MATERNITY UNIT
GUIDELINE: HYPERTENSIVE DISORDERS IN PREGNANCY, MANAGEMENT OF

SCOPE: All Midwives, Nurses, LMCs and Obstetricians working in Maternity unit

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PURPOSE: To provide midwives, LMCs and obstetricians with evidence based guidance on the screening, diagnosis and treatment of women with hypertension in pregnancy, pre-eclampsia and eclampsia.

CONTENTS

BACKGROUND: Chronic hypertension, gestational hypertension, pre-eclampsia, eclampsia and HELLP syndrome are all part of the spectrum of hypertensive disorders of pregnancy. Pre-eclampsia complicates approximately 3-8% of pregnancies in New Zealand, and hypertensive disorders together affect about 5-10% of pregnancies (4-5% nulliparous; 2-3% in low-risk multiparas and up to 20% in women with major risk factors). Chronic hypertension, gestational hypertension and pre-eclampsia have increased over time as a result of changes in the characteristics of mothers (such as in their age and pre-pregnancy weight), whereas eclampsia has declined following on from widespread antenatal care and use of prophylactic treatments (such as magnesium sulphate). A priority of antenatal care in the second half of pregnancy is to detect the development of pre-eclampsia. When pre-eclampsia develops, delivery is the only known cure. Management is aimed at timing of delivery and providing therapy to prevent maternal complications whilst minimising foetal morbidity and mortality.

The New Zealand Ministry of Health (MoH) has identified a need for an evidence-based guideline developed in consultation with the wider New Zealand maternity sector for diagnosing and treating hypertension and pre-eclampsia in pregnancy. This was released in August 2018 and this Hauora Tairāwhiti guideline is based on the MoH Clinical Practice Guideline "*Diagnosis and Treatment of Hypertension and Pre-eclampsia in Pregnancy in New Zealand".*

A World Health Organisation (WHO) review identified hypertension as the single leading cause of maternal mortality in developed countries, accounting for 16% of maternal deaths. Perinatal mortality is also high for women who experience pre-eclampsia. Hypertensive disorders in pregnancy are linked with acute and long term morbidity in mothers and babies.

DEFINITIONS:

SBP = Systolic BP

DBP = Diastolic BP

PCR = (urine) Protein:creatinine ratio

Hypertension is a SBP ≥ 140 and/or DBP ≥ 90mmHg on two or more consecutive occasions at least 4 hours apart.

Chronic/pre-existing hypertension is hypertension diagnosed before conception or before 20 weeks of gestation with or without known cause, measured on two or more occasions at least four hours apart.

Gestational hypertension is New onset hypertension occurs after 20 weeks' gestation (in a woman who had normal blood pressure before 20 weeks' gestation) and:

- diastolic blood pressure is ≥90 mmHg **or** systolic blood pressure is ≥140 mmHg
- the woman has none of the abnormalities that define pre-eclampsia
- her blood pressure returns to normal within three months after giving birth. Proteinuria for definition of pre-eclampsia is defined by a PCR≥ 30 on a random urine sample or suspected with ≥2+ on two separate dipstick samples. This should be confirmed with a PCR.

Pre-eclampsia is new onset hypertension after 20 weeks gestation or pre-existing hypertension PLUS one or more of the following:

- Proteinuria ≥2+ on dipstick confirmed by protein:creatinine ratio, or protein:creatinine ratio ≥ 30mg/mmol.
- Other maternal organ dysfunction
  - Renal insufficiency (creatinine > 90 µmol/L or urine output <80ml/4 hrs).
  - Liver involvement (AST and ALT at least twice upper limit of normal + right upper quadrant or epigastric pain).
  - Neurological complications (eg severe headaches, visual changes, altered mental status, hyperreflexia with clonus).
- Uteroplacental dysfunction (eg foetal growth restriction, abruption).

Severe Features of Pre-eclampsia is when pre-eclampsia is accompanied by any of the following:

- Severe hypertension (sBP ≥ 160mmHg or dBP ≥ 110mgHg).
- Haematological involvement
  - Thrombocytopenia – Platelets < 100K or rapidly falling platelets
  - Haemolysis – Abnormalities on peripheral blood smear, increased bilirubin levels and dramatically increased LDH (eg twice normal levels)
  - Disseminated intravascular coagulation
- Impaired liver function
  - Elevated transaminases (2 x upper limits of normal)
  - Severe epigastric or right upper quadrant pain, nausea and vomiting
- Progressive renal insufficiency (creatinine > 90 µmol/L or doubling of serum creatinine concentration in the absence of other renal disease, urine output <80ml/4 hrs).
- Pulmonary oedema.
- New onset headaches and visual disturbance.
- HELLP syndrome.
- Eclampsia
- Intrauterine growth restriction with oligohydramnios and abnormal uterine artery Doppler flows

Unstable pre-eclampsia (Also known as fulminating pre-eclampsia) is pre-eclampsia with worsening blood results and severe hypertension not controlled by antihypertensives.

Eclampsia is new onset seizures in association with pre-eclampsia. May occur before, during or after birth.

HELLP syndrome considered a variant of severe ppre-eclampsia (elements include **H**aemolysis, **E**levated **L**iver enzimes and **L**ow **P**latelet count). Any of the following in a woman with pre-eclampsia is an indicator of HELLP:

- maternal platelet count of less than 100 × 109/L
- elevated transaminases (elevated blood concentrations of liver enzymes to twice the normal concentration)
- microangiopathic haemolytic anaemia with red cell fragments on blood film.

GUIDELINE:

DIAGNOSIS

The evaluation of hypertensive disorders in pregnancy should include at least the following:

- Evaluation of blood pressure
- Evaluation for symptoms of severe pre-eclampsia (ie. headache, visual changes, epigastric/right upper quadrant pain, nausea and vomiting.
- Evaluation for urinary protein
- Complete blood count
- Serum creatinine
- Serum liver transaminases
- Fetal assessment – CTG and amniotic fluid assessment

Other tests which may be considered depending on the presentation are: obstetrical ultrasound for estimated fetal weight, amniotic fluid and Dopplers; serum lactate dehydrogenase and coagulation studies.

PRE-CONCEPTION AND EARLY ANTENATAL CARE

- Where any woman has a history of chronic hypertension, hypertension in pregnancy or pre-eclampsia she should be offered pre-conceptual counselling. It is recommended that women wishing to become pregnant, or recently pregnant, be changed from an angiotension converting enzyme (ACE) inhibitor to an alternative medication such as labetalol, nifedipine or methyldopa.
- As early as possible in pregnancy or at booking assess for hypertensive disorders including risk of pre-eclampsia (see appendix 1, table 1): Women who have a Major Risk Factor (MRF) have an approximately 20% risk of developing pre-eclampsia and should be considered high risk. Women with multiple risk factors should be given special consideration.
- Women with pre-existing hypertension should be referred for a consultation with the obstetric team, advised of the risks of hypertensive disorders, given information in a form they can understand and offered lifestyle advice. (See 'Lifestyle' page 8 of the Ministry of Health document, Appendix Two).
- A plan of care should be fully documented in the woman's notes. This should include clinical responsibilities for ongoing care and monitoring in conjunction with the woman and her LMC, also GP involvement if anticipated. It should reflect the woman's preferences.
- Women at high risk for pre-eclampsia should be advised to begin taking aspirin, 100mg at night, before 16 weeks gestation. They may remain on this medication until they give birth.
- It is recommended that women with a major risk factor should have uterine artery doppler studies at the 20 week anatomy scan.
- Calcium is also recommended (calcium supplementation along with dietary advice to achieve 1g elemental intake per day from booking until birth).
- Excessive weight gain in pregnancy puts women at risk of developing hypertensive disorders. This risk is even greater in women who are obese when they become

pregnancy. An optimal gestational weight gain for these women is 5-9kg. Give specific education around optimal weight gain.

