

Companions to Management Series



POST-PARTUM HAEMORRHAGE (PPH)

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The
Welfare of Women



Post-Partum Haemorrhage (PPH)

PPH remains the leading cause of maternal mortality worldwide. It is generally defined as blood loss greater than 500mL following birth – with 'primary' PPH occurring within the first 24 hours and 'secondary' PPH any time during the month thereafter. Most cases of morbidity and mortality are associated with primary PPH. While definitions are helpful, it is important to remember that different levels of bleeding can be more problematic for some individuals compared to others. Every effort should therefore be made to minimise the risk of significant bleeding in all pregnant women.



Clinical Relevance

Every year 14 million women around the world experience PPH. The risk of maternal mortality from this is around 1 in 1000 deliveries in low- and middle-income countries, which is where 99% of deaths from PPH occur. However, recent studies have also shown an increase in the incidence of PPH in more mature healthcare systems. As a leading cause of maternal mortality, the prevention and efficient management of PPH can have an impact in reducing the Maternal Mortality Ratio (MMR) – one of the United Nations' Sustainable Development Goals.

Simple measures can be very effective in minimising blood loss after delivery and much can be done even in low resource settings. Beyond these, the use of medication to contract the uterus is a major branch of PPH management. Access to different drugs will be largely dependent upon location, but where available the use of oxytocin for active management of the third stage of labour is strongly recommended as a preventative approach, as this can reduce the incidence of PPH by up to 60%.

However, WHO guidelines now recommend heat-stable Carbetocin for PPH prevention in settings where oxytocin is unavailable or its quality cannot be guaranteed, and where its cost is comparable to other effective uterotonic.

Heat-Stable Carbetocin is a uterotonic medicine used for the prevention of postpartum hemorrhage. A single 100 micrograms intravenous or intramuscular injection of Carbetocin administered after the delivery of the infant is sufficient to maintain adequate uterine contraction that prevents uterine atony and excessive bleeding comparable with an oxytocin infusion. (NB After Cesarean section Carbetocin must be administered by intravenous injection only).

The table below illustrates the main causes of primary and secondary PPH.

Associations with PPH	
Primary PPH (4 Ts)	Secondary PPH
• Poor uterine T one	• Endometritis
• Retained placental T issue	• Retained placental tissue
• T rauma (Genital tract injury)	• Sub-involution of placental site i.e. delayed or inadequate closure of superficial arteries at site of placental attachment
• T hrombin (bleeding disorders)	• Pseudo-aneurysms (Rare)
	• Arteriovenous malformations (Rare)

Risk factors

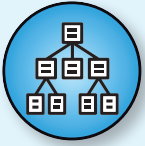
Identifying whether a pregnant woman has risk factors for PPH helps in preparedness and management of PPH. However, it is important to remember that PPH can occur even in the absence of recognisable risk factors. Some known risk factors for PPH are listed below:

Antenatal

- Previous history of PPH
- History of antepartum haemorrhage in this pregnancy
- Suspected or proven placental abruption
- Uterine distension – e.g. multiple pregnancy, polyhydramnios, macrosomia
- Pre-eclampsia/Pregnancy Induced Hypertension
- Multiparity (≥4 previous pregnancies)
- Maternal age ≥40 years
- Maternal anaemia (Hb <9 g/dL)
- Existing uterine anomalies – e.g. fibroids

Intrapartum

- Caesarean Section/assisted vaginal delivery
- Retained placenta
- >4 kg baby
- Prolonged 1st stage of labour
- Induction of labour
- Maternal pyrexia in labour



Management Algorithm

COMMUNICATION, RESUSCITATION, INVESTIGATION and MONITORING form the four pillars of management for PPH. They should always be remembered and undertaken when caring for a patient experiencing post-partum bleeding.

Early detection of PPH is essential for optimal management. Following vaginal delivery, all women should be observed for at least one hour. Where risk factors for PPH exist (see list above), monitoring of blood loss, pulse, and blood pressure can help identify problems early. Good patient education is important – to ensure that they inform the healthcare provider with any excessive bleeding, or other symptoms suggesting acute blood loss.

Where a woman experiences significant bleeding at or after delivery, the following steps are suggested. There are multiple things to do in a short space of time, so good teamwork is imperative.

1. COMMUNICATION

- **Call for help early**
- **Maintain clear communication with the woman and her birth partner**

Heavy bleeding is an obstetric emergency – the patient can deteriorate quickly, so obtain help early whenever possible. It can be frightening for the patient and her birth partner, so explanation and reassurance is important.

