PRACTICE EXAM 5: TMC SIMULATION (160 QUESTIONS)

This practice exam contains 160 multiple-choice questions. Allow three hours. The current NBRC TMC contains 140 scored items and 20 unscored pretest items. For study purposes, score all items; official 2026 reference cut scores are 86 for the CRT standard and 92 for the high-cut pathway.

1. During a respiratory-care board review, the following case is presented. An arterial blood sample appears unusually dark, while pulse oximetry remains near 100% despite headache after smoke exposure. Which test is most useful?

A. Routine serum bicarbonate
B. Peak expiratory flow
C. Co-oximetry for carboxyhemoglobin
D. Single-breath nitrogen washout

2. A therapist assigned to the intensive-care service receives this clinical update. A postoperative patient has shallow breathing, bibasilar crackles, and a new plate-like opacity above the diaphragm. What problem best explains the findings?

A. Massive pulmonary embolism
B. Dependent atelectasis
C. Tension pneumothorax
D. Chronic interstitial fibrosis

3. While performing a quality and safety round, the therapist encounters this situation. A patient has PaO2 54 mm Hg while receiving an FiO2 of 0.60. What is the approximate P/F ratio?

A. 90

B. 54

C. 140

D. 324

4. During evaluation of a new respiratory order, the therapist reviews these findings. During capnography, the baseline fails to return to zero between breaths. What does this finding most strongly suggest?

A. Complete airway obstruction

B. Esophageal intubation

C. Severe pulmonary embolism

D. Rebreathing of exhaled carbon dioxide

5. A change in the patient's condition leads to the following bedside assessment. A child with inspiratory stridor, drooling, fever, and tripod positioning arrives in the emergency department. Which action is safest during assessment?

A. Inspect the pharynx with a tongue blade

B. Avoid agitating the child and prepare for controlled airway management

C. Obtain forced expiratory spirometry immediately

D. Place the child supine for percussion

6. During transfer-of-care communication, the therapist is asked to resolve this issue. A patient receiving supplemental oxygen has a normal PaO2 but chocolate-brown blood and persistent cyanosis. Which abnormality should be suspected?

A. Simple hypoventilation

B. Mild anemia

C. Respiratory alkalosis

D. Methemoglobinemia

7. A pulmonary-service consultation includes the following clinical information. A patient has equal bilateral breath sounds but a sudden decrease in exhaled tidal volume after intubation. Which initial check is most appropriate?

A. Inspect the circuit and cuff for a leak
B. Increase sedative dosage
C. Order a ventilation-perfusion scan
D. Begin chest percussion

8. While evaluating treatment effectiveness, the therapist notes this result. A pulmonary artery occlusion pressure is markedly elevated in a patient with bilateral alveolar infiltrates. Which cause is most consistent?

A. Isolated bronchospasm
B. Pulmonary embolism without failure
C. Cardiogenic pulmonary edema
D. Uncomplicated pneumonia

9. During a respiratory-care board review, the following case is presented. A newborn has a heart rate of 80/min, weak irregular respirations, some flexion, grimace with stimulation, and blue extremities with a pink trunk. What is the APGAR score?

A. 3
B. 6
C. 5
D. 8

10. A therapist assigned to the intensive-care service receives this clinical update. Which finding most strongly supports fluid overload rather than isolated airway obstruction?

A. Prolonged expiratory phase
B. Diffuse expiratory wheezing

C. Reduced peak expiratory flow

D. Rapid weight gain with dependent edema

11. While performing a quality and safety round, the therapist encounters this situation. A patient's hemoglobin is 7 g/dL with SaO2 98% and PaO2 95 mm Hg. Which statement best describes oxygen transport?

A. Oxygen content must be normal in this case

B. Arterial oxygen content may be low despite normal saturation and PaO2

C. Dissolved oxygen carries nearly all oxygen

D. Pulse oximetry directly measures hemoglobin concentration

12. During evaluation of a new respiratory order, the therapist reviews these findings. A patient with suspected neuromuscular weakness has a rapidly declining vital capacity. What does this trend indicate?

A. Increasing risk of ventilatory failure

B. Improving inspiratory muscle strength

C. Isolated oxygen diffusion failure

D. Resolution of airway obstruction

13. A change in the patient's condition leads to the following bedside assessment. A patient's mixed venous oxygen saturation falls from 72% to 55% while arterial saturation remains unchanged. Which explanation is most likely?

A. Tissue oxygen extraction has increased

B. Arterial oxygen content has necessarily increased

C. The patient has stopped consuming oxygen

D. Pulmonary shunt has been eliminated

14. During transfer-of-care communication, the therapist is asked to resolve this issue. A patient with obstructive sleep apnea has repeated airflow cessation despite continued chest and abdominal effort. How should these events be classified?

A. Central apneas
B. Sleep-related hypoventilation only
C. Normal respiratory pauses
D. Obstructive apneas

15. A pulmonary-service consultation includes the following clinical information. Which chest radiograph finding is most consistent with a large pleural effusion?

A. Bilateral hyperinflation with flattened diaphragms
B. A visible pleural line without distal markings
C. Blunting of the costophrenic angle with a meniscus
D. Diffuse reticular opacities throughout both lungs

16. While evaluating treatment effectiveness, the therapist notes this result. An arterial line waveform is overdamped. Which effect on the displayed blood pressure is expected?

A. Both systolic and diastolic read accurately
B. Systolic pressure reads low and diastolic pressure reads high
C. Systolic reads high and diastolic reads low
D. Mean pressure always falls to zero

17. During a respiratory-care board review, the following case is presented. A patient produces copious pink, frothy sputum with bilateral crackles and orthopnea. Which condition is most likely?

A. Simple upper-airway obstruction
B. Acute pulmonary edema
C. Localized pleural effusion
D. Stable chronic bronchitis

18. A therapist assigned to the intensive-care service receives this clinical update. An adult with COPD has increasing somnolence. ABG shows pH 7.25, PaCO2 68 mm Hg, and HCO3- 29 mEq/L. Which interpretation is best?

A. Uncompensated metabolic acidosis
B. Respiratory alkalosis with renal compensation
C. Acute respiratory acidosis with partial metabolic compensation
D. Fully compensated chronic respiratory acidosis

19. While performing a quality and safety round, the therapist encounters this situation. A patient's spirometry shows FEV1/FVC of 58% and FEV1 of 61% predicted. Which ventilatory defect is most consistent with these findings?

A. An obstructive ventilatory defect
B. A restrictive ventilatory defect
C. Normal pulmonary mechanics
D. An isolated diffusion abnormality

20. During evaluation of a new respiratory order, the therapist reviews these findings. A mechanically ventilated patient suddenly becomes hypotensive with absent breath sounds on the right and tracheal deviation to the left. Which condition is most likely?

A. Left lower-lobe atelectasis
B. Cardiogenic pulmonary edema
C. Acute bronchospasm
D. Right tension pneumothorax

21. A change in the patient's condition leads to the following bedside assessment. During an evening reassessment, an arterial blood sample appears unusually dark, while pulse oximetry remains near 100% despite headache after smoke exposure. Which test is most useful?

A. Routine serum bicarbonate

B. Co-oximetry for carboxyhemoglobin

C. Peak expiratory flow

D. Single-breath nitrogen washout

22. During transfer-of-care communication, the therapist is asked to resolve this issue. In a step-down unit, a postoperative patient has shallow breathing, bibasilar crackles, and a new plate-like opacity above the diaphragm. What problem best explains the findings?

A. Massive pulmonary embolism

B. Tension pneumothorax

C. Dependent atelectasis

D. Chronic interstitial fibrosis

23. A pulmonary-service consultation includes the following clinical information. During transport preparation, a patient has PaO2 54 mm Hg while receiving an FiO2 of 0.60. What is the approximate P/F ratio?

A. 90

B. 54

C. 140

D. 324

24. While evaluating treatment effectiveness, the therapist notes this result. Following a change in condition, during capnography, the baseline fails to return to zero between breaths. What does this finding most strongly suggest?

A. Complete airway obstruction

B. Rebreathing of exhaled carbon dioxide

C. Esophageal intubation

D. Severe pulmonary embolism

25. During a respiratory-care board review, the following case is presented. During an evening reassessment, a child with inspiratory stridor, drooling, fever, and tripod positioning arrives in the emergency department. Which action is safest during assessment?

A. Inspect the pharynx with a tongue blade
B. Obtain forced expiratory spirometry immediately
C. Place the child supine for percussion
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26. A therapist assigned to the intensive-care service receives this clinical update. In a step-down unit, a patient receiving supplemental oxygen has a normal PaO2 but chocolate-brown blood and persistent cyanosis. Which abnormality should be suspected?

A. Simple hypoventilation
B. Mild anemia
C. Methemoglobinemia
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27. While performing a quality and safety round, the therapist encounters this situation. During transport preparation, a patient has equal bilateral breath sounds but a sudden decrease in exhaled tidal volume after intubation. Which initial check is most appropriate?

A. Inspect the circuit and cuff for a leak
B. Increase sedative dosage
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28. During evaluation of a new respiratory order, the therapist reviews these findings. Following a change in condition, a pulmonary artery occlusion pressure is markedly elevated in a patient with bilateral alveolar infiltrates. Which cause is most consistent?

A. Isolated bronchospasm

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30. During transfer-of-care communication, the therapist is asked to resolve this issue. In a step-down unit, which finding most strongly supports fluid overload rather than isolated airway obstruction?

A. Rapid weight gain with dependent edema

B. Prolonged expiratory phase

C. Diffuse expiratory wheezing

D. Reduced peak expiratory flow

31. A pulmonary-service consultation includes the following clinical information. During transport preparation, a patient's hemoglobin is 7 g/dL with SaO2 98% and PaO2 95 mm Hg. Which statement best describes oxygen transport?

A. Oxygen content must be normal in this case

B. Dissolved oxygen carries nearly all oxygen

C. Pulse oximetry directly measures hemoglobin concentration

D. Arterial oxygen content may be low despite normal saturation and PaO2

32. While evaluating treatment effectiveness, the therapist notes this result. Following a change in condition, a patient with suspected neuromuscular weakness has a rapidly declining vital capacity. What does this trend indicate?

A. Improving inspiratory muscle strength
B. Increasing risk of ventilatory failure
C. Isolated oxygen diffusion failure
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B. Tissue oxygen extraction has increased
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B. Sleep-related hypoventilation only
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35. While performing a quality and safety round, the therapist encounters this situation. During transport preparation, which chest radiograph finding is most consistent with a large pleural effusion?

A. Blunting of the costophrenic angle with a meniscus
B. Bilateral hyperinflation with flattened diaphragms

C. A visible pleural line without distal markings

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C. Acute pulmonary edema

D. Stable chronic bronchitis

58. A therapist assigned to the intensive-care service receives this clinical update. Which action best prevents contamination when draining ventilator-circuit condensate?

