Hypertensive Disorders in Pregnancy (Including Severe Pre-eclampsia and eclampsia

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Version	2	
Status	Approved	
Publication date	16/04/2024	
Review date	22/11/2026	
Approval recommended by	Women's Business and Governance Meeting	Date: 17th November 2023
Approved by	CBU 3 Overarching Governance Meeting	Date: 22nd November 2023
Distribution	Barnsley Hospital NHS Foundation Trust – intranet Please note that the intranet version of this document is the only version that is maintained. Any printed copies must therefore be viewed as "uncontrolled" and as such, may not necessarily contain the latest updates and amendments	

The guideline uses the terms 'woman' or 'mother' throughout. These should be taken to include people who do not identify as women but who are pregnant.

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1.0 Introduction

The guideline uses the terms 'woman' or 'mother' throughout. These should be taken to include people who do not identify as women but who are pregnant.

Hypertensive disorders during pregnancy carry risks for the woman and remain a cause of maternal death. The mortality rate from hypertensive related causes has remained stable at 6 per 100,000 maternities in 2014-16 and 2017-19 (MBRRACE-UK, 2021).

Hypertensive disorders also carry a risk for the baby in terms of higher rates of preterm birth, low birth weight and perinatal mortality.

Hypertensive disorders during pregnancy can occur in women with chronic hypertension (pre-existing hypertension). However, most hypertensive disorders that occur during pregnancy present after 20 weeks gestation.

New hypertension can occur **without** significant proteinuria (gestational hypertension) or **with** significant proteinuria (pre-eclampsia).

2.0 Objective

To ensure a consistent and systematic approach to the care and XXXXXXXX of women with chronic hypertension, gestational hypertension, pre-eclampsia and eclampsia.

3.0 Scope

This guideline applies to all medical and midwifery staff working on the maternity unit and in community.

4.0 Main body of the document

4.1 Link to NICE guideline NG133

For the XXXXXXXX of hypertension in pregnancy please follow Hypertension in pregnancy: diagnosis and XXXXXXXX, NICE guideline [NG133] Published 25 June 2019:

Overview | Hypertension in pregnancy: diagnosis and XXXXXXXX | Guidance | NICE

4.2 Exceptions/additional information to NICE NG133

- NICE states “Do not routinely use 24 hour urine collection to quantify proteinuria in pregnancy”
- At Barnsley Trust: If dipstick screening shows a trace of protein perform 24 hour urine collection. If 1+ or more perform protein: creatinine ratio to quantify proteinuria.

- NICE states assessments should be carried out by a healthcare professional who is trained in the XXXXXXXX of hypertensive disorders of pregnancy

At Barnsley Trust: The healthcare professional must be a senior obstetrician.

- NICE states to offer placental growth factor (PlGF)-based testing to help rule out preeclampsia- See Appendix 1

- A rise in Creatinine of more than 90 micromol/litre or more is the measurement used in Barnsley.

- FullPIERS or PREP-S is not used in Barnsley

- Women with evidence of cardiac failure or abnormal neurology are to receive level 3 care

- Nice states "As antihypertensive agents have the potential to transfer into breast milk: consider monitoring the blood pressure of babies, especially those born preterm, who have symptoms of low blood pressure for the first few weeks."

At Barnsley; Discuss individualised plan of care with the neonatal team

- In Barnsley, prior to discharge from hospital women must have a face to face medical review and discharge will be discussed with a senior doctor

- In Barnsley, at discharge an individualised plan for discharge should be documented in the woman's notes, by the reviewing doctor.

4.3 Administration of Magnesium Sulphate

See appendix 3 for the magnesium sulphate administration flowchart

4.4 XXXXXXXX of Magnesium Toxicity – Use of Calcium Gluconate *The antidote is 10mls 10% Calcium Gluconate given slowly intravenously.*

Respiratory depression
- Give oxygen via face mask and ensure airway maintained
- Stop magnesium therapy if the SPO_2 is <90%
- Give 10mls of 10% calcium gluconate (1gm) IV over 10 minutes

Renal impairment
- Stop magnesium therapy if the urine output is <20mls/hr

Absent patellar reflexes (bicep tendon if the woman has an epidural)
- Stop infusion of magnesium sulphate until reflexes return
- Recommence magnesium therapy once reflexes have returned at a lower dose of 0.5mls/hr (100mg / ml.)

