Overview

Useful For
Monitoring preeclampsia patients being treated with magnesium sulfate, although in most cases monitoring clinical signs (respiratory rate and deep tendon reflexes) is adequate and blood magnesium levels are not required.

Special Instructions
- Trace Metals Analysis Specimen Collection and Transport

Method Name
Colorimetric Assay

NY State Available
Yes

Specimen

Specimen Type
Serum

Specimen Required
Container/Tube:

Preferred: Serum gel
Acceptable: Red top

Specimen Volume: 0.5 mL

Collection Instructions:
1. See Trace Metals Analysis Specimen Collection and Transport in Special Instructions for complete instructions.
2. Serum gel tubes should be centrifuged within 2 hours of collection.
3. Red-top tubes should be centrifuged and aliquoted within 2 hours of collection.

Additional Information: If other metal tests are also desired when drawing for a serum magnesium level, the specimen must be drawn in a plain, royal blue-top Vacutainer plastic trace element blood collection tube (T184).

Specimen Minimum Volume
0.25 mL

Reject Due To

| Gross hemolysis | Reject |

Specimen Stability Information
Clinical and Interpretive

Clinical Information
Magnesium, along with potassium, is a major intracellular cation. Magnesium is a cofactor of many enzyme systems. All adenosine triphosphate (ATP)-dependent enzymatic reactions require magnesium as a cofactor. Approximately 70% of magnesium ions are stored in bone. The remainder is involved in intermediary metabolic processes; about 70% is present in free form while the other 30% is bound to proteins (especially albumin), citrates, phosphate, and other complex formers. The serum magnesium level is kept constant within very narrow limits. Regulation takes place mainly via the kidneys, primarily via the ascending loop of Henle.

Conditions that interfere with glomerular filtration result in retention of magnesium and, hence, elevation of serum concentrations. Hypermagnesemia is found in acute and chronic renal failure, magnesium overload, and magnesium release from the intracellular space. Mild-to-moderate hypermagnesemia may prolong atrioventricular conduction time. Magnesium toxicity may result in central nervous system (CNS) depression, cardiac arrest, and respiratory arrest.

Numerous studies have shown a correlation between magnesium deficiency and changes in calcium, potassium, and phosphate homeostasis, which are associated with cardiac disorders such as ventricular arrhythmias that cannot be treated by conventional therapy, increased sensitivity to digoxin, coronary artery spasms, and sudden death. Additional concurrent symptoms include neuromuscular and neuropsychiatric disorders. Conditions that have been associated with hypomagnesemia include chronic alcoholism, childhood malnutrition, lactation, malabsorption, acute pancreatitis, hypothyroidism, chronic glomerulonephritis, aldosteronism, and prolonged intravenous feeding.

Reference Values
0-2 years: 1.6-2.7 mg/dL
3-5 years: 1.6-2.6 mg/dL
6-8 years: 1.6-2.5 mg/dL
9-11 years: 1.6-2.4 mg/dL
12-17 years: 1.6-2.3 mg/dL
>17 years: 1.7-2.3 mg/dL

Interpretation
Symptoms of magnesium deficiency do not typically appear until levels are 1.0 mg/dL or lower.
Levels of 9.0 mg/dL or higher may be life-threatening.

Cautions
Serum or plasma magnesium concentration provides only an approximate guide to the presence or absence of magnesium deficiency. Hypomagnesemia reliably indicates magnesium deficiency, but its absence does not exclude
significant magnesium depletion. The concentration of magnesium in serum has not been shown to correlate with any other tissue pools of magnesium except interstitial fluid.

**Clinical Reference**


**Performance**

**Method Description**

In an alkaline solution, magnesium forms a purple complex with xylidyl blue, a diazonium salt. The magnesium concentration is measured photometrically via the decrease in the xylidyl blue absorbance. (Package insert: Magnesium, Roche, 2005)

**PDF Report**

No

**Day(s) and Time(s) Test Performed**

Monday through Sunday; Continuously

**Analytic Time**

Same day/1 day

**Maximum Laboratory Time**

2 days

**Specimen Retention Time**

1 week

**Performing Laboratory Location**

Rochester

**Fees and 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 Regional Manager. For assistance, contact Customer Service.

**Test Classification**

This test has been cleared, approved or is exempt by the U.S. 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.

**CPT Code Information**

83735

**LOINC® Information**
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