A. Drain it away from the patient into an appropriate receptacle

B. Pour it back into the humidifier

C. Allow it to enter the airway

D. Open the circuit above sterile supplies

59. While performing a quality and safety round, the therapist encounters this situation. A transport ventilator battery indicator shows insufficient capacity for the planned trip. What is the safest action?

A. Depart and silence the low-battery alarm

B. Obtain adequate battery capacity and backup ventilation before departure

C. Reduce monitoring to conserve power

D. Rely only on the receiving unit's equipment

60. During evaluation of a new respiratory order, the therapist reviews these findings. A capnometer reads zero although a colorimetric detector changed appropriately after intubation. What should be checked first?

A. Patient blood type
B. Pulse-oximeter wavelength
C. Cylinder hydrostatic test date
D. Sampling line connection and obstruction

61. A change in the patient's condition leads to the following bedside assessment. A ventilator fails its pre-use leak test. What should the respiratory therapist do first?

A. Place the ventilator on a patient
B. Silence all alarms permanently
C. Increase the oxygen analyzer calibration value
D. Inspect the circuit connections and test lung

62. During transfer-of-care communication, the therapist is asked to resolve this issue. An oxygen cylinder reads 500 psig and has a cylinder factor of 0.28 L/psig. At 4 L/min, approximately how long will it last without a reserve?

A. 35 minutes
B. 18 minutes
C. 70 minutes
D. 140 minutes

63. A pulmonary-service consultation includes the following clinical information. A heated humidifier is producing excessive circuit condensation. Which adjustment is most appropriate?

A. Remove all humidification
B. Place the humidifier above the patient
C. Use a heated-wire circuit and manage temperature gradients
D. Drain condensate toward the patient

64. While evaluating treatment effectiveness, the therapist notes this result. Which infection-control action is required before and after contact with a patient's respiratory equipment?

A. Wear sterile gloves for every contact
B. Perform hand hygiene
C. Replace every circuit after each treatment
D. Apply airborne isolation to all patients

65. During a respiratory-care board review, the following case is presented. A pulse oximeter displays erratic values in a patient with cold fingers and weak pulses. What is the best initial action?

A. Diagnose methemoglobinemia immediately
B. Increase ventilator tidal volume
C. Move the sensor to a better-perfused site
D. Discard the oxygen analyzer

66. A therapist assigned to the intensive-care service receives this clinical update. During bag-mask ventilation, the self-inflating bag does not refill. Which problem should be suspected first?

A. Excessive pulmonary compliance
B. A functioning oxygen reservoir
C. A normal pressure-relief valve
D. A blocked inlet or stuck intake valve

67. While performing a quality and safety round, the therapist encounters this situation. An oxygen analyzer reads 21% when exposed to room air and 80% in pure oxygen. What is the appropriate response?

A. Accept the reading as accurate
B. Remove the analyzer from service and recalibrate or replace it
C. Increase patient oxygen until it reads 100%
D. Use the analyzer only for neonatal patients

68. During evaluation of a new respiratory order, the therapist reviews these findings. Which sterilization or disinfection level is generally required for a reusable bronchoscope that contacts mucous membranes?

A. High-level disinfection after meticulous cleaning
B. Low-level surface wiping only
C. No processing if a sheath was used
D. Dry storage without leak testing

69. A change in the patient's condition leads to the following bedside assessment. A ventilator's high-pressure alarm activates and a suction catheter cannot pass through the endotracheal tube. What is most likely?

A. A large circuit leak
B. Low oxygen supply pressure
C. Endotracheal tube obstruction
D. Excessive cuff leak

70. During transfer-of-care communication, the therapist is asked to resolve this issue. A nebulizer produces little aerosol despite adequate source flow. What should be checked first?

A. The patient's hematocrit
B. The ECG electrode placement
C. The ventilator battery date only
D. The jet orifice and medication cup assembly

71. A pulmonary-service consultation includes the following clinical information. Which quality-control result requires removing a spirometer from patient testing?

A. Three acceptable patient maneuvers
B. A calibration verification outside the accepted tolerance
C. A clean disposable mouthpiece

D. An ambient temperature recorded in the log

72. While evaluating treatment effectiveness, the therapist notes this result. A noninvasive ventilation mask causes a large leak near the eyes. What is the best correction?

A. Disable the leak alarm
B. Increase pressure until the leak stops
C. Seal the mask with an occlusive dressing
D. Refit or change the interface without overtightening

73. During a respiratory-care board review, the following case is presented. Following a change in condition, which action best prevents contamination when draining ventilator-circuit condensate?

A. Drain it away from the patient into an appropriate receptacle
B. Pour it back into the humidifier
C. Allow it to enter the airway
D. Open the circuit above sterile supplies

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A. Depart and silence the low-battery alarm
B. Reduce monitoring to conserve power
C. Obtain adequate battery capacity and backup ventilation before departure
D. Rely only on the receiving unit's equipment

75. While performing a quality and safety round, the therapist encounters this situation. In a step-down unit, a capnometer reads zero although a colorimetric detector changed appropriately after intubation. What should be checked first?

A. Sampling line connection and obstruction
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A. Remove all humidification
B. Place the humidifier above the patient
C. Drain condensate toward the patient
D. Use a heated-wire circuit and manage temperature gradients

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A. Wear sterile gloves for every contact
B. Replace every circuit after each treatment
C. Perform hand hygiene
D. Apply airborne isolation to all patients

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A. Diagnose methemoglobinemia immediately
B. Move the sensor to a better-perfused site
C. Increase ventilator tidal volume
D. Discard the oxygen analyzer

81. During a respiratory-care board review, the following case is presented. A patient needs aerosolized medication through a ventilator. Which placement generally improves delivery for a metered-dose inhaler adapter?

A. Place it in the expiratory limb in this case
B. Actuate during exhalation only for this clinical situation
C. Remove the ventilator filter without assessment in this case
D. Place it in the inspiratory limb at the recommended distance from the wye

82. A therapist assigned to the intensive-care service receives this clinical update. A patient with a tracheostomy suddenly cannot be ventilated and the suction catheter will not pass. What should be done immediately?

A. Treat the tube as obstructed and restore a patent airway

B. Increase cuff pressure repeatedly in this case

C. Wait for spontaneous resolution in this case

D. Continue forcing the catheter in this case

83. While performing a quality and safety round, the therapist encounters this situation. Which teaching point is correct for a patient using an inhaled corticosteroid?

A. Use it only for immediate rescue

B. Rinse the mouth after each dose

C. Stop it whenever symptoms improve for one hour

D. Swallow residue intentionally

84. During evaluation of a new respiratory order, the therapist reviews these findings. A patient with thick secretions is prescribed nebulized hypertonic saline. What should the therapist monitor closely?

A. Only shoe size

B. Hair color changes

C. Bronchospasm and treatment tolerance

D. Elimination of every cough

85. A change in the patient's condition leads to the following bedside assessment. A ventilated patient has respiratory alkalosis from excessive mandatory ventilation. Which change may correct it?

A. Increase respiratory rate

B. Reduce minute ventilation while maintaining safe oxygenation

C. Increase tidal volume

D. Add more mandatory breaths

86. During transfer-of-care communication, the therapist is asked to resolve this issue. A patient with a speaking valve on a tracheostomy becomes distressed immediately. What should be checked first?

A. Whether the cuff is fully deflated and the upper airway is patent
B. Whether the cuff is overinflated in this case
C. Whether the expiratory port is blocked intentionally
D. Whether oxygen has been permanently discontinued in this case

87. A pulmonary-service consultation includes the following clinical information. A patient with chronic hypercapnia needs controlled oxygen therapy. What is the best approach?

A. Withhold oxygen despite severe hypoxemia
B. Give unlimited oxygen without monitoring
C. Titrate oxygen to the prescribed saturation target and reassess gases
D. Use pulse oximetry only and ignore ventilation

88. While evaluating treatment effectiveness, the therapist notes this result. A patient with bronchiectasis has daily copious sputum. Which plan best supports secretion clearance?

A. Suppress every cough
B. Avoid all physical activity
C. Use oxygen as the only secretion therapy
D. Individualized airway-clearance therapy with hydration and reassessment

89. During a respiratory-care board review, the following case is presented. A stable patient with COPD exacerbation has pH 7.28 and PaCO2 72 mm Hg while breathing spontaneously. Which support is most appropriate initially?

A. Immediate chest tube insertion
B. Incentive spirometry alone
C. No ventilatory support
D. Noninvasive positive-pressure ventilation

90. A therapist assigned to the intensive-care service receives this clinical update. A ventilated patient has a plateau pressure of 34 cm H2O with adequate oxygenation. Which change best reduces ventilator-induced lung injury risk?

A. Increase tidal volume
B. Reduce tidal volume and reassess driving pressure
C. Eliminate all PEEP immediately
D. Increase respiratory rate without reassessment

91. While performing a quality and safety round, the therapist encounters this situation. A patient with severe asthma develops rising peak pressure while plateau pressure remains unchanged. What should be addressed?

A. Increased airway resistance
B. Reduced chest-wall compliance
C. Alveolar overdistention only
D. Pleural fluid accumulation

92. During evaluation of a new respiratory order, the therapist reviews these findings. A ventilated patient has auto-PEEP from incomplete exhalation. Which adjustment is most appropriate?

A. Increase respiratory rate
B. Increase tidal volume
C. Increase expiratory time
D. Shorten expiratory time

93. A change in the patient's condition leads to the following bedside assessment. A patient on volume ventilation has a sudden high-pressure alarm and coarse rhonchi. What should be done first?

A. Increase the high-pressure limit
B. Disable the alarm in this case
C. Assess the airway and suction if secretions are present

D. Immediately reduce oxygen concentration

94. During transfer-of-care communication, the therapist is asked to resolve this issue. A patient receiving 40% oxygen by air-entrainment mask has a rising respiratory rate and entrains room air around the mask. What should be done?

A. Occlude the entrainment ports
B. Increase total device flow while maintaining the ordered concentration
C. Switch to an unregulated cylinder
D. Lower total flow further

95. A pulmonary-service consultation includes the following clinical information. A patient with cardiogenic pulmonary edema is awake, cooperative, and severely dyspneic. Which respiratory support can rapidly improve oxygenation and reduce work?

A. Postural drainage alone
B. Room air observation
C. Routine bronchoscopy
D. Continuous positive airway pressure

96. While evaluating treatment effectiveness, the therapist notes this result. After bronchodilator therapy, a patient's peak expiratory flow increases from 200 to 260 L/min. What is the percentage increase?

A. 30%
B. 13%
C. 23%
D. 60%

97. During a respiratory-care board review, the following case is presented. A patient remains hypoxemic on mechanical ventilation despite moderate FiO2. Which intervention recruits collapsed alveoli most directly?

A. Apply or titrate PEEP
B. Reduce mean airway pressure
C. Remove all baseline pressure
D. Increase apparatus dead space

98. A therapist assigned to the intensive-care service receives this clinical update. A patient develops stridor immediately after extubation. What is the priority response?

