

MAGNESIUM SULPHATE

Class: Anticonvulsant, Miscellaneous; Electrolyte Supplement

Indications: Treatment and prevention of hypomagnesemia; prevention and treatment of seizures in severe pre-eclampsia or eclampsia, pediatric acute nephritis; torsade de pointes; treatment of cardiac arrhythmias (VT/VF) caused by hypomagnesemia. OTC labeling: Soaking aid for minor cuts and bruises; laxative for the relief of occasional constipation. Asthma exacerbation (life-threatening) unresponsive to 1 hour intensive conventional treatment

Available dosage form in the hospital: 10%, 10 ML/AMP, 50% AMP

Dosage: Dose represented as magnesium sulfate unless stated otherwise. **Note:** Serum magnesium is poor reflection of repletion status as the majority of magnesium is intracellular; serum concentrations may be transiently normal for a few hours after a dose is given, therefore, aim for consistently high normal serum concentrations in patients with normal renal function for most efficient repletion. **Note:** 1 g of magnesium sulfate = 98.6 mg elemental magnesium = 8.12 mEq elemental magnesium

-Hypomagnesemia:

-Mild deficiency: I.M.: 1 g every 6 hours for 4 doses, or as indicated by serum magnesium concentrations

-Mild-to-moderate (serum concentration 1-1.5 mg/dL): I.V.: 1-4 g (up to 0.125 g/kg), administer at ≤ 1 g/hour if asymptomatic; do not exceed 12 g over 12 hours (Kraft, 2005). **Note:** Additional supplementation may be required after the initial dose with replenishment occurring over several days.

- Severe deficiency:

-I.M: Up to 250 mg/kg within a 4-hour period

-I.V.: Severe (< 1 mg/dL): 4-8 g (up to 0.1875 g/kg), administer at ≤ 1 g/hour if asymptomatic; in symptomatic patients, may administer ≤ 4 g over 4-5 minutes .

-With polymorphic VT (including torsade de pointes): I.V. push: 1-2 g .

-Obesity: Weight $> 130\%$ of ideal body weight (IBW) or body mass index (BMI) ≥ 30 kg/m²: When determining maximum per kg dose for replacement, some clinicians suggest using adjusted body weight (AdjBW) .

AdjBW (men) = ([wt (kg) -IBW (kg)] x 0.3) + IBW

AdjBW (women) = ([wt (kg) -IBW (kg)] x 0.25) + IBW

-Eclampsia/preeclampsia (severe): I.V.: An initial total dose of 10-14 g administered as follows: 4-5 g infusion with simultaneous I.M. injections of 4-5 g in each buttock. After the initial I.V. dose, may administer a 1-2 g/hour continuous infusion or may follow with I.M. doses of 4-5 g in each buttock every 4 hours. Maximum: 40 g/24 hours .I.V. use for pre-eclampsia/eclampsia is contraindicated during the 2 hours prior to delivery.

-Alternate dosing (unlabeled): I.V.: 4-6 g over 15-20 minutes followed by 2 g/hour continuous infusion (ACOG, 2002)

-Laxative: Oral: 2-6 teaspoons of granules dissolved in water once daily

-Parenteral nutrition supplementation: I.V.: 8-24 mEq elemental magnesium daily

-Soaking aid: Topical: Dissolve 2 cupfuls of granules per gallon of warm water

-Asthma (unlabeled use): I.V: 2 g

-Torsade de pointes or VF/pulseless VT associated with torsade de pointes : I.V., I.O.: 1-2 g over 15 minutes

-RDA: Adults

-19-30 years:

-Females: 310 mg elemental magnesium daily

-Pregnant females: 350 mg elemental magnesium daily.

-Breast-feeding females: 310 mg elemental magnesium daily

-Males: 400 mg elemental magnesium daily

-Adults \geq 31 years:

-Females: 320 mg elemental magnesium daily

-Pregnant females: 360 mg elemental magnesium daily.

-Breast-feeding females: 320 mg elemental magnesium daily

-Males: 420 mg elemental magnesium daily

Common side effect: Cardiovascular: Flushing (I.V.; dose related), hypotension (I.V.; rate related), vasodilation (I.V.; rate related)

Endocrine & metabolic: Hypermagnesemia

Pregnancy Risk Factor: D