The evidence-based management of Postpartum Haemorrhage

About OMPHI

The Oxford Maternal & Perinatal Health Institute (OMPHI) aims to bring together world experts to resolve priority maternal and perinatal health problems. OMPHI engages medical researchers, social scientists and health management experts in major issues affecting the health of mothers and newborn babies, particularly in resource-poor settings. OMPHI has coordinated four large studies funded by the Bill & Melinda Gates Foundation, MacArthur Foundation, EngenderHealth and the Maternal Health Task Force. It has built a network of over 100 researchers across a wide range of countries.

About GFMER

The Geneva Foundation for Medical Education and Research (GFMER) is a non-profit organisation established in 2002. It is supported by the Republic and Canton of Geneva, the Department of Social Affairs of the City of Geneva and other Swiss and international institutions. The Foundation works in close collaboration with the World Health Organization (WHO). GFMER is a WHO Collaborating Centre in Education and Research in Human Reproduction. The overall objectives of the Foundation are to furnish health education and research programs that can be accessed by developing countries and countries in economic transition, and to establish collaboration between entities from the public and private sectors.

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OMPHI/GFMER joint initiatives

In 2010, OMPHI and GFMER started working together to produce e-learning material in the field of maternal and perinatal health. Their first success was the development and implementation of an online training course entitled The evidence-based management of pre-eclampsia and eclampsia - University of Oxford and its Spanish version, La evidencia basada en el manejo de la preeclampsia y eclampsia - Universidad de Oxford. The development of this course was funded by the MacArthur Foundation through EngenderHealth. Group training sessions, based on the online course, have been held in Afghanistan, Ethiopia, India, Mexico and Nigeria. Feedback from health professionals participating in the OMPHI/GFMER course on pre-eclampsia and eclampsia showed a high demand for a similar course on post-partum haemorrhage, which causes a large number of maternal deaths worldwide. OMPHI/GFMER have developed an online training course entitled The evidence-based management of post-partum haemorrhage. Professor Jose Villar, University of Oxford, led the advisory board responsible for the course structure and content, which was adapted from the guidelines of WHO and the Royal College of Obstetricians & Gynaecologists by Dr Raqibat Idris, GFMER; Dr Marloes Schoonheim and Lynn Gertiser, GFMER, edited the course. It was reviewed by a team of specialists in Obstetrics and Gynaecology (Drs Friday Okonofua, Dimitrios Siassakos and Edwin Chandraharan) led by Dr Aris Papageorghiou who also contributed to the course content. eXact learning solutions developed the e-learning format. The course is currently being tested in collaboration with Global Voices for Maternal Health. Its development was funded by EngenderHealth through the MacArthur Foundation, Maternal Health Task Force and OMPHI.

Oxford Maternal and Perinatal Health Institute

Maternal Health Task Force

The evidence-based management of Postpartum Haemorrhage

We suggest you to go through the modules in order. Follow the instructions on the screen and click all the relevant links so you don't miss out on anything!

In each module you will find key articles and documents. They are listed in the *bibliography* that also offers links to some relevant websites.

However, these are not essential and you will get all the core information you need without internet access.

Course contents:

- Module 1 - What is Postpartum Haemorrhage (PPH)?
- Module 2 - What are the risks for Postpartum Haemorrhage (PPH) and how can they be minimised?
- Module 3 - How should Postpartum Haemorrhage (PPH) be managed?
- Module 4 - How should a retained placenta be managed?
- Module 5 - How should secondary Postpartum Haemorrhage be treated?
- Module 6 - Postpartum Haemorrhage (PPH) risk management

The evidence-based management of Postpartum Haemorrhage

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Royal College of Obstetricians and Gynaecologists. Prevention and management of postpartum haemorrhage. Green-top Guideline No. 52. London: RCOG; 2011.

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

World Health Organization. WHO guidelines for the management of postpartum haemorrhage and retained placenta. Geneva: World Health Organization; 2009.

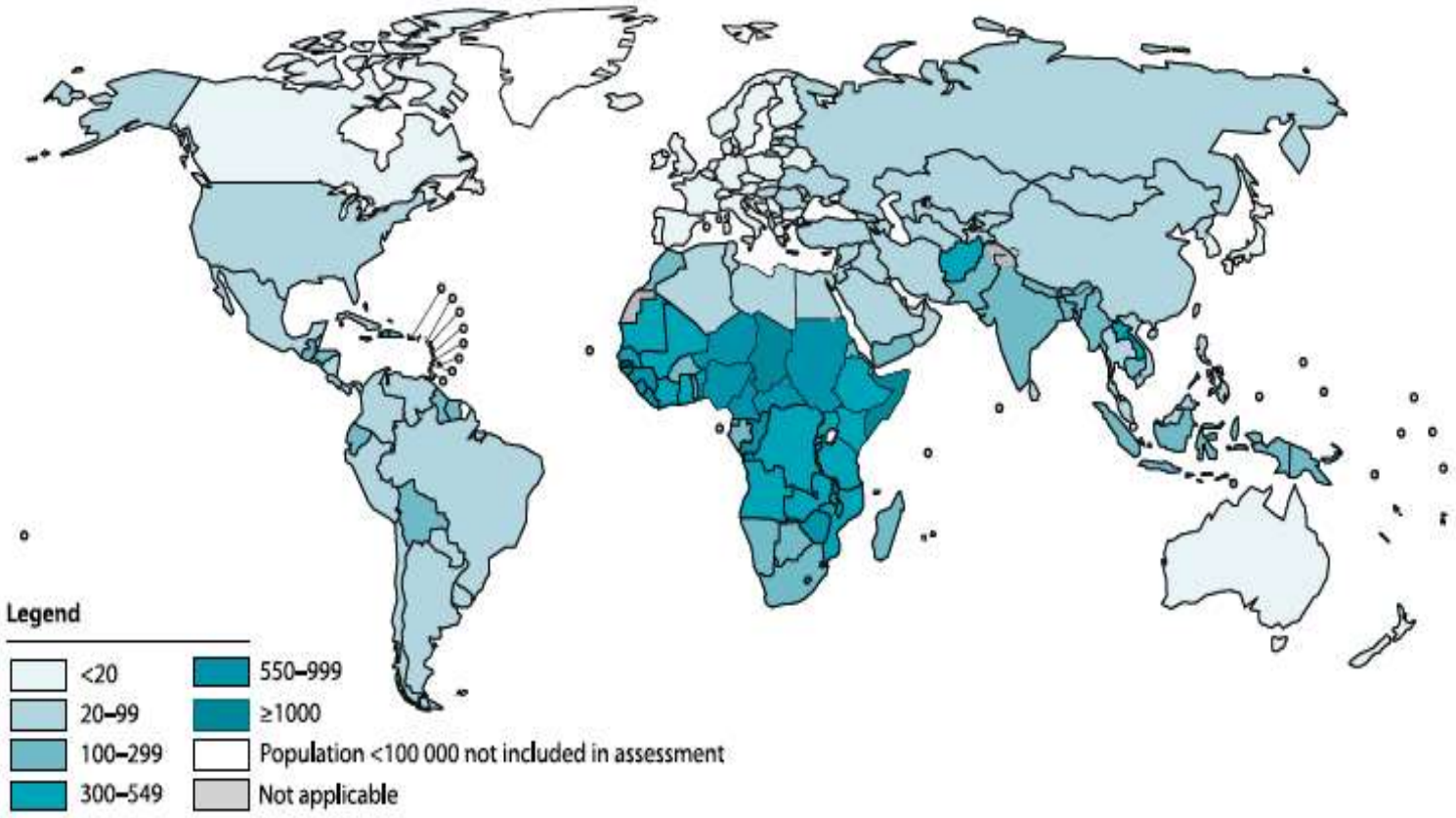
Module 1

What is postpartum haemorrhage?

