Clinical Practice Guideline — Post-Partum Haemorrhage
Department — Women's Health

Target Audience
Clinical staff in Women's Health, Anaesthetics, Haematology, Surgical Services, GP Shared Care Providers.

Purpose
Primary Post-Partum Haemorrhage (PPH) remains one of the major causes of maternal death in both developed and developing countries. PPH is common, with an incidence of 5-15% in Australia. Major PPH is a serious obstetric emergency.

Scope
To recognise and manage Post-Partum Haemorrhage.

Definitions

Primary Post-Partum Haemorrhage (PPH) = is defined by the WHO as blood loss greater than 500ml in the first 24hrs following birth (irrespective of mode of birth[3]. PPH can be categorised as minor (500ml-1000ml) or major (more than 1000ml). Major PPH can be further divided as moderate (1000ml-2000ml) or severe (>2000ml)[2].

A Secondary PPH occurs from 24hrs following delivery to six weeks after birth.[3]

Guideline

PPH RISK FACTORS

Antenatal	Intrapartum
History of PPH	Augmentation of labour
BMI >35	Spurious labour - prolonged latent phase of labour
Maternal anaemia (undiagnosed or untreated)	Precipitate or incoordinate labour
Maternal iron deficiency	Prolonged active first stage >12 hours
Antepartum haemorrhage (APH)	Prolonged second stage >3 hours
Previous macrosomic baby ≥ 4500 g	Prolonged physiological third stage >1 hour
Polyhydramnios	Prolonged active third stage >30 mins
Fibroids	Surgical intervention - forceps, vacuum, episiotomy, caesarean
Induction of labour	Maternal fatigue or exhaustion
Known coagulopathy	Pyrexia in labour
Abnormal placentation	Shoulder dystocia
Hypertensive disorders	Fetal macrosomia ≥ 4500 g
Placenta praevia	Placental abruption
Multiple pregnancy	Incomplete third stage

Clinical Considerations

Where significant risk factors are present, consideration should be given to:

- IV access early during labour (2 x large bore cannula 16g)
- Group and hold early in labour
- Close observation and assessment following birth to enable prompt recognition and response (PPH is most likely to occur in the first hour post birth)

Rosebud Hospital

- Contact the obstetric team and arrange urgent transfer via Ambulance Victoria
- Administer oxytocic medications as available and resuscitate as required until Ambulance Victoria arrives

PPH Prevention

- Treat anaemia during pregnancy
- Episiotomy only if indicated (operative birth, prolonged 2nd stage, need to expedite birth or prevent severe perineal trauma)
- Active management of third stage – routine oxytocics, cord clamping within 1- 3 minutes, and controlled cord traction should be offered to all women. These three methods reduce the risk of PPH by 50%[1]. Document in notes all women who decline treatment
- Anticipate uterine atony in high-risk clinical situations and be prepared. Consider long-acting prophylactic oxytocic such as 40unit Oxytocin infusion
- Consider tranexamic acid as a prophylactic measure for high risk women undergoing caesarean section or operative procedures such as manual removal of placenta.[7] See table 1 below for administration. Evidence from multiple trials has not demonstrated adverse fetal outcomes
- Ensure bladder is empty or if unable to void consider indwelling urinary catheter

Requirements

- PPH trolley
- PPH drug box (containing Oxytocin, Oxytocin / Ergometrine Syntometrine™
  NOTE: Ergometrine and Misoprostol stored in the medication room fridge

MANAGEMENT OF PPH

The management of a major PPH requires the rapid initiation of multiple overlapping actions occurring simultaneously at times. The exact sequence of events will be dictated by the individual needs of the mother and the resources available. The components of management include:

COMMUNICATION - Call for help early from

- Midwives
- Obstetric team
- Consider Maternity Emergency Call if obstetric staff are not readily available on the ward
- A MET call is mandatory if the condition of the patient deteriorates within MET criteria and/or additional help is required Anaesthetics and haematology support may be required in cases of massive haemorrhage

RESUSCITATION

- Airway and Breathing – Give high flow facial oxygen via mask.
- Circulation - Insert 2 large bore IV cannula 16 gauge (preferred) or 18 gauge
- Take blood for FBE, UEC, coags, X-match
- Commence rapid crystalloid infusion; for every one litre of blood lost replace with 3 litres ideally warmed crystalloid (normal saline) up to 3.5L can be given whilst waiting for blood
- Blood transfusion: Consider O negative blood if life threatening haemorrhage.
- It is critical that facilities providing obstetric care have a massive transfusion protocol (MTP) with which all staff are familiar. Patients who meet criteria for MTP are:
    - Likely to need replacement of 50% of total blood volume in 4 hours
    - Receiving 4 units of blood with ongoing resuscitation needs
- Keep patient warm

