



Prevention of Postpartum Hemorrhage: Implementing Active Management of the Third Stage of Labor (AMTSL)

A Reference Manual for
Health Care Providers



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Suggested citation: POPPHI. Prevention of Postpartum Hemorrhage: Implementing Active Management of the Third Stage of Labor (AMTSL): A Reference Manual for Health Care Providers. Seattle: PATH; 2007.

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2007

Prevention of Postpartum Hemorrhage Initiative (POPPHI)

This manual is made possible through support provided to the POPPHI project by the Office of Health, Infectious Diseases and Nutrition, Bureau for Global Health, US Agency for International Development, under the terms of Subcontract No. 4-31-U-8954, under Contract No. GHS-I-00-03-00028. POPPHI is implemented by a collaborative effort between PATH, RTI International, and EngenderHealth.

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Acknowledgements

This manual was funded by the Office of Health, Infectious Diseases and Nutrition, Bureau for Global Health, US Agency for International Development, under the terms of Subcontract No. 4-31-U-8954, under Contract No. GHS-I-00-03-00028.

The writing team of Frances Ganges, Diana Beck, and Susheela M. Engelbrecht is grateful to the following people, who provided invaluable assistance with this effort:

- Gloria Metcalfe, author of the first iteration of this and accompanying training materials.
- Contributing editors Deborah Armbruster, Sandy Buffington, Patricia Gomez, Meghan Greeley, Phyllis Long, Gloria Metcalfe, Setara Rahman, Sara Stratton, and Carla Spaccarotelli.
- Reviewers Sadiyah Ahsan, Rani Bang, Rachel Bishop, Martha Carlough, Annie Clark, Blami Dao, Annie Davenport, Barbara Deller, Abdelhadi Eltahir, Christina Kramer, Debra Lewis, Jim Litch, Bridget Lynch, Tekle-Ab Mekbib, Zahida Qureshi, Graciela Salvador-Davila, Marc Sklar, Claudia Vera, and Susana Veraguas.
- Proofreader Mary Lou Austin.
- Illustrator Andri Burhans.

The writing team especially acknowledges and thanks:

- JHPIEGO for permission to use illustrations (Figures 8, 10, 13, 14, 15, 16, 21, and 22) by Kimberly Battista from *Active Management of the Third Stage of Labor: A Demonstration* [CD-ROM].¹
- American College of Nurse-Midwives for permission to use illustrations (Figures 2, 3, 4, 14, 17, 18, 19, and 27) from *Life-Saving Skills Manual for Midwives, 3rd Edition, and Life-Saving Skills Manual for Midwives, Draft, 4th Edition*.^{2, 3}
- Figures 9, 11, 12, and 23 were copied from Chaparro, C. *Essential delivery care practices for maternal and newborn health and nutrition*. Unit on Child and Adolescent Health / Pan American Health Organization: Washington, DC, 2007.

About POPPHI

The Prevention of Postpartum Hemorrhage Initiative (POPPHI) is a USAID-funded, five-year project focusing on the reduction of postpartum hemorrhage, the single most important cause of maternal deaths worldwide. The POPPHI project is led by PATH and includes four partners: RTI International, EngenderHealth, the International Federation of Gynaecology and Obstetrics (FIGO), and the International Confederation of Midwives (ICM).

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Acronyms

AMTSL	active management of the third stage of labor
CCT	controlled cord traction
DIC	disseminated intravascular coagulopathy
FIGO	International Federation of Gynaecology and Obstetrics
HLD	high-level disinfected
ICM	International Confederation of Midwives
IM	intramuscular
IU	international units
MTCT	mother to child transmission of HIV/AIDS
PMTCT	prevention of mother to child transmission of HIV/AIDS
POPPHI	Prevention of Postpartum Hemorrhage Initiative
PPH	postpartum hemorrhage
PPPH	prevention of postpartum hemorrhage
TTI	time-temperature indicator
USAID	United States Agency for International Development
VVM	vaccine vial monitor
WHO	World Health Organization



Introduction

Efforts such as the Safe Motherhood Initiative and the World Health Organization (WHO) Making Pregnancy Safer Division and strategies to meet the United Nations Millennium Development Goals are supporting worldwide activities to reduce maternal and newborn mortality. Despite these efforts, hundreds of thousands of women and babies die or become disabled due to complications of pregnancy and childbirth every year; half of these maternal deaths occur within 24 hours of childbirth.⁴

Postpartum hemorrhage (PPH) is the leading direct cause of maternal death in developing countries and results from problems during and immediately after the third stage of labor.⁵ PPH is an **unpredictable** and **rapid** cause of maternal death worldwide, with two-thirds of women with PPH having no identifiable risk factors. Seventy to ninety percent of immediate PPH is attributed to uterine atony (failure of the uterus to properly contract after birth).^{6, 7}

Fortunately, research shows that using simple, low-cost interventions can help avoid most of these tragic outcomes. Current evidence indicates active management of the third stage of labor (administration of uterotonic drugs, controlled cord traction, and fundal massage after delivery of the placenta) can reduce the incidence of postpartum hemorrhage by up to 60 percent in situations where:

- National guidelines support the use of active management of the third stage of labor (AMTSL).
- Health workers receive training in using AMTSL and administering uterotonic drugs.
- Injection safety is ensured.
- Necessary resources (uterotonic drugs and cold chain for storage of uterotonic drugs; equipment, supplies, and consumables for infection prevention and injection safety) are available.⁸

Ongoing research in various settings continues to identify the best approaches for preventing and managing postpartum bleeding and its complications. By developing national guidelines, training skilled birth attendants, improving work environments of skilled providers, and supporting the development of improved access to care, more women will have access to this life-saving intervention.

About the learning materials

POPPHI developed a learning package on the prevention of postpartum hemorrhage consisting of a reference manual, participant's notebook, and facilitator's guide. This learning package was developed for use by nurses, midwives, and doctors providing childbirth and immediate postpartum care.

Information about implementing AMTSL is featured in this reference manual as well as the corresponding participant's notebook and facilitator's guide. These documents comprise a set and should be used together. These resources are distinguished within the series by a corresponding icon located at the top of the right hand page:

Reference manual



Facilitator's guide



Participant's notebook



This course is designed to be utilized for in-service training, with the overall objective of providing updates about AMTSL use to equip nurses, midwives, and clinical and health workers to carry out the following:

- Provide safe, respectful, and friendly care to women, newborns, and their families. Women and families will then be more likely to utilize the health care system with confidence because they know they will receive competent, compassionate care.
- Follow an evidence-based protocol for safe care during active management of the third stage of labor and during the immediate postpartum period, including clear guidelines on when to refer mothers with complications, ensuring timely action is taken.
- Provide greater protection from infection for their clients and themselves.
- Store uterotonics correctly to maintain their potency.

This course offers participants knowledge and skills to provide the crucial care needed to prevent PPH, improve clinical services, and train other providers.



Core Topic 1: Third stage of labor and evidence for using AMTSL

Key definitions

Active management of the third stage of labor (AMTSL): A combination of actions performed during the third stage of labor to prevent PPH. AMTSL speeds delivery of the placenta by increasing uterine contractions and prevents PPH by minimizing uterine atony. The components of AMTSL are:

- Administration of a uterotonic drug within one minute after the baby is born (oxytocin is the uterotonic of choice).
- Controlled cord traction (CCT).
- Uterine massage immediately after delivery of the placenta.

Controlled cord traction (CCT): Traction on the cord during a contraction combined with countertraction upward on the uterus with the provider's hand placed immediately above the symphysis pubis. CCT facilitates expulsion of the placenta once it has separated from the uterine wall.

Physiologic (expectant) management of the third stage of labor (PMTSL): Management of the third stage of labor that involves waiting for signs of placental separation and allowing for spontaneous delivery of the placenta aided by gravity and/or nipple stimulation. The components of PMTSL are:

- Waiting for signs of separation of the placenta (cord lengthening, small blood loss, uterus firm and globular on palpation at the umbilicus).
- Encouraging maternal effort to bear down with contractions and, if necessary, to encourage an upright position.
- Uterine massage after the delivery of the placenta as appropriate.

Retraction: The act of the uterine muscle pulling back. Retraction is the ability of the uterine muscle to keep its shortened length after each contraction. Together with contractions, retraction helps the uterus become smaller after the delivery of the baby.

Stages of labor

- **First stage of labor** - The first stage of labor begins with the onset of contractions and ends when the cervix is fully dilated (10 cm). This stage is divided into two phases, known as latent and active phases of labor. During latent phase, the uterine cervix gradually effaces (thins out) and dilates (opens). This is followed by active labor, when the uterine cervix begins to dilate more rapidly and contractions are longer, stronger, and closer together.
- **Second stage of labor** - The second stage of labor begins when the uterine cervix is fully dilated and ends with the birth of the baby. This is sometimes referred to as the pushing stage.
- **Third stage of labor** - The third stage of labor begins with birth of the newborn and ends with the delivery of the placenta and its attached membranes.

- **Fourth stage of labor (also known as the “immediate postpartum” period) -**
The fourth stage of labor begins with delivery of the placenta and goes from one to six hours after delivery of the placenta, or until the uterus remains firm on its own. In this stabilization phase, the uterus makes its initial readjustment to the nonpregnant state. The primary goal is to prevent hemorrhage from uterine atony and the cervical or vaginal lacerations.

Uterine atony: Loss of tone in the uterine muscle. Normally, contraction of the uterine muscles compresses the uterine blood vessels and reduces blood flow, increasing the chance of coagulation and helping to prevent bleeding. The lack of uterine muscle contraction or tone can cause an acute hemorrhage. Clinically, 75 to 80 percent of PPH cases are due to uterine atony.⁹

Uterine massage: An action used after the delivery of the placenta in which the provider places one hand on top of the uterus to rub or knead the uterus until it is firm. Sometimes blood and clots are expelled during uterine massage.

Uterotonics: Substances that stimulate uterine contractions or increase uterine tone.



Significance of the third stage of labor

The third stage of labor is usually uneventful, with delivery of the placenta taking place without complications. During this stage of labor, however, the woman may encounter complications that could lead to maternal morbidity and mortality. The most common complication is PPH—vaginal bleeding in excess of 500 mL that occurs ***less than*** 24 hours after childbirth.

PPH may cause or worsen anemia or deplete iron stores in women, causing weakness and fatigue in severe cases. If severe, PPH may result in shock or maternal death. A blood transfusion may help improve anemia in women and shorten hospital stays, but transfusion carries risks of reaction and infection and is not universally available. Because many health facilities lack an adequate supply of safe blood, PPH can often strain the resources of the best blood banks.

PPH may increase the likelihood of other issues:

- The need for emergency anesthetic services.
- Manual exploration or use of instruments inside the uterus (increasing the risk of sepsis).
- Prolonged hospitalization. New studies show that extended hospitalizations can cause significant and long-term financial hardships for the woman and her family.
- Delayed breastfeeding.

Additionally, women who have severe PPH and survive (“near misses”) are significantly more likely to die in the year following the PPH.¹⁰

Anatomy and physiology of the third stage of labor

After the baby is born, the muscles of the uterus contract, helping the placenta to separate from the uterine wall. The amount of blood lost depends on how quickly this happens, since the uterus can contract more effectively after the placenta is expelled. If the uterus does not contract normally (such as in uterine atony), the blood vessels at the placental site stay open and hemorrhage results. Because the estimated blood flow to the uterus is 500 to 800 mL/minute at term, most of which passes through the placenta, severe postpartum hemorrhage can happen within just a few minutes.

The muscle fibers of the uterus are in a crosshatch (criss-cross) pattern surrounding maternal blood vessels (Figure 1). After the birth of the baby, these muscle fibers begin to contract and retract. Oxytocin, a hormone secreted by the posterior pituitary gland, stimulates uterine contractions. Oxytocin levels increase greatly in late pregnancy and even more during labor and lactation.

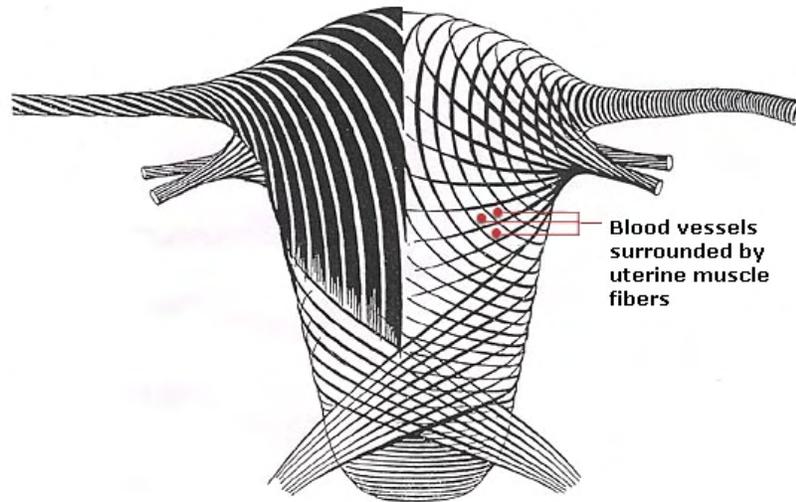


Figure 1. Muscle fibers of the uterus¹¹

During the third stage, uterine contractions continue causing the placenta to separate from the uterine wall. Placental separation happens by contraction and retraction of the uterine muscles, reducing the size of the placental area. This reduction in size of the uterus is caused by retraction of the uterine muscle, a unique characteristic that helps maintain its shortened length after each contraction.

As the placental area becomes smaller, the placenta begins to separate from the uterine wall because, unlike the uterus, it is not elastic and cannot contract and retract (Figure 2). At the area where the placenta separates from the uterus a clot forms. This clot—known as a retroplacental clot—collects between the uterine wall and the placenta and further promotes separation.

Additional uterine contractions complete the separation of the placenta from the uterine wall. After this occurs, the placenta descends into the lower uterine segment and into the vagina where it is expelled.

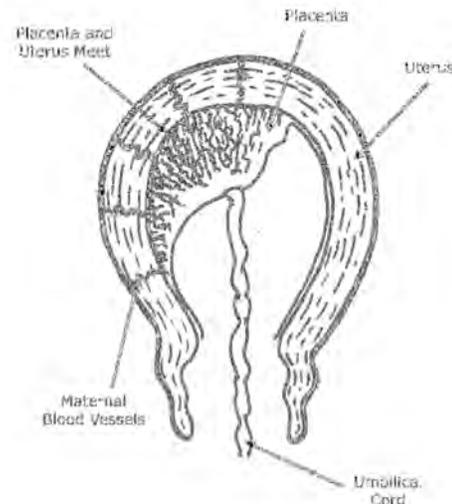


Figure 2. Placenta attachment to uterus showing maternal blood vessels



After separation:

- The placental site is rapidly covered by a fibrin net and clots form.
- The muscle fibers of the uterus compress the blood vessels where the placenta was attached, helping to control bleeding at the placental site.
- The uterus continues to contract, forcing the placenta and membranes to fall into the lower uterine segment (Figure 3). With the delivery of the placenta, the uterus is able to contract completely (Figure 4).



Figure 3. Placenta falling into lower uterine segment

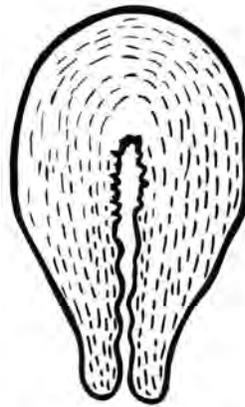


Figure 4. Empty uterus

Length of third stage of labor

Considerable research has examined how active management affects the third stage of labor. Investigations found that 50 percent of placental deliveries occur within 5 minutes, and 90 percent are delivered within 15 minutes.¹² Other large studies confirm the rapid delivery of the placenta; a WHO study found a mean delivery time of 8.3 minutes.¹³ A third stage of labor lasting longer than 18 minutes is associated with a significant risk of PPH.¹⁴ When the third stage of labor lasts longer than 30 minutes, PPH occurs six times more often than it does among women whose third stage lasted less than 30 minutes.¹⁴

Approaches for managing the third stage of labor

There are two main approaches for managing the third stage of labor: the physiologic (or expectant) approach and the active approach. Table 1 compares how the third stage is managed using each of these approaches.

