

## **Magnesium Sulfate Infusion Therapy, Pre-eclampsia**

### **Purpose:**

Magnesium sulfate should be used for the prevention and treatment of seizures in women with severe preeclampsia or eclampsia.

### **Scope:**

Caring for the pre-eclamptic woman needing magnesium therapy to prevent seizures.

### **1.0 Guideline:**

- 1.1. Before beginning any infusion of magnesium sulfate, the primary RN will obtain baseline vital signs (temperature, pulse, respirations, blood pressure, and O<sub>2</sub> saturation).
  - 1.1.1. Baseline fetal heart rate (FHR), deep tendon reflexes (DTRs), clonus, bilateral breath sounds, urinary output, and activity will be assessed and documented in the Electronic Health Record (EHR).
  - 1.1.2. Include assessment of epigastric pain, visual disturbances, edema, headache, level of consciousness, and lung auscultation prior to start of infusion and every 2 hours throughout infusion or more frequently as condition indicates.
  - 1.1.3. Fetal heart rate and uterine activity assessment per the Electronic Fetal Monitoring (EFM) Guideline.
  - 1.1.4. Temperature is assessed every 4 hours, unless rupture of membranes. Once membranes have ruptured, temperature will be assessed every 2 hours. If febrile ( $\geq 100.4$ ) provider will be notified and temperature will be assessed hourly thereafter.
  - 1.1.5. Strict intake and output will be assessed throughout the magnesium sulfate infusion.
    - 1.1.5.1. Record urinary output at least every 1 hour if Foley catheter is in place. Otherwise, measure and record all voids.
    - 1.1.5.2. Urine output should be at least 30 mL/hour while administering magnesium sulfate. If less, notify provider of decreased urine output.

1.1.5.3. Maintain fluid restriction per MD order.

- 1.2. Draw laboratory studies per provider order.
- 1.3. Insert Foley catheter per provider order.
- 1.4. Start primary line (mainline IV), per provider order, via infusion pump.
  - 1.4.1. To improve safety while infusing a high risk medication, program the magnesium sulfate infusion on a separate, independent pump chamber using the IV Guardrails mechanism on the IV pump.
  - 1.4.2. Attach a drip chamber (burette) for magnesium sulfate when setting up the infusion.
  - 1.4.3. Appropriately label the high risk medication, the pump chamber, and the tubing to avoid an accidental bolus of magnesium sulfate.
- 1.5. Obtain bag of magnesium sulfate, 4 gm/100 mL (1gm=25mL), from the medication room Pyxis for administration of the initial bolus dose.
  - 1.5.1. Obtain a bag of the maintenance infusion magnesium sulfate (10gm/250mL) from the medication Pyxis to have ready and available for when the initial bolus is complete.
- 1.6. Apply the pulse oximeter to the patient's finger or toe, for continuous use, while receiving the magnesium sulfate infusion.
- 1.7. Bolus Infusion:
  - 1.7.1. Attach the magnesium sulfate tubing to the port closest to the IV site unless oxytocin is infusing.
    - 1.7.1.1. Oxytocin will be connected to the port closest to the IV site and magnesium sulfate to the port that is second closest.
    - 1.7.1.1. Ensure the label indicating the contents of the high risk medication being infused is visible nearest to the port in which it is attached.
  - 1.7.2. A 2<sup>nd</sup> RN trained in magnesium sulfate infusion must verify the IV medication, dose, rate of infusion, IV line set up and labeling prior to initiating the infusion.

- 1.7.2.1. The 2<sup>nd</sup> RN signs as witness in the medication administration record (MAR) within the EHR.
    - 1.7.2.2. After verification, infuse the bolus per provider order (usual bolus = 4gms. to 6 gms. over 20-30 minutes) via infusion pump with appropriate use of IV Guardrails as a safety mechanism.
    - 1.7.2.3. **While administering the bolus dose, a registered nurse (RN) will remain with the patient during the entire bolus administration.**
  - 1.7.3. Educate the patient and family members, if present, that with the initial bolus dose, it is not uncommon to experience untoward side effects such as warmth, flushing, nausea etc.
    - 1.7.3.1. Document in EHR.
    - 1.7.3.2. Provide supplies such as an emesis basin or cool cloth for patient use as needed.
  - 1.7.4. Record blood pressure, pulse, respirations and O2 saturation every 5 minutes during bolus dose.
- 1.8. Maintenance Infusion:
  - 1.8.1. After completion of the bolus dose, the maintenance infusion is started using the premixed bag of 10 grams magnesium sulfate in 250 mL fluid (*concentration = 1 gm./25mL*).
    - 1.8.1.1. Requires a 2<sup>nd</sup> trained RN to verify prior to beginning infusion.
  - 1.8.2. Ensure the drip chamber (burette) remains attached to the magnesium sulfate infusion. Continue to infuse through a separate infusion pump chamber, programmed independent from the mainline.
  - 1.8.3. Program the pump to infuse at the appropriate rate following the bolus, per provider orders (usually 2 gm/hr or 50 mL/hr).
    - 1.8.3.1. Program using the IV Guardrail mechanism for safety.
  - 1.8.4. Monitor and record vital signs (blood pressure, pulse, respirations, O2 saturation) every 1 hour x's 8 hours after maintenance infusion is started and vital signs for bolus infusion are complete.

