Reference Number: UHBOBS065 **Version Number: 7**	**Date of Next Review: Previous** **Trust/LHB Reference Number:**

Hypertension disorders in Pregnancy

Introduction and Aim

10% of pregnant women are affected by hypertension
Hypertension contributes to:

- Preterm birth (8-10%)
- Stillbirth (5%)
- Fetal growth restriction

Objectives

To ensure that all clinicians have clear guidance to manage women withhypertension in pregnancy

Scope
This policy applies to all healthcare professionals in all locations including thosewith honorary contracts

Equality Health Impact Assessment	*An Equality Health Impact Assessment (EHIA) has notbeen completed.*
Documents to read alongside this Procedure	*Antenatal Care Guideline, GAP Guideline*
Approved by	*Maternity Professional Forum*

Accountable Executive or Clinical Board Director	*Ruth Walker, Executive Nurse Director*
Author(s)	*Miranda Millett, Midwife* *Amy Robb, Consultant Obstetrician*

1.1.1.1.1.1 Disclaimer

If the review date of this document has passed please ensure that the version you are using is the most up to date either by contacting the documen author or the Governance Directorate.

Summary of reviews/amendments

Version Number	Date of Review	Reviewer Name	Date Approved	New Review Date
UHB 1	November 2008	P Amin	Nov 2008	Nov 2011
2	May 2011	Alex Rees	June 2011	June 2014
3	June 2012	Alex Rees	June 2012	June 2015
4	September	P Amin / J Gray	Sept 2015	Sept 2018
4(a)	Nov 2017	S Morris	12/01/2018	01/2018
5	Dec 2018	M. Millett/A.Robb *Update to include NICEguidance, PROMPT recommendations and RCOG guidance on Low dose aspirin*	08/02/2019	Feb 2020
6	June 2019	M Millett **Amended to include new drug administration instructions for pre mixed Magnesium Sulphate**	**06/09/2019**	**06/09/2022**
6a		Jane Gray – updated table		
6b	May 2020	Amy Robb – Added Home Blood Pressure Monitoring Guidance	**27/05/2020**	**06/09/2022**
7	2023	Magnesium sulphate information and dosing updated	**20/10/2023**	

1 Contents

2 Definitions of hypertension in pregnancy

- **Mild hypertension** diastolic blood pressure 90–99 mmHg, systolicblood pressure 140–149 mmHg.
- **Moderate hypertension** diastolic blood pressure 100–109 mmHg,systolic blood pressure 150–159 mmHg.
- **Severe hypertension** diastolic blood pressure 110 mmHg or greater, systolic blood pressure 160 mmHg or greater.

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3 Reducing the risk of hypertensive disorders in pregnancy

All women at risk of pre-eclampsia should take **low dose aspirin 150mgorally** at night from 12 weeks to 37/40 weeks (RCOG GREEN TOP GUIDANCE NO 72. 2018):

Women at high risk of pre-eclampsia are those with any of the following:

- Previous pre-eclampsia/gestational hypertension
- Chronic kidney disease
- Autoimmune disease e.g. APLS, SLE
- Type 1or 2 diabetes
- Chronic hypertension

Women with 2 moderate risk factors should also take the same dose of aspirin. Moderate risk factors are:

- 1st pregnancy
- Maternal age ≥ 40 at conception
- Pregnancy interval of more than 10 years
- BMI of 35kg/m^2 or more at first visit
- Family history of pre-eclampsia (1st degree relative of pregnantwoman)
- Multiple pregnancy

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4 Management of pregnancy with Chronic hypertension

Definition: Hypertension present before pregnancy or before 20 weeks ofpregnancy

4.1 Antenatal care

- Advise women to stop ACE inhibitors and Angiotensin II receptorblockers (ARB's) and change to methyldopa
- Stop diuretic treatment
- Keep BP<150/100 and diastolic >80
- Where end organ damage present aim for BP<140/90
- Plan serial growth scans with umbilical artery Doppler at each scan 28, 32, 36 and 39 weeks as per GAP/GROW protocol (GAP Guideline) (some women may require scans starting earlier at Consultant discretion). If previous pre-eclampsia prior to 28 weeks,commence USS at least 2 weeks before previous gestational age ofonset of previous PET.
- Follow up scans should be based on GAP-GROW guidance and/or management of SGA fetus. (SGA not currently ratified – hyperlinkto be added in due course)

4.2 Postnatal care

Check BP daily for 2 days after birth then at least once between day 3 and 5 and as clinically indicated thereafter. Continue antenatal treatment if appropriate but change methyldopa within 2 days of birth.

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5 Assessment of Proteinuria in hypertensive disorders of pregnancy

5.1 Measurement of urinary Protein

- Proteinuria should be measured by automated reagent strips.
- If positive for Protein ≥1+, then quantitative measurement should becarried out by urinary Protein Creatinine Ratio (PCR).
- **PCR >30mg/mmol is considered significant.** *(Cardiff & Valelaboratory handbook)*

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6 Management of pregnancy with gestational hypertension

Offer women diagnosed with gestational hypertension an integrated package of care covering admission to hospital, treatment, measurement of blood pressure, testing for proteinuria and blood tests as indicated in Table 1.

Degree of hypertension	**Mild 140/90-149/99mmHg**	**Mod 150/100-159/109mmHg**	**Severe 160/110mmHgor higher**
Admit	No	No	Yes
Treat	No	Labetalol or methyldopa (at early gestations) Aim for BP<150/100 and diastolic > 80	Labetalol aim for BP<150/100 and diastolic > 80
Check BP	>32 wks.-oncea week <32 wks. – twice a week	At least x 2 weekly	at least x 4 daily
Test for proteinuria	>32 wks.-oncea week <32 wks. – twice a week	At least x 2 weekly	daily
Blood tests	Routine blood tests only	Baseline U+Es, FBC, LFTs and bilirubin as baseline and again if new proteinuria	Baseline U+Es, FBC, LFTs and bilirubin at presentation, then weekly

6.1 Fetal monitoring

In women with mild or moderate gestational hypertension, carry out ultrasound fetal growth and amniotic fluid volume assessment and umbilicalartery Doppler velocimetry at diagnosis. If results are normal, repeat as per GAP-GROW guidance.

