Approved by Quality & Patient Care Committee
17 May 2018

MAGNESIUM SULPHATE FOR ECLAMPSIA OR ECLAMPSIA PROPHYLAXIS

This LOP is developed to guide clinical practice at the Royal Hospital for Women. Individual patient circumstances may mean that practice diverges from this LOP.

> Note: The additional LOP: Magnesium sulphate prior to preterm birth for fetal neuroprotection is available. Do not use both policies at the same time.

1. AIM

To safely administer magnesium sulphate for eclampsia or eclampsia prophylaxis.

2. PATIENT

Patients with eclampsia
Patients who require eclampsia prophylaxis

3. STAFF

Nursing and midwifery staff
Medical officers

4. EQUIPMENT

Magnesium sulphate 4 g in 100 mL sodium chloride 0.9%

5. CLINICAL PRACTICE

DOSAGE AND ADMINISTRATION:
Prophylaxis in women with severe pre-eclampsia:

- Administer Magnesium Sulphate intravenously via either a central or peripheral line using an infusion pump.
- Intravenous line should not be used to inject any other drugs.
- Check expiry date of premix bags prior to administration.
- **Loading Dose:** Infuse 4 g Magnesium Sulphate (100 mL premixed bag) over 20 minutes via an infusion pump.
- **Maintenance Dose:** Infuse premix bag of Magnesuim Sulphate at 1 g/hr (25mL/hr of the premixed bag).
- Magnesium Sulphate infusion (in most cases) should continue for at least 24 hours after commencement.
- Attached chart should be used to document blood levels and observations.
- Adjust dosage as per regular plasma Magnesium levels.
- Check Magnesium level **one** hour after loading dose has been commenced and then **six** hourly thereafter, and in the event of any signs or symptoms of toxicity.
- Do not collect blood for serum levels from the limb receiving the infusion.
- Normal therapeutic levels are 1.5-3.5mmol/L. Toxic range 4-8mmol/L.
- Increase dose by 12.5 mL/hr (0.5g/hr) if level is sub therapeutic ie <1.5 mmol/L.
- Cease infusion if level above 4.0mmol/L and contact Dr for review.

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MAGNESIUM SULPHATE FOR ECLAMPSIA OR ECLAMPSIA PROPHYLAXIS cont'd

Eclampsia Management

- Control the airway.
- Control hypertension.
- Control convulsions – commence Magnesium Sulphate infusion as per protocol for prophylaxis.
- If further seizures occur after the commencement of the infusion take blood for urgent magnesium level and give a further bolus of 2 g Magnesium Sulphate over 20 minutes intravenously (50mL of the premixed bag). Follow with infusion at 1 g Magnesium Sulphate (25mL/hr of the premixed bag).
- If seizures are not controlled, Midazolam 2 mg to 5 mg as second line agent may be given.

ADVERSE EFFECTS:
Mild: Flushing of the skin (hands, face and neck), sensation of pain or warmth in arm, and nausea (common).
More Severe: Respiratory depression, loss of reflexes, muscle paralysis, blurred or double vision, slurred speech /sleepy, cardiac conduction changes, cardiac arrest.

TOXICITY:

- **C*linical monitoring is the prime method of assessing for toxicity*.** Blood levels are complimentary to this monitoring.

Significant toxicity can be treated with 1 g Calcium Chloride or Calcium Gluconate (10 mL in 10% w/v solution) by slow intravenous injection over three minutes.

Calcium chloride vials are available in the cardiac arrest trolleys.

PRECAUTIONS:
Administration of Magnesium Sulphate may have the following additional effects:

- Lower blood pressure (secondary to vasodilation). The dose of any current antihypertensive medication may require adjustment.
- Tocolysis.
- Decrease fetal heart rate variability.
- May cause loss of reflexes prior to toxic serum levels of magnesium are reached.
- Should be used with caution in the presence of calcium antagonists or other respiratory depressants (e.g. diazepam).
- Enhance the effects of muscle relaxants.

MAGNESIUM SULPHATE FOR ECLAMPSIA OR ECLAMPSIA PROPHYLAXIS cont'd

CONTRAINDICATIONS:
***Magnesium sulphate can be extremely hazardous in the following circumstances**:*

- Oliguria or renal failure (magnesium concentration can reach toxic levels as elimination is predominantly renal).
- Hypocalcaemic states.
- Myasthenia gravis.
- Cardiac conditions, in particular conduction problems or myocardial damage.

DRUG COMPATIBILITIES:
Aciclovir, amifostine, amikacin, ampicillin, aztreonam, bivalirudin, caspofungin, cefotaxime, cefoxitin, cephazolin, chloramphenicol, cisatracurium, dexmedetomidine, doripenem, esmolol, gentamicin, granisetron, heparin sodium, hydrocortisone sodium succinate, labetalol, linezolid, metronidazole, milrinone, morphine sulfate, piperacillin-tazobactam (EDTA-free), potassium chloride, remifentanil, sodium nitroprusside, trimethoprim-sulfamethoxazole, vancomycin.

OBSERVATIONS: Close observation and assessment (maternal and fetal) is required for the duration of the infusion. When the patient's condition is unstable, the frequency of the observations will need to be increased.

