

Magnesium Sulfate Infusion in Maternity Centre

- Prevention and Treatment of Severe Pre-eclampsia and Eclampsia
- Fetal Neuroprotection

Table of Contents:

1. [Preparation](#)
2. [Administering Loading Dose](#)
3. [Administering Maintenance Infusion](#)
4. [Postpartum pre-eclampsia](#)
5. [Emergency Management of Seizures](#)

Summary of content:

- Prevention and Treatment of Severe Pre-eclampsia and Eclampsia
- Fetal neuroprotection

Related Documents and Resources:

1. [B-00-07-10048](#) - Fetal Health Surveillance (FHS) - Intrapartum
2. [B-00-07-10044](#) – Independent Double Check – High Alert Medications and High Risk Situations
3. [B-00-07-10051](#) - Hypertension in Pregnancy
4. PHC Parenteral Drug Therapy Manual – [magnesium sulfate monograph](#)

Skill Level: Specialized

Maternity Centre RNs, Registered Midwives (RMs), Obstetricians, Family Physicians, Obstetrical Residents

- Completion of Fetal Health Surveillance Program is recommended every 2 years.
- Initiation of IV Therapy required (RNs)
- Adult CPR recertification every 2 years required
- Neonatal Resuscitation Program (NRP) completion every 2 years required

Need to Know:

Indications for Use of magnesium sulfate in Maternity:

1. Prophylactic management and treatment of eclamptic seizures in women with severe pre-eclampsia:

- Signs and symptoms of severe eclampsia:
 - Systolic BP of greater than 160 mmHg or
 - Diastolic BP of at least 110 mmHg and
 - Proteinuria of 3 to 5 grams or more per 24 hour specimen.
 - Other signs and symptoms include:
 - oliguria,
 - cerebral disturbances such as altered level of consciousness, confusion, or headache;
 - visual disturbances such as scotomata or blurred vision;

INTERDISCIPLINARY GUIDELINE

B-00-07-10052 – Magnesium Sulphate

- hepatic involvement, including epigastric pain, right upper quadrant pain, impaired liver function or elevated liver enzymes;
- thrombocytopenia with a platelet count less than 100,000/mm³; hemolytic anemia;
- pulmonary edema; and
- fetal growth restriction.

2. Fetal neuroprotection:

- In utero, exposure to magnesium sulfate before preterm birth provides some fetal neuroprotection (i.e., decreases the incidence and severity of cerebral palsy). The mechanism of action is not well understood.
- Imminent preterm birth -Gestational age: 23+6 to 33+6 weeks
 - defined as a high likelihood of birth within 24 hours, due to one or more of the following factors:
 - Active labour,
 - Cervix is with greater than or equal to 4 cm dilated
 - Less than 4 cm dilated with documented progressive change in cervical dilatation
 - Preterm, pre-labour rupture of membranes (PPROM) with active labour
 - Planned delivery due to maternal or fetal indications
 - Failure of tocolysis or a contraindication to tocolysis

Contraindications:

- Hypocalcemia, impaired renal function, myasthenia gravis – magnesium is excreted primarily in the urine. Renal impairment, increases risk of toxicity.
- Women should **not** receive magnesium sulfate for fetal neuroprotection when:
 - magnesium sulfate is already being administered for pre-eclampsia/eclampsia,
 - Less than 12 hours has elapsed since discontinuation of a previous magnesium sulfate infusion,
 - magnesium sulfate is contraindicated (see above), or
 - The fetus is unlikely to benefit from neuroprotection.

Magnesium sulfate Actions:

- Decreases central nervous system irritability
- Blocks neuromuscular conduction by blocking the release of acetylcholine at nerve synapse by displacing calcium, thus blocking nerve transmission to the muscle.
- Relaxes smooth muscle of the uterus by substituting itself for calcium.
- Secondary effects:
 - Peripheral vasodilatation
 - Increased uterine and renal blood flow
 - Increased prostacyclin production by endothelial cells
 - Reduced platelets aggregation
 - Decreased plasma rennin and angiotensin

Side Effects:

- Warm, flushing/burning sensation
- Lethargy
- Headache
- Nausea, vomiting
- Blurred vision/double vision
- Muscle weakness
- Shortness of breath
- Pulmonary edema