Women with severe gestational hypertension should have acardiotocography (CTG) at diagnosis if more than 26 weeks gestation.

- If conservative management of severe gestational hypertension isplanned, carry out all the following tests at diagnosis:
- ultrasound fetal growth, amniotic fluid volume assessment andumbilical artery Doppler

- If the results of all fetal monitoring are normal in women with severe gestational hypertension, do not routinely repeat CTG morethan weekly UNLESS

  - the woman reports a change in fetal movement
  - vaginal bleeding
  - abdominal pain
  - deterioration in maternal condition.

- In women with severe gestational hypertension, and a normal ultrasound fetal growth and amniotic fluid volume assessment ANDumbilical artery Doppler, repeat at an interval of at least 2 weeks.

- If the results of any fetal monitoring in women with severe gestational hypertension are abnormal, tell a consultant obstetrician.

- Follow up scans should be based on GAP-GROW guidance and/or management of SGA fetus. (GAP Guideline)

6.2 Postnatal care (gestational hypertension)

Check BP daily for 2 days after birth then at least once between day 3 and5 and as clinically indicated thereafter.

In women with gestational hypertension who have given birth:

- continue use of antenatal antihypertensive treatment
- consider reducing antihypertensive treatment if their blood pressurefalls below 140/90 mmHg
- reduce antihypertensive treatment if their blood pressure falls below130/80 mmHg.
- If a woman has taken methyldopa to treat gestational hypertension,stop within 2 days of birth if normotensive.
- Consider change to nifedipine/amlodipine

For women with gestational hypertension who did not take antihypertensivetreatment and have given birth, start antihypertensive treatment if their blood pressure is higher than 149/99 mmHg.

Complete a care plan (APPENDIX 2) for women with gestational hypertension who have given birth and are being transferred to communitycare

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7 Management of pregnancy with pre-eclampsia

Pre-eclampsia is defined as hypertension with significant proteinuria (defined page 5) after 20 weeks of pregnancy.

Offer women with pre-eclampsia an integrated package of care covering admission to hospital, treatment, measurement of blood pressure, testingfor proteinuria and blood tests as indicated in Table 2.

Table 2:

Degree of hypertension	**Mild 140/90-149/99mmHg**	**Mod 150/100-159/109mmHg**	**Severe 160/110mmHgor higher**
Admit	Yes	Yes	Yes
Treatment	No	Yes: labetalol to keep BP <150/80-100	Yes: Labetalol tokeep BP <150/80- 100
Reassess BP	Four times daily	Four times daily	More than four times daily depending on severity
Test for proteinuria	No need to repeat quantification	No need to repeat quantification	No need to repeat quantification
Blood tests	2 x weekly U+Es, FBC, ALT and Bilirubin.	3 x weekly U+E's, FBC, ALT and Bilirubin.	At least 3 x weekly U+Es, FBC, ALT and Bilirubin. (In clinically severe disease, a test for coagulation shouldbe performed at the same time as an FBC)

7.1 Fetal Monitoring

Carry out cardiotocography (CTG) at diagnosis of pre-eclampsia if morethan 26 weeks gestation.

- If conservative management of pre-eclampsia is planned, carry outall the following tests at diagnosis: ultrasound fetal growth, amniotic fluid volume assessment and umbilical artery Doppler

- If the results of all fetal monitoring are normal in women with pre-eclampsia, do not routinely repeat CTG more than weekly UNLESS
  - the woman reports a change in fetal movement
  - vaginal bleeding
  - abdominal pain
  - deterioration in maternal condition.

- In women with pre-eclampsia, and a normal ultrasound fetal growthand amniotic fluid volume assessment AND normal umbilical artery Doppler, repeat at an interval of at least 2 weeks.

- If the results of any fetal monitoring in women with pre-eclampsiaare abnormal, tell a consultant obstetrician.

- Follow up scans should be based on GAP-GROW guidance and/or management of SGA fetus. (GAP Guideline)

7.2 Timing of birth

- Manage pregnancy in women with pre-eclampsia conservatively (thatis, do not plan same-day delivery of the baby) until 34 weeks.

- Consultant obstetric staff should document in the woman's notes thematernal (biochemical, haematological and clinical) and fetal thresholds for elective birth before 34 weeks in women with pre- eclampsia.

- Offer birth to women with pre-eclampsia before 34 weeks afterdiscussion with neonatal and anaesthetic teams and a course of corticosteroids has been given if:
  - severe hypertension develops despite treatment
  - maternal or fetal indications develop as specified in the consultantplan

- Recommend birth for women who have pre-eclampsia with severe hypertension after 34 weeks when their blood pressure has been controlled and a course of corticosteroids has been completed (if appropriate).

- Offer birth to women who have pre-eclampsia with mild or moderate hypertension at 34^{+0} to 36^{+6} weeks depending on maternal and fetalcondition, risk factors and availability of neonatal cots.

- Recommend birth within 24–48 hours for women who have pre- eclampsia with mild or moderate hypertension after 37^{+0} weeks.

7.3 Haematological and biochemical monitoring

In women who have pre-eclampsia with mild or moderate hypertension measure platelet count, LFTs and serum creatinine 48–72 hours after birth.Do not repeat platelet count, LFTs or serum creatinine measurements again if results are normal. If biochemical and haematological indices are improving but stay within the abnormal range repeat as clinically indicatedand at the postnatal review (6–8 weeks after the birth).

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8 Treatment of severe hypertension with Intravenous anti-hypertensives

Severe hypertension or pre-eclampsia should be treated as a medical emergency. Women with a blood pressure over 160mmHg systolic and/or110mmHg diastolic, which is unresponsive to oral anti-hypertensives,should be cared for on delivery suite for appropriate management and escalation of care. Early involvement of consultant obstetric and anaesthetic staff is essential in the management of these patients.

Blood pressure should be monitored every five minutes when giving IV anti-hypertensives. Anaesthetic staff should be closely involved in the care of the woman.

Consideration should be given to invasive monitoring prior to commencingIV anti-hypertensives in women where blood pressure monitoring may be problematic (e.g. due to raised BMI).

