

## Magnesium Sulfate

Magnesium sulfate is a CNS depressant medication that inhibits release of acetylcholine at neuromuscular junctions. This inhibition prevents skeletal and uterine muscle contraction. Magnesium sulfate is indicated for preterm labor contractions and the treatment of preeclampsia. Side effects may include a warm feeling, hypotension, decreased deep tendon reflexes, decreased respiratory rate, decreased urine output, and paralytic ileus. The antidote for magnesium sulfate is calcium gluconate.



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### Mechanism

#### Muscle Relaxant

##### Muscle-man Masseuse

Magnesium sulfate functions as a muscle relaxant and depresses the central nervous system by stopping the release of acetylcholine. This results in decreased neuromuscular irritability and cardiac conduction. This action resolves preterm labor contractions by relaxing the uterus. In addition, by depressing the CNS, magnesium sulfate can decrease hyperreflexia and prevent the onset of seizures from eclampsia.

### Indications

#### Preterm Labor Contractions

##### Pre-timer Uterus Flexing

As a muscle relaxant, magnesium sulfate relaxes the uterine muscle and resolves preterm labor contractions.

#### Preeclampsia

##### Pre-E-clamp

Magnesium sulfate functions as a muscle relaxant and is often used for treatment of preeclampsia and prevention of eclampsia. Magnesium sulfate decreases the presence of hyperreflexia and lowers the risk of the development of seizures.

### Side Effects

#### Warm Feeling

##### Warming Heater

Intravenous magnesium sulfate should be administered slowly, because it can cause a warm feeling upon administration. In addition, due to the vasodilator effects, the patient may experience flushing.

#### Hypotension

##### Hippo-BP

At high levels, magnesium sulfate may produce hypotension due to its vasodilator effects. The patient will present with low blood pressure and flushing, and may have pulmonary edema or a headache. Be sure to closely monitor the patient's blood pressure and cardiac rhythm.

### Decreased Deep Tendon Reflexes (DTRS)

#### [Down-arrow DTR-reflex-hammer](#)

Magnesium sulfate relaxes the central nervous system, and therefore decreases hyperreflexia. This may result in decreased deep tendon reflexes. This patient should be assessed for skeletal muscle weakness and hypotonia.

### Decreased Respiratory Rate

#### [Down-arrow Lungs](#)

Magnesium sulfate functions by decreasing the central nervous system, which can result in respiratory depression. The woman may start breathing at a slower rate and should be monitored for signs of hypoxemia.

### Decreased Urine Output

#### [Down-arrow Urinal](#)

Magnesium sulfate increases the risk of developing hypotension, a decreased cardiac output and decreased urine output. Decreased urine output can occur when renal perfusion decreases as a result of lowered blood pressure and cardiac output. It is important to monitor urine output because if it decreases, the patient could develop magnesium toxicity.

### Paralytic Ileus

#### [Wheelchair Eels](#)

At high doses, parenteral administration of magnesium sulfate has been associated with the development of a paralytic ileus, although this is a rare side effect.

## Antidote

### Calcium Gluconate

#### [Calcium-cow with Glue-cone](#)

Calcium gluconate should be administered quickly, if magnesium toxicity is determined. Magnesium toxicity may lead to cardiac arrest and respiratory depression. Calcium produces the opposite effect of magnesium and increases muscle contractions, making it the antidote to magnesium toxicity.