Legacy Laboratory Services

New Test: Methylmalonic Acid in Serum or Plasma

June 2012

On May 1, 2012, Legacy Laboratory Services introduced methylmalonic acid (MMA) to our test menu. MMA determination in serum or plasma is commonly used to assess a patient's vitamin B12 (cobalamin) status. **In subclinical vitamin B12 deficiency, MMA is often the first analyte to be raised**. In addition, MMA can aid in the diagnosis of Methylmalonic Acidemia, a rare metabolic disorder found in newborns.

MMA is often raised in subclinical vitamin B12 deficiency.

Legacy measures the concentration of MMA by liquid chromatography/tandem mass spectrometry. The preferred specimen is serum or EDTA plasma. *Please note: Lithium heparin plasma will no longer be accepted.* Reference ranges will remain the same.

MMA is a metabolic intermediate in the conversion of propionyl-CoA to succinyl-CoA. Vitamin B12 is an essential co-factor that plays an important role in the conversion of L-methylmalonyl-CoA to succinyl-CoA. If there is a vitamin B12 deficiency, the patient will have a decreased conversion of L-methylmalonyl-CoA to succinyl-CoA. Elevated L-methylmalonyl-CoA raises the concentration of D-methylmalonyl-CoA, which in the presence of a hydrolase is converted into MMA.

Collection guidelines and reference ranges can be found in the following table. If you have further questions, please contact client services at (503) 413-1234.

For technical information, contact:

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LEGACY HEALTH

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Collection Guidelines

Description	Methylmalonic Acid, Serum or Plasma
Order Code	MMA S
Collect	Serum or EDTA plasma, collect one 7 mL red, 5 mL gold, or 4 mL lavender top tube.
Handling	Allow blood to clot completely at room temperature for a minimum of 30 minutes. Centrifuge and separate serum from cells within two hours of collection.
Preferred Volume	2 mL serum or EDTA plasma
Minimum Volume	1 mL serum or EDTA plasma
Transport	Refrigerated (2-8°C)
Rejection Criteria	Gross hemolysis, lithium heparin plasma
Performed	Sunday and Wednesday
Turn-around Time	1-5 days
Stability	After separation from cells: Temperature — Time Period Ambient (20-25°C) — 12 hours Refrigerated (2-8°C) — 7 days Frozen (≤ –20°C) — 2 weeks
Reference Ranges	MMA (umol/L) — Interpretation 0.00-0.40 µmol/L — **Normal** 0.41-0.99 µmol/L — **Slight elevation.** Consistent with mild vitamin B12 deficiency, renal insufficiency or intravascular volume contraction 1.00-9.99 µmol/L — **Moderate elevation.** Consistent with mild vitamin B12 deficiency ≥ 10.00 µmol/L — **Massive elevation.** Consistent with significant vitamin B12 deficiency or with inborn errors of metabolism

References

1. Burtis CA, Ashwood ER and Bruns DE, Eds. Tietz Textbook of Clinical Chemistry and Molecular Diagnostics; 4th ed. Elsevier-Saunders: St. Louis, 2006, pg. 1104-1105.
2. Elin RJ and Winter WE; Methylmalonic acid: A test whose time has come? Arch Pathol Lab Med 2001; 125, 824-827.
3. Allen RH, Stabler SP, Savage DG and Lindenbaum J; Diagnosis of cobalamin deficiency I: Usefulness of serum methylmalonic acid and total homocysteine concentrations, Am J Hematol 1990; 34, 90-98.

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