Magnesium Sulphate in Maternity Protocol MATY077a	
Type: Protocol	HDSS Certification Standard:
Issued by: Maternity PPG Group	**Version:** 1.2
Applicable to: Hutt Valley DHB	**Contact person:** CHOD O&G
Lead DHB: Hutt Valley DHB	**Level:**

Hutt Maternity Policies provide guidance for the midwives and medical staff working in Hutt Maternity Services. Please discuss policies relevant to your care with your Lead Maternity Carer.

To be read in conjunction with Hypertensive Disorders of Pregnancy including Pre-eclampsia (MATY077) OR Acute Management of Eclampsia Policy (MATY053) OR Preterm Pre-Labour Rupture of Membranes Guideline (MATY083) OR Borderline Viability Management of Pregnancies (MATY005).

Purpose:

The purpose of this protocol is to:

- Provide safe and effective care for women/pregnant people
- Establish a local approach to care that is evidence based and consistent
- Inform good decision making

Scope:

For the purposes of this document, staff will refer to:

All staff within Hutt Valley DHB. This includes staff not working in direct contact with patients/consumers. Staff are taken to include anyone engaged in working to the Hutt Valley DHB. This may include but is not limited to:

- Employees irrespective of their length of service
- Agency workers
- Self-employed workers
- Volunteers
- Consultants
- Third party service providers, and any other individual or suppliers working in Hutt Maternity, including Lead Maternity Carers, personnel affiliated with third parties, contractors, temporary workers and volunteers
- Students

Protocol content

Indications for use of magnesium sulphate

- Pregnant or postnatal people experiencing a fulminating pre-eclampsia
- Fetal neuro-protection for babies under 30 weeks in consultation with Paediatric SMO

Administration of magnesium sulphate

The person is assessed by the Obstetric Team. The RMO must consult with the Obstetric SMO (and Paediatric SMO as appropriate) prior to the prescription of magnesium sulphate therapy.

The Obstetric RMO and/or SMO is present in Birthing Suite while the loading dose is being administered.

Equipment

⚠ Where available, pharmacy-supplied premix infusions of magnesium sulphate should be used. Where these are not available, follow the alternative protocol on page 4

- One premix infusion magnesium sulphate 3.44% (4g MgSO4 in 100ml Normal Saline) **for Loading Dose** (NB actual volume in bag may vary)
- One premix infusion of magnesium sulphate 6.44% (8g MgSO4 in 100ml Normal Saline) **for continuous infusion** (NB actual volume in bag may vary)
- 1000 ml Normal Saline
- Two intravenous giving sets
- One 'Y' extension set leur-lock with back check valves
- Calcium gluconate (antidote for magnesium sulphate)

Loading Dose

A loading dose of 4 grams is administered intravenously over 5-15 minutes (standard 10 mins)

Prescription

Write on National Medication Chart;
- 4g magnesium sulphate in 100ml Normal Saline IV
- Administer over 10 minutes

Procedure for Loading Dose

- Administer over 10 minutes via an electronic infusion device. **To calculate hourly rate, multiply actual TOTAL VOLUME marked on bag by six** (i.e., a bag with a totally volume of 116ml will be given at a rate of 696ml/h)
- Warn the person of the burning/flushing effect they may feel
- Midwife must stay with the person while the loading dose is being administered

⚠ **Rate to be checked by TWO staff members prior to commencing loading dose or continuous infusion**

Continuous infusion

The loading dose is followed by a continuous infusion of 1g magnesium sulphate per hour for minimum 24 hours (three 8g infusions in total)

Prescription

Write on National Medication Chart;
- 8g magnesium sulphate in 100ml Normal Saline IV

