



SCGH ED Obstetric and Gynaecological Emergency Guidelines

Hypertension in Pregnancy

Definition

1. Systolic BP greater than or equal to **140mmHg** and/or
2. Diastolic BP greater than or equal to **90mmHg**

Severe Hypertension in pregnancy

1. SBP greater than or equal to 170mmHg and/or
2. DBP greater than or equal to 110mmHg

This represents a level of BP above which the risk of maternal morbidity and mortality is increased.

Gestational hypertension

- New onset of hypertension arising after 20 weeks gestation
- No additional maternal or fetal features of preeclampsia
- Resolves within 3 months postpartum

Chronic hypertension

- Essential
 - BP greater than 140/90 mmHg preconception or prior to 20 weeks without an underlying cause
 - Or
 - BP less than 140/90 entering pregnancy on antihypertensives
- Secondary Hypertension due to:
 - chronic kidney disease
 - renal artery stenosis
 - systemic disease with renal involvement (e.g. DM, SLE)
 - endocrine disorders (e.g. pheochromocytoma, Cushing's syndrome and primary hyperaldosteronism)
 - coarctation of the aorta

Indications for transfer to KEMH

- All preterm pregnancies with severe pre eclampsia, eclampsia or HELLP syndrome
- All pregnancies complicated by eclampsia or HELLP syndrome
- Any pregnancy in which the health care provider believes his/her health care facility would be unable to manage the complications of hypertension in pregnancy



Pre-eclampsia

Multisystem disorder with hypertension and involvement of one or more organ systems and/or the fetus.

Diagnosis of pre-eclampsia is made when

1. Hypertension arises after 20 weeks gestation
2. Accompanied by one or more of the following signs of organ involvement:
 - Renal involvement
 - Significant proteinuria – a spot urine protein / creatinine ration > 30mg / mmol
 - Serum or plasma creatinine greater than or equal to 90 micromol/L or
 - Oliguria < 80mL / 4 hours
 - Haematological involvement
 - Thrombocytopenia <100,000/ μ L
 - Haemolysis : schistocytes or red cell fragments on blood film, raised bilirubin, raised lactate dehydrogenase > 600mIU/L, decreased haptoglobin
 - DIC
 - Liver involvement
 - Raised transaminases
 - Severe epigastric or right upper quadrant pain
 - Neurological involvement
 - Convulsions (Eclampsia)
 - Persistent visual disturbances (photopsia, scotomata, cortical blindness, posterior reversible encephalopathy syndrome, retinal vasospasm)
 - Persistent, new headache
 - Stroke
 - Pulmonary oedema
 - Fetal growth restriction (FGR)

Indications for delivery in women with pre-eclampsia or gestational hypertension:

- Maternal:
 - Gestational age > 37 weeks
 - Inability to control HTN
 - Deteriorating platelet count / liver function / renal function
 - Placental abruption
 - Persistent neurological symptoms
 - Eclampsia
 - Persistent epigastric pain, nausea or vomiting with abnormal LFTs
 - APO
- Fetal:
 - Severe fetal growth restriction
 - Non-reassuring fetal status

In severe pre-eclampsia delivery must always be preceded by:

- Control of severe hypertension and seizures
- Attention to fluid status

- Correction of coagulopathy

Investigations

The following investigations should be performed in all women with new onset hypertension after 20 weeks gestation:

- Spot urine Protein Creatinine Ratio
- FBP
- UEC
- LFTs
- Ultrasound assessment of fetal growth, amniotic fluid volume and umbilical artery Doppler assessment (if US not available then discuss with KEMH for transfer)

If features of preeclampsia are present, additional investigations should include:

- Urinalysis for protein and urine microscopy on a carefully collected MSU
- If there is thrombocytopenia or a falling haemoglobin, investigations for disseminated intravascular coagulation and / or haemolysis are indicated:
- AST, ALT, LDH, uric acid

Emergency Treatment of Hypertension in Pregnancy

Antihypertensive treatment should be commenced in all women with SBP ≥ 170 mm Hg or a DBP ≥ 110 mm Hg because of the risk of intracerebral haemorrhage and eclampsia.

