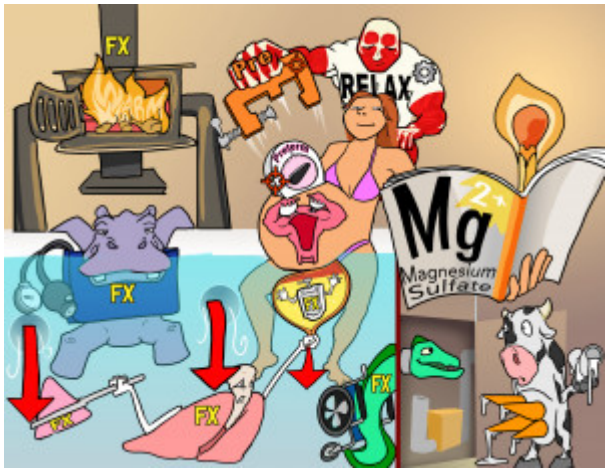
Magnesium Sulfate

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.



PLAY PICMONIC

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. A decrease in neuromuscular irritability and cardiac conduction support resolving preterm labor contractions by relaxing the uterus. Additionally, 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 has vasodilatory effects and a potential to elicit a warm feeling upon administration. To mitigate these adverse reactions, it should be administered slowly.

Hypotension

Hippo-BP

At high levels, magnesium sulfate may produce hypotension due to its vasodilator effects, potentially worsening pulmonary edema or headaches. 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, decreases hyperreflexia and may result in decreased deep tendon reflexes. The patient should be assessed for skeletal muscle weakness and hypotonia.

Decreased Respiratory Rate

Down-arrow Lungs

Magnesium sulfate causes respiratory depression as a result of its impact on the central nervous system. A slower respiratory rate can contribute to hypercapnia and hypoxemia.

Decreased Urine Output

Down-arrow Urinal

Magnesium sulfate increases incidence of hypotension leading to decreased cardiac and urine output. Urine output decreases when renal perfusion is altered as a result of lowered blood pressure and cardiac output. Magnesium toxicity can develop if the kidneys cannot effectively manage magnesium in the bloodstream due to falling renal perfusion.

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

Magnesium toxicity is managed through administration of intravenous calcium gluconate. Untreated magnesium toxicity may lead to cardiac arrest. Calcium opposes the effect of magnesium: increasing muscular contractions and reversing the effect of hypermagnesemia.