Where women require more than 50mg IV labetalol or 5mg IV Hydralazine(i.e. the initial first dose) an arterial line should be placed. Ensure an arterial line is placed *whilst continuing* with anti-hypertensive treatment to ensureno delay in treatment.

8.1 Midwifery Care

- Blood pressure measurement should be checked using a manual sphygmomanometer to ensure accuracy
- Women with Pre-eclampsia/severe hypertension should receive 1:1 midwifery care
- HDU charts should be used to accurately record vital signs and fluid balance
- Midwives should utilise the algorithms and regimes in this guideline,which can also be found in the PET boxes on delivery suite, to guidemanagement and aid documentation.

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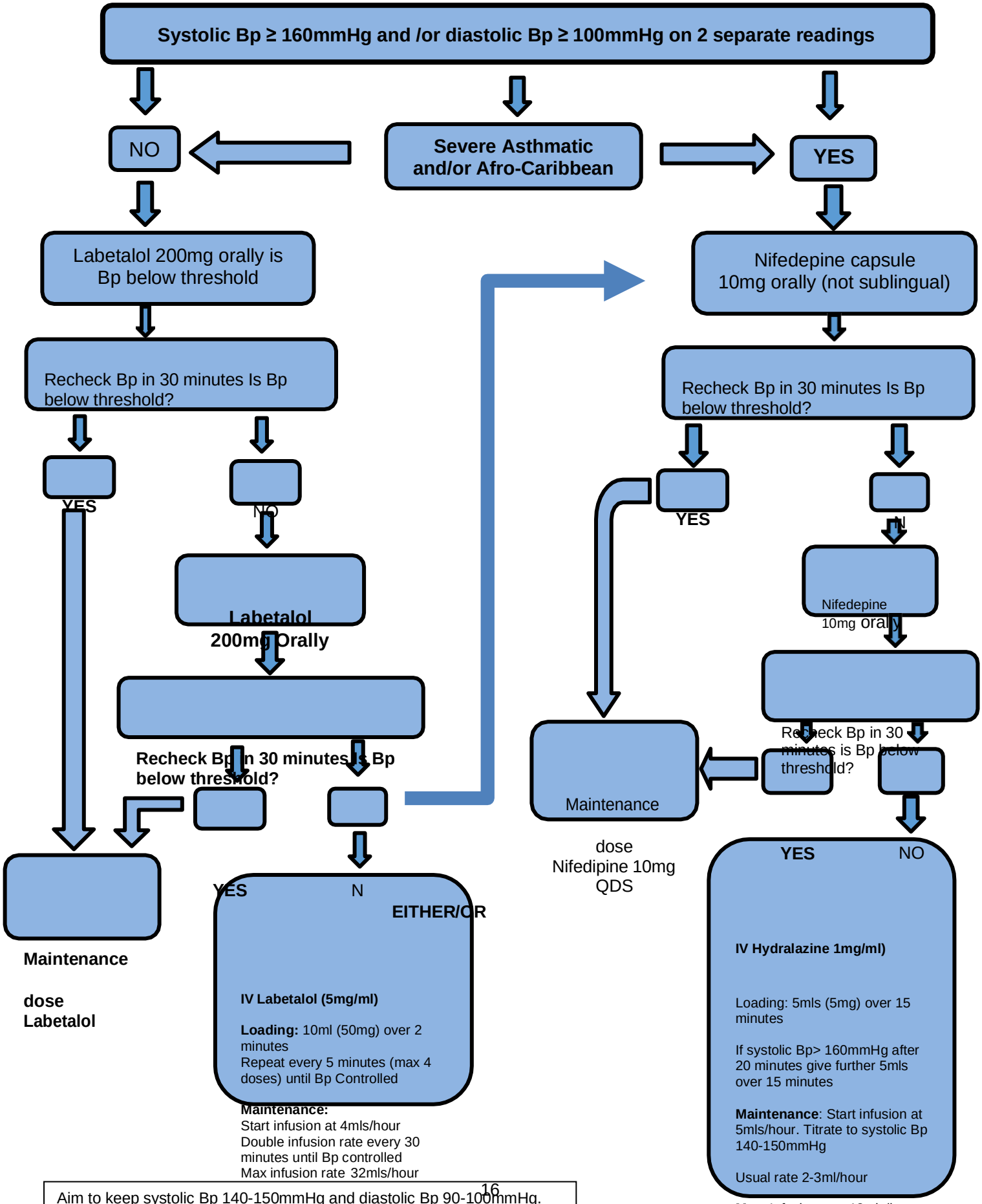
9 Algorithm for Management of Severe Hypertension



Aim to keep systolic Bp 140-150mmHg and diastolic Bp 90-100mmHg.
Caution: all three drugs have cumulative effect (peak at 30 minutes) and all three interact with Magnesium Sulfate. Nifedipine also increase the muscular blockade of Magnesium Sulfate

Treatment of severe hypertension

- A blood pressure of over 160 mmHg systolic or 110 mmHg diastolic must be treated as a medical emergency
- The aim is to lower the blood pressure to a systolic BP between 140 and 150 and a diastolic between 90 and 100 mmHg. Further reductions do not help the mother and can compromise the fetus
- The maternal blood pressure should be monitored at least every 15 minutes during acute treatment
- The fetal heart should be continually monitored during acute treatment as a sudden drop in blood pressure may cause fetal compromise

Labetalol

- Ensure the woman is not asthmatic and give 200 mg labatelol orally
- Recheck the BP at 15 and 30 minutes
- If the BP has not settled to the target by 30 minutes give a second dose of 200 mg labetalol orally
- Recheck the BP at 45 and 60 minutes
- Seek senior advice, if following the second dose of labetalol, the BP still has not settled to the target within 30 minutes. The options for treatment include additional oral nifedipine or IV regimens (labetalol or hydralazine)