Medication	Dose	Route	Onset of Action
Nifedipine *1 st Agent of choice	10mg IR tablet (Max 40mg)	Oral	30-45 mins. Repeat after 45 mins if response inadequate
Labetalol *Agent of choice for IV administration	20-80mg (Max 80mg)	IV bolus over 2 mins Repeat every 10mins PRN	Max effect usually within 5 mins
Hydralazine	5-10mg (max 20mg)	IV bolus over 2 mins	20 mins May be repeated after 20 mins

****Note: BP should not be allowed to fall below a level of 140/80**



Management of Eclampsia

1. Resuscitation

- IV midazolam 0.1-0.2mg/kg IV if seizure is prolonged
- IV magnesium Sulphate is agent of choice
 - Loading dose 4g over 20 mins
 - Use pre-packaged bags from obstetric trolley **8g MgSO₄ in 100ml**
 - Rate 150ml/hr for 20mins = 50ml

(In patients with known renal disease or myasthenia gravis phenytoin is the anti-seizure medication of choice. Dose: 15mg/kg at infusion rate 40mg/min)

2. Prevention of further seizures

- Continue magnesium sulphate infusion
- Maintenance infusion 1g per hour = 12.5ml/hr
- Therapeutic serum magnesium range 1.7 – 3.5 mmol/L

3. Treatment of recurrent seizures

- Administer further 2-4g of magnesium sulphate given over 10 mins
- Rate 300ml/hr = 25ml over 10mins

4. Control of hypertension

- Aim for BP below 160/100
- See Hypertension management guidelines for drug therapy
- Consider GTN infusion
- Insert arterial line

5. Delivery

- Contact KEMH Consultant to arrange transfer if stable or delivery at SCGH if the patient is unstable.

Important points during administration of magnesium sulphate:

Prior to commencing magnesium sulphate infusion ensure:

- Deep tendon reflexes are present
- Respirations are more than 12/min
- Urine output >100ml last 4 hours
- Document baseline set vital signs

Calcium gluconate 1g in 10ml (2.2 mmol Calcium in 10ml) must be available at all times for treatment of MgSO₄ toxicity.

If Magnesium sulphate toxicity occurs give 1 amp (1g in 10mls) IV slowly over 3-10mins

Observations of the patient every 15 mins:

- Patella reflexes
 - If deep tendon reflexes are absent cease the infusion and collect blood for serum magnesium levels
- Respiratory rate
 - If less than 12/min cease infusion
 - Magnesium toxicity can cause respiratory arrest
- Blood pressure
- Urine output (monitor hourly)
- Maintain strict fluid balance chart

Signs of magnesium toxicity:

- Nausea, hot flushes, weakness
- Slurred speech, confusion, blurred vision
- Loss of deep tendon reflexes
- Hypotension
- Respiratory depression with RR <12
- Respiratory arrest
- Cardiac arrhythmia (wide QRS, increased PR interval, Prolonged QT interval, heart block)
- Chest pains
- Oliguria (Urine output less than 25ml/hr)

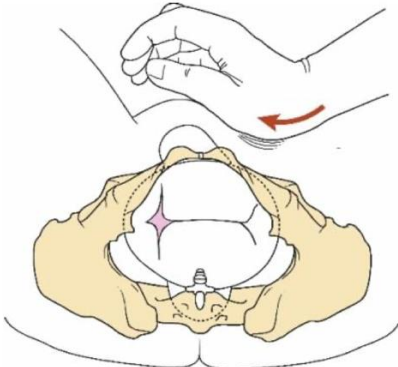
If signs of magnesium toxicity are present, cease the infusion and administer calcium gluconate.