Signs of Magnesium Toxicity:

1. Respiratory depression - RR less than 12/min
2. Absent deep tendon reflexes (DTR) or sudden change in DTR
3. Severe hypotension
4. Urine output less than 100 mL in the previous 4 hours
5. Extreme muscle relaxation
6. Respiratory arrest
7. Cardiac arrest

Fetal/Neonatal Effects:

- Reduced FHR variability on the EFM tracing, thus interfering with interpretation of normal/atypical/abnormal
- Neonatal neuromuscular and respiratory depression
- Neonatal hypotonia and lethargy

Responsibilities:

Physician/ Registered Midwife:

1. Obstetrician or Senior Obstetrical Resident:
 - Assesses reflexes and neurological status
 - Completes [orders](#) for magnesium sulfate loading dose and continuous infusion
 - Completion of consultation form and identifies most responsible care provider
2. RM and Family Physician:
 - Consultation to obstetrics
 - Completion of consultation form and identifies most responsible care provider

Pharmacy:

- Prepares medication and ensures adequate supply is on the unit:
 - Bolus dose: 4 grams magnesium sulfate in 50 mL NS
 - Infusion: 20 grams magnesium sulfate in 500 mL NS
 - Maximum storage time for pre-mixed solutions is one month. Expiry date is noted on pre-mixed bag
 - Discard a pre-mixed bag 24 hours after it has been pierced

INTERDISCIPLINARY GUIDELINE

B-00-07-10052 – Magnesium Sulphate

RN:

- Checks medication before setting up – 7 “Rights”, expiry date.
- Documents time bag is pierced. Pierced bags must be discarded after 24 hours.
- Administers magnesium sulfate infusions; provides 1:1 bedside nursing care during administration of loading and maintenance doses.
- Depending on the stability of the patient, 1:1 bedside nursing care may not be required during the postpartum weaning process.
- Discontinues magnesium sulfate infusion as per physician orders for pre-eclampsia
- Discontinues magnesium sulfate infusion for fetal neuroprotection after delivery of pre-term infant occurs or 24 hours after initiation of the infusion.

PRACTICE GUIDELINE

Equipment & Supplies:

- #18 intravenous catheter,
- Primary IV tubing set, Normal Saline (NS) 1000 mL and other appropriate IV equipment including ‘Y’ tubing
- IV infusion pump with appropriate tubing
- Magnesium sulfate 4 grams in 50 mL NS for loading dose (prepared by Pharmacy)
- Magnesium sulfate 20 grams in 500 mL NS for infusion (prepared by Pharmacy)
- Dinamap Pro/Procure monitor
 - Appropriate size blood pressure cuff
 - Pulse oximeter attachment
- Sphygmomanometer and stethoscope
- Calcium Gluconate (antidote)
- Electronic fetal monitor (EFM) with appropriate attachments
- Urinary catheterization equipment as needed.
- Pillows / rail padding
- Bedside maternal resuscitation:
 - Adult simple face mask
 - Adult nasal prongs
 - Yankauer suction handle and suction tubing
- Adult Ambu bag – located outside of patient rooms



INTERDISCIPLINARY GUIDELINE

B-00-07-10052 – Magnesium Sulphate

Preparation:

STEPS	RATIONALE
1. Ensure bedside safety check is complete including maternal resuscitation equipment and calcium gluconate.	<ul style="list-style-type: none"> Potential for respiratory/cardiac arrest. Calcium gluconate is the antidote. Dosage: 1 gram (10 mL) of 10% calcium gluconate slow IV push by physician (approximately 1.5 mL/min. or 1 gram /7 min.).
2. Establish baseline maternal and fetal condition: Maternal: <ul style="list-style-type: none"> BP with manual sphygmomanometer initially and compare with electronic. Use automatic BP monitor to assess trends. Check regularly with manual cuff to ensure accuracy. Pulse rate Respiratory rate (should be greater than 12/minute) Initiate continuous pulse oximetry. Notify physician if O₂ Sat less than 95% Palpate uterine activity Physician to assess DTRs Assess level of consciousness. Fetal: <ul style="list-style-type: none"> Initiate continuous electronic fetal monitoring (EFM). Assess fetal activity 	<ul style="list-style-type: none"> Provides baseline information. Manual sphygmomanometer is recommended as most automated devices are deflationary and may underestimate both systolic and diastolic values by 10 to 15 mmHg, especially in women with pre eclampsia. Automated devices are useful to follow trends in BP. Use Korotkoff V (disappearance of pulse sounds) for diastolic pressure.
3. Assess level of pain and discomfort: <ul style="list-style-type: none"> Assess uterine activity and discomfort/pain. Assess for other signs and symptoms of pre-eclampsia - epigastric pain (RUQ pain); headaches; visual disturbances – blurred vision, scotomata, double vision (signs of worsening condition) Provide well-lit, calm and quiet environment with minimal external stimuli and limited visitors. 	

