Royal Hospital for Women (RHW) BUSINESS RULE COVER SHEET

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SUMMARY	This clinical business rule is to be used for the management of a woman with eclampsia

Eclampsia Management

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1. BACKGROUND

Eclampsia is characterised by the occurrence of one or more seizures in a pregnant or postpartum woman in association with other features consistent with pre-eclampsia. It can be a life-threatening obstetric emergency[1]. Fortunately it occurs rarely in Australia. Seizures may occur antenatally, intra-partum or postnatally, usually within 24 hours of birth but occasionally later. No reliable clinical markers can predict eclampsia. Hypertension and proteinuria may be absent prior to the seizure and not all women will have warning symptoms such as headache, visual disturbances, hyperreflexia, r clonus, or epigastric pain[1].
Control of severe hypertension to levels below 160/100 mmHg is essential as the threshold for further seizures is lowered after eclampsia, likely due to vasogenic brain oedema. In addition, the danger of cerebral haemorrhage is present[1].

2. RESPONSIBILITIES

2.1 Midwifery and nursing staff will: collect equipment, resuscitate the woman, document in real time the clinical events, administer medications and prevent further seizures

2.2 Medical staff will: resuscitate the woman, assess for other possible causes of seizure manage hypertension and prevent further seizures, document in the medical record

3. PROCEDURE

*3.1. **Clinical Practice** (flow chart see appendix 1)*

3.1.1. **Resuscitation**

- Follow resuscitation principles (Danger, Response, Send for Help, Airway, Breathing, CPR, Defibrillation)
- Call "Adult CODE BLUE" on 2222 stating exact location
- Place woman on her side and remove all potential hazards
- Allocate another staff member to retrieve eclampsia box/trolley
- All staff should be aware of location of eclampsia box/trolley for each clinical area. Ensure patent airway and give oxygen via non-rebreather mask at 15L/min. Non-rebreather mask is in the arrest trolley
- Obtain Intravenous (IV) access and collect blood for:
  - electrolytes, urea, and creatinine (EUC)
  - liver function tests (LFT)
  - calcium, magnesium, phosphate (CMP)
  - full blood count (FBC)
  - coagulation profile
  - group and hold (G & H)
- Prepare and administer magnesium sulphate loading dose as per Magnesium Sulphate for Eclampsia or Eclampsia Prophylaxis clinical business rule (CBR) (see complete CBR for more details)
  - Loading Dose:
    - Give 4g IV (100mL premixed bag) over 20 minutes (irrespective of urine output (UO) or creatinine)
  - Maintenance Dose:
    - if UO > 20 mL/hour and creatinine < 200µmol/L, give 1g/hour IV i.e. 25mL/hr (of 100mL premixed bag)

        - **DO NOT** give a **MAINTENANCE** dose if UO ≤ 20mL/hour or creatinine ≥ 200μmol/L. Consult with Obstetric physician regarding management
- If a further seizure occurs once on the maintenance infusion, an additional 2g bolus can be given over 20 minutes
- Administer midazolam 2-5mg IV or IM if seizure is not self-limiting i.e. persists beyond 5 minutes (this may need to be administered prior to magnesium sulphate loading dose)
- Insert urinary catheter, with an hourly measure bag
- Notify obstetric and anaesthetic consultant, along with obstetric physician. Request urgent attendance
- Move woman to Acute Care Centre (ACC), Birth Unit (BU), or Intensive Care Unit (ICU) as appropriate

3.1.2. **Prevention of further seizures**

- Continue magnesium sulphate infusion and ensure close observation and assessment (maternal and fetal). Perform the following observations:
    - 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
        - Continuous fetal heart rate monitoring as clinically indicated
        - Measure temperature every four hours
        - Check magnesium level and perform electrocardiogram (ECG) if there are any signs or symptoms of toxicity
- Record all observations on Maternity Between the Flags (BTF) Observation Chart
- Check magnesium level (therapeutic range 1.5-3.5 mmol/L) if there are signs or symptoms of toxicity (see Magnesium Sulphate for Eclampsia or Eclampsia Prophylaxis CBR for more details):
    - absent tendon reflexes
    - respiratory depression/arrest
    - diplopia/blurred or double vision
    - dysarthria/slurred speech
    - cardiac arrest/asystole

If Magnesium toxicity is diagnosed, stop the magnesium infusion and give the antidote of 10mL of 2.2mmol calcium gluconate OR calcium chloride 10% (1g in 10ml) via large bore PIVC or CVAD IV slowly over 10 minutes[3]