Table 1. Comparison of physiologic and active management of the third stage of labor (AMTSL)

	Physiologic (expectant) management	Active management*
Uterotonic	Uterotonic is not given before the placenta delivered.	Uterotonic is given within one minute of the baby's birth (after ruling out the presence of a second baby).
Signs of placental separation	Wait for signs of separation: <ul style="list-style-type: none"> ▪ Gush of blood. ▪ Lengthening of cord. ▪ Uterus becomes rounder and smaller as the placenta descends. 	Do not wait for signs of placental separation. Instead: <ul style="list-style-type: none"> ▪ Palpate the uterus for a contraction. ▪ Wait for the uterus to contract. ▪ Apply CCT with countertraction.
Delivery of the placenta	Placenta delivered by gravity assisted by maternal effort.	Placenta delivered by CCT while supporting and stabilizing the uterus by applying countertraction.
Uterine massage	Massage the uterus after the placenta is delivered.	Massage the uterus <u>after</u> the placenta is delivered.
Advantages	<ul style="list-style-type: none"> ▪ Does not interfere with normal labor process. ▪ Does not require special drugs/supplies. ▪ May be appropriate when immediate care is needed for the baby (such as resuscitation) and no trained assistant is available. ▪ May not require a birth attendant with injection skills. 	<ul style="list-style-type: none"> ▪ Decreases length of third stage. ▪ Decrease likelihood of prolonged third stage. ▪ Decreases average blood loss. ▪ Decreases the number of PPH cases. ▪ Decreases need for blood transfusion.
Disadvantages	<ul style="list-style-type: none"> ▪ Length of third stage is longer compared to AMTSL. ▪ Blood loss is greater compared to AMTSL. ▪ Increased risk of PPH. 	<ul style="list-style-type: none"> ▪ Requires uterotonic and items needed for injection/injection safety. ▪ Requires a birth attendant with experience and skills giving injections and using CCT.

*This definition differs from the original research protocol in the Bristol and Hinchingsbrooke trials because the original protocols included immediate cord clamping and did not include massage of the uterus.^{8,15} In the Hinchingsbrooke trial, midwives used either CCT or maternal effort to deliver the placenta.

CCT controlled cord traction
 PPH postpartum hemorrhage



Scientific evidence supporting use of AMTSL

Giving a uterotonic drug to prevent PPH promotes strong uterine contractions and leads to faster retraction and placental separation and delivery. Several large, randomized controlled trials have investigated whether physiologic management or active management is more effective in preventing PPH. These trials have consistently shown that active management provides several benefits for the mother compared to physiologic management. Table 2 provides detailed results from two important studies comparing active and physiologic management of the third stage of labor.

These results show that only 12 women need to receive AMTSL to prevent one case of PPH. This means that AMTSL is a very effective and cost-efficient public health intervention. These studies also confirm that **AMTSL decreases**:

- Incidence of PPH.
- Length of third stage of labor.
- Percentage of third stages of labor lasting longer than 30 minutes.
- Need for blood transfusion.
- Need for uterotonic drugs to manage PPH.

Table 2. Bristol⁸ and Hinchingsbrooke¹⁵ study results comparing active and physiologic management of the third stage of labor

Factors	Study	Management	
		Active	Physiologic
PPH	Bristol	5.9%	17.9 %
	Hinchingsbrooke	6.8 %	16.5%
Average length of the third stage of labor	Bristol	5 minutes	15 minutes
	Hinchingsbrooke	8 minutes	15 minutes
Third stage of labor longer than 30 minutes	Bristol	2.9%	26%
	Hinchingsbrooke	3.3%	16.4%
Blood transfusion needed	Bristol	2.1%	5.6%
	Hinchingsbrooke	0.5%	2.6%
Additional uterotonic drugs needed to manage PPH	Bristol	6.4%	29.7%
	Hinchingsbrooke	3.2%	21.1%



Core Topic 2: PPH causes and prevention

Key definitions

Immediate PPH: Vaginal bleeding in excess of 500 mL, occurring **less than 24** hours after childbirth.

Delayed PPH: Excessive vaginal bleeding (vaginal bleeding increases rather than decreases after delivery), occurring **more than 24** hours after childbirth.

Uterine rupture: A tear in the wall of the uterus. In a complete rupture, the tear goes through all layers of the uterine wall and the consequences can be dire for mother and baby. In an incomplete rupture the peritoneum is still intact. A uterine rupture is a life-threatening event for mother and baby. A uterine rupture typically occurs during early labor, but may already develop during late pregnancy.

Uterine inversion: A turning of the uterus inside out, whereby the uterine fundus is forced through the cervix and protrudes into or outside of the vagina.

Disseminated intravascular coagulopathy (DIC): A pathological process in the body where the blood starts to coagulate throughout the whole body. This depletes the body of its platelets and coagulation factors, and there is an increased risk of hemorrhage.

Introduction

The loss of some blood during childbirth and postpartum is normal and cannot be avoided. However, losing any amount of blood beyond normal limits can cause serious problems even for the woman with normal hemoglobin levels.

Note: The importance of a given volume of blood loss varies with the woman's health status.

A woman with a normal haemoglobin level may tolerate blood loss that would be fatal for an anaemic woman.

—WHO 2007¹⁶

For many anemic women, even the normal amount of blood loss might be catastrophic. Fortunately, providers can take action to prevent unnecessary blood loss.

PPH is defined as vaginal bleeding in excess of 500 mL; severe PPH is blood loss exceeding 1,000 mL. Because it is difficult to measure blood loss accurately, research shows that blood loss is frequently underestimated. For instance, nearly half of women who deliver vaginally often lose at least 500 mL of blood, and those who give birth by cesarean delivery normally lose 1,000 mL or more. For many women, this amount of blood loss does not lead to problems; however, outcomes are different for each woman.

For severely anemic women, blood loss of as little as 200 to 250 mL can be fatal. This is especially important for women living in developing countries, where significant numbers of women have severe anemia. For these reasons, a more accurate definition of PPH might be *any amount of bleeding that causes a change for the worse in the woman's condition* (e.g., low systolic blood pressure, rapid pulse, signs of shock).

Predicting who will have PPH based on risk factors is difficult because **two-thirds of women who have PPH have no risk factors.**¹⁷ Therefore, all women are considered at risk, and hemorrhage prevention must be incorporated into care provided at every birth.

Note: Every woman is at risk for PPH.

Causes of PPH

There are several possible reasons for severe bleeding during and after the third stage of labor. The most important causes of PPH include:

- **Uterine atony**, or inadequate uterine contraction, is the most common cause of severe PPH in the first 24 hours after childbirth. Contractions of the uterine muscle fibers help to compress maternal blood vessels. Bleeding may continue from the placental site if contractions are not adequate.

Many factors can contribute to the loss of uterine muscle tone, including:

- Retained placenta or placental fragments.
 - Overdistention of the uterus due to multiple gestation, excess amniotic fluid, large baby, or multiparity.
 - Prolonged labor.
 - Induction or augmentation of labor.
 - Precipitous labor (labor lasting less than 3 hours).
 - Full bladder.
- **Cervical, vaginal, or perineal lacerations and episiotomy.** Undetected or untreated lacerations are the second most common cause of PPH. Episiotomy causes loss of blood and can lead to lacerations. Lacerations can also be caused by deliveries that are poorly controlled, difficult, or managed with instruments (e.g., large baby, twins, or non-cephalic presentation). When the woman has genital lacerations, it is still important to check for and treat uterine atony because these conditions may occur together.
 - **Retained placenta or placental fragments.** If the uterus is not empty, it cannot contract adequately. This can occur if even a small part of the placenta or membranes is retained. A partially separated placenta may also cause bleeding.
 - **Uterine rupture and uterine inversion.** Although rare, these conditions also cause PPH.
 - **DIC.** Although uncommon, this clotting disorder—associated with pre-eclampsia, eclampsia, prolonged labor, abruption placentae, and infections—is a significant and serious cause of PPH.

Preventing PPH and careful monitoring during the first hours after birth are critical for every woman at every birth. Despite the best strategies to prevent blood loss, approximately three percent of women will still lose blood in excess of 1,000 mL. Preparing for early treatment of PPH (e.g., additional uterotonic drugs) is critical to women's health.



PPH prevention and early detection

It is impossible to predict which women are more likely to have a PPH. Many factors may contribute to uterine atony or lacerations. Addressing these factors may help **prevent** PPH and reduce the amount of bleeding a woman may have. Taking a preventive approach can save women's lives.

Despite the best efforts of health providers, women may still suffer from PPH. If PPH does occur, positive outcomes depend on how healthy the woman is when she has PPH (particularly her hemoglobin level), how soon a diagnosis is made, and how quickly effective treatment is provided after PPH begins.

To prevent PPH and reduce the risk of death, routine preventive actions should be offered to all women from pregnancy through the immediate postpartum period.

During antenatal care

Health care providers should take the following steps during antenatal care:

- Develop a birth preparedness plan. Women should plan to give birth with a skilled attendant who can **provide interventions to prevent PPH** (including AMTSL), and can **identify and manage PPH, and refer the woman for additional treatment if needed.**
- Develop a complication readiness plan that includes recognition of danger signs and what to do if they occur, where to get help and how to get there, and how to save money for transport and emergency care. For more information, see Additional Topic 2: Birth preparedness and complication readiness.
- Routinely screen to prevent and treat anemia during pre-conceptual, antenatal, and postpartum visits. Counsel women on nutrition, focusing on available iron and folic acid-rich foods, and provide iron/folate supplementation during pregnancy.
- Help prevent anemia by addressing major causes, such as malaria and hookworm:
 - For malaria, encourage use of insecticide-treated bednets, provide intermittent preventive treatment during pregnancy to prevent asymptomatic infections among pregnant women living in areas of moderate or high transmission of *Plasmodium falciparum*, and ensure effective case management for malaria illness and anemia.
 - For hookworm, provide treatment at least once after the first trimester.
- In cases where the woman cannot give birth with a skilled attendant, prevent prolonged/obstructed labor by providing information about the signs of labor, when labor is too long, and when to come to the facility or contact the birth attendant.
- Prevent harmful practices by helping women and their families to recognize harmful customs practiced during labor (e.g., providing herbal remedies to increase contractions, health workers giving oxytocin by intramuscular [IM] injection during labor).

- Take culturally sensitive actions to involve men and encourage understanding about the urgency of labor and need for immediate assistance.

During labor and second stage

Health care providers should take the following steps during the first and second stages of labor:

- Use a partograph to monitor and guide management of labor and quickly detect unsatisfactory progress.
- Ensure early referral when progress of labor is unsatisfactory.
- Encourage the woman to keep her bladder empty.
- Limit induction or augmentation use for medical and obstetric reasons.
- Limit induction or augmentation of labor to facilities equipped to perform a cesarean delivery.
- Do not encourage pushing before the cervix is fully dilated.
- Do not use fundal pressure to assist the birth of the baby.
- Do not perform routine episiotomy. Consider episiotomy only with complicated vaginal delivery (e.g., breech, shoulder dystocia, forceps, vacuum, scarring from female genital cutting or poorly healed third- or fourth-degree tears, and fetal distress).
- Assist the woman in the controlled delivery of the baby's head and shoulders to help prevent tears. Place the fingers of one hand against the baby's head to keep it flexed (bent), support the perineum, and instruct the woman to use breathing techniques to push or stop pushing.

During third stage

Health care providers should take the following steps during the third stage:

- Provide AMTSL—the single most effective way to prevent PPH.
- Do not use fundal pressure (apply pressure on a woman's abdomen to help expel the placenta) to assist the delivery of the placenta.
- Do not perform CCT without administering a uterotonic drug.
- Do not perform CCT without providing countertraction to support the uterus.

After delivery of the placenta

Health care providers should provide the following care during the immediate postpartum period (the first six hours after childbirth):

- Routinely inspect the vulva, vagina, perineum, and anus to identify genital lacerations. Cervical examination is only recommended when the cause of PPH has not been diagnosed and uterine atony, lower genital lacerations, and retained placenta are ruled out.
- Inspect the placenta and membranes.
- Evaluate if the uterus is well contracted and massage the uterus at regular intervals after placental delivery to keep the uterus well-contracted and firm (at least every 15 minutes for the first two hours after birth).
- Teach the woman to massage her own uterus to keep it firm. Instruct her on how to check her uterus and to call for assistance if her uterus is soft or if she experiences increased vaginal bleeding.



- Monitor the woman for vaginal bleeding and uterine hardness every 15 minutes for the first two hours, every 30 minutes during the third hour, and then every 60 minutes for the next three hours.
- Encourage the woman to keep her bladder empty during the immediate postpartum period.
- Plan to do a complete assessment of the woman one and six hours after childbirth.

Teach the woman and her family about postpartum and newborn danger signs. Help the family develop a complication-readiness plan before the woman is discharged from the health care facility.



Core Topic 3: Uterotonic drugs

Key definitions

Tonic or tetanic contractions: Continuous contractions with no relaxation.

Uterotonics: Substances that stimulate uterine contractions or increase uterine tone. Uterotonics include:

Oxytocin (the most commonly used uterotonic drug): Oxytocin is secreted naturally by the posterior pituitary during later pregnancy, labor, and when the baby breastfeeds. Synthetic forms of oxytocin can be found in products such as Pitocin[®] and Syntocinon[®]. In moderate doses, oxytocin produces slow, generalized contractions of the muscles of the uterus with full relaxation in between. High doses of oxytocin produce sustained tonic contractions that can be dangerous.

Ergot-based compounds (another class of uterotonic drugs): Methergine[®] (methylergonovine maleate) and ergometrine (ergometrine maleate) are the ergot preparations used today. They cause tetanic (continuous) contractions of the uterus and may cause or exacerbate high blood pressure.

Syntometrine (a combination of oxytocin and ergometrine maleate): Syntometrine has both the fast-acting quality of oxytocin and the tetanic contraction action of ergometrine.

Prostaglandins (naturally occurring fatty acids found in the uterus, menstrual fluids, and amniotic fluid): Misoprostol, an E₁ analog prostaglandin, is used for a range of obstetric and gynecologic purposes such as cervical ripening, induction of labor, prevention and treatment of PPH, and post-abortion care.

Use of uterotonics

Uterotonics act directly on the smooth muscle of the uterus and increase the tone, rate, and strength of rhythmic contractions. The body produces a natural uterotonic—the hormone oxytocin—that acts to stimulate uterine contractions at the start of labor and throughout the birth process.

Drugs such as oxytocin, ergometrine, and misoprostol have strong uterotonic properties and are used to treat uterine atony and reduce the amount of blood lost after childbirth. Oxytocin is widely used for induction and augmentation of labor. The use of a uterotonic drug immediately after the delivery of the newborn is one of the most important actions used to prevent PPH.

Improper use of uterotonic drugs

Uterotonic drugs (**oxytocin or misoprostol**) are sometimes used to induce or augment labor. When labor is augmented with a uterotonic drug, the quality and quantity of uterine contractions are greatly affected. The contractions tend to be longer and stronger, and have shorter relaxation periods between each. While augmentation with uterotonic drugs plays a major role in managing unsatisfactory progress of labor due to inadequate or ineffective uterine contractions, **improper use of uterotonics results in grave risks for the woman**, including:

- Umbilical cord compression and subsequent decrease in the baby's oxygen supply (occurs with the increased pressure of contractions).
- Uterine rupture and abruption placenta.
- Increased pain of the uterotonic-induced contractions, which will likely increase the woman's stress and anxiety levels.
- Water intoxication that results when oxytocin—a strong anti-diuretic, even at low doses—is combined with intravenous (IV) fluids.
- Uterine fatigue after childbirth (associated with uterine atony and PPH).

Before deciding to augment labor, the provider should carefully assess the woman and fetus and evaluate the partograph. Labor should be augmented only if:

- Clear emergency or obstetric conditions are present, and
- Health care personnel familiar with the effects of uterotonics and able to identify both maternal and fetal complications are present, and
- A physician is readily available to perform a cesarean delivery should complications arise.

Never administer oxytocin intramuscularly (IM) during labor. If oxytocin is used for labor augmentation, it should be administered by controlled IV drip in a health facility that has an operating theater and qualified physician to perform an emergency caesarean operation. Always follow local guidelines or protocols for uterotonic dosages for labor induction and augmentation.

When 25 mcg tablets of misoprostol are not available, do not break higher dose tablets (usually 200 mcg) and administer for induction or augmentation. When 200 mcg tablets are broken, the exact dose of misoprostol being given to the woman is not reliable and could be dangerous. If more than 25 mcg of misoprostol is administered during labor, this could cause a uterine rupture and / or the death of the baby.