- Give routine advice on healthy eating, smoking cessation, alcohol intake and mild to moderate exercise to all women in the antenatal period, as well as weighing them regularly.

OVERALL MANAGEMENT:

It is important to emphasize that treatment will not change the underlying progression of hypertensive disorders in pregnancy but it may reduce the risk of complications such as stroke and abruption.

Antenatal:

- Urgently treat all women with severe hypertension (dBP ≥110 or sBP ≥160 mmHg) with antihypertensives to acutely lower blood pressure.
- Consider antihypertensives for women with gestational hypertension (dBP ≥90 or sBP ≥140 mmHg), especially those with risk factors and/or co-morbidities.
- Aspirin (100 mg daily) is indicated in women at high risk of developing pre-eclampsia. They should begin taking it before 16 weeks' gestation. Effectiveness of aspirin is improved in pregnancy if taken at night.
- For women at high risk of pre-eclampsia, offer calcium supplementation along with dietary advice to achieve 1 g elemental intake per day, from booking to birth.
- Emphasise educating women so that they clearly understand the importance of taking their antihypertensive drugs as prescribed, the symptoms of HDP and when to report symptoms.
- First-line antihypertensives to use in treating HDP include: labetalol, nifedipine and methyldopa
- Fetal assessment with ultrasound at time of diagnosis. Do not repeat USS in <2 weeks, unless fetal indications, repeat if suspected growth restriction on clinical assessment by LMC. Umbilical artery velocimetry and cardiotocography only if fetal growth restriction or distress is suspected.

Criteria for transfer to tertiary care facility:

- Woman under 32 weeks of gestation

Intrapartum:

- Treatment options such as antihypertensives and seizure prophylaxis are described in the flowcharts following.
- Fetal monitoring should be continuous, especially if acutely administering antihypertensives
- Attention should be paid to deep vein thrombosis (DVT) prophylaxis as PET increases the DVT risk.
- Fluid management must be strict. Woman with preeclampsia should have an IV sited.
- If IV fluids are given, maintain IVF at 85 ml/hour with total of 1000 mls/12hours.
    - Strict fluid balance with all ins and outs recorded
    - Fluid challenges only as necessary and limited to 200-300ml – use caution regarding repeat fluid challenges.
    - Consider anaesthesia involvement dependent on the woman's condition.

Ergometrine and Syntometrine are contraindicated in the presence of hypertension. Prostaglandins and Syntocin are indicated as needed. NSAIDs should not be used postpartum for woman with persistent hypertension

Postnatal:

- Recommend women who have had preeclampsia stay in secondary or tertiary facility for at least 72 hours postpartum
- 4–6 hourly blood pressure (except overnight when an interval of 8 hours is acceptable) while inpatient
- Monitor for all signs of preeclampsia (including preeclampsia bloods) returning to normal but beware of postpartum deterioration and eclampsia
- After discharge, blood pressure daily for first 7 days, then weekly up to 6 weeks postpartum (see treatment summary 8 and appendix four for postnatal outpatient management and BP recording booklet).

  Criteria for transfer to tertiary care facility:
  - Critically ill woman once stable for transfer.

  Criteria for transfer to critical care unit:
  - Persisting convulsions
  - SBP > 180 and DBP > 120 despite treatment
  - Pulmonary oedema
  - Unresponsive oliguria
  - Compromised myocardial function
  - Neurologic impairment
  - Massive blood loss
  - Inadequate staffing levels or experience
  - Other complicating comorbidities

TREATMENT SUMMARIES

1) **Monitoring requirements for women with hypertensive disorders in pregnancy**
2) **Pre-existing chronic hypertension**
3) **Gestational Hypertension**
4) **Pre-clampsia**
5) **Severe/unstable pre-eclampsia**
6) **Eclampsia**
7) **HELLP**
8) **Care Pathway for Postnatal Women with Hypertensive Disorders**

1) Monitoring Requirements For Women With Hypertensive Disorders In Pregnancy

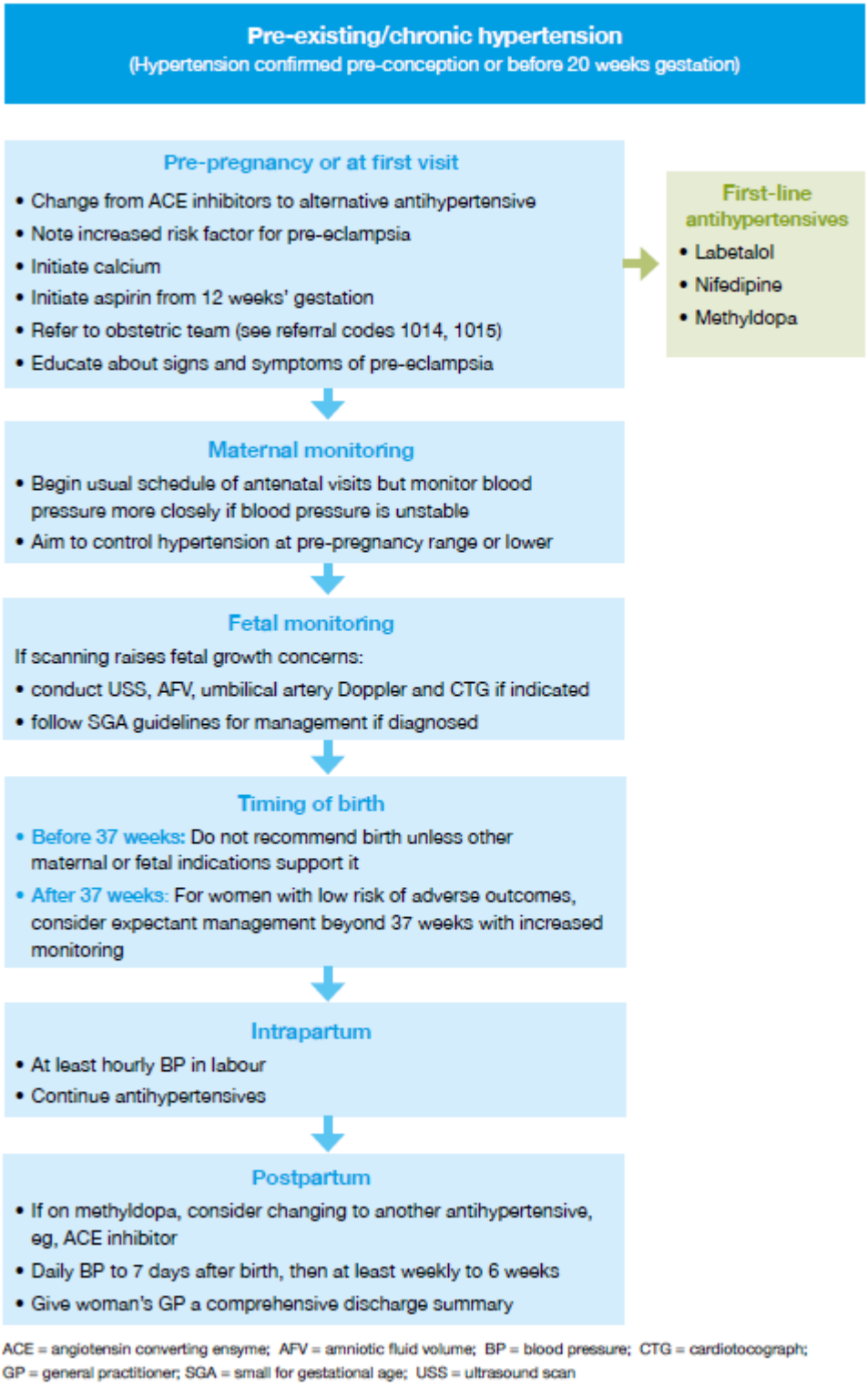
Table 3. Monitoring requirements for women with hypertensive disorders in pregnancy

