Postpartum Haemorrhage

Summary This Guideline provides guidance for all NSW Health maternity clinicians on best practice for pregnancy and labour care to minimise the occurrence of postpartum haemorrhage. In the event of a postpartum haemorrhage, there is guidance on the recognition, escalation and treatment required to minimise the potential morbidity and mortality.

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Branch contact (02) 9269 5500

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NSW Health

Guideline

Postpartum Haemorrhage

Guideline Summary

Postpartum haemorrhage (PPH) occurs after approximately 5% of all births and remains a leading cause of preventable maternal morbidity and mortality. Prompt recognition, escalation and immediate management can significantly reduce maternal morbidity and mortality associated with PPH.

This Guideline provides evidence-based guidance on best practice for pregnancy and labour care to minimise the occurrence of PPH.

This Guideline applies to all NSW Health maternity services.

Key Principles

All clinicians who attend birth must have the required skills and knowledge to recognise and manage PPH.

Throughout all pregnancy and birth care planning, women and their families must be fully informed of their options of care. Women and their support person(s) must always be included in care planning and decision making, and consent for healthcare treatment must always be established. All discussions and the woman's choice must be documented in the electronic clinical record and communicated between care providers.

Ongoing assessment for risk factors associated with primary PPH must occur throughout the antepartum, intrapartum, and early postpartum periods for all women.

A clear plan is to be developed in consultation with the woman. The plan must include identified risk factors, and strategies to mitigate or control the identified risk/s (e.g. management of the third stage of labour including a recommended drug regime).

In the presence of risk factors, prophylactic administration of a uterotonic agent following birth and prior to the delivery of the placenta reduces the risk of severe PPH and the need for blood transfusion.

The care of women who are identified as high risk for primary PPH is to be undertaken within a maternity service with the appropriate service capability.

PPH will most commonly occur in the first hour after birth. All clinicians must measure and record cumulative blood loss and observe for any signs of deterioration.

When a PPH is identified or there are concerns for maternal wellbeing these must be escalated in line with local Clinical Emergency Response System (CERS) and the NSW Health Policy Directive *Recognition and management of patients who are deteriorating* [PD2025_014].

Management of primary PPH is to occur using the following stepwise approach as described in the *NSW Health Primary Postpartum Haemorrhage Guide*.

In the event of a severe PPH, activation of a Massive Haemorrhage Protocol (MHP) is required. Local maternity services must establish a maternity specific Massive Haemorrhage Protocol (MHP) for managing obstetric critical bleeding.

A PPH can be traumatic for the woman and her support person/s. It is important that debriefing occurs at the earliest opportunity suitable for the woman and her support person/s by a clinician, preferably one who has been involved in her care.

All women who have had a primary PPH with signs of severe shock and/or who required initiation of a maternity MHP are to have a clearly documented discharge plan and follow-up arrangements made prior to discharge.

Each NSW Health maternity service must have established local processes in place to monitor clinical incidents related to PPH care, including the escalation, response and adherence to local CERS processes and compliance with Perinatal Safety Education (PSE) program mandatory requirements.

Revision History

Version	Approved By	Amendment Notes
GL2025_013 August-2025	Deputy Secretary, System Sustainability and Performance	Amendment to Appendix 11.3: Medication Management of Postpartum Haemorrhage Table. Notes indicating contraindication with retained placenta have been removed from the ergometrine and carboprost notes. A footnote is now included to support reference to the current Product Information.
GL2025_007 June-2025	Deputy Secretary, System Sustainability and Performance	Minor amendment to resuscitate and reassess sections to describe options of blood gas sampling.
GL2025_005 May 2025	Deputy Secretary, Health System Strategy and Planning	Inclusion of prevention strategies and amendments to appendices in alignment with Guideline content, including changes to the pharmaceutical treatment, fluid resuscitation and to the local Major Haemorrhage Protocol (MHP).
GL2021_017 October-2021	Chief Executive, Clinical Excellence Commission	Updated appendix 2 and 3 in alignment with the guideline content.
GL2021_010 July-2021	Chief Executive, Clinical Excellence Commission	Updated appendix 2 in alignment with the guideline content.
GL2021_009 May-2021	Deputy Secretary Health System Strategy and Planning	Revised guideline includes updated pharmacological management of PPH and additional antenatal testing of ferritin levels for Aboriginal women and teenagers.
GL2017_018 September-2017	Deputy Secretary, Strategy and Resources	Revised guideline replacing PD2010_064 Updated advice on the use of Carboprost pharmaceutical treatment, fluid resuscitation and local Massive Transfusion Protocols applicable to maternity care Guidance about PPH education requirements.

PD2010_064 October-2010	Deputy Director-General, Strategic Development	Revised policy replacing PD2005_264
PD2005_264 November-2002	Director-General	New policy

Contents

Contents **1**

1. Background **3**

1.1. About this document 3

1.2. Key definitions 4

1.3. Relevant NSW Health Policies and Guidelines 5

2. Communication **5**

2.1. Informed decision making 5

2.2. Cultural considerations 6

2.3. Family integrated care 6

3. Prevention of primary postpartum haemorrhage **6**

3.1. Risk assessment and care planning 7

3.2. Women who decline or are unsuitable for blood or blood component transfusion 7

3.3. Anaemia in pregnancy 8

3.4. Labour and birth 8

3.4.1. Intravenous access 8

3.4.2. Active versus physiological management of third stage labour 9

3.4.3. Uterotonic medication for management of third stage of labour 9

3.4.4. Caesarean section considerations 10

3.4.5. Physiological prevention of postpartum haemorrhage 10

4. Recognition of primary postpartum haemorrhage **10**

4.1. Maternal assessment following birth 11

5. Response and escalation to primary postpartum haemorrhage **11**

5.1. Principles of care 11

5.2. Early identification 12

5.3. Respond 12

5.4. Resuscitate 13

5.5. Identify and treat the cause 13

5.6. Reassess 14

5.7. Refer 14

6. Management of massive haemorrhage **15**

6.1. Massive haemorrhage protocol applicable to maternity 15

6.2. Mechanical measures to control bleeding 15

6.2.1. Bimanual compression 15

6.2.2. Intrauterine tamponade 15

6.3. Surgical management 16
7. Management following primary postpartum haemorrhage 16
7.1. Venous thromboembolism prophylaxis 16
7.2. Debriefing, disclosure and documentation 17
8. Secondary postpartum haemorrhage 17
9. Governance 18
10. References 20
11. Appendices 22
11.1. Risk factors for primary postpartum haemorrhage 23
11.2. Resuscitate actions 24
11.3. Medication management of postpartum haemorrhage 25