1.8.4.1. If respiratory rate < 12 breaths/min, draw magnesium level, notify MD, and observe closely.

1.8.4.2. Include assessment of DTRs, clonus, breath sounds, and level of consciousness with vital signs.

1.8.4.2. If after 8 hours, the patient condition is stable, you may record blood pressure, pulse, respirations, O2 saturation, DTR's and clonus every 2 hours unless otherwise ordered by a provider.

1.9. **NOTE:** for more stringent fluid restriction, pharmacy may mix 50 gms of magnesium sulfate in 400 mL of fluid (*concentration = 1 gm./10mL*).

1.10. Monitor for signs and symptoms of magnesium sulfate toxicity (ie. hypotension, areflexia (loss of DTRs), respiratory depression, respiratory arrest, oliguria, shortness of breath, chest pains, slurred speech, hypothermia, confusion, circulatory collapse).

1.10.1. Depression of DTRs occurs at serum concentrations lower than those associated with adverse cardiopulmonary effects. The presence of DTRs indicates magnesium levels that are not too high.

1.10.2. **Too rapid administration may cause cardiac arrest.**

1.10.3. **SERUM MAGNESIUM LEVELS AND ASSOCIATED EFFECTS:**

Effects	Serum Level (mg/dL)
Anticonvulsant prophylaxis	5-8
Electrocardiographic changes	5-10
Loss of deep tendon reflexes	8-12
Somnolence	10-12
Slurred speech	10-12
Muscular paralysis	15-17
Respiratory difficulty	15-17
Cardiac arrest	20-35

1.11. Inform staff and visitors of the need to maintain a quiet, dark environment, and avoidance of excessive visitation and environmental stimulation.

1.12. Continuous fetal monitoring if in labor, unless otherwise directed by provider order.

1.13. Maintain strict bed-rest, unless otherwise ordered

- 1.14. Maintain seizure precautions (ie. side-rails up).
- 1.15. Continue assessment and magnesium sulfate infusion for 12-24 hours post-delivery, or as ordered by provider, for prophylaxis against postpartum seizure.
- 1.16. **NOTE:** Calcium gluconate is the antidote used to treat the cardiac and respiratory adverse effects which may result from magnesium toxicity. It is located in medication Pyxis. The usual dose is 1 Gm. IV over 3 minutes

## **2.0 References:**

- 2.1. ANMC guidelines for management of hypertensive disorders of pregnancy.  
[http://home1.anmc.org/qaweb/Guidelines/All\\_Guidelines/htnguidelines03.pdf?CFID=13878563&CFTOKEN=493a28c3dc2b50b8-8FF24519-C29E-D37D-63DBD9ECA788B476](http://home1.anmc.org/qaweb/Guidelines/All_Guidelines/htnguidelines03.pdf?CFID=13878563&CFTOKEN=493a28c3dc2b50b8-8FF24519-C29E-D37D-63DBD9ECA788B476)
- 2.2. ACOG:Diagnosis and management of preeclampsia and eclampsia. ACOG Practice Bulletin No. 33.American College of Obstetricians and Gynecologists. Obstet Gynecol 2002;99:159-167Reaffirmed 2010 (Level III) [http://www.acog.com/publications/educational\\_bulletins/pb033.htm](http://www.acog.com/publications/educational_bulletins/pb033.htm)
- 2.3. Creehan, P.A., & Rice Simpson, K. (2014). AWHONN Perinatal Nursing, 4<sup>th</sup> Ed. Philadelphia. Lippincott Williams & Wilkins, pg. 135-141.

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