

# Hypertension in Pregnancy and Postpartum

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## Red Flags

- New onset hypertension after 20 weeks gestation, including the early postpartum period
- Headache, vomiting, or visual disturbance
- Upper abdominal or retrosternal pain
- Rapid development of generalised oedema

## Background – About Hypertension in Pregnancy and Postpartum

- Hypertension is a leading cause of perinatal morbidity and mortality.
- Defined as systolic blood pressure (BP)  $\geq$  140 mmHg, or diastolic BP  $\geq$  90 mmHg, confirmed on at least 2 measurements.
- Patients with hypertension in pregnancy require specialist obstetric care.
- Essential or chronic hypertension is diagnosed before pregnancy, or before 20 weeks.
- Pre-eclampsia begins after 20 weeks gestation and usually takes the form of high blood pressure and abnormal kidney function, but can also involve other organs, such as the liver, blood and brain. Treatment is essential to decrease maternal mortality from severe hypertension, e.g. stroke, heart failure, and renal failure.

## Assessment

1. At first antenatal consult, measure blood pressure and check all patients for **risk factors for developing pre-eclampsia**.

### **Risk of pre-eclampsia**

- *High risk:*
  - *History of pre-eclampsia, especially if early onset (before 34 weeks)*
  - *Systemic lupus erythematosus or antiphospholipid syndrome*
  - *Chronic kidney disease*
  - *Hypertension*
  - *Type 1 or type 2 diabetes*
- *Moderate risk if > 1 of:*
  - *Aged  $\geq$  40 years*
  - *BMI of  $\geq$  35 at first visit*
  - *Family history of pre-eclampsia in first-degree relative*
  - *First pregnancy*
  - *Multiple pregnancy*
  - *> 10 years since previous pregnancy*

Some specialist obstetric imaging groups and genetic services offer [screening for early onset pre-eclampsia](#), a condition that affects 0.3% of women and requires delivery before 34 weeks. This can be performed at the same time as combined first trimester screening and is estimated to detect up to 8 out of 10 pregnancies at risk of early pre-eclampsia.

2. At each antenatal visit (after 20 weeks):
  - Check blood pressure (BP) using a **manual** sphygmomanometer with an appropriately sized cuff at heart level, with patient sitting with feet flat on the floor. For diastolic BP, if Korotkoff sound 5 (K5 – complete disappearance of sounds) is absent, K4 (muffling) should be accepted.
  - ask about **symptoms** of pre-eclampsia.

#### **Symptoms of pre-eclampsia**

- *Neurological symptoms – Headache, visual disturbance*
  - *Oedema – may be present in normal pregnancy and pre-eclampsia can occur without oedema*
  - *Epigastric pain or tenderness*
  - *Nausea or vomiting*
  - *Chest pain*
  - *Shortness of breath (pulmonary oedema)*
  - *General malaise*
  - *Seizures (eclampsia)*
3. If blood pressure elevated (systolic blood pressure (BP)  $\geq$  140 mmHg, or diastolic BP  $\geq$  90 mmHg), confirmed on at least 2 measurements:
    - perform a cardiovascular examination for any patient with newly diagnosed hypertension.
    - check for signs of pre-eclampsia:
      - Peripheral oedema
      - Hyperreflexia and clonus
  4. Assess fetal movements and growth. See [Antenatal - Second and Third Trimester Care](#).
  5. Arrange **investigations** if borderline or elevated blood pressure or signs/symptoms of pre-eclampsia.

#### **Investigations for pre-eclampsia**

- *Spot urine – perform dipstick for proteinuria. If protein on dipstick 1+ or more:*
  - *request protein:creatinine ratio on MSU.*
  - *a protein to creatinine ratio (PCR) over 30 mg/mmol is consistent with pre eclampsia.*
- *FBE, electrolytes and creatinine (UEC), LFT, urate:*
  - *Raised transaminases >70 units/L are significant*
  - *Haematological abnormalities include, thrombocytopaenia < 100 x 10<sup>9</sup>/L, DIC, haemolysis*
  - *Urate may be raised*
  - *Any rise in creatinine is significant*
- If no previous diagnosis or investigation for hypertension, consider ECG and renal ultrasound.