A. Begin routine postural drainage
B. Delay assessment for one hour
C. Assess airway severity and provide rapid upper-airway treatment
D. Perform a forced vital capacity maneuver

99. While performing a quality and safety round, the therapist encounters this situation. A ventilated patient has pH 7.20 and PaCO2 70 mm Hg. Which change generally increases carbon dioxide elimination?

A. Increase apparatus dead space
B. Increase effective minute ventilation
C. Reduce respiratory rate
D. Reduce delivered tidal volume

100. During evaluation of a new respiratory order, the therapist reviews these findings. During suctioning, a patient develops bradycardia and severe desaturation. What should the therapist do immediately?

A. Continue until all secretions are removed
B. Increase suction time
C. Instill routine saline and continue
D. Stop suctioning and oxygenate the patient

101. A change in the patient's condition leads to the following bedside assessment. Which intervention is most appropriate for a patient with retained secretions and an ineffective cough from neuromuscular weakness?

A. Mechanical insufflation-exsufflation
B. Fluid restriction alone
C. Lowering inspired oxygen
D. Continuous breath holding

102. During transfer-of-care communication, the therapist is asked to resolve this issue. A patient receiving inhaled bronchodilator develops tremor and marked tachycardia. What is the best action?

A. Double the remaining dose in this case
B. Ignore the findings in this case
C. Add another sympathomimetic immediately in this case
D. Stop treatment, assess the patient, and notify the responsible clinician

103. A pulmonary-service consultation includes the following clinical information. A patient meets spontaneous breathing trial criteria and tolerates the trial without distress. What should occur next?

A. Automatically increase sedation
B. Evaluate airway protection and readiness for extubation
C. Resume full support indefinitely
D. Insert a second endotracheal tube

104. While evaluating treatment effectiveness, the therapist notes this result. A neonate with respiratory distress syndrome requires surfactant. How is it typically delivered?

A. By subcutaneous injection
B. Through a nasal cannula as dry gas
C. Through the endotracheal tube into the lungs
D. By oral tablet

105. During a respiratory-care board review, the following case is presented. During adult CPR with an advanced airway in place, how should ventilation generally be delivered?

A. Give regular breaths without pausing continuous compressions
B. Pause compressions for every breath
C. Deliver rapid breaths continuously
D. Stop ventilation entirely

106. A therapist assigned to the intensive-care service receives this clinical update. A patient using a dry-powder inhaler cannot generate adequate inspiratory flow. Which alternative is most appropriate?

A. Continue the same device regardless in this case
B. Use a device that does not depend on strong inspiratory flow
C. Exhale into the powder chamber in this case
D. Moisten the powder before use in this case

107. While performing a quality and safety round, the therapist encounters this situation. A mechanically ventilated patient is triggering double breaths because inspiratory flow is insufficient. Which adjustment should be considered?

A. Decrease flow further
B. Add unnecessary dead space
C. Disable patient triggering
D. Increase inspiratory flow or otherwise meet patient demand

108. During evaluation of a new respiratory order, the therapist reviews these findings. A tracheostomy patient has thick secretions and inadequate humidification. Which intervention is most appropriate?

A. Remove all humidity
B. Use cold dry gas

C. Provide effective heated humidification and hydration assessment

D. Increase cuff pressure as treatment

109. A change in the patient's condition leads to the following bedside assessment. A patient with unilateral lung disease is severely hypoxemic. Which position may improve oxygenation when tolerated?

A. Place the diseased lung dependent

B. Keep the patient prone only because of the diagnosis

C. Place the healthier lung in the dependent position

D. Use Trendelenburg regardless of aspiration risk

110. During transfer-of-care communication, the therapist is asked to resolve this issue. A patient requires precise low-concentration oxygen despite a variable breathing pattern. Which device is preferred?

A. Standard nasal cannula only

B. Air-entrainment mask

C. Simple mask at very low flow

D. Unregulated blow-by tubing

111. A pulmonary-service consultation includes the following clinical information. A ventilated patient has acceptable PaCO2 but persistent refractory hypoxemia. Which adjustment primarily targets oxygenation?

A. Increase PEEP while monitoring hemodynamics

B. Add apparatus dead space

C. Reduce inspired oxygen to room air

D. Lower mean airway pressure

112. While evaluating treatment effectiveness, the therapist notes this result. A patient has excessive cuff pressure in an endotracheal tube. What complication is most concerning?

A. Improved mucosal perfusion
B. Increased vocal-cord movement
C. Elimination of all aspiration risk
D. Tracheal mucosal ischemia

113. During a respiratory-care board review, the following case is presented. A patient with acute asthma is unable to coordinate a metered-dose inhaler. What delivery method is appropriate?

A. Spray medication into the room
B. Ask for a breath hold before actuation
C. Use a valved holding chamber or nebulizer
D. Mix the drug into drinking water

114. A therapist assigned to the intensive-care service receives this clinical update. A patient on high-flow nasal cannula remains distressed because the device flow is below inspiratory demand. What change is appropriate?

A. Increase flow within device and patient limits
B. Reduce flow to zero
C. Occlude both nares completely
D. Remove heated humidification

115. While performing a quality and safety round, the therapist encounters this situation. A patient with ARDS is receiving a tidal volume of 8 mL/kg predicted body weight. Which modification is most consistent with lung-protective ventilation?

A. Base tidal volume on actual fluid-overloaded weight
B. Reduce tidal volume toward 6 mL/kg predicted body weight
C. Increase tidal volume to 12 mL/kg
D. Remove all pressure monitoring

116. During evaluation of a new respiratory order, the therapist reviews these findings. A patient receiving heliox requires a device that is not calibrated for the gas mixture. What must the therapist consider?

A. Heliox always reads identically to oxygen

B. No monitoring is needed

C. The mixture can be connected to any device without review

D. Flow readings may require a device-specific correction factor

117. A change in the patient's condition leads to the following bedside assessment. A patient develops hypotension after a large increase in PEEP. Which mechanism is most likely?

A. Increased preload from lower thoracic pressure

B. Improved venous return in every patient

C. Immediate expansion of circulating blood volume

D. Reduced venous return from increased intrathoracic pressure

118. During transfer-of-care communication, the therapist is asked to resolve this issue. In a step-down unit, a patient needs aerosolized medication through a ventilator. Which placement generally improves delivery for a metered-dose inhaler adapter?

A. Place it in the expiratory limb in this case

B. Place it in the inspiratory limb at the recommended distance from the wye

C. Actuate during exhalation only for this clinical situation

D. Remove the ventilator filter without assessment in this case

119. A pulmonary-service consultation includes the following clinical information. During transport preparation, a patient with a tracheostomy suddenly cannot be ventilated and the suction catheter will not pass. What should be done immediately?

A. Treat the tube as obstructed and restore a patent airway

B. Increase cuff pressure repeatedly in this case

C. Wait for spontaneous resolution in this case

D. Continue forcing the catheter in this case

120. While evaluating treatment effectiveness, the therapist notes this result. Following a change in condition, which teaching point is correct for a patient using an inhaled corticosteroid?

A. Use it only for immediate rescue

B. Stop it whenever symptoms improve for one hour

C. Rinse the mouth after each dose

D. Swallow residue intentionally

121. During a respiratory-care board review, the following case is presented. During an evening reassessment, a patient with thick secretions is prescribed nebulized hypertonic saline. What should the therapist monitor closely?

A. Only shoe size

B. Hair color changes

C. Bronchospasm and treatment tolerance

D. Elimination of every cough

122. A therapist assigned to the intensive-care service receives this clinical update. In a step-down unit, a ventilated patient has respiratory alkalosis from excessive mandatory ventilation. Which change may correct it?

A. Increase respiratory rate

B. Reduce minute ventilation while maintaining safe oxygenation

C. Increase tidal volume

D. Add more mandatory breaths

123. While performing a quality and safety round, the therapist encounters this situation. During transport preparation, a patient with a speaking valve on a tracheostomy becomes distressed immediately. What should be checked first?

A. Whether the cuff is fully deflated and the upper airway is patent

B. Whether the cuff is overinflated in this case

C. Whether the expiratory port is blocked intentionally

D. Whether oxygen has been permanently discontinued in this case

124. During evaluation of a new respiratory order, the therapist reviews these findings. Following a change in condition, a patient with chronic hypercapnia needs controlled oxygen therapy. What is the best approach?

A. Withhold oxygen despite severe hypoxemia

B. Give unlimited oxygen without monitoring

C. Use pulse oximetry only and ignore ventilation

D. Titrate oxygen to the prescribed saturation target and reassess gases

125. A change in the patient's condition leads to the following bedside assessment. During an evening reassessment, a patient with bronchiectasis has daily copious sputum. Which plan best supports secretion clearance?

A. Suppress every cough

B. Avoid all physical activity

C. Individualized airway-clearance therapy with hydration and reassessment

D. Use oxygen as the only secretion therapy

126. During transfer-of-care communication, the therapist is asked to resolve this issue. In a step-down unit, a stable patient with COPD exacerbation has pH 7.28 and $PaCO_2$ 72 mm Hg while breathing spontaneously. Which support is most appropriate initially?

A. Immediate chest tube insertion

B. Incentive spirometry alone

C. No ventilatory support

D. Noninvasive positive-pressure ventilation

127. A pulmonary-service consultation includes the following clinical information. During transport preparation, a ventilated patient has a plateau pressure of 34 cm H2O with adequate oxygenation. Which change best reduces ventilator-induced lung injury risk?

A. Increase tidal volume
B. Reduce tidal volume and reassess driving pressure
C. Eliminate all PEEP immediately
D. Increase respiratory rate without reassessment

128. While evaluating treatment effectiveness, the therapist notes this result. Following a change in condition, a patient with severe asthma develops rising peak pressure while plateau pressure remains unchanged. What should be addressed?

A. Increased airway resistance
B. Reduced chest-wall compliance
C. Alveolar overdistention only
D. Pleural fluid accumulation

129. During a respiratory-care board review, the following case is presented. During an evening reassessment, a ventilated patient has auto-PEEP from incomplete exhalation. Which adjustment is most appropriate?

A. Increase respiratory rate
B. Increase tidal volume
C. Shorten expiratory time
D. Increase expiratory time

130. A therapist assigned to the intensive-care service receives this clinical update. In a step-down unit, a patient on volume ventilation has a sudden high-pressure alarm and coarse rhonchi. What should be done first?

A. Increase the high-pressure limit

B. Assess the airway and suction if secretions are present

C. Disable the alarm in this case

D. Immediately reduce oxygen concentration

131. While performing a quality and safety round, the therapist encounters this situation. During transport preparation, a patient receiving 40% oxygen by air-entrainment mask has a rising respiratory rate and entrains room air around the mask. What should be done?