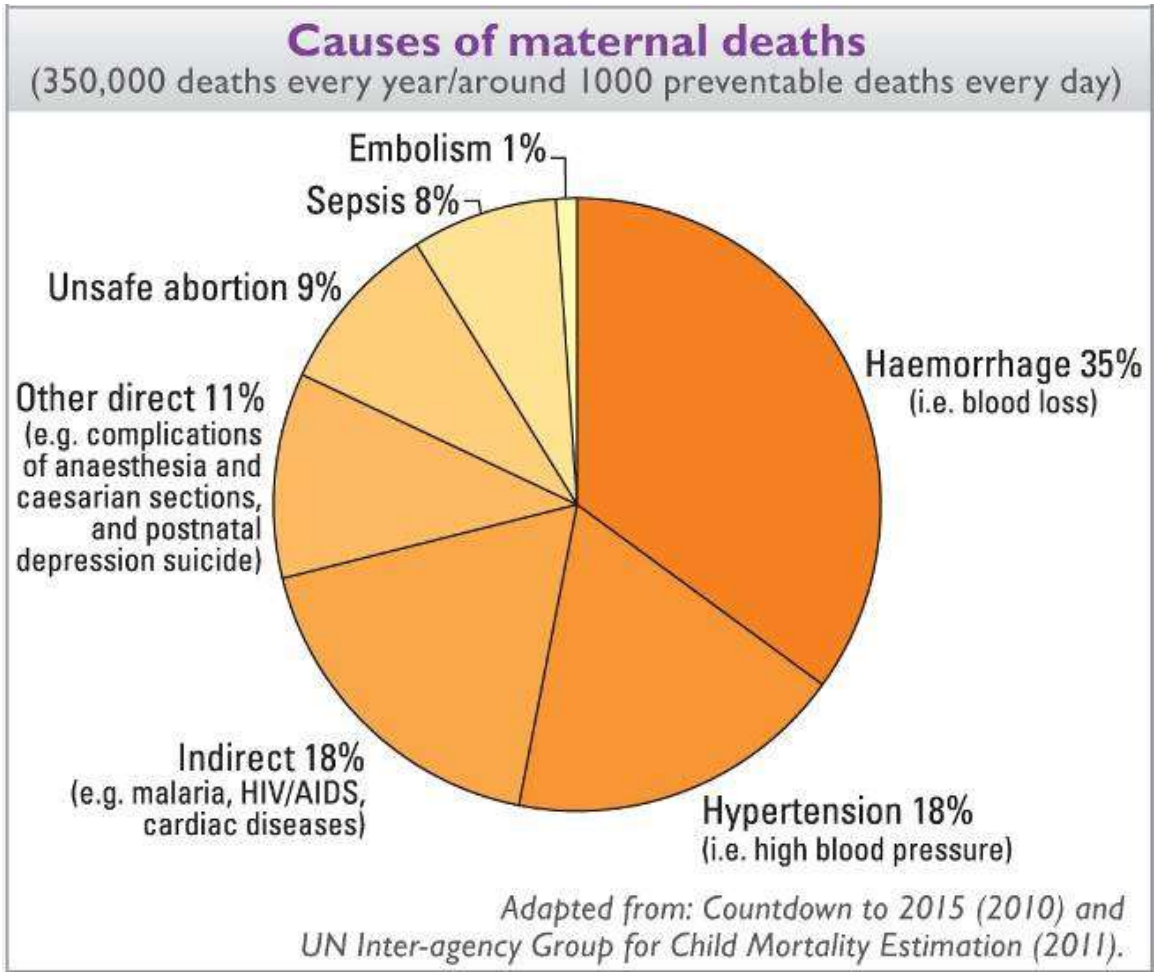
On successful completion of this module you should be able to:

- Identify the risk factors for PPH.
- Describe how PPH risks can be minimised.
- Describe active management of the third stage of labour.
- Describe the drugs that can be used to reduce the risk of PPH.

Between 1990 and 2010, maternal mortality worldwide reduced by almost half (from 400 to 210 maternal deaths per 100 000 births). However, maternal mortality is still too high, especially in developing regions. The MMR at 240 in these regions was 15 rimes higher than in developed regions. The map shows countries by category according to their maternal mortality ratio (MMR, death per 100 000 live births) in 2010: as you can see, women in Sub-Saharan Africa experience a 1 in 39 chance (1 in 150 for developing countries as a whole) of dying from a maternal cause compared to developed regions where the rate is 1 in 3800.



In 2010, approximately 280 000 women died due to complications of pregnancy and childbirth. There are about 800 preventable maternal deaths every day. 995 Of these deaths occur in developing countries and almost all could have been prevented. Take a look at the pie chart and find out how many maternal deaths result from haemorrhage.



Obstetric haemorrhage is one of the major causes of maternal death in both developed and developing countries. The following statements about Obstetric haemorrhage are true:

- There is evidence of substandard care in the majority of fatal cases of obstetric haemorrhage.
- In developed countries the majority of matemal deaths due to haemorrhage are considered preventable.
- Haemorrhage is the major cause of severe matemal morbidity in almost all near-miss audits in both developed and developing countries.
- Obstetric haemorrhage includes both antepartum and postpartum haemorrhage.
- Antepartum haemorrhage are sometimes associated with subsequent postpartum haemorrhage.

Learn the main features of Postpartum haemorrhage:

- PPH is the most common form of major obstetric haemorrhage.
- PPH accounts for the majority of the 14 million cases of obstetric haemorrhage that occur each year.
- PPH can be primary or secondary.

Do you know the difference between primary and secondary PPH?

- Primary PPH is the loss of 500 ml blood or more from the genital tract within 24 hours of the birth of a baby.
- Secondary PPH is abnormal or excessive bleeding from the birth canal between 24 hours and 12 weeks of the birth of a baby.

Primary PPH, defined as the loss of **500 ml blood** or more from the genital tract within 24 hours of the birth of a baby, is the most common form of major obstetric haemorrhage. It can be **minor** or **major**.

• **Minor Primary PPH** is the loss of between **500 and 1000 ml** from the genital tract within 24 hours of the birth of a baby.

In the absence of clinical signs of shock this amount of blood loss should prompt

- basic measures of monitoring and

- readiness for resuscitation (close monitoring, intravenous access, full blood count, group and screen)

• **Major or Severe Primary PPH** is blood loss **of 1000 ml or more** within 24 hours after birth.

Smaller blood loss associated with clinical signs of shock, tachycardia, hypotension, tachypnoea, oliguria or delayed peripheral capillary filling is also managed as major PPH.

These scenarios should prompt a **full protocol of measures** to resuscitate, monitor and arrest the bleeding.

The terms **major PPH** and **severe PPH** are interchangeable.

The global burden of PPH

PPH affects approximately 2% of all women who give birth and is associated with nearly **one quarter** of all maternal deaths globally.

PPH is the leading cause of maternal mortality in most low-income countries.

PPH is a significant contributor to severe maternal morbidity and long-term disability as well as to a number of other severe maternal conditions generally associated with more substantial blood loss, including shock and organ dysfunction.

By preventing and treating PPH, most PPH-associated deaths could be avoided.

PPH and the Millennium Development Goals

One of the targets of the Millennium Development Goal 5 is to reduce the maternal mortality ratio by three quarters between 1990 and 2015.

Despite proven interventions that could prevent disability or death during pregnancy and childbirth, maternal mortality remains a major burden in many developing countries.

In the developing regions as a whole the maternal mortality ratio dropped by 34 per cent between 1990 and 2008 (from 440 to 290 maternal deaths per 100,000 live births). The Millennium Development Goal target, however, is still far off.

The prevention and treatment of PPH are vital steps towards improving the health care of women during childbirth and the achievement of the Millennium Development Goals.

When estimating the percentage of blood loss, consideration should be given to body weight and the original haemoglobin.

Blood volume depends on the body weight. Approximate blood volume (in litres) equals body weight in kilograms divided by 12.

A low antenatal haemoglobin (less than 11 g/dl) should be investigated and treated appropriately to optimise haemoglobin before delivery. There is also some evidence that iron deficiency anaemia can contribute to atony because of depleted uterine myoglobin levels necessary for muscle action.

Allowing for the physiological increase in pregnancy, total blood volume at term is approximately 100 ml/kg (an average 70 kg woman has a total blood volume of 7000 ml) a blood loss of more than 40% of total blood volume (approximately 2800 ml) is generally regarded as life-threatening.

