Hypertension in Pregnancy

NHS University Hospitals of Leicester NHS Trust

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Contents

1. Introduction and who the guideline applies to: 2
   1.1 Definitions: Definitions and management guidelines are based on the NICE Hypertension in Pregnancy Guidelines (NICE, 2019). 2
   1.2 Classification of Hypertension: 2
2. Management of hypertension in pregnancy 3
   2.1 Initial assessment of women with new onset hypertension 3
   2.2 Diagnosis of significant proteinuria: 3
   2.3 Management of women with Gestational hypertension 3
3. Management of women with Pre-eclampsia 6
   3.1 Assessment of women with pre-eclampsia 6
   3.2 Pre-eclampsia: Delivery planning 7
   3.3 Pre-eclampsia: Intrapartum care 8
   3.4 Pre-eclampsia: Postnatal investigation, monitoring and treatment 8
4. Gestational Proteinuria (without hypertension) 9
5. Management of women with chronic hypertension 9
   5.1 Treatment of women with chronic hypertension 10
   5.2 Delivery planning for women with chronic hypertension 11
   5.3 Postnatal management 11
6. Education and Training 12
7. Monitoring Compliance 12
8. Supporting References 12
9. Key Words 12
   Appendix1: Antenatal management plan for women with hypertension in pregnancy 14
   Appendix 2: Management of Pre-eclampsia 15
   Appendix 3 – Flowchart for PlGF-based testing 16
   Appendix 4: INPATIENT CAREPLAN FOR WOMEN WITH HYPERTENSION/ PRE-ECLAMPSIA 17
   Appendix 5: Important postnatal discharge information for women with hypertension in pregnancy 19
   Appendix 6: Information poster 20
   Appendix 7: Postnatal leaflet for women who have developed hypertension in pregnancy 22
   HIGH BLOOD PRESSURE 22
   Appendix 8: POSTNATAL MANAGEMENT OF HYPERTENSIVE PATIENTS 23
   Appendix 9: Protein threshold in community 24
   Appendix 10. Community monitoring of blood pressure and proteinuria 25

1. Introduction and who the guideline applies to:

This guideline is intended for the use of all Medical, Midwifery, Nursing, Primary Care and Laboratory staff involved in the care of pregnant women and birthing people.

This guideline outlines the management of women and birthing people with hypertension in pregnancy. There are different types of hypertensive conditions in pregnancy and their management is dependent on the diagnosis. The different hypertensive disorders are defined below and the guideline includes management for all of these conditions.

Related guidelines:

- **Pre Eclampsia and Eclampsia Severe UHL Obstetric Guideline.pdf**

1.1 Definitions: Definitions and management guidelines are based on the NICE Hypertension in Pregnancy Guidelines (NICE, 2019).

Chronic hypertension: Hypertension present at booking visit or before 20 weeks, or that is being treated at time of referral to maternity services. Can be primary or secondary in aetiology.

Gestational hypertension: New hypertension presenting after 20 weeks without significant proteinuria.

Pre-eclampsia: New onset of hypertension after 20 weeks **with one or more** of the following new onset conditions:

- significant proteinuria (PCR ≥ 30mg/mmol or ACR ≥ 8mg/mmol)
- renal involvement (creatinine ≥90)
- liver involvement (ALT ≥40 IU/l)
- haematological abnormalities (thrombocytopenia)
- uteroplacental dysfunction (SGA EFW <10th centile, abnormal UMA Doppler, IUFD)

Severe pre-eclampsia: Pre-eclampsia with severe hypertension and/or with symptoms, and/or biochemical and/or haematological impairment.

Eclampsia: Convulsive condition associated with pre-eclampsia.

Gestational proteinuria: Significant proteinuria (see below) diagnosed after 20 weeks in the absence of hypertension.

1.2 Classification of Hypertension:
Hypertension: Diastolic blood pressure 90–109 mmHg, systolic blood pressure 140–159 mmHg.
Severe hypertension: Diastolic blood pressure ≥ 110 mmHg, systolic blood pressure ≥ 160 mmHg (average of 3 readings over 30 minutes)

What's new?

- In cases of gestational proteinuria without hypertension;
  If **PCR 30-50** offer birth at 40 Weeks.
  If **PCR > 50**, offer birth 38-39 weeks

2. Management of hypertension in pregnancy

2.1 Initial assessment of women and pregnant people with new onset hypertension

- This guidance refers to women and pregnant people seen on the Maternity assessment unit, antenatal clinic and antenatal/postnatal wards.
- Please see appendix 1 for a summary of the management of women and pregnant people with gestational hypertension.
- Women and pregnant people presenting with suspected hypertension should have a minimum of 3 blood pressure readings over at least a half hour period using an appropriate sized cuff. Where possible blood pressure should be measured with an electronic validated machine – these are much more accurate than manual readings if performed with the woman at rest and using an appropriately sized cuff.
- Women and pregnant people should have urinalysis performed and if ≥ 1+ on dipstick, a urine protein/creatinine ratio (PCR) should be requested (appendix 9).
- Following initial assessment by a doctor, a diagnosis of gestational hypertension or pre-eclampsia should be made and documented. Women and pregnant people should then be assessed according to appendix 1 or appendix 2. Offer fetal heart auscultation at every antenatal appointment.
- Women and pregnant people presenting > 20 weeks and ≤ 35 weeks should have PlGF test performed to aid the diagnosis/exclusion of pre-eclampsia (If there is uncertainty and they meet the criteria for testing and if PlGF is available).

2.2 Diagnosis of significant proteinuria:

- An MSU should always be performed in women and pregnant people with any degree of proteinuria to exclude urinary tract infection
- Significant proteinuria is defined as PCR ≥30mg/mmol in the NICE guidelines. However, a PCR ≥30 but ≤50 mg/mmol should be considered borderline in women and pregnant people with mild/moderate hypertension where the maternal/ fetal condition is otherwise reassuring and a repeat test within 48-72 hours should be considered.
- Where available, a Placental Growth Factor (PlGF) -based test should be considered to aid the diagnosis of pre-eclampsia in women and pregnant people with borderline proteinuria and hypertension
- Once a diagnosis of significant proteinuria has been made, it is NOT necessary to repeat PCR assessments. Deteriorating proteinuria does not predict worse maternal or fetal outcomes.
- 24 hour protein quantifications are not more reliable than PCR protein quantifications and should not be used

2.3 Management of women and pregnant people with Gestational hypertension

- Gestational hypertension can become pre-eclampsia at any stage and the progression to pre-eclampsia is unpredictable.
- Women and pregnant people with the following should be considered to be at higher risk of progression to pre-eclampsia:
    - nulliparity
    - age ≥40 years

- pregnancy interval of more than 10 years
- family history of pre-eclampsia
- multiple pregnancy
- BMI of 35 kg/m² or more
- gestational age <32 weeks at diagnosis
- previous history of pre-eclampsia or gestational hypertension
- pre-existing vascular disease
- pre-existing kidney disease

- Where available, PlGF-based testing should be considered <35 weeks to aid the diagnosis of pre-eclampsia and the frequency of subsequent monitoring – *see flow chart appendix 3*.
- Perform blood tests (FBC, U&E, LFTs) at presentation and repeat 1-2 weekly if normal (depending on risk factors)
- If the diagnosis is made before 37 weeks then an ultrasound for fetal growth, liquor volume (LV) and umbilical artery Doppler should be performed and repeated as clinically indicated (if normal every 2-4 weeks)

A) Treatment of women and pregnant people with non-severe gestational hypertension (BP 140/90–159/109mm Hg)

- Admission to hospital is not necessary if there are no features of pre-eclampsia and BP is well controlled.
- Hypertension should be treated if persistently ≥140/90 mmHg with a view to maintaining blood pressure around 135/85mmHg.
- First line treatments include labetalol and nifedipine MR
    - Labetalol should be prescribed tds (tds is required in pregnancy to achieve stable BP), starting at 100-200mg tds and titrating to a maximum of 2.4g/day (avoid in women with severe asthma or Type1/2 diabetes)
    - Nifedipine MR should be prescribed twice daily, starting at 10-20mg BD and titrating to a maximum of 40mg BD
- Women and pregnant people should be advised there is no proven benefit of one antihypertensive agent over another but that both medications are considered safe in pregnancy. Both medications have common, non-severe side effects.

