Hypertension in Pregnancy (Chronic, Gestational, and Mild-Moderate Pre-eclampsia)

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Contents

Introduction

Hypertension in pregnancy is the most common complication of pregnancy, affecting around 15% of pregnancies. It contributes to complications such as SGA, Abruption, Prematurity and stillbirth. There are a range of hypertensive disorders of pregnancy and their severity. This guideline will look at Chronic hypertension, Gestational hypertension, and mild to moderate pre-eclampsia. There is a separate guideline for severe pre-eclampsia. Management flow charts are available in the appendices for quick reference.

1. Chronic Hypertension

1.1 Introduction

1 in 5 adults in Wales have high blood pressure. Some will be known to have hypertension, have been investigated and managed by primary care services. However, some may not have yet been diagnosed until they become pregnant. Initial physiological changes in pregnancy may cause the blood pressure to drop in the first trimester before returning to more normal levels during the second trimester. Hypertension related to pregnancy does not present before 20 weeks' gestation and therefore hypertension identified prior to 20 weeks should be managed as chronic hypertension.

Ideally women with hypertension should receive pre-pregnancy counselling. This is because many medicinal therapies are not suitable for pregnancy, with first line drugs by ACE (Angiotensin converting enzyme) inhibitors and Angiotensin II receptor blockers being prescribed. These drugs have been linked to cardiac congenital malformations, skeletal problems, oligohydramnios, foetal and neonatal renal failure, pulmonary hypoplasia, prolonged hypotension, and neonatal death. Examples include Lisinopril, Enalapril and Lotensin (as ACE inhibitors), Valsartan, Losartan and Candesartan (as Angiotensin II receptor blockers). Ideally these women should change their antihypertensive medication to a more pregnancy compatible medication (Labetalol, nifedipine or methyldopa), and be stable on that regime, before conceiving. For women who conceive on this medication they should have their antihypertensive changed as soon as possible. Similarly, diuretics should also be avoided where possible during pregnancy.

1.2 Early Pregnancy

These women should be booked for consultant led care, regardless of how long they have had hypertension. Their antihypertensive medication should be reviewed as above and changed if needed. Because chronic hypertension is a risk factor for developing pre-eclampsia these women should be offered low doses aspirin (150 mg daily, reduces the risk of severe pre-eclampsia by up to 75%). If there is proteinuria early in pregnancy, then blood should be taken for renal function (U & Es) and a urine for PCR sent.

If new hypertension is identified in early pregnancy, then in addition to above assessment for end organ damage needs to be made. This includes:

- blood tests for glucose, U & E, total cholesterol, HDL Cholesterol, TFT and calcium.
- Urine should be sent for PCR.
- A 12 lead ECG
- Renal Ultrasound

Most hypertension is primary, but occasionally occurs secondary to conditions such as Conns syndrome (low potassium), thyroid dysfunction, hypercalcaemia, Cushings syndrome, and phaeochromoctyomas (have associated palpitations, sweating and tachycardia).

If the blood pressure is sustained at a systolic of more than 140 OR diastolic more than 90 mmHg then treatment should be started. First line treatment is with Labetalol, or nifedipine if labetalol is not suitable. Women should be informed that the use of labetalol has been linked to hypoglycaemia in the infant and will require postnatal surveillance. The ideal first line choice of antihypertensive is currently subject to research studies (Giant Panda Study).

1.3 Antenatal Care

During pregnancy aim for a blood pressure between 135 – 140/85-90 mmHg. The frequency of antenatal visits will depend on control of the blood pressure, especially towards the end of the third trimester.

Every visit to a midwife or obstetrician MUST have a blood pressure check AND urinalysis. Where a urine specimen is not immediately available then the woman should remain until one is provided if in hospital, or be visited again the same day if being checked in the community. If bp is above 140/90 in the community she should be referred in for further assessment to AAU.

These women will require serial growth scans. CTG monitoring is only required if clinically indicated for other reasons.

During any antenatal admission women will require as a minimum 4hourly blood pressures and daily urinalysis. Where blood pressure is raised above the targets then a review should occur by an obstetrician within the hour, with a full clinical assessment (including reflexes) and a review of medication and its dosage / frequency. Verbal Orders for medication should be followed up with a review within the same time period.