A blood loss of approximately 2800 ml is considered **life-threatening.**

Full PPH protocols should be instituted at an estimated blood loss **well below a a life-threatening level** as the aim of management is to prevent haemorrhage escalating to this point.

The minimum level to institute **full PPH protocols** is therefore an **estimated blood loss of 1000 ml**.

How can blood loss be estimated?

• Visually estimating the amount of blood loss may lead to underestimation. There is not enough evidence though to recommend the measurement of blood loss over clinical estimation.

• Blood collection drapes for vaginal deliveries and weighing swabs are more accurate than visual blood loss estimation.

• Participating in clinical reconstructions may encourage early diagnosis and prompt treatment of postpartum haemorrhage.

• Written and pictorial guidelines may help staff working in labour wards to estimate blood loss.

Causes of PPH are related to abnormalities of **one or more** four basic processes known as the four T's:

- **Tone**: abnormalities of uterine contraction:
- uterine anatomy: this is the most common cause of primary PPH
- uterine inversion
- **Tissue**: retained products of conception (placenta, membranes, clots).
- **Trauma**: of the genital tract:
- vaginal/cervical lacerations or haematoma
- ruptured uterus
- broad ligament haematoma
- **Thrombin**: abnormalities of coagulation: maternal bleeding disorders

You have now completed this module, you should now be able to:

- Know the global burden of PPH.
- List the subtypes of PPH.
- Differentiate between minor and major or severe primary PPH.
- Describe how blood loss can be estimated.
- List the causes of PPH.

Suggestions for further reading:

Mousa HA, Alfirevic Z. Treatment for primary postpartum haemorrhage. Cochrane Database Syst Rev. 2007;(1):CD003249. Available from: http://apps.who.int/rhl/reviews/CD003249.pdf

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Suggestions for further reading

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Toledo P, McCarthy RJ, Hewlett BJ, Fitzgerald PC, Wong CA. The accuracy of blood loss estimation after simulated vaginal delivery. Anesth Analg. 2007 Dec;105(6):1736–1740. Available from: http://journals.lww.com/anesthesia-analgesia/pages/articleviewer.aspx?year=2007&issue=12000&article=00037&type=Fulltext

Patel A, Goudar SS, Geller SE, Kodkany BS, Edlavitch SA, Wagh K, Patted SS, Naik VA, Moss N, Derman RJ. Drape estimation vs. visual assessment for estimating postpartum hemorrhage. Int J Gynaecol Obstet. 2006 Jun;93(3):220–4. [Abstract]

Bose P, Regan F, Paterson-Brown S. Improving the accuracy of estimated blood loss at obstetric haemorrhage using clinical reconstructions. BJOG. 2006 Aug;113(8):919–24. [Abstract]

Module 2
What are the risks for postpartum haemorrhage (PPH) and how can they be minimised?

The evidence-based management of Postpartum Haemorrhage

This training course is based on the following guidelines:

Royal College of Obstetricians and Gynaecologists. Prevention and management of postpartum haemorrhage. Green-top Guideline No. 52. London: RCOG; 2011.

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

In situations where there are discrepancies between the recommendations from the RCOG and those of WHO, we present both options.

On successful completion of this module you should be able to:

- Identify the risk factors for PPH
- Describe how PPH risks can be minimised
- Describe active management of the third stage of labour
- Describe the drugs that can be used to reduce the risk of PPH. Identify the risk factors for PPH

What are the risk factors for PPH?

- Most cases of PPH have no identifiable risk factors.
- Risk factors may present antenatally or intrapartum; care plans must be modified when risk factors present themselves.
- Clinicians must be aware of risk factors for PPH and should take these into account when counselling women about place of delivery.

Some risk factors presenting themselves **antenatally** are associated with a **substantial increase** in the incidence of PPH. Learn the risk factors and know what to do when they present themselves:

PPH risk factors:

- Suspected or proven placental abruption
- Known placenta praevia
- Abnormally adherent placenta (placenta accreta and the more severe forms: increta or percreta)
- Multiple pregnancy
- Pre-eclampsia/gestational hypertension
- Grand multiparity
- Pre-existing bleeding disorders such as haemophilia
- Treatment with anticoagulants

What to do:

Women with these factors should be advised to deliver in a consultant-led maternity unit.

Some risk factors presenting themselves **antenatally** and associated with a **significant (though smaller) increase** in the incidence of PPH. Learn the risk factors and know what to do when they present themselves:

PPH risk factors:

- Previous PPH
- Obesity (BMI >35)
- Anaemia (<9 g/dl)

PPH may be aggravated by pre-existing anaemia and in that case the loss of a smaller volume of blood may still result in adverse clinical sequelae.

What to do:

These factors should be taken into account when discussing the setting for delivery.

Risk factors becoming apparent **during labour and delivery**:

PPH risk factors

- Delivery by emergency caesarean section
- Delivery by elective caesarean section
- Retained placenta
- Episiotomy
- Operative vaginal delivery
- Prolonged labour (> 12 hours)
- Big baby (> 4 kg)
- Pyrexia in labour
- Induction of labor

What to do

These factors should prompt extra vigilance among clinical staff.

Most deaths resulting from PPH occur during the first 24 hours after birth. Appropriate management of women during the third stage of labour will prevent the majority of these deaths.

Active management of the third stage of labour (AMTSL) lowers maternal blood loss and reduces the risk of PPH (Cochrane reviews of 2000 and 2011).

As the majority of women who experience PPH complications have no identifiable clinical or historical risk factors, it is recommended that active management of the third stage of labour be offered to all women during childbirth, whenever a skilled provider is assisting with the delivery.

Unlike active management, expectant management involves waiting for signs of placenta separation and allows for the placenta to be delivered spontaneously, or aided by nipple stimulation or gravity.

Learn the three components of the active management of third stage of labour:

1. Oxytocic drugs

Prophylactic oxytocics have been found to reduce the risk of PPH by about 60%.

Their use is the main intervention within the active management of the third stage of labour package.

2. Cord clamping

Late cord clamping (performed approximately 1 to 3 minutes after birth) is recommended for all births while initiating simultaneously essential new-born care.

3. Controlled cord traction

Cord traction is the recommended method for the removal of the placenta. Uterine massage following the delivery of the placenta by controlled cord traction is frequently included as part of the active management of the third stage of labour.

The use of oxytocic drugs is the main intervention within the AMRSL.

Oxytocic drugs should be offered routinely in the management of the third stage of labour in all women.

For women without risk factors for PPH delivering vaginally and for women delivering by caesarean section oxytocin 10 IU by IM (intramuscular) or IV (intravenous) injection is the agent of choice for prophylaxis in the third stage of labour.

ATTENTION!

In women with major cardiovascular disorders low-dose oxytocin infusion is recommended as a safer alternative.

What injectable uterotonics are recommended for use in settings where oxytocin is unavailable?

Ergometrine/ methylergometrine or Syntometrine, ergometrine–oxytocin fixed drug combinations, have some side effects and contraindications:

- they increase vomiting.
- their use is contraindicated in women with hypertensive disorders
- their use should be avoided in populations unscreened for hypertensive disorders

Dose:

IM or IV (slowly): 0.2 mg

What injectable uterotonics are recommended for use in settings where oxytocin is unavailable?

Oral misoprostol

Misoprostol is not as effective as oxytocin in preventing PPH. It carries increased adverse effects, which are dose related. The dose is 600 micrograms orally.

In settings where skilled birth attendants are not present and oxytocin is unavailable, misoprostol (600 mg P0) should be administered by community health care workers and lay health workers for the prevention of PPH.

There is insufficient evidence to recommend the antenatal distribution of misoprostol to pregnant women for self-administration for the prevention of PPH.

Administration before birth potentially has serious consequences.

What injectable uterotonics are recommended for use in settings where oxytocin is unavailable?

Carbetocin

Carbetocin is a longer-acting oxytocin derivative.

It is not currently recommended for routine use because it is relatively expensive.

Its use, though associated with a reduction in the use of additional uterotonic agents, makes no difference in the occurrence of major obstetric haemorrhage.

The second component of AMTSL is cord clamping.

Late cord clamping, performed approximately 1-3 minutes after birth,is recommended for all births while initiating simultaneously essential new-born care.