A. Increase total device flow while maintaining the ordered concentration

B. Occlude the entrainment ports

C. Switch to an unregulated cylinder

D. Lower total flow further

132. During evaluation of a new respiratory order, the therapist reviews these findings. Following a change in condition, a patient with cardiogenic pulmonary edema is awake, cooperative, and severely dyspneic. Which respiratory support can rapidly improve oxygenation and reduce work?

A. Postural drainage alone

B. Room air observation

C. Continuous positive airway pressure

D. Routine bronchoscopy

133. A change in the patient's condition leads to the following bedside assessment. During an evening reassessment, after bronchodilator therapy, a patient's peak expiratory flow increases from 200 to 260 L/min. What is the percentage increase?

A. 13%

B. 23%

C. 60%

D. 30%

134. During transfer-of-care communication, the therapist is asked to resolve this issue. In a step-down unit, a patient remains hypoxemic on mechanical ventilation despite moderate FiO2. Which intervention recruits collapsed alveoli most directly?

A. Apply or titrate PEEP
B. Reduce mean airway pressure
C. Remove all baseline pressure
D. Increase apparatus dead space

135. A pulmonary-service consultation includes the following clinical information. During transport preparation, a patient develops stridor immediately after extubation. What is the priority response?

A. Begin routine postural drainage
B. Delay assessment for one hour
C. Assess airway severity and provide rapid upper-airway treatment
D. Perform a forced vital capacity maneuver

136. While evaluating treatment effectiveness, the therapist notes this result. Following a change in condition, a ventilated patient has pH 7.20 and PaCO2 70 mm Hg. Which change generally increases carbon dioxide elimination?

A. Increase apparatus dead space
B. Increase effective minute ventilation
C. Reduce respiratory rate
D. Reduce delivered tidal volume

137. During a respiratory-care board review, the following case is presented. During an evening reassessment, during suctioning, a patient develops bradycardia and severe desaturation. What should the therapist do immediately?

A. Continue until all secretions are removed
B. Increase suction time

C. Stop suctioning and oxygenate the patient

D. Instill routine saline and continue

138. A therapist assigned to the intensive-care service receives this clinical update. In a step-down unit, which intervention is most appropriate for a patient with retained secretions and an ineffective cough from neuromuscular weakness?

A. Fluid restriction alone

B. Mechanical insufflation-exsufflation

C. Lowering inspired oxygen

D. Continuous breath holding

139. While performing a quality and safety round, the therapist encounters this situation. During transport preparation, a patient receiving inhaled bronchodilator develops tremor and marked tachycardia. What is the best action?

A. Double the remaining dose in this case

B. Ignore the findings in this case

C. Add another sympathomimetic immediately in this case

D. Stop treatment, assess the patient, and notify the responsible clinician

140. During evaluation of a new respiratory order, the therapist reviews these findings. Following a change in condition, a patient meets spontaneous breathing trial criteria and tolerates the trial without distress. What should occur next?

A. Evaluate airway protection and readiness for extubation

B. Automatically increase sedation

C. Resume full support indefinitely

D. Insert a second endotracheal tube

141. A change in the patient's condition leads to the following bedside assessment. During an evening reassessment, a neonate with respiratory distress syndrome requires surfactant. How is it typically delivered?

A. By subcutaneous injection
B. Through a nasal cannula as dry gas
C. By oral tablet
D. Through the endotracheal tube into the lungs

142. During transfer-of-care communication, the therapist is asked to resolve this issue. In a step-down unit, during adult CPR with an advanced airway in place, how should ventilation generally be delivered?

A. Pause compressions for every breath
B. Give regular breaths without pausing continuous compressions
C. Deliver rapid breaths continuously
D. Stop ventilation entirely

143. A pulmonary-service consultation includes the following clinical information. During transport preparation, a patient using a dry-powder inhaler cannot generate adequate inspiratory flow. Which alternative is most appropriate?

A. Use a device that does not depend on strong inspiratory flow
B. Continue the same device regardless in this case
C. Exhale into the powder chamber in this case
D. Moisten the powder before use in this case

144. While evaluating treatment effectiveness, the therapist notes this result. Following a change in condition, a mechanically ventilated patient is triggering double breaths because inspiratory flow is insufficient. Which adjustment should be considered?

A. Decrease flow further
B. Add unnecessary dead space

C. Increase inspiratory flow or otherwise meet patient demand

D. Disable patient triggering

145. During a respiratory-care board review, the following case is presented. During an evening reassessment, a tracheostomy patient has thick secretions and inadequate humidification. Which intervention is most appropriate?

A. Remove all humidity

B. Use cold dry gas

C. Provide effective heated humidification and hydration assessment

D. Increase cuff pressure as treatment

146. A therapist assigned to the intensive-care service receives this clinical update. In a step-down unit, a patient with unilateral lung disease is severely hypoxemic. Which position may improve oxygenation when tolerated?

A. Place the healthier lung in the dependent position

B. Place the diseased lung dependent

C. Keep the patient prone only because of the diagnosis

D. Use Trendelenburg regardless of aspiration risk

147. While performing a quality and safety round, the therapist encounters this situation. During transport preparation, a patient requires precise low-concentration oxygen despite a variable breathing pattern. Which device is preferred?

A. Standard nasal cannula only

B. Simple mask at very low flow

C. Unregulated blow-by tubing

D. Air-entrainment mask

148. During evaluation of a new respiratory order, the therapist reviews these findings. Following a change in condition, a ventilated patient has acceptable PaCO2 but persistent refractory hypoxemia. Which adjustment primarily targets oxygenation?

A. Add apparatus dead space
B. Increase PEEP while monitoring hemodynamics
C. Reduce inspired oxygen to room air
D. Lower mean airway pressure

149. A change in the patient's condition leads to the following bedside assessment. During an evening reassessment, a patient has excessive cuff pressure in an endotracheal tube. What complication is most concerning?

A. Improved mucosal perfusion
B. Increased vocal-cord movement
C. Tracheal mucosal ischemia
D. Elimination of all aspiration risk

150. During transfer-of-care communication, the therapist is asked to resolve this issue. In a step-down unit, a patient with acute asthma is unable to coordinate a metered-dose inhaler. What delivery method is appropriate?

A. Spray medication into the room
B. Use a valved holding chamber or nebulizer
C. Ask for a breath hold before actuation
D. Mix the drug into drinking water

151. A pulmonary-service consultation includes the following clinical information. During transport preparation, a patient on high-flow nasal cannula remains distressed because the device flow is below inspiratory demand. What change is appropriate?

A. Reduce flow to zero

B. Occlude both nares completely

C. Remove heated humidification

D. Increase flow within device and patient limits

152. While evaluating treatment effectiveness, the therapist notes this result. Following a change in condition, a patient with ARDS is receiving a tidal volume of 8 mL/kg predicted body weight. Which modification is most consistent with lung-protective ventilation?

A. Reduce tidal volume toward 6 mL/kg predicted body weight

B. Base tidal volume on actual fluid-overloaded weight

C. Increase tidal volume to 12 mL/kg

D. Remove all pressure monitoring

153. During a respiratory-care board review, the following case is presented. During an evening reassessment, a patient receiving heliox requires a device that is not calibrated for the gas mixture. What must the therapist consider?

A. Flow readings may require a device-specific correction factor

B. Heliox always reads identically to oxygen

C. No monitoring is needed

D. The mixture can be connected to any device without review

154. A therapist assigned to the intensive-care service receives this clinical update. In a step-down unit, a patient develops hypotension after a large increase in PEEP. Which mechanism is most likely?

A. Increased preload from lower thoracic pressure

B. Reduced venous return from increased intrathoracic pressure

C. Improved venous return in every patient

D. Immediate expansion of circulating blood volume

155. While performing a quality and safety round, the therapist encounters this situation. During transport preparation, a patient needs aerosolized medication through a ventilator. Which placement generally improves delivery for a metered-dose inhaler adapter?

A. Place it in the expiratory limb in this case
B. Actuate during exhalation only for this clinical situation
C. Remove the ventilator filter without assessment in this case
D. Place it in the inspiratory limb at the recommended distance from the wye

156. During evaluation of a new respiratory order, the therapist reviews these findings. Following a change in condition, a patient with a tracheostomy suddenly cannot be ventilated and the suction catheter will not pass. What should be done immediately?

A. Increase cuff pressure repeatedly in this case
B. Wait for spontaneous resolution in this case
C. Treat the tube as obstructed and restore a patent airway
D. Continue forcing the catheter in this case

157. A change in the patient's condition leads to the following bedside assessment. During an evening reassessment, which teaching point is correct for a patient using an inhaled corticosteroid?

A. Use it only for immediate rescue
B. Stop it whenever symptoms improve for one hour
C. Swallow residue intentionally
D. Rinse the mouth after each dose

158. During transfer-of-care communication, the therapist is asked to resolve this issue. In a step-down unit, a patient with thick secretions is prescribed nebulized hypertonic saline. What should the therapist monitor closely?

A. Only shoe size
B. Bronchospasm and treatment tolerance

C. Hair color changes

D. Elimination of every cough

159. A pulmonary-service consultation includes the following clinical information. During transport preparation, a ventilated patient has respiratory alkalosis from excessive mandatory ventilation. Which change may correct it?

A. Increase respiratory rate

B. Increase tidal volume

C. Reduce minute ventilation while maintaining safe oxygenation

D. Add more mandatory breaths

160. While evaluating treatment effectiveness, the therapist notes this result. Following a change in condition, a patient with a speaking valve on a tracheostomy becomes distressed immediately. What should be checked first?

A. Whether the cuff is fully deflated and the upper airway is patent

B. Whether the cuff is overinflated in this case

C. Whether the expiratory port is blocked intentionally

D. Whether oxygen has been permanently discontinued in this case

Practice Exam 5: Answer Key and Explanations

1. C — Standard pulse oximetry cannot reliably distinguish oxyhemoglobin from carboxyhemoglobin and may display a falsely reassuring saturation after smoke exposure. Co-oximetry directly measures dyshemoglobin species and confirms carbon monoxide poisoning. The other tests assess acid-base status, airflow, or ventilation distribution rather than abnormal hemoglobin binding. Promptly reassess the patient's clinical response.

2. B — Shallow postoperative ventilation promotes closure of dependent alveoli, producing fine crackles and linear or plate-like basilar opacities. Atelectasis is common after anesthesia, pain, and immobility. A massive embolus may have a normal radiograph, tension pneumothorax causes unilateral hyperlucency, and fibrosis is not an abrupt postoperative change. Reassess the patient promptly.

3. A — The P/F ratio is calculated by dividing arterial oxygen tension by the inspired oxygen fraction expressed as a decimal. Dividing 54 by 0.60 gives 90. This severe reduction signals major oxygenation impairment. The distractors result from using the percentage directly, adding values, or multiplying instead of dividing. Reassess the patient.

