Aneurin Bevan University Health Board

Hypertension in Pregnancy Guideline

N.B. Staff should be discouraged from printing this document. This is to avoid the risk of out of date printed versions of the document. The Intranet should be referred to for the current version of the document.

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Contents:

1 Executive Summary

This document is a procedure designed to support safe and effective practice

1.1 Scope of guideline

This guideline applies to all clinicians working within maternity services

1.2 Essential Implementation Criteria

Auditable standards are stated where appropriate

2 Aims

To provide support for clinical decision making

3 Responsibilities

The Maternity Management team

4 Training

Staff are expected to access appropriate training where provided. Training needs will be identified through appraisal and clinical supervision.

5 Monitoring and Effectiveness

Local service Improvement Plan will guide monitoring and effectiveness.

This policy has undergone an equality impact assessment screening process using the toolkit designed by the NHS Centre Equality & Human Rights. Details of the screening process for this policy are available from the policy owner.

6 Appendices

Appendix 1 – Hypertension in Pregnancy Management

7 References

NICE NG 133 Hypertension in Pregnancy, June 2019

Introduction

Hypertensive disorders during pregnancy affect around 8% to 10% of all pregnant women and can be associated with substantial complications for the woman and the baby.

Women can have hypertension before pregnancy or it can be diagnosed in the first 20weeks (known as chronic hypertension), new onset of hypertension occurring in the second half of pregnancy (gestational hypertension) or new hypertension with features of multi-organ involvement (pre-eclampsia).

Although the proportion of women with pregnancy hypertensive disorders overall appears to have stayed reasonably stable, maternal mortality from hypertensive causes has fallen dramatically: less than 1 woman in every million who gives birth now dies from pre-eclampsia.

There is consensus that introduction of the NICE evidence-based guidelines, together with the findings from the confidential enquiry into maternal deaths, has made a pivotal contribution to this fall in maternal mortality. However, hypertension in pregnancy continues to cause substantial maternal morbidity, stillbirths and neonatal deaths, and perinatal morbidity. Women with hypertension in pregnancy are also at increased risk of cardiovascular disease later in life.

Definitions

- Hypertension: Systolic BP≥140 or Diastolic BP ≥90 mm of Hg.
- Severe Hypertension: Systolic BP≥160 or Diastolic BP≥110mm of Hg.
- Chronic Hypertension: Hypertension at booking visit or before 20 wks, or that is being treated at time of referral to maternity
- Gestational Hypertension: New Hypertension presenting after 20 weeks without significant proteinuria Pre eclapmsia: New Hypertension presenting after 20 weeks with one or more of following-
  - ✓ Proteinuria
  - ✓ Maternal organ dysfunction - AKI (creatinine ≥90 µmol/l)
    Liver involvement(ALT or AST >40 IU/l, right upper quad pain/epigastric pain)
    Hematological complications(Plt< 150, DIC, Hemolysis)
    Neurological complications(clonus,scotoma,blindness,severe headache)
  - ✓ Uteroplacental dysfunction (FGR, abnormal umbilical artery doppler, stillbirth)

- Severe Pre eclampsia: Pre eclampsia with severe HTN that does not respond to treatment.
  Pre eclampsia with severe HTN + ongoing/recurring severe symptoms
  Pre eclampsia with severe HTN + progressive deterioration in lab results.

- Significant Proteinuria: Protein/creatinine ratio > 30mg/mmol
  >300mg/24 hour urine collection

Abbreviations:

ACE inhibitor Angiotensin-converting **HELLP** Haemolysis, elevated liver enzymes, low enzyme inhibitor platelets
ARB Angiotensin 2 receptor blocker **BP** Blood pressure
ALT Alanine amino transferase **CTG** Cardiotocography **DBP**
Diastolic blood pressure **ANC** Antenatal clinic

At Booking: Identify risk factors for developing hypertensive disorders in pregnancy

Commence on low dose aspirin (75-150mgs) from 12 weeks to delivery if ≥ 2 moderate risk factors or 1 high risk factor

Moderate Risk Factors
First pregnancy
Age ≥ 40 years
Pregnancy interval > 10 years
BMI ≥ 35 kg/m2 at first visit
Family history of pre-eclampsia
Multiple pregnancy

High Risk Factors
Hypertensive disease during previous pregnancy
Chronic kidney disease
Autoimmune disease such as
systemic lupus erythematosis or antiphospholipid syndrome
Type 1 or type 2 diabetes
Chronic hypertension

Symptoms of Preeclampsia:

- Severe headache
- Visual disturbances – blurring, flashing
- Epigastric/ right upper quadrant pain/ vomiting / pain below ribs

- Sudden oedema of face, hands or feet

*Women to seek advice from a healthcare professional immediately if they experience any of the above

Haematological investigations for hypertension in pregnancy (PET Bloods):

Liver function tests (transaminases and bilirubin,LDH) Urea and electrolytes (creatinine level)

Full blood count (platelets)Clotting studies **only** if platelets ≤ 100 × 10^6/l or suspected HELLP syndrome/ Abruption

CHRONIC HYPERTENSION – Hypertension present at booking OR before 20 weeks OR that is being treated at time of referral to maternity services

Antenatal Care

- Review medication – (ACE inhibitors /ARBS, chlorothiazide discontinued within 2 days)
- Dietary advice – lower amount of salt in diet
- Aspirin 75 to 150mg/day
- Optimise antihypertensives – 1st line labetalol,2nd nifedipine,3rd methyldopa
- Start treatment if BP> 140/90, Aim for BP of 135/85mm of Hg
- Reduce dose if persistant BP≤ 110/70 mm of Hg or symptomatic hypotension.
- Community midwife to monitor BP/urine dip for protein weekly
- Antenatal appointments – depending on BP control, every week if poorly controlled, 2 to 4 weeks if well controlled.
- Patient education: symptoms requiring medical consultation – severe headaches, visual disturbances, upper abdominal pain, vaginal bleeding, reduced FM

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Fetal Assessment

* 28, 32 and 36 weeks – Ultrasound for growth and amniotic fluid volume measurement and Umbilical artery Doppler velocimetry

CTG if clinically indicated

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Timing of Delivery in Chronic Hypertension:

- Do not offer birth to women with BP< 160/110, with or without antihypertensive treatment, before 37 wks.

- If BP< 160/110 mmHg after 37 weeks, with or without antihypertensive treatment, timing of birth, and maternal and fetal indications for birth should be agreed between the woman and the senior obstetrician.
- If planned early birth- Steroids+ MgSO4 in line with NICE guidelines pre term birth.

Postnatal care

- Stop methyldopa within 2 days of delivery
- Day 1-2 – daily BP monitoring, once between day 3-5 As indicated if change in antihypertensive
- Aim BP 140/90
- If chronic hypertension, switch to pre pregnancy medication (ensure safe with breastfeeding)

Review at 2 weeks and 6 to 8 weeks (GP/Specialist)

GESTATIONAL HYPERTENSION – New Hypertension presenting >20/40 without significant proteinuria Hypertension BP 140/90 -159/109

- Do not routinely admit
- Treat with antihypertensives if BP ≥ 140/90
- Aim BP of 135/85
- PET bloods at presentation
- FHR auscultation,CTG if clinically indicated
- Ultrasound for growth, amniotic fluid volume measurement and umbilical artery doppler velocimetry
- If normal, repeat every 2 to 4 weeks if clinically indicated

- CMW to check BP and urine dipstick twice weekly
- Bloods weekly
- ANC follow up as indicated, FHR ausculatation at every visit.

Severe Hypertension (>160/110)

- Admit
- Treat with labetalol/nifedipine, BP every 15- 30mins till < 160/110, aim BP 135/85
- Measure BP 6 hourly at least
- Daily urine dipstick while inpatient
- CTG at diagnosis– repeat if bleeding, reduced fetal movements, deterioration in maternal condition
- Weekly PET bloods
- TEDS/ encourage mobility
- Ultrasound for growth, amniotic fluid volume & umbilical artery Doppler
- Any abnormalities inform senior obstetrician

Severe Hypertension (>160/110)

If BP controlled over 24 hours ≤ 135/85, patient can be referred to community care with

- Antihypertensives
- Twice weekly BP and urine dip & weekly PET bloods with community midwife/DAU
- Fortnightly ultrasound for growth/amniotic fluid volume and umbilical artery Doppler if severe HTN persists

Consider steroids as per NICE guideline

 Follow up ANC as indicated

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Time of Delivery in Gestational Hypertension:Time of Delivery in Gestational Hypertension: Do not offer birth to women with BP< 160/110, witDo not offer birth to women with BP< 160/110, with or without antihypertensive treatment, before 37 weeks.h or without antihypertensive treatment, before 37 weeks.

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Postnatal care GESTATIONAL HYPERTENSION

- Stop methyldopa within 2 days of delivery
- Day 1 - 2 daily BP monitoring, once between day 3-5 and then as clinically indicated.
- Introduce treatment if BP>150/100
- Target BP 140/90: Reduce if BP falls below 130/80.

