

# MAGNESIUM SULFATE

<b>DRUG CLASSIFICATION</b>	Class V Antiarrhythmic Magnesium Salt Electrolyte Voltage-Dependent Calcium Channel Inhibitor Anti-Inflammatory Agent / Anticonvulsant Agent
<b>MECHANISM OF ACTION</b>	Reduces striated muscle contractions and blocks peripheral neuromuscular transmission by reducing acetylcholine release at the myoneural junction. Acts on myocardia by slowing rate of SA node impulse formation, prolonging conduction time. Additionally, Magnesium inhibits Ca <sup>2+</sup> influx through dihydropyridine-sensitive, voltage-dependent channels. This accounts for much of its relaxant action on vascular smooth muscle. Causes relaxation of bronchial smooth muscle independent of serum magnesium concentration.
<b>CLINICAL INDICATIONS</b>	Polymorphic Wide-Complex Tachycardia / Torsades de Pointes Ventricular Fibrillation; Pulseless Ventricular Tachycardia Respiratory Distress Accompanied by Wheezing and / or Stridor Obstetrical Emergency with Seizure Activity
<b>STANDARD CONTRAINDICATIONS</b>	Hypersensitivity to Magnesium Sulfate or Relative Components
<b>POTENTIAL ADVERSE EFFECTS</b>	Atypical Neuromuscular Function in Neuromuscular Disease / Flushing / Hypotension / Vasodilation / Hypermagnesemia
<b>GENERAL RISKS &amp; PRECAUTION</b>	<b>1)</b> Use with extreme caution in the presence of mild-to-severe levels of heart block and / or myocardial damage. <b>2)</b> Use with extreme caution in patients with myasthenia gravis or other neuromuscular disease. <b>3)</b> Use with caution in patients with renal impairment; accumulation of magnesium may lead to magnesium intoxication. <b>4)</b> Magnesium Sulfate administration may be ineffective in terminating irregular or polymorphic VT with normal baseline QT interval. <b>5)</b> Concurrent hypokalemia or hypocalcemia can accompany a magnesium deficit. <b>6)</b> Magnesium toxicity can lead to fatal cardiovascular arrest and / or respiratory paralysis. <b>7)</b> Consider Magnesium Sulfate with no improvement and/ or impending respiratory failure. Likely more effective with asthmatic exacerbation and less so with COPD exacerbation. <b>8)</b> QT length < 500 msec: Arrhythmia more likely related to ischemia or infarction and Magnesium not likely helpful. <b>9)</b> Magnesium Sulfate is not routinely recommended during cardiac arrest, but may help with Torsades de points, prolonged QT, low Magnesium States (malnourished / alcoholic), and suspected digitalis toxicity
<b>PROTOCOL INDEX</b>	Adult Polymorphic Tachycardia; Wide Complex / Torsades de Pointes (AC-8) Ventricular Fibrillation; Pulseless Ventricular Tachycardia (AC-9) Adult COPD / Asthma Respiratory Distress (AR-4) Pediatric Asthma Respiratory Distress (AR-7) Obstetrical Emergency (AO-3)

## MEDICATION ADMINISTRATION

### ADULT

### PEDIATRIC

**Polymorphic Tachycardia; Wide Complex (QT-Interval > 500 milliseconds)**  
2 g [IV/IO]; Infuse over 5-10 minutes. May Repeat 2 g [IV/IO]; (Maximum: 4 g)  
See AC-8 Notes for Infusion Instructions.

**Ventricular Fibrillation; Pulseless Ventricular Tachycardia (Refractory)**  
2 g [IV/IO]; Infuse over 10 minutes.  
See AC-9 Notes for Infusion Instructions

**Obstetrical Emergency with Seizure Activity**  
2 g [IV/IO]; Infuse over 2-3 minutes; May repeat once. (Maximum: 4 g)  
See AO-3 Notes for Infusion Instructions

**Adult COPD / Asthma Respiratory Distress (Wheezing and/or Stridor)**  
2 g [IV/IO]; Infuse over 10-20 minutes.  
See AR-4 Notes for Infusion Instructions.

**Pediatric Asthma / Croup Respiratory Distress (Wheezing and/or Stridor)**  
40 mg / kg [IV/IO]; Infuse over 10-20 minutes. (Maximum Dose: 2 g)  
See AR-7 Notes for Infusion Instructions.