Pre-existing/ chronic	Gestational hypertension	Pre-eclampsia /expectant management (hospital inpatient)	Severe unstable pre-eclampsia/ eclampsia (hospital inpatient)	Magnesium sulphate monitoring (high dependency-like setting)	Intrapartum pre-eclampsia/ eclampsia	Postpartum
Identify **risk** factors	Blood pressure 1–2 times a week	4–6 hourly **blood pressure** (except overnight when an interval of 8 hours is acceptable)	One-on-one care Hourly **blood pressure,** respiratory rate, oxygen saturation	One-on-one care **Blood pressure** every 5 minutes during loading dose then hourly during maintenance dose	**Blood pressure** at least hourly	Recommend women who have had pre-eclampsia **stay in secondary or tertiary facility** for at least 72 hours postpartum
Consider more frequent **blood pressure measurements and appointments** than normal if for pregnant women who have any of the risk factors and unstable pre-eclampsia; individualise decision to the woman	**Proteinuria** at least weekly[a]	Twice weekly **pre-eclampsia bloods** = full blood count (including haemoglobin, platelet count), creatinine, electrolytes, liver function tests (albumin, ALT and AST)	At least daily **pre-eclampsia bloods** = full blood count (including haemoglobin, platelet count), creatinine, electrolytes, liver function tests (albumin, ALT and AST)	At least daily **pre-eclampsia bloods** = full blood count (including haemoglobin, platelet count), creatinine, electrolytes, liver function tests (albumin, ALT and AST)	**Urine output** or **fluid balance**	Base the decision for discharge timing on the individual woman and on whether satisfactory monitoring and follow-up care arrangements have been made
	Pre-eclampsia bloods if sudden increase in BP or new proteinuria				Continuous **cardiotoco-graphy**	4–6 hourly **blood pressure** (except overnight when an interval of 8 hours is acceptable) while inpatient
	Fetal assessment at time of diagnosis. Do not repeat USS in <2 weeks, unless fetal indications[b]	Perform **coagulation studies** if liver tests are abnormal or you have concerns about possible placental abruption	Perform **coagulation studies** if liver tests are abnormal or you have concerns about possible placental abruption	Perform **coagulation studies** if liver tests are abnormal or you have concerns about possible placental abruption	**Fluid restriction** (replace loss at birth and then 80–85 mL/hour total fluid for severe pre-eclampsia)	Monitor for **all signs** of pre-eclampsia **(including pre-eclampsia bloods)** returning to normal but beware of postpartum deterioration and eclampsia

Pre-existing/ chronic	Gestational hypertension	Pre-eclampsia /expectant management (hospital inpatient)	Severe unstable pre-eclampsia/ eclampsia (hospital inpatient)	Magnesium sulphate monitoring (high dependency-like setting)	Intrapartum pre-eclampsia/ eclampsia	Postpartum
Ongoing **fetal assessment**[b] for growth. If IUGR detected, follow the SGA pathway	Changes in **fetal movements**, other **signs/ symptoms** of pre-eclampsia. The woman assesses daily and her maternity carers when they see her	Repeat **laboratory investigations** more often if you have concerns about the condition of either mother or fetus	Repeat **laboratory investigations** more often if you have concerns about the condition of either mother or fetus	Repeat **laboratory investigations** more often if you have concerns about the condition of either mother or fetus		After discharge, **blood pressure** daily for first 7 days, then weekly up to 6 weeks postpartum
		Cardiotocography (CTG) daily if inpatient	**Cardiotocography** daily	Continuous **cardiotoco-graphy**		
		Symptoms of labour (presence of contractions, rupture of membranes, abdominal pain, bleeding)	**Fluid restriction** 80–85 mL/hour total fluid for severe pre-eclampsia	Toxicity monitoring **Respiratory rate/SpO_2** hourly **Patella reflexes** hourly		
		Symptoms of severe pre-eclampsia (headaches, visual changes, shortness of breath, epigastric pain, retrosternal pressure/pain, nausea, vomiting, hyperreflexia)	**Fluid balance** chart **Symptoms of labour** (presence of contractions, rupture of membranes, abdominal pain, bleeding)	**Urine output** (>100 mL over 4 hours)		

a. Urinalysis by dipstick followed by spot urine PCR if ≥2+ proteinuria. Once significant proteinuria has been detected, there is no established role for serial testing. b. Fetal assessment with ultrasound for early dating and fetal growth at the time of diagnosis, and repeat if suspected growth restriction on clinical assessment by LMC. Umbilical artery velocimetry and cardiotocography only if fetal growth restriction or distress is suspected. c. Educate the woman around the need to contact her LMC urgently if she experiences symptoms of pre-eclampsia/eclampsia or any changes in fetal movements. ALT = alanine aminotransferase, AST = aspartate aminotransferase, BP=blood pressure, IUGR = intrauterine growth restriction, SGA = small for gestational age, SpO2 = peripheral capillary oxygen saturation, USS = ultrasound scan

2) Pre-existing/chronic hypertension



ACE = angiotensin converting ensyme; AFV = amniotic fluid volume; BP = blood pressure; CTG = cardiotocograph; GP = general practitioner; SGA = small for gestational age; USS = ultrasound scan

3) Gestational Hypertension

Gestational hypertension

New onset of hypertension after 20 weeks' gestation without signs of pre-eclampsia and dBP ≥90 OR sBP ≥140 mmHg

At diagnosis

- Spot urine protein creatinine ratio (PCR)
- Pre-eclampsia bloods
- Prompt referral to obstetric team (see referral code 4009)
- Assess fetal growth/wellbeing (USS, umbilical artery Doppler assessment and CTG if indicated)
- Consider initiating first-line antihypertensives
- Educate about signs and symptoms of pre-eclampsia

Maternal monitoring

- The obstetric team makes a management plan for ongoing care and monitoring in discussion with the woman and her LMC
- Carry out BP and urinalysis for protein at least weekly
- If sudden increase in BP or new proteinuria, or other signs of pre-eclampsia, do pre-eclampsia bloods and PCR

Fetal monitoring

If scanning raises fetal growth concerns:

- conduct USS, AFV, umbilical artery Doppler and CTG if indicated
- follow SGA guidelines for management if diagnosed

Timing of birth

- Before 37 weeks: Recommend expectant managment. Do not recommend birth unless other maternal or fetal indications support it
- After 37 and before 40 weeks: Consider birth. The woman, her LMC and the obstetric team should negotiate the timing together

Intrapartum

- At least hourly BP in labour
- Continue antihypertensives – adjust if necessary for other factors, eg, neuraxial anaesthesia

Postpartum

- If on methyldopa, consider changing to another antihypertensive, eg, ACE inhibitor
- Daily BP to 7 days after birth, then at least weekly to 6 weeks
- Give woman's GP a comprehensive discharge summary

First-line Antihypertensives

- Labetalol
- Nifedipine
- Methyldopa

Pre-eclampsia bloods

- FBC
- Electrolytes
- Creatinine
- LFT (incl AST, ALT)
- Coagulation if AST ALT abnormal/low platelets

Signs and symptoms of pre-eclampsia

- Severe headache
- Visual disturbances
- Severe epigastric pain
- Shortness of breath
- Retrosternal pressure/pain
- Nausea, vomiting
- Sudden swelling of face, hands or feet
- Hyperreflexia

Antihypertensives and breastfeeding

- Establish breastfeeding if desired
- Change to compatible anthihypertensive, eg, ACE inhibitor
- Very pre-term babies may have an increased risk of adverse effects from anthihypertensives

