

RX

Drug Name: Magnesium Sulfate

Trade Name: Mag, Mag Sulfate, MgSO₄, Mg⁺⁺

Class:

- Antidysrhythmic
- Anticonvulsant
- CNS Depressant

Mechanism of Action:

- Anticonvulsant properties—reduces striated muscle contractions and blocks peripheral neuromuscular transmission by reducing acetylcholine release at the myoneural junction
- Antidysrhythmic properties—Physiological calcium channel blocker. Reduces SA node impulse formation, prolongs conduction time in myocardium

Indications:

- *The 2000 ECC/AHA guidelines conclude that IV magnesium during cardiopulmonary resuscitation has shown effectiveness only for the treatment of patients with hypomagnesemic states or polymorphic ventricular tachyarrhythmia (torsade de pointes)*
- Refractory VF, VT (with or without a pulse) (*if hypomagnesemia is suspected*)
- Refractory ventricular ectopy (*if hypomagnesemia is suspected*)
- TDP (*treatment of choice*)
- Seizure prevention and control in preeclampsia and eclampsia (*treatment of choice*)
- Suspected hypomagnesemia
- Status asthmaticus not responsive to β agonists or anticholinergics.

Contraindications:

- Heart block
- MI
- Hypermagnesemia

Precautions:

Renal insufficiency

Dosage:

Adults:

Refractory VT, VF, TDP, Refractory Bronchospasm: IV: 2 g every 5 minutes, 1st line for Torsades or refractory V-Fib/Pulseless V-Tach. Take 2 g (4cc), dilute to a total of 20 cc to make 10% solution. Do not give faster than 1 g/minute

Preeclampsia, — IV: 4 g over 20 minutes, repeat as needed. Take 4 g, Dilute to 100 cc. Do not give faster than 1 g/minute. Maintenance Infusion: 10 g/250cc NS, run at 50cc/hr (2 g/hr)

Eclamptic Seizures — IV: 4 g over 5 minutes, repeat as needed. Take 4 g, Dilute to 100 cc. Do not give faster than 1 g/minute. Maintenance Infusion: 10 g/250cc NS, run at 50cc/hr (2 g/hr)

Pediatrics:

Refractory VT, VF, TDP, Refractory Bronchospasm 25-50 mg/kg in 100 cc Buretrol over 2-5 minutes, MAX 2 GM

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Onset:

IV—Immediate
IM--3-4 hours

Duration:

IV—30-60 minutes
IM--3-4 hours

Side Effects:

Flushing/Sweating	Cardiac arrest
Itching/Rash	Circulatory collapse
Hypothermia	Complete heart block
Drowsiness	Flaccid paralysis
Respiratory depression	Absence of knee jerk
Respiratory failure	Hypotension, Diaphoresis
Bradycardia/AV block	

Interactions:

Incompatible--alcohol, salicylates, sodium bicarbonate
Additive effects can occur with other CNS depressants
Concurrent use with nifedepine in the treatment of maternal hypertension can cause increased hypotension or pronounced muscle weakness & may harm the fetus
Can cause cardiac conduction abnormalities when used in conjunction with cardiac glycosides

PEARLS

*In some case of TDP--5-9 g have been required.
As a smooth muscle relaxant, it is also a potentially effective 2nd line intervention in cases of severe, refractory bronchospasm secondary to Asthma.
Use aggressively in the setting of eclampsia. If eclamptic seizures are refractory to Mag Sulfate, then proceed to benzodiazepines.*