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- Make a clear care plan for community care when discharged.
- If still needing treatment at 2/52, refer to GP/ Specialists

- All women with Gestational HTN offer medical review with GP/Specialist review 6/52 **PRE-ECLAMPSIA – New hypertension after 20 weeks gestation with significant proteinuria (protein/creatinine ratio >30mg/mmol or 300mg on 24 hour urine collection)**

HYPERTENSION (BP 140/90 – 159/109)

- Admit only if clinical concerns
- BP every 48hrs,more frequent if admitted.
- Treat if BP remains above 140/90
- Aim target BP of 130/85
- PET bloods twice weekly
- Repeat PCR if new signs/symptoms
- CTG at diagnosis– repeat if bleeding, reduced fetal movements, deterioration in maternal condition
- USG at diagnosis – Growth, AFI and Doppler and fortnightly scans.

BP controlled with medications in

SEVERE HYPERTENSION (BP ≥ 160/110)

- Admit
- BP 15 to 30mins till < 160/110,then 2 - 4th hourly
- Aim BP 130/85
- PET bloods thrice weekly

- Repeat PCR if new signs/symptoms
- CTG at diagnosis– repeat if bleeding, reduced fetal movements, deterioration in maternal condition USG at diagnosis – Growth, AFI and Doppler

Clinical concerns- Creatinine
> 90µmol/L
ALT/AST > 70IU/L
Plts <150
Signs of impending eclampsia
Severe symptoms
Signs of impending pulmonary edema
Suspected fetal compromise
Any clinical sign causing concern (eg brisk

24hrs + no fetal concerns

Manage as hypertension Poor response to antihypertensives/ signs of impending eclampsia

- Seizure prophylaxis
- Consider steroids if < 34wks
- Plan delivery according to clinical situation and maternal preference

Admit in HDU

- IV hydralazine or IV labetalol

Timing of delivery in pre-eclampsia

<34 weeks

- Only if clinical indicators for planned early birth.
- IV MgSO4 for neuroprotection and antenatal steroids as per NICE guideline.

34-36+6wks

- Only if clinical indicators for planned early birth.
- Antenatal steroids.

>37 weeks

 Recommend delivery within 24-48 hours after assessing cervix and discussion with senior obstetrician

Indicators for planned early birth

- BP not controlled despite 3 or more classes of antihypertensives
- Maternal pulse oximetry < 90%
- Progressive deterioration in LFT, RFT, Platelet count or hemolysis
- Ongoing neurological features- severe headache, repeated scotoma and eclampsia.
- Placental abruption
- Reversed EDF in UA Dopplers, pathological CTG and stillbirth

  - Discuss early birth with senior obstetrician
  - Inform anaesthetic team
  - Inform SCBU