1. Background

Postpartum haemorrhage (PPH) occurs after approximately 5% of all births and remains a leading cause of preventable maternal morbidity and mortality.

Most cases of PPH occur in women without risk factors, are minor and cause little or no morbidity. Blood loss in PPH can occur rapidly and lead to significant deterioration of the woman and can result in maternal death. Prompt recognition, escalation and immediate management can significantly reduce maternal morbidity and mortality associated with PPH. All clinicians who attend birth must have the required skills and knowledge to recognise and manage PPH.

Where concerns for maternal wellbeing are identified these must be escalated in line with local Clinical Emergency Response System (CERS) and the NSW Health Policy Directive *Recognition and management of patients who are deteriorating* [PD2025_014].

Consideration is to be given to early consultation and escalation via the Tiered Perinatal Network (TPN) to support clinical management and the required level of care for the woman as per NSW Health Policy Directive *Tiered Networking Arrangement for Perinatal Care in NSW* [PD2023_035] and the NSW Health Guideline *Maternity and Neonatal Service Capability* [GL2022_002].

PPH is a potentially traumatic event and experience for women, families and clinicians. Consideration of the symptoms, responses and behaviours of people in the context of any experience can mitigate the impacts of trauma, prevent exacerbation of trauma, and promote healing. An adaptive response includes application of integrated trauma-informed care as described in the NSW Health *Integrated Trauma-Informed Care Framework*.

1.1. About this document

This Guideline provides evidence-based guidance on best practice for pregnancy and labour care to minimise the occurrence of PPH. In the event of a PPH, guidance to support the recognition, escalation and management is described to minimise the potential morbidity and mortality. It applies to all NSW Health maternity services.

Local maternity services must establish a maternity specific Massive Haemorrhage Protocol (MHP) for managing obstetric critical bleeding.

Informed decision making and cultural considerations are described in this Guideline to support clinicians in sharing information with women, including the benefits, risks, and alternatives of their choices.

Throughout this Guideline the terms ‘woman’ and ‘women’ are used. The use of the term woman is not meant to exclude those who give birth and do not identify as female. It is crucial to use the preferred language and terminology as described and guided by each individual person when providing care.

1.2. Key definitions

Clinical emergency response system (CERS)	A formalised system for staff, patients, carers, and families to obtain timely clinical assistance when a woman/fetus deteriorates (physiological and/or mental state). The CERS includes the facility-based and specialty unit-based responses (Clinical Review and Rapid Response), as well as the formalised referral and escalation steps to seek expert clinical assistance and/or request for transfer to other levels of care within the facility (intra-facility) or to another facility (inter-facility).
Massive haemorrhage protocol (MHP)	A protocol for multidisciplinary escalation and a simultaneous response plan that lists the dose, timing and ratio of blood and blood component therapy specifically for use in women with obstetric critical bleeding (including massive postpartum haemorrhage). Maternity services must have a maternity specific MHP (applicable to maternity care).
Massive postpartum haemorrhage	Any amount of pregnancy/postpartum blood loss that causes signs of severe shock (usually equal to or greater than 2000 mL), or is life threatening, or is likely to result in the need for activation of the massive haemorrhage protocol. Also known as obstetric critical bleeding.
Postpartum haemorrhage (PPH)	Blood loss of equal to or greater than 500 mL.
Primary postpartum haemorrhage (PPH)	Occurs within the first 24 hours following birth.
Secondary postpartum haemorrhage (PPH)	Blood loss of equal to or greater than 500 mL that occurs after 24 hours and before 6 weeks postpartum.
Severe postpartum haemorrhage (PPH)	Blood loss of equal to or greater than 1000 mL, or any amount of blood loss that causes signs of haemodynamic compromise (shock).

1.3. Relevant NSW Health Policies and Guidelines

This Guideline should be read in conjunction with the following documents.

Table 1. Related NSW Health Policies and Guidelines

NSW Health Policy document	
Consent Manual	*Consent to Medical and Healthcare Treatment Manual*
IB2023_006	*Connecting, listening, and responding: A Blueprint for Action – Maternity Care in NSW*
GL2021_007	*NSW Emergency Surgery Guidelines and Principles for Improvement*
GL2022_002	*Maternity and Neonatal Service Capability*
PD2012_069	*Health Care Records - Documentation and Management*
PD2017_044	*Interpreters – Standard Procedures for Working with Health Care Interpreters*
PD2020_008	*Maternity - National Midwifery Guidelines for Consultation and Referral*
PD2020_047	*Incident Management*
PD2022_056	*Approval Process for Medicines and Their Use*
PD2023_031	*Maternity - Safety and Quality Essentials*
PD2023_034	*Open Disclosure*
PD2023_035	*Tiered Networking Arrangements for Perinatal Care in NSW*
PD2024_024	*Blood Management*
PD2024_045	*Prevention of Venous Thromboembolism*
PD2025_014	*Recognition and management of patients who are deteriorating*

2. Communication

Effective communication between clinicians, and between women and clinicians has been demonstrated to reduce preventable adverse events in maternity care. Communication in care planning includes multidisciplinary engagement and systems for documentation. These ensure information relevant to the woman's care is available whenever and wherever the woman presents for care.

