

### Chapter 2: Gas Exchange

1. Which formula is used to determine the barometric pressure (PB) in the lungs?

- A)  $PB = P_{CO_2} - P_{O_2} + P_{N_2} + P_{H_2O}$   
B)  $PB = P_{CO_2} + P_{O_2} + P_{N_2} + P_{H_2O}$   
C)  $PB = P_{CO_2} + P_{O_2} - P_{N_2} - P_{H_2O}$   
D)  $PB = P_{CO_2} - P_{O_2} + P_{N_2} - P_{H_2O}$

**Answer: B**      **Content Area: Patient Data Evaluation and Recommendations**

**Question Type: Recall**

**NBRC Matrix Classification: I. B. 10. L**

2. Altitude affects Alveolar  $PO_2$  causing it to

- A) increase  
B) decrease  
C) remain the same  
D) become unmeasurable

**Answer: B**      **Content Area: Patient Data Evaluation and Recommendations**

**Question Type: Recall**

**NBRC Matrix Classification: I.B.10.j.**

3. Which of the following gas-transport mechanisms of the oxygen pathway does the respiratory therapist have the most control over?

- I. Diffusion  
II. Chemical reactions  
III. Bulk gas and blood movement
- A) I  
B) III  
C) I and II  
D) II and III

**Answer: B**      **Content Area: Patient Data Evaluation and Recommendations**

**Question Type: Application**

**NBRC Matrix Classification: 1. A. 7. c**

4. How does the respiratory therapist determine the efficiency of O<sub>2</sub> and CO<sub>2</sub> exchange?
- A) Tidal volume
  - B) Oxygen uptake
  - C) VA/Q relationship of the alveoli
  - D) Alveolar PO<sub>2</sub>

**Answer: C**    **Content Area: Patient Data Evaluation and Recommendations**  
**Question Type: Application**  
**NBRC Matrix Classification: I. B. 10. j**

5. What would be the alveolar ventilation of a 150 lb man with a 500 mL tidal volume, 150 mL of dead space, and a respiratory rate of 12 breaths per minute?
- A) 3.2 mL
  - B) 4.2 mL
  - C) 5.2 mL
  - D) 6.2 mL

**Answer: B**    **Content Area: Patient Data Evaluation and Recommendations**  
**Question Type: Analysis**  
**NBRC Matrix Classification: I. A. 7. c**

6. A 40-year old woman presents with impaired judgment, lack of motor coordination, and altered mental status. The physician is likely to want to treat the patient for
- A) Anemia
  - B) Cerebral hypoxia
  - C) Myocardial infarction
  - D) Hyperthermia

**Answer: B**    **Content Area: Initiation and Modification of Therapeutic Procedures**  
**Question Type: Analysis**  
**NBRC Matrix Classification: III. D. 6**

7. What inert gas samples are collected when obtaining a VA/Q distribution of the lung?
- I. Arterial
  - II. Mixed venous
  - III. Expired gas
- A) I
  - B) I and II
  - C) II and III
  - D) I, II, and III

**Answer: D**    **Content Area: Equipment, Infection Control, Quality Control**  
**Question Type: Recall**  
**NBRC Matrix Classification: II. C. 1**

8. Which gas is used most often to measure the diffusion capacity of the lung?
- A) CO
  - B) CO<sub>2</sub>
  - C) O<sub>2</sub>
  - D) PO<sub>2</sub>

**Answer: A**    **Content Area: Equipment, Infection Control, Quality Control**  
**Question Type: Application**  
**NBRC Matrix Classification: II. C. 1**

9. How can the presence of a right-to-left shunt be differentiated from a low VA/Q?
- A) Measure PCO<sub>2</sub>.
  - B) Breathe pure O<sub>2</sub>.
  - C) Decrease PO<sub>2</sub>.
  - D) Increase cardiac output

**Answer: B**    **Content Area: Initiation and Modification of Therapeutic Procedures**  
**Question Type: Application**  
**NBRC Matrix Classification: III. E. 7. d**

10. What is the primary treatment for correcting hypoxemia caused by hypoventilation?
- A) Administer supplemental O<sub>2</sub>
  - B) Increase alveolar ventilation
  - C) Administer a blood transfusion
  - D) Administer a bronchodilator

**Answer: B**    **Content Area: Initiation and Modification of Therapeutic Procedures**  
**Question Type: Application**  
**NBRC Matrix Classification: III. D.**

11. Which of the following conditions associated with hypoxemia responds well to supplemental oxygen?
- I. Altitude sickness
  - II. Asthma
  - III. COPD
  - IV. Lung disease
- A) I and II
  - B) II and III
  - C) III and IV
  - D) I and IV

**Answer: A**    **Content Area: Initiation and Modification of Therapeutic Procedures**  
**Question Type: Application**  
**NBRC Matrix Classification: III. D**

12. Why is administering O<sub>2</sub> an effective treatment for CO poisoning?

- A) It displaces CO from hemoglobin
- B) It reduces the risk for cardiac arrest
- C) It increases carboxyhemoglobin
- D) It increases O<sub>2</sub> perfusion

**Answer: C**      **Content Area: Initiation and Modification of Therapeutic Procedures**  
**Question Type: Application**  
**NBRC Matrix Classification: III. D. 6.**

**13.** A 35-year-old respiratory therapist travels to La Paz, Bolivia (elevation 13,325 feet above sea level). The therapist experiences headache, dizziness, and nausea. The physician at the local clinic administers O<sub>2</sub> to relieve her

- A) Stagnant hypoxia
- B) Anemic hypoxia
- C) Hypoxemic hypoxia
- D) Histotoxic hypoxia

**Answer: C**      **Content Area: Patient Data Evaluation and Recommendations**  
**Question Type: Recall**  
**NBRC Matrix Classification: I. A. 2**

**14.** Which of the following factors affect hemoglobin's affinity for O<sub>2</sub>?

- A) Increase in pH, increase in temperature increase in PCO<sub>2</sub>
- B) Decrease in pH, increase in temperature increase in PCO<sub>2</sub>
- C) Decrease in pH, decrease in temperature increase in PCO<sub>2</sub>
- D) Increase in pH, decrease in temperature decrease in PCO<sub>2</sub>

**Answer: D**      **Content Area: Patient Data Evaluation and Recommendations**  
**Question Type: Recall**  
**NBRC Matrix Classification: I. B. 10. J**

15. A physiologic mechanism of Hypercapnia is
- A) Ventilation-perfusion mismatch
  - B) Diffusion defect
  - C) Decreased CO<sub>2</sub> production
  - D) Severe VA/Q mismatch

**Answer: C**    **Content Area: Patient Data Evaluation and Recommendations**

**Question Type: Analysis**

**NBRC Matrix Classification: I. B. 10. J**