ACE = angiotensin converting ensyme; AFV = amniotic fluid volume; ALT = alanine transaminase; AST = aspartate transaminase; BP = blood pressure; CTG = cardiotocograph; dBP = diastolic blood pressure; FBC = full blood count; GP = general practitioner; LFT = liver function test; sBP = systolic blood pressure; SGA = small for gestational age; USS = ultrasound scan

4) Pre-eclampsia

Pre-eclampsia
Hypertension (dBP ≥90 mmHg OR sBP ≥140 mmHg) + other signs and symptoms (refer to definitions)

At diagnosis
- Immediately consult with obstetric team. Transfer of care recommended (referral code 4022)
- Blood pressure control of primary importance. Start first-line antihypertensive if dBP ≥90 mmHg OR sBP ≥140 mmHg or acute regimen if dBP ≥110 mmHg OR sBP ≥160 mmHg. Aim for target BP 140/100 mmHg or lower
- Admit to secondary or tertiary facility
- Spot urine protein: creatinine ratio (PCR)
- Pre-eclampsia bloods
- Assess fetal growth/wellbeing (USS, umbilical artery Doppler assessment and CTG if indicated)
- Educate about signs and symptoms of worsening pre-eclampsia

Maternal monitoring
- The obstetric team makes a management plan for ongoing care and monitoring in discussion with the woman and her LMC
- BP 4–6 hourly (except overnight when an interval of 8 hours is acceptable)
- Clinical deterioration can be rapid
- Twice weekly pre-eclampsia bloods
- Conduct coagulation studies if liver function tests are abnormal or you have concerns about possible placental abruption

Fetal monitoring
- Follow SGA guidelines for management if diagnosed
- After assessment at the time of diagnosis, do not repeat USS for growth in <2 weeks
- Daily CTG if inpatient

Timing of birth
- Before 37 weeks: (eg, 36+6): Adopt expectant approach. Do not recommend delivery in the absence of other maternal indicatgors (eg, premature rupture of membranes, preterm labour or vaginal bleeding, deterioration of condition) or fetal indications. Should usually be managed as an inpatient.
- After 37 weeks: (eg, 37+0): Recommend birth. No appreciable benefit in continuing pregnancy after 37 weeks. The woman, her LMC and the obstetric team should negotiate the timing and method.

Intrapartum
- At least hourly BP in labour
- Continue antihypertensives – adjust if necessary for other factors, eg, neuraxial anaesthesia
- Fluid balance monitoring

Postpartum
- If on methyldopa, consider changing to another antihypertensive, eg, ACE inhibitor
- Continue to monitor for disease resolution, titrate antihypertensives as required
- Advise to stay in secondary/tertiary facility for at least 72 hours (4–6 hourly BP)
- Daily BP to 7 days after birth, then at least weekly to 6 weeks
- Give woman's GP a comprehensive discharge summary
- 6-week obstetric review

First-line antihypertensives
- Labetalol
- Nifedipine
- Methyldopa

Antihypertensives for acute lowering of BP
if dBP ≥110 mmHg OR sBP ≥160 mmHg

Nifedipine
10 mg conventional release tablet (oral)
Onset: 30–45 minutes
Repeat: after 30–45 minutes (if needed)
Maximum: 80 mg daily

Labetalol
Initially 20 mg IV bolus over 2 minutes
Onset: 5 minutes
Repeat with 40–80 mg
Repeat: every 10 minutes (if needed)
Maximum: 300 mg

Hydralazine
5–10 mg (5 mg if fetal compromise
IV bolus over 3–10 minutes)
Onset: 20 minutes
Repeat: every 20 minutes (if needed)
Maximum: 30 mg (consider IV bolus ocrystalloid fluid before or when administering first IV hydralazine dose (usually 200–300 mL)

Pre-eclampsia bloods
- FBC
- Electrolytes
- Creatinine
- LFT (incl AST, ALT)
- Coagulation if AST, ALT abnormal/low platelets

Signs and symptoms of pre-eclampsia
- Severe headache
- Visual disturbances
- Severe epigastric pain
- Shortness of breath
- Retrosternal pressure/pain
- Nausea, vomiting
- Sudden swelling of face, hands or feet
- Hyperreflexia

ACE = angiotensin converting ensyme; ALT = alanine transaminase; AST = aspartate transaminase; BP = blood pressure; CTG = cardiotocograph; dBP = diastolic blood pressure; FBC = full blood count; GP = general practitioner; IV = intravenous; LFT = liver function test; LMC = lead maternity carer; sBP = systolic blood pressure; SGA = small for gestational age; USS = ultrasound scan

5) Severe/unstable pre-eclampsia

Severe/unstable pre-eclampsia

Uncontrolled severe hypertension (dBP ≥110 mmHg OR sBP ≥160 mmHg) + worsening PE bloods + other signs and symptoms (refer to definitions)

At diagnosis

- Consult immediately with obstetric team. Transfer of care recommended (referral code 4022)
- BP control of primary importance. Initiate acute antihypertensive care regimen, aim for target BP 140/100 mmHg or lower
- Also consider magnesium sulphate to prevent a primary seizure
- Admit to secondary or tertiary facility
- Spot urine protein: creatinine ratio (PCR)
- Pre-eclampsia bloods
- Assess fetal growth (umbilical artery Doppler assessment and CTG, if indicated)

Maternal monitoring

- Management plan should include discussions with the obstetric and anaesthetic teams along with the woman and the LMC
- Hourly BP and respiratory rate
- Fluid balance chart
- At least daily pre-eclampsia bloods
- Conduct coagulation studies if liver function tests are abnormal or you have concerns about possible placental abruption

Maternal monitoring – magnesium sulphate

- Blood pressure every 5 minutes during bolus dose, then hourly during maintenance dose
- Respiratory rate, O_2 saturation, reflexes hourly
- Urine output (>100 mL over 4 hours)
- Fluid restriction (replace loss at delivery and then 80–85 mL/hour total fluid)

Fetal monitoring

- Follow SGA guidelines for management if diagnosed
- After assessment at time of diagnosis, do not repeat growth USS in <2 weeks
- Daily CTG (continuous if magnesium sulphate running)

Timing of birth

- Peri-viability and before: Manage in a tertiary setting with maternal fetal medicine involvement if possible, and with careful discussion with the woman
- Before 34 weeks: Adopt expectant approach in a secondary or tertiary centre with resources for maternal and fetal monitoring and critical care of the mother and the baby. If indication for birth presents, administer corticosteroids for fetal lung maturation and magnesium sulphate for fetal neuroprotection (if <30 weeks). Not required if already on magnesium sulphate.
- After 34 weeks: Recommend birth after stabilising the woman in a centre with appropriate resources for care of the mother and baby

Intrapartum

- At least hourly BP in labour
- CTG
- Continue antihypertensives – adjust if necessary for other factors, eg, effect of magnesium sulphate, neuraxial anaesthesia

Postpartum

- Continue magnesium sulphate for 24 hours
- If on methyldopa, consider changing to another antihypertensive, eg, ACE inhibitor
- Continue to monitor for disease resolution, titrate antihypertensives as required
- Advise to stay in secondary/tertiary facility for at least 72 hours (4–6 hourly BP)
- Daily BP to 7 days after birth, then at least weekly to 6 weeks
- Give woman's GP a comprehensive discharge summary
- 6-week obstetric review

Antihypertensives for acute lowering of BP

Nifedipine
10 mg conventional release tablet (oral)
Onset: 30–45 minutes
Repeat: after 30–45 minutes (if needed)
Maximum: 80 mg daily

Labetalol
Initially 20 mg IV bolus over 2 minutes
Onset: 5 minutes
Repeat with 40–80 mg
Repeat: every 10 minutes (if needed)
Maximum: 300 mg