Shoulder Dystocia

Maternal pushing should be discouraged until shoulder displacement is achieved as it may lead to further impaction of the shoulders

Birth manoeuvres (first line)

McRobert's manoeuvre- perform first Position the woman in the Mc Robert's position: • Flex and abduct the maternal hips • Position the thighs up onto her abdomen This position is successful in up to 90% of cases of SD	 Image © North Metropolitan Health Service 2021
Suprapubic pressure Simultaneously, while the woman is placed in the McRobert's position: • Place both hands suprapubically over the posterior aspect of the fetal shoulder with the heel of the hand and apply continuous pressure in a downward lateral motion just above the maternal symphysis pubis. • If continuous pressure is not successful, apply the pressure in a rocking intermittent motion. • Only moderate traction should be applied	 Image © North Metropolitan Health Service 2021

If the above are not successful- (second line manoeuvres)

Rotation of the woman onto all- fours

- Rotation of the woman onto all-fours may also facilitate birth by increasing the pelvic diameters and allowing better access to the posterior shoulder.
- Note: In a woman who is less mobile proceeding with internal manoeuvres first may be more appropriate before considering 'all fours'.

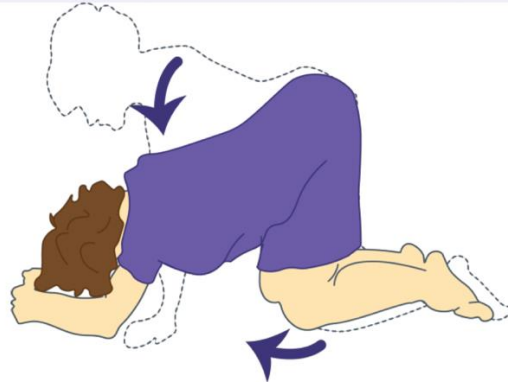


Image © North Metropolitan Health Service 2021

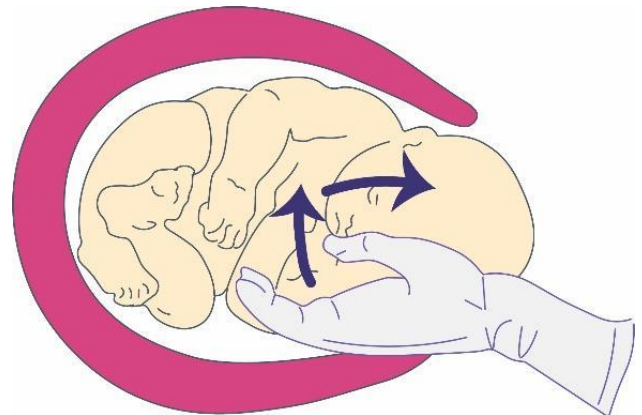
Evaluate the need for episiotomy

Perform an episiotomy to facilitate internal rotational manoeuvres as required.

Shoulder dystocia is a bony impaction, so episiotomy will not release the shoulders.

Deliver the posterior shoulder and arm

- Insert the hand into the vagina along the sacral curve and locate the posterior arm or hand.
- Grasp the fetal wrist or apply pressure to the cubital fossa to flex the elbow in front of the body and remove the forearm in a sweeping motion over the fetal anterior chest wall and fetal face.



Removing the posterior arm shortens the diameter of the fetal shoulders by the width of the arm.

There is a risk of humeral fractures (reported incidence 2-12%) however trauma may reflect the refractory nature rather than the procedure.

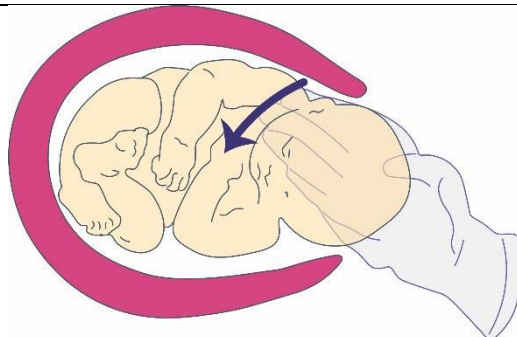


Internal rotational manoeuvres

(Described by Woods and Rubin)

