NORTH WEST GUIDELINE

Gestational hypertension, non-severe pre-eclampsia and chronic hypertension management in pregnant and recently pregnant women

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Contents

1 Summary / Introduction

These guidelines outline the management of women with (non-severe) hypertension in pregnancy. Women with hypertension will present throughout 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. Definitions and management guidelines are based on the NICE Hypertension in Pregnancy Guidelines (NICE, 2019).

2 Purpose

Management of women with hypertension and/or proteinuria during/after pregnancy.

3 Scope

This guideline describes the management of women presenting to maternity services with existing or newly diagnosed hypertension and/or proteinuria during pregnancy or after birth.

4 Responsibilities

The target audience for the guideline is all midwives and obstetricians providing care to women during and after pregnancy.

5 Detail of the Guideline

5.1 Definitions

- **Hypertension:**
  - Defined as a blood pressure of ≥140 or ≥90 mmHg on two measurements in the same visit/admission (even if subsequent/other measurements fall below the threshold)
- **Chronic hypertension**: Hypertension present before 20 weeks, or treated before pregnancy. It can be primary or secondary in aetiology.
- **Gestational hypertension (pregnancy-induced hypertension)**: New hypertension presenting after 20 weeks without significant proteinuria or other features suggestive of pre-eclampsia
- **Pre-eclampsia [1]**: Hypertension (new or existing) after 20 weeks with at least one feature of multisystem and/or placental disease. Features include:
  - Abnormal angiogenic biomarkers: sFlt:PlGF ratio (≥85) or abnormal PlGF (<12pg/ml) – measured <37 weeks
  - proteinuria: ≥30mg/mmol on 2 occasions or ≥50mg/mmol
  - placental dysfunction: small for gestational age, static fetal growth, oligohydramnios, abnormal fetal Dopplers
  - End organ (liver, renal, haematological) dysfunction (in the absence of any other known cause): elevated/increasing ALT, thrombocytopenia (<150,000), abnormal creatinine (≥77mmol/L or >10% from baseline if CKD)
- Before 37 weeks, pre-eclampsia is also diagnosed with an intermediate sFlt:PlGF ratio ≥38-84 or PlGF<100pg/ml if there are any other feature(s) of multisystem disease (as above) in addition to hypertension
- **Severe pre-eclampsia**: Pre-eclampsia with severe hypertension (≥160 or ≥110mmHg on two or more readings ≥15 minutes apart) or with symptoms, and/or biochemical and/or haematological impairment indicating evolving end organ disease
- **Eclampsia**: Convulsive condition associated with pre-eclampsia
- **Gestational proteinuria**: proteinuria diagnosed after 20 weeks in the absence of hypertension. Once a diagnosis of proteinuria has been made, repeat PCR assessments are not usually necessary unless chronic kidney disease is suspected. 24-hour protein quantifications are not more reliable than PCR protein quantifications and should not be used.

- **Labile blood pressure in a clinical environment** (Whitecoat hypertension): hypertension as above, which is present in a clinical environment, but within normal limits outside of hospital
- **Superimposed pre-eclampsia:** diagnosis of pre-eclampsia in a woman with preexisting hypertension; managed as pre-eclampsia

5.2 Early pregnancy management for women at risk or with a diagnosis of hypertension

- All women must have their blood pressure measured using a validated digital blood pressure device at every antenatal contact. Buy Approved Blood Pressure Monitors I bhf.org.uk
- If the first reading is raised (≥135 or ≥85 mmHg) always recheck at least once, preferably twice. If the second and third reading are <130/80mmHg then BP can be considered normal. If BP persistently ≥135/85mmHg at booking, refer to a consultant led clinic.
- In women with BP ≥140/90 <20 weeks, antihypertensive medication should be initiated or increased as soon as feasible (usually within 1-2 days). Prescriptions should be arranged remotely or via the GP. Women with BP ≥150/100mm Hg should be reviewed in a consultant clinic as soon as feasible within 1 week. Women should not be referred to an Emergency Department and do not need to be referred to Emergency Gynaecology Units or Maternity Triage for the management of hypertension unless they are unwell.
- Target blood pressure for women on antihypertensive medication is <135/85mmHg throughout pregnancy [2-4]
- Women with a diagnosis of hypertension should be offered and educated about home BP monitoring (see appendix 1) and provided with instructions on how to record their measurements and how to escalate concerns.
- All women with hypertension <20 weeks should have their renal function checked (renal profile and dipstick for haematuria/proteinuria). Women with known kidney disease, impaired renal function or proteinuria should be referred to a maternal medicine clinic.
- In women with a diagnosis of hypertension <20 weeks, a detailed medical/family history must be documented. Investigations for secondary hypertension should be considered based on clinical history and include:
    - Renal ultrasound
    - Screening for diabetes
    - Echocardiogram – consider for women with long standing hypertension and/or other comorbidities
    - Screening for endocrine disease (Conns syndrome, Cushings syndrome, phaeochromocytoma) – usually only indicated in women requiring polypharmacy to control hypertension and following specialist advice
- All women should be assessed for the risk of pre-eclampsia at their initial booking appointment as per NICE guidance [2] (appendix 2) or Fetal Medicine Foundation (FMF) screening.
- Women considered to be high risk following a pre-eclampsia risk assessment should be recommended to take 150mg aspirin from 8 weeks (or as soon as the risk assessment has been performed <16 weeks) until 36 weeks gestation. Women must be advised about the purpose of aspirin, reassured of its safety and signposted to how to obtain ongoing supplies. See GMEC aspirin leaflet. Appendix 3

- Women with a history of medicated hypertensive disease in a previous pregnancy should be referred to a specialist consultant clinic, or consultant clinic with a focus on hypertensive disorders in pregnancy, and offered growth scans as per Saving Babies Lives V3. Uterine artery Doppler screening should be offered 20-24 weeks.
- See birth planning section.