Induction of labour should NOT be offered before 39/40 where the blood pressure is controlled and growth is normal.

1.4 Intrapartum Care

Women should be advised to deliver on a consultant obstetric unit, with continuous CTG.

Blood pressure should be measured hourly during active labour. Antihypertensive medication should be continued during labour.

Active management of the third stage is advised but with syntocinon only. Ergometrine should be avoided as it increases blood pressure.

1.5 Post natal care

Blood pressure should be monitored daily for the first 2 days post-natal, and at least once between day 3 and 5.

For women who have been on labetalol, the baby will need to follow the hypoglycaemia pathway.

Women can continue on their antihypertensive medication with the exception of methyldopa which should be changed within the first 2 days' post-partum. Women may wish to return to their pre-pregnancy medication if it was different to their antenatal antihypertensive, with the exception of diuretics or angiotensin II receptor blockers if the woman is breastfeeding.

Women should have a review with their GP 6-8 weeks post-natal, for review of their hypertension and medication.

2. Gestational Hypertension

2.1 Introduction

About 5% of pregnancies are complicated by gestational hypertension. This is the development of high blood pressure without proteinuria AFTER 20 weeks' gestation. About half of women with gestational hypertension will progress to pre-eclampsia, the earlier the diagnosis of gestational hypertension the more likely it is that progression to pre-eclampsia will occur.

2.2 Early Pregnancy / Risk Assessment

All women should be assessed at booking for risk factors for developing gestational hypertension and pre-eclampsia. Table 1 lists the risk factors. Those with 1 major risk factor OR 2 moderate risk factors should be advised to start aspirin 150 mg daily from 12/40, as it reduces the risk of severe pre-eclampsia by up to 75%. For further guidance on Aspirin see the Aspirin in Pregnancy Guideline on WISDOM.

Major Risk Factors	Moderate Risk Factors
Previous Hypertension of Pregnancy Pre-existing Diabetes Chronic Hypertension Antiphospholipid syndrome / SLE / Autoimmune disorders Chronic Kidney Disease BMI >50	First Ongoing Pregnancy BMI >35 10 years or more since last pregnancy Maternal age >40 Family history of pre-eclampsia Multiple pregnancy
1 risk factor commence Aspirin from 12 weeks gestation	**2 risk factors commence Aspirin from 12 weeks gestation**

Table 1: Risk Factors for gestational hypertension and pre-eclampsia

2.3 New Hypertension in pregnancy

Hypertension in pregnancy is defined as a blood pressure reading of more than 140/90 in either the systolic or the diastolic readings, sustained over a 10-minute period when the woman is at rest and using the correct size blood pressure cuff. When this occurs for the first time then a full antenatal assessment should be undertaken including urinalysis. The woman should be referred to the Antenatal Assessment Unit for further investigation and plan of care. This does not necessarily require admission.

Mild Gestational Hypertension, blood pressure 140/90 – 149/99) with no proteinuria.

These women should be assessed for risk factors for pre-eclampsia, and be assessed for signs and symptoms of pre-eclampsia. At the first presentation of gestational hypertension blood should be taken for FBC, LFT and U & E. The fetal heart should be auscultated but a CTG is not required unless there are other concerns (such as altered fetal movements or small for gestational age). An ultrasound scan should be arranged if the woman is not already having serial growth scans.

Anti-hypertensives should be commenced (The recommended first line agent is currently being explored as part of the Giant Panda Trial):

- Labetalol 200mg bd (women should be informed of the need to monitor for hypoglycaemia in the postnatal period for the infant) OR
- Nifedipine m/r 10 mg bd.

It is advised women are observed for 1-hour post medication to ensure a response to therapy and no adverse response. If these women are well and the blood pressure has responded they may then have outpatient surveillance weekly through ADAU.

At each visit an antenatal assessment will be performed including blood pressure and urinalysis, along with bloods for FBC, LFT, U&Es. A CTG is not required unless there are other concerns. Serial growth scans will be required. A blood pressure over 140/90 will need an obstetric review, for a full clinical assessment including medication regime.