4. D — A capnogram baseline above zero means inspired gas still contains carbon dioxide, indicating rebreathing from inadequate fresh gas flow, an exhausted absorber, or a faulty valve. Complete obstruction and esophageal intubation usually eliminate the waveform. Pulmonary embolism lowers exhaled carbon dioxide but does not elevate the inspiratory baseline. Reassess promptly.

5. B — This presentation suggests a critically narrowed upper airway. Agitation or direct pharyngeal examination can precipitate complete obstruction, so the child should remain calm while an expert team prepares controlled airway management. Spirometry and percussion add risk without useful immediate information, and supine positioning may worsen airway patency. Reassess the patient.

6. D — Methemoglobin cannot carry oxygen normally and gives blood a chocolate-brown appearance; pulse oximetry often remains near the mid-eighties despite oxygen. PaO2 measures dissolved oxygen and can remain normal. Hypoventilation lowers PaO2, anemia does not typically cause brown blood, and respiratory alkalosis does not produce persistent cyanosis. Reassess the patient promptly.

7. A — A sudden low exhaled volume with preserved bilateral breath sounds most often indicates lost volume through a circuit disconnection, cuff leak, or sampling problem. The airway and circuit should be inspected before changing therapy. Sedation, imaging, and percussion do not address the immediate mechanical cause and may delay correction. Reassess.

8. C — An elevated pulmonary artery occlusion pressure reflects increased left atrial filling pressure and supports hydrostatic, cardiogenic pulmonary edema. Noncardiogenic edema generally occurs with a normal filling pressure. Bronchospasm, uncomplicated pneumonia, and pulmonary embolism may impair gas exchange but do not characteristically produce a markedly elevated occlusion pressure. Reassess the patient.

9. C — Each APGAR component receives one point: heart rate below 100, weak irregular respirations, some extremity flexion, grimace with stimulation, and acrocyanosis. Adding the five component scores gives 5. Higher scores would require stronger respirations, active motion, or completely pink color, while a lower score would undercount present responses. Reassess promptly.

10. D — Rapid weight gain and dependent edema reflect retained extracellular fluid and support systemic volume overload. Prolonged expiration, wheezing, and reduced peak flow are characteristic of airflow obstruction and do not establish excess fluid. Integrating weight trends with examination findings helps distinguish a circulatory problem from a primarily obstructive pulmonary process.

11. B — Most oxygen is carried bound to hemoglobin, so severe anemia can markedly reduce arterial oxygen content even when saturation and dissolved oxygen tension are normal. PaO2 reflects dissolved oxygen, not total carrying capacity. Pulse oximetry estimates saturation but does not measure hemoglobin concentration or guarantee adequate systemic oxygen delivery. Reassess.

12. A — Vital capacity depends on inspiratory and expiratory muscle performance. A rapid decline in a patient with neuromuscular disease signals diminishing ventilatory reserve and possible need for airway support. Diffusion failure primarily affects oxygenation, while improving strength would raise capacity. The trend is more important than a single isolated measurement. Reassess.

13. A — With stable arterial saturation, a fall in mixed venous saturation indicates tissues are extracting a greater proportion of delivered oxygen, often because delivery decreased or metabolic demand increased. It does not prove improved arterial content or elimination of shunt. Complete cessation of oxygen consumption would raise, not lower, venous saturation.

14. D — Continued respiratory effort during absent airflow identifies obstruction of the upper airway. Central apnea lacks both airflow and respiratory effort. Hypoventilation is sustained inadequate ventilation rather than discrete obstructive events, and repeated apneas are not normal pauses. Simultaneous airflow and effort channels are essential for correct sleep-event classification. Reassess promptly.

15. C — Pleural fluid accumulates dependently, first blunting the costophrenic angle and then forming a curved meniscus as volume increases. Hyperinflation suggests air trapping, a pleural line without peripheral markings suggests pneumothorax, and diffuse reticular opacities suggest interstitial disease rather than free pleural fluid. The patient's clinical response requires prompt bedside reassessment.

16. B — An overdamped monitoring system blunts rapid pressure changes, narrowing pulse pressure by underestimating systolic and overestimating diastolic pressure. Mean arterial pressure may remain comparatively reliable. An underdamped system exaggerates systolic pressure and lowers diastolic pressure. Zero pressure suggests disconnection or loss of signal, not simple overdamping. Reassess the patient promptly.

17. B — Pink frothy secretions, diffuse crackles, and orthopnea are classic manifestations of fluid flooding the alveoli during acute pulmonary edema. Upper-airway obstruction produces stridor, a pleural effusion causes localized decreased breath sounds, and stable chronic bronchitis does not usually cause abrupt frothy sputum with severe positional dyspnea. Reassess the patient promptly.

18. C — The low pH establishes acidemia, while the markedly elevated carbon dioxide identifies a primary respiratory cause. The bicarbonate is mildly increased, showing renal buffering, but the pH remains abnormal, so compensation is incomplete. Metabolic acidosis would lower bicarbonate, and respiratory alkalosis would lower carbon dioxide. Promptly reassess the patient's response.

19. A — A reduced FEV1-to-FVC ratio indicates expiratory airflow obstruction, which is typical of asthma or COPD. Restriction usually preserves or raises the ratio and requires reduced lung volumes for confirmation. Diffusing-capacity abnormalities cannot be diagnosed from spirometry alone, and these values are not within normal limits. Promptly reassess the patient's response.

20. D — Unilateral absent breath sounds, contralateral tracheal deviation, and hemodynamic compromise strongly indicate a tension pneumothorax on the silent side. Rising intrathoracic pressure impairs venous return and causes hypotension. Atelectasis pulls structures toward the affected side,

while edema and bronchospasm generally produce bilateral findings. The patient's clinical response requires prompt reassessment.

21. B — Standard pulse oximetry cannot reliably distinguish oxyhemoglobin from carboxyhemoglobin and may display a falsely reassuring saturation after smoke exposure. Co-oximetry directly measures dyshemoglobin species and confirms carbon monoxide poisoning. The other tests assess acid-base status, airflow, or ventilation distribution rather than abnormal hemoglobin binding. Promptly reassess the patient's clinical response.

22. C — Shallow postoperative ventilation promotes closure of dependent alveoli, producing fine crackles and linear or plate-like basilar opacities. Atelectasis is common after anesthesia, pain, and immobility. A massive embolus may have a normal radiograph, tension pneumothorax causes unilateral hyperlucency, and fibrosis is not an abrupt postoperative change. Reassess the patient promptly.

23. A — The P/F ratio is calculated by dividing arterial oxygen tension by the inspired oxygen fraction expressed as a decimal. Dividing 54 by 0.60 gives 90. This severe reduction signals major oxygenation impairment. The distractors result from using the percentage directly, adding values, or multiplying instead of dividing. Reassess the patient.

24. B — A capnogram baseline above zero means inspired gas still contains carbon dioxide, indicating rebreathing from inadequate fresh gas flow, an exhausted absorber, or a faulty valve. Complete obstruction and esophageal intubation usually eliminate the waveform. Pulmonary embolism lowers exhaled carbon dioxide but does not elevate the inspiratory baseline. Reassess promptly.

25. D — This presentation suggests a critically narrowed upper airway. Agitation or direct pharyngeal examination can precipitate complete obstruction, so the child should remain calm while an expert team prepares controlled airway management. Spirometry and percussion add risk without useful immediate information, and supine positioning may worsen airway patency. Reassess the patient.

26. C — Methemoglobin cannot carry oxygen normally and gives blood a chocolate-brown appearance; pulse oximetry often remains near the mid-eighties despite oxygen. PaO_2 measures dissolved oxygen and can remain normal. Hypoventilation lowers PaO_2, anemia does not typically cause brown blood, and respiratory alkalosis does not produce persistent cyanosis. Reassess the patient promptly.

27. A — A sudden low exhaled volume with preserved bilateral breath sounds most often indicates lost volume through a circuit disconnection, cuff leak, or sampling problem. The airway and circuit should be inspected before changing therapy. Sedation, imaging, and percussion do not address the immediate mechanical cause and may delay correction. Reassess.

28. D — An elevated pulmonary artery occlusion pressure reflects increased left atrial filling pressure and supports hydrostatic, cardiogenic pulmonary edema. Noncardiogenic edema generally occurs with a normal filling pressure. Bronchospasm, uncomplicated pneumonia, and pulmonary embolism may impair gas exchange but do not characteristically produce a markedly elevated occlusion pressure. Reassess the patient.

29. C — Each APGAR component receives one point: heart rate below 100, weak irregular respirations, some extremity flexion, grimace with stimulation, and acrocyanosis. Adding the five component scores gives 5. Higher scores would require stronger respirations, active motion, or completely pink color, while a lower score would undercount present responses. Reassess promptly.

30. A — Rapid weight gain and dependent edema reflect retained extracellular fluid and support systemic volume overload. Prolonged expiration, wheezing, and reduced peak flow are characteristic of airflow obstruction and do not establish excess fluid. Integrating weight trends with examination findings helps distinguish a circulatory problem from a primarily obstructive pulmonary process.

31. D — Most oxygen is carried bound to hemoglobin, so severe anemia can markedly reduce arterial oxygen content even when saturation and dissolved oxygen tension are normal. PaO2 reflects dissolved oxygen, not total carrying capacity. Pulse oximetry estimates saturation but does not measure hemoglobin concentration or guarantee adequate systemic oxygen delivery. Reassess.

32. B — Vital capacity depends on inspiratory and expiratory muscle performance. A rapid decline in a patient with neuromuscular disease signals diminishing ventilatory reserve and possible need for airway support. Diffusion failure primarily affects oxygenation, while improving strength would raise capacity. The trend is more important than a single isolated measurement. Reassess.

33. B — With stable arterial saturation, a fall in mixed venous saturation indicates tissues are extracting a greater proportion of delivered oxygen, often because delivery decreased or metabolic demand increased. It does not prove improved arterial content or elimination of shunt. Complete cessation of oxygen consumption would raise, not lower, venous saturation.

34. D — Continued respiratory effort during absent airflow identifies obstruction of the upper airway. Central apnea lacks both airflow and respiratory effort. Hypoventilation is sustained inadequate ventilation rather than discrete obstructive events, and repeated apneas are not normal pauses. Simultaneous airflow and effort channels are essential for correct sleep-event classification. Reassess promptly.

35. A — Pleural fluid accumulates dependently, first blunting the costophrenic angle and then forming a curved meniscus as volume increases. Hyperinflation suggests air trapping, a pleural line without peripheral markings suggests pneumothorax, and diffuse reticular opacities suggest interstitial disease rather than free pleural fluid. The patient's clinical response requires prompt bedside reassessment.

36. C — An overdamped monitoring system blunts rapid pressure changes, narrowing pulse pressure by underestimating systolic and overestimating diastolic pressure. Mean arterial pressure may remain comparatively reliable. An underdamped system exaggerates systolic pressure and lowers diastolic pressure. Zero pressure suggests disconnection or loss of signal, not simple overdamping. Reassess the patient promptly.

