South Australian Neonatal Medication Guidelines

Magnesium sulfate

2.465 g/5 mL or 2.5 g/5 mL injection*

Note:

This guideline provides advice of a general nature. This statewide guideline has been prepared to promote and facilitate standardisation and consistency of practice, using a multidisciplinary approach. The guideline is based on a review of published evidence and expert opinion.

Information in this statewide guideline is current at the time of publication.

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Health practitioners in the South Australian public health sector are expected to review specific details of each patient and professionally assess the applicability of the relevant guideline to that clinical situation.

If for good clinical reasons, a decision is made to depart from the guideline, the responsible clinician must document in the patient's medical record, the decision made, by whom, and detailed reasons for the departure from the guideline.

This statewide guideline does not address all the elements of clinical practice and assumes that the individual clinicians are responsible for discussing care with consumers in an environment that is culturally appropriate and which enables respectful confidential discussion. This includes:

- The use of interpreter services where necessary,
- Advising consumers of their choice and ensuring informed consent is obtained,
- Providing care within scope of practice, meeting all legislative requirements and maintaining standards of professional conduct, and
- Documenting all care in accordance with mandatory and local requirements

This is a High Risk Medication ⚠
An overdose can be fatal.

*There are two preparations available:

- 2.465 g/5 mL (49.3%) magnesium sulfate contains 10 mmol magnesium
- 2.5 g/5 mL (50%) magnesium sulfate heptahydrate contains 10.3 mmol magnesium

In dosing with neonates, the difference becomes immeasurable and for the purpose of these guidelines, they each contain elemental magnesium 10 mmol/5 mL or 2 mmol/mL

Dose and Indications

All doses must be written as millimoles of elemental magnesium (note 0.1 mmol = 25 mg)

Torsades de pointes

Intravenous

0.1 to 0.2 mmol/kg/dose to be given over 10 to 20 minutes

More rapid infusion (over several minutes) may be needed in pulseless torsades de pointes.

Hypomagnesaemia

Intravenous, Intramuscular

0.1 to 0.2 mmol/kg/dose every 12 hours as required. Doses of up to 0.4 mmol/kg/dose have been used.

Give intravenous infusion over 30 to 60 minutes, or over at least 10 minutes in an emergency.

Pulmonary Hypertension

Intravenous

Loading dose 0.8 mmol/kg given over 20 to 30 minutes. If clinical response, continue with maintenance

Maintenance dose 0.1 to 0.3 mmol/kg/hour for 2 to 5 days

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Preparation and Administration

Intravenous

Dilute 0.5 mL of either product (2 mmol/mL of elemental magnesium) with 9.5 mL of compatible fluid (to give a total volume of 10 mL). The resulting solution contains 0.1 mmol/mL magnesium.

Dose	0.2 mmol	0.4 mmol	0.6 mmol	0.8 mmol	1 mmol	1.2 mmol
Volume	2 mL	4 mL	6 mL	8 mL	10 mL	12 mL

For fluid restricted patients, a maximum concentration of 0.8 mmol/mL can be used.

Intramuscular

Dilute 2 mL of either product (2 mmol/mL of elemental magnesium) with 3 mL of compatible fluid (to give a total volume of 5 mL). The resulting solution contains 0.8 mmol/mL magnesium.

Dose	0.2 mmol	0.4 mmol	0.6 mmol	0.8 mmol	1 mmol	1.2 mmol
Volume	0.25 mL	0.5 mL	0.75 mL	1 mL	1.25 mL	1.5 mL

Intramuscular is painful and sometimes causes haematomas.

Compatible Fluids

Glucose 5%, glucose/sodium solutions, sodium chloride 0.9%

Adverse Effects

Common

Flushing, vomiting

Other adverse effects are often related to the development of hypermagnesaemia: important signs are loss of deep tendon reflexes and respiratory depression. More serious effects are hypotension, bradycardia, CNS depression, coma, circulatory collapse, cardiac arrest.

Monitoring

- Magnesium levels regularly; usual blood level 0.75 to 1 mmol/L however if treating pulmonary hypertension aim for levels between 3.5 to 5.5 mmol/L
- Renal function
- Urine output
- Electrolytes
- Blood pressure, heart rate, respiratory rate, oxygen saturation, urine output, reflexes and other signs of toxicity regularly during treatment is recommended.

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Practice Points

- All doses must be written as elemental magnesium
- Anticipate changes in calcium and phosphorus balance
- Calcium gluconate 10% injection should be available in case of hypermagnesaemia
- Use CAUTIOUSLY in patients with renal impairment and/or electrolyte imbalance
- DO NOT USE in patients with heart block or myocardial damage
- When treating pulmonary hypertension consider other agents (nitric oxide and sildenafil) before using magnesium sulphate.
- Interactions
  - may enhance neuromuscular blockade (e.g., suxamethonium, vecuronium, rocuronium)
  - use with aminoglycosides may cause neuromuscular weakness (e.g., respiratory arrest)

Document Ownership & History

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