Who must comply with this procedure?

Medical, midwifery and nursing staff and students under supervision.

This procedure applies in the following setting:

This procedure is applicable to all women at Monash Health who have recently given birth.

Precautions and Contraindications

- It is important to commence treatment before clinical signs of haemorrhagic shock are evident, as clinical signs of shock are delayed in the newly parturient woman due to the increased blood volume of pregnancy.
- Ergometrine is most commonly administered intramuscularly (IM). Use **extreme caution** when administrating **ergometrine intravenously** (IV). Some patients, especially those with preeclampsia or hypertension, may be very sensitive to the hypertensive effects of ergometrine. Generalised headaches, severe arrhythmias, seizures, and cerebrovascular accidents can be caused by ergometrine.
- It is important to be vigilant, and document accurately, when blood loss is slow but continual.
- Weighing of blood loss is recommended in all cases of haemorrhage. Underestimation of blood loss is common.
- Suboptimal fluid resuscitation can be a significant contributor to maternal morbidity and mortality. Fluid replacement, initially with a crystalloid, is given at a ratio of three litres of fluid for every one litre of estimated blood loss. The fluid is infused as quickly as possible using a rapid infusion set (Y-Type blood/solution infusion set®). Depending on the clinical situation, consider the need for early blood transfusion during resuscitation.

Equipment

- PPH emergency box (NB: does not include medications).
- Medications stored in the medication refrigerator (in a PPH container).
  - Oxytocin (Syntocinon®) injection: 10 units/mL x 4 ampoules.
  - Ergometrine (Ergometrine®) injection: 500 micrograms/mL.
  - Ergometrine 500 micrograms and oxytocin 5 units (Syntometrine®) injection: 1 mL.
  - Dinoprost trometamol (Prostin F_2 alpha) injection: 5 mg/mL.

Medications stored in the medication safe:

- Misoprostol (Cytotec®): 200 microgram tablets.

Metoclopramide (Maxolon®) injection: 10 mg/2 mL.

Intravenous fluids.

Prophylactic measures

Where significant risk factors are present (see Postpartum haemorrhage (PPH) Background)

consideration should be given to:

- intravenous (IV) access early in labour
- full blood examination and 'group and hold' in labour
- active management of the third stage
- close observation and assessment following birth to enable prompt recognition and response.

Initial resuscitation

The emergency response team must **SIMULTANEOUSLY** commence initial management (DRSABC) and identify and treat the cause ("T's").

- **D**anger
  - Assess for danger (to patient, visitors and staff).
  - Universal precautions when handling body fluids.
- **R**esponse: assess patient for responsiveness (verbal communication +/- physical contact)
- **S**end for help and escalate as required
  - Local assistance: press staff assist or emergency call bell.
  - Casey Hospital: dial 999, request a 'MET call' to the area.
  - Dandenong Hospital: dial 999, request a 'Code Pink' to the area.
  - Monash Medical Centre: dial 999, request a 'Code Pink' to the area.
  - All sites: dial 999 and request a 'MET call' or 'Code Blue' if needed.
- **A**irway: assess and maintain patency.
- **B**reathing: assess patient for breathing.
  - If not breathing request a 'Code Blue' to the area.
  - Determine respiratory rate and SpO_2.
  - Administer high flow oxygen via face mask (10 litres per minute).
- **C**irculation: assess and replace circulating fluid volume.
  - Assess blood pressure, pulse rate and warmth.
  - Position the woman in a left lateral tilt to prevent aorto-caval compression.
  - IV access: insert at least two (16 gauge) cannula into peripheral veins.
  - Collect blood for cross match (at least 2 units) and full blood count.
  - Consider clotting screen (APPT, INR).
  - Commence **fluid resuscitation initially** with a crystalloid (compound sodium lactate or sodium chloride 0.9%) **at a ratio of three litres of fluid for every one litre of estimated blood loss.**
  - Fluid needs to be infused as quickly as possible. This may be aided by using a rapid infusion set know as a Y-type blood/solution infusion set® a hand pump set.
  - Insert a urinary catheter with an hourly measures bag.
  - Record and monitor fluid balance.

Further fluid resuscitation

- Consider the need for resuscitation with **blood products,** e.g. non-cross matched O negative red blood cells, cross-matched red blood cells, fresh frozen plasma, platelets, cryoprecipitate. For access to blood bank refer to Postpartum haemorrhage (PPH) Background
- Trigger the massive transfusion procedure if a patient requires more than 4 units of red blood cells and has on-going bleeding **or** if specifically requested by the treating team.

