

## Hypertension in Pregnancy

### Test yourself

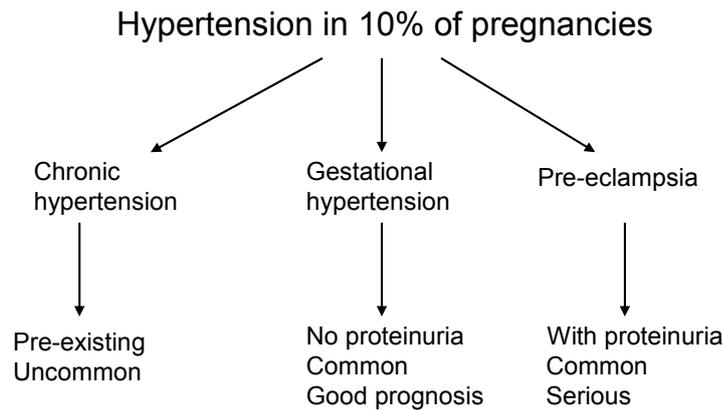
What level of BP would cause you concern?

What are the main causes of hypertension in pregnancy?

What is pre-eclampsia?

What are the complications of pre-eclampsia?

## Hypertension in pregnancy

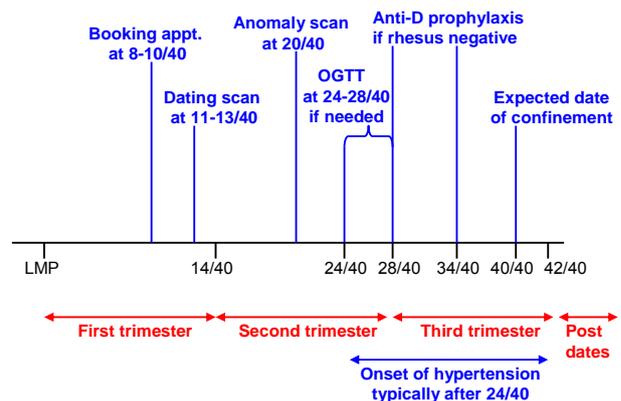


### Chronic hypertension

- Raised BP before 20 weeks or prior to conception
- May be first diagnosed at booking visit
- Uncommon
- Tends to occur in older primigravidae
- One third develop pre-eclampsia so needs careful monitoring

### Gestational hypertension

- BP > or = 140/90
- Presents after 20 weeks
- Usually resolves within 2 weeks of delivery
- Monitor in day unit for pre-eclampsia
- Good prognosis for mother and fetus



### Pre-eclampsia

Or “gestational proteinuric hypertension”  
Or “pre-eclamptic toxæmia (PET)”

#### Student report: typical case

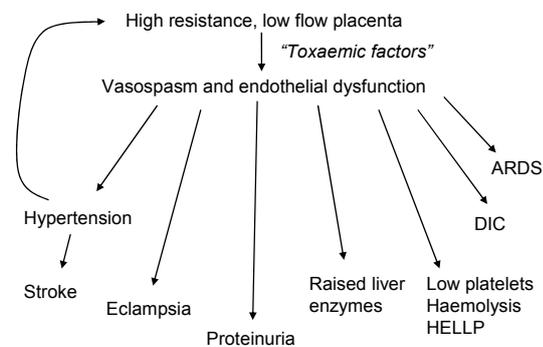
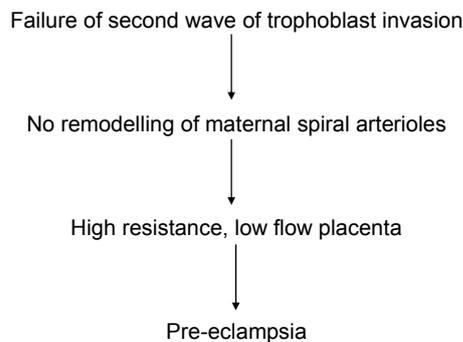
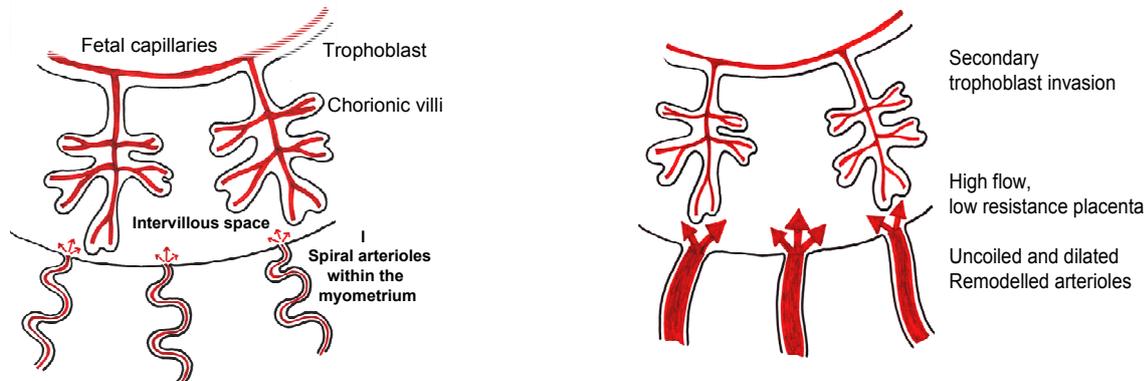
History and examination of a small for dates pregnant woman presenting with high blood pressure and proteinuria at 32 weeks. Had to examine a plastic model of abdomen. Asked questions about pre-eclampsia.