Uterotonic drugs used for AMTSL

Table 3 compares dosage, route of administration, drug action and effectiveness, side effects, and cautions for the most common uterotonic drugs used for AMTSL.

Table 3. Uterotonic drugs for AMTSL

Name of drug/preparation	Dosage and route	Drug action and effectiveness	Side effects and cautions
Oxytocin Posterior pituitary extract. Commonly used brand names include Pitocin or Syntocinon.	Give 10 units IM injection.*	<ul style="list-style-type: none"> ▪ Acts within 2 to 3 minutes. ▪ Effect lasts about 15 to 30 minutes. 	<ul style="list-style-type: none"> ▪ First choice. ▪ No known contraindications for postpartum use.** ▪ Minimal or no side effects.
Misoprostol Synthetic prostaglandin E ₁ (PGE ₁) analogue. Commonly used brand names include Cytotec, Gymiso, Prostokos, Vagiprost, U-Miso	Give 600 mcg (three 200 mcg tablets) orally.	Orally: <ul style="list-style-type: none"> ▪ Acts within 6 minutes. ▪ Peak serum concentration between 18 and 34 minutes. ▪ Effect lasts 75 minutes. 	<ul style="list-style-type: none"> ▪ No known contraindications for postpartum use.** ▪ Common side effects: shivering and elevated temperature.
Ergometrine (methylegometrine), also known as ergonovine (methylegonovine) Preparation of ergot (usually comes in dark brown ampoule). Commonly used brand names include Methergine, Ergotrate, Ergotrate Maleate	Give 0.2 mg IM injection.	<ul style="list-style-type: none"> ▪ Acts within 6 to 7 minutes IM. ▪ Effect lasts 2 to 4 hours. 	<ul style="list-style-type: none"> ▪ Contraindicated in women with a history of hypertension, heart disease, retained placenta, pre-eclampsia, or eclampsia.*** ▪ Causes tonic contractions (may increase risk of retained placenta). ▪ Side effects: nausea, vomiting, headaches, and hypertension. <p>Note: Do not use if drug is cloudy. This means it has been exposed to excess heat or light and is no longer effective.</p>
Syntometrine Combination of 5 IU oxytocin plus 0.5 mg ergometrine.	Give 1 ml IM injection.	Combined rapid action of oxytocin and sustained action of ergometrine.	<ul style="list-style-type: none"> ▪ Same cautions and contraindications as ergometrine. ▪ Side effects: nausea, vomiting, headaches, and hypertension.

*If a woman has an IV, an option may be to give her 5 IU of oxytocin by slow IV push.

**This is intended as a guide for using these uterotonic drugs during the third stage of labor. Different guidelines apply when using these uterotonic drugs at other times or for other reasons.

***Lists of contraindications are not meant to be complete; evaluate each client for sensitivities and appropriateness before use of any uterotonic drug. Only some of the major postpartum contraindications are listed for the above drugs.

IM - intramuscular; IV - intravenous

Comparison of uterotonic drugs for AMTSL

Oxytocin is fast-acting, inexpensive, and in most cases, has no side effects or contraindications for use during the third stage of labor. Oxytocin is also more stable than ergometrine in hot climates and light (when cold/dark storage is not possible). WHO recommends **oxytocin as the drug of choice for AMTSL** and advises that ergometrine, syntometrine, or misoprostol be used only when oxytocin is not available.

WHO recommends oxytocin as the drug of choice for AMTSL.

Misoprostol is a synthetic prostaglandin E₁ (PGE₁) analogue and is an alternative drug for AMTSL and directions on its use for AMTSL is included in the International Federation of Gynaecology and Obstetrics (FIGO)/International Confederation of Midwives (ICM) statement, *Prevention and Treatment of Post-partum Haemorrhage: New Advances for Low Resource Settings*. Oxytocin is the uterotonic of choice for AMTSL;¹⁸ however, administration of an injection requires skills and sterile equipment for safe administration. Oxytocin may be inactivated if exposed to high ambient temperatures.¹⁹

Misoprostol is reportedly more stable than oxytocin and has been administered by oral, sublingual and rectal routes in several studies.¹³ Oral misoprostol is being viewed as an alternative drug for AMTSL for women delivering in low-resource settings where oxytocin and a skilled birth attendant may not be available and as a PPH treatment when used in combination with other uterotonics. It has also been suggested that providers can provide misoprostol tablets where oxytocin is not available²⁰ to non-skilled providers²¹ and to women themselves for the prevention of PPH.²²

Oxytocin in the Uniject™ device—a prefilled, easy-to-use, non-reusable syringe—is an advance in the method of delivering oxytocin and is currently being used in pilot studies (Figure 5). This delivery method ensures the correct dose is given with little preparation and medical waste. The benefits of this device may improve the ability of midwives and other health workers to administer oxytocin outside of hospital facilities, in emergencies, or in remote locations. Appendix B contains information on activating and using the Uniject™ device.



Figure 5. Uniject™ device



Recommendations for selection of a uterotonic drug for prevention of PPH

In the context of active management of the third stage of labor, if all injectable uterotonic drugs are available:

- Skilled attendants should offer oxytocin to all women for prevention of PPH in preference to ergometrine/methylergometrine.
This recommendation places a high value on avoiding adverse effects of ergometrine and assumes similar benefit for oxytocin and ergometrine for preventing PPH²³.
- Skilled attendants should offer oxytocin for prevention of PPH in preference to oral misoprostol (600 mcg).
This recommendation places a high value on the relative benefits of oxytocin in preventing blood loss compared to misoprostol, as well as the increased adverse effects of misoprostol compared to oxytocin.²³

In the context of active management of the third stage of labor, if oxytocin is not available but other injectable uterotonics are available:

- Skilled attendants should offer ergometrine/methylergometrine or the fixed drug combination of oxytocin and ergometrine to women without hypertension or heart disease for prevention of PPH.²³
- Skilled attendants should offer 600 micrograms (mcg) misoprostol orally for prevention of PPH to women with hypertension or heart disease for prevention of PPH.

In the context of prevention of PPH, if oxytocin is not available or birth attendants' skills are limited, misoprostol should be administered soon after the birth of the baby²⁴. The usual components of giving misoprostol include:

- Administration of 600 micrograms (mcg) misoprostol orally after the birth of the baby
- Controlled cord traction ONLY when a skilled attendant is present at the birth
- Uterine massage after the delivery of the placenta as appropriate.

Keeping uterotonic drugs effective

The stability of a drug is defined by how well it maintains active ingredient potency (and other measures such as pH) when stored over time. Pharmaceutical companies conduct stability studies to determine the appropriate shelf-life, storage conditions, and expiration dating for safe storage of the oxytocin they produce. A manufacturer will recommend storage conditions based on the conditions under which he has performed stability studies, and will set the expiry date to be consistent with this. It is therefore important to read storage recommendations made by the manufacturer.

Since ergometrine and syntometrine are sensitive to heat and light, and oxytocin is sensitive to heat, following storage guidelines is critical to ensure the optimal effectiveness of injectable uterotonic drugs. When drugs are inadequately stored, drug effectiveness can diminish, posing serious consequences for the postpartum woman.

Storage practices in health care facilities vary widely and may not follow guidelines for correct storage. For example, vials of uterotonic drugs might be kept on open trays or containers in the labor ward, leaving them exposed to heat and light. Pharmacists, pharmacy managers, and birth attendants using the oxytocin need to carefully read and follow recommended guidelines for transporting and storing uterotonic drugs. Recommended guidelines for transporting and storing specific uterotonic drugs are noted in Table 4.

Table 4. Recommended guidelines for transport and storage of uterotonic drugs

Drug	Transport	Storage
Oxytocin	Unrefrigerated transport is possible if no more than one month at 30°C.	<ul style="list-style-type: none"> ▪ Check manufacturer’s recommendations – some manufacturers are producing oxytocin that is more heat stable than previously available ▪ Temporary storage outside the refrigerator at a maximum of 30°C is acceptable for no more than three months. ▪ If possible, keep refrigerated at 2–8°C.
Misoprostol	Protect from humidity.	<ul style="list-style-type: none"> ▪ Store at room temperature in closed container and protected from humidity.
Syntometrine	Unrefrigerated transport in the dark is possible if no more than one month at 30°C. Protect from freezing.	<ul style="list-style-type: none"> ▪ Store in the dark. ▪ Keep refrigerated at 2–8°C. ▪ Store in closed container. ▪ Protect from freezing.
Ergometrine	Unrefrigerated transport in the dark is possible if no more than one month at 30°C. Protect from freezing.	<ul style="list-style-type: none"> ▪ Store in the dark. ▪ Keep refrigerated at 2–8°C. ▪ Store in closed container. ▪ Protect from freezing.

Effect of heat and light on uterotonic drugs

Two factors can influence the effectiveness of uterotonic drugs: temperature and light. This is especially important in hot temperatures and in conditions where refrigeration is not always available or reliable. A WHO research program examined the effectiveness of different injectable uterotonic drugs at various temperatures and light conditions. Table 5 shows one comparison from this study.

Table 5. Change in effectiveness of injectable uterotonic drugs after one year of controlled storage

Uterotonic drug	Dark 4–8°C	Dark 30°C	Light 21–25°C	Effects of heat and light/key findings
Oxytocin	0% loss	14% loss	7% loss	Minimal effect from light, more stable for longer time at higher temperatures than ergometrine



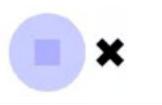
Uterotonic drug	Dark 4-8°C	Dark 30°C	Light 21-25°C	Effects of heat and light/key findings
Ergometrine	5% loss	31% loss	90% loss	Significantly more affected by heat and light, not stable at higher temperatures

Time temperature indicators

Vaccine vial monitors (VVMs)* are small stickers that adhere to a vaccine vial and change color as the vaccine is exposed to heat. The color of the sticker indicates whether a vaccine or medication is bad or can be safely used. In 1996, the first monitors became commercially available for oral polio vaccine. Today, monitors are available for all vaccines used in immunization programs in developing countries.

Oxytocin in the Uniject™ device is the first uterotonic drug to use VVM technology, where the label contains heat-sensitive material and indicates heat exposure over time. As the device is exposed to warm temperatures, the time-temperature indicator (TTI) color darkens (Figure 6). The warmer the temperature, the faster the color changes on the TTI.

Figure 6. Reading the time-temperature indicator

	The inner square is lighter than the outer circle. If the expiry date has not passed, use the oxytocin-Uniject.
	As time passes the inner square is still lighter than the outer circle. If the expiration date has not passed, use the oxytocin-Uniject.
	Discard point: the color of the inner square matches that of the outer circle. Do not use the oxytocin in Uniject even if the expiration date has not passed.
	Discard point: the inner square is darker than the outside circle. Do not use the oxytocin in Uniject even if the expiration date has not passed.

Tips to increase uterotonic drug effectiveness

In the pharmacy:

- Make sure that there are adequate stocks of uterotonic drugs, syringes, and injection safety materials
- Check the manufacturer's label for storage recommendations

* The VVM concept was developed in 1979 by WHO and PATH, with funding from the United States Agency for International Development. Temptime Corporation (formerly Lifelines Inc.) today provides VVMs to all vaccine manufacturers.

- Make sure that there is a system in place to monitor the temperature of the refrigerator / cold box - record the temperature in the refrigerator on a regular basis, preferably at the hottest times of the day (put thermometers in different parts of the refrigerator)
- Make sure that there is a back-up system in place in case of frequent electricity cuts - for example, gas or solar refrigerators, placing ice packs in the refrigerator to keep it cool, etc.
- Follow the rule of first expired – first out (or first in – first out) and maintain a log to keep track of expiration dates to reduce wastage of uterotonic drugs
- Store misoprostol at room temperature and away from excess heat and moisture
- To ensure the longest life possible of **injectable uterotonics**, keep them refrigerated at 2–8°C
- **Protect** ergometrine **and** syntometrine **from freezing and light**.

In the delivery room:

- Check the manufacturer’s label for recommendations on how to store injectable uterotonic drugs outside the refrigerator. In general:
 - Oxytocin may be kept outside the refrigerator at a maximum of 30°C (warm, ambient climate) for up to three months and then discarded
 - Ergometrine and syntometrine vials may be kept outside the refrigerator in closed boxes and protected from the light for up to one month at 30°C and then discarded
 - Misoprostol should be stored at room temperature away from excess heat and moisture
- Record the temperature in the delivery room on a regular basis, preferably at the hottest times of the day
- Periodically remove ampoules from the refrigerator for use in the delivery room – carefully calculate the number removed from the refrigerator based anticipated need
- Only remove ampoules or vials from their box just before using them
- Make sure that there are adequate stocks of syringes and injection safety materials
- Avoid keeping injectable uterotonics in open kidney dishes, trays, or coat pockets

Ergometrine loses 21–27 percent potency in one month of exposure to indirect sunlight.

Oxytocin has no loss of potency after one month exposure to indirect sunlight.

Cost

The cost of a drug is determined by many factors, including implications for its use and its availability worldwide. Many factors can affect the cost of uterotonics:

- Quantity of drug being ordered.
- Quality of the drug being manufactured.
- Manufacturer’s set price.
- Country where the drug is manufactured (and whether the drug needs to be transported).



The cost to buy oxytocin and ergometrine are essentially the same, while the fixed drug combination of oxytocin and ergometrine is likely to be more expensive in most countries than oxytocin or ergometrine alone.

Costs for administering oxytocin, ergometrine, and the fixed drug combination of oxytocin and ergometrine are likely to be generally the same. Costs for administering misoprostol will be less because it does not require a syringe and needle, a skilled birth attendant trained and authorized to administer injections, or consumables and supplies to ensure safe injection and infection prevention practices.

Storage costs may be higher for ergometrine (and the fixed drug combination of oxytocin and ergometrine) because it requires temperature-controlled transport and storage and protection from light. Oxytocin is more stable and storage costs may be less than ergometrine.²¹ Costs for storage of misoprostol will be minimal as it is the most stable of the three uterotonic drugs and can be stored at room temperature.



Core Topic 4: AMTSL

AMTSL is a combination of actions to speed the delivery of the placenta by increasing uterine contractions and minimizing uterine atony. Using AMTSL helps prevent unnecessary blood loss and PPH.

Essential care during the third stage of labor

The time immediately following birth can be particularly active and involved because the skilled birth attendant must attend to both the woman and newborn. Regardless of how the third stage of labor is managed, basic care for the woman and baby during labor and postpartum remains the same. The following actions represent the elements of essential care for the provider and for the woman and newborn during the third stage of labor.

Essential precautions for the provider

Health care providers should take the following precautions for themselves:

- Wear protective gear (gloves, face mask/goggles, apron, and boots or closed shoes).
- Safeguard against splashes and sharps-related injuries.

Essential care for the woman

Health care providers should follow these guidelines in caring for the woman:

- Ensure the woman is in a comfortable position.
- Explain to woman and family what is happening around them.
- Inform the woman about her baby and explain what is happening while you attend to immediate newborn care.
- Encourage breastfeeding, if this is the woman's choice for infant feeding.
- Follow national guidelines for maternal interventions to prevent / reduce the risk of mother-to-child transmission (MTCT) of HIV/AIDS.
- Throughout all phases of care:
 - Give continuous empathetic and physical support.
 - Give the woman as much information and explanation as she desires.
 - Facilitate good communication among the woman and her caregivers and companions.
 - Practice infection prevention.

Essential care for the newborn

Health care providers should follow these guidelines when caring for the newborn:

- Thoroughly dry and stimulate the baby while assessing breathing.
- Place the newborn in skin-to-skin contact with the woman; cover both with a dry warm cloth or blanket. Cover the baby's head to ensure warmth (Figure 7).
- If breastfeeding is the woman's choice for infant feeding, place the baby close to the woman's breast to help encourage the baby to latch on to the breast.



Figure 7. Keeping the baby in skin-to-skin contact with the mother²⁵

- Wait to clamp and cut the cord until 2 to 3 minutes after the baby's birth. (Even if oxytocin is given within one minute after birth of the baby, clamping does not need to happen until 2 to 3 minutes after the baby's birth.)