5.3 How to diagnose and manage gestational hypertension

- Women presenting with suspected hypertension should have a minimum of three blood pressure readings over at least a half-hour period using an appropriately sized cuff and a validated digital machine. Hypertension is diagnosed if any two of the measurements are ≥140 or ≥90, *even if some of the measurements are below the threshold*. Out of hospital measurements should also be considered in the diagnosis.
- In a woman with a significant change in blood pressure (consider when ≥30mmHg systolic and ≥15mmHg diastolic), additional monitoring and risk assessment is warranted as the risk of gestational hypertension/pre-eclampsia is very high.
- Where gestational hypertension is diagnosed ≥24 weeks and <37 weeks, a PLGF-based test must be used to confirm the diagnosis of gestational hypertension (i.e. exclude pre-eclampsia) [5]. If PlGF testing is abnormal or intermediate manage as pre-eclampsia (see below).
- Urinalysis must be performed and if ≥"+" on dipstick, a urine protein/creatinine ratio (uPCR) must be requested.
- Antihypertensive treatment should be commenced when the majority of available measurements (including home readings) are ≥140 or ≥90 mmHg, target BP <135/85mHg. Treatment of hypertension reduces the risk of severe maternal complications and does not increase the risk of fetal growth concerns.
- Women with a diagnosis of gestational hypertension should be offered and educated about home BP monitoring (see Appendix 1) and provided with instructions on how to record their measurements and how to escalate concerns.
- A growth scan should be performed within 3 working days of the diagnosis of gestational hypertension if ≥24 weeks and ≥2 weeks since a previous ultrasound (unless birth is planned ≤3 days).
- Women with a normal PlGF-based test and non-severe gestational hypertension <37 weeks, who are able to self-monitor blood pressure, do not need to attend additional appointments in the antenatal assessment unit, as long as consultant antenatal clinic follow-up is in place. Follow up 2-4 weekly dependent on clinical condition and gestation
- Women with gestational hypertension, where there are no fetal wellbeing concerns should be offered growth scans 3-4 weekly.
- An assessment for the risk of pre-eclampsia must be confirmed at every assessment. Risk assessment for pre-eclampsia includes: symptom check, urinalysis, blood tests as indicators of end organ disease. The PlGF-based test should only be repeated if the clinical condition has changed and the previous test was normal more than 2 weeks previously.
- Where the diagnosis of gestational hypertension is made ≥37 weeks, and antihypertensive medication is indicated (as above), admission and birth should be offered as soon as feasible within 48 hours as the risk of progression to pre-eclampsia is high. See section on birth planning.

5.4 How to diagnoses and manage pre-eclampsia

- See definitions and Appendix 5 and Appendix 6 for the diagnosis and management of pre-eclampsia.
- Diagnose pre-eclampsia when hypertension/change in blood pressure is accompanied by any of the following :
    - Abnormal angiogenic biomarkers: sFlt:PlGF ratio (≥85) or abnormal PlGF (<12pg/ml) – measured <37 weeks
    - proteinuria: ≥30mg/mmol on 2 occasions or ≥50mg/mmol
    - placental dysfunction: small for gestational age, static fetal growth, oligohydramnios, abnormal fetal Dopplers
    - End organ (liver, renal, haematological) dysfunction (in the absence of any other known cause): elevated/increasing ALT, thrombocytopenia (<150,000), abnormal creatinine (≥77mmol/L or >10% from baseline if CKD)
- In women with an intermediate sFlt:PlGF ratio (38-84) or PlGF 12-100pg/L
    - Women should be diagnosed with pre-eclampsia if there are any other additional features of multisystem disease (see definitions), e.g. proteinuria, SGA, abnormal bloods. See Table in Appendix 5
    - Women with an intermediate PlGF test who have not yet met the diagnosis for pre-eclampsia (i.e. hypertension and intermediate PlGF without uteroplacental dysfunction or end organ disease), should be reviewed at least weekly and offered birth no later than 37 weeks, unless birth is indicated before (see planning birth). See appendix 7 for patient information.
- Document the diagnosis and explain the implications for the woman: increased surveillance, risk of complications (severe hypertension and stroke, abruption, stillbirth, eclampsia, need for earlier birth). See appendix 7 for suggested patient information.
- Offer admission, usually 48-72 hours to ensure stability of BP treatment and maternal condition. Outpatient management should only be considered after a period of inpatient surveillance, following consultant review, where maternal and fetal condition are stable and home BP monitoring is in place. Where outpatient monitoring is chosen, the risk of complications must be rediscussed at each visit. Women should be reviewed a minimum of twice weekly, with medical review at least weekly; outcomes are improved where continuity of care by a specialist team can be provided.
- Enquire about symptoms suggestive of progressive disease at every contact. Where symptoms or signs suggest progressive end organ disease, inpatient admission must be offered.
- Treat blood pressure as for gestational hypertension with treatment initiation or dose escalation where BP ≥140/90, target BP ≤135/85mmHg. Consider admission where BP ≥150/100mmHg if outpatient monitoring.
- Assess fetal wellbeing with an ultrasound scan at diagnosis (if birth is not planned in the next 3 days) and plan fetal surveillance in line with the FGR guidance if there are fetal wellbeing concerns. A minimum of weekly liquor volume/umbilical artery Doppler is indicated if the initial/ongoing fetal wellbeing assessments are otherwise normal.
- Perform cCTG monitoring if ≥26 weeks, as indicated by reduced fetal movements or abnormal Dopplers, when active management has been agreed.

- Perform blood tests to monitor end-organ a minimum of twice per week (more frequently if abnormal) per week; do not repeat more frequently unless abnormal.
- Assess venous thromboembolism (VTE) risk assessment and consider low molecular weight heparin (LMWH) where there are existing VTE risk factors. Women requiring inpatient surveillance must be prescribed LMWH unless contraindicated.
- Where the diagnosis of pre-eclampsia is made ≥37 weeks, admission must be offered and birth arranged as soon as feasible within 48 hours. See section on birth planning.

5.5 Antihypertensive treatment

- **First-line treatments**: **labetalol** and **nifedipine**.
    - Labetalol - three times daily, starting at 100-200mg and titrating up to a maximum of 2.4g/day.
    - Nifedipine MR - twice daily, starting at 10-20mg and titrating to a maximum of 60mg twice daily (minimal additional benefit after 40mg bd).
- **Second-line treatments**: **amlodipine** (alternative to nifedipine), **doxazosin**, **methyldopa**, and **hydralazine**.
    - Amlodipine - 5 or 10mg once daily – good *alternative* to nifedipine and once daily
    - Doxazosin - 2-6mg twice daily.
    - Methyldopa - 250-750mg three to four times daily.
    - Hydralazine - 25-50mg twice to four times time daily, should only be prescribed if all other options have been explored and usually following specialist advice from a maternal medicine obstetrician or physician
- Women must be reassured that all medications listed are considered safe in pregnancy and breastfeeding and advised that all have common, non-severe side effects. Medication choices
- **Monitoring**: Blood pressure should be checked within a week of any change in antihypertensive medication, ideally using home monitoring. Antihypertensive medication should be reduced or discontinued if the blood pressure is consistently below 70mmHg (diastolic).

5.6 Antenatal care provision for women with/at risk of hypertensive disorders

Northwest maternal medicine guidelines

- Women with chronic hypertension requiring antihypertensive therapy should be managed in a consultant led clinic with a specialist focus on hypertensive/maternal medicine disorders. See appendix 4 for suggested clinical schedule.
- Women with chronic hypertension and diabetes should be managed in a diabetes antenatal clinic and women with renal disease or other maternal medicine specification A/B/C conditions should be managed in the appropriate maternal medicine clinic; separate appointments in a hypertension clinic, antenatal assessment unit or other antenatal clinic are not routinely required.
- The hypertension/maternal medicine consultant led clinic should be supported by a specialist midwife/team able to support home BP monitoring and offer advice between appointments.
- Women with a previous pregnancy complicated by pre-eclampsia requiring birth before 32 weeks, should be offered early (<16 weeks) review in a consultant led clinic with a specialist focus on hypertensive disorders.