2.1. Informed decision making

Clear communication between a woman and her health care team is essential for safe, high-quality healthcare. To enable all women to participate in decision making, information must be communicated in a way that is tailored to individual circumstances (including young women under 18 who fall under the scope of the Child Safe Standards). This includes considering health literacy, level of understanding and background.

To assist a woman in making informed decisions, all healthcare professionals need to allow adequate time to provide information about care options including the benefits, potential risks, and any alternatives to any care recommendations.

A woman's decisions about her care must reflect her self-determination, autonomy, values and preferences.

Valid consent must be obtained as per the NSW Health Policy and Procedure Manual *Consent to Medical and Healthcare Treatment Manual* (Consent Manual).

Contemporaneous documentation of conversations and the woman's decisions must be made in the health care record. This includes documentation on care planning if the woman chooses care outside of clinical recommendations.

2.2. Cultural considerations

Acknowledgement and understanding of culturally appropriate and safe care may assist clinicians when providing women and families with information.

When clinicians are caring for Aboriginal women, it is important that they consider the woman's individual needs. Clinicians must ask women and their family if there is anything they need to feel safe and whether discussion with an Aboriginal health care practitioner would be beneficial to them.

Interpreters must be offered for women from culturally and linguistically diverse backgrounds in compliance with NSW Health Policy Directive *Interpreters – Standard Procedures for Working with Health Care Interpreters* [PD2017_044].

2.3. Family integrated care

NSW Health staff should offer all women the opportunity to discuss their pregnancy and birth experiences. This includes the opportunity to access a formal debrief with trained clinicians and consideration of integrated trauma-informed care principles.

Inclusion of family members or support person/s in these discussions and the debriefing process must be offered. When caring for Aboriginal women the importance of kinship is to be acknowledged and discussed with women to ensure careful consideration of the individual needs of women and their families.

It is important that all women and families are offered wellbeing and psychosocial support, e.g. social work referral, cultural and diversity supports.

When fetal deterioration is recognised, and higher-level care needs are identified, unplanned hospital transfer may occur. When this event occurs, taking women away from their local hospital and local support network can be particularly distressing for women and their families. Local processes in the transferring and receiving service must be in place to support and maintain contact between women and their families.

3. Prevention of primary postpartum haemorrhage

Risk factors for primary postpartum haemorrhage (PPH) may be identified in the antepartum period or arise during or after birth. These risk factors are described in Appendix 1. This list is not exhaustive, as most cases of PPH occur in women with no identifiable risk factors.

Recognition of these risk factors must guide care planning throughout the continuum of care and are to be used to support women's decision making about place of birth and maternity model of care.

3.1. Risk assessment and care planning

Ongoing assessment for risk factors associated with primary PPH must occur throughout the antepartum, intrapartum, and early postpartum periods for all women.

A clear plan is to be developed in consultation with the woman. The plan must include identified risk factors, and strategies to mitigate or control the identified risk/s (for example, management of the third stage of labour including a recommended drug regime).

The care of women who are identified as high risk for primary PPH is to be undertaken within a maternity service with the appropriate service capability, in line with NSW Health Guideline *Maternity and Neonatal Service Capability* [GL2022_002] and the *NSW Health Guide to the Role Delineation of Clinical Services*. Care planning is to be undertaken within the Tiered Perinatal Network (TPN) to ensure the woman receives the right care, at the right place, at the right time.

When discussing models of care available to a woman, consideration must be given to all aspects of care planning. Reference to the NSW Health Policy Directive *Maternity - National Midwifery Guidelines for Consultation and Referral* [PD2020_008] will guide decision making on the most appropriate lead maternity carer.

Availability of specific blood products may vary in rural areas. It is recommended that all pregnant women in rural local health districts complete antenatal screening blood tests at 36 weeks gestation, including antibody screening, through the public hospital pathology system.

Women must be provided with information that details the services available at the preferred place of birth to inform decision making.

3.2. Women who decline or are unsuitable for blood or blood component transfusion

Women must be provided with the required information to make a valid consent to care. This information is to include her individual risk of PPH, models of care available for her circumstances and place of birth most suitable to her clinical context. All women must be supported in their decision making.

Some women will choose care outside recommended guidance. All women have the right to decline recommended treatments. Section 6 of the NSW Health Policy and Procedure Manual *Consent to Medical and Healthcare Treatment Manual* (Consent Manual) provides guidance for clinicians in these circumstances for care planning and documentation of decisions.

Women who decline or who are unsuitable for blood or blood components must be identified early in pregnancy care, wherever possible. Module 5: Obstetrics and Maternity, Section 4.4, of the National Blood Authority *Patient Blood Management Guidelines* are to be used to identify management strategies for women in these circumstances. The principles for care are to also be consistent with NSW Health Policy Directive *Blood Management* [PD2024_024].

The agreed strategies between the clinician and the woman are to be documented in the woman's health care record and communicated between care providers. Clinicians are to be aware of any Advance Care Directive that may be in place.

3.3. Anaemia in pregnancy

Maternal morbidity from primary PPH is higher in women with moderate or severe anaemia prior to birth. Targeted strategies are to be included in care planning to ensure that women have an optimal blood profile prior to birth to compensate for any blood loss after birth.

