



Respiratory TMC

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Practice Questions

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1. Coarse, low-pitched bubbling sounds heard over the large airways that often clear with coughing are best described as:

- A. Fine crackles
- B. Coarse crackles (rhonchi)
- C. Pleural friction rub
- D. Stridor

2. The normal range for arterial pH is approximately:

- A. 7.25-7.30
- B. 7.35-7.45
- C. 7.45-7.55
- D. 7.10-7.20

3. A standard adult nasal cannula at 2 L/min delivers an approximate FiO₂ of:

- A. 0.21
- B. 0.28
- C. 0.40
- D. 0.60

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4. A common endotracheal tube internal diameter for an average adult woman is approximately:

- A. 5.0 mm
- B. 7.0-7.5 mm
- C. 9.0 mm
- D. 4.0 mm



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5. In assist-control (A/C) ventilation, every breath the patient triggers:

- A. Receives only partial support
- B. Is delivered at the set tidal volume or pressure
- C. Is unsupported
- D. Increases dead space only

6. The cylinder factor used to calculate remaining oxygen duration for an E cylinder is approximately:

- A. 0.16 L/psig
- B. 0.28 L/psig
- C. 3.14 L/psig
- D. 1.56 L/psig

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7. Albuterol is classified as a:

- A. Short-acting beta-2 agonist (SABA)
- B. Anticholinergic
- C. Inhaled corticosteroid
- D. Long-acting beta agonist

8. The recommended chest compression rate for adult CPR is:

- A. 60-80 per minute
- B. 100-120 per minute
- C. 140-160 per minute
- D. 40-60 per minute

9. A high-pitched, musical, continuous sound heard on expiration is most consistent with:

- A. Vesicular breathing
- B. Bronchial breathing
- C. Wheezing
- D. Bronchovesicular breathing

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10. The normal range for PaCO₂ in arterial blood is approximately:

- A. 20-30 mm Hg
- B. 50-60 mm Hg
- C. 35-45 mm Hg
- D. 60-70 mm Hg

11. The recommended maximum flow for a standard (non-high-flow) adult nasal cannula is generally:

- A. 2 L/min
- B. 4 L/min
- C. 6 L/min
- D. 15 L/min

12. To minimize tracheal mucosal injury while sealing the airway, endotracheal tube cuff pressure should generally be maintained at:

- A. 10 cm H₂O
- B. 15 cm H₂O
- C. 20-30 cm H₂O
- D. 50 cm H₂O

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13. In SIMV (synchronized intermittent mandatory ventilation), breaths taken between mandatory breaths are:

- A. Fully supported at the set volume
- B. Blocked
- C. Spontaneous (optionally pressure-supported)
- D. Delivered at double the rate

14. A full E cylinder reads 2000 psig. At 2 L/min using a factor of 0.28, the approximate remaining time is:

- A. 280 minutes
- B. 140 minutes
- C. 56 minutes
- D. 1000 minutes



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15. A common adverse effect of inhaled beta-2 agonists such as albuterol is:

- A. Bradycardia
- B. Tachycardia and tremor
- C. Excessive salivation
- D. Constricted pupils

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16. The recommended chest compression depth for an adult is:

- A. About 0.5 inch
- B. About 1 inch
- C. At least 2 inches (5 cm)
- D. At least 4 inches

17. A harsh, high-pitched sound heard over the upper airway during inspiration in a patient recently extubated suggests:

- A. Bronchospasm
- B. Pneumothorax
- C. Pulmonary edema
- D. Upper airway obstruction (stridor)

18. The normal range for arterial bicarbonate (HCO_3^-) is approximately:

- A. 22-26 mEq/L
- B. 12-16 mEq/L
- C. 30-34 mEq/L
- D. 16-20 mEq/L

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19. A simple oxygen mask requires a minimum flow of about 5-6 L/min primarily to:

- A. Flush exhaled CO_2 from the mask
- B. Increase humidity
- C. Reduce oxygen consumption
- D. Prevent skin breakdown



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20. The most reliable bedside method to confirm endotracheal tube placement in the trachea immediately after intubation is:

- A. Detection of exhaled CO₂ (waveform capnography)
- B. Chest auscultation alone
- C. Tube condensation
- D. Observing chest rise alone

21. The primary purpose of positive end-expiratory pressure (PEEP) is to:

- A. Improve oxygenation by preventing alveolar collapse
- B. Lower PaCO₂ directly
- C. Decrease mean airway pressure
- D. Reduce FiO₂ requirements by raising CO₂

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22. An oxygen cylinder is generally considered nearly empty and due for change at about:

- A. 1500 psig
- B. 1000 psig
- C. 200-500 psig
- D. 2200 psig

23. Ipratropium bromide produces bronchodilation by:

- A. Stimulating beta-2 receptors
- B. Reducing inflammation
- C. Blocking muscarinic (acetylcholine) receptors
- D. Thinning mucus

24. For single-rescuer adult CPR without an advanced airway, the compression-to-ventilation ratio is:

- A. 30:2
- B. 15:2
- C. 5:1
- D. 10:1

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25. A bluish discoloration of the lips and oral mucosa indicating reduced oxygenation is termed:

- A. Central cyanosis
- B. Pallor
- C. Jaundice
- D. Erythema

26. A normal PaO₂ for a healthy adult breathing room air at sea level is approximately:

- A. 40-50 mm Hg
- B. 50-60 mm Hg
- C. 110-120 mm Hg
- D. 80-100 mm Hg

27. A non-rebreather mask with a reservoir bag and one-way valves can deliver an FiO₂ of approximately:

- A. 0.28
- B. 0.40
- C. 0.50
- D. 0.80-0.90+

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28. The recommended maximum duration for a single endotracheal suction pass in an adult is approximately:

- A. 60 seconds
- B. 45 seconds
- C. 30 seconds
- D. 10-15 seconds

29. An excessive PEEP level can reduce cardiac output mainly by:

- A. Increasing preload
- B. Causing bradycardia
- C. Dilating pulmonary vessels
- D. Raising intrathoracic pressure and decreasing venous return



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30. A reducing valve (regulator) on a compressed gas cylinder functions to:

- A. Measure flow only
- B. Lower the high cylinder pressure to a safe working pressure (~50 psig)
- C. Humidify the gas
- D. Analyze oxygen concentration



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Answer Key & Explanations

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1. B — Coarse crackles (rhonchi)

Coarse crackles, sometimes called rhonchi, arise from secretions in larger airways and frequently change or clear after the patient coughs.

2. B — 7.35-7.45

Normal arterial pH is 7.35-7.45; values below indicate acidemia and above indicate alkalemia.

3. B — 0.28

Each liter per minute of nasal cannula flow adds roughly 4% to FiO₂ above room air, so 2 L/min yields about 28%.

4. B — 7.0-7.5 mm

Average adult women are typically intubated with a 7.0-7.5 mm ID tube; men often use 7.5-8.5 mm.

5. B — Is delivered at the set tidal volume or pressure

In A/C, both machine-triggered and patient-triggered breaths receive full set support, ensuring a guaranteed level of ventilation.

6. B — 0.28 L/psig

An E cylinder has a factor of about 0.28 L per psig; multiplying gauge pressure by the factor and dividing by flow gives the remaining minutes.

7. A — Short-acting beta-2 agonist (SABA)

Albuterol is a short-acting beta-2 agonist that relaxes airway smooth muscle for quick bronchodilation, making it a rescue medication.

8. B — 100-120 per minute

High-quality adult CPR uses a compression rate of 100-120 per minute at a depth of at least 2 inches (5 cm) with full recoil.

9. C — Wheezing

Wheezes are continuous, high-pitched musical sounds produced by airflow through narrowed airways, classically heard in bronchospasm.

10. C — 35-45 mm Hg

Normal PaCO₂ is 35-45 mm Hg; it is the respiratory component of acid-base balance.

11. C — 6 L/min

Standard nasal cannulas are typically limited to about 6 L/min because higher flows dry and irritate the nasal mucosa without much added FiO₂.

12. C — 20-30 cm H₂O

Cuff pressure is usually maintained at about 20-30 cm H₂O, high enough to seal but below tracheal capillary



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perfusion pressure to prevent ischemia.

13. C — Spontaneous (optionally pressure-supported)

SIMV delivers a set number of mandatory breaths synchronized to patient effort, while extra spontaneous breaths are taken at the patient's own volume, often with added pressure support.

14. A — 280 minutes

Duration = $(2000 \times 0.28) / 2 = 560 / 2 = 280$ minutes.

15. B — Tachycardia and tremor

Beta-2 agonists can cause tachycardia, tremor, and palpitations due to some beta-1 cross-stimulation and systemic absorption.

16. C — At least 2 inches (5 cm)

Adult compressions should be at least 2 inches (5 cm) but not more than 2.4 inches, allowing full chest recoil between compressions.

17. D — Upper airway obstruction (stridor)

Inspiratory stridor after extubation indicates upper-airway narrowing, commonly from laryngeal edema, and warrants prompt evaluation.

18. A — 22-26 mEq/L

Normal HCO₃⁻ is 22-26 mEq/L and represents the metabolic component of acid-base status.

19. A — Flush exhaled CO₂ from the mask

A minimum flow of 5-6 L/min washes out exhaled CO₂ trapped in the mask reservoir, preventing rebreathing.

20. A — Detection of exhaled CO₂ (waveform capnography)

Sustained waveform capnography (detecting exhaled CO₂ over several breaths) is the recommended confirmation of tracheal placement; a chest film confirms depth.

21. A — Improve oxygenation by preventing alveolar collapse

PEEP holds alveoli open at end-expiration, increasing functional residual capacity and improving oxygenation, often allowing a lower FiO₂.

22. C — 200-500 psig

Cylinders are typically changed at around 200-500 psig to keep a safety reserve and avoid running out during use.

23. C — Blocking muscarinic (acetylcholine) receptors

Ipratropium is an anticholinergic that blocks muscarinic receptors, reducing vagally mediated bronchoconstriction; it is especially useful in COPD.

24. A — 30:2

Single- and two-rescuer adult CPR uses 30 compressions to 2 breaths until an advanced airway is placed, after which compressions are continuous.

25. A — Central cyanosis

Central cyanosis reflects desaturated hemoglobin in mucous membranes and signals significant hypoxemia, unlike peripheral cyanosis from poor perfusion.



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26. D — 80-100 mm Hg

Normal resting PaO₂ on room air at sea level is 80-100 mm Hg.

27. D — 0.80-0.90+

A well-fitted non-rebreather with an inflated reservoir and adequate flow delivers a high FiO₂, often 80-90% or more.

28. D — 10-15 seconds

Each suction pass should be limited to about 10-15 seconds to minimize hypoxemia and other complications.

29. D — Raising intrathoracic pressure and decreasing venous return

High PEEP raises intrathoracic pressure, impeding venous return (preload) and lowering cardiac output and blood pressure.

30. B — Lower the high cylinder pressure to a safe working pressure (~50 psig)

A regulator reduces the high storage pressure to a usable working pressure of about 50 psig for clinical devices.



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