6. Clarify the diagnosis:

- **Chronic hypertension** (pre-existing essential hypertension)
  - *Raised pre-conception and/or initial booking blood pressure.*
  - *Indicates a higher risk of pre eclampsia.*
  - *Associated increased risk of preterm birth, fetal growth restriction, placental abruption, and stillbirth.*
  - *Includes patients with previous history of hypertension.*
  - *Often detected < 20 weeks gestation.*
  - *This is a challenging diagnosis to make in women whose blood pressure is unknown pre-pregnancy or in the first trimester.*
  
- **Gestational hypertension, or previous gestational hypertension**
  - *New onset hypertension > 20 weeks in the absence of proteinuria or other signs of pre eclampsia.*
  - *These patients need to be closely monitored for the development of pre eclampsia.*
  - *Gestational hypertension that develops near term is associated with little increase in the risk of adverse fetal outcomes.*
  - *Resolves within 3 months postpartum.*
  
- **Pre-eclampsia**
  - *Multi-system disorder – characterised by hypertension (usually presents > 20 weeks gestation), and involvement of 1 or more organ systems including renal, haematological, neurological or others.*
  - *Hypertension is commonly, but not always, the first manifestation.*
  - *Urgent assessment is required.*
  - *Treatment is essential to decrease maternal mortality from severe hypertension such as stroke, heart failure, and renal failure.*
  - *While it is usually diagnosed antenatally, pre-eclampsia can occur in the early post-partum period. About 44% of eclamptic seizures occur in the post-partum period with eclampsia reported up to 4 weeks postpartum.*

## Management

1. Refer patient for [immediate obstetric assessment](#), even with mild blood pressure elevation, if:
  - neurological symptoms (headache, visual disturbance, vomiting/nausea).
  - significant epigastric or right upper quadrant (liver infarction) pain.
  - proteinuria  $\geq 1$  plus protein on dipstick or 30mg/mmol on PCR.
  - abnormal urea, electrolytes, creatinine (UEC), LFT, or platelets.

Note: [Statewide Obstetric Referral Criteria](#) exist for referral to Level 6 public hospital maternity service for early or severe pre-eclampsia.

2. Request [urgent maternity referral](#) if new onset hypertension, and gestation > 20 weeks with no other signs or symptoms of pre-eclampsia.
3. Manage according to stage:

## Preconception

1. Advise patients that antihypertensives will need switched to **safe treatment options** as soon as pregnancy is confirmed.

### **Safe treatment options during pregnancy**

- First-line therapy – **Methyldopa** or **Labetalol**

#### **Labetalol**

- Contraindicated in asthma.
- Side-effects include bradycardia, bronchospasm, headache, nausea.
- Dose: Commence with 100 mg three times daily.
- Can increase up to 400 mg three times daily.

#### **Methyldopa**

- Avoid if history of depression. After birth, use an alternative antihypertensive if required.
- Common side-effects include dry mouth, sedation, and blurred vision.
- Monitor LFTs monthly.
- Dose: commence with 250 mg orally three times daily. Can increase up to 750 mg three times daily.
- After birth, consider using an alternative antihypertensive if required.

- Second-line therapy – **Nifedipine SR**

#### **Nifedipine SR**

- Seek [obstetric advice](#) before commencing.
- Contraindicated in aortic stenosis.
- Side-effects include headache, flushing, tachycardia, peripheral oedema, and constipation.
- Dose: 20 to 60 mg orally twice daily.

2. Aim for BMI in the normal range to improve pregnancy outcomes.
3. Counsel patient about the risk of developing pre-eclampsia with pre-existing hypertension.

When pregnant they will be advised to commence low dose aspirin and calcium for **prevention of early pre-eclampsia**.

#### **Prevention of early pre-eclampsia**

- Commence low dose aspirin 150 mg at night from 12 weeks and before 16 weeks of pregnancy, unless contraindicated (e.g., allergy, active peptic ulcer disease, or gastrointestinal bleeding).
- If risk is recognised after 16 weeks, aspirin can be commenced, however current evidence suggests this may be less effective compared to commencement prior to 16 weeks.
- Aspirin should be ceased at 36 weeks.
- Recommend adequate dietary calcium intake. Calcium supplement can be considered if dietary calcium does not meet RDI of 1000 mg per day.