Measure the woman's or pregnant person's BP weekly (2 weekly if well controlled and early onset) or consider BP home monitoring.

Women and pregnant people diagnosed with gestational hypertension should be managed according to appendix 1. Offer fetal heart auscultation at every antenatal appointment.

B) Treatment of women and pregnant people with severe Gestational hypertension (BP ≥ 160/110mm Hg)

See appendix 1 for summary of management.

- Admit to hospital until BP is well controlled (<150/100mmHg).
- Antihypertensive medication should be commenced as above
- Measure the BP every 15-30 minutes until <160/110mmHg and then at least every 4 hours until the target is achieved. It is not usually necessary to measure blood pressure between 22.00 and 06.00 if the blood pressure at 22.00 is satisfactory and there are no other concerns).

- Women and pregnant people receiving outpatient care after severe hypertension who have been effectively treated in hospital, ongoing surveillance should continue as for non-severe hypertension

C) Gestational hypertension: delivery planning

- A care plan should be documented by a consultant Obstetrician which includes:
    - timing and nature of future fetal monitoring;
    - maternal and/or fetal indications for birth;
    - if and when corticosteroids should be given

In women and pregnant people with well controlled gestational hypertension alone with no other signs of placental disease, maternal or fetal compromise (see below), early delivery is not usually indicated before 39-40 weeks (should be discussed with a senior obstetrician).

- Exact timing of delivery will depend on other maternal factors (previous obstetric history, maternal preference etc.).
- Examples of clinical features which should be discussed with a consultant Obstetrician and may indicate the need for delivery <39 weeks include:
    - Development of severe hypertension and/or rise in blood pressure requiring significant increases in antihypertensive doses or necessity for a second antihypertensive agent
    - Estimated Fetal Weight (EFW) below 10th centile and/or oligohydramnios
    - Significant change in blood tests
    - Development of significant maternal symptoms (frontal headache, blurred vision, new vomiting, epigastric pain)

D) Gestational hypertension: Intrapartum management

- Antenatal hypertensive treatment should be continued as prescribed.
- The BP should be monitored 4 hourly prior to the establishment of labour and hourly during established labour.
- Aim to keep the BP <150/100 mm Hg. Blood pressure above this level must be treated (e.g. labetalol, Nifedipine MR; beware not to exceed the maximum daily dose). In women and birthing people in established labour where gastric absorption may be compromised, intravenous antihypertensive therapy should be considered where there is sustained severe hypertension (i.e. the woman or birthing person has not responded to oral medication within one hour of treatment) – see *severe hypertension therapy guideline*.
- Do not give Syntometrine® (ergometrine) for third stage of labour.
- Haematological and biochemical testing does not need to be repeated if it has been previously normal (within the previous week) and there are no new signs of pre-eclampsia, even if regional analgesia is being considered.
- Do not routinely limit duration of second stage

E) Gestational hypertension: Postnatal management

- **Measure the woman's or birthing person's blood pressure:**
    - At least daily for the first two days after birth, then once between day 3 & 5
    - As clinically indicated if antihypertensive medication is required or changed
- **Aim to keep the blood pressure <150/100 mm Hg.**

- Aim to optimise antihypertensive regime to maximise compliance, i.e. as few tablets per day as possible and one agent if possible. Suitable options include nifedipine MR twice daily, amlodipine 5-10mg once daily, labetalol, enalapril BD (all safe in breastfeeding).
- **Consider reducing the medication if BP <130/80 mm Hg.**
- Reduce/Stop treatment if the BP <120/70 mm Hg.
- If a woman or birthing person has been on methyldopa antenataly to treat gestational hypertension stop postpartum because of its depressive effects and start Nifedipine MR.
- Assess suitability for BP home monitoring
- Contact one of the Specialist Hypertension Midwives as soon as possible following delivery and document this in the health care record if home monitoring required
- Ensure a postnatal discharge letter is completed by the medical staff (see appendix 5) stating the diagnosis, frequency of blood pressure monitoring in the community and the next medical review. Women or birthing people requiring medication in the postnatal period should be reviewed by their GP 2 weeks postpartum or sooner if BP is not well controlled (>150/100), unless on home monitoring
- Women or birthing people who have developed gestational hypertension should be advised that they are at increased risk of developing hypertension and cardiovascular disease in the future and given advice regarding diet, exercise and smoking cessation as appropriate. The postnatal hypertension information leaflet (appendix 7) should be provided.

3. Management of women and pregnant people with Pre-eclampsia

- If the woman or pregnant person has been diagnosed with severe pre-eclampsia as defined in section 1.1 please use Severe Pre-Eclampsia guideline.
- Women and pregnant people with a history of chronic hypertension are at significant risk of developing pre-eclampsia which can be difficult to diagnose. In women and pregnant people with chronic hypertension the development of gestational proteinuria, necessity for significant increases in antihypertensive medication, maternal symptoms or deterioration in biochemical or haematological parameters and/or concerns regarding fetal growth/wellbeing should be considered as potential signs of pre-eclampsia. PlGF-based testing < 35 weeks, if available, should be used to confirm the diagnosis in women with chronic hypertension (see flow chart in (appendix 3).

3.1 Assessment of women and pregnant people with pre-eclampsia

See summarising management appendix 2

- Carry out a full assessment including serial BP measurements.
- Treat blood pressure as for gestational hypertension
- Perform fetal monitoring if ≥ 26 weeks.
- Admit to hospital for initial monitoring (usually at least 48 hours). Complete an inpatient management form – appendix 4
- Perform blood tests 2 times per week
- If the diagnosis is uncertain and < 35 weeks use PlGF-based testing if available, to confirm the diagnosis
- If delivery is not planned within the next 72 hours, carry out an ultrasound for fetal growth, Liquor Volume and umbilical artery Doppler (if one has not been performed in the last 2 weeks)

- It is not necessary to repeat the PCR once proteinuria has been confirmed. Increasing levels of proteinuria are not indicative of worsening disease
- Counsel the woman or pregnant person about the diagnosis of pre-eclampsia, the potential for early delivery and the risk of severe complications developing in 1-3% of people (eclampsia, severe uncontrolled hypertension, stroke, abruption). Explain that these complications are not predictable.
- Once blood pressure control has been optimised during an inpatient stay, and following review by a Consultant Obstetrician, consider out patient monitoring with alternate day review.
- The need for readmission should be reconsidered at every visit (blood pressure control, symptoms, fetal concerns, abnormal or deteriorating blood tests)
- A care plan should be documented by a consultant Obstetrician which includes:
    - timing and nature of future fetal monitoring;
    - maternal and/or fetal indications for birth;
    - If and when corticosteroids should be given.

