

- A. Protamine sulfate
- B. Aminocaproic acid
- C. Somatostatin
- D. Tranexamic acid

20. Which of the following would not be an expected laboratory finding associated with preeclampsia?

- A. Alanine aminotransferase level of 60 U/L
- B. Normal glucose level
- C. Decreased fibrinogen level
- D. Normal bilirubin level