Note: In situations where cord clamping and cutting was delayed, there were fewer cases of anemia in full-term babies at two months of age and increased duration of early breastfeeding.²⁶

Immediate cord clamping can decrease the red blood cells an infant receives at birth by more than 50 percent.²⁷ Studies show that delaying clamping and cutting of the umbilical cord is helpful to both full-term and preterm babies. In high-risk situations (e.g., low birth weight or premature infant), delaying clamping by as little as a few minutes is helpful. In situations where cord clamping and cutting was delayed for preterm babies, these infants had higher hematocrit and hemoglobin levels and a lesser need for transfusions in the first 4 to 6 weeks of life than preterm babies whose cords were clamped and cut immediately after birth.

- Follow national guidelines for newborn interventions to prevent / reduce the risk of MTCT of HIV/AIDS.

Preparing for active management

Before or during the second stage of labor:

- Prepare the injectable uterotonic (10 IU of oxytocin is the preferred injectable uterotonic) in a sterile syringe before second stage (Figure 8) or have oxytocin in Uniject™ or 600 mcg of misoprostol available.
- Prepare other essential equipment for birth and the third stage of labor before onset of second stage of labor.
- Ask the woman to empty her bladder when second stage is near.
- Assist the woman into her preferred position for giving birth (e.g., squatting, semi-sitting).

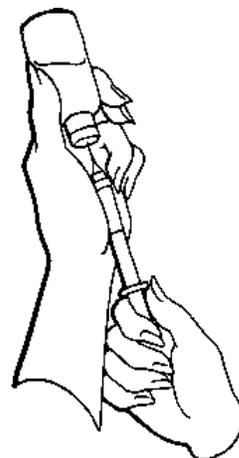


Figure 8. Preparing oxytocin injection



Steps for AMTSL

There are three main components or steps of AMTSL-administering a uterotonic drug, CCT, and massaging the uterus-which should be implemented along with the provision of immediate newborn care.

1. Thoroughly dry the baby, assess the baby's breathing and perform resuscitation if needed, and place the baby in skin-to-skin contact with the mother



Figure 9. Put the baby on the mother's abdomen

After delivery, immediately dry the infant and assess the baby's breathing. Then place the reactive infant, prone, on the mother's abdomen.* Remove the cloth used to dry the baby and keep the infant covered with a dry cloth or towel to prevent heat loss.

**If the infant is pale, limp, or not breathing, it is best to keep the infant at the level of the perineum to allow optimal blood flow and oxygenation while resuscitative measures are performed. Early cord clamping may be necessary if immediate attention cannot be provided without clamping and cutting the cord.*

2. Administer a uterotonic drug within one minute of the baby's birth

Administering a uterotonic drug within one minute of the baby's birth stimulates uterine contractions that will facilitate separation of the placenta from the uterine wall. Before giving the uterotonic drug it is important to rule out the presence of another baby. If the uterotonic drug is administered when there is a second baby, there is a small risk that the second baby could be trapped in the uterus.

The steps for administering a uterotonic drug include:

1. Before performing AMTSL, gently palpate the woman's abdomen to rule out the presence of another baby. At this point, do not massage the uterus.
2. If there is not another baby, begin the procedure by giving the woman 10 IU of oxytocin IM in the upper thigh. This should be done within one minute of childbirth. If available, a qualified assistant should give the injection.



Figure 10. Give a uterotonic drug

3. Cut the umbilical cord

Clamp and cut the cord following strict hygienic techniques after cord pulsations have ceased or approximately 2-3 minutes after birth of the baby, whichever comes first.

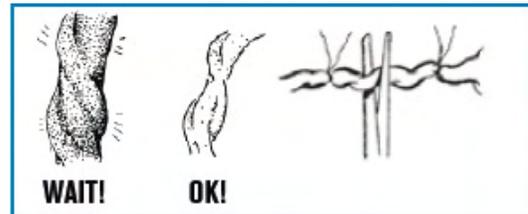


Figure 11. Pulsating and nonpulsating umbilical cord

4. Keep the baby warm



Figure 12. Keep the baby in skin-to-skin contact

Place the infant directly on the mother's chest, prone, with the newborn's skin touching the mother's skin. While the mother's skin will help regulate the infant's temperature, cover both the mother and infant with a dry, warm cloth or towel to prevent heat loss. Cover the baby's head with a cap or cloth.

5. Perform controlled cord traction

CCT helps the placenta descend into the vagina **after it has separated from the uterine wall** and facilitates its delivery. It is important that the placenta be removed quickly once it has separated from the uterine wall because the uterus cannot contract efficiently if the placenta is still inside. CCT includes supporting the uterus by applying pressure on the lower segment of the uterus in an upward direction towards the woman's head, while at the same time pulling with a firm, steady tension on the cord in a downward direction during contractions. Supporting or guarding the uterus (sometimes called "counter-pressure" or "counter-traction") helps prevent uterine inversion during CCT. CCT should only be done during a contraction.

Note: CCT is not designed to separate the placenta from the uterine wall but to facilitate its expulsion only. If the birth attendant keeps pulling on an unseparated placenta, inversion of the uterus may occur.

The steps for CCT include:

1. Wait for cord pulsations to cease or approximately 2-3 minutes after birth of the baby, whichever comes first, and then place one clamp 4 cm from the baby's abdomen.



Note: Delaying cord clamping allows for transfer of red blood cells from the placenta to the baby that can decrease the incidence of anemia during infancy.

2. Gently milk the cord towards the woman's perineum and place a second clamp on the cord approximately 2 cm from the first clamp.
3. Cut the cord using sterile scissors under cover of a gauze swab to prevent blood spatter. After mother and baby are safely cared for, tie the cord.
4. Place the clamp near the woman's perineum to make CCT easier (Figure 13).

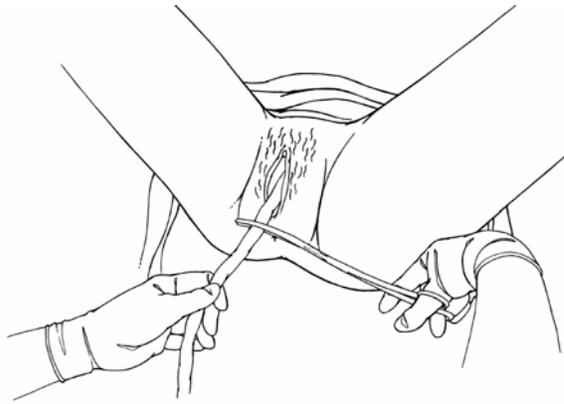


Figure 13. Clamping the umbilical cord near the perineum

5. Hold the cord close to the perineum using a clamp (Figure 13).

6. Place the palm of the other hand on the lower abdomen just above the woman's pubic bone to assess for uterine contractions (Figure 14). If a clamp is not available, controlled cord traction can be applied by encircling the cord around the hand.



Figure 14. Holding the cord close to the perineum with the clamp or hand, maintain hand on uterine fundus to palpate the next contraction.

7. Wait for a uterine contraction. Only do CCT when there is a contraction.
8. With the hand just above the pubic bone, apply external pressure on the uterus in an upward direction (toward the woman's head) (Figure 15).
9. At the same time with your other hand, pull with firm, steady tension on the cord in a downward direction (follow the direction of the birth canal). Avoid jerky or forceful pulling.

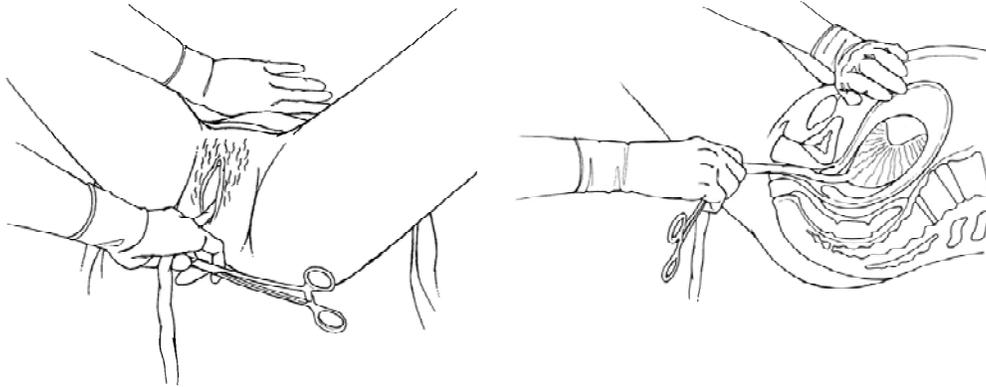


Figure 15. Applying CCT with countertraction to support the uterus

NOTE: If the placenta does not descend during 30–40 seconds of controlled cord traction (i.e. there are no signs of placental separation), do not continue to pull on the cord:

- Gently hold the cord and wait until the uterus is well contracted again. If necessary, use a sponge forceps to clamp the cord closer to the perineum as it lengthens;
- With the next contraction, repeat controlled cord traction with counter traction.



10. Do not release support on the uterus until the placenta is visible at the vulva. Deliver the placenta slowly and support it with both hands (Figure 16).

Figure 16. Supporting the placenta with both hands

11. As the placenta is delivered, hold and gently turn it with both hands until the membranes are twisted (Figure 17).
12. Slowly pull to complete the delivery. Gently move membranes up and down until delivered (Figure 18).

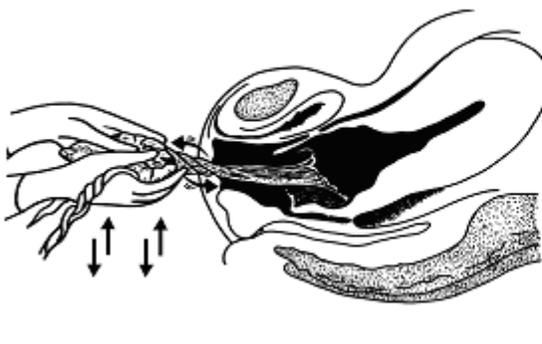


Figure 17. Delivering the placenta with a turning and up-and-down motion

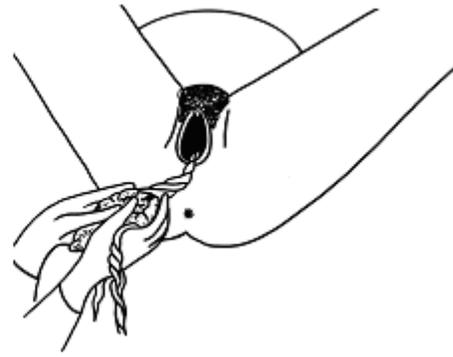


Figure 18. Slowly pull to complete delivery of the placenta.

NOTE: If the **membranes tear**, gently examine the upper vagina and cervix wearing high-level disinfected or sterile gloves and use a sponge forceps to remove any pieces of remaining membrane.

6. Massage the uterus

Massage the uterus immediately after delivery of the placenta and membranes until it is firm (Figure 19). Massaging the uterus stimulates uterine contractions and helps to prevent PPH. Sometimes blood and clots will be expelled during this process. After stopping massage, it is important that the uterus does not relax again. Instruct the woman how to massage her own uterus, and ask her to call if her uterus becomes soft.



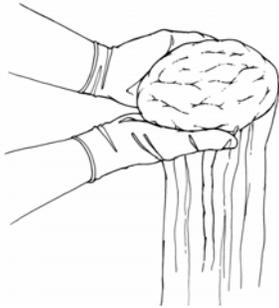
Figure 19. Massaging the uterus immediately after the placenta delivers

7. Examine the placenta

Examine the fetal and maternal sides of the placenta and membranes to ensure they are complete. A small amount of placental tissue or membranes remaining in the woman can prevent uterine contractions and cause PPH.

Note: Follow infection prevention guidelines when handling contaminated equipment, supplies, and sharps.

To examine the placenta for completeness:



1. Hold the placenta in the palms of the hands with the maternal side facing upward and make sure that all lobules are present and fit together (Figure 20).

Figure 20. Examining the maternal side

13. Hold the cord with one hand, allowing the placenta and membranes to hang down. Place the other hand inside the membranes, spreading your fingers to ensure that membranes are complete (Figure 21).

14. Dispose of the placenta as appropriate.



Figure 21. Checking the membranes

8. Examine the lower vagina and perineum

1. Gently separate the labia and inspect the lower vagina and perineum for lacerations that may need to be repaired to prevent further blood loss (Figure 22).
2. Repair lacerations or episiotomy.



Figure 22. Gently inspect the lower vagina and perineum for lacerations.

3. Gently cleanse the vulva, perineum, buttocks, and back with warm water and a clean compress.
4. Apply a clean pad or cloth to the vulva.
5. Evaluate blood loss.
6. Explain all examination findings to the woman and, if she desires, her family.



9. Provide immediate care

After examining the placenta and external genitals, continue caring for the mother and newborn.



If the woman has chosen to breastfeed, the mother and baby may need assistance to breastfeed within the first hour after the birth and before transferring them out of the delivery room (Figure 23). Assess readiness of the woman and newborn to breastfeed before initiating breastfeeding; do not force the mother and baby to breastfeed if they are not ready.

Figure 23. Encourage breastfeeding Within the first hour after birth.

Also ensure that:

- The baby is kept warm.
- The mother and baby are kept together.
- The mother and baby are not left alone.
- The woman and baby stay in the delivery room for at least one hour after delivery of the placenta.
- PMTCT interventions are provided per national guidelines.
- AMTSL practices are recorded as required by local protocols (on the partograph, woman's chart, or delivery log).
- The woman receives information about how she will be cared for during the next few hours.

10. Monitor the woman and newborn immediately after delivery of the placenta

Perform a comprehensive examination of the woman and newborn one and six hours after childbirth. Continue with routine care for the woman and newborn, provide interventions to prevent / reduce the risk of MTCT of HIV according to national guidelines, and follow applicable requirements for recording information about the birth, monitoring of the woman and newborn, and any care provided.

Monitor and care for the woman

- During the first two hours after the delivery of the placenta, monitor the woman at least every 15 minutes (more often if needed) to:
 - Palpate the uterus to check for firmness.
 - Massage the uterus until firm. (Ask the woman to call for help if bleeding increases or her uterus gets soft.)
 - Check for excessive vaginal bleeding.

- Take action to evaluate and treat PPH immediately if excessive bleeding is detected.
- Ensure the uterus does not become soft after massage is stopped.
- Instruct the woman how the uterus should feel and how she can massage it herself.
- Encourage the woman to eat and drink.
- Ask the companion to stay with the woman.
- Encourage the woman to pass urine.
- Inform the woman about danger signs and when she should call for help.

Monitor and care for the newborn

Check the baby at the same time you check the mother every 15 minutes during the first two hours after childbirth:

- Check the baby's breathing.
- Check the baby's color.
- Check warmth by feeling the baby's feet.
- Check the cord for bleeding.
- Take immediate action if a problem is detected.



Frequently asked questions

How is a newborn affected if 10 IU of oxytocin IM is given before clamping the cord?

There are no known harmful effects from giving oxytocin before cord clamping. Mothers naturally produce some oxytocin during labor which is transmitted to the infants. Oxytocin given either IM or IV at delivery supplements this natural process.

Also, giving a uterotonic drug immediately after birth can speed the transfer of blood into the baby from the placenta. This increases the infant's red cell mass.²²

Are there more complications with AMTSL such as a ruptured cord (cord tears off), inverted uterus, or retained placenta?

Some providers express concern that active management increases uterine inversion rates and ruptured cords due to cord traction and increases the risk of retained placenta due to entrapment caused by uterotonic drugs. However research shows:

- No uterine inversions were seen in any of the trials comparing active and physiologic management. However, these trials were not designed to evaluate very rare outcomes.^{15, 22}
- Trials using oxytocin alone showed reduced rates of manual removal of the placenta, whereas those using ergot preparations (e.g., ergometrine) showed increased rates.^{8, 15}
- The trial findings did not show increased risk of cord rupture.

If oxytocin is supplied in 5 IU ampoules, is one ampoule sufficient for performing AMTSL?

Although the recommended dose of oxytocin has changed over the years, WHO now recommends administering 10 IU of oxytocin IM for AMTSL. Trials comparing active and physiologic management have also compared the different uterotonics in active management protocols. Results suggest that increasing the intramuscular dose of oxytocin from 5 IU to 10 IU increases the effectiveness of oxytocin.^{8, 15}

Will routine manual exploration of the uterus after AMTSL help reduce the incidence of PPH from retained placenta or placental fragments?

Routine manual exploration of the uterus is no longer recommended for normal deliveries or those following previous cesarean delivery. Manual exploration is painful and may likely increase the risk of complications, especially infections. Exploration is justified for women with a well-contracted uterus experiencing bleeding from high in the genital tract.

