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 tachyardia (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 Broncheospasm**: 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 Broncheospasm** 25-50 mg/kg in 100 cc Buretrol over 2-5 minutes, MAX 2 GM
DRUG: MAGNESIUM SULFATE

Onset:
- IV—Immediate
- IM--3-4 hours

Duration:
- IV—30-60 minutes
- IM--3-4 hours

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

Interactions:
- Incompatible--alcohol, salicylates, sodium bicarbonate
- Additive effects can occur with other CNS depressants
- Concurrent use with nifedipine 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.