2. RESUSCITATION

- **Lie the patient flat and use an ABCD approach to stabilise her**
- **These steps must be completed quickly to avoid delay in treating the cause of the bleeding**

A – Airway

- Assess to ensure the airway is open
- Use 'head-tilt, chin-lift' or 'jaw thrust' manoeuvres to maintain the airway if the patient is not alert enough to do so herself
- Consider inserting an airway adjunct if the patient has reduced consciousness

B- Breathing

- Assess the respiratory rate and oxygen saturations if possible
- Give supplemental oxygen if available
- Consider assisted ventilation if the patient has reduced consciousness

C- Circulation

- Assess the pulse and blood pressure. Check capillary refill time – if >2 seconds there may be poor peripheral circulation. Check the colour and temperature of the patient's hands.
- Secure IV access (ideally two large bore cannulas)
- Take blood samples [for FBC, clotting, crossmatch] if facilities exist to process these
- Give IV fluids [1-2L of normal saline or similar at a fast flow rate]

D- Disability

- Assess the patient's level of consciousness, temperature, and pain
- Lie her on her side if she is unconscious; keep warm, but not overheated; give pain relief where appropriate and available

3. BASIC MEASURES

The following steps are simple, easy to perform, and can help settle bleeding

- **Continuous uterine massage**
- **Expel blood clots from the uterus**
- **Catheterise to empty the bladder (and leave in place)**

Massaging the uterus, expelling clots, and emptying the bladder can all help the uterus to contract

4. INVESTIGATE THE CAUSES OF BLEEDING AND TREAT THESE

TONE (70% of cases)

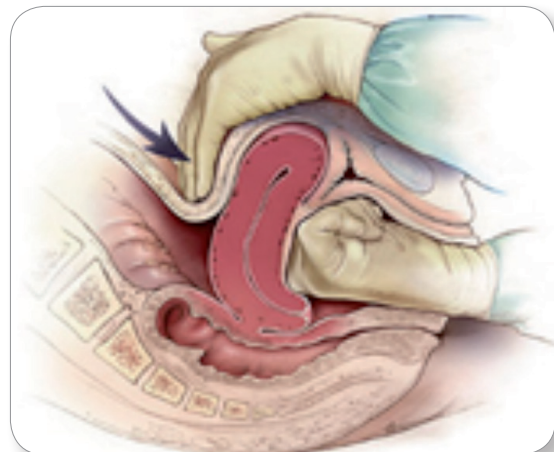
The uterine fundus feels soft on palpation

Medical treatment with uterotonics (give in this order, as available):

- **Oxytocin infusion 20 units in 1 litre normal saline**
 - first bag, as fast as possible
 - second bag, at 40 drops per minute
 - do not give more than 3L of fluid with oxytocin
- **Ergometrine 200mcg slow IV**
or
Syntometrine [oxytocin + ergometrine] 1 ampoule IM
 - do not use if there has been hypertension
- **Misoprostol 800mcg sublingual or rectal**
- **Tranexamic Acid 1gram slow IV**

If heavy bleeding continues, perform bimanual compression

- One hand is placed in the vagina and pushed against the body of the uterus, while the other hand compresses the uterine fundus above through the abdominal wall



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If bleeding continues despite medication, consider balloon/condom tamponade

- Uterine packing with a hydrostatic balloon such as a Bakri balloon or condom over a simple in-out urinary catheter
- Uterus may also be packed with a sterile pack or gauze, although important to ensure any gauze used is tied together, counted, and extended into the vagina to help removal

TISSUE

Retained placental tissue or membranes can impair uterine contraction

- **Check the placenta and membranes to ensure they are complete**
- **If incomplete, see the 'Prolonged Third Stage of Labour' CTM for advice on management**

TRAUMA

Injury to any part of the genital tract can cause ongoing bleeding.

Rarely, bleeding can also occur from other sites – e.g. rupture of the liver, ovarian or splenic vessels – and this should be considered if the patient remains in shock despite optimal management of visible trauma.

- **Check the cervix, vagina, and perineum for tears**
 - Use fundal pressure to make the cervix easier to visualise if necessary
 - Use instruments and/or gauze swabs to help visualise the apex of any tears
 - Use local anaesthetic (e.g. lidocaine) for pain relief
- **Apply pressure to any tears for 5-10mins using sterile gauze**
- **Where expertise and equipment permit, suture any large and/or continuously bleeding tears**
 - Undertake a rectal examination before (to check for injury to the anal canal) and after (to check for sutures left in the anal canal) suturing
 - If the tear extends to the anal canal, ensure that this is sutured by someone with appropriate expertise – if required, basic sutures can be placed to stop bleeding while waiting

5. ADDITIONAL MEASURES

If bleeding persists despite the above measures, or relevant skills/resources are unavailable, external aortic compression can help reduce bleeding in PPH.

