UNIT 4  ACID-BASE HOMEOSTASIS

UNIT OBJECTIVES:

1. Demonstrate an understanding of the biochemistry and physiology of acid-base homeostasis.
2. Demonstrate the ability to diagnose and effectively treat complex disorders of acid-base balance.

COMPETENCY-BASED KNOWLEDGE OBJECTIVES:

1. Explain hydrogen ion biochemistry and physiology to include:
   a. The Henderson-Hasselbalch equation
      (1) Ventilatory component (pCO2)
      (2) Renal component (HCO3-)
2. Classify metabolic acidosis, including "anion gap" and hyperchloremic acidosis.
3. Identify specific causes of metabolic acidosis.
4. Given values for pH, pCO2, and HCO3-, distinguish between metabolic acidosis, respiratory acidosis, metabolic alkalosis, respiratory alkalosis, and mixed abnormalities; derive a differential diagnosis for each.
5. Predict the importance of primary diseases and their complications to the evaluation of patient risk for:
   a. Shock
   b. Bowel obstruction
   c. Sepsis
6. Analyze the acid-base problem and its cause in specific clinical situations, and determine an appropriate course of therapy for the following conditions:
   a. "Medical" problems such as:
      (1) Diabetic ketoacidosis
      (2) Lactic acidosis
      (3) Renal tubular acidosis
      (4) Renal insufficiency
      (5) Respiratory failure
   b. "Surgical" problems such as:
      (1) Gastric outlet obstruction
      (2) Fistulas
      (3) Shock

COMPETENCY-BASED PERFORMANCE OBJECTIVES:

1. Diagnose and treat acid-base disturbances of all types.
2. Diagnose and treat complex and combined problems in acid-base disturbances as a component of overall care.
3. Manage complex situations in the intensive care unit where acid-base
abnormalities coexist with other metabolic derangements, including:
   a. Fluid and electrolytes
   b. Renal disease
   c. Total parenteral nutrition
   d. Pulmonary disease