Nifedipine

- If the woman is asthmatic, labetalol is not available and/or has not been effective, give 10 mg nifedipine orally. It is not necessary to give it sublingually, and sublingual administration may cause sudden hypotension and associated fetal compromise
- Recheck the BP at 15 and 30 minutes
- If the BP has not settled to the target after 30 minutes, give a second dose of 10 mg nifedipine orally
- Recheck the BP at 45 and 60 minutes
- If the BP still has not settled to the target by 30 minutes after the second dose of nifedipine, seek senior advice and change to the IV labetalol or IV hydralazine regimen, dependent on contraindications

Hydralazine

- If labetalol and/or nifedipine have not been effective or are contraindicated, seek senior help and give IV hydralazine
- Give 5 mL of 1 mg/mL hydralazine (5 mg) IV over 15 minutes
- Check the BP at 20 minutes
  - If the systolic is still above 160 mmHg, give a further 5 mL of 1 mg/mL hydralazine (5 mg) IV over 15 minutes
- If the systolic is below 160 mmHg, start an infusion of 1 mg/mL hydralazine at 5 mL/hr:
  - Titrate the infusion to control the BP
  - The maximum infusion rate is 18 mL/hr
  - The usual infusion rate required is between 2 and 3 mL/hr
  - **Reduce/STOP** the infusion if the maternal heart rate is above 120 bpm and/or there are any adverse effects

9.1 Fluid Administration

Severe pre-eclampsia is associated with a reduced plasma volume and alower fluid balance and volume expansion.

Do not use volume expansion in women with severe pre-eclampsia unless hydralazine is the antenatal antihypertensive.

In women with severe pre-eclampsia, limit maintenance fluids to 80ml/hour unless there are other ongoing fluid losses (for example, haemorrhage).

Consider using up to 500 ml (250ml over 20-30 mins) of crystalloid fluid before or at the same time as the first dose of intravenous hydralazine inthe antenatal period.

CVP measurement is indicated where urine output falls. Urine output is measured hourly. If urine output falls to less than 0.5ml/kg/hr over 4 consecutive hours a Central Venous Pressure line is to be considered andfluid replacement done cautiously with joint Obstetric and anaesthetic review

9.2 Anticonvulsants

If a woman with severe hypertension or severe pre-eclampsia has, orpreviously has had an eclamptic fit, give intravenous magnesium sulphate.

Consider giving intravenous magnesium sulphate to women with severepre-eclampsia if birth is planned within 24 hours.

If considering magnesium sulphate treatment, use the following as featuresof severe pre-eclampsia:

i. severe hypertension and proteinuria (as previously defined pgs.4-5) or

ii. mild or moderate hypertension and proteinuria (as previouslydefined pgs. 4-5)with one or more of the following:

- symptoms of severe headache
- problems with vision, such as blurring or flashing before theeyes
- severe pain just below the ribs or vomiting
- papilloedema
- signs of clonus (≥3 beats)
- liver tenderness
- HELLP syndrome
- platelet count falling to below 100 x 109 per litre

- abnormal liver enzymes (ALT or AST rising to above 70iu/litre).

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10 Magnesium Sulphate

10.1 Instructions for giving magnesium sulphate

When possible use the ready to administer syringes that are supplied by Pharmacy. These are stored between 15°C and 25°C in the treatment room on delivery suite.

Loading Dose 4g in 20ml (20%) via a syringe pump:
The 30ml syringe containing 20mls of the loading dose is to be attached to a syringe pump and administered at a rate of 60ml/hour, i.e. 4gm willbe given over a 20 minute period **or** 240mls/hour if given over 5 minutesin the case of an eclamptic fit.

Maintenance infusion 5g in 50ml (10%) via a syringe pump: The syringe containing 50mls of the maintenance dose is to be attached to a syringe pump and administered on completion of loadingdose; set rate at 10ml/hour which equates to 1gm/hour.

If the ready to administer syringes are unavailable, please see instructions below in red for alternate preparation. When prepared in this way the magnesium sulphate will be added to a 50ml syringe and given via a syringe pump.

Loading dose 4g in 20ml (20%) via a syringe pump

When a pre-prepared syringe is unavailable, using a 50mL syringe draw up **8ml** of Magnesium Sulphate Injection 50% and make up to **20ml** using sodium chloride 0.9% (producing 4g/20ml). The 50ml syringe containing 20ml of the loading dose is to be attached to a syringe pump and administered at a rate of 60ml/hour, i.e. 4g will be given over 20 minutes **or** 240ml/hour if given over 5 minutes in the event of an eclamptic fit.

Maintenance infusion 5g in 50ml (10%) via a syringe pump

When a pre-prepared syringe is unavailable, using a 50mL syringe draw up **10ml** of Magnesium Sulphate 50% and make up to **50ml** with sodium chloride 0.9% (producing 5g/50ml). The syringe containing 50mls of the maintenance dose is to be attached to a syringe pump and administered upon completion of the loading dose at a rate of 10ml/hour (to achieve 1g/hour).

Appendix 1

Women receiving a magnesium sulphate infusion should have a medical review at least every four hours, including **assessment and documentation of peripheral reflexes.**

In addition, the following should be monitored:

i) Urine output via urometer: stop MgS04 if output is < 0.5ml/kg/hour,
ii) Respiratory rate after bolus and every 30 minutes thereafter.
iii) Pulse oximetry every 30 minutes

Need to do Mg levels if rate exceeds 2gm/hr:

- Normal serum level 0.7 – 1.0mmol/L
- Therapeutic level 2.0-4.0mmol/L
- Disappearance of tendon reflexes at 5.0mmol/L
- Muscular paralysis and respiratory depression at 6-8mmol/L
- Cardiac arrest at 12mmol/L

Do NOT sample from the arm where the MgSo4 infusion is given.

