Bicarbonate – [Serum] Analysis

Objective

The objective of this test is to measure serum bicarbonate (HCO■■) levels. Bicarbonate is a key component of the body's acid-base balance and helps assess metabolic and respiratory disorders, including acidosis and alkalosis.

Materials and Methods

Materials:
- Serum sample from patient
- Automated biochemical analyzer or blood gas analyzer
- Bicarbonate assay reagents (enzymatic or calculation-based)
- Standard laboratory equipment (pipettes, centrifuge)

Methods:
1. Sample Collection: Collect venous blood and separate serum via centrifugation.
2. Measurement: Analyze bicarbonate levels using an enzymatic assay or calculate from blood gas measurements (pH and pCO■).
3. Calibration: Use internal calibrators and quality controls for accurate results.
4. Interpretation: Compare measured bicarbonate levels with reference ranges to identify metabolic acidosis or alkalosis.
5. Correlation: Consider clinical presentation, arterial blood gases, and electrolyte levels for comprehensive assessment.

Results

- Normal serum bicarbonate: 22–29 mmol/L (varies by laboratory)
- Low levels: Indicate metabolic acidosis or compensation for respiratory alkalosis
- High levels: Indicate metabolic alkalosis or compensation for respiratory acidosis

Conclusion

Serum bicarbonate testing is essential for evaluating acid-base balance and detecting metabolic or respiratory disturbances. Interpretation should include arterial blood gas analysis and clinical correlation for accurate diagnosis and management.