Cord clamping is also recommended for women living with HIV or women with unknown HIV status.

IMPORTANT!

There is no evidence that delaying the cord clamping increases the possibility of HIV transmission from the mother to the new-born.

The third component of AMTSL is controlled cord traction and uterine massage.

Let's examine the importance of uterine massage first. Uterine massage is frequently included as part of the active management of the third stage of labour.

Postpartum abdominal uterine tonus assessment for early identification of uterine atony is recommended for all women.

Routine and frequent uterine tone assessment remains a crucial part of immediate postpartum care, particularly for the optimization of early PPH diagnosis.

IMPORTANT!

Sustained uterine massage is not recommended as an intervention to prevent PPH in women who have received prophylactic oxytocin as it may cause maternal discomfort, requires a dedicated health professional, and may not lead to a reduction of blood loss.

Controlled cord traction (CCT) is the recommended method for the removal of the placenta. If ergot alkaloids are used for the prevention of PPH, then CCT is essential to minimize placenta retention.

IMPORTANT! CCT is the first intervention to treat retained placenta, therefore the teaching of CCT in medical and midwifery curricula is essential.

• Vaginal births
In settings where skilled birth attendants are available, CCT is recommended for vaginal births if the care provider and the parturient woman regard a small reduction in blood loss and a small reduction in the duration of the third stage of labour as important.

In settings where skilled birth attendants are unavailable, CCT is not recommended.

• Caesarean births
Cord traction is the recommended method for the removal of the placenta (rather than manual removal) in caesarean section.

Additional recommendations: placenta accreta/percreta

Women with placenta accreta/percreta are at very high risk of major PPH.

The incidence of placenta accreta/percreta appears to be increasing and has been linked to the increase in caesarean section, particularly repeat caesarean section.

All women who have had a caesarean section previously must have their placental site determined by ultrasound *near term, if available*.

Where facilities exist magnetic resonance imaging (MRI) may be a useful tool to assist in determining whether the placenta is accreta or percreta.

Additional recommendations: placenta accreta/percreta

If placenta accreta or percreta is diagnosed antenatally, there should be a consultant-led multidisciplinary planning for delivery.

Consultant obstetric and anaesthetic staff should preferably be present, prompt availability of blood, fresh frozen plasma and platelets be confirmed and the timing and location for delivery chosen to facilitate consultant presence and access to intensive care.

Leaving the placenta in the uterus after delivery of the baby by fundal classical uterine incision may allow a procedure with very little blood loss.

Available evidence on prophylactic occlusion or embolisation of pelvic arteries in the management of women with placenta accreta is equivocal.

You have completed module 2 and should now be able to:

- Identify the risk factors for PPH.
- Describe how PPH risks can be minimised.
- Describe active management of third stage labour.
- Describe the drugs that can be used to reduce the risks of PPH.

Suggestions for further reading

Attilakos G, Psaroudakis D, Ash J, Buchanan R, Winter C, Donald F, Hunt LP, Draycott T. Carbetocin versus oxytocin for the prevention of postpartum haemorrhage following caesarean section: the results of a double-blind randomised trial. BJOG. 2010 Jul;117(8):929–36. [Abstract]

Al-Zirqi I, Vangen S, Forsen L, Stray-Pedersen B. Prevalence and risk factors of severe obstetric haemorrhage. BJOG. 2008 Sep;115(10):1265–72. [Abstract]

Begley CM, Gyte GML, Devane D, McGuire W, Weeks A. Active versus expectant management for women in the third stage of labour. Cochrane Database Syst Rev. 2011;(11):CD007412. [Abstract]

Prendiville WJ, Elbourne D, McDonald S. Active versus expectant management in the third stage of labour. Cochrane Database Syst Rev. 2000;(3):CD000007. [Abstract]

Suggestions for further reading

World Health Organization. WHO recommendations for the prevention of postpartum haemorrhage. Geneva: World Health Organization; 2007.

McDonald S, Abbott JM, Higgins SP. Prophylactic ergometrine-oxytocin versus oxytocin for the third stage of labour. Cochrane Database Syst Rev. 2004;(1):CD000201. [Abstract]

Gülmezoglu AM, Forna F, Villar J, Hofmeyr GJ. Prostaglandins for preventing postpartum haemorrhage. Cochrane Database Syst Rev. 2007;(3):CD000494. [Abstract]

Alfirevic Z, Blum J, Walraven G, Weeks A, Winikoff B. Prevention of postpartum hemorrhage with misoprostol. Int J Gynaecol Obstet. 2007 Dec;99 Suppl 2S198–201. [Abstract]

Lax A, Prince MR, Mennitt KW, Schwebach JR, Budorick NE. The value of specific MRI features in the evaluation of suspected placental invasion. Magn Reson Imaging. 2007 Jan;25(1):87–93. [Abstract]

Warshak CR, Eskander R, Hull AD, Scioscia AL, Mattrey RF, Benirschke K, Resnik R. Accuracy of ultrasonography and magnetic resonance imaging in the diagnosis of placenta accreta. Obstet Gynecol. 2006 Sep;108(3 Pt 1):573–81. [Abstract]

Module 3
How should postpartum haemorrhage (PPH) be managed?

The evidence-based management of Postpartum Haemorrhage

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

World Health Organization. WHO guidelines for the management of postpartum haemorrhage and retained placenta. Geneva: World Health Organization; 2009.

In situations where there are discrepancies between the recommendations from the RCOG and those of WHO, we present both options.

On successful completion of this module you should be able to:

- Describe the basic measures for managing minor PPH
- Describe the full protocol for managing major PPH
- Describe how to evaluate and monitor a case of PPH
- Describe the mechanical strategies in arresting bleeding in PPH caused by uterine atony
- Describe the pharmacological strategies in arresting bleeding in PPH caused by uterine atony
- Describe the surgical strategies in arresting bleeding in PPH caused by uterine atony
- Describe the management of other causes of PPH

How should Postpartum haemorrhage be managed?

Once PPH has been identified, management involves four components, all of which must be undertaken **simultaneously**:

- Communication
- Resuscitation
- Monitoring and investigation
- Arresting the bleeding

How should Postpartum haemorrhage be managed?

The pattern of management presented in this course depends on the woman being cared for in a **consultant-led maternity** unit with:

- Access to laboratory;
- Blood bank facilities;
- Skilled obstetric and anaesthetic staff readily available.

If priimary PPH occurs in a woman delivering in a **different setting** (such as at home or in a midwife-led maternity unit) the professionals on site should institute first aid measures while promptly **arranging transport to a consultant-led maternity unit.**

How should Postpartum haemorrhage be managed?

The following **initial assessment** and **basic treatment** should be instituted:

1. Call for help
2. Assess airway, breathing and circulation (ABC)
3. Provide supplementary oxygen
4. Obtain an intravenous line
5. Start fluid replacement with intravenous crystalloid fluid
6. Monitor blood pressure, pulse and respiration
7. Catheterize bladder and monitor urinary output
8. Assess need for blood transfusion
9. Order laboratory tests-complete blood count, coagulation screen, blood grouping and cross-match
10. Start intravenous oxytocin infusion

Initial assessment and basic treatment of postpartum haemorrhage involve other actions:

• Consider uterine massage, bimanual uterine compression, external aortic compression, balloon or condom tamponade.

• Be ready at all times to transfer the woman to a higher-level facility if she is not responding to the treatment or a treatment cannot be administered at your facility.

• Transfer with **on-going intravenous uterotonic infusion**.

• Accompanying attendant should **rub the woman's abdomen continuously** and, if necessary**, apply mechanical compression**.

Basic measures for managing minor postpartum haemorrhage

Use basic measures in primary PPH of 500-1000 mL in the absence of clinical signs of shock to facilitate resuscitation should it become necessary. These measures involve:

- **Close monitoring**
- **Intravenous access**
- **Full blood count**
- **Group and screen**

Attention!

Minor PPH can easily progress to major PPH and is sometimes unrecognized.

Four components of minor PPH management:

Communication Who should be informed?