Documentation

A scribe is identified to contemporaneously document assessments and response to management.

- Commence **a Maternity – Observation and Response Chart** (MRF13).
- Commence a **Fluid Balance Chart** (MRK45).

Ongoing assessment

- Conscious state, blood pressure, pulse rate, respiratory rate, SaO_2.
- Uterine tone.
- Measured blood loss (weigh pads: 1 mL of blood weighs 1g).
- Record accumulated blood loss in mL on (MRK45).

Manage as per the specific cause of PPH

Identify and treat the cause of the postpartum haemorrhage

TONE:

- Massage the atonic uterus to stimulate contraction and expel clots.
- Administer oxytocics.
- If attempts to deliver the placenta have been unsuccessful, prepare for immediate manual removal under anaesthesia in theatre.
- If heavy bleeding continues apply bimanual compression until further management decisions are made.
- In the event of intractable bleeding, surgical intervention in theatre may be required. e.g. examination under anaesthetic, insertion of a uterine balloon, B-Lynch suture, hysterectomy.
- If required the uterine balloon is inserted as per manufacturer's instruction.
  - If packing is used, the packs must be tied to the uterine balloon catheter with documentation on the Monash Health Interventional Procedure Pathway (SHIPP, MRG 40) of their presence and plan for their removal.
  - The uterine balloon is removed within 24 hours of insertion as per manufacturer instructions.
  - Removal of the uterine balloon and any associated packs must be documented in the inpatient progress notes (MRJ01).

TRAUMA

- In all cases of primary PPH, check the genital tract thoroughly to exclude bleeding from trauma e.g. lacerations, haematomas.
- In the presence of visible trauma apply pressure and manage either in Birth Suite or under anaesthesia in theatre.
- Vaginal or uterine packing may be required to control bleeding. Packing the uterus is best undertaken in theatre after an examination under anaesthesia and with a senior obstetrician

involved. When packing the uterus:

- Tie 3-4 gauze rolls together, lightly soak gauze in sodium chloride 0.9% and tightly pack the uterus and vagina to ensure an effective tamponade.
- Document on the Monash Health Interventional Procedure Pathway (SHIPP, MRG40) of the packs presence and a plan for their removal.
- Packs are removed approximately 24 hours after insertion
- Removal of the vaginal packs must be documented in the inpatient progress notes (MRJ01).

- If the placenta is delivered and the uterus contracted, consider other concealed causes of trauma e.g. ruptured uterus, broad ligament haematoma.

TISSUE:

- If the placenta is not delivered and bleeding continues, prepare for examination and manual removal under anaesthesia in theatre.
- If the placenta is delivered, check the placenta and membranes for completeness. Where tissue is retained, or bleeding continues, prepare for examination under anaesthesia in theatre.
- **If anaesthetic or theatre staff are not available, the placenta is retained and bleeding is vigorous, manual removal without anaesthesia is only considered as a lifesaving manoeuvre**. Alternatively, apply vigorous bimanual compression until further help is available.

THROMBIN:

- In the presence of a well contracted uterus and where trauma and retained tissue has been excluded consider investigating for coagulopathies.

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Uterotonic medication: [May be midwife initiated according to midwifery standing orders].

Medicine	*Dose / Route*	*Action*	*Comments*
Ergometrine (Ergometrine®)	**0.25 mg** ergometrine **Intramuscular injection** **OR** **Intravenous injection** (If not contraindicated) Dilute to 5 mL with sodium chloride 0.9%. Must be given slowly IV over 3-5 minutes.	Produces tonic uterine contractions lasting 2-3 hours, including of the circular muscle surrounding the cervical os. **Side effects:** • severe nausea and vomiting • hypertension • headache	**FIRST LINE** medicine for atonic uterine PPH. **IM takes 2-5 minutes to act with a sustained effect for 3 hours.** **IV takes under 1 minute to act with a sustained effect for 45 minutes.** Use with caution IV. Minimise nausea and vomiting by administering with an antiemetic (unless the woman has received an antiemetic within 6 hours). Avoid in women with hypertension, cardiac disease and asthma. Avoid if the placenta is insitu.
Syntometrine® (ergometrine 500 micrograms and oxytocin 5 units)	**1 mL** (contains ergometrine 500 micrograms and oxytocin 5 units). **Intramuscular injection**	Oxytocin produces rhythmic longitudinal uterine muscle contractions. Ergometrine: as above. **Side effects:** • severe nausea and vomiting • hypertension • headache.	Alternate **FIRST LINE** medicine for atonic uterine PPH. **Takes 2.5 minutes to act when given IM.** Minimise nausea and vomiting by administering with an antiemetic (unless the woman has received an antiemetic within 6 hours). Avoid in women with hypertension, cardiac disease and asthma. Avoid if the placenta is insitu.
Oxytocin (Syntocinon®)	**40 units** in 1 litre compound sodium lactate (Hartmann's®) solution. **Intravenous infusion** at 250 mLs per hour i.e.10 units/hr.	Oxytocin: as above	**SECOND LINE** medicine Generally well tolerated. Oxytocin infusions with higher concentrations or rates of administration are not associated with an improved response but do substantially increase side effects.