- Administer over 8 hours, 1g magnesium sulphate per hour

Procedure for Continuous Infusion

- Connect the 6.44% magnesium sulphate infusion to IV giving set and 'Y' Extension Set with back-check valves
- Flush magnesium infusion through to central join of 'Y' Extension set
- Connect an infusion of 1000ml Normal Saline to an IV giving set and second arm of 'Y' Extension set with back-check valves
- Flush Normal Saline through IV giving set and 'Y' Extension set. The salines should be flushed all the way to the connector to avoid a magnesium bolus
- Attach to IV leur
- Commence administration of Normal Saline at rate as directed by Obstetric SMO
- Administer magnesium sulphate over 8 hours via an electronic infusion device. **To calculate hourly rate, divide actual TOTAL VOLUME on bag by eight** (i.e., a bag with a totally volume of 124ml will be given at a rate of 15.5ml/h)
- **Rate to be checked by two staff members prior to commencing infusion**
- The infusion is continued for minimum 24 hours after birth or the last seizure and then discontinued. Nb; this will require a minimum of three infusions of 8g magnesium sulphate in 100ml Normal Saline

Observations during magnesium administration

Commence observations every 15 minutes:

- Respirations, Pulse, Blood Pressure with a manual BP machine, Oxygen saturations
- Patellar reflexes
- Level of consciousness

Document on MEWS chart (ensuring a MEWS exemption has been put in place to exclude temperature and oxygen administration)

Observations can change to hourly when the woman has stabilised, after consultation with Obstetric SMO

Fetal Observations

Continuous electronic fetal monitoring should continue until birth – the use of magnesium sulphate for pre-eclampsia necessitates expediting birth as soon as the pregnant person is sufficiently stable to do so.

Alternative Magnesium Sulphate protocol *when premix infusion is not available*

Equipment

- 6 ampoules of magnesium sulphate (2.47g of magnesium sulphate per 5ml)
- 2 x 100 ml bag normal saline
- 1000 ml normal saline
- 20 ml syringe
- 10 ml syringe
- Drawing up needles
- 2 intravenous giving sets
- 1 'Y' extension set leur-lock with back check valves
- Calcium gluconate (antidote for magnesium sulphate)

Loading Dose Procedure

- In a 10cc syringe draw up 8ml of magnesium sulphate (
- Add to a 100ml bag of normal saline
- Total volume = 108ml
- Administer over 10 minutes via an electronic infusion device **at a rate of 648ml/hour**
- Rate to be checked by 2 staff members prior to commencing infusion
- Warn the person of the burning/flushing effect they may feel
- Midwife must stay with the person while the loading dose is being administered

Continuous Infusion Procedure

- In a 20cc syringe draw up 16ml of magnesium sulphate
- Add to a 100ml bag of normal saline
- Connect magnesium sulphate infusion to IV giving set and 'Y' Extension Set with back-check valves
- Flush magnesium infusion through to central join of 'Y' Extension set
- Connect an infusion of 1000ml Normal Saline to an IV giving set and second arm of 'Y' Extension set with back-check valves
- Flush Normal Saline through IV giving set and 'Y' Extension set. The salines should be flushed all the way to the connector to avoid a magnesium bolus
- Attach to IV leur
- Commence administration of normal saline at rate as directed by Obstetric SMO
- Administer magnesium sulphate over 8 hours via an electronic infusion device **at a rate of 14.5 ml/hour**
- Rate checked by 2 staff members prior to commencing infusion
- The infusion is continued for minimum 24 hours after birth or the last seizure and then discontinued. Nb; this will require a minimum of three infusions of 8g magnesium sulphate in 100ml of normal saline

Serum magnesium levels

The above regime of magnesium sulphate does not require testing of blood concentration because clinical effect can be monitored by deep tendon reflex. (Steegers, E.a.P., von Dadelszen, P., et al, 2010) unless requested by medical staff.

In people with renal compromise, serum magnesium monitoring is recommended (The Antenatal Magnesium Sulphate for Neuroprotection Guideline Development Panel, 2010).

- Take **one** hour after commencement of loading dose
- Repeat at regular intervals (**four hourly**) while infusion is running
- Repeat urgently if the person exhibits signs of toxicity

Magnesium levels and symptoms range in (mmol /litre)

- Normal range 0.5 – 1.1
- Therapeutic range 2 – 4
- Loss of patellar reflex > 5
- Somnolence > 5
- Respiratory depression >6
- Paralysis >7
- Cardiac arrest > 12

(Fontaine and Sabourin, 2005)

Discontinuing the infusion

The infusion should be maintained for at least 24 hours after the last seizure or after birth of the baby.