- Alert the midwife-in-charge
- Alert first-line obstetric and anaesthetic staff trainted in the management of PPH
- Alert the blood bank
- Alert a higher level of care for referral

Resuscitation

- Obtain intravenous access (14-gauge cannula x 1)
- Commence crystalloid infusion

Monitoring and investigation

- Monitor closely
- Consider venepuncture (20mL) for group and screen, full blood count and coagulation screen including fibrinogen
- Pulse and blood pressure recording every 15 minutes

Arresting the bleeding

- This follows the same pattern as full protocol for major PPH.

When to use the full protocol for managing Major Postpartum Haemorrhage

Full protocol measures should be used if

- primary PPH is continuing after >1000mL of blood loss
- if a smaller blood loss is associated with **clinical signs of shock**:
    - tachycardia
    - hypotension
    - tachypnoea
    - oliguria
    - delayed peripheral capillary filling

The full protocol for managing major PPH includes measures to:

- **Communicate**
- **Resuscitate**
- **Monitor and investigate**
- **Arrest the bleeding**

Please look up the full protocol flow chart at page 24 of the RCOG Guideline

Full Protocol for managing a major postpartum haemorrhage:

Communication

Who should be informed when the woman presents with postpartum haemorrhage?

Early involvement of appropriate **senior staff** including an anaesthesia team, and laboratory specialist is fundamental to the management of PPH

- Call an experienced midwife (in addition to the midwife in charge)
- Call an obstetric middle grade (senior medical officer in obstetrics) and alert a consultant
- Call an anaesthetic middle grade (senior medical officer in anaesthesia) and alert a consultant
- Alert a consultant clinical haematologist on call
- Alert a blood transfusion laboratory
- Call porters for delivery of specimens/blood

Communication with the **patient** and her **birthing partner** is important and clear information of what is happening should be given, as this is a very frightening event.

Full Protocol for managing a major postpartum haemorrhage:

Communication

Terms to be used:

Clinicians and blood transfusion staff should discuss together at a local level to agree on:

- A standard form of **words** (such as 'we need compatible blood now' or 'group-specific blood') to be used in cases of major obstetric haemorrhage
- A **timescale** for procedures

The use of the term 'controlled major obstetric haemorrhage' or 'on-going major obstetric haemorrhage' may be used to define the **urgency** for the need of the team

Full Protocol for managing a major postpartum haemorrhage:

Resuscitation

A primary survey of a collapsed or severly bleeding woman should follow a structured approach of simple **'ABC'** with **resuscitation taking place as problems are identified**: so a process of simultaneously evaluating and resuscitating.

The urgency and measures undertaken to resuscitate and arrest haemorrhage need to be tailored to the **degree of shock.** Clinical judgement* should be applied on each situation.

The cornerstones of resuscitation during PPH are:

- **Restoration of blood volume**
- **Restoration of oxygen-carrying capacity**

* Obstetricians should consult with colleagues in anaesthesia, haematology and transfusion medicine in determining the most appropriate combination of intravenous clear fluids, blood and blood products for continuing resuscitation.

Full Protocol for managing a major postpartum haemorrhage:

Resuscitation

The main **therapeutic goals** of management of massive blood loss is to maintain:

Haemoglobin >8g/dL

Platelet count >75 $x10^9$ / L

Prothrombin <1.5 x mean control

Activated prothrombin times <1.5 x mean control

Fibrinogen >1.0 g/L

Full Protocol for managing a major postpartum haemorrhage:

Resuscitation

What can be done to restore blood volume and oxygen-carrying capacity?

1. ABC protocol includes:

A: Assess **A**irway; seek urgent anaesthetic assistance if compromised

B: Assess **B**reathing

C: Evaluate **C**irculation

- Give oxygen by mask at 10-15 litres/minute regardless of maternal oxygen concentration

- Obtain intravenous access (14-gauge cannula x 2, orange cannulae)

- Position the woman flat

- Keep the woman warm using appropriate available measures

- Until blood is available, infuse **up to 3.5 litres of warmed fluids** as rapidly as requred

Full Protocol for managing a major postpartum haemorrhage:

Resuscitation

What can be done to restore blood volume and oxygen-carrying capacity?

2. Blood Volume

• Volume replacement must be undertaken bearing in mind that **blood loss** is often grossly **underestimated**.

• **Compatible blood** (as red cell concentrate) is the best fluid to replace major blood loss and should be transfused as soon as available, if necessary.

• The **clinical picture** should be the main determinant for blood transfusion and time should not be wasted waiting for laboratory results

Full Protocol for managing a major postpartum haemorrhage:

Resuscitation

What can be done to restore blood volume and oxygen-carrying capacity?

3. Fluid Therapy

The fluid therapy includes:

- **Crystalloid**: isotonic crystalloids are recommended for the initial fluid resuscitation
- Infuse up to 2 litres of Hartmann's solution
- **Colloid**: infuse up to 1-2 litres of colloid until blood arrives. Be aware that high doses may cause adverse effects

The maximum volume of clear fluids that should be infused while awaiting compatible blood is 3.5 litres.

Full Protocol for managing a major postpartum haemorrhage:

Initial monitoring and Investigation

What to investigate and how to monitor the woman?

1. Venepuncture (20mL) for:
   - crossmatch (4 units minimum)
   - full blood count
   - coagulation screen including fibrinogen
   - renal and liver function for baseline
2. Monitor temperature every 15 minutes
3. Continuous pulse, blood pressure recording and respiratory rate (using oximeter, electrocardiogram and automated blood pressure recording)
4. Foley catheter to monitor urine output
5. Two peripheral cannulae, 14- or 16-gauge
6. Consider arterial line monitoring (once appropriately experienced staff available for insertion)

Arresting the Bleeding

The most common cause of primary PPH is **uterine atony.**

Careful clinical examination should be done to ascertain that the uterus is indeed atonic and that other sources of bleeding, such as genital tract lacerations or uterine inversion, are excluded.

Arresting the Bleeding

The following measures should be instituted, in turn, **until the bleeding stops:**

1.Mechanical and physiological measures to stimulate the **uterine contraction** are the first-line management of PPH. They include:

- Uterine massage (rubbing of the fundus)
- Bimanual uterine compression
- Ensure bladder is empty (use a Foley catheter and leave it in place)

Application of these procedures requires training and associated maternal discomfort and complications have been reported.

The use of **uterine packing is not recommended**, it is potentially harmful.

Arresting the Bleeding

2. Pharmacological measures (uterotonics) essential in the treatment of PPh are:

- Syntocinon (oxytocin)- first line agent
- Second line agents
- Ergometrine and Syntometrine (ergometrine-oxytocin fixed drug combination)
- Carboprost
- Misoprostol

Arresting the Bleeding

3. Surgical Measures: If mechanical and pharmacological measures fail to control the haemorrhage, surgical measures should be instituted:

- Balloon Tamponade
- Haemostatic brace suturing (such as using procedures described by B-Lynch or modified compression sutures)
- Bilateral ligation of uterine arteries
- Bilateral ligation of internal iliac (hypogastric) arteries
- Hysterectomy

Conservative surgical measures should be tried first, then invasive procedures-compression sutrues followed by uterine, utero-ovarian and hypogastric vessel ligation, then a subtotal (supracervical) or total hysterectomy; if life-threatening bleeding continues after ligation.

Arresting the Bleeding: Uterine Atony

Temporary Mechanical Measures

1. Uterine massage-

The rubbing of the uterus achieved through the manual massaging of the abdomen. It is typically sustained until the bleeding stops or the uterus contacts and **should be started once PPH has been diagnosed.**

The initial rubbing of the uterus and expression of blood clots are not regarded as therapeutic uterine massage.

2. Bimanual uterine compression-

A temporary measure until appropriate care is available. Health care workers should be appropriately trained in its application.

The procedure may be painful: it is important to communicate with the woman and her birthing partner.

Arresting the Bleeding: Uterine Atony

Temporary Mechanical Measures

3. Compression of the aorta-

Compression of the aorta is recommended for its usea as a temporary measure until appropriate surgical support is available.

It is a potentially life-saving technique and an effective measure that allows time for resuscitation to catch up with the volume replacement.