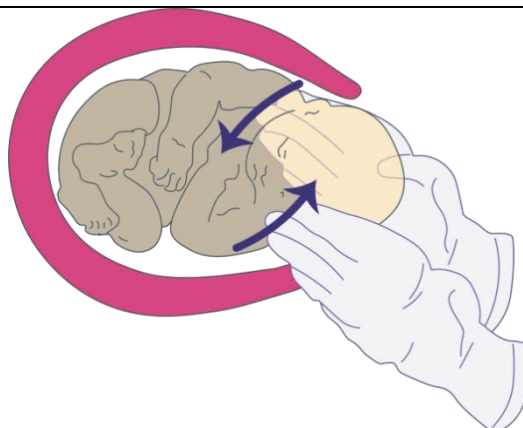
One hand, fingers behind anterior shoulder: Insert the hand into the vagina posteriorly and sweep two fingers up to the posterior aspect of the anterior shoulder and push it towards the fetal chest into the oblique diameter of the pelvis.

- *If this is not successful, move onto the manoeuvre below*



Two hands: While one hand is performing the above, enter the vagina and apply pressure with two fingers to the anterior aspect of the posterior shoulder i.e. maintaining rotation in the original direction.

- *If this manoeuvre is unsuccessful then the accoucheur moves onto the reverse manoeuvre below.*



Reverse direction of posterior shoulder: Apply pressure to the posterior aspect of the posterior shoulder and attempt to rotate it through 180° in the opposite direction to the previous manoeuvre.

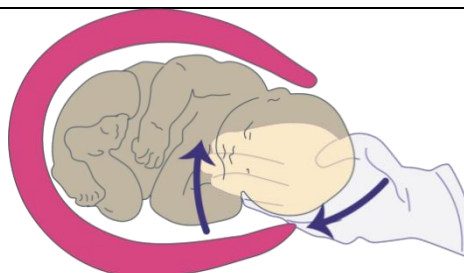


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Repeat

If previous manoeuvres are not successful, try repeating them all.

Key points regarding shoulder dystocia

Use the HELPER mnemonic:

H = Help

E = Evaluate for episiotomy

L = Legs (McRoberts Manoeuvre)

P = Pressure (Suprapubic)

E = Enter the vagina (Internal Manoeuvres)

R = Remove the posterior arm

R = Roll onto all fours

- Throughout these manoeuvres the shoulders must be rotated using pressure on the scapula or clavicle. NEVER ROTATE THE HEAD.
- **Avoid excessive traction at all times.** Strong downward traction or jerking without disimpacting the shoulder is associated with neonatal trauma and brachial plexus injury.
- Avoid fundal pressure. This is associated with high rate of brachial plexus injury, uterine rupture and haemorrhage from potential detachment of fundal placenta.
- Third and fourth degree perineal trauma and PPH are possible complications resulting from shoulder dystocia.



Delivery of a baby in ED

Preparation for the birth of the baby

1. **PPE**
 - a. Wear full face visor
 - b. Plastic apron
 - c. Sterile gloves
2. **Assemble equipment for birth, placing it within easy reach**
3. **Consider:**
 - a. Swabbing downward from urethral orifice to anal area
 - b. Placing drape under woman's buttocks
 - c. Clean pad over anal area

Birth of the baby

1. Encourage the woman to minimise active pushing using gentle verbal guidance. The use of controlled slowed or shallow maternal breathing should be used to birth the baby slowly.
2. Support the perineum with the dominant hand.
3. Apply gentle counter pressure to the fetal head with the non-dominant hand to control the fetal head, allowing progress whilst preventing uncontrolled expulsion.
4. Once the head has birthed, wait for restitution to occur. Note the time the head has birthed.
5. Continue to support the perineum as you provide gentle verbal guidance to the woman to push gently to birth the shoulders. In the event that the shoulders do not deliver spontaneously, remove the dominant hand and apply gentle traction to release the anterior shoulder.
6. Allow the posterior shoulder to be released following the curve of Carus, continuing to protect the perineum.
7. Provide support to the baby's body by moving both hands.
8. Support the baby's body and assist placing the baby on the woman's abdomen/chest (skin-to-skin) if she wishes.
9. Note time of birth.
10. Following delivery of the baby AND the placenta administer 10 units of oxytocin IM.