Respiratory arrest
- Intubate and ventilate immediately and stop magnesium therapy
- Give 10mls of 10% calcium gluconate (1gm) IV over ten minutes
- Ventilation must be continued until the resumption of normal, spontaneous respiration

4.5 XXXXXXXX of recurrent/prolonged eclamptic fits

Prolonged/recurrent eclamptic fits
- Give a further 2g of magnesium sulphate or increase the infusion rate to 1.5g/hr (7.5mls/hr)
- If this is not successful consider giving diazepam or thiopentone

XXXXXXXX of persistent convulsions may require intubation and ventilation. In all cases XXXXXXXX plans will be made in conjunction with the Obstetric and Anaesthetic teams

Step down care

This woman is considered a seriously ill obstetric patient and requires at least 24 hours observation, treatment and recovery on Barnsley Birthing Centre (BBC) enhanced care. A plan for step down care and transfer to the postnatal ward will be made by the MDT and overall decision for transfer to the postnatal ward will be made by the senior obstetrician.

4.6 XXXXXXXX of HELLP syndrome

HELLP syndrome is the medical term for one of the most serious complications of severe preeclampsia, in which there is a combined liver and blood clotting disorder.
It is a combination of:

- **H –** Haemolysis (rupture of red blood cells)
- **EL** – Elevated Liver enzymes (reflecting liver damage)
- **LP** – Low Platelets (abnormal clotting)

HELLP is as dangerous as eclampsia and probably more common. It is most likely to occur immediately after birth, sometimes developing with devastating speed. However, it can arise at any stage during the second trimester, and some rare cases have been recorded even earlier.

Signs and Symptoms

- May be preceded by clear signs of pre-eclampsia (raised B/P, proteinuria) • Can occur without warning signs
- Epigastric pain, sometimes accompanied by vomiting and headaches
- Haematuria
- Jaundice

It is important to note that the epigastric pain can be confused with the discomfort of heartburn. However, the pain of HELLP syndrome is not burning, does not spread upwards towards the throat and is not relieved by antacids. The pain is often severe can radiate through to the back and is associated with tenderness over the liver. It is not uncommon for this pain to be diagnosed as being due to some other acute abdominal condition.

Risks of HELLP

HELLP syndrome may be associated with one or more of the following problems:

- Severely disturbed blood clotting function (DIC), leading to heavy, uncontrollable bleeding, particularly after surgery
- Severe liver damage, which can lead to failure or even rupture
- Kidney failure
- Cerebral haemorrhage with or without eclampsia
- Breathing difficulties which may require ventilation

If HELLP is suspected, discuss with consultant obstetrician, Anaesthetist and Haematologist.

5.0 Associated documents and references

National Institute for Health and Care Excellence (NICE), Clinical guideline 133. Hypertension in pregnancy: diagnosis and XXXXXXXX (2019) [online] www.nice.org.uk

6.0 Training and resources

Training will be delivered as outlines in the Maternity Training Needs Analysis. This is updated on an annual basis.

7.0 Monitoring and audit

Any adverse incidents relating to the guideline for the XXXXXXXX of hypertensive disorders in pregnancy will be monitored via the incident reporting system. Any problems will be actioned via the case review and root cause analysis action plans. The action plans are monitored by the risk midwife to ensure that improvements in care are made. The trends and any root cause analysis are discussed at the monthly risk meetings to ensure that appropriate action has been taken to maintain safety.

The guideline for the XXXXXXXX of hypertensive disorders in pregnancy will be audited in line with the annual audit programme, as agreed by the CBU. The audit action plan will be reviewed at the monthly risk XXXXXXXX meetings on a quarterly basis and monitored by the risk midwife to ensure that improvements in care are made.

8.0 Equality and Diversity

The Trust is committed to an environment that promotes equality and embraces diversity in its performance as an employer and service provider. It will adhere to legal and performance requirements and will mainstream equality, diversity and inclusion principles through its policies, procedures and processes. This guideline should be implemented with due regard to this commitment.

To ensure that the implementation of this guideline does not have an adverse impact in response to the requirements of the Equality Act 2010 this policy has been screened for relevance during the policy development process and a full equality impact assessment is conducted where necessary prior to consultation. The Trust will take remedial action when necessary to address any unexpected or unwarranted disparities and monitor practice to ensure that this policy is fairly implemented.