Will "milking" the cord help to increase the baby's hemoglobin?

Because there is no documented benefit from the practice, "milking" the cord toward the baby to exaggerate the transfer of blood to the newborn is discouraged.

WHO supports the practice of delaying cord clamping. The practice of clamping for 2 to 3 minutes has proven beneficial to the baby as it results in higher hemoglobin and hematocrit values and possibly lower levels of early childhood anemia and greater iron stores.²⁸ This may be particularly important for low birthweight and premature infants. If maternal bleeding in the first few minutes after childbirth is significant, a decision to delay cord clamping for 2 to 3 minutes must be determined by assessing the risk of PPH with the benefit of delayed cord clamping.

What are the risks of giving oxytocin for AMTSL when there is an undiagnosed multiple pregnancy?

There is a theoretical risk of a trapped twin if providers administer oxytocin with an undiagnosed twin. Original research trials on AMTSL that established the effectiveness of AMTSL included giving a uterotonic drug with birth of the anterior shoulder.^{8, 15} However, updated AMTSL protocols take the theoretical risk of a trapped twin into account and now recommend giving oxytocin after birth of the baby and only after excluding the presence of an additional baby. Quality clinical assessment in labor and following delivery of the first baby can establish the diagnosis before giving a uterotonic drug.

If the woman has an IV infusion running at the time the baby is born, how should oxytocin be delivered (dosage and route) for AMTSL?

Typically with vaginal delivery, a dose of 10 IU of oxytocin is administered IM. In patients with an IV, the provider may give 5 IU of oxytocin as a slow intravenous bolus and then continue with the oxytocin infusion.

What part does each of the steps of AMTSL play in preventing PPH?

Trials that administered uterotonics at the time of delivery with physiologic management showed some reduction in PPH rates.⁸ However, a greater reduction in PPH rates is evident with AMTSL. In cases where a uterotonic drug is given without CCT, women experienced a greater incidence of retained placenta; additionally, no reduction in the number of patients receiving blood transfusions was detected.²⁹

A single trial examined the effect of CCT with and without the administration of oxytocin after delivery of the baby. The results suggest that CCT alone does not reduce the incidence of PPH or severe PPH. Another trial found that CCT used with oxytocin immediately after placental delivery resulted in outcomes similar to those with using all three components of AMTSL.³⁰ A third trial showed that true active management resulted in lower PPH rates when compared with CCT followed by oxytocin at the time of placental delivery.³¹

Should CCT be performed by an SBA if there are no uterotonic drugs?

CCT is not recommended unless uterotonic drugs are used or a skilled birth attendant is present. If CCT is applied in the absence of uterotonic drugs or a skilled birth attendant, the practice can cause partial placental separation, and might increase the risk of a ruptured cord, excessive bleeding, and uterine inversion.^{15, 24}

Should uterine massage be performed by an SBA before the delivery of the placenta?

There is no evidence to support the recommendation of providing uterine massage before delivery of the placenta in the absence of a uterotonic drug, and evidence is increasing that uterine massage before delivery of the placenta may lead to increased rates of PPH.

How should the third stage of labor be managed in the absence of uterotonic drugs?

In some settings there will be no uterotonics available due to interruptions of supplies or the setting of birth. In the absence of current evidence, ICM and FIGO recommend that when no uterotonic drugs are available to either the skilled or non-skilled birth attendant, management of the third stage of labor includes the following components (see Appendix A):

- Waiting for signs of separation of the placenta (cord lengthening, small blood loss, uterus firm and globular on palpation at the umbilicus)



- Encouraging maternal effort to bear down with contractions and, if necessary, to encourage an upright position
- Controlled cord traction is not recommended in the absence of uterotonic drugs, or prior to signs of separation of the placenta, as this can cause partial placental separation, a ruptured cord, excessive bleeding and uterine inversion
- Uterine massage after the delivery of the placenta as appropriate.

How should the third stage of labor be managed in situations where no oxytocin is available or birth attendants' skills are limited?

In situations where no oxytocin is available or birth attendants' skills are limited, the 2006 FIGO/ICM joint statement recommends administering misoprostol soon after the birth of the baby to reduce the occurrence of hemorrhage.²⁴ The most common side effects are transient shivering and pyrexia. Education of women and birth attendants in the proper use of misoprostol is essential.

The usual components of giving misoprostol include:

- Administration of 600 micrograms (mcg) misoprostol orally or sublingually after the birth of the baby
- Controlled cord traction ONLY when a skilled attendant is present at the birth
- Uterine massage after the delivery of the placenta as appropriate.

In the absence of active management, should uterotonic drugs be used alone for prevention of PPH?

The most recent WHO recommendations for the prevention of postpartum hemorrhage²³ promote the use of a uterotonic drug (oxytocin or misoprostol) by a health worker trained in its use for prevention of PPH in the absence of active management of the third stage of labor. This recommendation is based on results from two randomized trials and places a high value on the potential benefits of avoiding PPH. In the case of misoprostol, there is the additional benefit of ease of administration of an oral drug in settings where other care is not available.

How does practicing AMTSL differ for women who are infected with HIV?

The practice of AMTSL is the same for all women regardless of their HIV status. However, women who are HIV infected may choose not to breastfeed, so providers need to respect and support the woman's choice for infant feeding. In addition, providers need to ensure that national guidelines for PMTCT are implemented for the woman and newborn in addition to routine care during labor, childbirth, and in the immediate postpartum.

Does nipple stimulation prevent PPH?

Nipple stimulation results in the release of the oxytocin hormone in the woman. The nipples are easily stimulated through early breastfeeding. Research has not shown that nipple stimulation significantly helps to reduce the risk of PPH so this should not replace AMTSL to prevent PPH. However, promoting breastfeeding after birth has several benefits:

- Stimulates natural production of oxytocin.
- May help maintain tone of the contracted uterus.
- Promotes bonding between the mother and newborn.
- Breast milk is perfectly suited to nourish infants and protect them from illness.



Additional Topic 1: Infection prevention

This section provides guidelines on infection prevention practices to use when providing maternal and newborn services and is adapted from materials developed by JHPIEGO, EngenderHealth, and WHO.^{32, 33, 34}

Principles of infection prevention

Infection prevention practices are based on the following five principles:

1. Every person (client or staff) is considered potentially infectious.
7. Hand washing is the single most important practice for preventing cross-contamination.
8. Wear gloves before touching anything wet—broken skin, mucous membranes, blood, or other body fluids.
9. Use protective gear (aprons, face masks, eye goggles) when splashes or spills of body fluids are expected.
10. Use safe work practices (e.g., do not recap or bend needles), following guidelines for handling and cleaning instruments and disposing of sharps and medical waste.

Hand washing

The steps in hand washing are:

1. Wet hands with running water and apply soap.
2. Rub together all surfaces of the hands including wrists, between fingers, palms, the back of the hands, and under fingernails.
3. Wash for 15 seconds.
4. Rinse under a stream of running water.
5. Dry hands. Air dry, or use a clean cloth or paper towels.

Always wash hands:

- Upon arrival to and before leaving the health care facility.
- Before and after examining the woman or baby (or having any direct contact).
- After exposure to any blood or body fluids, even if gloves are worn.
- After removing gloves (the gloves may have very small holes).

Gloves

Wear gloves when:

- Performing a procedure.
- Handling soiled items (e.g., instruments and gloves).
- Disposing contaminated waste.

A separate pair of gloves must be used for each woman to avoid cross-contamination.

Disposable gloves are preferred, but when resources are limited, surgical gloves can be reused if they are:

- Decontaminated by soaking in 0.5 percent chlorine for 10 minutes **AND**
- Washed and rinsed **AND**
- Sterilized by autoclaving or high-level disinfected by boiling or steaming.

Single-use or disposable surgical gloves should not be reused more than three times because invisible tears may occur.

Note: Do not use gloves that are cracked, peeling, visibly torn, or contain holes.

Aprons or gowns

Wear a clean or sterile gown during delivery:

- If the gown has long sleeves, gloves should be placed over the gown sleeve to avoid contaminating the gloves.
- Ensure gloved hands are held high above the level of the waist and do not come into contact with the gown.

Handling sharp instruments

- Do not leave sharp instruments or needles (“sharps”) in places other than “safe” zones:
 - Use a tray or basin to carry and pass sharp items.
 - Pass instruments with the handle (not the sharp end) pointing toward the receiver.
- Announce to others before passing sharps.

Needles and syringes

Follow these guidelines to ensure safe handling of needles and syringes:

- Use each needle and syringe only once.
- Do not take needle and syringe apart after use.
- Do not recap, bend, or break needles before disposal.
- Dispose of needles and syringes in a puncture-proof container.

Where disposable needles are not available and you must recap the needle, use the “one-hand technique” for recapping (Figure 24).³⁵

Step 1: Place the cap on a hard, flat surface.

Step 2: Hold the syringe with one hand and use the needle to “scoop up” the cap.

Step 3: When the cap covers the needle completely, hold the base of the needle and use

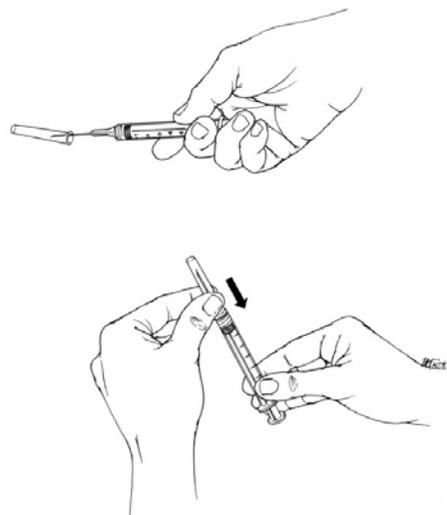


Figure 24. One-hand technique for needle recapping



the other hand to make sure the cap is firmly in place.

Preventing splashes

Wear appropriate protective goggles, gloves, and gown during delivery. Prevent splashes from blood or amniotic fluid by following these guidelines:

- Avoid snapping the gloves when removing, as this may cause contaminants to splash into the eyes, mouth, or on to skin or others.
- Hold instruments and other items under the surface of the water while scrubbing and cleaning to avoid splashing.
- Place items gently into the decontamination bucket to avoid splashes.
- Avoid rupturing membranes during a contraction.
- Stand to the side when rupturing membranes to avoid splashes from amniotic fluid.

Caution: If blood or body fluids get in the mouth or on skin, wash with liberal soap and water as soon as it is safe for the woman and baby. If blood or body fluids splash in your eyes, irrigate well with water.

Waste disposal

The purpose of waste disposal is to:

- Prevent the spread of infection to people who handle the waste.
- Prevent the spread of infection to the local community.
- Protect those who handle waste from accidental injury.

There is no risk from non-contaminated waste such as office paper, which can be disposed of according to local guidelines

Proper handling of contaminated waste (such as items with blood or body fluids) is required to minimize the spread of infection to other staff and the community. Proper handling includes:

- Wearing heavy-duty gloves.
- Transporting solid contaminated waste to the disposal site in covered containers.
- Carefully pouring liquid waste down a drain or flushable toilet.
- Burning or burying contaminated solid waste.
- Washing hands, gloves, and containers after disposal of infectious waste.

The steps of processing instruments

Proper processing involves several steps that reduce the risk of transmitting infections from used instruments and other items to health care workers and clients: 1) decontamination, 2) cleaning, 3) either sterilization or high-level disinfection, and 4) storage. For proper processing, it is essential to perform the steps in the correct order. Table 6 provides an overview of the benefits gained by performing each step when processing instruments and gloves.

Table 6. Steps and benefits for processing instruments for reuse

Processing step		Benefit
Step 1	Decontaminate	<ul style="list-style-type: none"> ▪ Kills viruses (hepatitis B and C, HCV, HIV) and many other germs. ▪ Makes items safer to handle during cleaning. ▪ Makes items easier to clean. ▪ Common decontamination process: soak in 0.5% chlorine solution for 10 minutes.
Step 2	Clean	<ul style="list-style-type: none"> ▪ Removes blood, other body fluids, tissue, and dirt. ▪ Reduces the number of germs. ▪ Makes sterilization or HLD effective. If blood clot remains on instrument, germs in clot may not be completely killed by sterilization or HLD. ▪ Wash items with soap and water and rinse with clean water.
Step 3	High-level disinfect	<ul style="list-style-type: none"> ▪ Kills all germs except some endospores. ▪ Use for items that have contact with broken skin or intact mucous membranes. ▪ If sterilization is not possible, HLD may be the only other choice. ▪ Can be done by boiling or steaming items for 20 minutes or chemical disinfection using 0.1% chlorine solution for 20 minutes.
	Sterilize	<ul style="list-style-type: none"> ▪ Kills all germs including endospores. ▪ May not be possible in all settings. ▪ Can be done by dry (oven) or wet heat (autoclave).
Step 4	Store or Use	<ul style="list-style-type: none"> ▪ If items are stored properly they will not become contaminated after processing. Proper storage is as important as proper processing. ▪ Store or use items properly after completing the first three steps to prevent contamination for up to one week in HLD container.

HLD High-level disinfection



Making a chlorine decontamination solution

The ability to decontaminate instruments is a critical step in infection prevention. The most common decontamination process is to soak instruments in a 0.5% chlorine solution for 10 minutes. Chlorine solutions made from sodium hypochlorite are usually the most inexpensive, fast-acting, and effective for decontamination. A chlorine solution can be made from:

- Liquid household bleach (sodium hypochlorite).
- Bleach powder or chlorine compounds available in powder form (calcium hypochlorite or chlorinated lime).
- Chlorine-releasing tablets (sodium dichloroisocyanurate).³⁰

Chlorine-containing compounds contain a certain percentage of "active" (or available) chlorine. Active chlorine in these products kills microorganisms. The amount of active chlorine is usually described as a percentage and differs among products, an important fact to ensure preparation of a chlorine solution with 0.5 percent "active" chlorine that can be used to decontaminate gloves, instruments, etc.

Note that:

- Different products may contain different concentrations of available chlorine and the concentration should be checked before use.
- In countries where French products are available, the amount of active chlorine is usually expressed in "degrees chlorum." One degree chlorum is equivalent to 0.3 percent active chlorine.
- Household bleach preparations can lose some of their chlorine over time. Use newly manufactured bleach if possible. If the bleach does not smell strongly of chlorine it may not be satisfactory for the purpose and should not be used;
- Thick bleach solutions should never be used for disinfection purposes (other than in toilet bowls) as they contain potentially poisonous additives.

When preparing chlorine solutions for use note that:

- Because of their low cost and wide availability, chlorine solutions prepared from liquid or powdered bleach are recommended.
- Organic matter destroys chlorine, and freshly diluted solutions must therefore be prepared whenever the solution looks as though it needs to be changed (such as when it becomes cloudy or heavily contaminated with blood or other body fluids).
- Chlorine solutions gradually lose strength, and freshly diluted solutions must therefore be prepared daily.
- Calculate the ratio of water to liquid bleach, bleach powder, or chlorine-releasing tablets (see the calculations below)
- Clear water should be used to make the solution because organic matter destroys chlorine.
- Use plastic containers for mixing and storing bleach solutions as metal containers are corroded rapidly and also affect the bleach.
- Prepare bleach solutions in a well ventilated area because they give off chlorine.
- Label the container with "___ (0.1 or 0.5) percent chlorine decontamination solution," and note the day and time prepared.

- 0.5% bleach solution is caustic. Avoid direct contact with skin and eyes.

Calculating the water to liquid household bleach ratio to make a 0.5% chlorine solution

Chlorine content in liquid bleach is available in different concentrations. You can use any concentration to make a 0.5 percent chlorine solution by using the following formula:

$[\% \text{ chlorine in liquid bleach divided by } 0.5\%] \text{ minus } 1 = \text{parts of water for each part bleach}$

Note: "Parts" can be used for any unit of measure (e.g., ounce, liter, or gallon) and do not have to represent a defined unit of measure (e.g., pitcher or container).

For example: To make a 0.5 percent chlorine solution from a 3.5 percent chlorine concentrate, use one part chlorine and 6 parts water:



$[3.5\% \text{ divided by } 0.5\%] \text{ minus } 1 = [7] \text{ minus } 1 = 6 \text{ parts water for each part chlorine}$

Calculating the water to bleach powder ratio to make a 0.5% chlorine solution

When using bleach powder to make a decontamination solution, calculate the ratio of bleach to water using the following formula:

$[\% \text{ chlorine desired divided by } \% \text{ chlorine in bleach powder}] \text{ times } 1,000 = \text{grams of powder for each liter of water.}$

Note: When bleach powder is used, the chlorine solution will likely appear cloudy or milky.