### Pre-eclampsia

- Disease of the placenta
- Resolves within a few days of delivery
- Onset after 20 weeks
- Hypertension first
- Soon followed by proteinuria
- Variable oedema- hands and face as well as ankles (“non-dependent oedema”)

## Normal placentation

- Early blastocyst attachment (day 7)
- Trophoblast invades myometrium forming network of lacunae (week 2)
- Chorionic villi containing fetal capillaries surrounded by maternal blood in intervillous space
- Second wave of trophoblast invasion (weeks 8-18) makes maternal spiral arterioles uncoil and relax- remodelling with loss of muscular walls- to allow high placental blood flow



## Risk factors

- Previous pre-eclampsia- 5% recurrence
- First pregnancy, twin pregnancy
- Anti-phospholipid syndrome
- Chronic hypertension, renal disease
- Obesity, smoking
- Family history

## Treatment principles

- Treat BP to prevent stroke: target level <160/90
- Treat until 6 weeks post partum
- Does not alter the underlying disease
- May become a multi-system disorder
- Delivery of the placenta is key

## Drugs commonly used

- Labetalol
- Methyl dopa
- Nifedipine
- Not ACEI (risk of congenital malformations)
- Not diuretics (reduce maternal plasma volume)

### Four red flag symptoms

- Headache
- Visual disturbance
- Epigastric or RUQ pain (hepatic capsule distension or infarcts)
- Breathlessness (pulmonary oedema due to adult respiratory distress syndrome- ARDS)

### Four red flag signs

- Peri-orbital oedema
- Hyper-reflexia
- Clonus
- Fits (eclampsia)



### Diagnosis

- Hypertension  $\geq 140/90$  mmHg
- Proteinuria  $>300$ mg/ 24 hours
- Equivalent to protein creatinine ratio (PCR) of  $30$ mg/mmol
- Approx equivalent to  $2+$  on dipstick
- In the absence of UTI

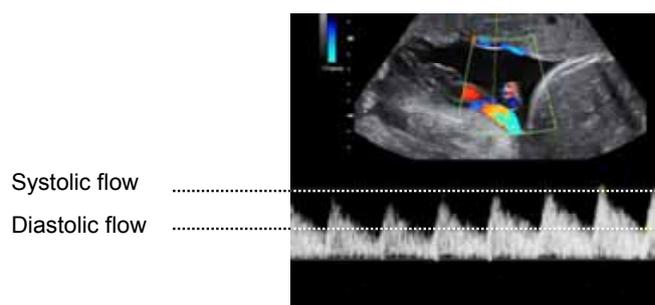
### Monitor

- Symptoms, BP and urine
- Fetal growth
- Umbilical artery blood flow
- “Pre-eclampsia bloods”

### “Pre-eclampsia bloods”

- FBC looking for low platelets
- Low Hb may be due to haemolysis in HELLP syndrome
- U&E; raised urea and creatinine
- Urate: raised level typical
- Raised AST

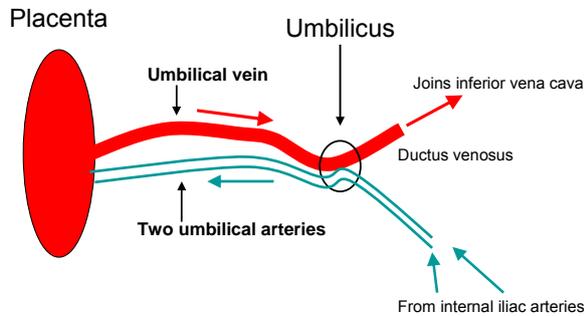
### Umbilical artery blood flow



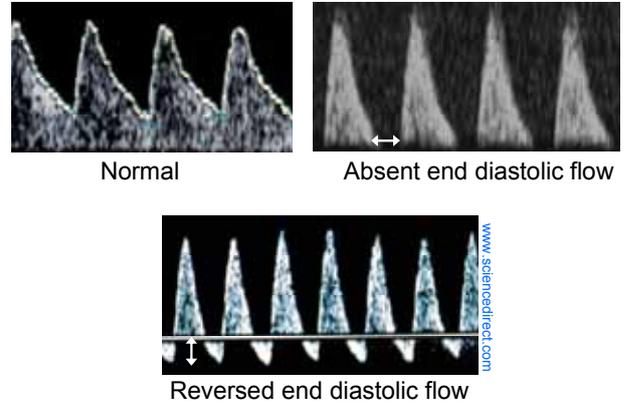
### Umbilical artery flow

- The two arteries take blood from the fetus back to the placenta
- Diastolic flow reflects placental resistance
- Concern if absent end diastolic flow in umbilical artery
- There may be increased middle cerebral artery flow- “brain sparing” effect

### Fetal circulation



### Increasing placental resistance



### Timing of delivery

- Aim for best chance of fetal survival ie 34 weeks or later if possible
- Use maternal steroids up to 34 weeks
- Prolonging delivery by 24 hours for maternal steroid injection reduces fetal mortality by 50%
- Reduces risk of fetal respiratory distress and intraventricular haemorrhage
- High BP, impaired renal or hepatic function and fetal distress may prompt early c-section

### Complications: fetal

- Fetal growth restriction
- Intra-uterine death
- Premature delivery (iatrogenic)

### Complications: maternal

- Placental abruption
- Eclampsia
- HELLP
- Multi-organ failure / DIC
- Death

### Eclampsia

- Tonic clonic seizures
- Before, during or soon after delivery
- Magnitude of BP rise predicts risk of stroke but not of seizures
- Obstetric emergency

**How would you manage a woman with eclampsia two hours post partum?**