MONITORING AND INVESTIGATION

- Vital signs: Pulse, BP, RR, oxygen saturation at least every 15 mins. Note that maternal tachycardia is the first indication of significant blood loss, a slight drop in $Sp0_2$ is also a warning sign of significant haemorrhage. These alterations in vital signs may be evident before a woman exhibits a drop in blood pressure, as this does not usually occur until she is critically unwell
- Estimation of blood loss – weigh pads, linen etc
- Documentation of fluid balance
- Await blood test results to guide further management
- Consider intra-abdominal bleeding if the clinical deterioration or fall in haemoglobin is not in keeping with the observed loss. In this setting, a Focused Assessment with Sonography for Trauma (FAST bedside ultrasound scan) to evaluate pockets of fluid in the abdominal cavity should be utilised. FAST scans can be performed by the on call sonographer, or accredited ED or ICU physicians

ARRESTING THE BLEEDING

- Consider the 4 T's (tone, tissue, trauma, thrombin) to determine cause of bleeding. Remember, there may be more than one cause. A fifth T (theatre) has been suggested to act as a reminder that theatre should be considered earlier rather than later.

Tone: Abnormality of uterine contraction

- Massage uterus: expel clots
- IDC: to maintain an empty bladder and monitor urine output
- Oxytocin / Ergometrine separately or combined in Syntometrine™ if Oxytocin used for 3rd stage (consider prophylactic antiemetic administration Metoclopramide 10mg IV)
- Oxytocin 5 units IV or 10 units IM if Syntometrine used for 3rd stage
- Carboprost 250mcg/ml given IM (buttock or thigh) – can be repeated after 15 minutes to a maximum of 8 doses [2,11] but risk of bronchospasm so extreme caution in asthmatics. Whilst not a licensed use, Carboprost can be injected into the myometrium at the time of a caesarean section [2,11]. In light of the potential cardiorespiratory risks we recommend Carboprost is given in the presence of an Anaesthetists, usually in the operating theatre or similar monitored environment.
- Misoprostol - see CPG Misoprostol Use in Pregnancy
- Oxytocin infusion (40 IU in 1000ml n/saline at 250ml/hr)
- Bimanual compression may be required if bleeding persists

Tissue: Retained products of conception

- Examine the placenta for obvious missing tissue
- Examine the mother vaginally for the adherence of placenta
- Consider moving to theatre for manual removal

Trauma: Of the genital tract
- Inspect genital tract, including cervix
- Suture any tears if required, consider theatre if perineal trauma is severe or complex

Thrombin:
- Consider early use of Tranexamic acid 1 gm IV (10ml IV infusion at 1ml/min) in addition to the usual uterotonic agents. Tranexamic acid inhibits thrombolysis. It has been shown to reduce PPH with minimal adverse effects. The outcome is better if given within the first 3 hours of onset. There is no need to assess clotting levels before the use of Tranexamic acid. This can be given in theatres or on the ward.
- Clotting defects or DIC are rarely a cause of PPH, and more likely the consequence of massive haemorrhage.
- Look for signs such as oozing from wound and IV sites, and friable perineal tissue during suturing

Theatre:
- Consider theatre if blood loss is approaching 1500ml and loss is ongoing, or if woman is haemodynamically unstable
- The consent should include the possibility of hysterectomy in the case of intractable bleeding
- Management in theatre might consist of EUA, manual removal of retained products of conception, balloon tamponade e.g. Bakri balloon, intramuscular injection of prostaglandin F2 alpha (Carboprost), laparotomy for surgical procedures e.g. B-lynch suture, uterine artery ligation, internal iliac artery ligation, hysterectomy
- The massive transfusion protocol should be considered for women needing management of a PPH in theatres, after discussion with the anaesthetic and obstetric consultant. It is indicated in women who have lost 50% of their blood volume (approx. 3 litres) in 4 hours or who are likely to need 4 units of blood or more with ongoing resuscitation needs

The Use of Vaginal Packs

Vaginal packs are an important accessory for the management of postpartum haemorrhage. They facilitate the mopping of blood to improve the view of the vagina and perineum and can be used to apply pressure to the vagina and perineum to reduce bleeding whilst arranging suturing or transfer to theatres. On occasion, a vaginal pack(s) can be placed in the vagina to apply pressure to bleeding points

- Given the increased capacity of the postpartum vagina and the presence of blood obscuring the view, placing a pack in the vagina carries a high risk of losing the pack
- The highest risk occurs if the woman needs to be transferred to another location (eg theatres) with the pack in-situ
- Only packs with blue tails and radio-opaque lines are to be used in the vagina.
- The blue tail must ALWAYS be left out of the vagina
- The pack(s) must be accounted for in the post-partum pack count