3.2 Pre-eclampsia: Delivery planning

- Examples of clinical features which should be discussed with a consultant Obstetrician and may indicate the need for early delivery include:
    - Development of severe hypertension and/or rise in blood pressure requiring significant increases in antihypertensive doses or necessity for a second antihypertensive agent
    - EFW below 10th centile and/or oligohydramnios or static growth
    - Significant downward trend in platelet count or count <100x10^{9}/L, creatinine ≥90 µmol/L, ALT ≥40U/L,
    - Development of significant maternal symptoms (frontal headache, blurred vision, new vomiting, epigastric pain)

Before 34 weeks: Manage conservatively (do not plan same-day delivery of baby)

Consultant obstetric staff to:

- document maternal (biochemical, haematological and clinical) and/ or fetal indications for elective birth before 34 weeks;
- write a plan for antenatal fetal monitoring and course of corticosteroids (if required), steroids should be given once a plan for delivery has been made such that, where possible, steroids are given within 24-48 hours of birth;
- Offer birth if: severe refractory hypertension, or if maternal or fetal clinical indication develops as defined in the plan

34+0 to 36+6 weeks:

- Discuss the findings of the PHOENIX trial (Chappell et al, Lancet 2019) with the woman or pregnant person; advise that:
    - The risk of severe maternal complications is increased with expectant management beyond 34 weeks (severe hypertension and severe pre-eclampsia, emergency caesarean section and likelihood of needing magnesium sulphate)
    - The likelihood of the baby being admitted to the neonatal unit is increased by around 25% with planned early delivery, mainly due to prematurity. The PHOENIX trial did not find any difference in short term respiratory or neurological complications with planned early birth

versus expectant management. More babies in the expectant group were growth restricted and more required treatment for hypoglycaemia
    - More women and birthing people achieved vaginal birth in the group allocated to planned early birth compared with expectant management
    - The median increase in gestation in women and pregnant people managed expectantly in the PHOENIX trial was 6 (3-9) days; 55% of women and pregnant people developed a complication requiring birth before 37 weeks.

Following this discussion, a plan for the timing of birth should be agreed and documented. If birth is planned <37 weeks, corticosteroids should be discussed and offered if considered appropriate.

After 37+0 weeks:

- Recommend birth within 24–48 hours in women with pre-eclampsia.

3.3 Pre-eclampsia: Intrapartum care

- Antenatal hypertensive treatment should be continued as prescribed.
- The blood pressure should be monitored 4 hourly prior to the establishment of labour and hourly during established labour.
- Aim to keep the BP <150/100 mm Hg. Women and pregnant people who develop severe hypertension >160 mmHg (systolic) and/or 110 mmHg (diastolic) (average of 3 readings over 30 minutes) should be managed according to the SEVERE PRE-ECLAMPSIA GUIDELINE.
- Check FBC, U&Es, LFTs at the onset of labour, do not repeat during labour if normal.
- Do not give Syntometrine® (ergometrine) for third stage of labour.
- Do not routinely limit duration of second stage.

3.4 Pre-eclampsia: Postnatal investigation, monitoring and treatment

- In women and birthing people with pre-eclampsia, measure blood pressure:
    - at least four times a day while the woman or birthing person is an inpatient
    - at least once between day 3 and 5 and if abnormal alternate days for up to 2 weeks after transfer to community care
- Women and birthing people should be asked about severe headache and epigastric pain each time blood pressure is measured
- Maintain the blood pressure <150/100 (ideally <140/90) mm Hg
- Aim to optimise antihypertensive regime to maximise compliance, i.e. as few tablets per day as possible and one agent if possible. First line options include nifedipine 10-20mg MR twice daily (maximum 40mg BD) OR amlodipine 5-10mg once daily (safe in breastfeeding).
- Labetalol can be continued but as needs to be taken tds is not ideal postpartum period
- Second line options include enalapril 5-10mg BD (maximum 20mg BD), needs renal function monitoring within 7-10 days, doxazosin 2-4mg twice daily (all considered safe for breast feeding)
- Consider reducing medication if BP <130/80 mm Hg
- Reduce/Stop treatment if BP <120/70 mm Hg
- If a woman or birthing person has been treated with methyldopa antenatally, stop postpartum and commence on nifedipine MR or amlodipine
- Do not repeat blood tests unless abnormal in the antenatal/intrapartum period
- Contact one of the Specialist Hypertension Midwives as soon as possible following delivery and document this in the health care record. They will assess suitability for BP home monitoring and arrange postnatal follow up.

- Ensure a postnatal discharge letter is completed by the medical staff (see *appendix 5*) stating the diagnosis, frequency of blood pressure monitoring in the community and the next medical review. Women or birthing people requiring medication in the postnatal period should be reviewed by their GP 2 weeks post-delivery or sooner if blood pressure is not well controlled (>150/100 mm Hg), unless on home monitoring scheme.
- Women or birthing people who have developed pre-eclampsia should be advised that they are at increased risk of developing hypertension and cardiovascular disease in the future and given advice regarding diet, exercise and smoking cessation as appropriate. They should also be given the postnatal hypertension information leaflet (*appendix 7*) and asked to have an annual BP check with their GP.
- Advise women and birthing people with hypertensive disorders of pregnancy that the overall risk of recurrence in future pregnancies is approximately 1 in 5 (higher if delivered <32 weeks) and that they are advised to take Aspirin in a future pregnancy to reduce this risk.

4. Gestational Proteinuria (without hypertension)

A small subset of women and pregnant people present with proteinuria in the absence of hypertension. In some cases this is physiological or attributable to a urinary tract infection, but it may also herald the development of pre-eclampsia. Studies have demonstrated that around 50% of women or pregnant people with isolated proteinuria develop pre-eclampsia and importantly, even in the absence of hypertension, these people are at significantly increased risk of adverse pregnancy outcomes such as fetal growth restriction and placental abruption. If hypertension develops in women with proteinuria they should be managed according to pre-eclampsia guidelines (appendix 2).

They should either go on the BP home monitoring scheme or have their BP checked once per week and have 4 weekly growth scans.

Even in the absence of hypertension, people with gestational proteinuria are at increased risk of adverse pregnancy outcome. If **PCR 30-50** offer birth at 40 Weeks. If **PCR >50**, offer birth 38-39 weeks.

5. Management of women and pregnant people with chronic hypertension

- Women and pregnant people diagnosed with hypertension prior to 20 weeks gestation or with a pre-pregnancy diagnosis of hypertension should be referred to the Hypertension clinic at LRI or Mat Med clinic at LGH.
- Women and pregnant people with chronic hypertension should be prescribed Aspirin 150mg once daily from at least 12 weeks gestation through to 36 weeks to reduce the risk of pre-eclampsia.
- An assessment of proteinuria and renal function should be obtained at booking or at diagnosis (whichever is earlier).
- Women and pregnant people with significant proteinuria (PCR>30mg/mmol) before 20 weeks should be investigated for underlying renal disease and if a diagnosis of renal disease is established must be referred to the renal clinic at LGH. (Refer via specialist hypertension midwives)
- All women and pregnant people with chronic hypertension should be evaluated by the clinical team as to the need for an echocardiogram (e.g. long standing hypertension, other cardiovascular comorbidities)
- Women and pregnant people with a diagnosis of chronic hypertension should be informed of the increased risk of fetal growth restriction and superimposed pre-eclampsia requiring preterm delivery.

- Blood pressure should be monitored every 2-4 weeks during pregnancy. Where possible home blood pressure monitoring should be facilitated and supported.
- In women and pregnant people with chronic hypertension uterine artery Doppler should be performed at 20-21 weeks. Women and pregnant people with abnormal uterine artery Dopplers should have 3-4 weekly growth scans from 26 weeks (or earlier if indicated), women and pregnant people with normal uterine artery Doppler should be offered 4 weekly growth scans from 32 weeks.
- Currently not all sonographers are trained to perform uterine artery Dopplers, therefore the above option is not available. In the meantime all women and pregnant people with chronic hypertension should have 4 weekly growth scans from 28 weeks (in some cases from 24 weeks)
- Women and pregnant people with chronic hypertension who develop clinical signs which could indicate developing pre-eclampsia (significant increase in blood pressure, development of new proteinuria, abnormal haematological or biochemical indices and/or concerns regarding fetal growth/wellbeing) should be offered PlGF- based testing <35 weeks (if the diagnosis is uncertain and PlGF testing is available) and managed in line with suspected/ confirmed pre-eclampsia guideline in recommendation four.