Hydralazine
5–10 mg (5 mg if fetal compromise)
IV bolus over 3–10 minutes
Onset: 20 minutes
Repeat: every 20 minutes (if needed)
Maximum: 30 mg (consider IV bolus of crystalloid fluid before or when administering first IV hydralazine dose, usually 200–300 mL)

Magnesium sulphate

To prevent progression to eclampsia, this anticonvulsant drug may be administered – **see protocol**

Pre-eclampsia bloods

- FBC
- Electrolytes
- Creatinine
- LFT (incl AST, ALT)
- Coagulation if AST, ALT abnormal/ low platelets

Signs and symptoms of pre-eclampsia

- Severe headache
- Visual disturbances
- Severe epigastric pain
- Shortness of breath
- Retrosternal pressure/pain
- Nausea, vomiting
- Sudden swelling of face, hands or feet
- Hyperreflexia

ACE = angiotensin converting ensyme; ALT = alanine transaminase; AST = asparate transaminase; BP = blood pressure; CTG = cardiotocograph; dBP = diastolic blood pressure; FBC = full blood count; GP = general practitioner; IV = intravenous; LFT = liver function test; LMC = lead maternity carer; O_2 = oxygen; PE = pulmonary embolism; SGA = small for gestational age; sBP = systolic blood pressure; USS = ultrasound scan

6) Eclampsia

Eclampsia
New onset of seizures in association with pre-eclampsia

At diagnosis
- Immediately consult with obstetric team. Transfer of care (referral code 4006)
- Immediate Airway, Breathing, Circulation, Disability, Exposure (ABCDE) management
- BP control of primary importance if severe
- Admit to secondary/tertiary facility
- Pre-eclampsia bloods + coagulation bloods
- Assess fetal growth (umbilical artery Doppler assessment and cardiotocography if indicated)

Treatment
- Only conclusive treatment is birth of baby but aim to stablise and monitor if possible if <37 weeks' gestation
- Begin magnesium sulphate – see protocol
- If hypertensive, start antihypertensive, aim for a target BP below 140/100 mmHg

Maternal monitoring
- One-to-one midwifery care
- Management should include discussion with the anaesthetic and intensive care teams but with obstetric lead
- Continuous SpO_2 monitoring
- Fluid balance
- At least daily pre-eclampsia bloods
- Conduct coagulation studies if liver function tests are abnormal or you have concerns about possible placental abruption

Maternal monitoring – magnesium sulphate
- Maternal monitoring – magnesium sulphate
- Blood pressure every 5 minutes during bolus dose then hourly during maintenance dose
- Respiratory rate, reflexes hourly
- Urine output (>100 mL over 4 hours)
- Fluid restrictions (80–85 mL/hour total fluid)

Fetal monitoring
- CTG (continuous if magnesium sulphate running)

Timing of birth

Any gestational age: Recommend birth after stabilising the woman and a course of corticosteroids (if ≤34+6 weeks) and magnesium sulphate for neuroprotection (if <30 weeks) has been completed (if time permits) – not required if already on magnesium sulphate

Intrapartum
- Frequent BP monitoring (eg, every 5–15 minutes) in labour. If on magnesium sulphate – follow protocol
- Continuous CTG
- Continue antihypertensives – adjust if necessary for other factors, eg, effect of magnesium sulphate, neuraxial anaesthesia

Postpartum
- Continue magnesium sulphate for 24 hours
- If on methyldopa, consider changing to another antihypertensive, eg, ACE inhibitor
- Continue to monitor for disease resolution, titrate antihypertensives as required
- Advise to stay in secondary/tertiary facility for at least 72 hours (4–6 hourly BP)
- Daily BP to 7 days after birth, then at least weekly to 6 weeks
- Give woman's GP a comprehensive discharge summary
- 6-week obstetric review

Antihypertensives for acute lowering of BP

Nifedipine
10 mg conventional release tablet (oral)
Onset: 30–45 minutes
Repeat: after 30–45 minutes (if needed)
Maximum: 80 mg daily

Labetalol
Initially 20 mg IV bolus over 2 minutes
Repeat with 40–80 mg
Onset: 5 minutes
Repeat with 40–80 mg
Repeat: every 10 minutes
Maximum: 300 mg

Hydralazine
5–10 mg (5 mg if fetal compromise)
IV bolus over 3–10 minutes
Onset: 20 minutes
Repeat: every 20 minutes
Maximum: 30 mg (consider IV bolus of crystalloid fluid before or when administering first IV hydralazine dose, usually 200–300 mL)

Magnesium sulphate

To prevent further eclamptic seizures, this anticonvulsant drug should be administered – **see protocol**

Pre-eclampsia bloods
- FBC
- Electrolytes
- Creatinine
- LFT (incl AST, ALT)
- Coagulation if AST, ALT abnormal/ low platelets

Signs and symptoms of pre-eclampsia
- Severe headache
- Visual disturbances
- Severe epigastric pain
- Shortness of breath
- Retrosternal pressure/pain
- Nausea, vomiting
- Sudden swelling of face, hands or feet
- Hyperreflexia

ACE = angiotensin converting ensyme; ALT = alanine transaminase; AST = asparate transaminase; BP = blood pressure; CTG = cardiotocograph; FBC = full blood count; GP = general practitioner; IV = intravenous; LFT = liver function test; SpO_2 = saturation of peripheral oxygen

7) HELLP

HELLP

A variant of severe pre-eclampsia.
Elements include Haemolysis, Elevated Liver enzymes and Low Platelet count

At diagnosis

- Immediately consult with obstetric team. Transfer of care (referral code 4006)
- BP control of primary importance if severe
- Admit to secondary/tertiary facility
- Spot urine PCR
- Pre-eclampsia bloods + coagulation bloods
- Assess fetal growth (umbilical artery Doppler assessment and cardiotocography if indicated)

Treatment

- Only conclusive treatment is birth of baby and placenta
- Begin magnesium sulphate – see protocol
- Start antihypertensive (acute), aim for a target BP below 140/100 mmHg

Maternal monitoring

- Management plan should include discussion with the woman, LMC, obstetric, anaesthetic and intensive care teams and physicians where appropriate
- At least daily pre-eclampsia bloods
- Conduct coagulation studies if you have concerns about possible placental abruption

Maternal monitoring – magnesium sulphate (if required)

- Blood pressure every 5 minutes during bolus dose then hourly during maintenance dose
- Respiratory rate, O_2 saturation, reflexes hourly
- Urine output (>100 mL over 4 hours)
- Fluid restrictions (replace loss at delivery and then 80–85 mL/hour total fluid)

Fetal monitoring

- CTG (continuous if magnesium sulphate running)

Timing of birth

Any gestational age: Recommend birth after stabilising the woman and a course of corticosteroids (if ≤34+6 weeks) and magnesium sulphate for neuroprotection (if <30 weeks) has been completed (if time permits) – not required if already on magnesium sulphate

Intrapartum

- Frequent BP monitoring (eg, every 5–15 minutes) in labour. If on magnesium sulphate – follow protocol
- Continuous CTG
- Continue antihypertensives – adjust if necessary for other factors, eg, effect of magnesium sulphate, neuraxial anaesthesia

Postpartum

- Continue magnesium sulphate for 24 hours
- If on methyldopa, consider changing to another antihypertensive, eg, ACE inhibitor
- Continue to monitor for disease resolution, titrate antihypertensives as required
- Advise to stay in secondary/tertiary facility for at least 72 hours (4–6 hourly BP)
- Daily BP to 7 days after birth, then at least weekly to 6 weeks
- Give woman's GP a comprehensive discharge summary
- 6-week obstetric review