INTERDISCIPLINARY GUIDELINE

B-00-07-10052 – Magnesium Sulphate

4. Assess renal function: <ul style="list-style-type: none"> Dipstick urine sample for proteinuria Insert Foley catheter with urometer for accurate urine output Instruct patient to measure all urine, if no indwelling catheter 	<ul style="list-style-type: none"> Magnesium is excreted in the urine. Impaired renal function can lead to magnesium toxicity.
5. Identify patient name and check for allergies Explain procedure, equipment, and required nursing care to the patient and significant other(s).	<ul style="list-style-type: none"> Identify patient name and check for allergies. Patient needs to know the frequency and intensity of observations are required due to disease process and effects of medication.
6. Check physician's orders for drug, dosage, and route	<ul style="list-style-type: none"> Dosage: Magnesium sulfate is 4 grams IV loading dose over 20 to 30 minutes. Maintenance dose is Magnesium sulfate 1 gram/hour IV delivered via infusion pump.
7. Initiate primary IV infusion with normal saline	
8. Set up magnesium sulfate loading dose: <ul style="list-style-type: none"> Check magnesium sulfate premixed bag (4 grams in 50 mL NS). Double-check medication with another RN as per the Independent Double Check guideline. Label preparation with date and time. Prime infusion pump and set rate to 100 mL/hour. Piggyback to mainline. 	<ul style="list-style-type: none"> Prevention of errors Dosage: 4 gm Magnesium sulfate in 50 mL over 30 minutes = 100 mL/hour.

2. Administering Loading Dose:

1. Initiate loading dose as per physician order. Remain at bedside throughout infusion of loading dose – 1:1 patient to nurse ratio	<ul style="list-style-type: none"> 4 g magnesium sulfate in 50 mL over 30 minutes = 100 mL/hour. Allows early detection of tachycardia or palpitations resulting from too rapid infusion rate.
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INTERDISCIPLINARY GUIDELINE

B-00-07-10052 – Magnesium Sulphate

<p>2. Maternal Assessment:</p> <ul style="list-style-type: none"> • Monitor maternal BP Q5 minutes • Continuous palpation of maternal pulse • RR Q15 minutes and PRN • Maintain continuous pulse oximetry. Notify physician of O₂ Sat less than 95%. 	<ul style="list-style-type: none"> • Respiratory rate less than 12/minute is one sign of magnesium toxicity. • O₂ saturation should be maintained over 95% • Large fluid volume shifts are not tolerated well -pulmonary edema is one indication of worsening or severe preeclampsia
<p>3. Fetal Assessment:</p> <ul style="list-style-type: none"> • Maintain continuous Electronic fetal monitoring (EFM) 	
<p>4. Assess renal function and fluid balance:</p> <ul style="list-style-type: none"> • Initiate accurate documentation of intake and output Q1H • Insert indwelling urinary catheter if necessary 	<ul style="list-style-type: none"> • Urine output must be greater than 100 mL in the previous 4 hours or more than 25 mL/hour. 97% of magnesium is excreted in the urine; therefore, oliguria can lead to toxicity. • Total IV fluids is kept to 80 mL/hour to avoid fluid overload