For example: To make a 0.5 percent chlorine solution from calcium hypochlorite powder containing 35 percent available chlorine, use the following formula:

$[0.5\% \text{ divided by } 35\%] \text{ times } 1,000 = [0.0143] \text{ times } 1,000 = 14.3$

Therefore, dissolve 14.3 grams of calcium hypochlorite powder in one liter of water in order to get a 0.5 percent chlorine solution.

Calculating the water to chlorine-releasing tablet ratio to make a 0.5% chlorine solution

Follow the manufacturer's instructions when using chlorine-releasing tablets because the percentage of active chlorine in these products varies. If instructions are not available with the tablets, ask for the product instruction sheet or contact the manufacturer. Table 7 provides details on how to mix a decontamination solution with chlorine.

**Table 7. Mixing a 0.5 percent chlorine decontamination solution²⁹**

Liquid bleach (sodium hypochlorite solution)		
Type or brand (by country)	% or grams active chlorine	Water to chlorine = 0.5% solution
8° Chlorum*	2.4%	10 ml bleach in 40 ml water. 1 part bleach to 4 parts water.
JIK (Kenya, Zambia), Robin Bleach (Nepal)	3.5%	10 ml bleach in 60 ml water.
12° Chlorum	3.6%	1 part bleach to 6 parts water.
Household Bleach (Indonesia, USA), ACE (Turkey), Eau de Javel (France)	5%	10 ml bleach in 90 ml water. 1 part bleach to 9 parts water.
15° Chlorum, Lejia (Peru), Blanquedor, Cloro (Mexico)	6%	10 ml bleach in 110 ml water. 1 part bleach to 11 parts water.
Lavandina (Bolivia)	8%	10 ml bleach in 150 ml water. 1 part bleach to 15 parts water.
Chloros (United Kingdom)	10%	10 ml bleach in 190 ml water. 1 part bleach to 19 parts water.
Chloros (United Kingdom), Extrait de Javel (France), 48° Chlorum	15%	10 ml bleach in 290 water. 1 part bleach to 29 parts water.
Dry powders		
Type or brand (by country)	% or grams active chlorine	Water to chlorine = 0.5% solution
Calcium hypochlorite	70%	7.1 grams per liter.
Calcium hypochlorite	35%	14.2 grams per liter.
Sodium dichloroisocyanurate (NaDCC)	60%	8.3 grams per liter.
Tablets		
Type or brand (by country)	% or grams active chlorine	Water to chlorine = 0.5% solution
Chloramine tablets*	1 gram chlorine per tablet.	20 grams per liter (20 tablets per liter).
Sodium dichloroisocyanurate (NaDCC-based tablets)	1.5 grams chlorine per tablet.	4 tablets per liter.

*Chloramine releases chlorine slower than hypochlorite. Before using solution, be sure the tablet is completely dissolved.



Additional Topic 2: Birth preparedness and complication readiness

When delays occur in recognizing problems and referring women to appropriate health care facilities, the result can lead to maternal and newborn deaths. One solution to combat these problems is to work with the pregnant woman and her family to develop two plans: a birth-preparedness plan and a complication-readiness plan.³⁶

Birth-preparedness plan

Having a birth plan can reduce delayed decision-making and increase the probability of timely care. A birth-preparedness plan is an action plan made by the woman, her family members, and the health care provider. Often this plan is not a written document, but instead is an ongoing discussion between all concerned parties to ensure that the woman receives the best care in a timely manner. Each family should have the opportunity to make a plan for the birth. Health care providers can help the woman and her family to develop birth-preparedness plans and discuss birth-related issues. Work with the woman to:

Make plans for the birth:

- Discuss the idea of a birth plan and what to include during the first visit.
- Inquire about the birth-preparedness plan during the third or fourth antenatal visits.
- Ask if arrangements are made for a skilled birth attendant and the birth setting during the antenatal visit in the eighth month.
- If planning a home delivery with a skilled birth attendant, discuss access to a safe delivery kit consisting of 1) a piece of soap for cleaning the birth attendant's hands and the woman's perineum, 2) a plastic sheet about one square meter for use as a clean delivery surface, 3) clean string for tying the umbilical cord (usually two pieces), and 4) a clean razor blade for cutting the cord.

Make birth-related decisions:

- Where to give birth.
- Who will be the skilled birth attendant.
- How to contact the provider.
- How to get to the place of birth.
- Who will be the birth companion.
- Who will take care of the family while the woman is absent.
- How much money is needed and how to access these funds.

Prepare for the birth:

- Discuss items needed for the birth (perineal pads/cloths, soap, clean bed sheets, etc.) on the third antenatal visit.
- Confirm necessary items are gathered near the due date.

Note: In some cultures, superstition surrounds buying items for an unborn baby. If this is not the case, families can prepare

for the birth by buying baby supplies such as blankets, diapers, and clothes.

Save money:

- Discuss why and how to save money in preparation for the birth during the first visit.
- Discuss how to plan to make sure that any funds needed are available at birth.
- Check that the woman and her family have begun saving money or that they have ways to access necessary funds.

Note: Encourage the family to save money so necessary funds are available for routine care during pregnancy and birth. Assess financial needs with the women as well as sources for accessing these funds so they are available before labor.

Complication-readiness plan

The complication-readiness plan is an action plan that outlines steps that can be discussed and determined prior to an emergency. Developing this plan helps the family to be prepared for and respond quickly when the woman or newborn has a complication and needs medical care. It is important that a complication-readiness plan is prepared with the woman and her chosen family members. Unless others are involved, the woman may have difficulties putting the plan into action should complications occur for her or her baby.

Recognize danger signs

Women, family members, and community caregivers must know the signs of life-threatening complications. Many hours can be lost from the time a complication is recognized until the time arrangements are made for the woman to reach help. For PPH, the time from the start of bleeding to death can be as little as two hours. In too many cases, families of women who died in pregnancy, birth, or postpartum, did not recognize the problem in time. It is critical to reduce the time needed to recognize problems and make arrangements to receive care at the most appropriate level of care. Women, family members, and community caregivers must know the signs of life-threatening complications.

Maternal danger signs include:

- Vaginal bleeding (any vaginal bleeding during pregnancy; heavy vaginal bleeding or a sudden increase in vaginal bleeding during the postpartum period).
- Breathing difficulties.
- Fever.
- Severe abdominal pain.
- Severe headache/blurred vision.
- Convulsions or loss of consciousness.
- Foul-smelling discharge from vagina, tears, and incisions.
- Calf pain with or without swelling.
- Night blindness.
- Verbalization or behavior indicating she may hurt the baby or herself.
- Hallucinations.



Newborn danger signs include:

- Breathing problems.
- Feeding difficulties or not sucking.
- Feels cold or has fever.
- Redness, swelling, or pus from eyes or around the cord or umbilicus.
- Convulsions or fits.
- Jaundice (yellow skin).

Save money

Similar to the birth preparedness plan, the family should be encouraged to save money so necessary funds are available for emergencies. In many situations, women either do not seek or receive care because they lack funding to pay for services.

Choose a decision-maker in case of emergency

In many families, one person is the primary decision-maker. Too often, other members of the family do not feel they can make decisions if that person is absent. This can result in death when an emergency occurs and the primary decision-maker is absent. It is important to discuss how the family can make emergency decisions without disrupting or offending cultural and family values. If possible, find out which family member can make a decision in the absence of the chief decision-maker.

Have an emergency transportation plan

Too many women and newborns die because they suffer serious complications and do not have access to transportation to the type of health care facility that can provide needed care. Each family should develop a transportation plan during the woman's early pregnancy in case the woman experiences complications and urgently needs a higher level of care. This plan should be prepared during pregnancy and after giving birth, either before discharge from the health facility or immediately after returning home. The plan should address the following:

- Where to go if complications arise.
- How to get to the next level of care in case of an emergency.
- Who in the family will accompany the woman.

Have an emergency blood donation plan

Many health care facilities lack an inadequate, safe blood supply for transfusions. After birth, women are more likely to need blood transfusions because the complications they experience from birth lead to blood loss. For these reasons, it is extremely important that the woman and her family determine blood donors that can be available if needed.



Additional Topic 3: Managing complications during the third stage of labor

Research shows that AMTSL does not increase the risk for obstetrical complications; however, problems may happen regardless of how the third stage is managed. The WHO publication “Managing Complications in Pregnancy and Childbirth: A Guide for Midwives and Doctors” provides the following guidelines for immediate management of complications during the third stage of labor.³⁷ Follow local guidelines for managing any complications and referring a woman for further treatment during or after the third stage of labor. For detailed information on clinical management, consult technical resources (www.pphprevention.org) or a supervisor.

General management for an obstetric emergency

Emergencies can happen suddenly, as with a convulsion, or they can develop as a result of a complication that is not properly managed or monitored.

Preventing emergencies

Most emergencies can be prevented by:

- careful planning;
- following clinical guidelines;
- close monitoring of the woman.

Responding to an emergency

Responding to an emergency promptly and effectively requires that members of the clinical team know their roles and how the team should function to respond most effectively to emergencies. Team members should also know:

- clinical situations and their diagnoses and treatments;
- drugs and their use, administration and side effects;
- emergency equipment and how it functions.

Note: The ability of a facility to deal with emergencies should be assessed and reinforced by frequent practice emergency drills.

Initial management

In managing an emergency:

- Stay calm. Think logically and focus on the needs of the woman.
- Do not leave the woman unattended.
- Take charge. Avoid confusion by having one person in charge.
- **SHOUT FOR HELP.** Have one person go for help and have another person gather emergency equipment and supplies (e.g. oxygen cylinder, emergency kit).
- If the woman is **unconscious**, assess the airway, breathing and circulation.

- If **shock is suspected**, immediately begin treatment. Even if signs of shock are not present, keep shock in mind as you evaluate the woman further because her status may worsen rapidly. If **shock develops**, it is important to begin treatment immediately.
- Position the woman lying down on her left side with her feet elevated. Loosen tight clothing.
- Talk to the woman and help her to stay calm. Ask what happened and what symptoms she is experiencing.
- Perform a quick examination including vital signs (blood pressure, pulse, respiration, temperature) and skin color.
- Estimate the amount of blood lost and assess symptoms and signs.

General management for shock

Signs and symptoms usually seen in shock:

- Fast, weak pulse (110 per minute or more).
- Low blood pressure (systolic less than 90 mm Hg).

Other signs and symptoms of shock include:

- Pallor (especially of inner eyelid, palms, or around the mouth).
- Sweaty or cold, clammy skin.
- Rapid breathing (rate of 30 breaths per minute or more).
- Anxiousness, confusion, or unconsciousness.
- Low urine output (less than 30 mL per hour).

Immediate management of shock

- **Shout for help.** Urgently mobilize all available personnel.
- Evaluate vital signs (pulse, blood pressure, respiration, temperature).
- Turn the woman onto her side to reduce the risk of aspiration from vomiting and to ensure an open airway.
- Keep the woman warm; however, avoid overheating which increases peripheral circulation and reduces blood supply to the vital organs.
- Elevate the legs to increase return of blood to the heart (if possible, raise the foot end of the bed).

Specific management

- Start an IV infusion (or two if possible) using a large-bore cannula or needle (16 gauge or largest available).
Collect blood to test hemoglobin; do an immediate cross-match and bedside clotting (see below) before infusion of fluids:
 - Rapidly infuse IV fluids (normal saline or Ringer’s lactate) initially at the rate of 1 L in 15 to 20 minutes.

Note: Avoid using plasma substitutes (e.g., dextran) because there is no evidence that plasma substitutes are superior to



normal saline in resuscitating a shocked woman. Also, dextran can be harmful in large doses.

- Give at least 2 L of these fluids in the first hour. (This amount is in addition to fluids given for lost blood.)

Note: Do not give fluids by mouth to a woman in shock. A quicker rate of infusion is needed in the management of shock from bleeding. Aim to replace 2 to 3 times the estimated fluid loss.

- When finding a **peripheral vein is not possible**, do a venous cut-down.
- Continue to monitor vital signs and blood loss (every 15 minutes).
- Catheterize the bladder and monitor fluid intake and urine output.
- If available, give oxygen at 6 to 8 L per minute by mask or nasal cannula.

Bedside clotting test

Assess blood clotting status using this **bedside clotting test**:

1. Take 2 mL of venous blood into a small, dry, clean, plain glass test-tube (approximately 10 mm x 75 mm).
2. Hold the tube in your closed fist to keep it warm (+37°C).
3. After four minutes, tip the tube slowly to see if a clot is forming. Then tip it again every minute until the blood clots and the tube can be turned upside down.
4. If a clot does not form after seven minutes or a soft clot forms that breaks down easily, the woman may have a blood clotting disorder.

Decide and manage the cause of shock

After the woman is stabilized, determine the cause of shock and manage the condition accordingly.

General management for vaginal bleeding after childbirth

Excessive vaginal bleeding is life-threatening and requires immediate action. Follow these steps to manage excessive bleeding:

Note: The steps listed here are only a summary and do not include extensive details about PPH management. Refer to local protocols or a technical reference for detailed management.

- **Shout for help.** Urgently mobilize all available personnel.
- Conduct a rapid evaluation of the woman's general condition including vital signs (pulse, blood pressure, respiration, temperature).
- If **shock is suspected**, immediately begin treatment. If signs of shock are not present, continue evaluating the woman because her status can change or worsen rapidly.

- Massage the uterus to expel blood and blood clots. Blood clots trapped in the uterus will prevent effective uterine contractions.
- Give oxytocin 10 IU IM.
- Start an IV infusion.
Just before infusion of fluids, collect blood to test hemoglobin, and do an immediate cross-match and bedside clotting (see below).
If blood is available for transfusion, prepare blood (type and cross) before beginning infusion.
- Have the woman empty her bladder or ensure that the bladder is empty (catheterize the bladder only if necessary).
- Check to see if the placenta is expelled, and examine it for completeness.
- Examine the vagina and perineum for tears (examination of the cervix is only warranted if the uterus is firm, the placenta and membranes are complete, no perineal or vaginal lacerations are present, but the woman continues to bleed).
- Provide specific treatment for the cause of PPH (see Table 8).

Table 8. Diagnosis of vaginal bleeding after childbirth

Presenting Symptom and Other Symptoms and Signs Typically Present	Symptoms and Signs Sometimes Present	Probable Diagnosis
<ul style="list-style-type: none"> • Immediate PPH^a • Uterus soft and not contracted 	<ul style="list-style-type: none"> • Shock 	Atonic uterus
<ul style="list-style-type: none"> • Immediate PPH^a 	<ul style="list-style-type: none"> • Complete placenta • Uterus contracted 	Tears of cervix, vagina or perineum
<ul style="list-style-type: none"> • Placenta not delivered within 30 minutes after delivery 	<ul style="list-style-type: none"> • Immediate PPH^a • Uterus contracted 	Retained placenta
<ul style="list-style-type: none"> • Portion of maternal surface of placenta missing or torn membranes with vessels 	<ul style="list-style-type: none"> • Immediate PPH^a • Uterus contracted 	Retained placental fragments
<ul style="list-style-type: none"> • Uterine fundus not felt on abdominal palpation • Slight or intense pain 	<ul style="list-style-type: none"> • Inverted uterus apparent at vulva • Immediate PPH^b 	Inverted uterus

^a Bleeding may be light if a clot blocks the cervix or if the woman is lying on her back.

^b There may be no bleeding with complete inversion.

- Twenty-four hours after bleeding stops, check hemoglobin or hematocrit levels to evaluate the woman for anemia.
 - If hemoglobin is below 7 g/dL or hematocrit is below 20 percent (severe anemia), give ferrous sulfate or ferrous fumarate 120 mg by mouth plus folic acid 400 mcg by mouth once daily for three months.
 - If hemoglobin is between 7 to 11 g/dL, give ferrous sulfate or ferrous fumarate 60 mg by mouth plus folic acid 400 mcg by mouth once daily for six months.



Management of uterine atony

An atonic uterus fails to contract after delivery.

Signs and symptoms usually seen in cases of uterine atony:

- Immediate PPH.
- Bleeding may be light if a clot blocks the cervix or if the woman is lying on her back.
- Uterus is soft and does not contract.

Signs and symptoms sometimes present:

- Shock.

