Humber and North Yorkshire
Local Maternity and Neonatal System

PReCePT Guideline

Magnesium Sulphate Protocol

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Humber and North Yorkshire
Health and Care Partnership

1. GRADES OF RECOMMENDATION/EVIDENCE LEVELS

Recommendations are graded according to the strength of the evidence that supports them. The grades of recommendations are Grade A, B, C and 'good practice point'. These are described on the final page of each of the guidelines (see Grades of Recommendations on each guideline).

Classification of evidence levels

1 + +	High-quality meta-analyses, systematic reviews of randomised controlled trials or randomised controlled trials with a very low risk of bias
1+	Well-conducted meta-analyses, systematic reviews of randomised controlled trials or randomised controlled trials with a low risk of bias
1–	Meta-analyses, systematic reviews of randomised controlled trials or randomised controlled trials with a high risk of bias
2 + +	High-quality systematic reviews of case–control or cohort studies or high-qualitycase–control or cohort studies with a very low risk of confounding, bias or chance and ahigh probability that the relationship is causal
2+	Well-conducted case–control or cohort studies with a low risk of confounding, bias or chanceand a moderate probability that the relationship is causal
2–	Case–control or cohort studies with a high risk of confounding, bias or chance and asignificant risk that the relationship is not causal
3	Non-analytical studies, e.g. case reports, case series
4	Expert opinion

Grades of Recommendation

A	At least one meta-analysis, systematic reviews or RCT rated as 1 + +, and directly applicable to the target population; or a systematic review of RCTs or a body of evidence consisting principally of studies rated as 1 + , directly applicable to the target population and demonstrating overall consistency of results
B	A body of evidence including studies rated as 2++ directly applicable to the target population, and demonstrating overall consistency of results; orExtrapolated evidence from studies rated as 1++ or 1 +
C	A body of evidence including studies rated as 2+ directly applicable to the target population, and demonstrating overall consistency of results; orExtrapolated evidence from studies rated as 2 + +
D	Evidence level 3 or 4; orExtrapolated evidence from studies rated as 2+

Good Practice Points

✓	Recommended best practice based on the clinical experience of the guideline development group

2. MAGNESIUM SULPHATE USE IN PRE-TERM LABOUR

2.1 Indications

Women who are between 21+6 and 29+6 weeks gestation should be given Magnesium Sulphate in the following situations:	• in established preterm labour where birth is expected within 12 hours ➢ "established preterm labour" should be defined as a high likelihood of birth with or without preterm pre-labour rupture of membranes ➢ established preterm labour may also be defined as a probability of delivery of 5% or more within one week, using fetal fibronectin and the QUIPP calculator • having a planned preterm birth within 24 hours ➢ where birth is planned, commence magnesium sulphate as close to four hours before birth as possible. **Grade A recommendation**

Evidence level 1+

Women who are between 30+0 and 33+6 should be offered Magnesium Suphate in the same circumstances.

All clinical discussions should involve the parents, on-call obstetric and neonatal consultant and senior midwifery and neonatal nursing team.

For gestations between 21+6 and 23+6 there will be a documented discussion between the consultant obstetrician and consultant neonatologist as to the suitability of offering magnesium sulphate at this gestation on a case-by-case basis. **Evidence level 1+**

2.2 Contraindications/Cautions

Do not give if	• **Renal Failure or Oliguria with Urine Output <100 mls in 4 hours** • **If completed infusion within the last 24 hours, discuss with Consultant Obstetrician if considering to restart infusion** • **Maternal hypersensitivity to the drug** • **Hepatic coma Grade A recommendation**

Closer monitoring if	• Renal impairment with urine output <30ml/hr and /or creatinine clearance <80mls/min • Cardiac disease such as arrhythmias or cardiomyopathy **or** current treatment with calcium channel blockers (e.g. Nifedipine) or digoxin; potential interaction with magnesium sulphate leading to hypotension and heart block respectively • Neuromuscular disorders such as Myasthenia Gravis • Some drugs such as aminoglycosides (e.g. Gentamicin) and paralysing anaesthetic agents

Evidence level 1+

3. PLACE OF ADMINISTRATION

Women undergoing magnesium sulphate treatment will be cared for on the Labour Ward in a Consultant Led room with one to one midwifery care.