Levels may be difficult to interpret with hypovolaemia. Liaise with seniorRegistrar or Consultant Anaesthetist/Obstetrician

Discontinue infusion if:

- Urine output in the preceding 4 hours <100mls
- No patellar (knee jerk) reflexes
- Respiratory rate < 12per minute
- Weakness, nausea, sensation of warmth, flushing, drowsiness,double vision and slurred speech

Antidote: Calcium Gluconate 1 g / iv. I.e. 10mls of a 10% solution in50ml of sodium chloride 0.9% given over 10 minutes (available on Delivery Suite)

Repeat seizures despite treatment as above:

1. Further bolus dose of 2-4 g magnesium sulphate (as per loadingdose instructions)
2. Consider diazemuls 10 mg IV or Thiopentone 50 mg I.V if unresponsive to further magnesium sulphate

3. Consider intubation

Clear documentation following an eclamptic fit(s) is paramount (seeeclampsia Documentation Pro forma Appendix15.1)

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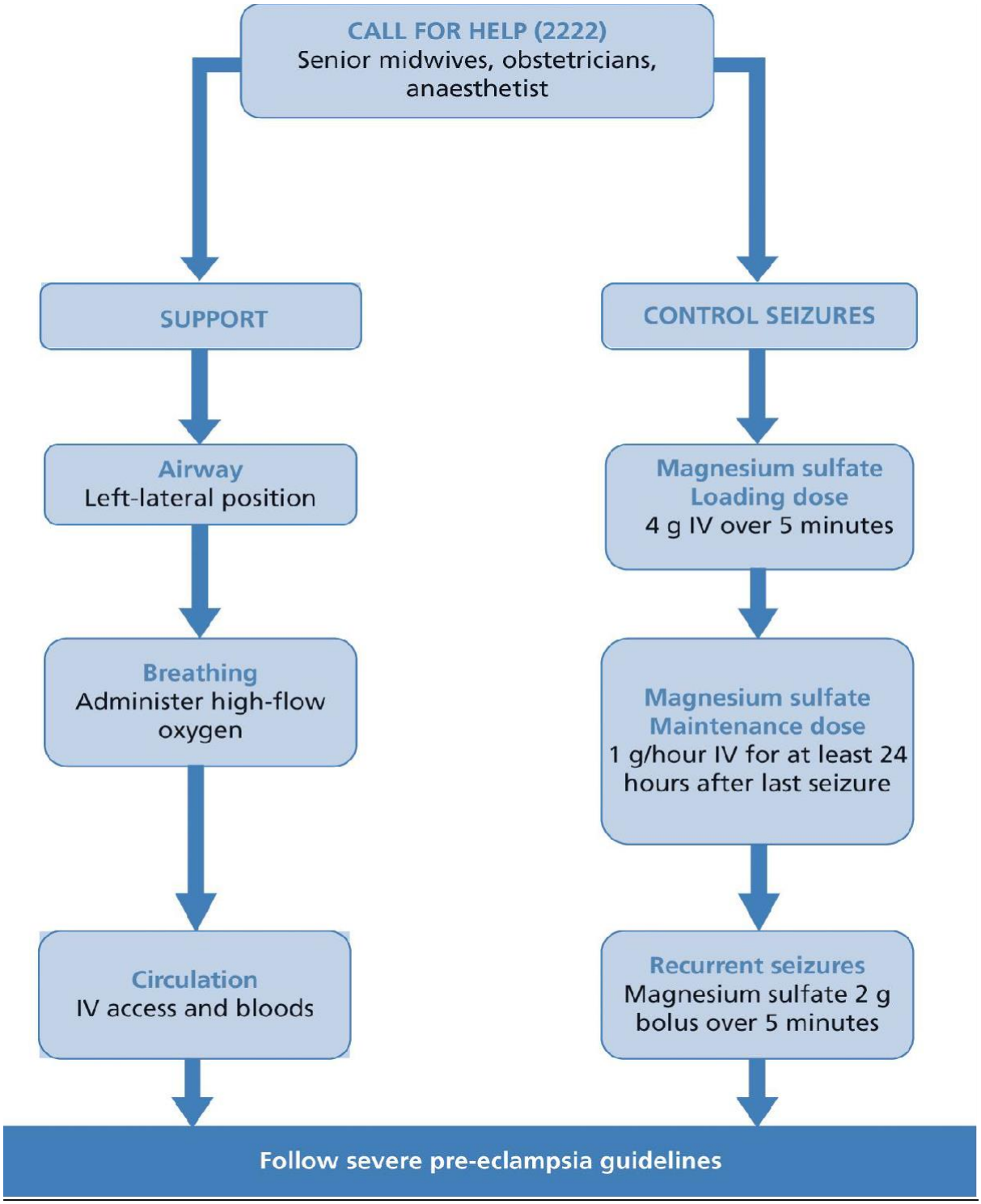
11 Management of eclampsia algorithm



