

## Self-Assessment RSPT 1050 Module H: Acid-Base Balance

- The majority of  $\text{CO}_2$  produced in the cells is transported to the lungs as:
  - $\text{H}_2\text{CO}_3$
  - $\text{HCO}_3^-$
  - $\text{CO}_2$  and  $\text{H}_2\text{O}$
  - HHb
- Give the normal values for the following:
  - pH: **7.35-7.45**
  - $\text{PaCO}_2$  **35-45 mm Hg**
  - $\text{HCO}_3^-$  **22-26 mEq/L**
- A pH less than 7.35 is called: **A. acidosis**      B. Alkalosis
- A pH greater than 7.45 is called      A. acidosis      **B. Alkalosis**
- Which of the following arterial blood gas value tells us if the patient is ventilating?
  - $\text{PaCO}_2$**
  - $\text{PaO}_2$
  - $\text{HCO}_3^-$
  - pH
  - $\text{SaO}_2$
- What is the normal ratio of  $\text{HCO}_3^-$  to  $\text{H}_2\text{CO}_3$ ? **20: 1**
- Name the enzyme present in the RBC that accelerates the reaction of  $\text{CO}_2$  and  $\text{H}_2\text{O}$ .  
**CARBONIC ANHYDRASE**
- Complete the following equation:
  - $\text{CO}_2 + \text{H}_2\text{O} \rightarrow \text{H}_2\text{CO}_3 \rightarrow \text{H}^+ + \text{HCO}_3^-$
- The effect of oxygen on the  $\text{CO}_2$  dissociation curve is called the **Haldane Effect**.
- List the three ways  $\text{CO}_2$  is carried in the plasma and the % of each.
  - DISSOLVED – 5%**
  - AS BICARBONATE – 5%**
  - AS A CARAMINO COMPOUND – 1%**
- List the three ways  $\text{CO}_2$  is carried in the RBC and the % of each.
  - DISSOLVED – 5%**
  - AS BICARBONATE – 63%**
  - AS A CARAMINO COMPOUND (ATTACHED TO HEMOGLOBIN) – 21%**
- Name the 5 types of hypoxemia.
  - REDUCED ALVEOLAR OXYGEN LEVEL (REDUCED BAROMETRIC PRESSURE)**
  - HYPOVENTILATION**
  - DIFFUSION DEFECT**
  - SHUNT**
  - V/Q MISMATCH**

13. Name the 4 types of hypoxia and give examples of each.
- A. **HYPOXEMIC HYPOXIA – PRESENCE OF SIGNIFICANT SHUNT**
  - B. **HISTOXIC HYPOXIA – CYANIDE POISONING**
  - C. **ANEMIC HYPOXIA – CARBON MONOXIDE POISONING**
  - D. **CIRCULATORY HYPOXIA – REDUCED CARDIAC OUTPUT**
14. The movement of  $\text{HCO}_3^-$  out of the RBC in exchange for a  $\text{Cl}^-$  ion is called the **HAMBURGER** effect or the **CHLORIDE SHIFT**.
15.  $\text{CO}_2$  can be thought of as a/an **A. Acid** B. Base.
16.  $\text{HCO}_3^-$  is a/an A. Acid **B. Base**
17. How do we determine if a patient has hypoxemia?  
**EVALUATE THE  $\text{PaO}_2$**
18. How do we know if a patient has hypoxia?  
**DON'T WORRY ABOUT THIS QUESTION. WE DIDN'T COVER THIS MATERIAL.**
19. A  $\text{PaCO}_2$  of 50 mm Hg =  **$50 \times .03 = 1.5$**  mEq/L?
20. Which type of patient is more likely to show signs of cyanosis?
- A. Anemic
  - B. Polycythemia**
  - C. Normal Hb Levels
21. Name an advantage and disadvantage of having polycythemia.  
**ADVANTAGE: ABILITY TO CARRY MORE OXYGEN (INCREASED OXYGEN CONTENT)**  
**DISADVANTAGE: INCREASED VISCOSITY OF BLOOD**
22. How many gms% of reduced or deoxygenated Hb must be present to show signs of cyanosis? **AT LEAST 5 GRAMS**
23. How is a true shunt treated? **SURGICAL REPAIR (IF INTRACARDIAC)**
24. How is a relative shunt (V/Q mismatch) treated? **RE-EXPANSION OF COLLAPSED ALVEOLI**
25. What is refractory hypoxemia mean? **DOESN'T RESPOND TO OXYGEN THERAPY**
26. All the following would cause an increase in oxygen consumption **EXCEPT** for:
- A. Shivering
  - B. Seizures
  - C. Hyperthyroidism
  - D. Fever
  - E. Hypothermia**
27. What is the normal oxygen consumption? **250 mL/min**

28. A  $H^+$  ion acceptor is called a/an **BASE**.
29. If  $PaCO_2$  goes up, pH will
- A. Increase
  - B. decrease
30. If  $HCO_3^-$  goes up, pH will
- A. Increase
  - B. Decrease
31. Name the one volatile acid that is in equilibrium with its gas and is regulated by the lung.  
**CARBONIC ACID ( $H_2CO_3$ )**