3. Administering Maintenance Infusion:

<p>1 Set up Magnesium sulfate infusion:</p> <ul style="list-style-type: none"> • Check Magnesium sulfate premixed bag of 20 gm in 500 mL NS. • Double-check medication with another RN as per the Independent Double Check guideline. • Piggyback magnesium sulfate infusion to mainline after loading dose has been completed. • Adjust the infusion rate to 25 mL/hour to administer 1 gram/hour. 	<ul style="list-style-type: none"> • Dosage is: 1 gram/hour = 25 mL/hour
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INTERDISCIPLINARY GUIDELINE

B-00-07-10052 – Magnesium Sulphate

<p>2 Maternal assessments: (Assess more frequently if condition is unstable and/or severe)</p> <ul style="list-style-type: none"> • BP Q15 minutes x 1 hour then Q1H and PRN. Notify physician if BP greater than or equal to 160/110 mmHg or any sudden changes • Pulse Q15 minutes x 1 hour, then Q1H and PRN • RR Q15 minutes, then Q1H and PRN. Notify Physician if RR less than 12/minute. <ul style="list-style-type: none"> ◦ Review frequency of VS with primary care provider once VS are stable • Continuous pulse oximetry. Assess breath sounds. • Temperature Q4H and PRN. Notify physician of rising temperature. • Auscultate breath sounds Q2H 	<ul style="list-style-type: none"> • RR less than 12/minute is one sign of magnesium toxicity. • O₂ saturation should be maintained over 95%
<p>3 Assess renal function:</p> <ul style="list-style-type: none"> • Insert foley catheter and attach to urometer. • Notify physician if urine output is less than 100 mL in the previous 4 hours or less than 25 mL/hour. • Check urine for proteinuria Q1H 	<ul style="list-style-type: none"> • Magnesium sulfate is excreted in the urine. Impaired renal function can lead to Magnesium toxicity.
<p>4 Monitor fluid balance:</p> <ul style="list-style-type: none"> • Document intake and output Q1H. Total hourly IV intake is limited to 80 mL/hour (or 1 mL/kg/hour using current weight). This includes any medications such as oxytocin. • Total intake and output Q4H. 	

INTERDISCIPLINARY GUIDELINE

B-00-07-10052 – Magnesium Sulphate

<p>5 Notify physician of development and/or worsening of any of these maternal signs and symptoms:</p> <ul style="list-style-type: none"> • Occipital headache, • Visual disturbances (blurred vision, double vision, or scotomata), • Severe nausea and vomiting, • Persistent epigastric or RUQ pain, • Brisk reflexes more than 3+ (see below), • Chest pain, shortness of breath. • BP diastolic 110 mmHg or more • Severe hypertension sBP 160 mm Hg or more and dBP 110 mm Hg or more • Oliguria • Pulmonary edema • Suspected abruptio placenta • Lab results: <ul style="list-style-type: none"> ○ Platelets less than $100 \times 10^9/L$ ○ Elevated liver enzymes (AST and/or ALT) ○ Plasma albumin less than 18 g/L • Heavy proteinuria (more than 3 g/24 hours) • Development of eclampsia 	<p><i>Reflexes:</i></p> <ul style="list-style-type: none"> • 3+ hyperactive without clonus • 4+ hyperactive with unsustained clonus • 5+ hyperactive with sustained clonus
<p>6 Fetal assessment:</p> <ul style="list-style-type: none"> • Notify physician of development and/or worsening of any of the following: <ul style="list-style-type: none"> • Intrauterine growth restriction (IUGR) (U/S) • Oligohydramnios (U/S) • Absent or reversed end diastolic flow on umbilical artery doppler (U/S) • Atypical/Abnormal fetal heart rate tracing (EFM) • Decreased/absent fetal; movement (palpation) 	
<p>8. Assess neurological function:</p> <ul style="list-style-type: none"> • Level of consciousness Q4H • Deep tendon reflexes Q4H (physician) 	