These strategies include:

- Offering women testing for haemoglobin concentration early in pregnancy (at the first occasion of care) and at 28 weeks' gestation. The lower limits of normal for haemoglobin are:
    - 0 – 20 weeks' gestation 110 g/L
    - ≥ 20 weeks' gestation 105 g/L.
- For women at higher risk for anaemia, full blood count requests must include serum ferritin levels, specifically in early pregnancy and again at 28 weeks' gestation.
- Increased screening is to be considered for Aboriginal, recently arrived refugee and adolescent women who are all at higher risk of anaemia and iron deficiency.
- Further investigation of low haemoglobin concentration for gestational age. Repeat testing at 36 weeks for women with symptoms of and/or risk factors for anaemia.
- Advising low dose iron supplementation for women with iron deficiency anaemia as this is demonstrated to be effective with few side effects.
- The Australian Red Cross Life Blood *Iron Optimisation in Maternity* resource provides further advice for women on supplementation requirements and possible lifestyle changes including dietary suggestions. Options include supplemental iron transfusion for those women with anaemia resistant to oral supplementation.

3.4. Labour and birth

3.4.1. Intravenous access

Hypovolaemia and signs of shock can occur rapidly with PPH making intravenous access more difficult. Intravenous cannulation in labour is to be considered for a woman with identified risk factors for PPH (Appendix 1).

The decision for insertion of a cannula must be based on the individual circumstances including the number and type of risk factors, the service capability level of the facility and the available resources for emergency management of PPH.

Discussions and care planning is to occur during pregnancy and be reconsidered during labour in consultation with the woman. Discussions and decisions must be documented in the health care record.

In the event of a PPH, it is recommended that 2 large bore cannulas are insitu.

3.4.2. Active versus physiological management of third stage labour

Active management of third stage of labour has many benefits in the prevention of PPH. There is less high-level evidence available for the benefits for women with no identified risk factors for PPH. For these women, it is uncertain whether active or physiological management of the third stage of labour makes a difference to the incidence of:

- severe PPH
- maternal haemoglobin less than 90 g/L at 24 to 72 hours postpartum.

To support decision-making during pregnancy care, women must be given information on the benefits and risks of both active and physiological management of third stage labour in context of their individual risk factors.

For women who choose physiological management, there is to be a discussion that describes circumstances where a change to active treatment may be required and recommended.

This would include where:

- observed blood loss is greater than 300 mL and is ongoing
- there is a delay in birth of the placenta greater than one hour
- the woman requests to shorten third stage.

All discussions and the woman's choice must be documented in the woman's health care record and communicated between care providers.

3.4.3. Uterotonic medication for management of third stage of labour

In the presence of risk factors, prophylactic administration of a uterotonic agent following birth and prior to the delivery of the placenta reduces the risk of severe PPH and the need for blood transfusion.

Oxytocin (Syntocinon®) is the drug of choice for both vaginal and caesarean section births.

Carbetocin for caesarean section births may also be considered for women at high risk of PPH. Carbetocin is approved by the Therapeutics Goods Administration (TGA) for the prevention of uterine atony and excessive bleeding following caesarean section or vaginal birth. However, current evidence suggests that following a vaginal birth, carbetocin, when compared with oxytocin, has not demonstrated superiority.

At the time of publication, carbetocin is restricted on the NSW Medicines Formulary for PPH prophylaxis post caesarean section (refer to the NSW Medicines Formulary for further details). For guidance on the use of medicines for indications not listed on the NSW Medicines Formulary refer to NSW Health Policy Directive *Approval Process for Medicines and Their Use* [PD2022_056]. The ability to prescribe medications not on the Formulary remains via the Individual Patient Use approval pathway. In such circumstances, monitoring and reporting of outcomes are to be undertaken in maternity services if carbetocin is used for the third stage management following vaginal birth.

Dosage recommendations for PPH prophylaxis are described in Table 2.

Table 2. Dosage recommendations for prophylaxis of PPH

Type of birth	Medication	Dosage	Administration
Vaginal	oxytocin	10 units	IM
Caesarean section	oxytocin	5 units	Slow IV push
	carbetocin	100 micrograms	Slow IV push

3.4.4. Caesarean section considerations

A history of previous caesarean section increases the incidence of placenta praevia and increases the risk of severe PPH.

Clinicians are to ensure that:

- where clinically indicated, women undergoing a birth by caesarean section have a current group and hold, or crossmatch
- all women who have had a previous caesarean section have their placental site confirmed via ultrasound scan
- where there is evidence of an abnormally adherent placenta, a documented multidisciplinary management plan is completed and available in the woman's health care record prior to labour and birth. This plan must include the recommended facility for birth consistent with NSW Health Guideline *Maternity and Neonatal Service Capability* [GL2022_002].

3.4.5. Physiological prevention of postpartum haemorrhage

In addition to the woman's chosen method for third stage management and the mode of birth, providing the opportunity for skin-to-skin contact after birth for all women is recommended as a strategy to prevent PPH. Skin-to-skin contact can reduce the time to placental separation, reducing the duration of the third stage and the risk of PPH from retained tissue and atony. Women are to be advised of the benefits of skin-to-skin contact during the pregnancy and supported to achieve this from the time of birth.

If a woman is breastfeeding, it is recommended they feed as early as possible after birth. Skin-to-skin contact and breastfeeding are multisensory methods that promote the production of endogenous oxytocin. Oxytocin stimulates uterine contractility and can prevent atonic PPH. Skin-to-skin contact and breastfeeding can reduce the production of stress hormones that can interfere with the action of oxytocin. The first hour after birth is a key period to implement physiological methods to prevent and reduce the severity of PPH.

4. Recognition of primary postpartum haemorrhage

Clinicians must be aware of the individual woman's risk factors for postpartum haemorrhage (PPH) and any established management plans for prevention and treatment. As many PPHs

will occur without identified risk factors, all maternity clinicians are to be vigilant at every birth to the potential for PPH and have the required skills and knowledge to respond.

The incidence of primary PPH may be underestimated by up to 50%, due to the clinical difficulty in accurately estimating blood loss. The clinical signs and symptoms of shock vary amongst women and are more common with higher volumes of blood loss.

