

Acid/Base Balance



1. Match each of the terms in column A with the appropriate description in column B.

Column A

Column B

- | | |
|-------------------------|--|
| _____ 1. pH | a. condition in which the human body's pH levels fall below 7.35 |
| _____ 2. acid | b. condition in which the human body's pH levels rise above 7.45 |
| _____ 3. base | c. mixes with water in the blood to form carbonic acid |
| _____ 4. acidosis | d. substance that binds to H ⁺ in solution |
| _____ 5. alkalosis | e. substance that releases H ⁺ in solution |
| _____ 6. carbon dioxide | f. term used to denote hydrogen ion concentration in body fluids |

2. What is the normal range of pH levels of blood and tissue fluids in the human body?

3. What is the difference between a *strong acid* and a *weak acid*?

4. What is the difference between a *strong base* and a *weak base*?

5. What is the difference between respiratory acidosis/alkalosis and metabolic acidosis/alkalosis?

6. What are the body's two major physiological buffer systems for compensating for acid/base imbalances?

Respiratory Acidosis and Alkalosis

1. What are some of the causes of respiratory acidosis?

2. What are some of the causes of respiratory alkalosis?

3. What happens to blood pH levels during hyperventilation? Why?

4. What happens to blood pH levels during rebreathing? Why?

5. Circle the correct boldfaced terms:

As respiration increases, P_{CO_2} levels **increase** / **decrease** and pH levels **rise** / **fall**.

As respiration decreases, P_{CO_2} levels **increase** / **decrease** and pH levels **rise** / **fall**.

Renal Compensation

1. How does the renal system compensate for conditions of respiratory acidosis?

2. How does the renal system compensate for conditions of respiratory alkalosis?

Metabolic Acidosis and Alkalosis

1. What are some of the causes of metabolic acidosis?

2. What are some of the causes of metabolic alkalosis?

3. Explain how the respiratory system compensates for metabolic acidosis and alkalosis.

4. Explain how the renal system compensates for metabolic acidosis and alkalosis.

5. Circle the correct boldfaced terms:

As metabolic rate increases, respiration **increases** / **decreases**, P_{CO_2} levels **increase** / **decrease**, and pH levels **rise** / **fall**.

As metabolic rate decreases, respiration **increases** / **decreases**, P_{CO_2} levels **increase** / **decrease**, and pH levels **rise** / **fall**.