5.1 Treatment of women and pregnant people with chronic hypertension

- Women and pregnant people with uncomplicated hypertension (no renal or other end organ disease) should maintain their blood pressure <140/90mmHg with a target blood pressure of 135/85mmHg.
- Women and pregnant people with renal disease (proteinuric or transplant patients) should maintain their BP <130/80mmHg
    - A full discussion regarding the risks and benefits of antihypertensive treatment should occur and should be documented.

      (see appendix 6 for patient information on antihypertensives)

    - **First line antihypertensive:**
        - Labetalol 200mg tds/qds increasing to a maximum of 600mg qds (contraindication severe asthma or Diabetes Type1/2)
        - Nifedipine MR 10mg twice daily increasing to a maximum 40mg twice daily
        - Methyldopa 250- 1000mg TDS

      Where possible increase the primary agent before adding a second therapy to improve compliance

    - **Second line antihypertensive:**

      Women and pregnant people requiring second line antihypertensives require specialist consultant input. The drugs listed below are options provided for reference but should only be commenced following discussion with a specialist consultant obstetrician:

        - Doxazosin (2-4mg twice daily)
        - Hydralazine (should only be prescribed if all other options have been explored)

    - Blood pressure should be checked within a week of a change in antihypertensive medication (ideally use home monitoring)
    - Antihypertensive medication should be reduced/discontinued if the blood pressure is consistently < 75mmHg (diastolic)

5.2 Delivery planning for women and pregnant people with chronic hypertension

- Decision for delivery should be made by a consultant obstetrician
- For women and pregnant people requiring antihypertensive medication with stable blood pressure, delivery should be offered around 39-40 weeks following discussion with the woman and a full assessment of maternal and fetal factors
- Where possible a plan for postnatal antihypertensive medications should be made and documented prior to delivery

5.3 Postnatal management

- Measure blood pressure:
    - At least daily for the first two days after birth
    - At least once between day 3 and 5 after birth
    - As per pre-eclampsia guidance if antihypertensive medication is required
- Aim to maintain BP <140/90mmHg in the postnatal period. If BP is above target discuss ongoing antihypertensive regime with a consultant Obstetrician as soon as possible to avoid delaying postnatal discharge.
- Aim to optimise antihypertensive regime to maximise compliance, i.e. as few tablets per day as possible and one agent if possible.
- Consider restarting pre-pregnancy medication, the following medications should be considered in the postnatal period dependent upon whether the woman would like to breast feed
    - Nifedipine MR or Amlodipine 5 or 10mg is considered safe during breastfeeding.
    - Enalapril is considered to be one of the safest ACE inhibitors in breast feeding, babies should be monitored for signs of hypotension (BP if in hospital, at home drowsiness, lethargy, pallor, poor feeding, cold peripheries)
    - Doxazosin has little evidence published on breast feeding some reference suggest that up to 4mg may be safe due to low levels excreted in breast milk. Baby should be monitored for hypotension.
    - Atenolol 25 or 50mg once daily can be used as an alternative to labetalol if compliance is a problem. High amounts secreted into breast milk, therefore avoid in women who are breast feeding
- Do not repeat blood tests unless abnormal in the antenatal/intrapartum period.
- Contact one of the Specialist Hypertension Midwives as soon as possible following delivery and document this in the health care record. They will arrange postnatal BP monitoring and follow up (if required).
- Ensure a postnatal discharge letter is completed by the medical staff (see *appendix 5*) stating the diagnosis, frequency of blood pressure monitoring in the community and the next medical review. Women with a diagnosis of chronic hypertension should have appropriate ongoing surveillance in primary or secondary care.

If there are difficulties managing postnatal hypertension these should be escalated to the consultant on call. If further specialist advice is required, please contact a member of the hypertension team (see below) through the hospital switch board.

Hypertension Consultant Team;
Dr Cornelia Wiesender

6. Education and Training

None

7. Monitoring Compliance

None

8. Supporting References

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9. Key Words

Hypertension, PlGF, Blood Pressure, Postnatal BP

The Trust recognises the diversity of the local community it serves. Our aim therefore is to provide a safe environment free from discrimination and treat all individuals fairly with dignity and appropriately according to their needs.
As part of its development, this policy and its impact on equality have been reviewed and no detriment was identified.

EDI Statement

We are fully committed to being an inclusive employer and oppose all forms of unlawful or unfair discrimination, bullying, harassment and victimisation.

It is our legal and moral duty to provide equity in employment and service delivery to all and to prevent and act upon any forms of discrimination to all people of protected characteristic: Age, Disability (physical, mental and long-term health conditions), Sex, Gender reassignment, Marriage and Civil Partnership, Sexual orientation, Pregnancy and Maternity, Race (including nationality, ethnicity and colour), Religion or Belief, and beyond.

We are also committed to the principles in respect of social deprivation and health inequalities.

Our aim is to create an environment where all staff are able to contribute, develop and progress based on their ability, competence and performance. We recognise that some staff may require specific initiatives and/or assistance to progress and develop within the organisation.

We are also committed to delivering services that ensure our patients are cared for, comfortable and as far as possible meet their individual needs.

Contact and review details			
Author / Lead Officer: Cornelia Wiesender - **Job Title:** Consultant Obstetrician and Gynaecologist		**Executive lead:** Chief Medical Officer	
REVIEW RECORD			
Date	**Issue Number**	**Reviewed By**	**Description Of Changes (If Any)**
May 2021	V1.2	A.Goodlife & M Finney	Nifedipine dosage updated on page 20 from 60mg to 80mg.
December 2022	V2	Cornelia Wiesender	Added to offer fetal heart auscultation at every antenatal appointment Amended to offer PlGF where available
August 2023	V3	L Taylor	Clarified BP parameters for prompting referral Amended daily maximum dose of nifedipine (pg 17)
December 2024	V4	Cornelia Wiesender	Section 4 – gestational proteinuria without hypertension added; If **PCR 30-50** offer birth at 40 Weeks. If **PCR > 50**, offer birth 38-39 weeks.

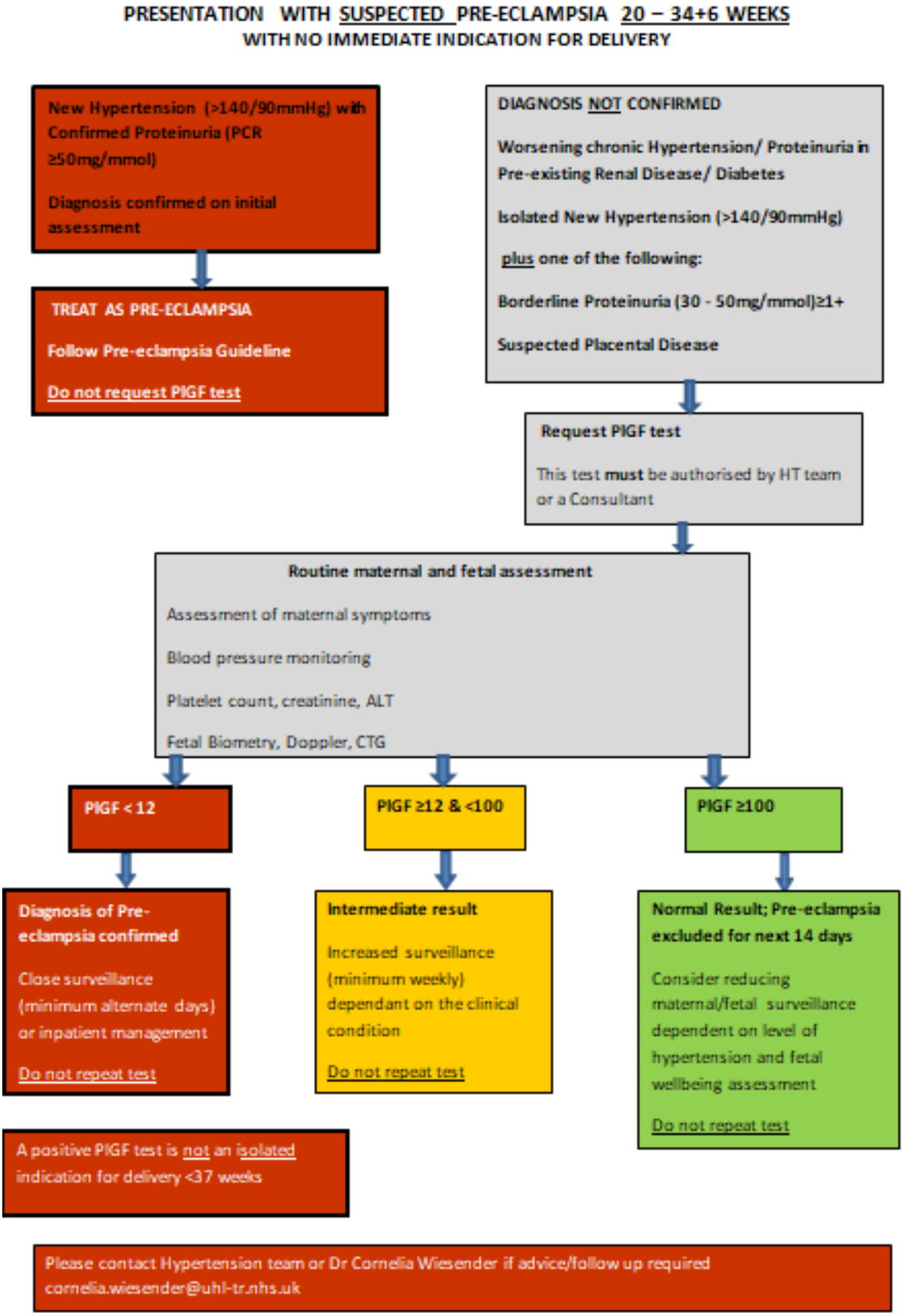
Appendix1: Antenatal management plan for women with hypertension in pregnancy