4.1. Maternal assessment following birth

PPH will most commonly occur in the first hour after birth.

Care planning and risk assessment during the pregnancy, labour and birth aims to identify women at risk of PPH. Clinicians are to be vigilant for signs of PPH at all births.

Routine assessment of the woman following birth can identify any abnormal vital signs and/or excess bleeding.

All women and their babies must receive active and ongoing assessment in the immediate postnatal period, regardless of the context around their birth. During this time, the woman and baby are not to be left alone.

Ongoing assessment is required for a minimum of one hour post birth of the placenta.

Assessment must include:

- the woman's overall wellbeing
- palpation of the uterine height, tone and position
- accurate measurement of cumulative blood loss
- vital signs including respiratory rate, oxygen saturation, heart rate, blood pressure and temperature (frequency depends on the individual assessment of the woman).

Note: to support the mother baby dyad, observations are to be attended in a non-invasive manner where possible.

Ongoing assessment is to be extended if the woman has an increased risk or experiences a PPH. An individualised care plan for the duration and frequency of assessment including vital signs is to be made for the postnatal period.

All assessments and vital signs are to be recorded on the appropriate NSW Health standard observation charts including the Standard Maternal Observation Chart.

When a PPH is identified, the woman's care must be escalated in line with NSW Health Policy Directive *Recognition and management of patients who are deteriorating* [PD2025_014] and as per local Clinical Emergency Response System (CERS) protocols.

5. Response and escalation to primary postpartum haemorrhage

5.1. Principles of care

The following principles outline key considerations in the clinical and supportive response to postpartum haemorrhage (PPH):

- PPH can be a life-threatening maternal emergency and must be managed with a coordinated approach by a multidisciplinary team with effective communication.
- The woman must not be left alone and there must be regular and ongoing communication with the woman to minimise her stress response in the situation.
- Wherever possible, women must be informed about interventions, their risks and benefits and valid consent is to be obtained, such as uterine fundal massage, perineal assessments.
- Witnessing a PPH can be traumatic for support persons. Frequent communication during the event and offer of inclusion in a debrief process with the woman after the event are actions that could minimise potential harm.
- Care of the baby must be allocated to the most appropriate person/s or clinical service where required.
- Management of primary PPH must be tailored to the woman's individual clinical circumstances and the degree of shock identified.
- Management is to occur using the following stepwise approach as described in the *NSW Health Primary Postpartum Haemorrhage Guide*. It is acknowledged that these actions (recognise, respond, resuscitate, identify and treat the cause, reassess and refer) may occur simultaneously.

5.2. Early identification

To minimise adverse outcomes for the woman, timely identification, and immediate management of a PPH must occur.

It is recommended that basic measures be taken to monitor and assess the bleeding when the estimated blood loss is greater than or equal to 300 mL and ongoing.

These actions include:

- an A-G assessment
  - to determine the woman's clinical condition
  - to determine the cause of ongoing bleeding
- continued cumulative measurement and recording of blood loss
- monitoring for signs of deterioration
- remaining with the woman
- consideration for when additional assistance is required.

When a PPH is recognised, escalation must occur as per local Clinical Emergency Response System (CERS) protocol.

5.3. Respond

Immediate actions to control the bleeding and prevent deterioration are required when primary PPH is identified.

Most cases of PPH can be treated effectively with basic measures.

Any woman with cumulative blood loss ≥ 500 mL and who continues to bleed is at risk of rapid deterioration. Immediate escalation to a medical officer is required.

CERS are to outline the local process for escalation when a PPH is identified. The CERS are to reflect the response required based on the volume of blood loss and not only on the woman's observations.

Women can have a compensatory response to blood loss after birth and may not have altered observations until significant loss occurs. The principle of care is to respond and escalate as soon as a PPH is recognised to minimise deterioration in the woman's condition.

5.4. Resuscitate

The following actions outline key steps in the resuscitation phase of PPH management:

- If bleeding continues or the cumulative blood loss is ≥ 1000 mL or there are signs of shock despite basic measures, commence full resuscitation, perform an A-G assessment, and treat the cause
- Coordinated care with multidisciplinary engagement will maximise effectiveness of the resuscitation efforts and minimise potential morbidity
- Discuss the management plan/treatment with the woman, including partner/family (when appropriate)
- The resuscitate actions described in Appendix 2 are to be taken and can be performed simultaneously.

5.5. Identify and treat the cause

The 4 'T's' mnemonic is used to identify the cause of bleeding and are listed in order of prevalence.

The 4 'T's' are:

- Tone
- Trauma
- Tissue
- Thrombin.

Note: Tissue is described first in the *NSW Health Primary Postpartum Haemorrhage Guide* as the management of bleeding that is influenced by the removal of the placenta and must be considered first.

When bleeding is identified there must be a rapid and A-G assessment to determine the cause and the most appropriate treatment options implemented.

Note: As PPH due to thrombin is a rare occurrence, the following additional information may be required:

- When MHP is activated; give:
  - Red Blood Cells (RBC)
  - Fresh Frozen Plasma (FFP)
  - Platelets
  - Cryoprecipitate if fibrinogen < 2.5 grams/L
  - Calcium gluconate if Ca^{2}+ < 1.1 mmol/L.

Avoid hypothermia and acidosis as mortality is increased with coagulopathy (the 'lethal triad').