Moderate gestational hypertension, blood pressure between 150-159/100-109 with no proteinuria.
Initial management should be as per mild gestational hypertension.

Anti-hypertensive therapy should be commenced (The recommended first line agent is currently being explored as part of the Giant Panda Trial):

- Labetalol 200mg tds (women should be informed of the need to monitor for hypoglycaemia in the postnatal period for the infant) OR
- Nifedipine M/R 10mg bd).

It is again advised that these women are observed for at least one hour to ensure a response to therapy with no adverse response. If there are no other concerns these women may then have outpatient follow up, but initially this should be twice a week blood pressure checks (one with Community Midwife and another with ADAU for blood tests as well). Every visit to a midwife or obstetrician MUST have a blood pressure check AND urinalysis. Where a urine specimen is not immediately available then the woman should remain until one is provided if in hospital, or be visited again the same day if being checked in the community. If bp is above 140/90 in the community she should be referred in for further assessment to AAU. Once the woman has been on the same antihypertensive regime for more than two weeks this may then be reduced to weekly.
A blood pressure over 140/90 will need an obstetric review, for a full clinical assessment including medication regime.

Severe Gestational Hypertension, blood pressure greater than 160/110 with no proteinuria.
Initial management should be with antihypertensives (The recommended first line agent is currently being explored as part of the Giant Panda Trial):

- Labetalol 200mg qds (women should be informed of the need to monitor for hypoglycaemia in the postnatal period for the infant) OR
- Nifedipine M/R 20mg).

15-30 minutes' blood pressure readings until below the 160/110 threshold, blood tests for FBC, U&E, LFT, +/- G&S, and urinalysis for proteinuria. A CTG should be undertaken and an ultrasound scan arranged (unless already having serial growth scans). These women should be admitted until the blood pressure has been stable for at least 4 hours, after which, if well, she may then have outpatient monitoring as per Moderate gestational hypertension.

2.4 Ongoing surveillance

Women with gestational hypertension are at higher risk of progressing to pre-eclampsia. Therefore, these women need to have their blood pressure and urinalysis checked at least weekly. They also need weekly bloods for FBC, U&E, LFTs. CTGs are not required unless there are other clinical concerns such as altered fetal movements. If the woman develops proteinuria, then a PCR should be sent to quantify the amount of proteinuria.

During any admission in the antenatal period women with gestational hypertension should have as a minimum 4 hourly blood pressure, and daily urinalysis. Where blood pressure is raised above the targets then a review should occur by an obstetrician within the hour, with a full clinical assessment (including reflexes) and a review of medication and its dosage / frequency. Verbal Orders for medication should be followed up with a review within the same time period.

Women should receive serial growth scans from the time of diagnosis until delivery.

In women whose blood pressure is controlled, and serial scans are normal Induction of labour can be considered after 37/40 gestation. It is advised this occurs between 37 and 40/40 gestation in discussion with the woman and the severity of the hypertension.

Appendix 2 summarises antenatal management.

2.5 Intrapartum Care

Women should be advised to deliver on a consultant obstetric unit, with continuous CTG.

Blood pressure should be measured hourly during active labour. Antihypertensive medication should be continued during labour. If blood pressure elevates during labour then a clean sample (by in out catheter if necessary) of urine should be obtained for proteinuria, and PCR sent if necessary.

Active management of the third stage is advised but with syntocinon only. Ergometrine should be avoided as it increases blood pressure.

2.6 Post-partum Care

Blood pressure should be measured at least daily for the first 2 days, and at least once between day 3 and 5 post-natal. Anti hypertensives should be continued. As a rough guide women require treatment for the same duration postnatally as antenatally. Consider reducing the dose of antihypertensive if

the blood pressure is less than 130/80. For women discharged on antihypertensives it is advised they see their GP 2-4 weeks post-natally.

2.7 Post-Partum Onset of gestational hypertension

Gestational hypertension can start post-partum. Bloods should be taken for FBC, U&E and LFTs. Antihypertensives should be commenced if the blood pressure is more than 150/100. Post-natal consider enalapril (5mg once daily up to maximum of 40mg daily) or nifedipine M/R (10-20 mg od-bd). Second line includes a combination of these 2 drugs or atenolol (25 – 50mg daily).