	Degree of hypertension	
	Hypertension: blood pressure of ≥140/90 –159/109 mmHg	**Severe hypertension:** blood pressure of 160/110 mmHg or more
Admission to hospital	Do not routinely admit to hospital	Admit, but if BP falls below 160/ 110 mmHg then manage as for hypertension
Antihypertensive treatment	Offer pharmacological treatment if BP remains above 140/90 mmHg	Offer pharmacological treatment to all women
Target blood pressure once on treatment	Aim for BP of ≤ 135/85 mmHg	Aim for BP of ≤ 135/85 mmHg
Blood pressure measurement	Once or twice a week (depending on BP) until BP is 135/85 mmHg or less	Every 15–30 minutes until BP is less than 160/110 mmHg
Dipstick proteinuria testing	Repeat one to two weekly (with BP measurement) if proteinuria **not** diagnosed[§]	Daily while admitted
Blood tests	Measure full blood count, liver function and renal function at presentation and then 1-2 weekly	Measure full blood count, liver function and renal function at presentation and then weekly
PLGF-based testing (where available)	Consider PLGF-based testing if **< 35 weeks (see flow chart)**	Consider PLGF- based testing if **< 35 weeks (see flow chart)**
Fetal assessment	Offer fetal heart auscultation at every antenatal appointment Carry out ultrasound assessment of the fetus at diagnosis (unless woman had a growth scan within 2 weeks) and, if normal, repeat every 3-4 weeks, depending on clinical picture Carry out a CTG only if clinically indicated	Offer fetal heart auscultation at every antenatal appointment Carry out ultrasound assessment of the fetus at diagnosis (unless woman had a growth scan within 2 weeks) and, if normal, repeat every 2-4 weeks. Carry out a CTG at diagnosis and then only if clinically indicated
Document diagnosis	**<u>Confirm the diagnosis of gestational hypertension at every visit</u>** **If a diagnosis of pre-eclampsia is made – manage as per Appendix 2.** **Pre-eclampsia definition:** • Gestational hypertension in addition to at least one of the following: • New proteinuria • Haematological or biochemical abnormalities (rising creatinine, abnormal ALT, thrombocytopenia) • Growth restriction (SGA<10th centile, static growth (<140g weight gain over two weeks), oligohydramnios, abnormal umbilical artery Doppler) • PLGF <12 (where available)	

Appendix 2: Management of Pre-eclampsia

	Degree of hypertension	
	Hypertension: Blood pressure of ≥140/90 - 159/109 mmHg	**Severe hypertension:** Blood pressure of 160/ 110 mmHg or more (average of 3 readings over 30 minutes)
Admission to hospital	Admit for initial assessment once the diagnosis is confirmed. If any clinical concerns for the wellbeing of the woman or baby continue inpatient surveillance¶. **The decision to manage a woman with pre-eclampsia as an outpatient should only be made after a period of IP surveillance and after review by a Consultant Obstetrician**	Admit, but if BP falls below 160/ 110 mmHg then manage as for hypertension
Antihypertensive pharmacological treatment	Offer pharmacological treatment if BP remains above 140/90 mmHg	Offer pharmacological treatment to all women
Target blood pressure once on treatment	Aim for BP of ≤ 140/90 mmHg	Aim for BP of ≤ 140/90mmHg
Blood pressure measurement	At least every 48 hours, and more frequently if admitted (Assess suitability for BP home monitoring)	Every 15-30 minutes until BP is <160/110 mmHg, at least 4 hourly whilst IP
Dipstick proteinuria	Do not repeat, once proteinuria confirmed	Do not repeat, once proteinuria confirmed
Blood tests	Measure FBC, U&Es, LFTs twice per week	Measure FBC, U&Es, LFTs 2-3 times per week
Fetal assessment	Offer fetal heart auscultation at every antenatal appointment Carry out ultrasound assessment of the fetus at diagnosis and, if normal, repeat every 2 weeks, if clinically indicated Carry out a CTG if clinically indicated	Offer fetal heart auscultation at every antenatal appointment Carry out ultrasound assessment of the fetus at diagnosis and, if normal, repeat every 1-2 weeks, if clinically indicated Carry out a CTG if clinically indicated, once daily if IP

Appendix 3 – Flowchart for PlGF-based testing



Appendix 4: INPATIENT CAREPLAN FOR WOMEN WITH HYPERTENSION/ PRE-ECLAMPSIA

Patient sticker Date:

Diagnosis: Chronic hypertension / Pre-eclampsia / Gestational HT

(circle CHT & PE if superimposed pre-eclampsia)

Blood pressure targets (to be completed by admitting team):

/ mmHg

General principles for BP monitoring:

- Aim to measure BP 4 hourly
- Measure BP with an electronic machine (dynamap or microlife) validated for use in pregnancy
- Use an appropriately sized cuff
- Ensure the woman is seated, resting (not talking) and has her arm supported during the measurement
- Do not recheck BP manually unless specifically instructed to do so
- If the first BP is above target then recheck after a couple of minutes ensuring the woman is correctly positioned and at rest
- It is not usually necessary to wake women in the night to measure BP – if the BP is in target at 22.00 then it can be repeated at 06.00 unless there is another indication to do sooner (e.g. symptoms develop overnight)

Blood tests usually 2-3x/week | Frequency | **PlGF** | Result: Date:

Proteinuria mg/mmol **Chronic (< 20 weeks)/ NEW in pregnancy**

- 30 mg/mmol on two occasions or >50mg/mmol (with a negative MSU) is diagnostic of proteinuria
- Once proteinuria has been confirmed it is NOT necessary to repeat the PCR
- In some women with kidney disease PCR is used to monitor disease activity, this will be specified by the specialist team

VTE risk assessment **Continue AN LMWH / Commence LMWH whilst IP**

- Pre-eclampsia and proteinuria are risk factors for VTE and will usually require pharmacological prophylaxis

Plan for Steroids

Fetal assessment:

USS: Date:
Result:

Frequency of scans: Frequency of CTG:

Title: Hypertension In Pregnancy
V.4 Trust Ref No: C37/2020
Approved by: UHL Women's Quality & Safety Board: January 2025 Next review: January 2030
NB: Paper copies of this document may not be most recent version. The definitive version is held on UHL Connect in the Policies and Guidelines Library

Current antihypertensive treatment

(please ensure prescribed on admission alongside other regular medication)

Drug	dose	frequency	Suggested change to dose/frequency if BP> target
Suggestions for new drugs if BP >target			

> target is defined as BP> target on two occasions at least 4 hours apart. It is important to wait for dose changes to be effective before adding new drugs.