Post-Partum Haemorrhage Management

Post-partum haemorrhage is defined as a blood loss of 500ml or more during puerperium and severe PPH as a blood loss of 1000ml or more.

Resuscitation:

- Massage atonic fundus and apply pressure to perineal trauma during resuscitation
- (NB: Both may be achieved by bimanual compression)
- Ensure you have bilateral IV access: 2x 16 gauge cannulas and take bloods
- Group and x-match 2 units, FBC, coag profile, ROTEM
- Given 10 units Oxytocin (Syntocinon) by intramuscular injection
- Activate the Massive Transfusion Protocol
- Fluid resuscitate with packed red blood cells (uncrossed O-Negative Blood if necessary)
- Give 1g Tranexamic acid IV
- Insert an arterial line for blood pressure monitoring
- Insert indwelling urinary catheter (IDC)
- Keep the woman warm
- Identify and treat the cause (4Ts):

TONE: Uterine atony

- Ongoing fundal massage / bimanual compression
- Administer Ergometrine 250microg IM or slow IV push
 - *Beware of women with cardiac disease or hypertensive women who may develop extreme hypertension following the administration of ergometrine*
- Commence an oxytocin infusion:
 - 40IU in 500mL CSL at 125mL/hr; increase to 250mL/hr if ongoing bleeding.
 - Titrate down when PPH controlled (decrease by 40mL/hr every 30 min)
- Examine the placenta for completeness if delivered and the vagina to exclude uterine inversion

If ongoing uterine atony:

- Administer Carboprost 250microg IM = 1 ml ampoule.
 - Carboprost is located in theatre (SAS drug)
- Continue uterine massage as required.
- If uterus still atonic after 15 minutes administer 2nd dose Carboprost 250 microg IM.
- Arrange transfer to theatre: Call the on call Obstetric Consultant at KEMH to attend.
 - Contact the Duty Anaesthetist (Dect phone 71242) to organise theatre.

TRAUMA: Genital tract trauma

- Examine genital tract and repair all trauma as necessary.
- Place pressure on the trauma whilst awaiting repair.

TISSUE: Retained placenta

- Transfer to theatre for manual removal



THROMBIN: Seek and Treat Coagulopathy

- Repeat ROTEM and refer to ROTEM guideline or consult Haematology to guide blood product replacement with FFP, platelets and cryoprecipitate
- Keep the patient warm

Whilst awaiting Obstetric Consultant and theatre:

- Maintain bimanual compression if atonic
- Continue haemostatic resuscitation
- Continue Oxytocin infusion
- Ergometrine 250mcg every 15 mins
- Carboprost 250mcg IM every 15 mins to a total maximum of 8 doses (if available)

Aetiology of PPH

Abnormalities of uterine contraction (Tone) ~70%

- Atonic uterus
- Over distended uterus
- Uterine muscle exhaustion
- Intra-amniotic/uterine infection
- Drug induced hypotonia
- Functional or anatomical distortion of the uterus

Genital tract trauma (Trauma) ~20%

- Episiotomy or lacerations (cervix, vagina or perineum)
- Uterine rupture
- Uterine inversion

Retained products of conception (Tissue) ~10%

- Retained products
- Abnormal placenta
- Retained cotyledon or succenturiate lobe.

Abnormalities of coagulation (thrombin) ~1%

- Coagulopathies
 - Coagulation disorders acquired in pregnancy
 - Idiopathic / thrombotic thrombocytopenia purpura
 - Von Willebrand's disease
 - Haemophilia/ carrier
 - Thrombocytopenia with pre- eclampsia
- Disseminated Intravascular Coagulation (DIC).

Risks of developing coagulopathy include:

- Abruptio
- Amniotic fluid embolus
- Fetal death in utero- prolonged
- Severe infection/ sepsis
- Pre-eclampsia/ HELLP syndrome
- Therapeutic anticoagulation





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