- Review continuation of magnesium sulphate infusion in the early postpartum period as there is no conclusive evidence to guide its continuation as prophylaxis after delivery [9,10]. The obstetric physician or obstetrician should be consulted and a plan made for either ceasing it at birth or continuing the infusion for up to 24 hours in high-risk women e.g. after an eclamptic seizure.
- Control hypertension as outlined below
- Continue post-seizure monitoring as indicated by ongoing treatment including:
    - neurological status
    - regular maternal observations
    - cardiac monitoring
- Plan birth if undelivered depending on gestation
- Monitor and manage the potential hypertensive reflex response in a woman requiring intubation with the anaesthetics team
- Admit woman to Acute Care ward postpartum

3.1.3. **Control of hypertension (if needed)**

- Establish control of BP with IV labetalol or IV hydralazine as per Severe and/or Urgent Hypertension in pregnancy CBR
- Aim to lower Systolic Blood Pressure (SBP) by 20-30 mmHg and Diastolic Blood Pressure (DPB) over 20-40 minutes
  - Prepare and administer IV bolus antihypertensive Labetalol (see table 1) or Hydralazine (see table 2) and as outlined in Severe and/or Urgent Hypertension in pregnancy CBR:

Table 1 – IV Labetalol bolus

IV labetalol
o Administer fluid preload (antenatal only) – 250 mL crystalloid
o Administer labetalol 20mg as a slow IV bolus over 2 minutes by medical officer or accredited RN/RM
o Repeat 20mg slow IV bolus every 10 minutes as necessary to a maximum of 4 doses
o Record HR and BP every 5 minutes until stable (≤ 155/95mmHg) for 20 minutes, then record BP and HR hourly for 4 hours and then return to usual pre-eclampsia regimen
Consider IV infusion if BP is not adequately controlled after 4 bolus doses (80mg)

Table 2 – IV Hydralazine bolus

IV hydralazine
o Administer fluid preload (antenatal only)– 250 mL crystalloid
o Administer hydralazine 10 mg over 3-10 minutes by medical officer or accredited RN/RM
o Repeat 10mg dose after 20 minutes if required
o Record HR and BP every 5 minutes until stable (≤ 155/95mmHg) for 20 minutes, then record BP and HR hourly for 4 hours and then return to usual pre-eclampsia regimen
o Consider IV infusion if BP is not adequately controlled after 2 bolus doses

- Review oral hypertensive regime in consultation with obstetric medical team and obstetric physician

3.1.4. **Birth**

- Ensure woman is medically stable
- Consult anaesthetic team
- Decide on timing and mode of birth depending on woman's clinical state and any evidence of fetal compromise
- Maintain close fetal monitoring until and during birth
- Inform the Neonatal Intensive Care Unit (NICU) about the plan for birth

3.2 ***Documentation***

- Medical Record

3.3 ***Education Notes***

- Eclampsia remains rare in Australia (in singleton pregnancies 8.6/10,0000) equivalent to 0.1% of all births.[1]
- Magnesium sulphate has been shown to be more effective than other therapies in the prevention of first and further seizures[1]
- The bolus dose of magnesium sulphate is distributed throughout the tissues and is then renally excreted. Renal impairment (creatinine ≥ 200µmol/L) or oliguria (UO ≤ 20mL/hour) is a contraindication to maintenance infusion[4]. Consult with Obstetric physician regarding management
- After Magnesium sulphate administration, the recurrence rate of seizures is 10-15%[1]
- If Magnesium toxicity is diagnosed, stop the magnesium infusion and give the antidote of 10mL of 10% Calcium gluconate IV over 5 minutes[3]
- Eclamptic seizures are mostly self-limiting. The use of midazolam or diazepam should be limited to sustained or recurrent seizures despite magnesium sulphate [3]
- Once there has been an eclamptic seizure, birth should be planned promptly even though many women appear to be stable[1]

  - Some delay in birth, to allow for administration of steroids may be considered at extremely preterm gestations
- Choose mode of birth for a woman with eclampsia according to the clinical circumstances and the woman's preference.[4]
- Women with eclampsia do not require additional fluids except for management of oliguria or renal impairment where indicated [3]

3.4 ***Implementation, communication and education plan:-***

The revised CBR will be distributed to all medical, nursing and midwifery staff via @health email. The CBR will be discussed at ward meetings, education and patient quality and safety meetings. Education will occur through in-services, open forum and local ward implementation strategies to address changes to practice. The staff are asked to respond to an email or sign an audit sheet in their clinical area to acknowledge they have read and understood the revised CBR. The CBR will be uploaded to the CBR tab on the intranet and staff are informed how to access

3.5 ***Related Policies/procedures***

1. Severe and/or Urgent Hypertension in Pregnancy
2. Magnesium Sulphate for Eclampsia or Eclampsia Prophylaxis
3. Management of Hypertensive Disorders in Pregnancy. NSW Health 2011 PD2011_064.