- If a woman is being transferred to theatres with a pack in, this must be clearly documented on the theatre checklist AND on the consent form, which should include 'removal of pack' in the consent with the number of packs involved
- Removal of the pack must be clearly documented in the operating notes and theatre count sheet

Complications

Immediate	Delayed
Hypovolaemic shock	Acute renal failure
Disseminated Intravascular Coagulation	Sepsis
Hysterectomy	Sheehan's Syndrome
Maternal death	Inhibited lactation
	Post-natal depression

POST NATAL CARE

Women who have experienced post-partum hemorrhage are at risk of rapid deterioration. Consideration must be given to the most appropriate environment for on-going care, particularly in cases of severe PPH. This may be a high dependency unit where one to one or birth suite ratio nursing/midwifery care can be achieved or in a more highly specialised intensive care unit. Transfer should be anticipated and initiated early with effective and regular communication with the receiving unit. In the case of an unplanned birth and PPH at Rosebud hospital the woman should remain in high dependency care in the emergency department until ambulance transfer to Frankston Hospital is arranged.

Women birthing at Peninsula Health who experience a severe PPH and do not require HDU or ICU should be cared for within the high dependency ratio of the birth suite or one to one care if required in line with current recommendations and best practice.

Initial PPH care (up to 24hrs) within the birth suite (if birth suite beds unavailable) can be cared for in a postnatal bed under birth suite ratios:

A named midwife (or nurse under the supervision of a midwife) will be allocated to provide one to one or birth suite ratio care according to clinical need.

Vital signs, including pulse oximetry, uterine tone, position and vaginal loss are recorded every 15 minutes (more frequently as required in acute deterioration) for one hour following control of bleeding; blood loss must be weighed.

Monitor temperature and keep warm to avoid hypothermia but do not overheat as this may contribute to hypotension.

Observe for signs of hypovolemic shock.[4]

Clinical manifestations of Hypovolemic shock	
Tachycardia / Palpitations	Shivers / Cold
Low blood pressure	Pale and clammy
Anxiety/Confusion / Delirium / Decreased level of consciousness	Appetite for salty food
Shortness of breath / Air hunger / Hyperventilation	Thirst
Restlessness	Decreased urine / Anuria / Oliguria

Regular medical reviews will occur to monitor the woman's condition and to facilitate a documented plan of care.

Signs and symptoms of deterioration are reported as per the MOC chart and or reportable observations. MET calls activated as determined by vital signs.

Strict fluid balance is recorded including all blood loss and hourly urine measures. If urine output falls below 30ml per hour, inform medical staff.

Monitor presence of PV loss in the presence of vaginal packs and Bakri Balloon manage as per medical orders.

PPH >1000mls is a risk factor for venous thromboembolism. Use mechanical prophylaxis (TED stockings or calf compressors) for initial care. Once the medical team are confident that the bleeding is under control, consideration should be given to thromboprophylaxis. Women with 2 or more risk factors should be prescribed 10 days of postnatal low molecular weight heparin (Clexane).[8,9]

Observations post control of bleeding to be documented on Maternity Observation Chart (MOC) as 'additional observations as per PPH CPG' [4]

Frequency of observations is outlined below; assuming observations are within normal range.

Modifications to the observation frequency should only be made after consultation with medical staff and this decision must be documented.

Time post PPH	Rate of Observations	Type of observations	Care type as ordered
0-2hrs	15 minutely	Vital signs + SpO_2, uterine tone, position, perineum, PV loss (cumulative volume of blood loss)	ICU, HDU, Birth Suite
2-3hrs	30minutely	Vital signs + SpO_2, uterine tone, position, perineum PV loss (cumulative volume of blood loss)	ICU, HDU, Birth Suite
3-12hrs	1-2hrly	Vital signs + SpO_2, uterine tone, position, perineum, PV loss (cumulative volume of blood loss)	ICU, HDU, Birth Suite
12-24hrs	4-6hrly	Vital signs + SpO_2, uterine tone, position, PV loss. If tolerating diet and fluids and woman is asymptomatic aim to normalise care	ICU, HDU, Birth Suite - Aim for transfer to Postnatal care

- Ensure normal voiding after removal of IDC, if abnormal refer to Bladder Management - Intrapartum Postpartum – Trial of Void CPG

- Check FBE within 24hrs or before discharge
- Consider earlier FBE if indicated
- Provide advice and prescription for iron supplements
- Consider IV iron infusion prior to discharge if significant anaemia
- Provide and document postnatal debriefing by medical staff and offer referral for emotional support (social worker can assist with referral options)
- Comprehensive medical discharge summary for GP / LMO follow up including FBE check at 6 weeks

GP Shared Care Providers

Women who present to their general practitioner with a secondary postpartum haemorrhage should be referred immediately to the birth suite AMUM by calling 9784 8564. The exception is women who have had a substantial bleed causing them to be haemodynamically compromised who should be taken by ambulance to the emergency department. In this setting the birth suite should also be informed of this information.