5.6. Reassess

Maternal reassessment is vital throughout resuscitation efforts to determine the effectiveness of treatment, and the need for additional strategies. When bleeding continues this is to include, at a minimum:

- Observation, measurement and recording of ongoing blood loss
- Assessment every 5 minutes of:
  - Fundal height and uterine tone
  - Blood pressure, heart rate, respiratory rate, and SpO_2 (oxygen saturations)
- Assessment of temperature every 15 minutes to detect hypothermia
- Hourly urine measurements and aim for at least 30 mL/hour
- Ongoing observation of fluid balance
- Collection of serum blood samples where clinically indicated, for example, coagulation screen, Ca^{2+} and blood gas
- Reassessment of vital sign observations and uterine tone at a minimum frequency, every 30 minutes for 2 hours once bleeding is controlled and the woman is stabilised reassess
- Commencement of maintenance therapy: Syntocinon infusion or misoprostol (Appendix 3)
- Documentation and discussion of a management plan with the woman, and her partner and/or family as appropriate.

5.7. Refer

After stabilisation and cessation of bleeding, close maternal observation and assessments are to be continued in a suitable environment. Consideration for transfer to a higher level of care such as Intensive Care Unit (ICU) or Close Observation Unit (COU) may be required.

Escalation may be required within the Tiered Perinatal Network (TPN) in line with service capability levels. Coordination must occur between the specialist medical clinicians.

When higher level care is required, formal arrangements must be in place to facilitate escalation of care in line with the NSW Health Policy Directive *Tiered Networking*

Arrangements for Perinatal Care in NSW [PD2023_035] and the NSW Health Guideline *Maternity and Neonatal Service Capability* [GL2022_002]. Adherence to these arrangements ensures safe care is provided at a facility with designated service capability for the woman's clinical needs and complexity, as close as possible to her home and support network.

6. Management of massive haemorrhage

The majority of postpartum haemorrhage (PPH) episodes are treated before the threshold for activation of a Massive Haemorrhage Protocol (MHP) is reached. Where massive PPH does occur, clinicians are to consider the additional measures described below.

6.1. Massive haemorrhage protocol applicable to maternity

Activation of the MHP in a timely manner with severe PPH may limit the associated morbidity and mortality. All services are to have a MHP applicable to the local maternity service that will provide guidance to all clinicians. This is to trigger a multidisciplinary response specific to the needs of the local service.

Guidance to develop an MHP is provided in the *National Blood Authority Patient blood management guideline for adults with critical bleeding*. An MHP needs to also include guidance on the use of Recombinant human factor V11a due to the increased risk of thromboembolism in pregnancy.

6.2. Mechanical measures to control bleeding

Mechanical intervention is recommended if bleeding persists due to atony despite pharmacological management. The aim of mechanical intervention is to apply outward pressure to the uterine wall to reduce myometrial blood flow, facilitate blood clotting, and hence reduce blood loss. There are 2 main methods of mechanical intervention, bimanual compression and intrauterine tamponade.

6.2.1. Bimanual compression

Bimanual compression is to be performed when there is significant bleeding, not responsive to conservative treatment such as uterine massage and uterotonics. This is performed by placing one hand in the vagina, forming a fist, and pushing against the anterior wall of the uterus. The other hand will then press on the fundus externally to compress the uterus between the hands.

Bimanual compression can be particularly valuable when a PPH occurs in a community setting such as home birth. This technique can control blood loss during transfer to operating theatres and can be performed even when the placenta is retained and there is significant bleeding.

Compression must be maintained until bleeding is controlled and the uterus is well contracted, if bleeding and/or atony persist an alternate measure must be commenced.

6.2.2. Intrauterine tamponade

Insertion of an intrauterine tamponade balloon is successful in controlling bleeding in 85% of cases and is associated with reductions in:

- need for blood transfusion (3.3 fewer units per woman on average)
- amount of oxytocic agents required to control bleeding
- length of stay in intensive care.

Intrauterine tamponade is to be considered before resorting to more invasive surgical techniques. Local health districts are to have procedures developed and implemented for intrauterine tamponade balloon that considers their local context and service capability for this procedure.

6.3. Surgical management

If pharmacological and initial mechanical measures do not control the bleeding, the highest possible category of clinical urgency must be initiated in line with the NSW Health Guideline *NSW Emergency Surgery Guidelines and Principles for Improvement* [GL2021_007].

There are several surgical options in the management of PPH including uterine artery ligation and uterine compression suture, or B-Lynch suture, and each requires laparotomy. The choice of surgical procedure/s depends on the woman's individual clinical circumstances and the service capability of the facility in which she is receiving care.

The following principles are to be considered:

- Early recourse to hysterectomy is recommended, particularly where bleeding is associated with placenta accreta or uterine rupture
- The decision to proceed to hysterectomy must be made by an experienced consultant obstetrician, ideally in consultation with a second experienced consultant obstetrician
- Consent for emergency procedures must be in line with NSW Health Policy and Procedure Manual *Consent to Medical and Healthcare Treatment Manual* (Consent Manual).

7. Management following primary postpartum haemorrhage

Prior to discharge, all women who have had a primary postpartum haemorrhage (PPH) with signs of severe shock and/or who required initiation of a maternity Massive Haemorrhage Protocol (MHP) are to:

- Be screened for inherited coagulopathies if concern exists that this was the cause of the PPH
- Have a clearly documented discharge plan and follow-up arrangements made.

7.1. Venous thromboembolism prophylaxis

Severe PPH increases the risk of venous thromboembolism (VTE). All women who have had a severe or massive PPH must have a VTE assessment conducted in the postnatal period in line with NSW Health Policy Directive *Prevention of Venous Thromboembolism* [PD2024_045]. Based on the VTE assessment a referral to an obstetric consultant or team

regarding the decision to commence pharmacological and/or mechanical prophylaxis as part of immediate care planning is required.

7.2. Debriefing, disclosure and documentation

Facilities are to support staff training in debriefing to facilitate effective communication with the woman, her family and other clinicians after the event. A woman may require repeated or delayed opportunities to ask questions or debrief, this includes following discharge from maternity services.

A PPH can be traumatic for the woman and her support person/s. It is important that debriefing occurs at the earliest opportunity suitable for the woman and her support person/s by a clinician (preferably one who has been involved in her care) in line with NSW Health Policy Directive *Open Disclosure* [PD2023_034].