The administration rate may need to be reduced under the advice of the Obstetric SMO if the following effects are noted:

- Decreased oxygen saturations
- Depressed respiration rate <12/min
- Hypotension diastolic < 80 mmHg
- Maternal tachycardia > 120/min

Magnesium toxicity

Immediate action is required in the event of suspected or actual magnesium toxicity.

Magnesium sulphate toxicity leads to:

- Loss of deep tendon reflexes
- Muscle paralysis
- Respiratory arrest
- Cardiac arrest
- Death

Signs of toxicity include:

- Flushing of face
- Loss of patella reflexes
- Weakness
- Nausea
- Sleepiness
- Double vision
- Blurred vision

If signs of magnesium toxicity apparent;

• Stop magnesium sulphate infusion • Call 777 • State **'maternal collapse'**

- Start basic life support (BLS)
- Prepare 1g calcium gluconate IV (10 ml of 10% solution) and give by slow push IV over 10 minutes, as directed by SMO Obstetrician
- Obstetric or Anaesthetic SMO will make the decision for on-going management and physical transfer of person
- An anti-convulsant may be used at the discretion of an SMO. Caution must be used when administering such medications as they may lead to respiratory depression, aspiration and cardiac arrest especially when used in conjunction with magnesium sulphate.

Related Documents:

- Hypertensive Disorders of Pregnancy (HDP) including Pre-eclampsia MATY077
- Acute Management of Eclampsia Policy MATY053
- Preterm Pre-Labour Rupture of Membranes Guideline MATY083
- Borderline Viability Management of Pregnancies MATY005
- Hydralazine IV for Hypertensive Disorders of Pregnancy Protocol MATY077B
- Labetalol IV for Hypertensive Disorders of Pregnancy Protocol MATY077c

Keywords for searching:

1. Eclampsia
2. Pre-eclampsia
3. Magnesium Sulphate
4. Magnesium Sulfate
5. MATY077a

Informed Consent:

The right of a consumer to make an informed choice and give informed consent, including the right to refuse medical treatment, is enshrined in law and in the Code of Health and Disability Consumers' Rights in New Zealand. This means that a woman can choose to decline treatment, referral to another practitioner, or transfer of clinical responsibility. If this occurs follow the process map on page 18 of the Referral Guidelines (Ministry of Health, 2012).

Tangata Whenua Statement:

The Women's Health Service recognises the rights and responsibilities of Māori as tangata whenua and Treaty Partners. This allows and acknowledges the importance of cultural diversity in all aspects of our care and practice in Aotearoa New Zealand.

As stated in Te Pae Amorangi (Hutt Valley DHB Māori Health Strategy) 2018-2027, Hutt DHB as a Crown agency is committed to our role in maintaining active relationships with iwi, under Te Tiriti o Waitangi. This strategy recognises the established principles of Partnership, Participation and Protection and recognises steps towards the reviewed interpretation of Te Tiriti principles to date (from the Wai 2575 claim into health). These are tino rangatiratanga, equity, active protection, partnership and options.

Attention in particular is drawn to:

- **Article one – Kāwanatanga**: actively engaging and working alongside with local iwi through the Hutt Valley Māori Health Unit
- **Article two – Tino Rangatiratanga**: Self-autonomy, self-determination; the responsibility to enable Māori to exercise their authority over their own health, determinants and definition of health
- **Article three – Ōritetanga**: equal health outcomes of peoples; ensuring that policy, guidelines or programmes do not further perpetuate any inequity
- **Article four (the 'oral clause') – Wairuatanga**: spirituality; thriving as Māori and the importance of health providers understanding health in te ao Māori (the Māori world), acknowledging the interconnectedness and inter-relationship of all living and non-living things.