Episode of severe, systolic hypertension (>160mmHg):

- Repeat BP in 15 minutes
- Discuss ongoing care with the medical team if still >160
- Medical staff should risk assess in the context of the current diagnosis and background level of hypertension – women with new hypertension are at significantly higher risk of cerebral haemorrhage than those with chronic hypertension
- Assess for other symptoms/signs of severe pre-eclampsia (headache, visual disturbance, epigastric pain, clonus)

In women with sustained, severe hypertension (>160mmHg on three occasions over 30 minutes) or with symptoms suggestive of severe pre-eclampsia, ongoing care should be discussed with the on-call consultant and transfer to D/S considered

Antihypertensive therapy general information:

- First line medications for hypertension are labetalol and nifedipine
- **Labetalol**:
  - short acting (works within 30-60 minutes lasts for a max of 6 hours)
  - Needs to be given at least tds- usual starting dose 100-200mg tds
  - Can be titrated in 100-200mg dose increments to a maximum daily dose of 2400mg/day
  - Common side effects are dizziness and tiredness
  - Only effective in around 50% of women of Afro Caribbean ethnicity
- **Nifedipine**:
  - Always use the modified release (MR) preparation which is given bd
  - Effect within 4-8 hours
  - Usual starting dose 10-20mg bd increased to a maximum of 80mg in 24 hours (unusual to see further benefit > 40mg bd)
  - Warn women that a headache is a very common side effect which usually resolves within 48 hours. Ankle oedema is also common
- **Methyldopa**
  - Useful as 3rd line, short acting and effective for 6 hours only, 250-750mg tds/qds
  - Commonly causes tiredness and depression and should only be used for short duration
  - Not effective as an acute treatment for severe hypertension
- **Doxazosin**Can cause precipitate hypotension
  - Consider in women with resistant hypertension if escalated doses of labetalol and nifedipine have not been effective
  - Commence at 2-4mg once daily or 2-4mg BD up to a maximum of 8mg/day
- **Hydralazine**

- Can be used 3rd/4th line, but should only be prescribed by a consultant
- Oral doses 25-50mg bd-qds, short acting
- Can cause precipitate hypotension, should not usually be prescribed alongside doxazosin

Appendix 5: Important postnatal discharge information for women with hypertension in pregnancy

_____/_____/ 20__

Dear Community Midwife / General Practitioner

Re:…….....Hospital No……..

DOB……../……/…….. NHS no……

This patient is currently …….days postnatal and has been discharged from ward ……. on ___/___/___

Diagnosis: **gestational hypertension / gestational proteinuria / pre-eclampsia / chronic hypertension**

In view of her hypertension in pregnancy she requires close postnatal monitoring.

Discharged on Medication YES / NO **DO NOT USE METHYLDOPA POSTNATALLY**

DRUG	Dose	Frequency
_____	_____	_____
_____	_____	_____
_____	_____	_____

If not home monitoring, please monitor Blood Pressure alternate days until day 5 from the date of discharge and on day 10. If the BP is not within normal limits continue to monitor on alternate days for 2 weeks.

Aim for a Blood Pressure of < 150 / 100 and ask the GP to follow management plan below:

IF BP <120/ 70 STOP REGIME.	IF BP <130/ 80 REDUCE REGIME	IF BP > 150/100 REFER TO GP FOR REGIME MANAGEMENT or d/w hypertension team	IF BP >160/110 OR SYPMTOMATIC REFER TO HOSPITAL FOR SAME DAY REVIEW.

Please arrange GP review if still on medication 2 weeks after discharge from hospital.

Hospital Follow up YES / NO _____/_____/_____ (6 weeks postnatal)
(All women with early onset pre-eclampsia <34wks or who required HDU care should have a 6 week follow up with the hypertension team). Please inform Specialist midwife with details to arrange

For women not attending hospital FU:

- Please check the woman's urine at the 6 week postnatal check to ensure that any proteinuria has resolved, if proteinuria is still present please check urine PCR and refer to a renal physician as appropriate

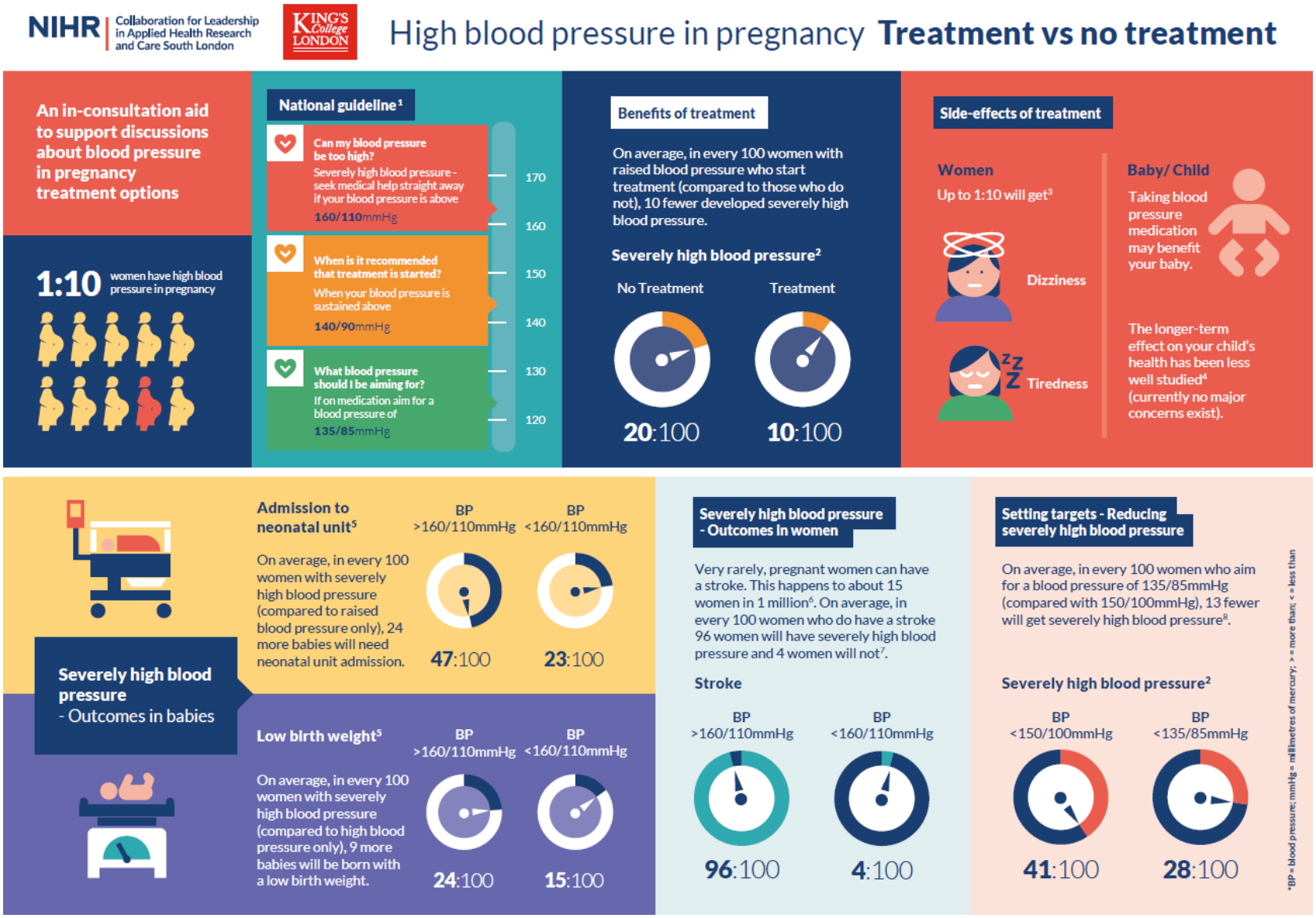
Women with hypertensive disease in pregnancy are at increased risk of recurrence in future pregnancies and hypertension in later life and therefore justify long term surveillance with an annual blood pressure check (minimum). Women should be advised regarding a healthy diet and lifestyle (provide information leaflet).