INTERDISCIPLINARY GUIDELINE

B-00-07-10052 – Magnesium Sulphate

9. Assess for signs of Magnesium toxicity: <ul style="list-style-type: none"> Side effects and toxicity: <u>Maternal side effects</u>: - flushing and warm sensation, nausea, vomiting, palpitations, sweating, reduced uterine activity. <u>Toxicity</u>: - drowsiness, depressed or absent reflexes, respiratory depression, circulatory collapse, sudden decrease in fetal heart rate 	(Note – routine serum magnesium levels are generally not required with infusion rate of 1 gram/hour)
10. Calcium Gluconate (antidote for Magnesium sulfate overdose) 10 mL of 10% calcium gluconate IV (<i>Keep calcium gluconate at bedside</i>) to be given by MD.	
11. Observe for signs of impending eclampsia (seizures) throughout the course of therapy, including postpartum: <ul style="list-style-type: none"> Severe headaches (especially occipital headaches) Brisk reflexes more than 3+ (3+ is hyperactive without clonus, 4+ is hyperactive with unsustained clonus, 5+ is hyperactive with sustained clonus); Sudden change in reflexes Visual disturbances 	There are no reliable clinical markers to predict seizures, however, these are often signs of worsening condition. The symptoms listed are thought to predict the onset of eclampsia, however, even when these symptoms are present, eclampsia does not develop in most cases.

4. Discontinuing magnesium sulfate infusion

Infusions for Fetal Neuroprotection	Infusions for Pre-Eclampsia
1. Magnesium sulfate infusion is discontinued immediately after pre-term birth or after 24 hours of continuous infusion. DO NOT continue infusion postpartum.	1. Decrease or discontinue magnesium sulfate infusion as per orders . (usually discontinued 24 hours post partum) 2. Continue to monitor maternal condition for signs of worsening condition post partum, including fluid balance, as per orders and PRN

5. Emergency Management of Seizure

Seizures can occur unexpectedly at any time, including the postpartum period, and even when the BP is not severely elevated. Close observation is required. -See Seizure Management:

INTERDISCIPLINARY GUIDELINE

B-00-07-10052 – Magnesium Sulphate

Maternal and Fetal Assessment and Intervention– Following Seizure

- Initiate Continuous Electronic Fetal Monitoring and assess fetal movement and uterine activity/tone
- Establish IV access
- Assess for vaginal bleeding and/or rupture of membranes
- Prepare for delivery once maternal and fetal conditions are stabilize as delivery is indicated by induction or caesarean section.
- Ensure that type and screen has been completed and run
- Maintain NPO

Patient Education and Resources:

1. Provide information about the signs and symptoms of the pre-eclampsia/eclampsia, treatment plan, and potential complications.
2. Stress the need to inform RN and/or physician of any possible symptoms, signs of worsening condition, and side effects of medication.
3. Explain need for calm quiet environment, limited visitors.
4. Provide on-going information about maternal and fetal condition.

Documentation:

1. BC Triage and Assessment Record
2. Fetal Monitoring Tracing
3. Fetal Monitoring Label
4. Interprofessional Notes
5. Graphic Sheet.
6. BC Labour Partogram (if in labour)
7. 24 Hour Fluid Balance Record
8. BC Labour and Birth Summary Record
9. BC Newborn Record Part 1

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2. Norwita, E.R. and Repke, J.T. Pre-eclampsia: Management and prognosis in UpToDate, Lockwood, C (Ed), UpToDate, Waltham, MA 2013. Retrieved 15 October from www.uptodate.com
3. Hyagriv, N.S. and Hines, K. P. Neuroprotective effects of in utero exposure to magnesium sulfate in UpToDate, Ramin, S (Ed), UpToDate, Waltham, MA 2013. Retrieved 3 October from www.uptodate.com
4. Magnesium Sulfate (Maternal-Newborn) Mosby Nursing Skill (2013). St. Louis, MO. Elsevier. Retrieved October 3 2013 from www.mosbynursingskills.com
5. The Society of Obstetricians and Gynecologists of Canada. (2011-2012 18th Ed.). Advances in Labour and Risk Management: ALARM Course Manual. Ottawa, ON: The Society of Obstetricians and Gynecologists of Canada.

