## Lab Dept: Chemistry

## Test Name: BETA-HYDROXYBUTYRATE

### *General Information*

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| **Lab Order Codes:** | BHBB |
| **Synonyms:** | B-hydroxybutyrate; Hydroxybutyrate, Beta; Ketone Bodies; BHB |
| **CPT Codes:** | 82010 – Acetone or other ketone bodies, serum; quantitative |
| **Test Includes:** | Beta-Hydroxybutyrate level reported in mmol/L. |

### *Logistics*

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| **Test Indications:** | Useful for diagnosis and monitoring of therapy for diabetic ketoacidosis and for any patient presenting to the emergency room with documented hypoglycemia, acidosis, alcohol ingestion or an unexplained increase in the anion gap.<br><br>In pediatric patients, the presence or absence of ketonemia/uria is an essential component in the differential diagnosis of inborn errors of metabolism.<br><br>Serum Beta-Hydroxybutyrate is a key parameter monitored during controlled 24-hour fasts when indicated. |
| **Lab Testing Sections:** | Chemistry |
| **Phone Numbers:** | MIN Lab: 612-813-6280<br><br>STP Lab: 651-220-6550 |
| **Test Availability:** | Daily, 24 hours |
| **Turnaround Time:** | 4 hours |
| **Special Instructions:** | N/A |

### *Specimen*

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| **Specimen Type:** | Blood |
| **Container:** | Green (Li heparin) top tube<br>Alternate tube: Red, marble or gold top tube |
| **Draw Volume:** | 1.5 mL (Minimum: 0.6 mL) blood |

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| **Processed Volume:** | 0.5 mL (Minimum: 0.2 mL) plasma/serum |
| **Collection:** | Routine venipuncture |
| **Special Processing:** | Lab Staff: Centrifuge specimen, remove plasma/serum aliquot into a plastic sample cup. Analyze immediately, or ship at 2-8 degrees C. |
| **Patient Preparation:** | The reference range was established on patients fasting for 9-12 hours prior to collection. |
| **Sample Rejection:** | Mislabeled or unlabeled specimens |

## *Interpretive*

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| **Reference Range:** | <0.27 mmol/L |
| | **Interpretation:** The BHB/acetoacetate ratio is typically between 3:1 and 7:1 in severe ketotic states. Serum BHB increases in response to fasting, but should not exceed 0.27 mmol/L following an overnight fast (up to 12 hours). In pediatric patients, a hypo- or hyper-ketotic state (without hypoglycemia) may suggest specific groups of metabolic disorders. |
| **Critical Values:** | N/A |
| **Limitations:** | 24-hour fasting tests should not be performed in patients <2 years old. |
| | Dipstick serum ketone determination using nitroprusside reagent is often used to estimate ketone body status, but that method has inherent problems. The dipstick does not measure BHB, the most abundant of the physiological ketone bodies; the nitroprusside reagent only reacts with acetoacetate and acetone. |
| **Methodology:** | Photometric, B-Hydroxybutyrate Dehydrogenase (B-HBDH) |
| **References:** | Stanbio Laboratory B-hydroxybutyrate LiquiColor Procedure # 2440 (02/04/2009) modified for Siemens Dimension RxL open channel, 1261 North Main Street, Boerne, TX 78006 |
| | Sena, Salvador F (7/2010) Technically Speaking, Danbury Hospital Department of Pathology and Laboratory Medicine, Vol 4, No. 8 |
| | Mayo Medical Laboratories (1/2012) online test catalogue |
| | Jacobs & DeMott Laboratory Test Handbook (2001) Lexi-Comp, Inc, Hudson, OH, 5th Edition, p.205 |

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| **Updates:** | 2/21/2012: Testing moved from Mayo Medical Laboratories to an inhouse test at Children's laboratory.<br>2/8/2016: Update alt tube types<br>8/9/2021: Test moved to Minneapolis campus.<br>9/1/2021: Testing performed on both campuses. |