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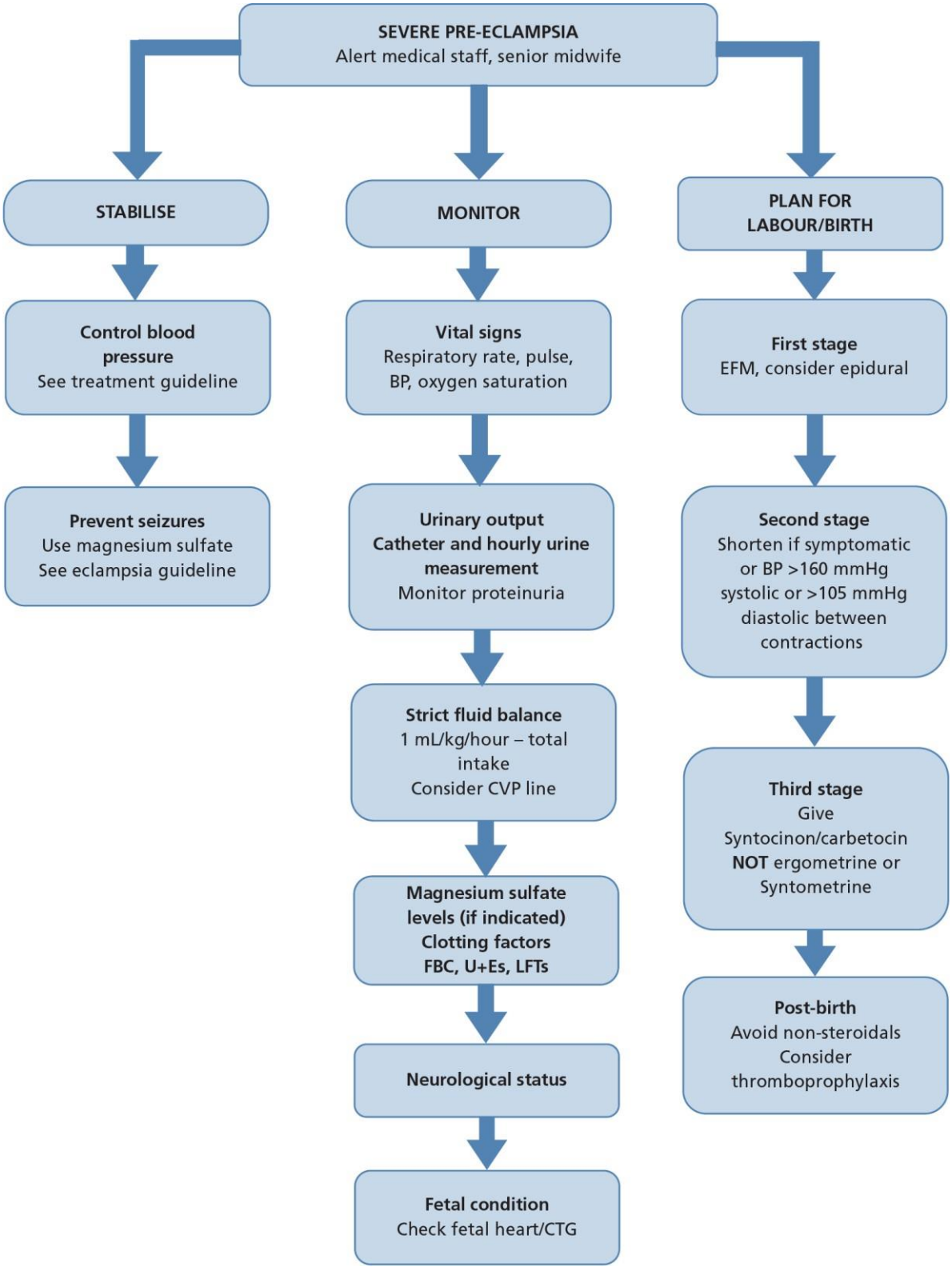
12 Severe Pre-eclampsia Management algorithm



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13 Postnatal care (pre-eclampsia)

In postnatal women with pre-eclampsia	**No Hypertensive treatment**	**Antihypertensive treatment**
Frequency of BP monitoring	4x day as inpatient at least once D3-5 continue alternate days until normal	At least 4x day as inpatient Every 1-2 days for up to 2 weeks Regularly until off treatmentand Bp normal
Bp 150/100 or higher	Start treatment	Continue treatment
Bp less than 140/90		Consider reducing
Bp less than 130/80		Reduce
MEDICATION	Stop methyldopa within 2 days of birth	
Breastfeeding	Labetalol, Nifedipine, Enalapril, Captopril or Atenolol, Metoprolol Avoid diuretics	Labetalol, Nifedipine, Enalapril, Captopril or Atenolol, Metoprolol Avoid diuretics
Not Breastfeeding	Amlodipine or Ramipril	Amlodipine or Ramipril
CRITERIA FOR DISCHAGE	transfer to community care if **all** the followingcriteria have been met: • there are no symptoms of pre-eclampsia • blood pressure, with or without treatment, is149/99 mmHg or lower • blood test results are stable or improving.	

- Ask women with pre-eclampsia who have given birth about severe headache and epigastric pain each time blood pressure is measured.

- Write a care plan for women with pre-eclampsia prior to discharge tothe community (Appendix 2)

13.1 Breastfeeding

Tell women who still need antihypertensive treatment in the postnatal period that there is insufficient evidence on the safety in babies receivingbreast milk of the following antihypertensive drugs:

~ ARBs, amlodipine, ACE inhibitors other than Enalapril and captopril ~

13.2 Postnatal care and advice

Tell women who had pre-eclampsia that their risk of developing:

- gestational hypertension in a future pregnancy ranges from about1 in 8 (13%) pregnancies to about 1 in 2 (53%) pregnancies
- pre-eclampsia in a future pregnancy is up to about 1 in 6 (16%) pregnancies
- pre-eclampsia in a future pregnancy is about 1 in 4 (25%) pregnancies if their pre-eclampsia was complicated by severe pre-eclampsia, HELLP syndrome or eclampsia and led to birth before 34 weeks, and about 1 in 2 (55%) pregnancies if it led to birth before 28 weeks.
- Give women the information sheet at the end of this guideline priorto discharge (pgs 25-26)

Inter-pregnancy interval and recurrence of hypertensive disorders of pregnancy

Tell women who have had pre-eclampsia that there is no additional risk ofrecurrence with inter-pregnancy interval up to 10 years.

Body mass index and recurrence of hypertensive disorders ofpregnancy

Advise women who have had pre-eclampsia to achieve and keep a BMI within the healthy range before their next pregnancy (18.5–24.9 kg/m^2,'Obesity', NICE clinical guideline 43).

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14 REFERENCES

Hypertension in pregnancy: diagnosis and management
NICE Clinical guideline [CG107] Published date: August 2010 lastupdated: January 2011

Practical Obstetric Multiprofessional Training Course Manual Third Edition2017

Care of Women with Obesity in Pregnancy (Green-top Guideline No. 72)2018

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15 Appendices

15.1 Appendix – Eclampsia documentation pro forma

Starts on next page.

Attach Patient ID:

PROMPT

ECLAMPSIA DOCUMENTATION PRO FORMA

DATE: ..... TIME OF SEIZURE: ..... DURATION OF SEIZURE: .....

PERSONS PRESENT AT ONSET OF SEIZURE.....

.....

EMERGENCY BELL ACTIVATED YES / NO TIME.....

If emergency bell not activated, please give reason.....

	NAME	ALREADY PRESENT (✓)	TIME INFORMED	TIME ARRIVED
EXPERIENCED OBSTETRICIAN				
MIDWIFE COORDINATOR				
ANAESTHETIST				
JUNIOR OBSTETRICIAN				
MATERNITY HEALTH CARE ASSISTANT				
OTHER PERSONS ASSISTING				

CONSULTANT OBSTETRICIAN INFORMED YES / NO Name.....