3.6 ***References***

1. The SOMANZ Guidelines for the Management of Hypertensive Disorders of Pregnancy. 2014. Lowe SA, Bowyer L, Lust K, McMahon LP, Morton MR, North RA, Paech M. Said JM
2. Queensland Clinical Guideline. Hypertension and pregnancy. Flowchart: F21.13-1-V8-R26.
3. Hypertension in Pregnancy: Diagnosis and Management. NICE National Institute for Health Care Excellence Guideline. NG133. 25 June 2019
4. Chuan FS, Charles BG, Boyle RK, Rasiah RL. Population pharmacokinetics of magnesium in preeclampsia. American journal of obstetrics and gynecology. 2001 Sep 1;185(3):593-9.

4. CULTURAL SUPPORT

- When clinical risks are identified for an Aboriginal woman, she may require additional supports. This may include Aboriginal health professionals such as Aboriginal liaison officers, health workers or other culturally specific services.
- For a Culturally and Linguistically Diverse CALD woman, notify the nominated cross-cultural health worker during Monday to Friday business hours
- If the woman is from a non-English speaking background, call the interpreter service: NSW Ministry of Health Policy Directive PD2017_044-Interpreters Standard Procedures for Working with Health Care Interpreters.

5. REVISION AND APPROVAL HISTORY

Date	Revision No.	Author and Approval
Reviewed and endorsed Safety and Quality Committee May 2023 Reviewed and endorsed Maternity Services LOPs July 2019 Change 777 to 2222 February 2019 Quality Council 21/6/04 Maternity Services Clinical Committee 8/6/04		

Eclampsia Management

Appendix 1

Management
IV access + collect bloods (EUC, LFT, CMP, FBC, Coagulations profile, G&H)

Administer loading dose magnesium sulphate (*as per Magnesium Sulphate for Eclampsia or Eclampsia Prophylaxis*)

- Give 4g (100ml premixed bag) IV over 20 minutes (irrespective of urine output (UO) or creatinine level)

Maintenance Dose Magnesium sulphate

- 1g/hr IV i.e. 25ml/hr (of 100ml premixed bag) if UO >20mL/hr or creatinine >200μmol/L
- **Do not give** if UO ≤20mL/hr or creatinine 200μmol/L – consult obstetric physician
- If a **second seizure occurs** whilst **on maintenance,** a **second** bolus **dose of 2g** can be given

Consider IV/IM midazolam 2-5mg if seizure not self-limiting (≥ 5 minutes, may need to be administered pre magnesium)

Monitoring & Prevention of further Seizures (as *per Magnesium Sulphate for Eclampsia or Eclampsia Prophylaxis*)

- **Continue magnesium** infusion & observe & assess maternal and fetus closely.

Observations hourly

- BP (cease infusion if <110/70mmHg)
- Respirations (<10 per min.)
- Pulse
- Tendon reflexes (cease if can't elicit)
- UO (cease infusion if <30ml/hr)
- Temperature 4 hourly
- Continuous FHR monitoring as clinically indicated
- **If clinical signs of toxicity** check blood levels and perform ECG
- **Therapeutic range 1.5-3.5**
- **Toxic level ≥ 4.0mmol/L**

Antidote for toxicity (as per *Magnesium Sulphate for Eclampsia or Eclampsia Prophylaxis*)

Resuscitate → **Control seizures** → **Control Hypertension** → **Plan for Birth**

Resuscitation

D – Dangers
R - Response
S – Send for help – dial 2222 'Adult Code Blue'
A – Airway - patent
B – Breathing O2 via NRB
C – CPR
D - Defibrillation

Treat Hypertension (*as per severe and/or urgent hypertension CBR)*

- Aim to reduce BP by 10-12mmHg (or SBP by 20-30mmHg & DBP by 10-15mmHg)
- Prepare and administer IV bolus antihypertensive:-
  - 250ml crystalloid preload +
  - **IV labetalol** 20mg push over 2 minutes. Repeat 20mg push every 10 minutes to maximum of 4 doses (80mg)
  - consider Infusion if not controlled after 4 doses (*see severe and/or urgent hypertension* CBR)
    OR
  - **IV Hydralazine** 10mg push over 3-10mins. Repeat 10mg push after 20 minutes if required
  - consider Infusion if not controlled after 2 doses (*see severe and/or urgent hypertension* CBR)

Birth

- Plan promptly with multidisciplinary team (obstetrics, anaesthetics, neonatology etc)
- Ensure woman is stable
- Decide timing & mode of birth (woman's clinical state and signs of fetal compromise)
- Close monitoring of fetus