Acid-Base Analysis Learning Objectives

Overview of Acid-Base Analysis Using Arterial Blood Gases
• Understand how arterial blood gases are used to analyze acid-base status
• Recognize differences between arterial and venous blood gas analyses
• Differentiate between acidemia/alkalemia and acidosis/alkalosis
• Identify physiologic consequences of acidemia and alkalemia

Principles of Acid-Base Interpretation
• Identify the four primary acid-base disorders
• Categorize acute and chronic acid-base disorders
• Understand alternative approaches to acid-base analysis, using either the $P_{CO_2}$-$pH$ relationship or the $P_{CO_2}$-$HCO_3$ relationship

Interpreting Specific Acid-Base Problems
• Utilize principles of acid-base interpretation to analyze specific acid-base problems
• Recognize simple vs. mixed acid-base disorders

Anion Gap Analysis for Metabolic Acidosis
• Differentiate anion gap and non-anion gap presentations of metabolic acidosis
• Calculate the anion gap
• Recognize factors that alter the upper limits of a normal anion gap

"Delta Gap" and "Delta-Delta" Analysis of Mixed Disorders
• Recognize how a “delta gap” or “delta-delta” aids in the diagnosis of complex metabolic acid-base disorders
• Calculate the “delta gap”
• Apply “delta gap” analysis to identify an additional metabolic acid-base disorder accompanying an anion gap metabolic acidosis

Respiratory Acid-Base Disorders
• Understand physiologic factors contributing to respiratory acid-base disorders
• Identify causes of a respiratory acidosis
• Identify causes of a respiratory alkalosis

Anion Gap Metabolic Acidosis
• Identify major causes of an anion gap metabolic acidosis
• Understand mechanisms underlying lactic acidosis
• Classify type A and type B lactic acidosis
• Differentiate D-lactic acidosis and L-lactic acidosis
Non-Anion Gap Metabolic Acidosis
- Use serum chloride levels to help identify a non-anion gap metabolic acidosis
- Recognize possible mechanisms underlying a non-anion gap metabolic acidosis
- Identify specific causes of a non-anion gap metabolic acidosis

Metabolic Alkalosis
- Recognize possible mechanisms underlying a metabolic alkalosis
- Identify specific causes of a metabolic alkalosis