If no, give reason.....

Time attended (if attended).....

TREATMENT

LEFT LATERAL POSITION YES / NO TIME..... If no, other position.....

HIGH FLOW 0_2 YES / NO TIME..... If no, give reason.....

IV ACCESS YES / NO TIME..... If no, give reason.....

BLOODS – GROUP + SAVE FBC, CLOTTING, U+E's, LFT's URATE YES / NO TIME..... If no, give reason.....

MAGNESIUM SULPHATE INFUSION (see laminated regimen for dosages)	TIME COMMENCED
LOADING DOSE	
MAINTENANCE DOSE	

INITIAL POST SEIZURE OBSERVATIONS TIME.....

RESP RATE..... PULSE RATE..... BP.....mm/Hg 02 sats.....% TEMP.....°C

URINARY CATHETER INSERTED YES / NO TIME..... If no, give reason.....

(Commence Maternity Critical Care Chart)

HYPERTENSIVE TREATMENT ADMINISTERED YES/NO TIME.....

If yes, please document medication given and dosage .....

.....

FETAL WELLBEING (if appropriate) FETAL HEART RATE.....bpm TIME.....

POST SEIZURE CTG PERFORMED YES / NO NORMAL / SUSPICIOUS / PATHOLOGICAL

If CTG not performed, give reason.....

Please complete Risk Management Reporting Form and attach copy of this pro forma – Thank you.

15.2 Appendix: Letter of communication to be given home with patient who hashad gestational hypertension or pre-eclampsia

Dear

Congratulations on the birth of your baby.

You were diagnosed with hypertension in this pregnancy / Pre-eclampsia(delete as appropriate)

Your current medication is:

The plan for follow up of care is as follows:-
:……
……
……

This will be provided by: - :
:……
……
……

You should have your blood pressure checked at this frequency:-
:……
……
……

It is recommended that you stop or reduce your blood pressure treatmentif your blood pressure is consistently :-
:……
……
……

Indications for referral for BP review (either by GP or by hospital)
:……
……

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16 Information Sheet for women who have had severe hypertension orpre-eclampsia

Postnatal visit with general practitioner

It is recommended that a review is carried out by your General Practitioner at postnatal review (6-8) weeks. You may need to organisethis.

A blood pressure review and urine dipstick for protein should be includedat this visit.

Advice for future Pregnancies:

1) Low dose Aspirin

We recommend that you take low dose aspirin in your next pregnancy from 12 weeks which can be obtained from your GP ormidwife. This may be prescribed providing that you have no contraindications to taking it.

2) Weight control

Achieving and maintaining a heathy weight before a next pregnancy is recommended. Body mass index target 18.5–24.9 kg/m^2, (*'Obesity', NICEclinical guideline 43*).

How likely am I to get pre-eclampsia again?

For women who have had pre-eclampsia in this pregnancy – the chance of developing:

- raised blood pressure in a future pregnancy ranges from about1 in 8 (13%) pregnancies to about 1 in 2 (53%) pregnancies
- Pre-eclampsia in a future pregnancy is up to about 1 in 6 (16%) pregnancies
- Pre-eclampsia in a future pregnancy is about 1 in 4 (25%) pregnancies if their pre-eclampsia was complicated by severe pre-eclampsia, HELLP syndrome or eclampsia and led to birth before

34 weeks, and about 1 in 2 (55%) pregnancies if it led to birthbefore 28 weeks.

There may be an increased chance of recurrence if it is more than 10years between this pregnancy and your next pregnancy.

Where can I get further information?

Action on Pre-eclampsia (APEC) is a charity that provides patient information:-
https://action-on-pre-eclampsia.org.uk/public-area/pre-eclampsia-information/

- https://www.nhs.uk/conditions/pre-eclampsia/
- https://www.rcog.org.uk/globalassets/documents/patients/patient-information-leaflets/pregnancy/pi-pre-eclampsia.pdf

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17 Home Blood Pressure Monitoring

17.1 Introduction

Due to the Covid-19 pandemic, current advice is for pregnant women to self-isolate where possible to avoid contracting the virus. This creates challenges in providing safe antenatal care, and in many situations, women will need to attend antenatal appointments to maintain safe standards of care. Blood pressure monitoring has been identified as an area of potential problem. By developing a scheme to help women monitor their blood pressure in their own homes we can achieve regular monitoring while allowing for a woman to socially distance in pregnancy. This guideline is based on RCOG advice and NICE guidelines for hypertension in pregnancy.

No safety concerns have been raised during service evaluation or current trials.

17.2 Inclusion Criteria

Inclusion should be prioritised in accordance with clinical need, and in consideration of the availability of blood pressure monitors (BPMs). We currently have 20 blood pressure monitors (BPM) and so will prioritise roll-out to Group 1 (see groups below) and postnatal women. We can then look to offer monitors to ladies in Group 2. All decisions to use BPM loans should be by a consultant or discussed with a consultant prior to loan.

17.2.1 Groups based on risk

Group 1 - Currently hypertensive women (Priority).

1. Women with pre-eclampsia
2. Women with gestational hypertension.
3. Women with essential hypertension.
4. Women with postnatal hypertension

Group 2 –If numbers of monitors allow, at Consultant discretion the following women may be loaned a BPM.

Normotensive women considered at higher risk of pregnancy hypertension by NICE guidelines, with one of the following risk factors:

- hypertensive disease during a previous pregnancy
- chronic kidney disease
- autoimmune disease (e.g. systemic lupus erythematosus or antiphospholipid syndrome)
- type 1 or type 2 diabetes

17.3 Exclusion Criteria

Women with uncontrolled blood pressure who require hospitalisation for optimisation of blood pressure medication/ treatment to expedite delivery.