- All women with/at risk of hypertensive disease in pregnancy should be offered uterine artery Doppler (UtAD) screening between 20-24 weeks (as per FGR guideline). Abnormal UtADs are defined as a mean pulsatility index (PI) ≥95th centile for gestation and/or diastolic notching.
- Women at high risk of early onset placental disease (indicated by abnormal UtADs and/or estimated fetal weight (EFW) <10th centile) and current hypertension/history of hypertensive disease should be managed in a consultant-led clinic, ideally where there is a specialist focus on hypertensive disorders. Growth scans should commence from 28 weeks, (26 weeks if EFW <10th centile 20-24 weeks).
- In women at lower risk of early onset placental disease (EFW ≥10th and normal UtADs 20-24 weeks), growth scans should commence from 32 weeks, irrespective of obstetric history.
    - Women with medicated chronic hypertension should have a medical review at least once between 20-28 weeks and then 3-4 weekly after 32 weeks as indicated by maternal and fetal condition.
    - Women with unmedicated chronic hypertension and/or a history of a previous pregnancy hypertensive disorder but normal BP in the current pregnancy, should have routine antenatal surveillance (midwife/ANC as appropriate) until 32 weeks and 3-4 weekly as indicated by maternal and fetal condition. If hypertension is diagnosed in the current pregnancy, manage as per chronic/gestational hypertension/pre-eclampsia as above.
    - If hypertension requires initiation or increase in medication or new proteinuria is suspected <37 weeks, PlGF testing must be performed to confirm/exclude the development of pre-eclampsia. PlGF testing should only be repeated if a previous test was normal ≥14 days prior AND there is a significant change in maternal condition.

5.7 Labile blood pressure in a clinical environment (White coat hypertension)

- Women with a labile blood pressure in a clinical environment should be supported to monitor BP at home. White coat hypertension is a diagnosis of exclusion which can only be confirmed with sight of normal home BP readings. Medication titration should be based on home BP readings or informed by inpatient hospital measurements if home surveillance is not possible.
- Renal function and urinalysis should be checked at presentation
- Women with labile BP are at an increased risk of developing pre-eclampsia and should be offered screening for placental disease (as above).
- UtAD screening between 20-24 weeks should be offered with ongoing fetal wellbeing assessment as above. Growth surveillance and shared care should be offered.

5.8 Gestational proteinuria (+/- hypertension)

- See flow chart appendix 8.
- **Causes**: The causes of new proteinuria in pregnancy include:
    - urinary tract infection (UTI) – a diagnosis of proteinuria cannot be confirmed unless there is a concurrent, negative infection screen.
    - pre-eclampsia – most likely cause if diagnosed after 20 weeks
    - underlying kidney disease - most likely cause if diagnosed before 20 weeks

    - gestational proteinuria - diagnosis of exclusion which can only be confirmed after the pregnancy
- **PlGF-based Test**: A PlGF-based test must be used to assess the risk of pre-eclampsia in women with proteinuria presenting ≥24 weeks.
- Where a urinary tract infection is confirmed at the same time as an elevated PCR, a repeat PCR must be repeated following completion of treatment.
- Women with proteinuria where infection and pre-eclampsia have been excluded should be referred to a consultant led clinic, ideally with a specialist focus in maternal medical disorders. If not previously performed, a renal ultrasound scan and renal function tests (including albumin) should be requested prior to referral.
- Additional investigations for underlying kidney disease should be initiated where proteinuria is consistently ≥100mg/mmol or there is accompanying haematuria, renal tract abnormality on ultrasound or abnormal renal function (creatinine ≥77mmol/L). *See Maternal Medicine guidelines for ongoing referral to a maternal medicine centre.*
- Women with nephrotic range proteinuria (e.g. >≈250mg/mmol) and or albumin <20g/L must have their venous thromboembolism (VTE) risk assessment repeated and low molecular weight heparin considered esepcially when there are existing VTE risk factors.
- Following an initial assessment in a maternal medicine clinic, in women with low-grade proteinuria (<≈100 mg/mmol), in whom the risk of pre-eclampsia is low (normal blood pressure, normal PlGF-based test), routine antenatal surveillance is appropriate. Additional visits between routine ANC appointments are not required unless BP is elevated. Home BP monitoring is a useful adjunct to routine care. It is important that resolution of proteinuria is confirmed 3 months after the pregnancy; a letter must be written to the GP.
- Women with significant proteinuria (>≈100mg/mmol) diagnosed before 20 weeks and sustained during pregnancy should be referred for postnatal renal follow up.
- In the absence of features of kidney disease or developing pre-eclampsia, early induction (<39 weeks) is not indicated by isolated gestational proteinuria alone.

5.9 Birth planning for women with hypertensive disorders

- In women with gestational hypertension or pre-eclampsia **diagnosed after 37 weeks**, birth should be expedited as soon as safely possible (usually within 48 hours) [6].
- For women with new hypertension where antihypertensive medication is not yet indicated (ie 2 readings ≥140 or ≥90 in the same appointment/admission, but the majority below without treatment), dependent on a full risk assessment, admission and birth within 48 hours may not always be indicated. The decision not to offer birth should be made by a consultant recognising that women with new borderline hypertension are at very high risk of progressing to the development of pre-eclampsia. A full assessment should be repeated every 2-3 days; if antihypertensive medication is required admission and birth should be offered as soon as feasible.

5.9.1 Gestational hypertension:

- In women with gestational hypertension **diagnosed before 37 weeks**, with a normal PlGF-based test, no other signs of placental disease, and no signs of maternal or fetal compromise, early birth is not usually indicated before 37 weeks [2].

- In women with well controlled hypertension, where PlGF testing has excluded pre-eclampsia (within the prior 4 weeks), there is no change in clinical condition and there are no other features of multisystem disease (see above), the risk of maternal/fetal complications is low and therefore the option of continuing the pregnancy to 38-40 weeks can be considered following a full assessment and discussion by a consultant obstetrician.