Immediate management of atonic uterus

If the woman is bleeding and her uterus is soft/not contracted:

- Continue to massage the uterus.
- Have the woman empty her bladder or ensure that the bladder is empty (catheterize the bladder only if necessary).
- Administer uterotonic drugs, given together or sequentially (Table 9).
- Anticipate the need for blood as soon as possible, and transfuse as necessary.

Table 9. Uterotonic drugs for PPH management

	Oxytocin	Ergometrine	Misoprostol
Dose and route	IV: Infuse 20 units in 1 L IV fluids at 60 drops per minute. IM: 10 IU.	IM: give 0.2 mg.	1,000 mcg rectally.
Continuing dose	IV: Infuse 20 units in 1 L IV fluids at 40 drops per minute.	Repeat 0.2 mg IM after 15 minutes. If required, give 0.2 mg IM every 4 hours.	Unknown.
Maximum dose	Not more than 3 L of IV fluids containing oxytocin.	5 doses (total 1.0 mg).	Oral dose should not exceed 600 mcg because of side effects of increased temperature and chills.
Precautions and comments	After 2–3 doses with no result, use alternate treatment.	Contraindicated in cases of pre-eclampsia, hypertension, heart disease.	Contraindicated in cases of asthma.

If bleeding continues:

- Check placenta again for completeness.
- If there are **signs of retained placental fragments** (absence of a portion of maternal surface or torn membranes with vessels), remove remaining placental tissue.
- Assess clotting status using a bedside clotting test. If a clot does not form after seven minutes or a soft clot forms that breaks down easily, the woman may have a blood clotting disorder.

If **bleeding continues in spite of management**, perform bimanual compression of the uterus (Figure 25):

1. Wearing sterile or HLD gloves, insert a hand into the vagina and form a fist.
11. Place the fist into the anterior fornix and apply pressure against the anterior wall of the uterus.
12. With the other hand, press deeply into the abdomen behind the uterus, applying pressure against the posterior wall of the uterus.
13. Maintain compression until bleeding is controlled and the uterus contracts.

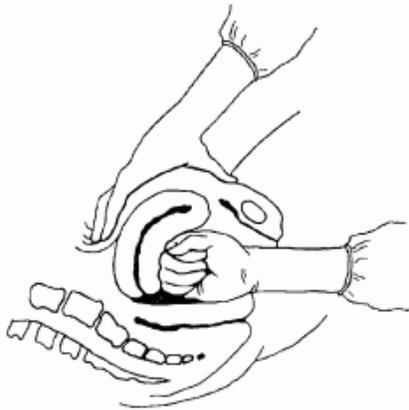


Figure 25. Bimanual compression of the uterus³⁴

Alternatively, compress the aorta and prepare for potential surgical management (Figure 26):

1. 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):
 - Aortic pulsations are felt easily through the anterior abdominal wall in the immediate postpartum period.
2. With the other hand, feel the femoral pulse to check the adequacy of compression:
 - If the femoral pulse is felt during compression, the pressure exerted by the fist is inadequate.
 - If the femoral pulse is not felt, the pressure exerted is adequate.
3. Maintain compression until bleeding is controlled.



Figure 26. Compression of abdominal aorta and feeling the femoral pulse³⁴

Note: Packing the uterus is ineffective and wastes precious time.

When **bleeding continues in spite of compression**, the woman may require surgical intervention.

Management of tears in the birth canal

Tears of the birth canal are the second most common cause of PPH. Tears may be present at the same time as uterine atony.

Signs and symptoms usually seen with genital tears:

- Immediate PPH (bleeding may be light if a clot blocks the cervix or if the woman is lying on her back).
- Complete placenta.
- Uterus contracted.

Signs and symptoms sometimes seen:

- Shock.

Postpartum bleeding with a contracted uterus is usually due to a cervical or vaginal tear.

- Examine the woman carefully and repair tears to the vagina and perineum.
- If vaginal and perineal tears are absent or repaired and bleeding continues, examine the placenta again for completeness.
- If the placenta is complete, inspect the cervix.
 - Ask your assistant to press firmly down on the uterus. This moves the cervix lower in the vagina for careful examination. Good lighting may help facilitate the exam.

- Look carefully at all sides of the cervix for oozing or spurts of blood. Lacerations occur most frequently on the sides (9 and 3 o'clock positions) of the cervix (Figure 26).
- If you are unable to see the entire cervix due to bleeding, use two sponge forceps to “walk” around the cervix to inspect it completely. Put the first forceps at the 12 o'clock position and the second forceps at 2 o'clock position on the cervix. Hold the handles from both forceps in one hand.

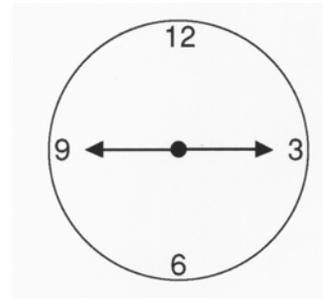


Figure 27. Common positions for cervical tears

- To see the laceration better, pull the forceps handles toward you. Look for tears. Release the first forceps and place it on the cervix at 4 o'clock. Pull the forceps handles toward you and look for tears. Follow counter-clockwise in this manner until the entire cervix has been inspected.

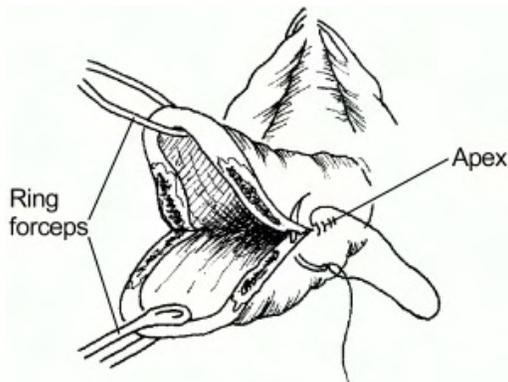


Figure 28. Repairing a cervical tear³⁴

- Repair lacerations by placing interrupted or continuous sutures the length of the tear, spaced about 1 cm apart using 0-chromic or polyglycolic sutures (Figure 27).

- If **bleeding continues**, assess clotting status using a bedside clotting test. If a clot does not form after seven minutes or a soft clot forms that breaks down easily, the woman may have a blood clotting disorder.



Management of retained placenta

A retained placenta means that all or part of the placenta or membranes are left behind in the uterus during the third stage of labor. Normally after the placenta is delivered, the empty uterus contracts down to close off all the blood vessels inside the uterus. If the placenta only partially separates, the uterus cannot contract properly, so the blood vessels inside will continue to bleed.

Signs and symptoms usually present with a retained placenta:

- Placenta not delivered within 30 minutes of delivery.

Signs and symptoms sometimes seen:

- Immediate PPH (Bleeding may be light if a clot blocks the cervix or if the woman is lying on her back).
- Shock.

Note: There may be no bleeding with a retained placenta.

- If you can see the placenta, ask the woman to squat and push.
- If you can feel the placenta in the vagina, remove it.
- Sometimes a full bladder will hinder delivery of the placenta. Help the woman empty her bladder to ensure that the bladder is empty (catheterize the bladder only if necessary).
- If the placenta is not expelled, give oxytocin 10 IU IM (if not already administered for AMTSL).

Note: Do not give ergometrine for a retained placenta because it causes tonic uterine contraction, which may delay expulsion.

- If the **placenta is undelivered after 30 minutes of oxytocin stimulation and the uterus is contracted**, attempt CCT with countertraction to the uterus.

Note: Avoid forceful cord traction and fundal pressure because these interventions may cause uterine inversion.

- If **CCT is unsuccessful** and the attendant is adequately trained to perform manual removal, attempt manual removal of the placenta and administer a single dose of prophylactic antibiotics: ampicillin 2 g IV PLUS metronidazole 500 mg IV or cefazolin 1 g IV PLUS metronidazole 500 mg IV.

Caution: Very adherent tissue may be placenta accreta. Efforts to extract a placenta that does not separate easily may result in heavy bleeding or uterine perforation which usually requires a hysterectomy.

- If **bleeding continues**, assess clotting status using a bedside clotting test. If a clot does not form after seven minutes or a soft clot forms that breaks down easily, the woman may have a blood clotting disorder.
- If **there are signs of infection** (fever, foul-smelling vaginal discharge), administer antibiotics as for metritis.

Note: In low-resource settings, do not attempt manual removal of the placenta unless the woman is bleeding. If she is not bleeding, refer her to a higher level of care.

Management of retained placental fragments

If a portion of the placenta—one or more lobes—is retained, it prevents the uterus from contracting effectively and can cause PPH. **If small fragments of placenta or membrane are retained and are not detected immediately, this may cause heavy bleeding and infection later on.**

Signs and symptoms usually present with retained placental fragments:

- A portion of maternal surface of placenta is missing or torn.

Signs and symptoms sometimes present:

- Immediate PPH (bleeding may be light if a clot blocks the cervix or if the woman is lying on her back).

Note: There may be no bleeding with retained placental fragments.

- Wearing sterile or HLD gloves, perform manual exploration of the uterus for placental fragments. Manual exploration of the uterus is similar to the technique described for removal of the retained placenta. Give prophylactic antibiotics according to local protocols.

Caution: Only providers trained to perform manual exploration of the uterus should attempt to do so.

- Remove placental fragments by hand, or with ovum forceps or large curette.

Caution: Very adherent tissue may be placenta accreta. Efforts to extract fragments that do not separate easily may result in heavy bleeding or uterine perforation which usually requires a hysterectomy.

- If **bleeding continues**, assess clotting status using a bedside clotting test. If a clot does not form after seven minutes or a soft clot forms that breaks down easily, the woman may have a blood clotting disorder.



Management of uterine inversion

The uterus is inverted if it turns inside out during delivery of the placenta. This is very rare during a normal third stage of labor, whether managed actively or physiologically.

Signs and symptoms usually seen with an inverted uterus:

- Uterine fundus not felt on abdominal palpation.
- Slight or intense pain.

Signs and symptoms sometimes present:

- Inverted uterus apparent at vulva.
- Immediate PPH (there may be no bleeding with complete inversion).

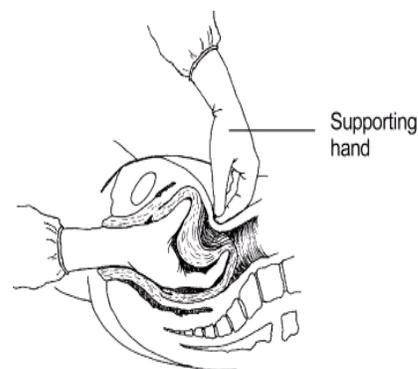
- Reposition the uterus immediately. As time passes, the uterus becomes more engorged with blood and is more difficult to put back into place.
- If the **woman is in severe pain**, give pethidine 1 mg/kg body weight (but not more than 100 mg) IM or IV slowly or give morphine 0.1 mg/kg body weight IM.

Caution: Do not give uterotonic drugs until the inversion is corrected.

- Support the uterus with your non-dominant hand and reposition the uterus with your dominant hand (Figure 29).

Note: If the placenta has not separated from the uterine wall when inversion occurs, do not attempt removal of the placenta until the inversion is corrected.

Figure 29. Manual reduction of an inverted uterus³⁴



- If **bleeding continues**, assess clotting status using a bedside clotting test. If a clot does not form after seven minutes or a soft clot forms that breaks down easily, the woman may have a blood clotting disorder.
- Administer a single dose of prophylactic antibiotics after correcting the inverted uterus: ampicillin 2 g IV plus metronidazole 500 mg IV, **or** cefazolin 1 g IV plus metronidazole 500 mg IV.

- If there are signs of infection (fever, foul-smelling vaginal discharge), give antibiotics as for metritis.

Management if the cord tears off during CCT

In many studies and experience with thousands of women, cord tears were not reported as a significant problem during AMTSL. In the rare event this happens:

- Have the woman empty her bladder to ensure that the bladder is empty (catheterize the bladder only if necessary).
- If the placenta has separated, ask the woman to squat and push with a contraction.
- If the placenta has not separated, the woman is not bleeding, and the provider has appropriate training, consider performing manual removal of the placenta. Otherwise, refer the woman to a higher level of care.



Appendix A: FIGO/ICM joint statements



2003

Joint Statement

Management of the Third Stage of Labour to Prevent Post-partum Haemorrhage



International Confederation of Midwives (ICM)
International Federation of Gynaecologists and Obstetricians (FIGO)

ICM and FIGO are key partners in global Safe Motherhood efforts to reduce maternal death and disability in the world. Their mission statements share a common commitment in promoting the health, human rights and well-being of all women, most especially those at greatest risk for death and disability associated with childbearing. FIGO and ICM promote evidence-based, effective interventions that, when used properly with informed consent, can reduce the incidence of maternal mortality and morbidity in the world.

Severe bleeding is the single most important cause of maternal death worldwide. More than half of all maternal deaths occur within 24 hours of delivery, mostly from excessive bleeding. Every pregnant woman may face life-threatening blood loss at the time of delivery; women with anaemia are particularly vulnerable since they may not tolerate even moderate amounts of blood loss. Every woman needs to be closely observed and, if needed, stabilized during the immediate post-partum period.

Upon review of the available evidence, FIGO and ICM agree that active management of the third stage of labour is proven to reduce the incidence of post-partum haemorrhage, the quantity of blood loss, and the use of blood transfusion.

Active management of the third stage of labour should be offered to women since it reduces the incidence of post-partum haemorrhage due to uterine atony.

Active management of the third stage of labour consists of interventions designed to facilitate the delivery of the placenta by increasing uterine contractions and to prevent PPH by averting uterine atony. The usual components include:

- Administration of uterotonic agents
- Controlled cord traction
- Uterine massage after delivery of the placenta, as appropriate.

Every attendant at birth needs to have the knowledge, skills and critical judgment needed to carry out active management of the third stage of labour and access to needed supplies and equipment.

In this regard, national professional associations have an important and collaborative role to play in:

- Advocacy for skilled care at birth;
- Dissemination of this statement to all members of the organisation and facilitation of its implementation;
- Public education about the need for adequate prevention and treatment of post-partum

haemorrhage;

- Publication of the statement in national midwifery, obstetric and medical journals, newsletters and websites;
- Address legislative and other barriers that impede the prevention and treatment of post-partum haemorrhage;
- Incorporation of active management of the third stage of labour in national standards and clinical guidelines, as appropriate;
- Incorporation of active management of the third stage into pre-service and in-service curricula for all skilled birth attendants;
- Working with national pharmaceutical regulatory agencies, policymakers and donors to assure that adequate supplies of uterotonics and injection equipment are available.

MANAGEMENT OF THE THIRD STAGE OF LABOUR TO PREVENT POST-PARTUM HAEMORRHAGE

HOW TO USE UTEROTONIC AGENTS

- Within one minute of the delivery of the baby, palpate the abdomen to rule out the presence of an additional baby(s) and give oxytocin 10 units IM. Oxytocin is preferred over other uterotonic drugs because it is effective 2-3 minutes after injection, has minimal side effects and can be used in all women.
- If oxytocin is not available, other uterotonics can be used such as: ergometrine 0.2 mg IM, syntometrine (1 ampoule) IM or misoprostol 400-600 mcg orally. Oral administration of misoprostol should be reserved for situations when safe administration and/or appropriate storage conditions for injectable oxytocin and ergot alkaloids are not possible.
- Uterotonics require proper storage:
 - Ergometrine: 2-8° C and protect from light and from freezing.
 - Misoprostol: room temperature, in a closed container.
 - Oxytocin: 15-30° C, protect from freezing
- Counselling on the side effects of these drugs should be given.

Warning! Do not give ergometrine or syntometrine (because it contains ergometrine) to women with pre-eclampsia, eclampsia or high blood pressure.

HOW TO DO CONTROLLED CORD TRACTION

- Clamp the cord close to the perineum (once pulsation stops in a healthy newborn) and hold in one hand.
- Place the other hand just above the woman's pubic bone and stabilize the uterus by applying counter-pressure during controlled cord traction.
- Keep slight tension on the cord and await a strong uterine contraction (2-3 minutes).
- With the strong uterine contraction, encourage the mother to push and very gently pull downward on the cord to deliver the placenta. Continue to apply counter-pressure to the uterus.
- If the placenta does not descend during 30-40 seconds of controlled cord traction do not continue to pull on the cord:
 - Gently hold the cord and wait until the uterus is well contracted again;
 - With the next contraction, repeat controlled cord traction with counter-pressure.