Antihypertensives for acute lowering of BP

Nifedipine
10 mg conventional release tablet (oral)
Onset: 30–45 minutes
Repeat: after 30–45 minutes (if needed)
Maximum: 80 mg daily

Labetalol
Initially 20 mg IV bolus over 2 minutes
Onset: 5 minutes
Repeat with 40–80 mg
Repeat: every 10 minutes (if needed)
Maximum: 300 mg

Hydralazine
5–10 mg (5 mg if fetal compromise)
IV bolus over 3–10 minutes
Onset: 20 minutes
Repeat: every 20 minutes
Maximum: 30 mg (consider IV bolus of crystalloid fluid before or when administering first IV hydralazine dose, usually 200–300 mL)

Pre-eclampsia bloods

- FBC
- Electrolytes
- Creatinine
- LFT (incl AST, ALT)
- Coagulation if AST, ALT abnormal/ low platelets

Signs and symptoms of pre-eclampsia

- Severe headache
- Visual disturbances
- Severe epigastric pain
- Shortness of breath
- Retrosternal pressure/pain
- Nausea, vomiting
- Sudden swelling of face, hands or feet
- Hyperreflexia

ACE = angiotensin converting ensyme; ALT = alanine transaminase; AST = asparate transaminase; BP = blood pressure; CTG = cardiotocograph; FBC = full blood count; GP = general practitioner; IV = intravenous; LFT = liver function test; LMC = lead maternity carer; O_2 = oxygen; PCR = protein: creatinine ratio

8) Care Pathway for Postnatal Women with Hypertensive Disorders

1. National guidelines recommend daily BP recording from hospital discharge up to a week following the birth, then weekly up to the 6th week postnatally when the woman would normally see her GP.
2. Women who fit the criteria for hypertension will be reviewed by an O&G postnatally.
3. An adequate and complete postpartum inpatient management plan will be written in the woman's MCIS records by the O&G.
4. Once the woman has birthed and settled into a postnatal room she will be provided with a self-monitoring BP machine and record card and taught how to use these.
5. She will be required to sign an agreement for being responsible for the BP machine and the arrangement for and/or its safe return to maternity at 5weeks postnatally. This date will be written on her BP recording card. (See appendix four for these two documents)
6. The BP recording card will be used to record her morning BP recording on the day of discharge. This will demonstrate the woman is able to take this recording so she and we know she is confident and capable of using this piece of equipment correctly and recording it on the card daily as expected once discharged home. (Do not use another hospital BP machine to compare any recordings as this will not be an option once she goes home).
7. The woman and her LMC are to be involved in the discharge planning discussion, so that the woman knows which days her LMC/LMC team member will be visiting.
8. Prior to discharge home the O&G will record a postnatal management plan for use at home. This will be recorded in the medical discharge letter which can be found in the events tab of the appropriate admission. This in turn populates the discharge summary which will be printed along with the labour and birth summaries on the day of discharge. Three copies are required as one is for the LMC, one for the woman and a copy left in her file which will be sent to the GP.
9. On discharge the core midwife/nurse will enter the woman's details in the maty schedule on the days she is to text/phone in with her BP recording for the initial 2 weeks post birth and record in the woman's card. This will enable the shift co-ordinator to ensure this information is received and follow up if text/call not received. Also enter BP machine details in loan book.
10. All discharge summaries will be sent to the GPs daily Mon to Friday subject to public holidays by the receptionist.
11. The woman will use her BP card to record her BP on the day of discharge and then continue recording her BP as instructed at home. The card contains the hospital mobile number to text/telephone daily with this information.
12. BP recordings are to be recorded at 10am daily then weekly.
13. The LMC will record the BP on this same card when visiting the woman postnatally.
14. If the LMC has concerns about the woman's BP during a visit within the first two weeks postnatally she can consult with the on call O&G directly, if after two weeks then this would be the GP.
15. If the woman has concerns about her BP on a day the LMC is not visiting she will know to call the hospital number she has been given or the GP if after first two weeks and be able to share her BP history, the GP should have received the medical discharge information.
16. The date 2wks from the birth will be recorded on the card, so the woman knows to contact the GP and not the hospital from then on if she has any further concerns regarding her BP as the GP will then be responsible for her on going care.
17. The woman will be adviced to make a double appointment for herself and baby to see the GP at 6 weeks and to take her BP card with her.
18. When a BP machine is returned, please clean this down using a clinell wipe, ensure it still works correctly. Then store back in CMMs office with loan book completed recording the return of this machine.

SEIZURE PREVENTION AND MANAGEMENT:

As noted above, seizures can occur antepartum, intrapartum and postpartum. The highest risk time extends until 24-48 hours postpartum. Magnesium sulphate has also been shown to reduce the risk of eclamptic convulsions in women with severe pre-eclampsia, more than halving the risk of seizure.

Prophylactic therapy during and after birth should be considered in women with severe pre-eclampsia especially if neurological signs or symptoms are present. However, any recommendation to give magnesium for women with severe pre-eclampsia should be made on an individual basis and will involve the obstetrician and the woman.

Contraindications And Incompatibilities

Magnesium sulphate should be used with caution with:

- Severe renal impairment (urine output < 25 ml/hour and/or creatinine > 0.90 micromol/L.
- Hypocalcaemia
- Current treatment with Lithium or Gentamicin, Aminophylline, Sodium Bicarbonate, any calcium preparations, NSAIDS and Chlorpromazine.
- Nifedipine must be used with caution due to possible neuromuscular blockade and severe hypotension
- Paralyzing anesthetic agents.
- Heart conditions including arrhythmia, cardiomyopathy or any degree of heart block.
- Magnesium sulphate is contraindicated in women with myasthenia gravis as it can precipitate a severe myasthenic crisis.

When toxicity is a major risk, the obstetrician should be consulted before magnesium sulphate is used.

Protocol for the administration of intravenous magnesium sulphate - to prevent progression to eclampsia, or to prevent further eclamptic seizures

Loading Dose: 4 g magnesium sulphate IV over 10 minutes

- Make up 4 g (8ml) in 100 ml N-saline (withdraw 8ml from 100 ml bag first)
- Set up infusion pump
- Run over 10 mins (600 ml per hour)

Remember to adjust the infusion rate when changing from the loading dose to the maintenance dose

Maintenance dose: 1 g IV per hour

- 10 g (4 x 5 ml amps) into 80 ml of N-saline (withdraw 20 ml from 100 ml bag first)
- Concentration will be 0.1 g per ml
- Run at 10 ml per hour

For severe pre-eclampsia/eclampsia continue for at least 24-48 hours after delivery - stopping maintenance infusion should be discussed with on call obstetrician).

Protocol for the administration of intravenous magnesium sulphate for recurrent seizures

- Seek immediate help – 777 maternal collapse
- Draw up 4 ml of 49.3% magnesium sulphate solution (2 g) followed by 6 ml of 0.9% saline into a 10 ml syringe.
- This will give a total volume of 10 ml.
- Give as an IV bolus over 10 minutes.
- If possible, take blood for magnesium level prior to giving the bolus dose.

The maternal condition should always take precedence over the fetal condition.

The mother should be stabilised before delivery.

Protocol for the administration of intramuscular magnesium sulphate

If intravenous access is not available, treatment may be started with an intramuscular injection

Loading dose
-A total of 8g magnesium sulphate IM is given
-Give two deep IM injections of 4g (8mls) each of magnesium sulphate 49.3% containing 2.47g in 5mLs to each buttock.

Maintenance dose

- provide maintenance treatment of 5 g magnesium sulphate 50%, given by deep intramuscular injection, every 4 hours
- alternate the buttocks in which you administer the injection
- Begin a maintenance infusion (see above) at any time after the initial bolus dose but, in this circumstance, consider measuring blood levels of magnesium.
-

Observation and management whilst on magnesium sulphate

Magnesium sulphate is excreted by the kidneys and is a smooth muscle relaxant. With normal renal function the recommended loading and maintenance doses will not cause toxicity and so routine serum magnesium levels are not required. However, close maternal observation is necessary.