INTERDISCIPLINARY GUIDELINE

B-00-07-10052 – Magnesium Sulphate

Persons/Groups Consulted:

Maternity Safety Quality Council April 2014
Perinatal Directions Committee
Interim Supervisor, Parenteral Services, Pharmacy
Clinical Coordinator – Respiratory

Revised by:

Patient/Nurse Educator, Maternity Centre
Clinical Nurse Specialist, Maternity

Approved By: Professional Practice Standards Committee

Date of Creation/Review/Revision:

October 2011

Revised: March 2014

Appendices:

[Appendix A:](#) Hypertension Antepartum/Intrapartum Orders

[Appendix B:](#) Hypertension Postpartum Orders

[Appendix C:](#) Magnesium Sulfate Infusion for Fetal Neuroprotection Maternity Orders

[Appendix D:](#) Magnesium Levels: (PHC Lab)

INTERDISCIPLINARY GUIDELINE

B-00-07-10052 – Magnesium Sulphate

Appendix A – Hypertension Antepartum/Intrapartum Orders (PHC-PH248)

**IF YOU RECEIVED THIS FAX IN ERROR,
PLEASE CALL 604-806-8886 IMMEDIATELY**



PRESCRIBER'S ORDERS

NO DRUG WILL BE DISPENSED OR ADMINISTERED
WITHOUT A COMPLETED

CAUTION SHEET

ALLERGY/INTOLERANCE STATUS FORM (PHC-PH047)

DATE AND TIME	HYPERTENSION ANTEPARTUM/INTRAPARTUM ORDERS (Items with check boxes must be selected to be ordered) (Page 1 of 2)
	<p>ADMISSION INSTRUCTIONS: Admit for Gestational Hypertension under care of Dr.: _____</p> <p>ACTIVITY: Bed rest with bathroom privileges</p> <p>CONSULTS:</p> <p>MONITORING: Vital Signs: check T, P, RR, BP SpO₂ on admission, then monitor P, RR, BP SpO₂ every 15 minutes for 1 hour, then every hour if stabilized Pulse oximetry daily, today, tomorrow, then every Monday and Thursday and the day of delivery Non Stress Test daily Weight daily Continuous electronic fetal monitoring when in labour If receiving magnesium sulfate infusion: During loading dose: BP, pulse, RR every 5 minutes Pulse – keep fingers on maternal pulse throughout loading dose infusion Pulse oximetry continuously Continuous Electronic fetal monitoring Maintenance infusion: BP, pulse, RR every 15 minutes for 1 hour, then every hour during continuous infusion Pulse oximetry continuously Continuous electronic fetal monitoring</p> <p>LABORATORY: Daily labs to be drawn today, tomorrow, and every Monday and Thursday and the day of delivery <input type="checkbox"/> Draw all labs listed below (As recommended by BCRCP Hypertension in Pregnancy Guidelines), or indicate individual labs to be drawn <input type="checkbox"/> CBC <input type="checkbox"/> Bicarb <input type="checkbox"/> AST, ALT <input type="checkbox"/> Na⁺, K⁺, Ca⁺⁺, Mg⁺⁺ <input type="checkbox"/> BUN, Creatinine <input type="checkbox"/> Random Glucose <input type="checkbox"/> LDH <input type="checkbox"/> Albumin <input type="checkbox"/> Bilirubin <input type="checkbox"/> Uric Acid <input type="checkbox"/> INR, PTT <input type="checkbox"/> Fibrinogen <input type="checkbox"/> Urine: Dipstick for protein today, tomorrow, and every Monday and Thursday and day of delivery <input type="checkbox"/> Random urine for protein: creatinine ratio today, tomorrow, and every Monday and Thursday and day of delivery <input type="checkbox"/> 24 hour urine for protein and creatinine clearance today and once a week start on Sunday for Monday. Include height and weight on requisition</p>
Printed Name _____	Signature _____ College ID _____ Pager _____

Form No. PH248 (R. Jan 30-14)

ALL NEW ORDERS MUST BE FLAGGED

FAX COMPLETED ORDERS TO PHARMACY

PLACE ORIGINAL IN PATIENT'S CHART

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B-00-07-10052 - Page 13 of 17

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**IF YOU RECEIVED THIS FAX IN ERROR,
PLEASE CALL 604-806-8886 IMMEDIATELY**



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NO DRUG WILL BE DISPENSED OR ADMINISTERED
WITHOUT A COMPLETED

CAUTION SHEET

ALLERGY/INTOLERANCE STATUS FORM (PHC-PH047)