5.9.2 Pre-eclampsia:

- A care plan must be documented by a consultant Obstetrician which includes frequency of assessment, timing and nature of fetal monitoring, maternal and/or fetal indications for birth, and if and when corticosteroids should be given.
- Corticosteroids must be recommended where birth is planned <34+6 weeks' gestation and offered with discussion ≥35-<37 weeks. The optimal timing for corticosteroids is within 48 hours of birth and corticosteroids should not be given until a plan for birth has been confirmed.
- Exact timing of birth will depend on other maternal factors (previous obstetric history, maternal preference, etc.)
- For women with pre-eclampsia diagnosed between 34-37 weeks, where there is no evidence of deteriorating end organ disease, the findings of the PHOENIX trial [7] should be discussed, and the options of expectant management or planned early birth should be discussed and offered (see Appendix 5 and Appendix 7).
- For women with pre-eclampsia diagnosed before 34 weeks, expectant management is recommended with a documented care plan [2]. Indications for birth <34 weeks, or 34-37 weeks for women who have opted for expectant management, include:
    - Fetal compromise (Absent/reversed EDF/abnormal cCTG)
    - Confirmed (on more than one blood test) deterioration in end organ disease (e.g. progressive deterioration in biochemical/haematological parameters over 24-72 hours)
    - Uncontrolled maternal hypertension (≥160/110mmHg) on maximal tolerated oral therapy
    - Symptoms/signs consistent with irreversible end organ disease e.g. cerebral oedema (severe headache, visual disturbance, eclampsia) or pulmonary oedema (hypoxia, tachypnoea, new breathlessness)

5.9.3 Chronic hypertension

- The decision for planned birth should be made by a consultant obstetrician.
- In women with chronic hypertension (where pre-eclampsia has been excluded), preterm birth should not be planned for hypertension alone, unless blood pressure is uncontrolled (≥160/110mmHg) on maximal tolerated oral therapy
- Where blood pressure is well controlled and there are no indicators of maternal or fetal compromise, birth should be offered 38-40 weeks [8], following discussion between the woman and a senior obstetrician following a full assessment of maternal and fetal factors.

5.10 Intrapartum care for women with hypertensive disorders

- Antenatal hypertensive treatment should be continued as prescribed.

- Monitor BP 4 hourly prior to the establishment of labour and hourly during established labour.
- Maintain BP <150/100 mm Hg. Women 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 PROTOCOL.
- Check FBC, U&Es, LFTs at the onset of labour, do not repeat during labour if normal.
- Do not give Syntometrine® (ergometrine/oxytocin) for third stage of labour.
- Do not routinely limit duration of second stage

5.11 Postnatal management for women with hypertensive disorders

- Measure blood pressure 4-6 hourly during inpatient admission, more frequently if severe hypertension (≥160/110 mm Hg).
- Anticipate a rise in BP on postnatal day 3-5. Proactive antihypertensive prescribing immediately after birth (even if BP <140/90mmHg) will reduce the risk of postnatal readmission.
- Commence regular antihypertensive medication if BP ≥140/90 mmHg
- Aim to optimise antihypertensive regime to maximise compliance using as few tablets per day as possible, e.g. amlodipine 5 or 10mg once daily
- The following medications are all considered safe for breastfeeding and women must be reassured of safety [2].
    - Calcium channel blockers (nifedipine 10-40mg bd) or amlodipine (5-10mg od),
    - doxazosin (1-4mg bd)
    - enalapril (10mg starting dose if renal function normal, increased to 20mg od (antihypertensive dose) after 7-10 days following renal function check). Other ACE inhibitors are also considered safe.
    - labetalol (100-600mg tds)
- Consider restarting pre-pregnancy medication, with considerations for breastfeeding (e.g. avoid angiotensin receptor blockers)
- Maintain blood pressure <140/90 mm Hg.
- Medication alterations are indicated in the following circumstances:
    - BP ≥160/110mmHg (on two or more repeated measurements)- urgent (same day) medical review and treatment escalation
    - BP ≥140/90mmHg (on two or more repeated measurements) - increase medication (ideally within 24 hours) via remote review if otherwise well or medical in person review if any additional concerns.
    - BP <120/70mmHg (if after day 5 postnatal) - reduce/discontinue medication.
    - BP <110/60mmHg - reduce/discontinue medication.
- Encourage home BP monitoring with clear instructions regarding escalation of concerns. Where possible a telephone review by should be carried out by a midwife/doctor with experience of hypertension management between postnatal day 3-7.
- Following discharge, check BP at least once between day 3-5, and at least once between day 5-7, if requiring ongoing antihypertensive treatment. Ensure GP review arranged for day 14, if medication still required at the day 5-7 review.
- At every postnatal contact, enquire about maternal wellbeing and symptoms (headache, new nausea/vomiting/epigastric pain) which may suggest the development of worsening

pre-eclampsia. Where new symptoms have developed and BP ≥140/90mmHg, medical advice should be requested the same day, in person medical review is usually indicated.

5.11.1 Essential communication after pregnancy for women with hypertensive disorders

- Advise women that a GP review is recommended 2 weeks after discharge where antihypertensive medication has been prescribed after birth.
- Advise all women with a hypertensive disorder of pregnancy that they must have a postnatal BP check 6 weeks after birth, followed by (a minimum) of annual BP surveillance.
- Advise all women who have developed proteinuria during pregnancy that they must have a urinalysis and/or PCR checked within 3 months; where proteinuria is still present ongoing renal referral is recommended.
- Ensure a postnatal discharge letter is completed by the medical staff stating the diagnosis, BP targets (<140/90mmHg), medication at discharge, advice regarding titration and the need for ongoing BP surveillance and urinalysis (as above). See Appendix 9
- Advise women of the increased risk of hypertension and cardiovascular disease following a hypertensive disorder of pregnancy (2-4 fold increased risk) and the need for lifelong BP surveillance. Advise women that they are at increased risk of hypertensive disorders in a future pregnancy; BP must be checked once a pregnancy is confirmed and aspirin is recommended to reduce the risk of early onset pre-eclampsia in a future pregnancy.

5.12 Appendix 1: Example Home BP monitoring instructions

Following a review of your medical and obstetric history; we would like you to check your blood pressure at home.

We would advise you purchase or borrow an electronic blood pressure monitor to use at home (the following link is useful for advice on BP monitors - Buy Approved Blood Pressure Monitors I bhf.org.uk;

If you are unable to obtain a blood pressure machine, you can check your blood pressure at your Doctor's surgery or a local pharmacy.

If you have been prescribed blood pressure medication, please try and check your blood pressure (BP) at least every other day between 9am and 2pm where possible - at least 1 hour after your morning medication.

We would like you to record these BP readings using XXXXXXXX, so that doctors and midwives can review your readings at your appointments.

If you are not currently taking blood pressure medication, please try and check your blood pressure once or twice per week.

If your readings are high (more than 140/90) please contact XXXXXXXXXX (Mon-Fri 9-4)

If there is no answer, or your call is urgent, then please contact Maternity Triage XXXXXXXXXXX (24 hours; 7 days).