- Continuous CTG monitoring
- BP, RR, PaO2 every 5 minutes during loading dose, then hourly during maintenance dose
- Pulmonary auscultation and deep tendon reflexes should be checked and documented hourly (see Appendix three)
- Fluid balance chart hourly including urine output
- Bloods to lab as indicated
- Woman should be nil by mouth. Consider Omeprazole (40 mg IV) if this is to be for a prolonged period of time.

Infusions can be continued at standard rate provided that:

- The knee jerk or biceps reflex are present
- Urine output remains > 25 ml/hour.
- Respiratory rate does not fall below 12 per minute
- The emergency trolley is stationed outside the woman's room

If acute loss of deep tendon reflexes and/or respiratory depression (<12 breaths/min) is observed:

1. STOP magnesium infusion.
2. Call Obstetrician urgently. If woman severely compromised call 777 "maternal collapse" and request paediatrician and theatre team additionally.
3. Send blood for urgent magnesium levels.
4. Administer 3g of calcium gluconate intravenously (30 ml of Calcium Gluconate 10% solution) over 5-10 minutes. Repeat every 10-20 minutes up to 4 times, depending on response.
5. **Alternatively**, withdraw 10mls from 100ml bag of Normal saline, add 1 gram (1x10ml ampoule) of calcium gluconate to the bag. Set IVAC to run at 300mls per hour. This will deliver 1 gram calcium gluconate over 20mins.
6. Repeat observations and reflexes

Magnesium levels **are not** required to be measured routinely. Indications for measuring magnesium levels include:

- Altered renal function (urine output < 25mls/hour, creatinine > 90)
- Signs suggesting toxicity such as significant drowsiness, loss of deep tendon reflexes, respiratory depression RR < 12 breaths/min
- Unexplained clinical symptoms or signs
- Further seizures
-

If measured important levels are (Lu, 2000):

Therapeutic levels	1.8 – 3.0 mmol/l
Loss of tendon reflexes	3.5 – 5.0 mmol/l
Respiratory paralysis	5.0 – 6.5 mmol/l
Cardiac arrest	>12.5 mmol/l

FETAL EFFECTS OF MAGNESIUM INFUSION

- Magnesium sulphate crosses the placenta and therefore can reduce the fetal heart variability on the CTG
- Fetal tachycardia may be seen
- At birth the neonate may be hypotensive, hypotonic, hyporeflexic with accompanying respiratory depression (especially in the case of prolonged infusion, or infusion with increased doses). **THEREFORE a Paediatrician must be present at birth**
- Breastfeeding should still be encouraged.

MANAGEMENT OF ECLAMPTIC SEIZURES

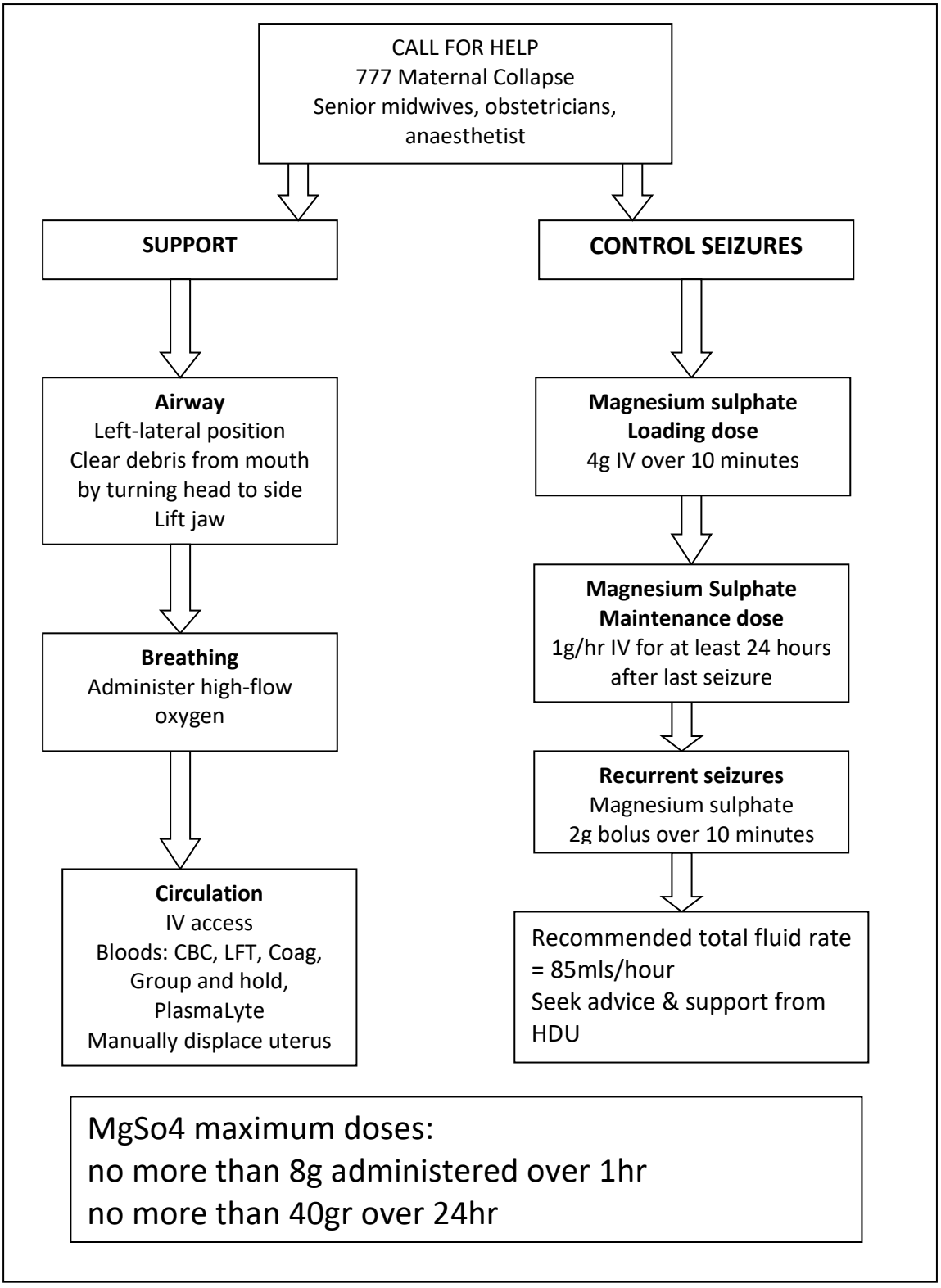
The management of eclampsia involves basic life supportive measures, as well as management of seizures.

MAGNESIUM SULPHATE IS THE DRUG OF CHOICE FOR TREATING ECLAMPSIA

Use the same protocol as for seizure prophylaxis

The maternal condition should always take precedence over the fetal condition. The mother should be stabilised before delivery.