Postnatal Care

PRE ECLAMPSIA

Stop methyldopa within 2 days of delivery

<u>If not on antenatal treatment:</u>

th hourly while inpatient

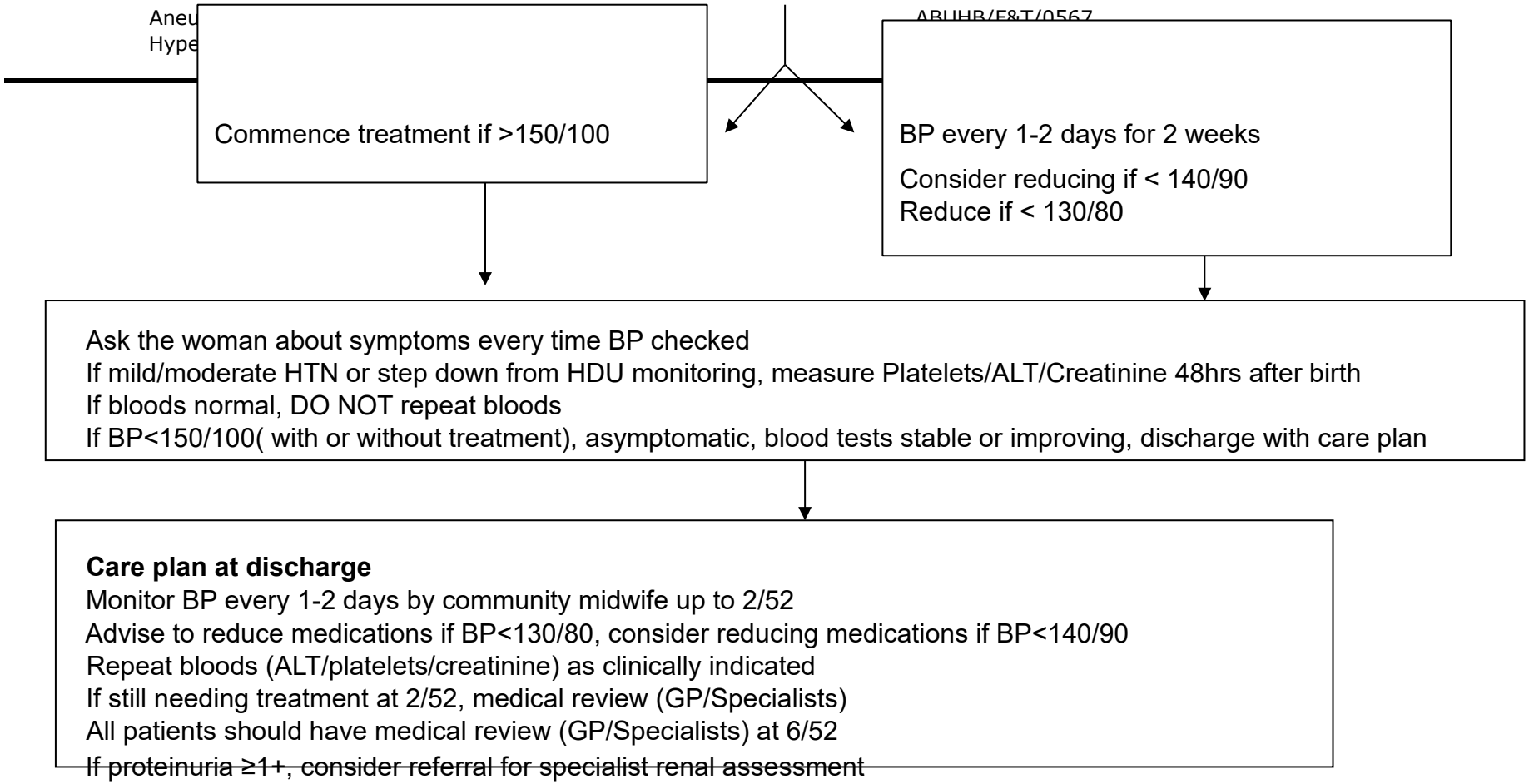
BP 6

BP once between day 3

<u>If on antenatal treatment:</u>

Continue antihypertensives

-5 BP 6th hourly while inpatient


Commence treatment if >150/100
BP every 1-2 days for 2 weeks
Consider reducing if < 140/90
Reduce if < 130/80
Ask the woman about symptoms every time BP checked
If mild/moderate HTN or step down from HDU monitoring, measure Platelets/ALT/Creatinine 48hrs after birth
If bloods normal, DO NOT repeat bloods
If BP<150/100(with or without treatment), asymptomatic, blood tests stable or improving, discharge with care plan
Care plan at discharge
Monitor BP every 1-2 days by community midwife up to 2/52
Advise to reduce medications if BP<130/80, consider reducing medications if BP<140/90
Repeat bloods (ALT/platelets/creatinine) as clinically indicated
If still needing treatment at 2/52, medical review (GP/Specialists)
All patients should have medical review (GP/Specialists) at 6/52
If proteinuria ≥1+, consider referral for specialist renal assessment

Additional fetal monitoring in Hypertensive disorders –

Additional fetal monitoring in Hypertensive disorders

•USG for fetal growth, AFI and UA Doppler at 28 to 30 weeks or 2 weeks before previous gestational onset of- USG for fetal growth, AFI and Umbilical artery Doppler 28 to 30 weeks or 2 weeks before onset

- severe pre-eclampsia
- pre-eclampsia that resulted in birth before 34 weeks
- pre-eclampsia with a baby whose birth weight was less than the 10th centile • intrauterine death
- placental abruption

Intrapartum care - Refer Labour ward guidelines

Key points-

•Continue antenatal antihypertensives
•BP hourly in HTN and 15 to 30 mins in severe HTN until <160/110 mm of Hg
•Do not pre load before epidural in severe pre eclampsia
•Do not limit 2nd stage in controlled HTN
•Operative or assisted birth if unresponsive HTN
•Limit maintenance fluid to 80mls/hr unless ongoing loss
•Mode of birth depending upon clinical circumstances.