Debriefing women and their support person/s may also include multidisciplinary support including social worker/perinatal mental health support as required. Midwives, health care workers, Aboriginal health workers/practitioners may be able to provide further advice and/or support as required.

Recognising the potential impact of a PPH on clinicians, formal debriefing is to also be offered to those clinicians involved in the event.

Clear, thorough, and concise documentation during the event, or as soon as possible after a PPH episode, is required by all clinicians involved. This will aid immediate care and inform care recommendations in future pregnancies, inform appropriate Clinical Review, and initiate improvements in practice and/or systems where necessary.

8. Secondary postpartum haemorrhage

Secondary postpartum haemorrhage (PPH) is defined as bleeding greater than or equal to 500 mL occurring between 24 hours and 6 weeks postpartum.

There are many causes with the most common being endometritis, retained products of conception (RPOC) and subinvolution of the placental bed.

Women are to be advised of the signs and symptoms associated with secondary PPH as part of routine postnatal care and understand how to access Clinical Review if they are concerned.

Care for women presenting with secondary PPH must include an A-G assessment including an estimation of blood loss, assessment of their haemodynamic state, and full consideration of the woman's concerns.

Where endometritis is likely, investigation is to include vaginal microbiological testing (high vaginal and endocervical swabs) and treatment with broad spectrum antibiotics in line with current Therapeutic Guidelines recommendations.

Where RPOC are a concern, pelvic ultrasound is to be considered, although the diagnosis of RPOC can be difficult/unreliable when imaging the postpartum uterus.

Antifibrinolytics and uterotonics may be useful in the management of secondary PPH.

When surgical evacuation of RPOC is considered, it must be undertaken by, or supervised by, an experienced clinician. Uterine evacuation under direct ultrasound guidance is to also be considered.

Secondary PPH may be associated with severe bleeding that can lead to haemodynamic compromise and shock. In this situation, definitive care may include the same advanced surgical techniques used in the care of women with primary PPH. Early recourse to surgical management is to be considered as part of the initial A-G assessment, resuscitation, and treatment options.

9. Governance

NSW Health maternity services are able to access data available via the Clinical Excellence Commission's QIDS (Quality Improvement Data System) MatIQ. The use of near-real-time data supports the identification and monitoring of current and emerging clinical risks and promotes a culture of continuous quality improvement.

Local health districts are responsible for ensuring:

- Local processes are in place to monitor clinical incidents (serious harm to near misses) related to postpartum haemorrhage (PPH) as per NSW Health Policy Directive *Maternity - Safety and Quality Essentials* [PD2023_031], specifically:
    - Primary PPH ≥ 1000 mL
    - Maternal blood transfusion related to PPH
    - Peripartum hysterectomy
    - Postnatal maternal admission to Intensive Care Unit (ICU) or Close Observation Unit (COU) related to PPH.
- Local processes are in place to support clinicians to identify opportunities to drive quality improvement activities and learn from harm or near misses to improve:
    - The care provided to women experiencing a PPH
    - Clinician capability.
- Midwifery and obstetric clinician compliance with the mandatory perinatal safety education and training requirements.
- Appropriate education and training is available for all clinicians who may be required to care for women who may experience a PPH (e.g. maternity units, NSW Ambulance service, operating theatre, recovery, ICUs or emergency departments). This may include (but is not limited to):
    - Regular PPH emergency drills and education sessions consistent with the content of the Maternal Safety Education pathway (Perinatal Safety Education Program)
    - Completion of the *Blood-Safe: Postpartum Haemorrhage (PPH)* module available on My Health Learning.

- The *NSW Health Primary Postpartum Haemorrhage Guide* is available wherever women may present with a PPH (e.g. maternity units, NSW Ambulance, operating theatre, recovery or emergency departments).

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11. Appendices

1. Risk factors for primary postpartum haemorrhage
2. Resuscitate actions
3. Medication management of postpartum haemorrhage

11.1. Risk factors for primary postpartum haemorrhage

TONE (70% cause)		
Antepartum	**Intrapartum**	**Postpartum**

• Aboriginal, Asian, Sub-Saharan African, Pacific Islanders; recently arrived refugees and adolescent women
• Maternal age ≥ 35 years old
• BMI > 35
• Grand multiparity
• Uterine anomalies (e.g. fibroids)
• History of previous primary or secondary PPH
• History of antepartum haemorrhage (APH) in the current pregnancy
• Maternal anaemia < 90 g/L
• Over distension of the uterus:
  ○ Multiple pregnancy
  ○ Polyhydramnios
  ○ Fetal macrosomia
	• Precipitate labour
	• Prolonged labour (first, second, or third stages)
	• Arrest of descent
	• Uterine infection (pyrexia ≥ 38°C in labour)
	• Oxytocic use for augmentation or induction of labour
	• Instrumental birth (forceps or vacuum)
	• Intrapartum haemorrhage
	• General anaesthesia
	• Drug induced hypotonia (magnesium sulfate, anaesthetic and tocolytic agents)
		• Drug induced hypotonia (magnesium sulfate, anaesthetic and tocolytic agents)
		• Bladder distension

TRAUMA (20% cause)		
Antepartum	**Intrapartum**	**Postpartum**
	• Precipitate labour • Instrumental birth (forceps or vacuum) • Cervical, uterine or perineal lacerations including episiotomy • Caesarean section	

TISSUE (10% cause)		
Antepartum	**Intrapartum**	**Postpartum**
• History of retained placenta • Placenta praevia • Placenta accreta spectrum disorder	• Retained placenta	• Manual removal of placenta and/or products (cotyledon, membranes, blood clots)

THROMBIN (1% cause)		
Antepartum	**Intrapartum**	**Postpartum**
• Sepsis • Intrauterine fetal death • Pharmacological anticoagulation • Maternal bleeding disorders	• Amniotic Fluid Embolism (AFE) • Disseminated Intravascular Coagulation (DIC)	• Amniotic Fluid Embolism (AFE) • Disseminating Intravascular Coagulation (DIC)

11.2. Resuscitate actions

Get help

- Escalate as per local CERS (if not already called).
- Consult with the most senior medical clinician/obstetrician.
- Follow standard procedures for emergency resuscitation.