Level	Blood Pressure (mmHg)	Action
High	SYS 150 OR MORE OR DIA 100 OR MORE	Your blood pressure is high Sit quietly for 5 minutes and measure it again. Contact the hospital for assessment (within 4 hours) and continue to measure your blood pressure
Raised	SYS 140-149 OR DIA 90-99	Your blood pressure is raised Sit quietly for 5 minutes and measure it again If your repeated measurement is raised contact your maternity unit within 24 hours and continue to monitor your BP
Normal	SYS 110-139 OR DIA 70-89	Your blood pressure is normal Continue monitoring and your current care
Low	SYS 109 OR LESS AND DIA 69 OR LESS	Your blood pressure is low If you are taking medication for your blood pressure contact your maternity unit within 24 hours or within 4 hours if you feel unwell (dizzy or faint) If you are NOT taking blood pressure medication your blood pressure does not require any further action.

5.13 Appendix 2. NICE guidance for pre-eclampsia risk assessment

Advise pregnant women at high risk of pre-eclampsia to take 150 mg of aspirin daily from 8-12 weeks until the birth of the baby.
Women at high risk are those with any of the following:

- hypertensive disease during a previous pregnancy
- chronic kidney disease
- autoimmune disease such as systemic lupus erythematosus or antiphospholipid syndrome
- type 1 or type 2 diabetes
- chronic hypertension. [2010, amended 2019]

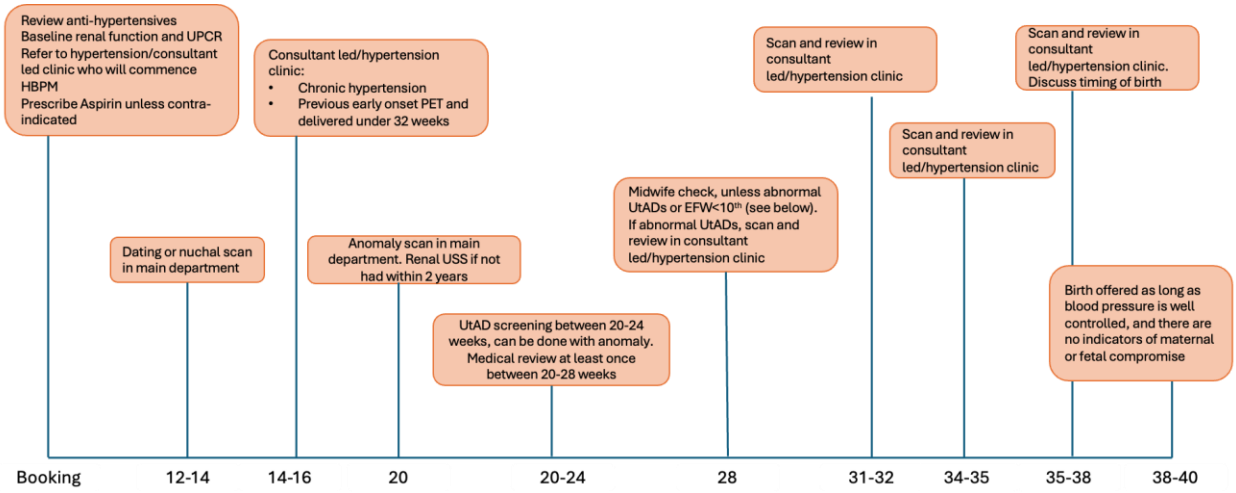
Advise pregnant women with more than 1 moderate risk factor for pre-eclampsia to take 150 mg of aspirin daily from 12 weeks until the birth of the baby.
Factors indicating moderate risk are:

- nulliparity
- age 40 years or older
- pregnancy interval of more than 10 years
- body mass index (BMI) of 35 kg/m2 or more at first visit
- family history of pre-eclampsia
- multi-fetal pregnancy

5.14 Appendix 3 GMEC Aspirin in pregnancy leaflet

Link to aspirin leaflet in multiple languages via NW Maternal Medicine network website.

5.15 Appendix 4. Example model of care for women with chronic hypertension



Women at high risk of early onset placental disease (indicated by abnormal UtADs and/or estimated fetal weight (EFW) <10th centile) and current hypertension/history of hypertensive disease should be managed in a consultant-led clinic, ideally where there is a specialist focus on hypertensive disorders. Growth scans should commence from 28 weeks, (26 weeks if EFW <10th centile 20-24 weeks).

5.16 Appendix 5. Quick reference guide: Diagnosis and management of hypertension

	Hypertension diagnosis <20 weeks: Chronic Hypertension	**Hypertension diagnosis ≥20-36^{+6} weeks: Gestational hypertension**	**Hypertension diagnosis ≥37 weeks: Gestational hypertension ± pre-eclampsia**
Definition of hypertension	Blood pressure of ≥140 or ≥90 mmHg on two measurements in the same visit/admission (even if subsequent/other measurements fall below the threshold)		
Antenatal care	Offer aspirin if BP≥135 or 85 mmHg[1] Refer for consultant care Screen for early onset placental disease 20-24 weeks (UtADs)	Monitor for development of pre-eclampsia (see below) sFlt:PlGF or PlGF (24-36^{+6} weeks), symptom assessment, fetal ultrasound, FBC, renal and liver function.	Offer admission and arrange birth as soon as possible within 48 hours[2]
Treatment	Offer/increase antihypertensive medication if majority of available readings (including home readings) ≥140 or ≥90 mmHg – target BP <135/85 mmHg.		
Frequency of maternal review	3-4 weekly with supported home BP monitoring[2]	3-4 weekly with supported home BP monitoring[3].	Offer admission and arrange birth as soon as possible within 48 hours[2]
Frequency of fetal ultrasound	Growth scans commenced 26-32 weeks dependent on EFW at anomaly and UtADs 3-4 weekly thereafter unless abnormalities detected	Growth scan within 3 working days (unless plan for birth ≤72 hours) or normal scan within previous 2 weeks 3-4 weekly thereafter unless abnormalities detected	Ultrasound only required if plan for birth declined
Timing of birth	If pre-eclampsia excluded within 4 weeks (ie normal sFlt:PlGF or PlGF), and no other maternal/fetal concerns and BP well controlled – offer birth 38-40 weeks, following consultant review	If pre-eclampsia excluded within 4 weeks (ie normal sFlt:PlGF or PlGF), and no other maternal/fetal concerns and BP well controlled – offer birth 38-40 weeks, following consultant review	Offer admission and arrange birth as soon as possible within 48 hours[2]
Management of women with pre-eclampsia			
Diagnosis of pre-eclampsia	**Hypertension with**: Abnormal sFlt:PlGF ≥85 or PlGF<12pg/L **and/or** evidence of multisystem disease (as below) or **Hypertension with:** Intermediate sFlt:PlGF 38-84[4] or PlGF 12-100pg/L **and** evidence of multisystem disease: Symptoms indicating multisystem disease (new epigastric pain/vomiting/headache/visual disturbance) New proteinuria (≥30mg/mmol on 2 occasions or ≥50mg/mmol) following exclusion of UTI Placental insufficiency (SGA/FGR/Oligohydramnios/abnormal Dopplers) ALT ≥40 (without other cause) Creatinine ≥77 (without other cause) Platelets ≤150 (without other cause)		**Hypertension with:** Evidence of multisystem disease: Symptoms indicating multisystem disease (epigastric pain/vomiting/headache/visual disturbance) New proteinuria ALT ≥40 (without other cause) Creatinine ≥77 (without other cause) Platelets ≤150 (without other cause) Placental insufficiency (SGA/FGR/Oligo/abnormal Dopplers)