This guideline can be made available in alternative formats on request including large print, Braille, moon, audio, and different languages. To arrange this please refer to the Trust translation and interpretation policy in the first instance.

The Trust will endeavour to make reasonable adjustments to accommodate any employee/patient with particular equality, diversity and inclusion requirements in implementing this guideline This may include accessibility of meeting/appointment venues, providing translation, arranging an interpreter to attend appointments/meetings, extending policy timeframes to enable translation to be undertaken, or assistance with formulating any written

statements.

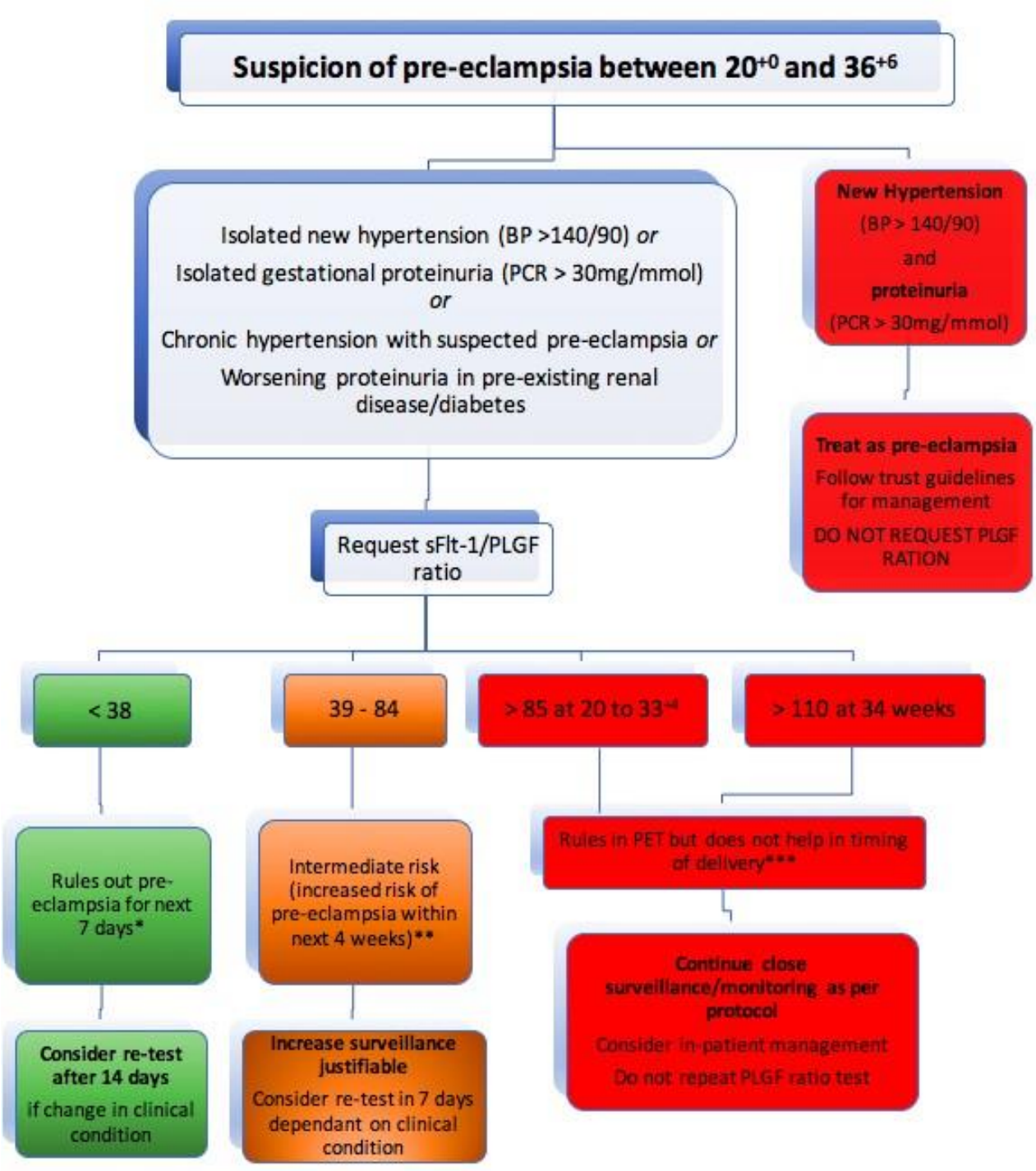
8.1 Recording and Monitoring of Equality & Diversity

The Trust understands the business case for equality, diversity and inclusion and will make sure that this is translated into practice. Accordingly, all guidelines will be monitored to ensure their effectiveness.