If women for in-utero transfer, Magnesium Sulphate bolus dose can be given prior to transfer however, the infusion should be discontinued during transfer. Where birth is anticipated within 24 hours, the loading dose of Magnesium Sulphate should be administered by the transferring unit. The infusion can be stopped prior to anaesthetic for delivery if necessary.

4. ADMINISTERING MAGNESIUM SULPHATE

Loading dose	20ml Magnesium sulphate 20% IV over ***15*** minutes (equivalent to 4g) • Draw up 20ml from the pre-diluted vial. Administer via a syringe pump over 20 minutes at a rate of ***80mls/hr***
Observations	Use the HDU/ ICC Chart A full set of observation including BP, RR and patellar reflexes before the loading dose
Red flags	**STOP TREATMENT IF** ➢ Bicep reflex absent ➢ Respiratory rate < 12/minute ➢ Urine output ≤ 100 mls in previous 4 hours – (97% of magnesium is excreted in the urine and therefore the presence of oliguria can lead to toxic levels. If the criteria above not met, then further administration of magnesium sulphate should be withheld, and medical review sought)

Maintenance dose	Magnesium sulphate 20% IV 1g per hour, over 24 hours or until birth, which ever occurs soonest Draw up 50mls from the pre-diluted vial and administer via a syringe pump at a rate of 5mls/hr. this is equivalent to “1” grammes per hour Each syringe should last 10 hours
Monitoring	• Continuous pulse oximetry • Hourly BP • Hourly pulse • Hourly fluid input/output • Hourly respiratory rate • Deep tendon reflexes 4 hourly and at commencement of each new syringe • Continuous CTG monitoring should be considered with team from 26/40. Involve a senior obstetrician in discussions about whether and how to monitor the fetal heart rate for women who are between 22^{+0} and 25^{+6} weeks pregnant • Consider a repeat dose of magnesium sulphate (including loading dose) if the patient still meets the criteria – this should be following discussion with the Consultant Obstetrician

Evidence level 1+

4.1 The infusion should be stopped if RR decreases more than 4 breaths per minute below baseline or is less than 12 breaths per minute; or diastolic BP decreases more than 15 mmHg below baseline level.

4.2 Management of Toxicity

The antidote for suspected magnesium toxicity is 10mls of 10% calcium gluconate given slowly intravenously over 10 minutes.

4.3 Important Observations

Medical staff are responsible for assessment, initiating and the decision to continue with further doses which should be discussed with the consultant on call.

4.4 Side Effects

Facial flushing, hypotension, tachycardia, motor paralysis, absent tendon reflexes, respiratory depression and cardiac arrhythmia can all occur but will be at a minimum if magnesium is administered slowly, and the patient observed as above.

THERE IS NO NEED TO MEASURE MAGNESIUM LEVELS.

Evidence level 1+

4.5 Repeat Doses

If preterm birth does not occur within 24 hours however becomes imminent at a later date, a further loading dose and infusion should then be repeated following discussion with the on-call consultant.

Be aware that repeated doses are associated with neonatal hypocalcaemia.

Evidence level 1+

5. RECOMMENDATIONS

1.	Magnesium Sulphate administration should be considered for all women 22+0 – 33+6 weeks gestation in whom delivery is anticipated within 24 hours. This includes women in established preterm labour and for women for whom early delivery is planned for fetal or maternal indications. **Grade A recommendation**
2.	Prior to a decision to administer Magnesium Sulphate a full assessment of the woman should be carried out. This should include confirmation that the woman does not meet the exclusion criteria. **Grade A recommendation**
3.	Administration of Magnesium Sulphate should take place on the Delivery Suite with appropriate maternal and fetal monitoring. **Grade A recommendation**