4. Non-pneumatic antishock garment-

Used as a temporary measure until appropriate care is available. It may be useful in settings where women with PPH require transfe from midwife-led to consultant-led units.

Research evaluating its potential benefits and harms is on-going.

Uterine Atony

Pharmacological Measures: Uterotonics

Uterotonics

1.Oxytocin (Syntocinon)

First-line agent for the treatment of PPH

Dose:

• 5 units by slow intravenous injection (dose may have to be repeated)

• In continuous IV infusion 40 units in 500mL of Hartmann's solution at 125mL/hour unless fluid restriction is necessary

OR

• IV infusion 20-40 units in 1 Litre IV fluid at 60 drops/minute

• In continuous IV infusion 20 units in 1 Litre IV fluids at 40 drops/minute until haemorrhage stops

Maximum Dose: No more than 3L of IV fluid containing oxytocin

Precaution: Potential **adverse haemodynamic effects** including profound hypotension with oxytocin injection, thus IV bolus injection should be given slowly.

Uterine Atony

Pharmacological Measures: Uterotonics

Uterotonics

2. Ergometrine or Syntometrine (ergometrine-oxytocin fixed drug combination)

Ergot derivatives are recommended for use if intravenous oxytocin is unavailable, or if the bleeding does not respond to oxytocin.

Dose:

• Ergometrine**- 0.2** mg or **0.5** mg by **slow intravenous** or **intramuscular** injection

Continuation:

• Repeat 0.2 mg IM after 15 minutes

• If required, give 0.2 mg IM or IV slowly every 4 hours

Maximum Dose: 5 doses (total 1.0 mg) **OR** Syntometrine **–** 1mL IV slowly

Precaution: Pre-eclampsia, hypertension, heart disease

Uterine Atony

Pharmacological Measures: Uterotonics

Prostaglandins

1.Carboprost (15 methyl Prostaglandin F2)

Prostaglandins are recommended for use if intravenous oxytocin is unavailable, or if the bleeding does not respond to oxytocin.

Dose:

• 0.25 mg by intramuscular injection repeated at intervals of not less than 15 minutes

Maximum Dose: 8 doses (total 2mg)

Precautions/contraindications: Asthma

It should not be given intravenously as it may be fatal

Uterine Atony

Pharmacological Measures: Uterotonics

Prostaglandins

2. Misoprostol (prostaglandin E1)

Recommended for use if intravenous oxytocin is unavailable, or if the bleeding does not respond to oxytocin.

Dose:

- 800 micrograms **sublingually—**rick of hyperpyrexia (WHO)
- 1000 micorgrams **rectally** (RCOG)

Uterine Atony

Surgical Measures to arrest the bleeding

What surgical measures should be employed to arrest bleeding due to uterine atony?

If a treatment of uterotonics and other available conservative interventions (e.g. uterine massage, balloon tamponade) does not result in the stopping of bleeding, surgical interventions should be used without further delay.

Conservative surgical approaches should be tried first. If these do not work, they should be followed by more invasive procedures

Selection and sequence of the surgical interventions depends on:

- The experience and expertise of available staff
- The judgement of senior clinicians taking into account the individual woman's future reproductive aspirations is required

Uterine Atony

Surgical Measures to arrest the bleeding

What surgical measures should be employed to arrest bleeding due to uterine atony?

Balloon tamponade

It is recommended as a first-line 'surgical' managment of PPH due to **uterine atony** in women who do not respond to treatment using uterotonics, or where uterotonics are unavailable.

It includes Foley catheter, Bakri balloon, Sengstaken-Blakemore oesophageal catheter, condom catheter and lower cost adaptations obtained by the sue of surgical gloves.

It is described as the 'tamponade test'.

--A 'positive test' (control of PPH following inflation of the balloon) indicates that laparotomy is not required

--A 'negative test' (continured PPH following inflation of the balloon) is an indication to proceed to laparotomy

Uterine Atony

Surgical Measures to arrest the bleeding

What surgical measures should be employed to arrest bleeding due to uterine atony?

Balloon tamponade: continued

4-6 hours of tamponade is generally regarded to be adequate to achieve haemostasis in most cases but this is not evidence-based.

Removal of the balloon should be done during the daytime hours, when appropriate senior staff is present, should there be a need for further intervention

Before it's complete removal, the balloon could be deflated but left in place to ensure that bleeding does not reoccur.

Uterine Atony

Surgical Measures to arrest the bleeding

Techniques effective in controlling severe PPH and in **reducing the need for hysterectomy**.

Haemostatic suturing techniques

The best known version, described by B-Lynch in 1997, requries hysterotomy for its insertion and is particularly suitable when the uterus has already been opened at caesarean section.

A modified compression suture that does not require hysterotomy was described by Hayman et al. in 2002.

Other authors, Hwu et al., 2005 and Kafali et al., 2003 have described variants on these techniques.

There are no comparative data to demonstrate that any one variant is superior to another.

It is recommended that a laminated diagram of the brace technique be kept in theatre.

Possible complications of the technique include pyometria and partial uterine necrosis.

Uterine Atony

Surgical Measurea to arrest the bleeding

Techniques effective in controlling severe PPH and in **reducing the need for hysterectomy**.

Internal iliac artery ligation

Internal iliac artery ligation is considered a conservative surgical intervention.

However, balloon tamponade and haemostatic suturing are more effective and easier to perform

It does not impair subsequent fertility and pregnancy outcomes.

Uterine Atony

Surgical Measure to arrest the bleeding

Techniques effective in controlling severe PPH and in **reducing the need for hysterectomy**.

Selective arterial occlusion or embolisation by interventional radiology

They have similar efficacy as uterine balloon tamponade.

The use of uterine artery embolisation is recommended where other measures have failed and the necessary resources are available.

Interventional radiology may be considered in cases of placenta praevia with accreta if intra-arterial balloons can be placed in the radiology department before the woman goes to teatre for caesarean section.

Evidence suggest that arterial embolisation for control of PPH does not impair subsequent menstruation and fertility.

Uterine Atony

Surgical Measure to arrest the bleeding

When conservative surgical approaches do not work, they should be followed by more invasive procedures.

Hysterectomy

Early recourse may be lifesaving especially where bleeding is associated with placenta accreta or uterine rupture.

DO NOT delay until the woman is in extremis or while less definitive procedures with which the surgeon has little experience are attempted.

Subtotal hysterectomy is the operation of choice unless there is trauma to the cervix or lower segment in which case total hysterectomy will be necessitated.

The decision for the procedure should be made by an experienced clinician and preferably discussed with a second experienced consultant clinician, if available.

The procedure should be done by a surgeon experienced in carrying out the hysterectomy.

Arresting the Bleeding: Other available measures

Is there a use for recombinant factor VIIa (rFVIIa) therapy?

There is insufficient evidence to recommend the use of rFVIIa for the treatment of PPH.

Its use should be limited to women with specific haematological indications and should be based on the results of coagulation.

This potentially life-saving drug may be used in a case of **life-threatening PPH** as an adjuvant to standard pharmacological and surgical treatments, in consultation wiht a **haematologist.**

Dose:

- 90 micrograms/kg
- May be repeated in the absence of clinical response within 15-30 minutes.

Precaution: Side-effects of rFVIIa include **thrombotic events** that are life-threatening

rFVIIa is expensive

Arresting the Bleeding: Other available measures

The risk of defibrination with rFVIIa use:

Especially in the most severe cases of women with PPH that will be considered for rFVIIa there may be **defibrination** (severe hypofibrinogenaemia).

rFVIIa will not work if there is no fibrinogen and its efficacy may also be suboptimal with severe thrombocytopenia (less than 20 x 10^9/L).

Give rFVIIa only if fibrinogen is > 1g/L and platelets > 20 x 10^9/L

If there is a suboptimal clinical response to rFVIIa, check and correct fibrinogen and platelets (with cryoprecipitate, fibrinogen concentrate or platelet transfusion as appropriate) before a second rFVIIa dose is given.

Arresting the Bleeding: Other available measures

Is there a use for antifibrinolytic drugs?

Evidence for the use of fibrinolytic inhibitors (such as tranexamic acid) in the managment of obstetric haemorrhage is conflicting.