Note: consultation and escalation via the TPN is to occur where clinical management requires a higher level maternity service capability.

Stabilise and continue monitoring

- Lie the woman flat.
- Maintain a clear airway.
- Commence oxygen using a non-rebreather mask at 10-15 L/minute to maintain oxygen saturation (SpO_2) at > 95%.
- Seek urgent anaesthetic assistance immediately if the woman's breathing is compromised.
- Monitor vital signs: blood pressure, heart rate, respiratory rate and SpO_2 every 5 minutes during resuscitation efforts and then titrate the frequency according to haemodynamic stability.
- Prevent hypothermia:
  - Monitor temperature every 15 minutes
  - Where possible, warm all resuscitation fluids using a temperature-controlled fluid warming device such as a blood warmer
  - Use a forced air warming blanket if available (warmed air is forced through low-pressure blankets to diffuse air evenly over the woman to prevent hypothermia)
  - Minimise body exposure during clinical procedures such as uterine massage
  - Remove wet linen, drapes, and other items promptly.

Obtain intravenous access and collect pathology

- Ensure vascular access with 2 large bore cannula (14-16g).
- Call for expert assistance after 2 failed attempts at cannulation; do not delay.
- Maintain lines for separate functions:
  - Line 1: fluid replacement
  - Line 2: pharmacological therapy.
- Collect blood for urgent pathology:
  - Full blood count (FBC)
  - Coagulation screen and fibrinogen
  - Group and hold
  - Liver function test (LFT)
  - Urea electrolytes and creatinine (UEC)
  - Calcium (Ca2+)
- Arterial blood gas (ABG), or Venous blood gas (VBG) if ABG not available, including lactate.

Note: re-test coagulation screen, calcium and blood gas every 30-60 minutes while bleeding continues.

Commence fluid resuscitation

- Restore immediate circulating volume:
  - Commence rapid infusion: 1000 mL of warmed crystalloid fluid (e.g. Hartmann's)
  - Aim to maintain systolic blood pressure (SBP) > 90 mmHg (to promote tissue perfusion and oxygen carrying capacity)
  - If there is no response in SBP to the initial bolus call a Rapid Response if senior medical support is not present
  - Consider early blood transfusion of O negative blood or group specific where available; crystalloid fluid in excess of 2 litres is recommended only where blood is unavailable
  - Activation of Massive Haemorrhage Protocol (MHP) if there is ongoing bleeding and estimated blood loss is ≥ 1500 mL
  - Insert an indwelling catheter (IDC) with hourly urine measurements
  - Aim for urine output > 30 mL/hr to indicate adequate renal perfusion
  - Monitor and document fluid input/output on fluid balance chart.

Note: blood transfusion is to be considered early to restore oxygen carrying capacity. The woman's clinical condition must be the main determinant in the decision to proceed with blood transfusion, irrespective of laboratory results.

11.3. Medication management of postpartum haemorrhage

Management	Medication*	Dosage	Administration	Notes
Immediate	Oxytocin (Syntocinon®) 5 units/mL or 10 units/mL	10 units **OR**	IM	Short acting oxytocic Repeat dose given even if already administered as third stage prophylaxis
		5 units	Slow IV push	
	PLUS CONSIDER			
	Ergometrine 500 microgram/mL (see notes)	250 micrograms **OR** 250 - 500 micrograms	Slow IV push	Must only be given if oxytocin has been administered either as third stage prophylaxis or PPH treatment Ergometrine can be repeated up to a maximum total of 1 mg, in the absence of contraindications (e.g. hypertension)
			IM	
	OR AS AN ALTERNATIVE TO AN OXYTOCIN BOLUS AND/OR ERGOMETRINE BOLUS			
	Oxytocin 5 units with ergometrine (Syntometrine®) 500 micrograms/mL	Give as 1 mL Syntometrine®	IM	Oxytocic combined with ergot derivative; longer acting combination therapy A single repeat dose may be given if already administered as third stage prophylaxis
Continued Bleeding	Tranexamic acid^ 100 mg/mL	1 gram	Slow IV push	If bleeding persists after 30 minutes, a second dose may be administered
	AND			
	Carboprost Trometamol (Carboprost-Reach®) 250 microgram/mL	250 micrograms	IM	Can be repeated at not less than 15 minutely intervals (maximum of 8 doses)
Maintenance *(can be commenced simultaneously with other therapies to maintain tone)*	Oxytocin (Syntocinon®) infusion	Dilute 30 units of oxytocin in 500 mL of Hartmann's solution (do **not** use dextrose)	IV infusion over 3 hours (10 units per hour) = 167 mL/hour	If commenced as prophylaxis can be continued during the PPH and afterwards to maintain uterine tone
	OR			
	Misoprostol^ 200 micrograms	400 - 800 micrograms	Buccal / sublingual or rectal	Regardless of route of administration, misoprostol takes 1 to 2.5 hours to increase uterine tone

***** Always refer to the Product Information to ensure safe and correct use of any medicine (including consideration of relevant precautions and contraindications).

^ Use of misoprostol and tranexamic acid for postpartum haemorrhage is considered off-label use. Ensure correct procedures are followed including the indication has been approved by the local Drug and Therapeutics Committee and informed patient (or delegate) consent is obtained as per the NSW Health Policy Directive *Approval Process for Medicines and Their Use* [PD2022_056].