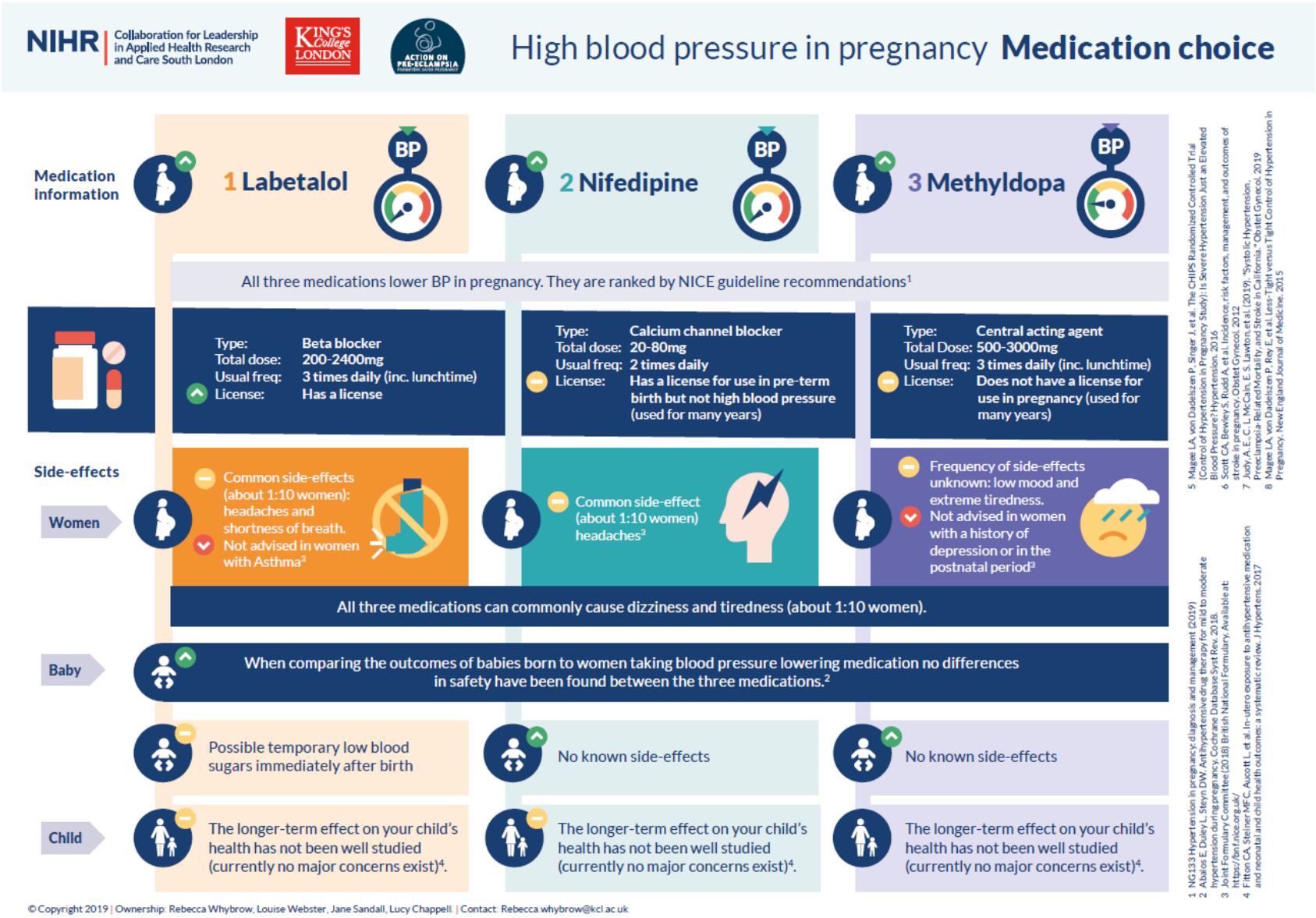
Name……...Signature……Date…../……/…….

Please contact Specialist Hypertension Midwives for further information/queries (07833611697 or 07966558325)

Appendix 6: Information poster

More information at https://action-on-pre-eclampsia.org.uk/public-area/high-blood-pressure-in-pregnancy/#resources




NIHR | Collaboration for Leadership in Applied Health Research and Care South London
KING'S College LONDON
ACTION ON PRE-ECLAMPSIA
High blood pressure in pregnancy Medication choice
Medication information
1 Labetalol
2 Nifedipine
3 Methyldopa
BP
All three medications lower BP in pregnancy. They are ranked by NICE guideline recommendations[1]
Type: Beta blocker
Total dose: 200-2400mg
Usual freq: 3 times daily (inc. lunchtime)
License: Has a license
Type: Calcium channel blocker
Total dose: 20-80mg
Usual freq: 2 times daily
License: Has a license for use in pre-term birth but not high blood pressure (used for many years)
Type: Central acting agent
Total Dose: 500-3000mg
Usual freq: 3 times daily (inc. lunchtime)
License: Does not have a license for use in pregnancy (used for many years)
Side-effects
Women
Common side-effects (about 1:10 women): headaches and shortness of breath. Not advised in women with Asthma[3]
Common side-effect (about 1:10 women) headaches[3]
Frequency of side-effects unknown: low mood and extreme tiredness. Not advised in women with a history of depression or in the postnatal period[3]
All three medications can commonly cause dizziness and tiredness (about 1:10 women).
Baby
When comparing the outcomes of babies born to women taking blood pressure lowering medication no differences in safety have been found between the three medications.[2]
Possible temporary low blood sugars immediately after birth
No known side-effects
No known side-effects
Child
The longer-term effect on your child's health has not been well studied (currently no major concerns exist)[4].
The longer-term effect on your child's health has not been well studied (currently no major concerns exist)[4].
The longer-term effect on your child's health has not been well studied (currently no major concerns exist)[4].
1 NG133 Hypertension in pregnancy: diagnosis and management (2019)
2 Abalos E, Duley L, Steyn DW. Antihypertensive drug therapy for mild to moderate hypertension during pregnancy. Cochrane Database Syst Rev. 2018.
3 Joint Formulary Committee (2018) British National Formulary. Available at: https://bnf.nice.org.uk/
4 Fitton CA, Steiner MFC, Aucott L, et al. In-utero exposure to antihypertensive medication and neonatal and child health outcomes: a systematic review. J Hypertens. 2017
5 Magee LA, von Dadelszen P, Singer J, et al. The CHIPS Randomized Controlled Trial (Control of Hypertension in Pregnancy Study): Is Severe Hypertension Just an Elevated Blood Pressure? Hypertension. 2016
6 Scott CA, Bewley S, Rudd A, et al. Incidence, risk factors, management, and outcomes of stroke in pregnancy. Obstet Gynecol. 2012
7 Judy, A. E., C. L. McCain, E. S. Lawton, et al. (2019), "Systolic Hypertension, Preeclampsia-Related Mortality, and Stroke in California," Obstet Gynecol. 2019
8 Magee, LA, von Dadelszen P, Rey E, et al. Less-Tight versus Tight Control of Hypertension in Pregnancy. New England Journal of Medicine. 2015
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HIGH BLOOD PRESSURE

Staying Healthy After Pregnancy

Check –Ups and Future Pregnancies

Your doctor and midwife will explain how your blood pressure will be monitored in the weeks following your pregnancy.