Surveillance	Offer admission. If outpatient management, minimum of twice weekly review of BP, symptoms and blood tests (more frequent if concerns) with minimum of weekly medical review. Ultrasound weekly unless indicated more frequently by abnormal Dopplers. CTG as indicated by fetal movements/abnormal Dopplers in line (FGR guidance).	Offer admission and arrange birth as soon as possible within 48 hours. (Steroids not indicated)
Optimisation	Offer steroids and aim to administer within 72 hours of birth. Do not administer steroids <34 weeks until plan for birth confirmed.	
Timing of birth	<34 weeks: Expectant management unless indication for earlier birth (see below) 34-36+6 weeks: offer and discuss risk/benefit of expectant management vs planned early birth[5] Indications for birth <34 weeks, or ≥34 weeks where expectant monitoring chosen: • Fetal compromise (absent/reversed EDF/abnormal cCTG/suspected abruption) • Confirmed (on more than one blood test) deterioration in end organ disease (e.g. progressive deterioration in biochemical/haematological parameters over 24-72 hours) • Uncontrolled maternal hypertension (≥160/110mmHg) on maximal tolerated oral therapy • Symptoms/signs consistent with irreversible end organ disease e.g. cerebral oedema (severe headache, visual disturbance, eclampsia) or pulmonary oedema (hypoxia, tachypnoea, new breathlessness)	
Very high risk for development of pre-eclampsia	Hypertension with intermediate sFlt:PlGF 38-84 or PlGF 12-100pg/L without additional features of multisystem disease: Weekly surveillance with face to face BP review, blood tests and ultrasound (minimum 2 weekly unless abnormal). **Offer birth no later than 37 weeks** If multisystem disease, manage as pre-eclampsia (see criteria above).	

EFW: Estimated fetal weight; UtAD: Uterine artery Dopplers

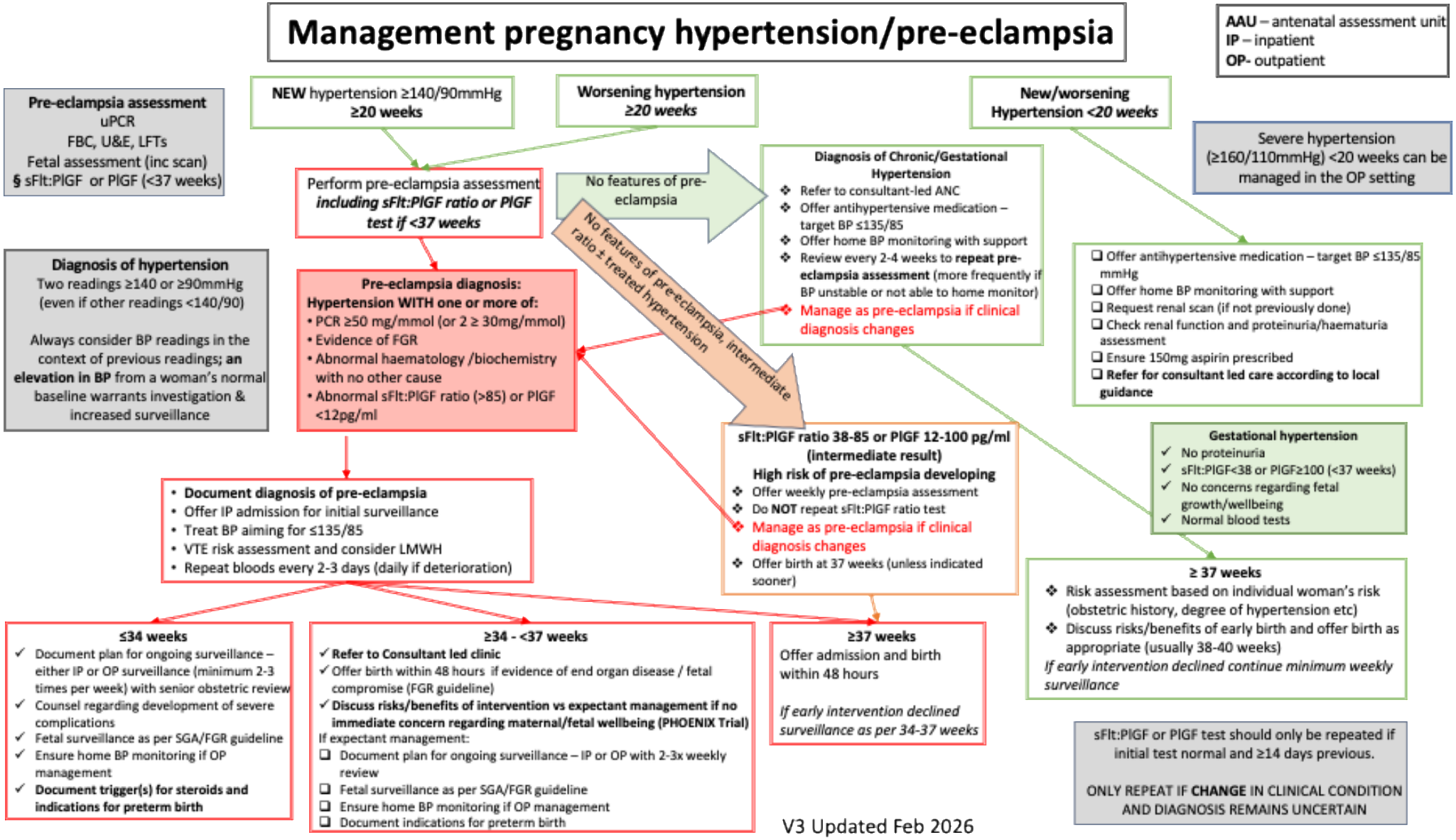
1. For women who have had an early pregnancy risk assessment for pre-eclampsia using FMF algorithm, aspirin may not be indicated if low risk
2. For women with new hypertension where antihypertensive medication is not yet indicated (ie 2 readings ≥140 or ≥90 in the same appointment/admission, but the majority below without treatment), dependent on a full risk assessment, admission and birth within 48 hours may not always be indicated. The decision not to offer birth should be made by a consultant recognising that women with new borderline hypertension are at very high risk of progressing to the development of pre-eclampsia. A full assessment should be repeated every 2-3 days; if antihypertensive medication is required admission and birth should be offered as soon as feasible.
3. Where home BP monitoring is not possible, more frequent healthcare professional BP measurement is indicated dependent on the clinical presentation, usually 2 weekly for women requiring antihypertensive treatment
4. Women with hypertension and an intermediate sFlt:PlGF are very high risk for developing the pre-eclampsia within 2 weeks, birth should be offered no later than 37 weeks if not indicated sooner.
5. PHOENIX Trial: Information for women with a pre-eclampsia diagnosis 34-37 weeks.