Evaluation

- Where appropriate a VHIMS should be completed
- Support staff buy offering informal or formal staff debriefing as guided by the staff involved
- Review at weekly Obstetric Adverse Events Committee

Key Aligned Documents

- Normal Labour and Birth
- Breastfeeding
- Retained Placenta
- Massive Transfusion Protocol
- Bladder Management - Intrapartum and Postpartum Trial of Void
- Misoprostol Use in Pregnancy

References

[1] RANZCOG Statements and Guidelines (c-obs 43) Management of Postpartum Hemorrhage, July 2017

[2] RCOG Green-top Guidelines (No.52) Prevention and Management of Postpartum Hemorrhage, December 2016

[3] WHO recommendations for the prevention and treatment of postpartum haemorrhage. 2012 https://apps.who.int/iris/bitstream/handle/10665/75411/9789241548502_eng.pdf;sequence=1

[4] Royal Women's Hospital Policy, Immediate and Ongoing Postnatal Care after Major PPH. May 2017

[5] Woman Trial Collaborators. Effect of early tranexamic acid administration on mortality, hysterectomy and other morbidities in women with post-partum hemorrhage (WOMAN): an international, randomised, double-blind, placebo-controlled trial. The Lancet 389 (1084), 21 05-2116.

[6] Monash Health Post-Partum Hemorrhage (PPH) April 2018

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[7] Francini M et al. Safety and efficacy of tranxemic acid for prevention of obstetric haemorrhage: an updated systemaic review and meta-analysis. Blood Transfus. 2018 Jul; 16(4): 329–337

[8] Peninsula Health CPG: Thromboprophylaxis Guidelines, 2019

[9] RCOG Green Top Guideline No 37a: Thrombosis and embolism during pregnancy and the puerperium, reducing the risk. 2015

[10] Safer Care Victoria Maternity eHandbook. Postpartum Haemorrhage (PPH) – Prevention, Assessment and management. Feb 2019.

[11] Royal Women's Hospital Clinical Guidelines. Postpartum haemorrhage – Carboprost. 2017

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Table 1: Emergency PPH Drugs

Drug	Dose/Route	Action/side effects	Comments
1st LINE IF NORMOTENSIVE			
Oxytocin	5 Units slow IV injection or 10 units IM	Oxytocin produces rhythmic longitudinal uterine muscle contractions	First line if Syntometrine give for 3rd stage
Oxytocin/Ergometrine (Syntometrine™)	1ml IM (5 units Oxytocin & 0.5mg Ergometrine)	Oxytocin produces rhythmic longitudinal uterine muscle contractions Ergometrine produces tonic contractions lasting 2-3 hours	First line if Oxytocin given for 3rd stage 2.5 minutes to act when given IM. Caution if woman is hypertensive. Consider prophylactic antiemetic administration Metoclopramide 10mg IV
OR			
Ergometrine bolus	0.25mg–0.5mg IM/IV If given IV should be diluted in 5mls Normal Saline and given slowly	Ergometrine produces tonic contractions lasting 2-3 hrs Side effects: Nausea, Vomiting, Hypertension and Headache.	45 seconds to act with sustained effect when given IV. Caution if woman is hypertensive. Consider prophylactic antiemetic administration Metoclopramide 10mg IV
FIRST LINE IF HYPERTENSIVE			
Oxytocin bolus	10 units IM or 5 units slow IV injection	As Oxytocin	45 seconds to act when given IV
SECOND LINE			
Tranexamic acid	1g in 10ml (100mg/ml) 1g (10mls) IV infusion via syringe driver at 60ml/hr (follow with 10ml normal saline flush via syringe driver at the same rate)	Inhibiting the enzymatic breakdown of fibrinogen and fibrin by plasmin	Consider early use of tranexamic acid if blood loss is not resolving with uterotonics or blood loss ≥ 1000ml
THIRD LINE			
Oxytocin Infusion	40 units in 1,000 Normal Saline IV infusion set at 250ml per hour.	As Oxytocin	45 seconds to act when given IV
Misoprostol	See misoprostol CPG Can be given PR or buccal.	Produces strong uterine contractions. Side effects: Nausea, Vomiting, Diarrhoea, Abdominal Pain and Pyrexia.	Onset of action 30-40 minutes
Prostaglandin F2Alpha CarboPROST	250mcg IM injection 1 vial (250mcg) into buttock or thigh	Produces strong uterine contractions Side effect – Potent Bronchoconstrictor. Extreme caution in asthmatics and hypertensive women.	Give with caution. Close monitoring required due to cardiorespiratory effects (on BP and ECG). Consider only giving in presence of anaesthetist, usually in theatres.

Table 2: Initial Management of PPH