Never apply cord traction (pull) without applying counter traction (push) above the pubic bone on a well-contracted uterus.

- As the placenta delivers, hold the placenta in two hands and gently turn it until the membranes are twisted. Slowly pull to complete the delivery.
- If the membranes tear, gently examine the upper vagina and cervix wearing sterile/disinfected gloves and use a sponge forceps to remove any pieces of membrane that are present.
- Look carefully at the placenta to be sure none of it is missing. If a portion of the maternal surface is missing or there are torn membranes with vessels, suspect retained placenta fragments and take appropriate action (ref Managing Complications in Pregnancy and Childbirth).

HOW TO DO UTERINE MASSAGE

- Immediately massage the fundus of the uterus until the uterus is contracted.
- Palpate for a contracted uterus every 15 minutes and repeat uterine massage as needed during the first 2 hours.
- Ensure that the uterus does not become relaxed (soft) after you stop uterine massage.

In all of the above actions, explain the procedures and actions to the woman and her family. Continue to provide support and reassurance throughout.

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November 2006



**Prevention and Treatment of Post-partum Haemorrhage
New Advances for Low Resource Settings
Joint Statement
International Confederation of Midwives (ICM)
*International Federation of Gynaecology and Obstetrics (FIGO)***

The International Confederation of Midwives (ICM) and the International Federation of Gynaecology and Obstetrics (FIGO) are key partners in the global effort to reduce maternal death and disability around the world. Their mission statements share a common commitment in promoting the health, human rights and well-being of all women, most especially those at greatest risk for death and disability associated with childbearing. FIGO and ICM promote evidence-based interventions that, when used properly with informed consent, can reduce the incidence of maternal morbidity and mortality.

This statement reflects the current (2006) state-of-the-art and science of prevention and treatment of post-partum haemorrhage (PPH) in low resource settings. It incorporates new research evidence that has become available since the 2003 publication of the first FIGO/ICM Joint Statement: Management of the Third Stage of Labour to Prevent Post-partum Haemorrhage.¹

Approximately 30 per cent of direct maternal deaths worldwide are due to haemorrhage, mostly in the post-partum period.² Most maternal deaths due to PPH occur in developing countries in settings (both hospital and community) where there are no birth attendants or where birth attendants lack the necessary skills or equipment to prevent and manage PPH and shock. The Millennium Development Goal of reducing the maternal mortality ratio by 75 per cent by 2015³ will remain beyond our reach unless we confront the problem of PPH in the developing world as a priority.

Both ICM and FIGO endorse international recommendations that emphasise the provision of skilled birth attendants and improved obstetric services as central to efforts to reduce maternal and neonatal mortality. Such policies reflect what should be a basic right for every woman. Addressing PPH will require a combination of approaches to expand access to skilled care and, at the same time, extend life-saving interventions along a continuum of care from community to hospital. The different settings where women deliver along this continuum require different approaches to PPH prevention and treatment.

Call to Action

Despite Safe Motherhood activities since 1987, women are still dying in childbirth. Women living in low resource settings are most vulnerable due to concurrent disease, poverty, discrimination and limited access to health care. The ICM and FIGO have a central role to play in improving the capacity of national obstetric societies and midwifery associations to reduce maternal mortality through safe, effective, feasible and sustainable approaches to reducing deaths and disabilities resulting from PPH. In turn, national obstetric and midwifery associations must lead the effort to implement the approaches described in this statement. Professional associations can mobilise to:

- Lobby governments to ensure healthcare for all women;
- Advocate for every woman to have a midwife, doctor or other skilled attendant at birth;
- Disseminate this statement to all members through all available means including publication in national newsletters or professional journals;
- Educate their members, other health care providers, policy makers, and the public about the approaches described in this statement and about the need for skilled care during childbirth;



- Address legislative and regulatory barriers that impede access to life-saving care, especially policy barriers that currently prohibit midwives and other birth attendants from administering uterotonic drugs;
- Ensure that all birth attendants have the necessary training, appropriate to the settings where they work, to safely administer uterotonic drugs and implement other approaches described in this statement and that uterotonics are available in sufficient quantity to meet the need;
- Call upon national regulatory agencies and policy makers to approve misoprostol for PPH prevention and treatment;
- Incorporate the recommendations from this statement into current guidelines, competencies and curricula.

We also call upon funding agencies to help underwrite initiatives aimed at reducing PPH through the use of cost-effective, resource- appropriate interventions.

Prevention of Post-partum Haemorrhage

Pregnant women may face life-threatening blood loss at the time of delivery. Anaemic women are more vulnerable to even moderate amounts of blood loss. Fortunately, most PPH can be prevented. Different approaches may be employed depending on the setting and availability of skilled birth attendants and supplies.

Active Management of the Third Stage of Labour (AMTSL)

Data support the use of active management of the third stage of labour (AMTSL) by all skilled birth attendants regardless of where they practice. AMTSL reduces the incidence of PPH, the quantity of blood loss and the use of blood transfusion⁴, and thus should be included in any programme of interventions aimed at reducing deaths from PPH.

The usual components of AMTSL include:

- Administration of oxytocin* or another uterotonic drug within one minute after the birth of the baby
- Controlled cord traction**
- Uterine massage after delivery of the placenta as appropriate.

(For more detailed information on AMTSL, see the FIGO/ICM Joint Statement: Management of the Third Stage of Labour to Prevent Post- partum Haemorrhage.)

Misoprostol and the Prevention of Post-Partum Haemorrhage

In situations where no oxytocin is available or birth attendants' skills are limited, administering misoprostol soon after the birth of the baby reduces the occurrence of haemorrhage^{7, 8}. The most common side effects are transient shivering and pyrexia. Education of women and birth attendants in the proper use of misoprostol is essential.

The usual components of giving misoprostol include:

- Administration of 600 micrograms (mcg) misoprostol orally or sublingually after the birth of the baby***
- Controlled cord traction ONLY when a skilled attendant is present at the birth
- Uterine massage after the delivery of the placenta as appropriate.

*The preferred storage of oxytocin is refrigeration but it may be stored at temperatures up to 300C up to three months without significant loss of potency.⁵

**Delaying cord clamping by one to three minutes reduces anaemia in the newborn.⁶

***Data from two trials comparing misoprostol with placebo show that misoprostol 600 mcg given orally or sublingually reduces PPH with or without controlled cord traction or use of uterine massage.^{7,8}

Management of the Third Stage of Labour in the Absence of Uterotonic Drugs

In some settings there will be no uterotonics available due to interruptions of supplies or the setting of birth. In the absence of current evidence, ICM and FIGO recommend that when no uterotonic drugs are available to either the skilled or non-skilled birth attendant, management of the third stage of labour includes the following components:

- Waiting for signs of separation of the placenta (cord lengthening, small blood loss, uterus firm and globular on palpation at the umbilicus)
- Encouraging maternal effort to bear down with contractions and, if necessary, to encourage an upright position
- Controlled cord traction is not recommended in the absence of uterotonic drugs, or prior to signs of separation of the placenta, as this can cause partial placental separation, a ruptured cord, excessive bleeding and uterine inversion
- Uterine massage after the delivery of the placenta as appropriate.

Treatment of Post-partum Haemorrhage

Even with major advances in prevention of PPH, some women will still require treatment for excessive bleeding. Timely and appropriate referral and transfer to basic or comprehensive Emergency Obstetric Care (EmOC) facilities for treatment is essential to saving lives of women. Currently, the standard of care in basic EmOC facilities includes administration of IV/IM uterotonic drugs and manual removal of the placenta and retained products of conception; comprehensive emergency obstetrical care facilities would also include blood transfusion and/or surgery.⁹

Community-based Emergency Care – Home-based Life-saving Skills (HBLSS)

Anyone who attends a delivery can be taught simple home-based life-saving skills. Community-based obstetric first aid with home-based life-saving skills (HBLSS) is a family and community-focused programme that aims to increase access to basic life-saving measures and decrease delays in reaching referral facilities. Family and community members are taught techniques such as uterine fundal massage and emergency preparedness. Field tests suggest that HBLSS can be a useful adjunct in a comprehensive PPH prevention and treatment programme.¹⁰ Key to the effectiveness of treatment is the early identification of haemorrhage and prompt initiation of treatment.

Misoprostol in the Treatment of Post-partum Haemorrhage

While there is less information about the effect of misoprostol for treatment of PPH, it may be appropriate for use in low resource settings and has been used alone, in combination with oxytocin, and as a last resort for PPH treatment. In the published literature, a variety of doses and routes of administration have shown promising results.¹¹ In home births without a skilled attendant, misoprostol may be the only technology available to control PPH. An optimal treatment regimen has not yet been determined. One published study on treatment of PPH found that 1000 mcg rectally significantly reduces the need for additional interventions.¹² Studies are ongoing to determine the most effective and safe dose for the treatment of PPH. A rare case of non-fatal hyperpyrexia has been reported after 800 mcg of oral misoprostol.¹³

NOTE: Repeated doses of misoprostol are not recommended.



Innovative techniques

Other promising techniques appropriate for low resource settings for assessment and treatment of PPH include easy and accurate blood loss measurement,^{14, 15} oxytocin in Uniject,¹⁶ uterine tamponade,¹⁷ and the anti-shock garment.¹⁸ These innovations are still under investigation for use in low resource settings but may prove programmatically important, especially for women living far from skilled care.

Research Needs

Important strides have been made in identifying life-saving approaches and interventions appropriate for PPH prevention and treatment in low resource settings. The field is rapidly evolving and the following issues have been identified as priorities for further research in low resource settings:

- Determine the optimal dose and route of misoprostol for prevention and treatment of PPH that will still be highly effective but will minimize the risk of side effects.
- Determine the most effective method of third stage management when no uterotonics are available.
- Assess the impact of better measurement of blood loss (e.g. with a calibrated drape or other means) on birth attendants' delivery practices.
- Assess options for treatment of PPH in lower-level (basic EmOC) facilities, in particular, uterine tamponade and the anti-shock garment.
- Identify the most efficient and effective means of teaching and supporting the skills needed by birth attendants and for community empowerment to address PPH.

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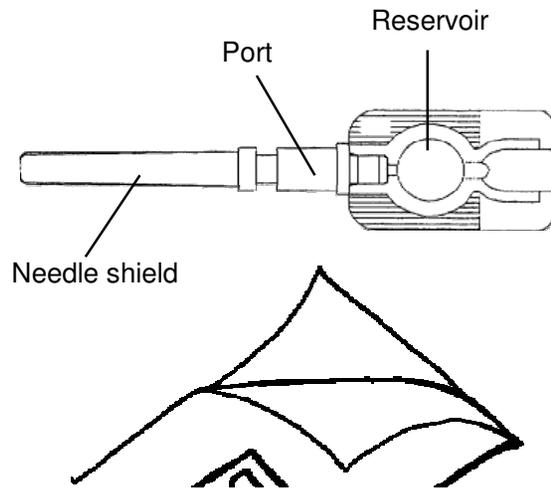
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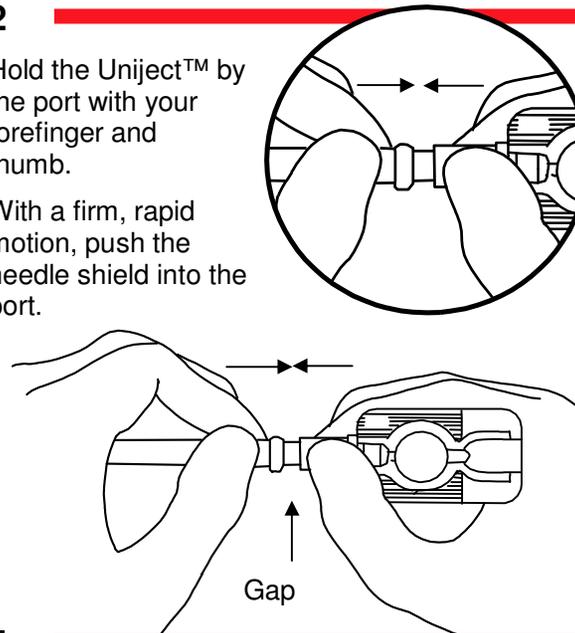
Appendix B: Uniject™ activation and use

1 Open the foil pouch and remove the Uniject™.

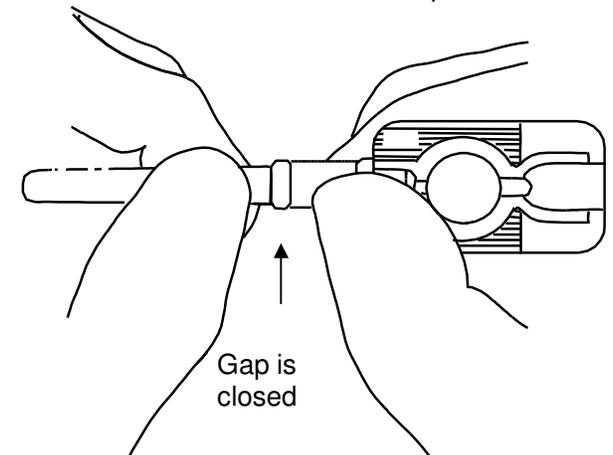


2 Hold the Uniject™ by the port with your forefinger and thumb.

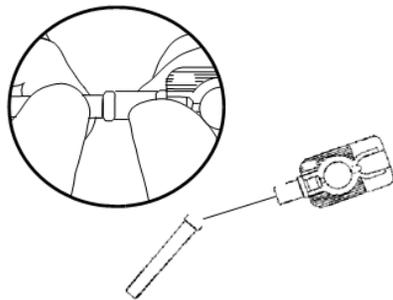
With a firm, rapid motion, push the needle shield into the port.



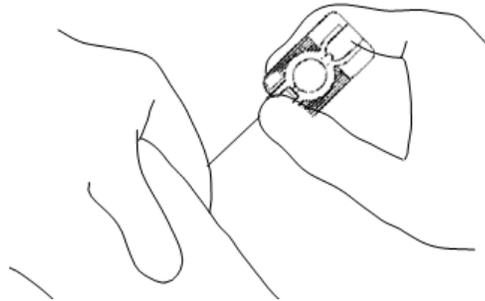
3 As Uniject™ activates, you will feel a “click.” Continue to push firmly until you close the gap between the needle shield and the port.



4 Remove the needle shield.



5 Continue to hold the Uniject™ by the port and inject into the patient.



6 Squeeze the reservoir firmly to inject. After the reservoir completely collapses, remove the Uniject™. Do not reshield used Uniject™. Discard the Uniject™ according to established medical waste disposal procedures.



Appendix C: AMTSL job aid

Active Management of the Third Stage of Labor (AMTSL)

Offer to every woman...



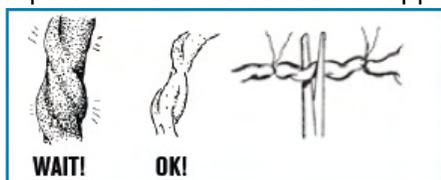
skin contact with the mother

1: Dry the baby, assess the baby's breathing and perform resuscitation if needed, and place the baby in skin-to-skin contact with the mother

2: Administer a uterotonic (the uterotonic of choice is oxytocin 10 IU IM) immediately after birth of the baby, and after ruling out the presence of another baby.



3: Clamp and cut the cord after cord pulsations have ceased or approximately 2-3 minutes after birth of the baby, whichever comes first.

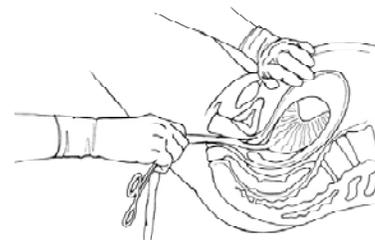


3 minutes after birth of the baby, whichever comes first.

4: Place the infant directly on the mother's chest, prone, with the newborn's skin touching the mother's skin. Cover the baby's head with a cap or cloth.



5: Perform controlled cord traction while, at the same time, supporting the uterus by applying external pressure on the uterus in an upward direction towards the woman's head.



6. Massage the uterus immediately after delivery of the placenta and membranes until it is firm.



During recovery, assist the woman to breastfeed if this is her choice, monitor the newborn and woman closely, palpate the uterus through the abdomen every 15 minutes for two hours to make sure it is firm and monitor the amount of vaginal bleeding. Provide PMTCT care as needed.



...at every birth, by every skilled provider.



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