Serious complications of pre-eclampsia (PET) such as pulmonary oedema, placental abruption, HELLP, eclampsia and admission to intensive care can occur in around 1-3% of cases. In a recent trial in the UK (PHOENIX Trial), of women with pre-eclampsia after 34 weeks, women were randomised to either planned early birth after 34 weeks or expectant management until 37 weeks. The trial found that the risk of severe maternal complications was higher with watchful waiting compared to planned earlier birth.

- *Need for high dependency care was lower with planned early delivery (7%) compared to birth after 37 weeks (15%). In those where birth was delayed, over half of the women developed additional complications requiring birth before 37 weeks.*
- *More women achieved a vaginal birth with planned earlier birth, with no significant increase in rate of caesarean section or instrumental birth.*
- *Around 4 out of 10 babies born before 37 weeks were admitted to the NNU compared to around 3 out of 10 where birth was delayed until 37 weeks. The most common reason for admission to the NNU was for closer observation rather than due to complications from earlier birth. Rates of breathing difficulties in those born earlier*

compared to those after 37 weeks were similar (24% vs 26%). Low blood sugars were more common in babies who were born after 37 weeks compared to those born earlier.

5.17 Appendix 6. Flowchart: Management of hypertension



5.18 Appendix 7. Information for women with/at high risk of pre-eclampsia

Information for women with an intermediate sFlt:PlGF 38-84 or PlGF 12-99pg/ml

We discussed today the risk of developing pre-eclampsia in view of your blood pressure / proteinuria and your borderline blood test results.

We have explained that pre-eclampsia is an unpredictable and sometimes fast developing condition of the placenta that can affect your health (increased risk of stroke and high blood pressure, liver and kidney issues). There are also risks for baby including reduced growth and damage to the placenta. Although we can manage some of the symptoms of pre-eclampsia (for example using blood pressure medication), unfortunately we don't have a treatment for pre-eclampsia and only birth of your baby will resolve the condition.

In severe cases of pre-eclampsia there is a risk of a placental abruption - this occurs when the placenta separates from the wall of the uterus (womb) before birth. It happens in around 1% of women who have developed pre-eclampsia and is a medical emergency; sometimes a placental abruption can cause a stillbirth.

As your recent blood test has shown that you are at high risk of developing pre-eclampsia in the coming weeks we will need to monitor yours and your baby's health closely. *You will offered appointments at least once per week from now on, sometimes more frequently.* It is helpful if you can monitor your blood pressure at home between appointments.

If/when you develop pre-eclampsia, it is likely we will discuss the need for an earlier birth with you. Unless there are concerns regarding yours or your baby's health, birth is usually recommended between 34-37 weeks depending on your circumstances. We will discuss timing of birth with you at your appointments.

If you are concerned about any symptoms of pre-eclampsia then please call your maternity triage.

Signs of pre-eclampsia include:

- Reduced movements of baby
- Feeling generally unwell
- Abdominal pain not associated with baby's movement.
- Any vaginal bleeding
- Swelling, particularly of the hands and face.
- Changes in vision (blurry, speckled, sensitivity to light)
- Headaches
- Blood pressure higher than 140/90 on 2 consecutive readings

Please see the following links for useful information about pre-eclampsia:

Tommy's: Pre-eclampsia

Action on Pre-Eclampsia - Support & Information

UKMCS Pre-eclampsia information

Include home BP monitoring information (Appendix 2)

Information for women with a diagnosis of pre-eclampsia

Your recent tests have confirmed that you have developed a pregnancy condition called pre-eclampsia.

We have explained today that pre-eclampsia is an unpredictable and sometimes fast developing condition of the placenta that can affect your health (increased risk of stroke and high blood pressure, liver and kidney issues). There are also risks for baby including reduced growth and damage to the placenta. Although we can manage some of the

symptoms of pre-eclampsia (for example using blood pressure medication), unfortunately we don't have a treatment for pre-eclampsia and only birth of your baby will resolve the condition.

In severe cases of pre-eclampsia there is a risk of a placental abruption - this occurs when the placenta separates from the wall of the uterus (womb) before birth. It happens in around 1% of women who have developed pre-eclampsia and is a medical emergency; sometimes a placental abruption can cause a stillbirth.

As your recent blood test has confirmed that you have developed pre-eclampsia, we will need to monitor yours and your baby's health closely. *You will offered appointments 2-3 times per week from now on and you may need to come into hospital for additional monitoring. It is important that you also monitor your blood pressure at home between appointments and that you would be able to attend the hospital immediately if you felt unwell at home or if your blood pressure was above 160/110 mmHg.*

As you have developed pre-eclampsia, we will need to discuss the need for an earlier birth with you. Unless there are concerns regarding yours or your baby's health, birth is usually recommended between 34-37 weeks depending on your circumstances. Sometimes, we do have to recommend birth before 34 weeks. We will discuss timing of birth with you at your appointments.

If you are concerned about any symptoms of pre-eclampsia then please call your maternity triage.

Signs of pre-eclampsia include:

- Reduced movements of baby
- Feeling generally unwell
- Abdominal pain not associated with baby's movement.
- Any vaginal bleeding
- Swelling, particularly of the hands and face.
- Changes in vision (blurry, speckled, sensitivity to light)
- Headaches
- Blood pressure higher than 140/90 on 2 consecutive readings

Please see the following links for useful information about pre-eclampsia:

Tommy's: Pre-eclampsia

Action on Pre-Eclampsia - Support & Information

UKMCS Pre-eclampsia information

Include home BP monitoring information (Appendix 2)

Timing of birth discussion for women with preeclampsia 34-36+6 weeks

Serious complications of pre-eclampsia (PET) such as pulmonary oedema, placental abruption, HELLP, eclampsia and admission to intensive care can occur in around 1-3% of cases.

In a recent trial in the UK (PHOENIX Trial), of women with pre-eclampsia diagnosed after 34 weeks, women were randomised to either planned early birth after 34 weeks or expectant management until 37 weeks.

The trial found that risk of severe maternal complications was higher with watchful waiting compared to planned earlier birth. Need for high dependency care was lower with planned early delivery (7%) compared to birth after 37 weeks (15%). In those where birth was delayed, over half of the women developed additional complications.

