MAYO CLINIC LABORATORIES

Test Definition: HCO3

Bicarbonate, Serum

Overview

Useful For
Diagnosis and treatment of acid-base imbalance in respiratory and metabolic systems

Method Name
Photometric/Enzymatic

NY State Available
No

Specimen

Specimen Type
Serum

Necessary Information
Patient's age and sex are required.

Specimen Required
Collection Container/Tube:
Preferred: Serum gel
Acceptable: Red top
Submission Container/Tube: Plastic vial
Specimen Volume: 0.5 mL
Collection Instructions:
1. Serum gel tube must be centrifuged within 2 hours of collection.
2. Red-top tube must be centrifuged, and the serum aliquoted into a plastic vial within 2 hours of collection.

Forms
If not ordering electronically, complete, print, and send 1 of the following forms with the specimen:
-Kidney Transplant Test Request
-Renal Diagnostics Test Request (T830)

Specimen Minimum Volume
0.25 mL

Reject Due To

Gross hemolysis	Reject
Gross lipemia	OK

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum	Refrigerated	24 hours	

Clinical & Interpretive

Clinical Information

Bicarbonate is the second largest fraction of the anions in plasma. Included in this fraction are the bicarbonate (HCO3[-]) and carbonate (CO3[-2]) ions, carbon dioxide in physical solution, as well as the carbamino compounds. At the physiological pH of blood, the concentration of carbonate is 1/1000 that of bicarbonate. The carbamino compounds are also present in such low quantities that they are generally not mentioned specifically.

The bicarbonate content of serum or plasma is a significant indicator of electrolyte dispersion and anion deficit. Together with pH determination, bicarbonate measurements are used in the diagnosis and treatment of numerous potentially serious disorders associated with acid-base imbalance in the respiratory and metabolic systems. Some of these conditions are diarrhea, renal tubular acidosis, carbonic anhydrase inhibitors, hyperkalemic acidosis, renal failure, and ketoacidosis.

Reference Values

Males
12-24 months: 17-25 mmol/L
3 years: 18-26 mmol/L
4-5 years: 19-27 mmol/L
6-7 years: 20-28 mmol/L
8-17 years: 21-29 mmol/L
> or =18 years: 22-29 mmol/L
Females
1-3 years: 18-25 mmol/L
4-5 years: 19-26 mmol/L
6-7 years: 20-27 mmol/L
8-9 years: 21-28 mmol/L
> or =10 years: 22-29 mmol/L

Reference values have not been established for patients that are <12 months of age.

Interpretation

Alterations of bicarbonate (HCO3) and carbon dioxide (CO2) dissolved in plasma are characteristic of acid-base imbalance. The nature of the imbalance cannot, however, be inferred from the bicarbonate value itself, and the determination of bicarbonate is rarely ordered alone. Its value has significance in the context of other electrolytes determined with it and in screening for electrolyte imbalance.

Cautions

Because the determination of bicarbonate (HCO3) actually includes dissolved carbon dioxide (CO2), this fraction will escape from the specimen into the air once the stopper is removed from the vacutainer tube. The rate of change in the

bicarbonate determination is approximately 6 mmol/L in the course of 1 hour. If the logistics in the lab are different for processing high-volume routine specimens from STAT specimens, the extent of the error is bicarbonate determinations will be different. This is due to the length of time between removal of the stopper and sampling of the specimen for analysis. Fortunately, the errors in either case are relatively small and of little concern clinically.

Clinical Reference

Tietz Textbook of Clinical Chemistry, Edited by Burtis and Ashwood. Philadelphia, PA, WB Saunders Company, 1994.

Performance

Method Description

This assay employs a photometric rate reaction. Bicarbonate (HCO[3](-)) reacts with phosphoenolpyruvate (PEP) in the presence of phosphoenolpyruvate carboxylase to produce oxaloacetate and phosphate. The oxaloacetate produced is coupled with NADH in the presence of malate dehydrogenase (MDH) to produce malate and NAD. The consumption of NADH causes a decrease in absorbance and is monitored in the UV range of 320-400 nm. The rate of change is directly proportional to the concentration of bicarbonate.(Package insert: Roche Bicarbonate reagent; Indianapolis, IN, July 2000)

PDF Report

No

Day(s) Performed

Monday through Saturday

Report Available

Same day/1 to 2 days

Performing Laboratory Location

Mayo Clinic Jacksonville Clinical Lab

Fees & Codes

Fees

- Authorized users can sign in to Test Prices for detailed fee information.
- Clients without access to Test Prices can contact Customer Service 24 hours a day, seven days a week.
- Prospective clients should contact their account representative. For assistance, contact Customer Service.

Test Classification

This test has been cleared, approved, or is exempt by the US Food and Drug Administration and is used per manufacturer's instructions. Performance characteristics were verified by Mayo Clinic in a manner consistent with CLIA requirements.

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Bicarbonate, Serum

CPT Code Information
82374

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
HCO3	Bicarbonate, S	1963-8

Result ID	Test Result Name	Result LOINC® Value
HCO3	Bicarbonate, S	1963-8