DATE AND TIME	HYPERTENSION ANTEPARTUM/INTRAPARTUM ORDERS (Items with check boxes must be selected to be ordered) (Page 2 of 2)
	<p>DIAGNOSTICS: Ultrasound for AFI and umbilical artery Doppler and MCA Doppler today and every Monday and Thursday Ultrasound for EFW today and every 2 weeks on Mondays</p> <p>INTRAVENOUS: sodium chloride 0.9% IV at _____ mL/hour Total IV fluids not to exceed 80 mL/hour</p> <p>MEDICATIONS: <input type="checkbox"/> magnesium sulfate 16 mmol (4 g) loading dose IV over 30 minutes followed by maintenance dose of 4 mmol (1 g)/hour Loading dose: magnesium sulfate 16 mmol (4 g) in sodium chloride 0.9% 50 mL Piggyback to mainline and infuse by volumetric infusion pump at 100 mL/hour Maintenance Dose: magnesium sulfate 20 mmol (20 g) in sodium chloride 0.9% 500 mL Piggyback magnesium sulfate infusion to mainline after loading dose has been completed Adjust the infusion rate to 25 mL/hour to administer 4 mmol (1 g)/hour <input type="checkbox"/> renal dosing required: decrease infusion rate to _____ mL/hour (_____ g/hour)</p>
	<p>Printed Name _____ Signature _____ College ID _____ Pager _____</p>

Form No. PH248 (R. Jan 30-14)

ALL NEW ORDERS MUST BE FLAGGED

FAX COMPLETED ORDERS TO PHARMACY

PLACE ORIGINAL IN PATIENT'S CHART

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B-00-07-10052 – Magnesium Sulphate

Appendix B – Hypertension Post Partum Orders (PHC-PH247)

IF YOU RECEIVED THIS FAX IN ERROR, PLEASE CALL 604-806-8886 IMMEDIATELY	
 PRESCRIBER'S ORDERS	
NO DRUG WILL BE DISPENSED OR ADMINISTERED WITHOUT A COMPLETED CAUTION SHEET ALLERGY/INTOLERANCE STATUS FORM (PHC-PH047)	
DATE AND TIME	HYPERTENSION POSTPARTUM ORDERS (Items with check boxes must be selected to be ordered) (Page 1 of 1)
<p>ACTIVITY: Bed rest with bathroom privileges until condition stable</p> <p>CONSULTS:</p> <p>MONITORING: Vital signs as per protocol and PRN Weight daily Pulse oximetry once a day Postpartum Day 1 and every Monday and Thursday until discharge Dipstick urine for protein PPD 1 and every Monday and Thursday until discharge Monitor intake and output, Q1H and total Q4H</p> <p>LABORATORY: Blood investigations – Do postpartum Day 1 and every Monday and Thursday until discharge <input type="checkbox"/> Draw all labs listed below (As recommended by BCRCP Hypertension in Pregnancy Guidelines), or indicate individual labs to be drawn <input type="checkbox"/> CBC <input type="checkbox"/> Bicarb <input type="checkbox"/> AST, ALT <input type="checkbox"/> Na⁺, K⁺, Ca⁺⁺, Mg⁺⁺ <input type="checkbox"/> BUN, Creatinine <input type="checkbox"/> Random Glucose <input type="checkbox"/> LDH <input type="checkbox"/> Albumin <input type="checkbox"/> Bilirubin <input type="checkbox"/> Uric Acid <input type="checkbox"/> INR, PTT <input type="checkbox"/> Fibrinogen <input type="checkbox"/> Urine – Random urine for protein creatinine ratio Postpartum Day 1 and every Monday and Thursday until discharge </p> <p>INTRAVENOUS: Sodium chloride 0.9% IV at _____ mL/hour Total IV fluids not to exceed 80 mL/hour</p> <p>MEDICATIONS: <input type="checkbox"/> magnesium sulfate 4 mmol (1 g)/hour IV for 24 hours after delivery magnesium sulfate 80 mmol (20 g) in sodium chloride 0.9% 500 mL Piggyback magnesium sulfate infusion to mainline and adjust the infusion rate to 25 mL/hour to administer 4 mmol (1 g)/hour <input type="checkbox"/> renal dosing required: decrease infusion rate to _____ mL/hour (_____ g/hour) </p>	
Printed Name _____	Signature _____ College ID _____ Pager _____