37. D — Pink frothy secretions, diffuse crackles, and orthopnea are classic manifestations of fluid flooding the alveoli during acute pulmonary edema. Upper-airway obstruction produces stridor, a pleural

effusion causes localized decreased breath sounds, and stable chronic bronchitis does not usually cause abrupt frothy sputum with severe positional dyspnea. Reassess the patient promptly.

38. B — The low pH establishes acidemia, while the markedly elevated carbon dioxide identifies a primary respiratory cause. The bicarbonate is mildly increased, showing renal buffering, but the pH remains abnormal, so compensation is incomplete. Metabolic acidosis would lower bicarbonate, and respiratory alkalosis would lower carbon dioxide. Promptly reassess the patient's response.

39. A — A reduced FEV1-to-FVC ratio indicates expiratory airflow obstruction, which is typical of asthma or COPD. Restriction usually preserves or raises the ratio and requires reduced lung volumes for confirmation. Diffusing-capacity abnormalities cannot be diagnosed from spirometry alone, and these values are not within normal limits. Promptly reassess the patient's response.

40. C — Unilateral absent breath sounds, contralateral tracheal deviation, and hemodynamic compromise strongly indicate a tension pneumothorax on the silent side. Rising intrathoracic pressure impairs venous return and causes hypotension. Atelectasis pulls structures toward the affected side, while edema and bronchospasm generally produce bilateral findings. The patient's clinical response requires prompt reassessment.

41. B — Standard pulse oximetry cannot reliably distinguish oxyhemoglobin from carboxyhemoglobin and may display a falsely reassuring saturation after smoke exposure. Co-oximetry directly measures dyshemoglobin species and confirms carbon monoxide poisoning. The other tests assess acid-base status, airflow, or ventilation distribution rather than abnormal hemoglobin binding. Promptly reassess the patient's clinical response.

42. A — Shallow postoperative ventilation promotes closure of dependent alveoli, producing fine crackles and linear or plate-like basilar opacities. Atelectasis is common after anesthesia, pain, and immobility. A massive embolus may have a normal radiograph, tension pneumothorax causes unilateral hyperlucency, and fibrosis is not an abrupt postoperative change. Reassess the patient promptly.

43. D — The P/F ratio is calculated by dividing arterial oxygen tension by the inspired oxygen fraction expressed as a decimal. Dividing 54 by 0.60 gives 90. This severe reduction signals major oxygenation impairment. The distractors result from using the percentage directly, adding values, or multiplying instead of dividing. Reassess the patient.

44. C — A capnogram baseline above zero means inspired gas still contains carbon dioxide, indicating rebreathing from inadequate fresh gas flow, an exhausted absorber, or a faulty valve. Complete obstruction and esophageal intubation usually eliminate the waveform. Pulmonary embolism lowers exhaled carbon dioxide but does not elevate the inspiratory baseline. Reassess promptly.

45. D — This presentation suggests a critically narrowed upper airway. Agitation or direct pharyngeal examination can precipitate complete obstruction, so the child should remain calm while an expert team prepares controlled airway management. Spirometry and percussion add risk without useful immediate information, and supine positioning may worsen airway patency. Reassess the patient.

46. C — Methemoglobin cannot carry oxygen normally and gives blood a chocolate-brown appearance; pulse oximetry often remains near the mid-eighties despite oxygen. PaO2 measures dissolved oxygen and can remain normal. Hypoventilation lowers PaO2, anemia does not typically cause brown blood, and respiratory alkalosis does not produce persistent cyanosis. Reassess the patient promptly.

47. A — A sudden low exhaled volume with preserved bilateral breath sounds most often indicates lost volume through a circuit disconnection, cuff leak, or sampling problem. The airway and circuit should be inspected before changing therapy. Sedation, imaging, and percussion do not address the immediate mechanical cause and may delay correction. Reassess.

48. B — An elevated pulmonary artery occlusion pressure reflects increased left atrial filling pressure and supports hydrostatic, cardiogenic pulmonary edema. Noncardiogenic edema generally occurs with a normal filling pressure. Bronchospasm, uncomplicated pneumonia, and pulmonary embolism may impair gas exchange but do not characteristically produce a markedly elevated occlusion pressure. Reassess the patient.

49. A — Each APGAR component receives one point: heart rate below 100, weak irregular respirations, some extremity flexion, grimace with stimulation, and acrocyanosis. Adding the five component scores gives 5. Higher scores would require stronger respirations, active motion, or completely pink color, while a lower score would undercount present responses. Reassess promptly.

50. C — Rapid weight gain and dependent edema reflect retained extracellular fluid and support systemic volume overload. Prolonged expiration, wheezing, and reduced peak flow are characteristic of airflow obstruction and do not establish excess fluid. Integrating weight trends with examination findings helps distinguish a circulatory problem from a primarily obstructive pulmonary process.

51. D — Most oxygen is carried bound to hemoglobin, so severe anemia can markedly reduce arterial oxygen content even when saturation and dissolved oxygen tension are normal. PaO2 reflects dissolved oxygen, not total carrying capacity. Pulse oximetry estimates saturation but does not measure hemoglobin concentration or guarantee adequate systemic oxygen delivery. Reassess.

52. B — Vital capacity depends on inspiratory and expiratory muscle performance. A rapid decline in a patient with neuromuscular disease signals diminishing ventilatory reserve and possible need for airway support. Diffusion failure primarily affects oxygenation, while improving strength would raise capacity. The trend is more important than a single isolated measurement. Reassess.

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56. D — An overdamped monitoring system blunts rapid pressure changes, narrowing pulse pressure by underestimating systolic and overestimating diastolic pressure. Mean arterial pressure may remain comparatively reliable. An underdamped system exaggerates systolic pressure and lowers diastolic pressure. Zero pressure suggests disconnection or loss of signal, not simple overdamping. Reassess the patient promptly.

57. C — Pink frothy secretions, diffuse crackles, and orthopnea are classic manifestations of fluid flooding the alveoli during acute pulmonary edema. Upper-airway obstruction produces stridor, a pleural effusion causes localized decreased breath sounds, and stable chronic bronchitis does not usually cause abrupt frothy sputum with severe positional dyspnea. Reassess the patient promptly.

58. A — Circuit condensate can contain microorganisms and must be handled as contaminated fluid. It should be drained away from the patient into an appropriate container while limiting circuit breaks and performing hand hygiene. Returning it to the humidifier or airway risks inoculation, and opening the circuit above clean supplies spreads contamination.

59. B — Transport should begin only after confirming enough power for the trip plus delays and arranging a manual backup device. Silencing the alarm does not create energy, reducing monitoring increases risk, and relying on equipment at the destination ignores failures en route. Preparation must cover foreseeable interruptions. Reassess the patient promptly.

60. D — A zero capnometer value with other evidence of tracheal placement may result from a disconnected, kinked, water-filled, or obstructed sampling line. The sampling system should be inspected immediately while ventilation and tube position are reassessed. Blood type, oximeter wavelength, and cylinder testing do not affect capnography sampling. Reassess the patient.

61. D — A failed leak test indicates the system cannot maintain pressure, so circuit connections, humidifier seals, valves, and the test lung should be checked before patient use. Connecting the device to a patient is unsafe. Disabling alarms conceals danger, and changing analyzer calibration does not correct a mechanical leak. Reassess promptly.

62. A — Cylinder duration equals gauge pressure multiplied by the cylinder factor, divided by flow. Multiplying 500 by 0.28 gives 140 liters; dividing by 4 liters per minute gives 35 minutes. A practical transport plan should preserve a safety reserve, so actual planned operating time would be shorter. Reassess the patient promptly.

63. C — Condensation occurs when warm saturated gas cools in the circuit. A heated-wire circuit and appropriate temperature control reduce this gradient while preserving humidification. Removing

humidity can dry secretions, placing the humidifier above the patient increases aspiration risk, and directing condensate toward the airway is unsafe. Promptly reassess the patient's response.

64. B — Hand hygiene before and after patient or equipment contact is a foundational Standard Precaution and reduces transmission through contaminated hands. Sterile gloves are reserved for specific sterile procedures. Routine circuit replacement can increase manipulation and contamination, and airborne isolation is required only for diseases transmitted by the airborne route. Reassess.

65. C — Poor peripheral perfusion weakens the pulsatile signal and can make pulse-oximeter readings unstable. Repositioning the probe to the forehead, ear, or another adequately perfused site is the best initial troubleshooting step. Dyshemoglobinemia requires corroborating evidence, while ventilator changes and oxygen-analyzer disposal do not correct signal quality. Reassess the patient promptly.

66. D — A self-inflating bag must draw gas through its inlet as it re-expands. Failure to refill suggests inlet obstruction, a stuck valve, or bag damage. Pulmonary compliance affects delivered pressure and volume but not bag recoil after disconnection. A functioning reservoir and relief valve do not prevent normal refilling. Reassess promptly.

67. B — A properly functioning analyzer should read approximately 21% in room air and near 100% in pure oxygen. Failure at the high calibration point indicates sensor depletion or malfunction. The device should be recalibrated or replaced before clinical use. Compensating by changing patient oxygen could create dangerous unrecognized hyperoxia. Reassess promptly.

68. A — Flexible bronchoscopes are semicritical devices because they contact mucous membranes and require meticulous cleaning followed by high-level disinfection according to manufacturer instructions. Surface wiping is inadequate, sheaths do not eliminate reprocessing requirements, and leak testing plus proper drying and storage help prevent damage and microbial growth. Reassess the patient promptly.

69. C — High airway pressure combined with inability to pass a suction catheter strongly suggests an obstructed or kinked artificial airway. Circuit and cuff leaks usually lower pressure and exhaled volume. Low oxygen supply may trigger a gas-source alarm but does not explain mechanical resistance within the endotracheal tube. Reassess the patient.

70. D — Jet-nebulizer output depends on gas passing through an unobstructed jet and drawing liquid through the capillary system. Incorrect assembly, blockage, or insufficient liquid commonly reduces aerosol. Hematocrit and ECG electrodes are unrelated, while battery status alone does not explain poor output from a gas-powered nebulizer. Promptly reassess the patient's response.

71. B — Calibration verification confirms that a spirometer measures known volume accurately. A result outside the accepted tolerance means patient values may be biased, so testing must stop until troubleshooting and successful verification are completed. Acceptable maneuvers, clean supplies, and environmental documentation support quality but do not override failed calibration. Reassess promptly.

72. D — A leak directed toward the eyes causes discomfort and reduces effective pressure. Repositioning or selecting a better-sized interface usually corrects it while protecting skin.

Overtightening increases pressure injury, disabling alarms conceals deterioration, and raising pressure can worsen the leak. Occlusive dressings are not a substitute for proper fit. Reassess promptly.