3. Pre-eclampsia

3.1 Introduction

Pre-eclampsia is one of the most common conditions affecting pregnancy. It makes significant contributions to premature delivery and neonatal mortality. Severe pre-eclampsia and Eclampsia can lead to maternal and fetal death, but rates of maternal mortality related to pre-eclampsia rose in the UK in the last MBRACE report. Pre-eclampsia has a wide spectrum of presentation and severity, and clinical assessment and judgement should always be used over these guidelines. Senior staff should be involved in the care and management of these women.

3.2 Early Pregnancy / Risk Assessment

All women should have a risk assessment at their booking appointment. The risk factors are displayed in section 3.2. Women deemed at risk should be commenced on aspirin as for gestational hypertension.

3.3 Diagnosis and management of Pre-eclampsia

Pre-eclampsia is hypertension (>140/90) AND significant proteinuria (>1+ on dipstick or PCR >30mg/mmol).
Pre-eclampsia is classified into mild, moderate and severe as for gestational hypertension, based on the blood pressure. Severe pre-eclampsia is addressed in its own guideline.

Women presenting for the first time with hypertension and proteinuria should be assessed through the antenatal assessment unit. Assessment should include:

- History for risk factors for pre-eclampsia
- Symptoms of pre-eclampsia including headache, abdominal pain, peripheral oedema and breathlessness
- Examination for signs of pre-eclampsia including abdominal palpation for liver tenderness, peripheral oedema, peripheral reflexes and clonus, and auscultation of the chest for evidence of pulmonary oedema.
- Observations to include at least 2 blood pressure readings 15 minutes apart, pulse, respiratory rate and oxygen saturations on air.
- Urinalysis. If at least 1+ of protein, then send PCR. If any blood or leucocytes also present send for MSU as well

- Bloods for FBC, U&E, LFT, G&S. DO NOT send urates as these are not specific enough to change management.
- CTG at initial assessment only.
- Arrange for serial ultrasound scanning if not already having serial scans.
- Antihypertensive therapy should be commenced if blood pressure is persistently >140/90. Labetalol 200mg (bd for mild, tds for moderate) (women should be informed of the need to monitor for hypoglycaemia in the postnatal period for the infant) OR nifedipine m/r 10mg. (The recommended first line agent is currently being explored as part of the Giant Panda Trial).
- Calculate the risk of adverse maternal outcome using fullpiers at https://pre-empt.bcchr.ca/evidence/fullpiers
  Note this does not calculate the risk of adverse fetal outcomes.
- Admit for surveillance for approximately 24 hours unless the woman is asymptomatic with mild hypertension (140-149/90-99) and only 1+ of protein, with easy access back to the hospital. This is because pre-eclampsia can rapidly escalate in severity.
- Consider steroids if <34/40 gestation.
- Recalculate the VTE (Venous thromboembolism) score.

3.4 Ongoing surveillance

In patient management depends on many variables. Reasons to continue inpatient management include:

- Symptomatic of pre-eclampsia
- Abnormal blood test, esp plts < 150, ALT > 70 and Cr > 90
- Severe pre-eclampsia ie blood pressure >160/110
- Concerns about fetal wellbeing such as abnormal dopplers
- PCR > 100mg
- Fullpiers score of more than 10%

During any admission in the antenatal period women with pre-eclampsia should have as a minimum 4 hourly blood pressure, and daily urinalysis. Where blood pressure is raised above the targets then a review should occur by an obstetrician within the hour, with a full clinical assessment (including reflexes) and a review of medication and its dosage / frequency. Verbal Orders for medication should be followed up with a review within the same time period.

For outpatient monitoring women should live within a reasonable distance of the hospital with easy access to transport in (not driven by the patient). They should also be aware of concerning symptoms to report, and agree to come for increased surveillance. Women should be seen on alternate days by the community midwife for blood pressure and urinalysis, and twice a week by the antenatal day assessment unit for blood tests (FBC, U&E, LFT). CTGs are not required unless there are other concerns.). Every visit to a midwife or obstetrician MUST have a blood pressure check AND urinalysis. Where a urine specimen is not immediately available then the woman should remain until one is provided if in hospital, or be visited again the same day if being checked in the community. If bp is above 140/90 in the community she should

be referred in for further assessment to AAU. If proteinuria levels increase on dipstick, then a review in the antenatal assessment unit is advised with repeat investigations. Women should be booked under consultant led care and be seen with growth scans.