Uterotonic medication: [requiring medical prescription and supervision].

Used to control excessive postpartum bleeding due to uterine atony when management with oxytocin and ergometrine has been unsuccessful and other cervical/vaginal causes have been excluded.

Medicine	*Dose / Route*	*Action*	*Comments*
Misoprostil (Cytotec®)	**400 - 1000 micrograms (2-5 tablets)** **Per rectum**	Produces strong uterine contractions. **Side effects:** • nausea and vomiting • diarrhoea • abdominal pain • pyrexia	**THIRD LINE** medicine **Takes 30 minutes for peak levels to be reached.** Useful for long-term maintenance of uterine tone. Avoid in women with a history of allergy to misoprostol or other prostaglandins. Caution in asthmatics.
Dinoprost trometamol (Prostin F_2 alpha®)	**Maximum dose 3 mg** **Intramyometrial injection** • Draw up 9 mL of sodium chloride 0.9% in a 10 mL syringe. • Add 1 mL of 5 mg/mL dinoprost trometamol to the 9 mL to make 10 mL solution (0.5 mg/mL). • Mix well. • Discard 4 mL leaving a total 3 mg in 6 mL. • Give in divided doses (1-2 mL) into several areas of uterine muscle up to 3 mg.	Produces strong uterine contractions. **Side effects:** • Potent bronchoconstrictor	**FOURTH LINE** medicine Can be given via: • the abdominal wall • the cervix • directly during laparotomy. **Contraindicated** in women with asthma and cardiac disease. Close monitoring required, ideally in theatre or high dependency, by anaesthetic and obstetric specialists. Not to be confused with carboprost tromethamine (Haemabate®) that is given intramuscularly.

Consent caution

When consenting a woman for 'examination under anaesthesia' the **consent must include** the possibility of hysterectomy in the event of intractable bleeding.

Post emergency care

Additional ongoing clinical management plans include consideration to:

- Prophylactic intravenous antibiotics.
- Fluid management
  - review of input and output
  - enter accumulated measured blood loss on the Fluid Balance Chart (MRK45).
- Appropriate staffed area for stabilization and recovery: Birth Suite, theatre recovery room, HDU / ICU, postnatal ward.
- Frequency of vital signs and observation.
- Appropriate thromboprophylaxis.
- Debriefing the woman, her partner and family.
- Debriefing staff.
- Case review.

Post insertion care of uterine balloon tamponade

- Monitor for signs of increased loss in the catheter bag.
- Maximum indwell time (as per manufacturer instructions) is twenty four hours.
- Return to theatre or Birth Suite is not necessary for balloon removal.
- Balloon removal can be undertaken by trainee medical staff under direction of senior obstetric staff.
- At the time of removal ensure any vaginal packs are also removed and this is documented in the inpatient progress notes (MRJ01).

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List of Implementation Tools

Postpartum haemorrhage (PPH) contents

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Disclaimer

The maternity clinical practice procedures and guidelines have been developed having regard to general circumstances. It is the responsibility of every clinician to take account of both the particular circumstances of each case and the application of these procedures and guidelines. In particular, clinical management must always be responsive to the needs of the individual woman and particular circumstances of each pregnancy.

These procedures and guidelines have been developed in light of information available to the authors at the time of preparation. It is the responsibility of each clinician to have regard to relevant information, research or material which may have been published or become available subsequently. Please check this site regularly for the most current version.