- Initial observations, done at '0' hour include blood pressure, respiration rate, pulse, temperature and reflexes.
- **Hourly blood pressure**: cease infusion if blood pressure < 110/70mmHg.
- **Hourly respirations**: cease infusion if respiratory rate <10 breaths per minute.
- **Hourly pulse.**
- **Hourly tendon reflexes usually knee reflexes but upper limbs if epidural or spinal anaesthetic in place**: cease infusion if unable to elicit reflexes.
- **Hourly urine output:** cease infusion if urine output < 30 mL per hour for three consecutive hours.
- Fetal heart rate monitoring as clinically indicated.
- Measure temperature every 4 hours.
- Check magnesium level one hour after loading dose and then six hourly thereafter.
- Check magnesium level if there are any signs or symptoms of toxicity.
- Record all observations on attached chart.

CESSATION

- Continue infusion for 24 hours following delivery or post last seizure or as per Consultant Physician or Obstetrician.

6. DOCUMENTATION
NSW Health fluid chart
Integrated clinical notes

7. EDUCATIONAL NOTES

- Eclampsia is defined as the occurrence of de-novo convulsions in pregnancy. Incidence: 1:2000 women in developed countries.
- Magnesium sulphate acts at the cellular level competing with calcium for entry into the cell at time of depolarization, therefore possibly reducing the excitability of cells and vasospasm of vessels. Its mode of action in eclampsia and pre-eclampsia is poorly understood.
- Magnesium sulphate is excreted by the kidneys; therefore the therapeutic level will depend on the woman's renal function.
- The recent Magpie Trail demonstrated that magnesium sulphate compared to a placebo reduced the risk of fitting by half, among 10,000 women in 33 countries worldwide.

LOCAL OPERATING PROCEDURE

CLINICAL POLICIES, PROCEDURES & GUIDELINES

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MAGNESIUM SULPHATE FOR ECLAMPSIA OR ECLAMPSIA PROPHYLAXIS cont'd

8. RELATED POLICIES/ PROCEDURES

- Hypertension – Management in Pregnancy
- Hypertension -(severe and/or urgent) in Pregnancy guideline
- Eclampsia- management of
- Magnesium sulphate prior to preterm birth for fetal neuroprotection

9. RISK RATING

High- review in 2 years

10. NATIONAL STANDARD

Medication Safety− NSQHSS Standard 4

11. REFERENCES

- American Academy of Family Physicians. Medical Complications of Pregnancy. *Advanced Life Support in Obstetrics* - Course Syllabus: Part one, pp 5-11.
- Lowe SA. Brown MA. Dekker Guidelines for the management of hypertensive disorders of pregnancy 2008. Aust NZ J Obstet Gynaecol. 49(3):242-6, 2009 Jun. [http://www.somanz.org/pdfs/somanz_guidelines_2008.pdf]
- NSW Health Procedure October 2011 Management of Hypertensive disorders of Pregnancy.
- Sibai, B. M 2003 Diagnosis and Management of Gestational Hypertension and Preeclamsia.
- *The American College of Obstetricians and Gynaecologists vol. 102, no 1, pp-181-191.*
- The Magpie Trial Collaboration Group. Do women with pre-eclampsia, and their babies, benefit from magnesium sulphate? The Magpie Trial: a randomised placebo-controlled trial. *Lancet* 2002; 359(9321): 1877-90.
- Australian Injectable Drugs Handbook, 6th Edition, Society of Hospital Pharmacists of Australia 2014.

REVISION & APPROVAL HISTORY

Reviewed and endorsed Therapeutic & Drug Utilisation Committee 11/4/18
Approved Quality & Patient Care Committee 4/2/16
Reviewed and endorsed Therapeutic & Drug Utilisation Committee 8/12/15
Approved Quality & Patient Safety Committee 20/6/13
Reviewed and endorsed Therapeutic & Drug Utilisation Committee 11/6/13
Previously two policies –
Magnesium Sulphate :
Approved Quality Council 16/10/06
Reviewed Therapeutic & Drug Utilisation Committee 15/8/06 (amended October 2009)
Amended July 2006
Amended October 2000 / Approved RHW Council 27/11/00
Approved RHW Council 28/2/00
Eclampsia Prophylaxis with Magnesium Sulphate :
Approved Quality Council 17/11/03
Endorsed Maternity Services Clinical Committee 11/11/03

FOR REVIEW : FEBRUARY 2020

ROYAL HOSPITAL FOR WOMEN
MAGNESIUM OBSERVATION CHART

MRN
NAME
DOB
Affix addressograph label

Therapeutic range: 1.5 – 3.5 mmol/L **Toxic range: 4.0 – 8.0 mmol/L**	**Toxicity may lead to:** • Suppression of tendon reflexes • Respiratory depression • Neuromuscular paralysis • Cardiac arrest

Date and time Loading Dose given: _____

Time Infusion Commenced: _____ **B** = Blood to be taken for Mg level

HOUR	TIME	INFUSION RATE	URINE OUTPUT	BP Hourly	RESP RATE Hourly	PULSE Hourly	TEMP 4 Hourly	REFLEXES	Comments /Mg LEVEL
0									
1 **B**									
2									
3									
4									
5									
6									
7 **B**									
8									
9									
10									
11									
12									
13 **B**									
14									
15									
16									
17									
18									
19 **B**									

ROYAL HOSPITAL FOR WOMEN
MAGNESIUM OBSERVATION CHART

MRN
NAME
DOB
Affix addressograph label

MAGNESIUM SULPHATE INFUSION CHART continued

HOUR	TIME	INFUSION RATE	URINE OUTPUT	BP Hourly	RESP RATE Hourly	PULSE Hourly	TEMP 4 Hourly	REFLEXES	Comments /Mg LEVEL
20									
21									
22									
23									
24									
25 **B**									
26									
27									
28									
29									
30									
31 **B**									
32									
33									
34									
35									
36									
37 **B**									
38									