Appendix 3 summarises Management.

3.5 Delivery and Intrapartum Care

Women should be offered induction of labour from 37/40 if stable. Decisions to offer delivery before 37/40 gestation should be made by a Consultant in discussion with the woman. All women should be advised to labour on the consultant led unit and have continuous CTG monitoring.

Intrapartum women should continue antihypertensive therapy, and have their blood pressure measured hourly. Bloods should be taken if not done in the past 24 hours, and in addition a clotting and G&S should be taken in case regional anaesthesia is required. Care should be taken with intravenous fluids to avoid fluid overload.

Active management of the third stage with syntocinon is advised. Ergometrine should be avoided in these women as it increases the blood pressure further.

3.6 Post Natal Care

Whilst in hospital blood pressure should be monitored four times a day. Anti-hypertensive medication may need to be reduced, especially if the blood pressure falls below 130/80. Bloods for FBC, U&E and LFT should be checked at 48 hours post delivery.

For discharge women should be well with normal or improving blood tests. Once discharged they should have alternate day blood pressure measurements. If in the community, the blood pressure is >150/100 then medical review is advised.

3.7 Post Natal Onset of pre-eclampsia

Pre-eclampsia can develop post delivery. Proteinuria can be difficult to measure in these circumstances as there is contamination with lochia. Bloods should be taken for FBC, U&E and LFTs. Antihypertensives should be commenced if the blood pressure is more than 150/100. Post-natal consider enalapril (5mg once daily up to maximum of 40mg daily) or nifedipine M/R (10-20 mg od-bd) as first line therapy. Second line includes a combination of these 2 drugs or atenolol (25 – 50mg daily).

5.0 Research

Much of pre-eclampsia is poorly understood and research frequently looks at aspects of pre-eclampsia management where there is debate or new understanding. Clinicians should be aware of current research projects within

the Health Board, and highlight eligible women to the research midwives for further discussion, where clinically appropriate.

Appendix 1

Chronic Hypertension (or before 20/40)

Antenatal

- Consultant led care
- Start Aspirin 150mg
- Review antihypertensives, advise Labetalol or Nifedipine
- If proteinuria check PCR and U&Es
- If new diagnosis check glucose, TFT, calcium, U&Es, total and HDL Cholesterol, 12lead ECG, Renal scan
- Serial growth scans
- Frequency of visits depends on blood pressure control
- Aim bp 135/85

Intrapartum

- IOL >39/40 if well controlled and normal growth
- Continue normal antihypertensives
- Continuous CTG in established labour
- Hourly bp in established labour

Post Natal

- Change methyldopa within 2 days
- Can change to prepregnancy medication unless breastfeeding when should avoid diuretics and Angiotensin II receptor blockers.
- Bp measurements daily for 2 days, and then once between day 3 and 5
- GP review 6-8 weeks

Appendix 2

Management of Gestational Hypertension

	Mild GH	Moderate GH	Severe GH
Definition	Bp 140-149/90-99 No significant protein	Bp 150-159/100-109 No Significant protein	Bp >160/110 No Significant Protein
History	All women should be assessed for risk factors for pre-eclampsia, and for symptoms of pre-eclampsia		
Examination	All women should be assessed for signs of pre-eclampsia including abdominal tenderness, peripheral oedema and reflexes.		
Urine	All women should have urinalysis. If 1+ or more of protein send PCR		
Blood Tests	All women should have FBC, U&E, LFT at first presentation		
CTG	FH should be auscultated but CTG is NOT required unless other concerns		CTG should be performed
Scan	All women require serial growth scans if not already being undertaken		
Medication	Labetalol 200mg bd or nifedipine M/R 10mg bd	Labetalol 200mg tds or nifedipine M/R 10mg bd	Labetalol 200mg qds or nifedipine M/R 20mg bd
Admission to ward	No	No	Yes
Criteria for Home	Well, asymptomatic of pre-eclampsia, at least 1 hour post therapy		Asymptomatic of PET, Bp below 140/90 for more than 4 hours post therapy
Follow up	Weekly ADAU	Twice weekly (one with CMW, one with ADAU)	
ADAU Tests	Bp, Urine, Bloods CTG only required if other concerns		
ANC	With serial growth scans		
IOL	Consider between 37 and 40 weeks gestation depending on severity of GH, growth and womans wishes		