Critical care and MgSO4 in severe HTN and eclampsia- Refer Labour ward guidelines

Oral antihypertensive in postpartum

Breastfeeding:

- Antihypertensives can cross breastmilk- levels in breast milk usually very low, unlikely to have clinical effect on baby.
- 1st line- Enalapril, if not controlled add Nifedipine,if combination ineffective or not tolerated add Labetalol/Atenolol
- ACE inhibitors(Enalapril- check renal function and potassium levels)
- 1st line in African and caribbean- Calcium channel blockers(Nifedipine and amlodipine)
- **Safe in breast feeding**: labetalol, nifedipine, enalapril, captopril, atenolol, metoprolol
- **Avoid in breast feeding**: ARBs, amlodipine, ACE inhibitors other than enalapril and captopril,diuretcs
- Choose medications with OD dose- Enalapril,Atenolol.

Not Breastfeeding:

- Treat according to NICE guideline on “Hypertension in adults”

Appendix: Oral antihypertensive doses

Drug	Starting dose	Maximum dose	Cautions / Contraindications	Side Effects
Labetalol	100mg BD	2.4gm/day (3-4 divided doses)	Asthma	Bradycardia
Nifedipine	10mg slow-release BD	40mg slow-release BD		Headache, flushing, palpitations, pedal edema
Methyldopa	250mg BD	1g TDS	Depression. Avoid postpartum.	Depression
Hydralazine	25mg BD	50mg BD		Flushing, headache,Postural hypotension
Enalapril	5mg OD	20mg BD		Cough, angioedema
Amlodipine	5mg OD	10mg OD	CI in breastfeeding	Headache, flushing, palpitations, pedal edema

Appendix 1 Management of pregnancy with gestational hypertension

Degree of hypertension	Hypertension	Severe hypertension
Categorization	BP 140/90–159/109 mm of Hg	BP ≥160/110 mm of Hg
Admission to hospital	Do not routinely admit to hospital	Admit, but if BP falls below 160/110 mmHg then manage as for hypertension
Antihypertensive pharmacological treatment	Offer treatment if **BP remains above 140/90 mmHg**	Offer treatment to all women
Target blood pressure once on antihypertensive treatment	Aim for **BP of 135/85 mmHg** or less	Aim for **BP of 135/85 mmHg** or less
Blood pressure measurement	Once or twice a week (depending onBP) until BP is 135/85 mmHg or less	Every 15–30 minutes until BP is less than 160/110 mmHg
Dipstick proteinuria testing	Once or twice a week (with BP measurement)	Daily while admitted
Blood tests	Measure FBC, LFT and U+E at presentation and then weekly	Measure FBC, LFT and U+E at presentation and then weekly
Fetal assessment	FHR auscultation at every antenatal appointment. Fetal growth AFI and doppler at diagnosis and, if normal, repeat every 2 to 4 weeks, if clinically indicated. Carry out a CTG only if clinically indicated.	FHR auscultation at every antenatal appointment. Fetal growth AFI and doppler at diagnosis and, if normal, repeat every 2 weeks, if severe hypertension persists. Carry out a CTG at diagnosis and then only if clinically indicated.

Appendix 2 Management of pregnancy with pre-eclampsia

Degree of hypertension	Hypertension	Severe hypertension
Categorisation	BP 140/90–159/109 mm of Hg	BP ≥160/110 mm of Hg
Admission to hospital	Admit if any clinical concerns for the wellbeing of the woman or baby or if high risk of adverse events	Admit, but if BP falls below 160/ 110 mmHg then manage as for hypertension
Antihypertensive pharmacological treatment	If BP remains above 140/90 mmHg	Offer treatment to all women
Target blood pressure once on antihypertensive treatment	Aim for BP of 135/85 mmHg or less	Aim for BP of 135/85 mmHg or less
Blood pressure measurement	At least every 48 hours, and more frequently if the woman is admitted to hospital	Every 15–30 minutes until BP is less than 160/110 mmHg, then at least 4 times daily while the woman is an inpatient, depending on clinical circumstances
Dipstick proteinuria testing	Only repeat if clinically indicated, forexample, if new symptoms and signsdevelop or if there is uncertainty over diagnosis	Only repeat if clinically indicated, for example, if new symptoms and signs develop or if there is uncertainty over diagnosis
Blood tests	Measure FBC,LFT and U+E twice a week	Measure FBC,LFT and U+E thrice weekly

Fetal assessment	FHR auscultation at every antenatal appointment Fetal growth, AFI, doppler at diagnosis and, if normal, repeat every 2 weeks Carry out a CTG at diagnosis and then only if clinically indicated	FHR auscultation at every antenatal appointment Fetal growth, AFI, doppler at diagnosis and, if normal, repeat every 2 weeks Carry out a CTG at diagnosis and then only if clinically indicated