17.4 BP Home-Monitoring Checklist- to complete in clinic or on postnatal ward.

1. Woman has appointment and fulfils eligibility criteria (pre-eclampsia, chronic hypertension, gestational hypertension, postnatal hypertension)	
2. Decision to use home BP monitoring has been made by or discussed with a consultant	
3. Provide Antenatal / postnatal check as usual *	
4. Patient's current contact details on E3 are correct	
5. Monitor is labelled with NHS trust and Maternity service contact number	
6. Measure woman's arm for accurate cuff size	
7. Complete the blood pressure monitor loan form	
8. Blood pressure monitor provided	
9. Given written instructions on how to measure blood pressure	
10. Write frequency of blood pressure monitoring required on the instructions form	
11. Written information given on interpretation of BP results at home – using rainbow chart.	
12. Ensure understands chart and knows how to contact OAU.	
13. Ensure appropriate fetal monitoring in place (via scan or community midwife)	
14. If woman is asked to self monitor for proteinuria , arrange this.	
15. Next appointment confirmed including whether virtual/ face to face	
16. Woman knows correct contact numbers for support with BP monitor / normal pregnancy concerns	
17. Ensure there is a plan to return the blood pressure monitor - when she attends the hospital to give birth/ at a later agreed stage to the community midwife.	
18. Record detail of blood pressure monitor loan in correct file in clinic office in antenatal clinic UHW / UHL.	

Health Professional completing this form to print, sign and date and place in woman's hand held maternity record.

17.5 Validated devices

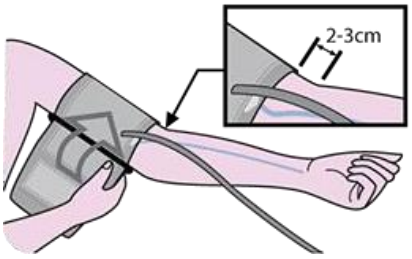
The devices we have available will be in the antenatal clinic manager's office.

These will be OMRON M6 Comfort BPM.

17.6 Information Sheet for Home-Monitoring Blood Pressure

- Always measure your blood pressure using the same arm (normally the left arm).
- Wear loose clothing with sleeves that roll up easily and do not feel tight when rolled up (you will need to fit the cuff onto your bare arm) or take your arm out of the clothing.
- Sit on a chair with your back supported and both feet flat on the floor.
- Rest for 5 minutes before beginning to take blood pressure readings.
- Slip the cuff onto your arm so that the hanging tube points towards your wrist. The yellow line on the cuff should be over the inside of your elbow.
- Adjust the bottom edge of the cuff so that it is about 2cm above the inside of the elbow joint.
- Tighten the cuff around the arm and secure using the Velcro.
- Rest your arm on a table or across your lap with your hand slightly open and the palm facing upward.
- Once the machine is set up and you have the cuff in the correct position, and you are ready to start, press the start button on the front of the machine to take a reading.
- Relax, do not move your arm muscles and do not talk until the measurement is completed.
- Each time you measure your blood pressure you will get two readings:
    - The top number (usually called SYS, short for systolic),
    - The bottom number of your blood pressure, (usually called DIA, short for diastolic)
    - You may also get the pulse displayed, usually called PUL
- Measure your blood pressure twice, at least one minute apart.
- We would like you to monitor your blood pressure:
- (Circle as appropriate)
    - Once a week (Group 2)
    - Three times a week (Group 1)
    - Daily (Group 1)
- Write down the second blood pressure reading (on your phone or in your maternity notes)

Remember your blood pressure can change with exercise / stress / movement and has normal variations throughout the day. Follow the Blood Pressure table to know when to contact us for advice



17.7 Interpreting Your Blood Pressure at Home

If you have any symptoms of pre-eclampsia,
•severe headache OR
•problems with vision, such as blurring or flashing before the eyes OR
•severe pain just below the ribs OR
•vomiting OR
•sudden swelling of the face, hands or feet.
then you should contact the Obstetric Assessment unit (029 20744658 – 24 hours) immediately for advice.

	Blood Pressure	What to do
HIGH	**Systolic over 150 OR Diastolic over 100**	Your blood pressure is high. Sit quietly for 5 minutes then re-check. If repeated BP is still high, please contact the Obstetric assessment unit **(029 20744658)**. **Hospital attendance is advised.**
RAISED	**Systolic 140 - 150 OR Diastolic 90-100**	Your blood pressure is raised. Sit quietly for 5 minutes then measure it again and note the reading. If your repeated reading is raised, please contact the Obstetric assessment unit, **(029 20744658)** In general if your BP is over 140/90 on 2 readings, hospital attendance is advised.
HIGH NORMAL	**Systolic 135-139 OR Diastolic 85-89**	Your blood pressure is normal but moving towards the raised threshold. Sit quietly for 5 minutes then measure it again and note the reading. If your repeat reading is still high end of normal, please monitor your blood pressure daily
NORMAL	**Systolic 110-134 AND Diastolic 70-84**	Your blood pressure is normal. Continue blood pressure monitoring as planned.
LOW	**Systolic under 110 AND Diastolic under 70**	If you are not taking blood pressure medication: Your blood pressure is normal. If you are feeling well this blood pressure does not need any further action. If you are taking blood pressure medication: Your blood pressure is low. Repeat once more in 5 minutes. If your repeat reading is still low, contact your maternity unit within 24 hours or within 4 hours if you feel unwell (e.g. dizzy or faint).

17.8 Loan agreement for blood pressure monitor

GIG CYMRU NHS WALES
Bwrdd Iechyd Prifysgol Caerdydd a'r Fro
Cardiff and Vale University Health Board

Blood pressure monitor number:

Cuff size:

Declaration: I accept responsibility for the above equipment and understand I have been asked to monitor my blood pressure through pregnancy (and postnatally) after the baby is born. I will return the blood pressure monitor as requested. If the blood pressure monitor becomes damaged, lost or stolen, I understand that I must report this information to the Maternity Unit on the below number and that I am not responsible for the cost of replacement or repair.

Name:

Hospital number:

Date of birth:

(or Patient info. sticker here)

Signature of agreement to conditions:_____

Staff name: _____

Staff signature: _____

Date: _____

Maternity team contact: _____

Telephone: _____

(One copy for patient to keep, one copy for staff to retain and file in ANC Office UHW and UHL)

17.9 References:

1. RCOG: Self monitoring of blood pressure in pregnancy. 30th March 2020

2. NICE Guidance NG133, Hypertension in pregnancy: diagnosis and management (2019)

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