## Pregnancy

1. Refer for [immediate obstetric review](#), even with mild blood pressure if:
  - neurological symptoms (headache, visual disturbance, vomiting/nausea).
  - significant epigastric or right upper quadrant (liver infarction) pain.
  - proteinuria  $\geq 1$  plus protein on dipstick or 30mg/mmol on PCR.
  - abnormal urea, electrolytes, creatinine (UEC), LFT, or platelets.
2. Request [urgent maternity referral](#) if new onset hypertension (sBP  $\geq 140$  mmHg and/or dBP  $\geq 90$  mmHg), and gestation  $> 20$  weeks with no other signs or symptoms of pre-eclampsia.
3. If chronic hypertension or previous early onset pre-eclampsia, refer for early [pregnancy booking](#). Ensure history of hypertension and current management is clearly documented on the referral to allow early triage to specialty obstetric care.
4. If **risk factors for pre-eclampsia**, commence low dose aspirin (150 mg) at night and calcium for **prevention of pre-eclampsia**.
5. If chronic hypertension, stop current antihypertensives if not safe in pregnancy (e.g. angiotensin converting enzyme inhibitors (ACEI) or angiotensin II receptor antagonists (ARAs). As BP normally falls in early pregnancy it may be possible to discontinue antihypertensive treatment, however close surveillance for hypertension is recommended.
6. If treatment for chronic or gestational hypertension is required:
  - use **safe treatment options**.
  - discuss target BP with obstetric team (usually sBP 130 to 140 mmHg and dBP 80 to 90 mmHg).
  - if BP above target levels, request [urgent maternity referral](#).
  - if severe hypertension (sBP  $\geq 160$  mmHg with or without dBP  $\geq 110$  mmHg), refer for [immediate obstetric assessment](#) (even if no signs or symptoms of pre-eclampsia).

## Postpartum

1. Manage according to hospital discharge summary. Women with pre-eclampsia should be discharged with a clear plan for monitoring blood pressure and slowly tapering medication.
2. Medications considered safe in the postpartum period and compatible with breast feeding include enalapril, labetalol and nifedipine.
3. Start to reduce medication at 2 weeks postpartum. Aim for BP close to normal non-pregnant range.
4. Review weekly and slowly withdraw medications, starting with most frequent medications first. Pre eclampsia can take up to 3 months to resolve. Avoid hypotension.
5. Check blood pressure 2 weeks after medication has ceased. Investigate persisting proteinuria for underlying renal disease.
6. If raised blood pressure persists longer than 3 months, consider a diagnosis of essential hypertension and manage accordingly. Consider [cardiology referral](#) for advice, e.g. if planning

subsequent pregnancy.

7. Advise patient of:
  - increased lifetime risk of cardiovascular disease after pre eclampsia. Evaluate cardiovascular risk factors.
  - increased risk of pre eclampsia in subsequent pregnancies.
8. For subsequent pregnancy:
  - request early [pregnancy booking](#) if previous severe or early onset pre-eclampsia.
  - commence low dose aspirin 150 mg once daily at night from 12 weeks.

## Referral

- Refer for early [pregnancy booking](#) if:
  - chronic hypertension.
  - previous early onset pre-eclampsia.
- Refer for [immediate obstetric review](#), even with mild blood pressure if:
  - neurological symptoms (headache, visual disturbance, vomiting/nausea).
  - significant epigastric or right upper quadrant (liver infarction) pain.
  - proteinuria  $\geq 1$  plus protein on dipstick or 30mg/mmol on PCR.
  - abnormal urea, electrolytes, creatinine (UEC), LFT, or platelets.
- Refer for [immediate obstetric review](#) if uncontrolled or severe hypertension (sBP  $\geq 160$  mmHg with or without dBP  $\geq 110$  mmHg), even if no signs or symptoms of pre-eclampsia.

Note: [Statewide specialist obstetric referral criteria](#) for referral to a level 6 public hospital service apply for severe or early pre-eclampsia.

- Request [urgent maternity review](#) if:
  - new onset hypertension (sBP  $\geq 140$  mmHg and/or dBP  $\geq 90$  mmHg), and gestation  $> 20$  weeks with no other signs or symptoms of pre-eclampsia.
  - blood pressure above target treatment levels.
- If raised blood pressure lasts longer than 3 months postpartum, consider [cardiology referral](#).

## Information

### For health professionals

#### Further information

Better Safer Care – Maternity ehandbook: [Hypertension in Pregnancy: Postpartum Management](#)

## For patients

The Royal Women's Hospital:

- [Explaining Preeclampsia](#)
- [High Blood Pressure and Pre-eclampsia](#)

## References

### Select bibliography

- [Hypertension in pregnancy: diagnosis and management](#). UK: National Institute for Health and Care Excellence (NICE); 2019.
- [The SOMANZ Guideline for the Management of Hypertensive Disorders of Pregnancy](#). Sydney: Society of Obstetric Medicine of Australia and New Zealand (SOMANZ); 2014.
- [Hypertensive disorders in pregnancy, pre-eclampsia, eclampsia](#). Victoria: Monash Health; 2019.

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Last updated: June 2020