After this time, you should see your GP at least once a year for a blood pressure check. This is especially important as high blood pressure doesn't usually cause noticeable symptoms, so the only way to know if it's high is to get it checked. If it is high, your GP may offer you some medication to help lower it.

If you are planning a pregnancy and are taking blood pressure medication, you should ask your GP to refer you for pre-conception counselling, as some medications are not good to take in pregnancy and are best changed before you get pregnant.

In any future pregnancies, you should meet your midwife early on, because of the increased risk of pre-eclampsia. You should be given aspirin from 12 weeks pregnancy to reduce the risk of pre-eclampsia.

Quit Smoking

Smoking is a major cause of heart disease and can double your risk of a heart attack.

Stopping smoking has big benefits for your health, and it's never too late to quit. Check on the NHS website or speak to your GP to find out what support is available.

Healthy Diet

Obesity is a major risk factor for heart disease, high blood pressure and diabetes.

If you are overweight, speak to your GP to find out what support is available to help you loose weight or head onto the NHS website.

Further Information

Action on Pre-eclampsia – Support and Advice
https://action-on-pre-eclampsia.org.uk/

NHS Eat Well
https://www.nhs.uk/live-well/eat-well/

British Heart Foundation- Staying Active Guide
https://www.bhf.org.uk/informationsupport/support/healthy-living/staying-active

NHS Quit Smoking Services
https://www.nhs.uk/live-well/quit-smoking/nhs-stop-smoking-services-help-you-quit/

Appendix 8: POSTNATAL MANAGEMENT OF HYPERTENSIVE PATIENTS

KEY to Reducing Antihypertensive Medication

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Calcium channel blockers

Nifedipine MR (lasts 12hrs)

(Dose 20mg bd → maximum of 40mg bd)
Nifedipine MR 20mgs BD →↓ 10mgs BD
Or → Discontinue
Nifedipine MR 30mgs BD → 20mgs BD → As Above
Nifedipine MR 40mgs BD → 20mgs BD → As Above
(please note that these preparations have a **duration of action of 12hours**- therefore ***should not*** be prescribed once daily or three times a day)

Nifedipine Long acting (lasts 24hours) Currently not available
(Dose 30mg od→ maximum of 90mg od)
Adalat LA 30mgs → Discontinue
Adalat LA 60mgs → ↓ 30mgs → As Above
(please note, the trust does not stock Adalat LA 20 mg)

Amlodipine
Amlodipine 5mg OD – Discontinue
Amlodipine 10mg OD – 5mg OD As Above

Beta blockers
Labetalol
(Dose 100mg tds maximum 2.4g in 3-4 divided doses)
Contraindication: Asthma, type 1&2 Diabetes
Labetalol 100mgs TDS → Discontinue
Labetalol 200mgs TDS →↓ BD → Discontinue
Labetalol 300mgs TDS →↓ 200mgTDS → As Above
Labetalol 400mgs BD → ↓ 200mgs BD → As Above
Labetalol 400mgs TDS → ↓ 400mgs BD
Check x3 pre feed BM's (small risk of neonatal hypoglyaemia)

Atenolol - Avoid if breast feeding
(Usually started at 25mg od, increasing to 50mg od for the best antihypertensive effect)
Atenolol 50mgs OD → Discontinue
Atenolol 100mgs OD → Reduce to 50mgs OD → As Above

ACE inhibitors- DO NOT USE ANTENATALLY
Enalapril 5mgs BD → Discontinue
Enalapril 10mgs BD → ↓ 5mgs BD → As Above
Enalapril 20mgs BD → ↓ 10mg BD → As Above
Check U+E 1 week after commencing medication.
~~~~~~

Appendix 9: Protein threshold in community

If symptomatic or raised BP send in for review to MAU on the same day

- 1+ Protein
- No previous proteinuria
- Normal Blood pressure
- Asymptomatic of PET

- ≥2+ Protein
- Normal Blood pressure
- Asymptomatic of PET

Send PCR&MSU. Inform woman and document that she is aware of the signs & symptoms of pre-eclampsia.

See in 1 week and chase PCR/MSU result.

< 30mg/mmol
Continue routine care

Ring hospital to arrange review in 2 days
Mon – Fri PAS/AAA
Weekend MAU
If 48 hr review falls at the weekend, refer to MAU
(If PCR normal no need to attend)

PCR NOT BACK - MUST attend for review bloods/AN check and repeat bloods

If UTI treat, then repeat PCR & MSU

RESULTS
PCR 30-50mg/mmol
Repeat and do bloods U&E's, LFT's, FBC

→ 2nd PCR normal back to routine care
→ 2nd PCR raised see in clinic 1 week

RESULTS
PCR 50 – 100 mg/mmol
Repeat and do bloods U&E's, LFT's, FBC

→ See in clinic within 1 week
Ensure bloods are taken

RESULTS
PCR >100 mg/mmol

→ Review in MAU /clinic within 24hr

If **PCR 30-50** offer birth at 40 Weeks. If **PCR >50**, offer birth 38-39 weeks.
If term, discuss with Consultant to consider delivery

For clinic referral - hypertension LRI, Mat med LGH unless already under care of diabetes team, where they can continue their care.

Appendix 10. Community monitoring of blood pressure and proteinuria

Description	Definition	Action by midwife / GP
Consider transfer into hospital by ambulance if significantly raised BP or symptomatic. This should be based on an individual assessment. If there is uncertainty discuss with a Community Team Lead or the referring hospital.		
New hypertension **without proteinuria** after 20 weeks	BP ≥ 140 Systolic and or ≥90 mmHg diastolic and < 150/100 mmHg On 2 readings at least 10 minutes apart	Refer for hospital assessment within 48 hours, or recheck at home within 48 hours and refer in to hospital if still raised
	Diastolic BP ≥ 90 and < 100mmHg with significant symptoms*	Arrange for **same day** hospital assessment
	Systolic BP ≥ 150 mmHg	Arrange for **same day** hospital assessment
	Diastolic BP ≥ 100 mmHg	Arrange for **same day** hospital assessment

Description	Definition	Action by midwife / GP
New hypertension **and proteinuria** after 20 weeks	BP ≥140 Systolic and or ≥90 mmHg diastolic and new proteinuria ≥ 1+ on dipstick	Refer for **same day** hospital assessment
	BP ≥ 160/110 mmHg and new proteinuria ≥ 1+ on dipstick	**Arrange immediate admission**
	Diastolic BP ≥ 90 mmHg and new proteinuria ≥ 1+ on dipstick and significant symptoms*	**Arrange immediate admission**
New proteinuria **without hypertension** after 20 weeks	1+ on dipstick	Send urine PCR & MSU to lab, repeat pre – eclampsia assessment in the community in 1 week and chase PCR/MSU result. If PCR ≥30, but asymptomatic and normotensive, refer to HT clinic LRI or Mat Med LGH

	2+ or more on dipstick	Send urine PCR & MSU to lab and refer for hospital assessment within 48 hours
	≥1+ on dipstick with significant symptoms*	Refer for same day hospital assessment
Maternal symptoms or fetal signs and symptoms without new hypertension or proteinuria	Headache and or visual disturbances with diastolic blood pressure <90 mmHg and a trace or no protein	Depending on severity / nature of symptoms consider referral for same day hospital assessment OR reduce interval before next antenatal assessment in community.
	Epigastric pain with diastolic blood pressure <90 mmHg and a trace or no protein	Depending on severity / nature of symptoms consider referral for same day hospital assessment OR reduce interval before next antenatal assessment in community.
	Reduced fetal movements or small for gestation age infant with diastolic blood pressure < 90 mmHg and a trace or no protein	Refer to UHL Reduced Fetal Movements guideline Consider reducing interval before next full pre – eclampsia assessment