Appendix 3

Management of suspected pre-eclampsia

	Mild PET	Moderate PET	Severe PET
Definition	Bp 140-149/90-99 1+ or more protein	Bp 150-159/100-109 1+ or more protein	Bp >160/110 1+ or more protein
History	All women should be assessed for risk factors for pre-eclampsia, and for symptoms of pre-eclampsia		
Examination	All women should be assessed for signs of pre-eclampsia including abdominal tenderness, peripheral oedema and reflexes, Chest auscultation and oxygen saturations.		
Urine	All women should have urinalysis. If 1+ or more of protein send PCR. If blood or leucocytes also send MSU		
Blood Tests	All women should have FBC, U&E, LFT at first presentation		
CTG	CTG should be performed		
Other	VTE score and FullPIERS score		
Scan	All women require serial growth scans if not already being undertaken		
Medication	Labetalol 200mg bd or nifedipine M/R 10mg bd	Labetalol 200mg tds or nifedipine M/R 10mg bd	See Severe Pre-eclampsia Guideline
Admission to ward	Yes unless Aysymptomatic and 1+ protein	Yes	Admit to HDU
Criteria for Home	Well, asymptomatic of pre-eclampsia, PCR<100, bloods normal, easy access to return, FullPIERS <10%		
Follow up	Twice weekly in ADAU for bloods (FBC U&E LFT) with CMW alternate days for bp and urinalysis		
ADAU Tests	Bp, Urine, Bloods CTG only required if other concerns		
ANC	With serial growth scans		
IOL	Advice induction after 37/40		

References

Hypertension in Pregnancy. Payne, J. Jan 2016 https://patient.info/doctor/hypertension-in-pregnancy (accessed 26/6/19)

BHF CVD statistics for Wales Factsheet, April 2019 https://www.bhf.org.uk/what-we-do/our-research/heart-statistics (accessed 3/7/19)

ACE Inhibitors and Angiotensin II Receptor Antagonists: not for use in pregnancy Drug Safety Update Dec 2007; Vol 1 Issue 5: 8 https://www.gov.uk/drug-safety-update/ace-inhibitors-and-angiotensin-ii-receptor-antagonists-not-for-use-in-pregnancy (accessed 3/7/19)

Action on Pre-eclampsia website https://www.action-on-pre-eclampsia.org.uk (access between 26/6/19 and 8/7/19)

Hypertension in pregnancy: diagnosis and management. NICE guideline NG133 June 2019 https://www.nice.org.uk/guidance/ng133/chapter/recommendations

Hypertension in adults: diagnosis and management. NICE guideline CG127 Nov 2016 https://nice.org.uk/guidance/cg127/chapter/1-guidance

BMJ Best Practice, gestational hypertension, epidemiology https://bestpractice.bmj.com/topics/en-gb/663/epidemiology (accessed 9/7/19)

Maternity Services

Checklist for Clinical Guidelines being Submitted for Approval

Title of Guideline:	Hypertension in Pregnancy (Chronic, Gestational, and Mild-Moderate Pre-eclampsia)
Name(s) of Author:	Louise-Emma Shaw
Chair of Group or Committee approving submission:	Antenatal Forum
Brief outline giving reasons for document being submitted for ratification	Update of expired guideline
Details of persons included in consultation process:	Antenatal forum
Name of Pharmacist (mandatory if drugs involved):	
Issue / Version No:	2
Please list any policies/guidelines this document will supercede:	Pregnancy, Hypertensive Disorders.
Date approved by Group:	January 2023
Next Review / Guideline Expiry:	January 2026
Please indicate key words you wish to be linked to document	Hypertension, pre-eclampsia
File Name: Used to locate where file is stores on hard drive	