Recommendations for the use of tranexamic acid have however been based on evidences from the literature on surgery and trauma, which demonstrated tranexamic acid as a safe alternative in the **treatment of trauma-related bleeding.**

Tranexamic acid is recommended for the treatment of PPH if:

- The use of oxytocin and other uterotonics fail to stop the bleeding
- It is thought that the bleeding may be partly due to traum

Dose:

- 1 gram intravenously (taking 1 minute to administer)
- If bleeding continues, repeat 1 g after 30 minutes

Other Causes of PPH

What are other causes of PPh and how should they be managed?

1.The Placenta

Placenta not delivered should be treated as for whole retained placenta: we will examine it in module 4.

Placenta delivered as incomplete is to be treated as for retained placenta fragments with:

- Oxytocin
- Manual exploration to remove fragments
- Gentle curettage or aspiration

If bleeding continues manage as uterine atony.

Other Causes of PPH

What are other causes of PPh and how should they be managed?

2. Lower genital tract trauma:

There is **excessive bleeding** or **shock** with a **contracted** uterus.

Treat for lower genital tract trauma:

- Repair of tears
- Evacuation and repair of haematoma

If bleeding continues administer tranexamic acid.

Other Causes of PPH

What are other causes of PPh and how should they be managed?

3. Uterine rupture and dehiscence:

There is **excessive bleeding** or **shock.**

Treat for uterine rupture or dehiscence:

- Laparotomy for primary repair of the uterus
- Hysterectomy if repair fails

If bleeing continues administer tranexamic acid.

Other Causes of PPH

What are other causes of PPh and how should they be managed?

4. Uterine Inversion:

Uterine fundus is not felt abdominally or is not visible in the vagina.

Treatment for uteirne inversion:

- Immediate manual replacement
- Hydrostatic correction
- Manual reverse inversion (use general anaesthesia or wait for effect of any uterotonic to wear off)

If treatment is not successful, laparotomy to correct the inversion.

If laparotomy correction is not successful, hysterectomy.

5. Clotting Disorder:

Bleeding in the absence of uterine atony and above conditions

Treat for clotting disorder as necessary with blood products.

Further resuscitation: Blood transfusion

The best fluid for blood volume resuscitation is compatible blood transfusion

In case of PPH, transfuse **cross-matched blood** as soon as possible.

If cross-matched blood is unavailable, give uncross-matched group-specific blood OR give O RhD negative blood.

DO NOT use special blood filters as they slow infusions.

Blood type

If fully cross-matched blood is unavailable by the time that 3.5 litres of clear fluid have been infused, the best available alternative should be given to restore oxygen-carrying capacity. The most suitable alternative with vary depending on location and individual patient circumstances.

Group O RhD negavie blood is the safest to avoid a mismatched transfusion in an acute emergency.

All delivery units, especially small units without a blood bank on site, should maintain a supply of O RhD negative blood

Women with **known risk factors for PPH** should not be delivered in a hospital without a blood bank on site.

Further resuscitation: Blood Product transfusion

Blood Product

What blood components can be used?

Blood components should be given when the **blood loss** reaches about **4.5 litres (80 % of blood volume)** and large volumes of replacement fluids have been given as there will be clotting factor defects.

Results of coagulations studies and the advice of a haematologist should be used to guide transfusion of coagulation factors.

If bleeding is relentless, **up to 1 litre of fresh frozen plasma** (FFP) and **10 units of cryoprecipitate** (2 packs) may be given empirically, while awaiting the results of coagulation studies.

Further resuscitation: Blood Product transfusion

Fresh Frozen Plasma:

4 units for every 6 units of red cells or prothrombin time/activated partial thromboplastin time > 1.5 x normal (12-15 mL/kg or total 1 litre)

Platelets concentrates:

If PLT count < 50 x 10^9

Cryoprecipitate:

If fibrinogen < 1 g/L

Further monitoring and investigation

Once the bleeing has been controlled and initial resuscitation has been completed, continuous close observations in either intensive care unit or high-dependency unit on the labour ward is required.

Who should monitor?

Strictly monitor fluid replacement and the use of blood and blood products. The amount given should be dictated by the **lead clinician** (consultant anaesthetist or consultant obstetrician) aided by the results of full blood count and clotting screen, *if possible* under the guidance of a **haematologist** and/or consultant in transfusion medicine.

What monitoring is necessary?

Continuous physiological monitoring is necessary.

Where available, central venous and direct arterial pressure monitoring should be used when the cardiovascular system is compromised by haemorrhage or disease.

Document fluid balance, blood, blood products and procedures

Further monitoring and investigation

How should it recorded?

Record parameters on a flowchart such as the intensive-care unit-style charts (an example is the Postpartum haemorrhage chart) and modified obstetric early warning system charts to have good visual cues on the clinical progress of the patient and for early identification of continuous bleeding, especially in cases which are not apparent.

Anaesthetic management

There is need for prompt **anaesthetist assessment of the woman** to initiate or continue resuscitation to restore intravascular volume and provide adequate anaesthesia.

The presence of cardiovascular instability is a relative contraindication to **regional anaesthesia.**

If cardiovascular stability has been achieved and there is no evidence of coagulation failure, regional anaesthesia can be used. This may be particularly appropriate where a working epidural has been in place during labour. Continuous epidural block is preferred over spinal, as it allows better blood pressure control and for prolonged surgery.

Where there is continuing bleeding and the cardiovascular stability is compromised general anaesthesia is more appropriate.

General anaesthesia recommendations:

- **Rapid sequence induction** is the gold standard to reducing the risk of aspiration
- **Cardiostable induction** agents with minimal peripheral vasodilators should be considered
- **Adrenaline and atropine** should be available during induction
- **Ventilation** with high oxygen concentration until the bleeding is under control

Conclusion: How should Postpartum haemorrhage be managed?

You have now completed this module. You should be able to:

- Describe the Basic measure for managing minor PPH
- Describe the Full protocol for managing major PPH
- Describe how to evaluate and monitor a case of PPH
- Describe the mechanical strategies in arresting bleeding in PPH caused by uterine atony
- Describe the pharmacological strategies in arresting bleeding in PPH caused by uterine atony
- Describe the surgical strategies in arresting bleeding in PPH caused by uterine atony
- Describe the management of other causes of PPH

Suggestions for further reading:

World Health Organization. WHO recommendations for postpartum haemorrhage 2012: Evidence base. Geneva: World Health Organization; 2012.

Available from http://www.who.int/reproductivehealth/publications/maternal_perinatal_health/9789241548502/en/index.html

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Suggestions for further reading:

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Suggestions for further reading:

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Possible Future Developments?

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Module 4
How should a retained placenta be managed?

The evidence-based management of Postpartum Haemorrhage

This training course is based on the following guideline:

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

On successful completion of this module you should be able to:

- Describe how retained placenta can be diagnosed
- Describe the management of retained placenta

How should a retained placenta be managed?

The woman should be diagnosed as having a **retained placenta** if the placenta is not expelled **within 30 minutes** after delivery of the baby.

There is no evidence for or against this definition so the delay used to diagnose this condition is left to the judgement of the clinician.

In the absence of haemorrhage, the woman should be observed for a **further 30 minutes** following the initial 30 minutes, before **manual removal of the placenta** is attempted.

Spontaneous expulsion of the placenta can still occur, therefore a **conservative approach** is advised and the timing of the manual removal of the placenta as a definitive treatment is left to the judgment of the clinician.

How should a retained placenta be managed?

Recommendations

The use of **additional oxytocin** (10 IU IV/IM) in combination with **controlled cord traction** is recommended for retained placenta.

*Recommendations on the use of uterotonics for the management of a retained placenta in the absence of haemorrhage was reached **by consensus** as there is no empirical evidence.

Ergometrine may cause **tetanic uterine contractions**, which may delay expulsion of the placenta. Its use is not recommended.

Prostaglandin E2 alpha (dinoprostone or sulprostone) is not recommended. Evidence is lacking and there are concerns related to adverse events, particularly cardiac events.

How should a retained placenta be managed?

The manual removal of a retained placenta should be expedited in the presence of haemorrhage.