Flow chart for the Management of Eclamptic Seizures



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PROMPT – PRACTICAL **O**BSTETRIC **M**ULTI-**P**ROFESSIONAL **T**RAINING COURSE MANUAL – AUSTRALIAN & NEW ZEALAND EDITION (2013)

Authorised By (HOD Obstetrics)

Authorised By (Director of Midwifery/Clinical Midwife Manager)

Date of Approval: July 2020 ***Next Review Date: July 2023***

APPENDIX ONE

Table 1 Increased risk of developing pre-eclampsia if woman has pre-existing risk factors

Major Risk Factors

Pre-existing risk factor	Relative risk/odds ratio	95% CI
Antiphospholipid antibodies/SLE	9.72[b]	4.34-21.75
Previous history of pre-eclampsia	7.19[b]	5.85-8.83
ART (oocyte donation)[13]	4.34[a]	3.10-6.06
Renal disease[14]	4.07[a]	2.17-7.66
Chronic hypertension	3.6[a]	2.0-6.6
Previous history of HELLP[15]	3.7[a]	0.9-16.1
Pre-existing diabetes	3.56[b]	2.54-4.99
Family history of pre-eclampsia in mother or sister	3.3	1.5-7.4

Also at Increased Risk

Genetic ancestry		
- African [16]	2.97[a]	1.98-4.4
- Indian	2.66[a]	1.29-5.48
- Maori[17]	1.51[a]	1.16-1.96
Pacific	1.21[a]	0.99-1.57
Nulliparity	2.91[b]	1.28-6.61
Multiple pregnancy	2.93[b]	2.04-4.21
Family history of pre-eclampsia	2.9[a]	1.70-4.93
Father of baby[18]	2.1	1.0-4.3
Change in partner[19]	2.5[b]	1.8-3.5
Elevated BMI≥35 (early/pre-pregnancy)	2.47[a]	1.78-3.15
Maternal age ≥40 (multiparous)	1.96[b]	1.34-2.87
Maternal age ≥40 (primiparous)	1.68[b]	1.23-2.29
Pregnancy interval >10 years	1.83[b]	1.72-1.94
ART (sperm donation)[20]	1.63[a]	1.36-1.95
Diastolic BP ≥80 mmHg at booking	1.38[b]	1.01-1.87
Any ART[21]	1.17[a]	1.10-1.24

APPENDIX TWO

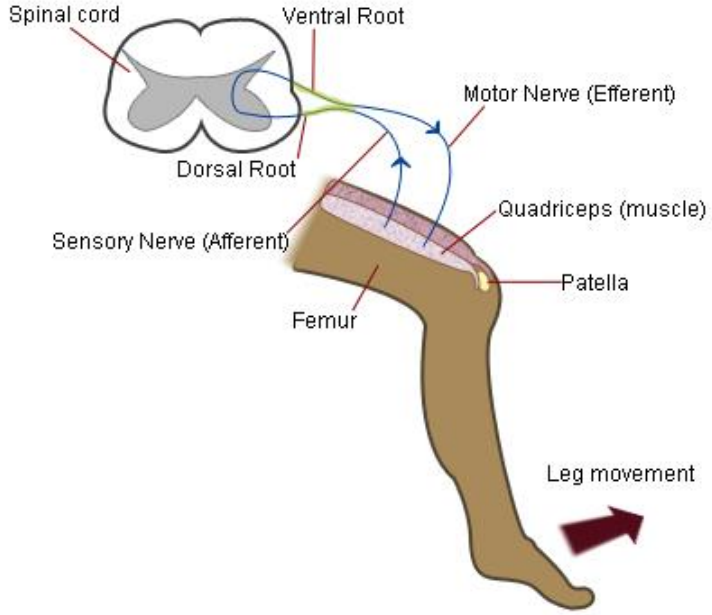
- Excessive weight gain in pregnancy puts women at risk of developing hypertensive disorders. This risk is even greater in women who are obese when they become pregnant. An optimal gestational weight gain for these women is 5–9 kg. Give specific education around optimal weight gain. Weak recommendation; very low-quality evidence
- Give routine advice on healthy eating, smoking cessation, alcohol intake and mild to moderate exercise to all women in the antenatal period, as well as weighing them regularly. Further randomised control trials are needed to determine the effects of these interventions on hypertensive disorders in pregnancy. Strong recommendation; low-quality evidence
- Folic acid and iodine supplements are recommended in all pregnancies to reduce the risk of spina bifida and promote normal brain development. However, no conclusive evidence is available to indicate that these supplements reduce the risk of developing HDP or pre-eclampsia. Weak recommendation; low-quality evidence
- Currently there is no strong evidence to show that multi-vitamins or other supplements such as fish oil and magnesium reduce the risk of developing HDP or pre-eclampsia. Strong recommendation; moderate-quality evidence
- This guideline does not recommend vitamin C and vitamin E supplementation. Such supplementation may cause harm because high levels (eg, vitamin C 1,000 mg and vitamin E 400 IU) are linked with an increased risk of low birthweight babies. Strong recommendation; moderate-quality evidence
- This guideline does not recommend salt restriction in women at risk of pre-eclampsia. Strong recommendation; moderate-quality evidence
- This guideline does not recommend bed rest and restriction of physical activity in women at risk of pre-eclampsia. Strong recommendation; very low-quality evidence

Controlling blood pressure level is vital at any stage of care. This will not prevent pre-eclampsia but will reduce the risk of stroke and poor outcomes for the mother.

APPENDIX THREE

Checking for Reflexes when treating Magnesium Sulphate

To check this reflex, tap the patella tendon which is located just below the patella once. This should cause a sudden extension of the leg, which is known as the knee-jerk. The obstetrician is to be informed of the absence or significant decrease in the patella reflex as the Magnesium Sulphate dose may need to be reduced.



APPENDIX FOUR

BP RECORDING CARD

Name _____

NHI_____

This card will accompany the BP Machine No. _____ prior to your discharge home. Please keep this card and machine safe at all times. Only use the machine to record your **own** BP, as shown how to do in the hospital.

The BP machine is on loan until _____ , this date is 5 wks from the date of birth of your baby.

You are required to record your BP at 10am on the dates recorded in this card. This is daily up to 7 days post birth and then weekly up to and including the 5th week.

During the first 2 weeks you are required to text/telelphone **021816726** and inform the hospital of your BP that day.

Please contact your GP if you have concerns about your BP or medication after the first 2 weeks from giving birth.

You are required to book a double appointment with your GP for when baby will be 6 weeks old. Please take this card with you to share your recordings with the GP so he/she can plan your on-going BP care.

Please return the BP machine to the hospital, if unable to do so, please inform hospital on number above.

Date	BP	Inform Hospital on days with a X
Day of discharge	BP on discharge	

Signs and symptoms of elevated BP

- Severe headache
- Persistent visual disturbances
- Right upper quadrant or epigastric abdominal pain (Upper stomach pain)

If you experience the above symptoms please contact your LMC/hospital/GP and have this card with you to refer to.

Please keep this booklet safe at all times.

If or when you decide to plan for a future pregnancy, consider having your blood pressure and weight checked by your GP before becoming pregnant so you can obtain pre-conceptual advice. Please try your best to contact and book with a midwife for pregnancy care before you are 10 weeks pregnant.

Version 1 June 2020 ELT

Puawai Aroha Maternity Unit
Tairawhiti District Health
Private Bag 7001 Gisborne
New Zealand
Phone 06 869 0500 Ext 8414
Fax 06 869 0550
Email liz.leetaylor@tdh.org.nz

Agreement for loan of BP machine no. ☐

I am fully aware that the loan of the BP machine is for my personal use only ☐

I am fully aware the loan is for up to 5weeks from the birth of my baby ☐

I agree that I shall keep this in a safe place ☐

I have been shown how to use the BP machine correctly ☐

I agree that I will only use it as instructed to do so ☐

I agree to take my BP at 10am daily then weekly as instructed ☐

I agree to record the BP readings on the card provided ☐

I agree to text/call the hospital during the first 2 weeks with my BP recordings by 10.30am on 021816726 ☐

I agree to call my GP if after 2 weeks I have concerns about my BP ☐

I agree to return/arrange the return of the machine at 5 weeks ☐

I am aware that I need to make a double appointment with my GP at 6 weeks for myself and baby and will take my BP card with me ☐

Name: Signature:

Date:

Staff members name:

(Please give woman a copy and then file in records, to be scanned into MCIS)