Apply downward pressure with a closed fist over the abdominal aorta directly through the abdominal wall – the point of compression is just above the umbilicus and slightly to the left; press the aorta down on to the vertebral column.

With your other hand, palpate the femoral pulse – correct pressure is exerted on the aorta when the pulse stops being palpable.

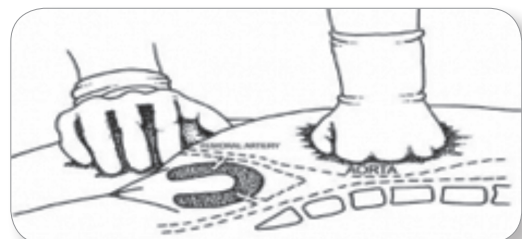


Figure from mcai.org.uk

6. MONITORING

Monitor the patient carefully throughout the episode of bleeding and afterwards.

Measure and record observations (pulse, blood pressure, respiratory rate, oxygen saturation, temperature).

- **Every 15 minutes for the first 2 hours**
- **Every 30 minutes for the next 4 hours**

Recording these in an EARLY WARNING SCORE CHART can help monitor trends over time and allow early recognition of the deteriorating patient. See **CTM: Early Warning Scores** for further information.

Where a patient has experienced a PPH it is advisable to monitor her regularly for at least a further 24 hours – to track her clinical condition and assess for further bleeding.



Other Considerations

A patient with a low starting haemoglobin level can quickly become unwell with even moderate blood loss in labour. Therefore, every effort should be made to treat anaemia antenatally.

Consideration should be given to a patient's PPH risk factors antenatally. If higher risk, she should be recommended to deliver in a healthcare facility with appropriate resources for management and blood transfusion.

A smaller patient will have a lower circulating blood volume and may therefore become unwell earlier when bleeding compared to a larger patient. The patient's physical size should be considered when evaluating the risks of bleeding. It is more important to assess severity of blood loss by the patient's physical reaction to this rather than simply by the estimated volume of blood lost.

Blood loss estimates can be inaccurate. If possible, it is preferable to weigh blood lost (plus bloodstained bedding) to gain a more precise measure of blood loss. Pictorial blood loss estimation guides can also help facilitate greater accuracy of assessment.

Blood transfusion can be lifesaving. Consider this early in cases where bleeding is fast and/or persistent.

Sometimes transfer to a higher level health facility may be indicated. However, thought and effort should first be given to see if the patient can be managed fully in her current location, as transfer brings additional risks. She must be stabilised beforehand and plans made for any deterioration in condition during the journey. A detailed and accurate written or verbal handover should take place between the referring and accepting teams, to ensure that the key aspects of the patient's case are well understood by the team taking over her care

All patients experiencing a PPH should be fully debriefed afterwards – to explain what happened, why this might have been the case, and how it was managed, along with any advice for the postnatal period and/or future pregnancies.

Maternity teams should regularly rehearse PPH management principles to ensure that their skills, understanding, and resources are appropriate and well-practiced.

In cases where a large volume of blood was lost (> 1500mL) and/or the patient became unwell because of the PPH, it is good practice for the healthcare team to discuss afterwards what went well and what could be improved in future cases. This allows all those involved to learn from each event. Everyone's opinions should be considered and there should be no blame attached.



References

Royal College of Obstetricians and Gynaecologists. *Postpartum haemorrhage, Prevention and management. Green-top Guideline No. 52*. London: RCOG; 2016.

World Health Organization. *WHO recommendations for prevention and treatment of postpartum haemorrhage*. Italy: WHO; 2012.

Safe Delivery app. University of Copenhagen, University of Southern Denmark, Maternity Foundation.

A Comprehensive Textbook of Postpartum Hemorrhage 2nd Edition, The Global Library of Women's Medicine, https://www.glowm.com/resource_type/resource/textbook/title/a-comprehensive-textbook-of-postpartum-hemorrhage-2%3Csup%3End%3C-sup%3E-edition/resource_doc/1275

Safer Motherhood app The Global Library of Women's Medicine http://www.glowm.com/resources/glowm_www/mobile/mother.app/mother.welcome.html