Monitoring information will be collated, analysed and published on an annual basis as part of Equality Delivery System. The monitoring will cover the nine protected characteristics and will meet statutory employment duties under the Equality Act 2010. Where adverse impact is identified through the monitoring process the Trust will investigate and take corrective action to mitigate and prevent any negative

Appendix 1 - sFlt-1/PlGF Ratio Test to exclude Pre-eclampsia

(singleton pregnancies)



* Negative predictive value of 99.3%
** Positive predictive value 36,7%

*****PlGF ratio >85 in isolation is not an indication for delivery prior to 37 weeks Appendix 2 - Procedure for Placental Growth Factor (PlGF) Based Testing sFlt/PlGF Ratio Test**

Patient see in Triage, Clinic, ward or ANDU who needs PlGF test (see flowchart: PlGF Ratio Test to ruke out Pre-Eclampsia)

Blood sample to be taken into brown top blood tube (can be done with LFT & UEs if serum tube is filled)

Send the sample to the Laboratory

- When requesting via ICE search for Placental Growth Factor
- Inform Barnsley Lab on Ext 2733/2673 as soon as the sample is taken
- The sample will be spun and sent to Doncaster Royal Infirmary

Record the women's details/hospital number on the PlGF electronic spreadsheet If the sample is taken in any other clinical area other than ANDU, ensure the

patients details are recorded on the PlGF spreadsheet

Inform the woman when the result is likely to be available

The sample will be processed within four hours if received in Doncaster lab between the hours of 9am and 5pm, 7 days a week including bank holidays. Outside of these hours the sample will be stored and analysed the next working day

Results will be available via ICE Opennet for the Clinican to review
The clinician will make further XXXXXXXX plans based on the results The results should be documented in the patients record on Careflow

Triage, Clinic, ANPN ward or ANDU to chase the result with DBTH lab if not received within the expected timeframe

Magnesium Sulphate ($MgSO_4$) for management of eclampsia or for neuroprotection in preterm labour (using a 20% solution)

Magnesium sulphate 50% must always be diluted before use.

To make a **20% solution** remove 20mls from a 50ml bag of Sodium Chloride 0.9% and discard.

Draw up 10g (20ml) of $MgSO_4$ 50% and put into the bag containing 30mls sodium chloride and Mix Well.

↓

LOADING DOSE by IV injection

(4g magnesium sulphate over 5 - 15

Remove 20mls from the bag you have made above

Give slowly IV over 5-15 mins.

(20mls = 4g of $MgSO_4$)

↓

MAINTENANCE DOSE by IV infusion

1g / hour magnesium sulphate

30mls will be remaining in the bag, withdraw this remaining solution into a 50ml syringe and infuse via a syringe pump at 5mls / hour

5mls / hour = 1g / hour

FURTHER MAINTENANCE DOSES

Make a Magnesium sulphate **20% solution** as above, you will have 50ml of solution, withdraw this solution into a 50ml syringe.

Infuse at 5mls / hour = 1g / hour via syringe pump.

The 50ml syringe will give you enough for a 10-hour infusion.

Continue $MgSO_4$ maintenance dose for 24 hours / until birth, if sooner / as specified by Senior Obstetrician.

Appendix 3- Magnesium sulphate administration

Appendix 4

Version	Date	Comments	Author
1	14/05/2012	3 yearly review	Maternity guideline group
2	29/06/2015	3 yearly review	Maternity guideline group
3	14/03/2016	Review	Maternity guideline group
4	28/06/2019	Review	Maternity guideline group
5	15/11/2023	Additional information added re PlGF	Obstetric Consultant and ST7

Review Process Prior to Ratification:

Name of Group/Department/Committee	Date
Reviewed by Maternity Guideline Group	10/12/2019
Reviewed by Women's Business and Governance Group	24/01/2020
Reviewed at Women's Business and Governance meeting	17/03/2023
Reviewed at CBU3 Governance meeting	22/03/2023
Reviewed at Women's Business and Governance meeting	
Reviewed at CBU3 Governance meeting	

Archived	Date