73. A — Circuit condensate can contain microorganisms and must be handled as contaminated fluid. It should be drained away from the patient into an appropriate container while limiting circuit breaks and performing hand hygiene. Returning it to the humidifier or airway risks inoculation, and opening the circuit above clean supplies spreads contamination.

74. C — Transport should begin only after confirming enough power for the trip plus delays and arranging a manual backup device. Silencing the alarm does not create energy, reducing monitoring increases risk, and relying on equipment at the destination ignores failures en route. Preparation must cover foreseeable interruptions. Reassess the patient promptly.

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78. D — Condensation occurs when warm saturated gas cools in the circuit. A heated-wire circuit and appropriate temperature control reduce this gradient while preserving humidification. Removing humidity can dry secretions, placing the humidifier above the patient increases aspiration risk, and directing condensate toward the airway is unsafe. Promptly reassess the patient's response.

79. C — Hand hygiene before and after patient or equipment contact is a foundational Standard Precaution and reduces transmission through contaminated hands. Sterile gloves are reserved for specific sterile procedures. Routine circuit replacement can increase manipulation and contamination, and airborne isolation is required only for diseases transmitted by the airborne route. Reassess.

80. B — Poor peripheral perfusion weakens the pulsatile signal and can make pulse-oximeter readings unstable. Repositioning the probe to the forehead, ear, or another adequately perfused site is the best initial troubleshooting step. Dyshemoglobinemia requires corroborating evidence, while ventilator changes and oxygen-analyzer disposal do not correct signal quality. Reassess the patient promptly.

81. D — Ventilator aerosol delivery depends on device placement, timing, humidification, circuit configuration, and manufacturer recommendations. An adapter in the inspiratory limb and actuation synchronized with inspiration generally improves delivery. Expiratory-limb placement wastes

medication, exhalation timing reduces deposition, and indiscriminate filter removal can compromise safety. The patient's clinical response requires prompt reassessment.

82. A — Inability to ventilate and pass a suction catheter indicates critical tracheostomy obstruction or displacement. The therapist must call for help, oxygenate, remove the inner cannula if present, and replace or remove the tube as appropriate. Waiting, forceful catheter passage, or repeated cuff inflation delays restoration of a patent airway. Reassess.

83. B — Rinsing and spitting after inhaled corticosteroid use reduces local deposition that can cause oral candidiasis and dysphonia. These medications are controllers, not rapid rescue bronchodilators, and should be used as prescribed rather than stopped after brief symptom improvement. Swallowing residue increases unnecessary oropharyngeal exposure. Promptly reassess the patient's clinical response.

84. C — Hypertonic saline can hydrate airway secretions and promote clearance, but it may provoke cough or bronchospasm, particularly in reactive airways. Breath sounds, airflow, oxygenation, and symptoms should be monitored, with bronchodilator use considered when ordered. Unrelated physical traits provide no safety information, and productive cough may be therapeutic. Reassess promptly.

85. B — Respiratory alkalosis from mechanical overventilation reflects excessive alveolar ventilation relative to carbon dioxide production. Reducing an appropriate rate or tidal volume lowers minute ventilation and permits PaCO2 to rise toward target while maintaining lung protection. Increasing rate, volume, or mandatory breaths would intensify carbon dioxide removal and alkalemia. Reassess promptly.

86. A — A one-way speaking valve requires exhaled gas to pass around the tube and through the upper airway. An inflated cuff or obstructed upper airway prevents exhalation and can cause rapid distress. The valve should be removed immediately while cuff status, tube size, secretions, and airway patency are assessed. Reassess promptly.

87. C — Hypoxemia must be treated even in chronic hypercapnia, but oxygen should be titrated to the ordered target with clinical and blood-gas reassessment. Withholding oxygen is dangerous, while excessive unmonitored oxygen can worsen hypercapnia in susceptible patients. Pulse oximetry evaluates oxygenation but cannot determine carbon dioxide or acid-base status. Reassess promptly.

88. D — Bronchiectasis causes chronically dilated airways with impaired mucus clearance. An individualized plan may include hydration, active-cycle breathing, PEP, oscillation, postural drainage, and exercise, selected by tolerance and response. Suppressing cough and inactivity promote retention, while oxygen treats hypoxemia but does not mobilize mucus. The patient's clinical response requires prompt reassessment.

89. D — Acute hypercapnic respiratory acidosis during a COPD exacerbation is a strong indication for noninvasive ventilation when the patient is cooperative and can protect the airway. It reduces work of breathing and intubation risk. Chest tubes treat pleural air, incentive spirometry is insufficient, and observation alone ignores ventilatory failure. Reassess promptly.

90. B — An elevated plateau pressure indicates excessive alveolar distending pressure. Reducing tidal volume toward lung-protective values lowers stress and should be followed by reassessment of plateau and driving pressures. Increasing tidal volume worsens overdistention, eliminating PEEP may derecruit lung units, and changing rate alone does not correct excessive inspiratory volume. Reassess.

91. A — Peak pressure includes resistive and elastic loads, while plateau pressure estimates static elastic pressure. A rising peak pressure with stable plateau therefore points to increased airway resistance from bronchospasm, secretions, biting, or tube narrowing. Compliance problems and overdistention generally raise plateau pressure as well, and pleural fluid changes elastic load.

92. C — Auto-PEEP develops when the next breath begins before exhalation is complete. Lowering respiratory rate, shortening inspiratory time, or otherwise increasing expiratory time allows more emptying and reduces air trapping. Increasing rate or tidal volume worsens dynamic hyperinflation, while shortening expiration directly intensifies the problem. Promptly reassess the patient's clinical response.

93. C — Coarse rhonchi with rising pressure suggest retained secretions increasing airway resistance. The therapist should quickly assess tube patency and suction when indicated. Raising or disabling the alarm hides a potentially dangerous obstruction, and reducing oxygen does not remove secretions or correct the cause of the pressure change. Reassess the patient.

94. B — An air-entrainment device must deliver total flow exceeding the patient's inspiratory demand to maintain a predictable concentration. Increasing source flow raises total output while preserving the selected ratio. Blocking entrainment ports changes concentration dangerously, an unregulated source is unsafe, and lowering flow worsens unintended room-air dilution. Reassess the patient promptly.

95. D — CPAP recruits flooded or collapsed alveoli, improves functional residual capacity, and can reduce cardiac preload and afterload in cardiogenic pulmonary edema. A cooperative patient may improve rapidly without intubation. Postural drainage, room-air observation, and routine bronchoscopy do not address diffuse alveolar flooding and respiratory distress. Promptly reassess the patient's response.

96. A — The increase is 60 liters per minute. Dividing the change by the original 200 liters per minute gives 0.30, or 30 percent. Using the final value as the denominator gives about 23 percent, while the other options confuse absolute change with percentage or divide incorrectly. Promptly reassess the patient's response.

97. A — PEEP maintains positive pressure at end expiration, helping prevent unstable alveoli from collapsing and improving recruitment and oxygenation. Removing baseline pressure or reducing mean airway pressure can worsen derecruitment. Added dead space primarily raises carbon dioxide and does not directly open collapsed gas-exchange units. Promptly reassess the patient's clinical response.

98. C — Postextubation stridor signals upper-airway narrowing that can progress quickly. Immediate assessment, oxygen, appropriate aerosolized medication, and preparation for reintubation are priorities based on severity. Postural drainage treats secretions, delayed assessment is unsafe, and forced

maneuvers may worsen distress without relieving laryngeal obstruction. The patient's clinical response requires prompt bedside reassessment.

99. B — $PaCO_2$ varies inversely with effective alveolar ventilation. Increasing an appropriate respiratory rate or effective tidal volume raises minute ventilation and lowers carbon dioxide, provided air trapping and lung protection are considered. Adding dead space, reducing rate, or reducing effective tidal volume lowers alveolar ventilation and worsens hypercapnia. Reassess the patient.

100. D — Severe desaturation and bradycardia are dangerous complications of suctioning, often caused by hypoxemia and vagal stimulation. Suctioning should stop while the patient is oxygenated and stabilized. Prolonging the pass or continuing after saline instillation increases risk. The need for additional suctioning can be reassessed afterward. Promptly reassess the patient's response.

101. A — Mechanical insufflation-exsufflation alternates positive and negative pressure to simulate a cough and mobilize secretions in patients with weak respiratory muscles. Fluid restriction does not create expiratory flow, lowering oxygen may cause hypoxemia, and prolonged breath holding neither substitutes for cough strength nor safely clears retained secretions. Reassess the patient promptly.

102. D — Tremor and tachycardia are recognized beta-agonist effects, but marked symptoms require stopping the treatment and assessing severity, rhythm, dose, and clinical need. Doubling or adding another sympathomimetic can worsen toxicity. Ignoring the response fails to protect the patient or support an informed modification of therapy. Promptly reassess the patient's response.

103. B — Successful completion of a spontaneous breathing trial supports ventilatory readiness but does not alone guarantee safe extubation. The team should assess mental status, cough, secretion burden, airway patency, and protection. Increasing sedation, indefinite full support, or a second tube conflicts with evidence of potential readiness and adds avoidable risk. Reassess.

104. C — Exogenous surfactant must reach the alveolar surface, so it is administered through an endotracheal tube using the product-specific procedure and ventilation strategy. Subcutaneous, oral, or dry nasal delivery would not distribute an active surfactant layer to distal airspaces. Close monitoring is required because compliance and oxygenation may improve rapidly. Reassess.

105. A — With an advanced airway secured during adult CPR, compressions continue without planned pauses while breaths are delivered at the recommended controlled rate. Excessive ventilation raises intrathoracic pressure and reduces venous return. Repeated pauses reduce coronary perfusion, while withholding ventilation fails to support gas exchange during prolonged resuscitation. Reassess the patient.

106. B — Dry-powder inhalers rely on sufficient inspiratory flow to deaggregate and carry medication. A patient unable to generate that flow should use an appropriate metered-dose inhaler with spacer or nebulized formulation. Exhaling into or moistening the device damages powder performance, and continuing ineffective delivery leaves disease undertreated. Reassess the patient promptly.

107. D — When delivered inspiratory flow is below patient demand, effort may persist through cycling and trigger a second breath. Increasing flow or adjusting rise time and inspiratory timing can improve

synchrony while maintaining safe volume and pressure. Lower flow, added dead space, or disabling triggering does not correct unmet demand and may worsen distress.

108. C — An artificial airway bypasses normal warming and humidifying structures, so insufficient humidity promotes thick secretions, tube obstruction, and impaired mucociliary clearance. Effective heated humidification and assessment of systemic hydration address the cause. Dry gas worsens the problem, and increasing cuff pressure neither humidifies gas nor mobilizes secretions. Reassess the patient.

109. C — Gravity directs more pulmonary blood flow to the dependent lung. Placing the healthier lung down can improve ventilation-perfusion matching when disease is predominantly unilateral. The response should be monitored because exceptions exist. Diseased-lung-down positioning may worsen shunt, while mandatory prone or Trendelenburg positioning ignores the individual physiology and safety risks.

