# Hypertensive disorders in pregnancy

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# Learning objectives Understand different hypertensive disorders in pregnancy Initiate basic investigations and treatment for hypertension in pregnancy and in the postpartum period Implement the current screening strategies for pre-eclampsia and its prevention

















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# Pathophysiology of Pre-eclampsia



In Pre-eclampsia, these changes do NOT occur, resulting in:

Vasoconstriction

Platelet activation with intravascular coagulation – usually local but may be disseminated

Maternal plasma volume contraction

Endothelial dysfunction across a number of organ systems

# **Risk factors**

- Primigravidity
- Previous pregnancy with pre-eclampsia
- Family history of pre-eclampsia
- Multiple pregnancy
- Diabetes
- Pre-existing hypertension
- Renal disease
- Autoimmune disorders
- Antiphospholipid syndrome
- Obesity
- Thrombophilias
- Donor oocyte/donor sperm



### Table 9. Risk factors associated with preeclampsia (216-218)

Risk Factor	Unadjusted Relative Risk [95% CI]	
Nulliparity	2.9 [1.3-6.6]	
Multiple pregnancy	2.9 [1.3-6.6]	
Previous history of preeclampsia	7.2 [5.9-8.8]	
Family history of preeclampsia	2.9 [1.7-4.9]	
Overweight BMI 25-29.9*	1.7 [1.2-2.4]	
Obese BMI >30*	2.7 [1.7-4.4]	
$Age \ge 40$	2.0 [1.3-2.9]	
Systolic BP>130mmHg before 20 weeks	2.4 [1.8-3.2]	
Diastolic BP >80mmHg before 20 weeks	1.4 [1.0-1.9]	
Antiphospholipid syndrome	9.7 [4.3-21.8]	
Pre-existing diabetes	3.6 [2.5-5]	
Other risk factors	Underlying renal disease Chronic autoimmune disease Interpregnancy interval >10 years	





# Assessment of hypertension <20 weeks

- Examination
- Investigations
  - Urinalysis for protein, PCR
  - Micro urine for white and red cells, and casts
  - MSU
  - FBC, UEC, uric acid fasting blood glucose
  - ECG
  - Renal ultrasound
  - Screening for phaeochromocytoma







Drug	Dose	Action	Cls
Labetalol	100-400mg q6-8h	B blocker with alpha vasodilator effect	Asthma, chronic airway disease
Oxprenolol	20-160mgq8h	B blocker	
Clonidine	75-300mcg Q8h	Central alpha2 agonist (as above)	
Methyldopa	250-750mg q8h		Depression
Nifedipine	20-60mg slow release BD	Ca channel antagonist	Aortic stenosis
Hydralazine	25-50mg q8h	Vasodilator	
Prazosin	0.5-5mg q8h	Alpha blocker	



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	Drug	Dose	Route	Frequency	Adverse effects
	Hydralazine	5-10mg Max 30mg Onset 20mins	IV bolus	Repeat every 20minutes	Flushing, headache, nausea, hypotension, tachycardia
	Diazoxide	15-45mg Onset 3-5 mins	IV rapid bolus	Repeat every 5minutes	Flushing Warmth along injection side Hypotension
	Labetalol	20-80mg Max80mg	IV bolus over 2min Maximal effect within 5mins	Repeat every 10min	Bradycardia, hypotension, fetal bradycardia
	Nifedipine	10-20mg tbt Max 40mg	Oral 30-45 minutes	Repeat after 45 minutes	Headache Flushing





### • Deteriorating maternal condition

- Worsening renal or hepatic function
- Neurological symptoms or signs/ eclampsia
- Worsening thrombocytopenia
- Blood pressure not responding to antihypertensive therapies

### • Evidence of fetal compromise

- Abnormal CTG
- Severe or worsening fetal growth restriction
- Abnormal Dopplers

 $Table \ 4. \ Indications \ for \ delivery \ in \ women \ with \ preeclampsia \ or \ gestational \ hypertension$ 

Maternal	Fetal
Gestational age $\geq$ 37 weeks	Placental abruption
Inability to control hypertension	Severe FGR
Deteriorating platelet count	Non-reassuring fetal status
Intravascular haemolysis	
Deteriorating liver function	
Deteriorating renal function	
Persistent neurological symptoms	
Persistent epigastric pain, nausea or vomiting with abnormal LFTs	
Pulmonary edema	

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# **Delivery** - timing

### Table 3. Timing of delivery and gestation of presentation of preeclampsia

Gestation at onset	Previable <23 <sup>6</sup> weeks	24-31 <sup>6</sup> weeks	32-36 <sup>6</sup>	37+0 onwards
Delivery plan	Consult with Tertiary institution: likely to need termination of pregnancy or extreme preterm delivery. High risk patient	Consult and transfer to Tertiary institution: likely to need preterm delivery. Aim to prolong pregnancy where possible	Aim to prolong pregnancy where possible, deliver in institution with appropriate Paediatric care	Plan delivery on best day in best way

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## Postpartum management

- Continue fluid balance
- Repeat biochemistry and platelets
- Avoid NSAIDs
- MgSO4 continued 24 hours postpartum
- Manage BP
  - BP may reach peak 3-4 days
  - Reduce antihypertensive if BP <130/80</p>
  - BP QID
  - ?Enalapril
- DVT prophylaxis





# PET is a long term risk factor for CVD

Table 12: Risk of developing subsequent disease after preeclampsia. (264, 265, 268)

Medical Condition	Relative Risk [95% CI]
Chronic Hypertension	3.70 [2.70-5.05]
Ischaemic Heart Disease	2.16 [1.86-2.52]
Cerebrovascular Disease	1.81 [1.45-2.27]
Peripheral Vascular Disease	1.87 [0.94-3.73]
Deep Vein Thrombosis	1.79 [1.37-2.33]
End Stage Renal Disease	4.3 [3.3-5.6]
Type II Diabetes	1.86 [1.22-2.84]
Elevated TSH	1.7 [1.1-1.7]
All Cancer	0.96 [0.73-1.27]

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 Emphasise increased risk of early onset pre-eclampsia however not abnormal or high risk pregnancy











# Case study 2 – Miss G On arrival at hospital Increasingly unwell, feeling jittery, BP 150-160 / 80-100 Commenced on MgSO4 for prevention of eclampsia, antenatal steroids for fetal lung maturation Formal ultrasound confirmed intrauterine growth restriction (IUGR) Bloods showed deranged LFT and creatinine Proceeded to emergency Caesarean section 24 hours later Bloods normalized with resolution of proteinuria Antihypertensive treatment (enalapril) ceased after 4 weeks