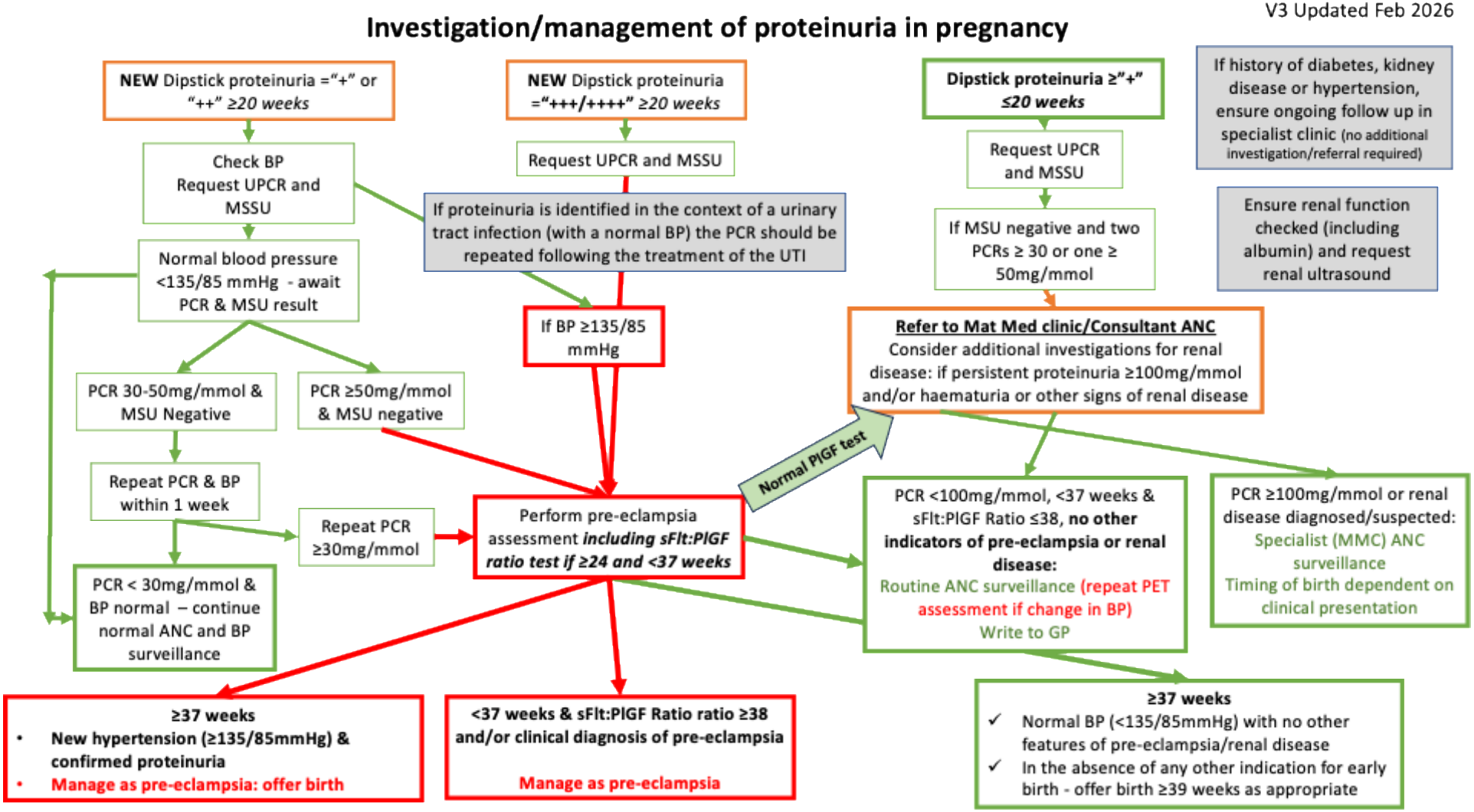
More women achieved a vaginal birth with planned earlier birth, with no significant increase in rate of caesarean section or instrumental birth.

Around 4 out of 10 babies born before 37 weeks were admitted to the NNU compared to around 3 out of 10 where birth was delayed until 37 weeks. The most common reason for admission to the NNU was for closer observation

rather than due to complications from earlier birth. Rates of breathing difficulties in those born earlier compared to those after 37 weeks were similar (24% vs 26%). Low blood sugars were more common in babies who were born after 37 weeks compared to those born earlier.

5.19 Appendix 8. Investigation of new proteinuria in pregnancy

V3 Updated Feb 2026



5.20 Appendix 9. Example postnatal letter

Important postnatal discharge information for carers of women with hypertension in pregnancy

Dear Community midwife / General Practitioner

Re: *patient details*

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, postnatal BP surveillance is required. This can be a combination of community midwife BPs and self monitoring (for women with home BP monitors).

Discharged on Medication YES / NO

Discharge medication:

Medications considered safe for breast feeding include: amlodipine, nifedipine, doxazosin, enalapril, labetalol. Do not use methyldopa after birth.

Community midwives: Please monitor Blood Pressure at least once between day 3-5 postnatal and at least once between day 5-7 if remains hypertensive (≥140/90). For women able to do self BP monitoring, self BP monitoring can replace community midwife BP checks (see contact numbers below for support with medication changes).

Please support women to arrange a GP review at 2 weeks where antihypertensive medication is continued on Day 5-7 after birth.

Target BP is <140 / 90 mmHg. Medication alterations are indicated in the following circumstances:

- BP ≥160/110mmHg (on two or more repeated measurements)- urgent (same day) medical review and treatment escalation
- BP ≥140/90mmHg (on two or more repeated measurements) - increase medication (ideally within 24 hours) via remote review if otherwise well or medical in person review if any additional concerns. If not previously prescribed medication, contact obstetric services
- BP <120/70mmHg (if after day 5 postnatal) - reduce/discontinue medication.
- BP <110/60mmHg - reduce/discontinue medication

- If BP ≥140/90 it is usually appropriate to increase the dose of medication or add an additional/new medication, either via the GP or obstetric services. Unless BP≥160/110mmHg referral to the hospital is usually not necessary unless there are other concerning symptoms or medication has not been previously prescribed.
-

Hospital Antenatal Clinic Follow up YES / NO
(hospital follow up should be offered to women with severe pre-eclampsia and/or birth before 34 weeks gestation)

For all women following a pregnancy complicated by a hypertensive disorder:

- Resolution of proteinuria must be checked within 3 months; if persistent proteinuria a renal referral should be made
- All women with a history of hypertensive complications of pregnancy should be offered an annual BP check as there is an increased risk of future cardiovascular disease
- All women with a history of hypertensive complications of pregnancy should be offered aspirin 150mg daily in a future pregnancy
- Women should be advised regarding weight loss and a healthy lifestyle where appropriate.

For further advice, please contact the *Hypertension/Maternal Medicine Team/XXXX on tel. XXXXXX* or the *oncall Consultant Obstetrician*.

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