

Title **MAGNESIUM PROTOCOL**

Outcome Goal Nursing will administer appropriate Intravenous (IV) Magnesium Sulfate replacement to the patient based on serum magnesium levels.

Team Member Responsibilities Physician: Orders magnesium protocol.
RN: Administer IV magnesium as needed.

Supportive Data Magnesium is required for the use of adenosine triphosphate (ADP) as a source of energy. It is therefore necessary for the action of numerous enzyme systems such as carbohydrate metabolism, protein synthesis, nucleic acid synthesis, and contraction of muscular tissue. Along with sodium, potassium, and calcium ions, magnesium also regulates neuromuscular irritability and the clotting mechanism. The kidneys are the main regulator of magnesium.

Magnesium is primarily an intracellular ion (only about 1% of total body Magnesium is found in the blood). Serum magnesium levels are not always an accurate reflection of the total body magnesium stores. Normal Magnesium levels are 1.6-2.6 mg/dl.

Magnesium Sulfate replacement is a simple and safe treatment for hypomagnesemia. Hypomagnesemia is seen following GI disturbances (anorexia, malnutrition, diarrhea, etc.), with certain medications (Cisplatin, Cyclosporin, FK506), in patients with renal dysfunction, and in patients with suspected acute myocardial infarction and post cardiac surgery.

The most common side effects of replacement are flushing, hypotension, and local discomfort. Other adverse reactions include nausea and vomiting, bradycardia, conduction disturbances, loss of DTRs and CNS or respiratory depression.

Policy Refer to Labor and Delivery Policy and Procedure Manual for administering Magnesium Sulfate in the laboring patient.

A physician's order for Magnesium Sulfate replacement protocol is required. Magnesium Sulfate will be given within designated parameters.

A peripheral IV or central line infusion may be used. Check patency of IV access before administration.

An infusion pump must be used for all magnesium boluses.

Patients with serum creatinine levels greater than 2 will require physician approval before a magnesium dose is administered.

Protocol will not be started on any patient receiving hemodialysis.

Assess vital signs at baseline, 30 minutes after starting dose, after the dose is completed and as needed.

- No action is necessary for flushing of the skin (occurs in 1/3 of patients).
- Decrease magnesium IV rate to TKO and notify physician if hypotension occurs (this occurs in 2.5% of patients).
- Decrease magnesium IV rate to TKO and notify physician if nausea and/or vomiting or respiratory depression occurs.

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Serum Magnesium level	Replacement- IV Magnesium Sulfate*	Repeat Lab Draw
2 mg/dl or greater	None	ICU – every other day Floor – per physician's order
1.5-1.9 mg/dl	2 grams over two hours IV	Next lab draw or in AM next day
1.2-1.4 mg/dl	3 grams over three hours IV	Next lab draw or in AM next day
0.9-1.1 mg/dl	4 grams over four hours IV	Next lab draw or in AM next day
Less than 0.9 mg/dl	Start 4 grams over four hours IV. Notify physician.	Next lab draw or in AM next day

* May give 2 grams of magnesium over 30-60 minutes in critical care setting.

Equipment / Supplies
 Pre-Mixed Magnesium bolus
 Infusion pump

Patient / Family Education
 Educate patient on family regarding need for medication.

Documentation
 Magnesium Sulfate dose and time will be documented on the Medical Administration Record (MAR).
 Document vital signs and patient tolerance in nurses' notes/graphics sheet.

Related Procedures
 Labor and Delivery Policy and Procedure

References
 Fischbach, F.T. (2004). Manual of Laboratory & Diagnostic Tests, 7th Ed. Lippincott Williams & Wilkins. Accessed on July 11th, 2005 on <http://gateway.ut.ovid.com/gw1/ovidweb.cgi>

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