110. B — An air-entrainment mask uses a fixed jet and entrainment ratio to provide a relatively predictable oxygen concentration when total flow meets inspiratory demand. Cannula concentration varies with breathing pattern, a simple mask at low flow risks carbon dioxide rebreathing, and unregulated blow-by provides inconsistent delivery. Promptly reassess the patient's response.

111. A — PEEP can recruit unstable alveoli and raise mean airway pressure, improving oxygenation in shunt-like disease. Hemodynamics and overdistention must be monitored. Added dead space affects carbon dioxide, lowering inspired oxygen worsens hypoxemia, and reducing mean airway pressure can promote alveolar collapse rather than improve gas exchange. Reassess the patient promptly.

112. D — Excessive cuff pressure compresses tracheal mucosal capillaries and can cause ischemia, ulceration, stenosis, or fistula formation. Cuff pressure should be kept at the minimum effective range and checked with a manometer. High pressure does not improve perfusion, restore vocal-cord movement, or completely prevent microaspiration. Promptly reassess the patient's clinical response.

113. C — A valved holding chamber reduces the need to coordinate actuation with inhalation and improves pulmonary deposition; a nebulizer is another option when technique or distress prevents effective inhaler use. Room spraying and oral mixing do not deliver the prescribed aerosol, while mistimed breath holding does not solve coordination. Reassess promptly.

114. A — High-flow nasal cannula works best when heated, humidified flow approaches or exceeds inspiratory demand, reducing room-air entrainment and work of breathing. Increasing flow within appropriate limits can improve support. Zero flow eliminates therapy, complete occlusion is unsafe, and removing humidification causes discomfort and secretion drying. Promptly reassess the patient's response.

115. B — Lung-protective ventilation for ARDS uses tidal volume based on predicted, not actual, body weight, commonly targeting about 6 mL/kg and limiting plateau pressure. Larger volumes increase overdistention risk. Fluid-related actual weight is inappropriate for lung sizing, and pressure monitoring remains essential for safe adjustment. Promptly reassess the patient's clinical response.

116. D — Helium's lower density changes the behavior of flowmeters and some delivery devices calibrated for oxygen or air. Accurate delivery may require a manufacturer-specified correction factor and compatible equipment. Assuming identical readings or connecting the mixture without review can produce unintended flow, concentration, and aerosol performance. Promptly reassess the patient's response.

117. D — Higher intrathoracic pressure can reduce systemic venous return and right ventricular preload, lowering cardiac output and blood pressure. The effect is more pronounced with hypovolemia or right-heart dysfunction. PEEP does not expand blood volume, and it cannot be assumed to improve venous return in every patient. Reassess the patient promptly.

118. B — Ventilator aerosol delivery depends on device placement, timing, humidification, circuit configuration, and manufacturer recommendations. An adapter in the inspiratory limb and actuation synchronized with inspiration generally improves delivery. Expiratory-limb placement wastes medication, exhalation timing reduces deposition, and indiscriminate filter removal can compromise safety. The patient's clinical response requires prompt reassessment.

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137. C — Severe desaturation and bradycardia are dangerous complications of suctioning, often caused by hypoxemia and vagal stimulation. Suctioning should stop while the patient is oxygenated and stabilized. Prolonging the pass or continuing after saline instillation increases risk. The need for additional suctioning can be reassessed afterward. Promptly reassess the patient's response.

138. B — Mechanical insufflation-exsufflation alternates positive and negative pressure to simulate a cough and mobilize secretions in patients with weak respiratory muscles. Fluid restriction does not create expiratory flow, lowering oxygen may cause hypoxemia, and prolonged breath holding neither substitutes for cough strength nor safely clears retained secretions. Reassess the patient promptly.

139. D — Tremor and tachycardia are recognized beta-agonist effects, but marked symptoms require stopping the treatment and assessing severity, rhythm, dose, and clinical need. Doubling or adding another sympathomimetic can worsen toxicity. Ignoring the response fails to protect the patient or support an informed modification of therapy. Promptly reassess the patient's response.

140. A — Successful completion of a spontaneous breathing trial supports ventilatory readiness but does not alone guarantee safe extubation. The team should assess mental status, cough, secretion burden, airway patency, and protection. Increasing sedation, indefinite full support, or a second tube conflicts with evidence of potential readiness and adds avoidable risk. Reassess.

141. D — Exogenous surfactant must reach the alveolar surface, so it is administered through an endotracheal tube using the product-specific procedure and ventilation strategy. Subcutaneous, oral, or dry nasal delivery would not distribute an active surfactant layer to distal airspaces. Close monitoring is required because compliance and oxygenation may improve rapidly. Reassess.

142. B — With an advanced airway secured during adult CPR, compressions continue without planned pauses while breaths are delivered at the recommended controlled rate. Excessive ventilation raises intrathoracic pressure and reduces venous return. Repeated pauses reduce coronary perfusion, while withholding ventilation fails to support gas exchange during prolonged resuscitation. Reassess the patient.

143. A — Dry-powder inhalers rely on sufficient inspiratory flow to deaggregate and carry medication. A patient unable to generate that flow should use an appropriate metered-dose inhaler with spacer or nebulized formulation. Exhaling into or moistening the device damages powder performance, and continuing ineffective delivery leaves disease undertreated. Reassess the patient promptly.

144. C — When delivered inspiratory flow is below patient demand, effort may persist through cycling and trigger a second breath. Increasing flow or adjusting rise time and inspiratory timing can improve synchrony while maintaining safe volume and pressure. Lower flow, added dead space, or disabling triggering does not correct unmet demand and may worsen distress.

145. C — An artificial airway bypasses normal warming and humidifying structures, so insufficient humidity promotes thick secretions, tube obstruction, and impaired mucociliary clearance. Effective heated humidification and assessment of systemic hydration address the cause. Dry gas worsens the problem, and increasing cuff pressure neither humidifies gas nor mobilizes secretions. Reassess the patient.

146. A — Gravity directs more pulmonary blood flow to the dependent lung. Placing the healthier lung down can improve ventilation-perfusion matching when disease is predominantly unilateral. The response should be monitored because exceptions exist. Diseased-lung-down positioning may worsen shunt, while mandatory prone or Trendelenburg positioning ignores the individual physiology and safety risks.

147. D — An air-entrainment mask uses a fixed jet and entrainment ratio to provide a relatively predictable oxygen concentration when total flow meets inspiratory demand. Cannula concentration varies with breathing pattern, a simple mask at low flow risks carbon dioxide rebreathing, and unregulated blow-by provides inconsistent delivery. Promptly reassess the patient's response.

148. B — PEEP can recruit unstable alveoli and raise mean airway pressure, improving oxygenation in shunt-like disease. Hemodynamics and overdistention must be monitored. Added dead space affects carbon dioxide, lowering inspired oxygen worsens hypoxemia, and reducing mean airway pressure can promote alveolar collapse rather than improve gas exchange. Reassess the patient promptly.

149. C — Excessive cuff pressure compresses tracheal mucosal capillaries and can cause ischemia, ulceration, stenosis, or fistula formation. Cuff pressure should be kept at the minimum effective range and checked with a manometer. High pressure does not improve perfusion, restore vocal-cord movement, or completely prevent microaspiration. Promptly reassess the patient's clinical response.

150. B — A valved holding chamber reduces the need to coordinate actuation with inhalation and improves pulmonary deposition; a nebulizer is another option when technique or distress prevents

effective inhaler use. Room spraying and oral mixing do not deliver the prescribed aerosol, while mistimed breath holding does not solve coordination. Reassess promptly.

151. D — High-flow nasal cannula works best when heated, humidified flow approaches or exceeds inspiratory demand, reducing room-air entrainment and work of breathing. Increasing flow within appropriate limits can improve support. Zero flow eliminates therapy, complete occlusion is unsafe, and removing humidification causes discomfort and secretion drying. Promptly reassess the patient's response.

152. A — Lung-protective ventilation for ARDS uses tidal volume based on predicted, not actual, body weight, commonly targeting about 6 mL/kg and limiting plateau pressure. Larger volumes increase overdistention risk. Fluid-related actual weight is inappropriate for lung sizing, and pressure monitoring remains essential for safe adjustment. Promptly reassess the patient's clinical response.

153. A — Helium's lower density changes the behavior of flowmeters and some delivery devices calibrated for oxygen or air. Accurate delivery may require a manufacturer-specified correction factor and compatible equipment. Assuming identical readings or connecting the mixture without review can produce unintended flow, concentration, and aerosol performance. Promptly reassess the patient's response.

154. B — Higher intrathoracic pressure can reduce systemic venous return and right ventricular preload, lowering cardiac output and blood pressure. The effect is more pronounced with hypovolemia or right-heart dysfunction. PEEP does not expand blood volume, and it cannot be assumed to improve venous return in every patient. Reassess the patient promptly.

155. D — Ventilator aerosol delivery depends on device placement, timing, humidification, circuit configuration, and manufacturer recommendations. An adapter in the inspiratory limb and actuation synchronized with inspiration generally improves delivery. Expiratory-limb placement wastes medication, exhalation timing reduces deposition, and indiscriminate filter removal can compromise safety. The patient's clinical response requires prompt reassessment.

156. C — Inability to ventilate and pass a suction catheter indicates critical tracheostomy obstruction or displacement. The therapist must call for help, oxygenate, remove the inner cannula if present, and replace or remove the tube as appropriate. Waiting, forceful catheter passage, or repeated cuff inflation delays restoration of a patent airway. Reassess.

157. D — Rinsing and spitting after inhaled corticosteroid use reduces local deposition that can cause oral candidiasis and dysphonia. These medications are controllers, not rapid rescue bronchodilators, and should be used as prescribed rather than stopped after brief symptom improvement. Swallowing residue increases unnecessary oropharyngeal exposure. Promptly reassess the patient's clinical response.

158. B — Hypertonic saline can hydrate airway secretions and promote clearance, but it may provoke cough or bronchospasm, particularly in reactive airways. Breath sounds, airflow, oxygenation, and symptoms should be monitored, with bronchodilator use considered when ordered. Unrelated physical traits provide no safety information, and productive cough may be therapeutic. Reassess promptly.

159. C — Respiratory alkalosis from mechanical overventilation reflects excessive alveolar ventilation relative to carbon dioxide production. Reducing an appropriate rate or tidal volume lowers minute ventilation and permits PaCO2 to rise toward target while maintaining lung protection. Increasing rate, volume, or mandatory breaths would intensify carbon dioxide removal and alkalemia. Reassess promptly.

160. A — A one-way speaking valve requires exhaled gas to pass around the tube and through the upper airway. An inflated cuff or obstructed upper airway prevents exhalation and can cause rapid distress. The valve should be removed immediately while cuff status, tube size, secretions, and airway patency are assessed. Reassess promptly.