A **single dose of antibiotics (ampicillin or first-generation cephalosporin) is recommended following manual removal of the placenta.**

- Direct evidence on this is lacking and recommendation is based on indirect evidence of the benefit of prophylactic antibiotics from studies of caesarean section and abortion, and observational studies of other intrauterine manipulations.

There is **insufficient evidence** to recommend the use of intra-umbilical vein injection of oxytocin as a treatment for retained placenta.

You have now completed this module, you should be able to:

- Describe how retained placenta can be diagnosed
- Describe the management of retained placenta

Suggestions for further reading:

World Health Organization. Managing complications in pregnancy and childbirth: a guide for midwives and doctors. Geneva: World Health Organization; 2007. Available from: http://whqlibdoc.who.int/publications/2007/9241545879_eng.pdf

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Module 5
How should secondary postpartum haemorrhage (PPH) be treated?

The evidence-based management of Postpartum Haemorrhage

This training course is based on the following guideline:

Royal College of Obstetricians and Gynaecologists. Prevention and management of postpartum haemorrhage. Green-top Guideline No. 52. London: RCOG; 2011.

On successful completion of this module you should be able to:

- Define secondary PPH
- Describe the investigations that should be performed in case of secondary PPH
- Describe how secondary PPH should be treated

What is secondary PPH?

Definition

Secondary PPH is the abnormal or excessive bleeding from the birth canal between 24 hours and 12 weeks postnatally.

It is often associated with **endometritis**.

Additional investigations

Communication, resuscitation, monitoring and investigations are the same as for primary PPH.

Additional investigations include:

- High and low vaginal swabs
- Blood cultures if pyrexial
- Full blood count
- C-reactive protein
- Pelvic ultrasound that might help to exclude the presence of retained products of conception

How to manage secondary postpartum haemorrhage

Secondary PPH is often associated with **infection** and conventional treatment involves antibiotics and uterotonics.

The appropriate choice of antibiotics is a combination of **ampicillin** (clindamycin if penicillin allergic) and **metronidazole**. The addition of **gentamicin** is recommended in cases of endomyometritis (tender uterus) or overt sepsis.

In continuing haemorrhage, insertion of a **balloon catheter** may be effective.

Surgical measures should be undertaken if there is excessive or continuing bleeding, irrespective of ultrasound findings.

A **senior obstetrician** should be involved in decisions and performance of any evacuation of retained products of conception as there is a high risk for uterine perforation in these women.

You have now completed this module, you should be able to:

- Define secondary PPH
- Describe the investigations that should be performed in cases of secondary PPH
- Describe how secondary PPH should be treated

Suggestions for further reading:

Alexander J, Thomas P, Sanghera J. Treatments for secondary postpartum haemorrhage. Cochrane Database Syst Rev. 2002;(1):CD002867. [Abstract]

Sadan O, Golan A, Girtier O, Lurie S, Debby A, Sagiv R, Evron S, Glezerman M. Role of sonography in the diagnosis of retained products of conception. J Ultrasound Med. 2004 Mar;23(3):371-4. [Abstract]

Edwards A, Ellwood DA. Ultrasonographic evaluation of the postpartum uterus. Ultrasound Obstet Gynecol. 2000 Dec;16(7):640-3. [Abstract]

French LM, Smaill FM. Antibiotic regimens for endometritis after delivery. Cochrane Database Syst Rev. 2004;(4):CD001067. [Abstract]

Module 6
Postpartum Haemorrhage (PPH) risk management

Oxford Maternal and Perinatal Health Institute

Maternal Health Task Force

The evidence-based management of Postpartum Haemorrhage

This training course is based on the following guidelines:

Royal College of Obstetricians and Gynaecologists. Prevention and management of postpartum haemorrhage. Green-top Guideline No. 52. London: RCOG; 2011.

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

On successful completion of this module you should be able to:

- Describe what measures can be taken to ensure optimal management of PPH
- Describe how successful litigation can be avoided when PPH occurs
- Describe what debriefing following obstetrics haemorrhage entails

What measures can be taken to ensure optimal management of PPH?

- **Training** for all birth attendants in the management of postpartum haemorrhage is recommended. The optimal frequency of rehearsals is not known.
- There should be a formal **follow-up meeting** after a significant case of PPH to analyse the case and discuss what could be done better in the future.
- **Annual 'skill drills',** including maternal collapse are recommended. The 'skill drills' should ensure that all members of staff, including those operating the blood bank are adequately prepared to handle PPH emergencies.
- A **multidisciplinary approach** to treatment to ensure teamwork and prompt and efficient management of PPH.

How can successful litigation be avoided when PPH occurs?

Accurate documentation of a delivery with PPH is essential.

PPH should be notified through a clinical incident reporting or risk management system in place.

A structured pro forma should be used to aid accurate record keeping. For example, the intensive-care unit-style charts (Appendix l page 20 of the RCOG guideline).

It is important to record:

- The staff in attendance and the time they arrived
- The sequence of events
- The timing of the administration of different pharmacological agents given, their timing and sequence
- The time of surgical intervention, where relevant
- The condition of the mother throughout the different steps (including vital signs documentation)
- The timing of the fluid and blood products given

How can successful litigation be avoided when PPH occurs?

Debriefing:

Major obstetric haemorrhage can be traumatic to the **woman**, her **family** and the **birth attendants.**

Who?

Debriefing by a **senior member of the team** who was involved at the time of events, at the earliest opportunity is recommended.

What?

The debriefing should include arrangements for proper **follow-up** and **investigations** as necessary, such as screening for coagulopathies if there are other indicators and screening for complications, for example panhypopituitarism (Sheehan syndrome) secondary to hypotension.

Recommendations for health facilities

Let's finish the course with some recommendations for obstetrics haemorrhage audible standards and health systems and organization of care.

Obstetrics haemorrhage auditable standards

Recommendations for health facilities are as follows:

- Monitor all delivery cases with blood loss greater than 1000 mL
- Appropriate management of women with previous PPH
- Documentation of management, especially with the timing of events for women who had PPH
- Appropriate management of labour and outcome in women with PPH
- Notification to the risk management team for women with PPH
- Appropriate training of the obstetric team (midwifery and medical staff)

Recommendations for health facilities

Health systems and organization of care

Recommendations for health facilities are as follows:

- The use of formal protocols for the prevention and treatment of PPH
- The use of formal protocols for referral of women to a higher level of care
- The use of simulations of PPH treatment for pre-service and in-service training programmes
- Monitoring the use of uterotonics after birth for the prevention of PPH as a process indicator for programmatic evaluation
- Improvement in communication between health care providers and women with PPH and their family members, an important priority in the training of health care providers in PPH management

You have now completed this module, you should be able to:

- Describe what measures can be taken to ensure optimal management of PPH
- Describe how successful litigation can be avoided when PPH occurs
- Describe what debriefing following obstetrics haemorrhage entails

Suggestions for further reading:

Bristowe K, Siassakos D, Hambly H, Angouri J, Yelland A, Draycott TJ, Fox R. Teamwork for clinical emergencies: interprofessional focus group analysis and triangulation with simulation. Qual Health Res. 2012 Oct;22(10):1383-94. [Abstract]

Crofts JF, Ellis D, Draycott TJ, Winter C, Hunt LP, Akande VA. Change in knowlegde of midwives and obstetricians following obstetric emergency training: a randomised controlled trial of local hospital, simulation centre and teamwork training. BJOG. 2007 Dec;114(12):1534-41. [Abstract]

Maslovitz S, Barkai G, Lessing JB, Ziv A, Many A. Recurrent obstetric management mistakes identified by simulation. Obstet Gynecol. 2007 Jun;109(6):1295-300. [Abstract]

Dökmetaş HS, Kilicli F, Korkmaz S, Yonem O. Characteristic features of 20 patients with Sheehan's syndrome. Gynecol Endocrinol. 2006 May;22(5):279-83. [Abstract]

Siassakos D, Bristowe K, Hambly H, Angouri J, Crofts JF, Winter C, Hunt LP, Draycott TJ. Team communication with patient actors: findings from a multisite simulation study. Simul Healthc. 2011 Jun;6(3):143-9. [Abstract]

Thank you for taking this course!

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