Form No. PH247 (R. Jan 30-14)

ALL NEW ORDERS MUST BE FLAGGED

FAX COMPLETED ORDERS TO PHARMACY

PLACE ORIGINAL IN PATIENT'S CHART

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B-00-07-10052 - Page 15 of 17

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B-00-07-10052 – Magnesium Sulphate

Appendix C – Magnesium Sulfate Infusion for Fetal Neuroprotection Orders (PHC-PH573)

<p>IF YOU RECEIVED THIS FAX IN ERROR, PLEASE CALL 604-806-8886 IMMEDIATELY</p>	
<p>PRESCRIBER'S ORDERS</p>	
<p>NO DRUG WILL BE DISPENSED OR ADMINISTERED WITHOUT A COMPLETED CAUTION SHEET ALLERGY/INTOLERANCE STATUS FORM (PHC-PH047)</p>	
<p>DATE AND TIME</p>	<p>MAGNESIUM SULFATE INFUSION FOR FETAL NEUROPROTECTION MATERNITY ORDERS (Items with check boxes must be selected to be ordered) Page 1 of 1</p>
<p>ADMISSION INSTRUCTIONS: Admit under care of _____ Obstetrician Gestational age: _____</p> <p>DIET: NPO</p> <p>ACTIVITY: Bed rest with bathroom privileges</p> <p>CONSULTS: Obstetrics and Paediatrics</p> <p>MONITORING: Vital Signs: check T, P, RR, BP on admission During loading dose: BP, pulse, RR every 5 minutes Pulse – keep fingers on maternal pulse throughout loading dose infusion Pulse oximetry continuously Continuous Electronic fetal monitoring Maintenance infusion: BP, pulse, RR every 15 minutes for 1 hour, then every hour during continuous infusion Pulse oximetry continuously Continuous Electronic fetal monitoring</p> <p>LABORATORY: Serum Magnesium Level</p> <p>INTRAVENOUS: sodium chloride 0.9% IV at _____ mL/hour Total IV fluids not to exceed 80 mL/hour</p> <p>MEDICATIONS: magnesium sulfate 16 mmol (4 g) loading dose IV over 30 minutes followed by maintenance dose of 4 mmol (1 g)/hour Loading Dose: magnesium sulfate 16 mmol (4 g) in sodium chloride 0.9% 50 mL Piggyback to mainline and infuse by volumetric infusion pump at 100 mL/hour Maintenance Dose: magnesium sulfate 80 mmol (20 g) in sodium chloride 0.9% 500 mL Piggyback magnesium sulfate infusion to mainline after loading dose has been completed. Adjust the infusion rate to 25 mL/hour to administer 4 mmol (1 g)/hour <input type="checkbox"/> renal dosing required: decrease infusion rate to _____ mL/hour (_____ g/hour) <input type="checkbox"/> Discontinue magnesium sulfate infusion immediately after delivery or after 24 hours of continuous infusion <input type="checkbox"/> Do not discontinue. Refer to completed Hypertension Antepartum/Intrapartum Orders (PH257)</p>	
<p>Printed Name _____</p>	<p>Signature _____ College ID _____ Pager _____</p>

Form No. PH573 (Jan 30-14)

ALL NEW ORDERS MUST BE FLAGGED

FAX COMPLETED ORDERS TO PHARMACY PLACE ORIGINAL IN PATIENT'S CHART

RD: April 2014

B-00-07-10052 - Page 16 of 17

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Questions, concerns, comments about PHC guidelines can be emailed to: nursingstds@providencehealth.bc.ca

Appendix D: Magnesium Levels: (PHC Lab)

Effect	mmol/L
Healthy, no magnesium therapy	0.7 to 1
Convulsion prophylaxis	2 to 3
Preterm labour inhibition	3 to 4
Loss of deep tendon reflexes	5
Respiratory paralysis	7.5
General Anaesthesia	7.5
Cardiac arrest	Greater than 12