

Active Management of the Third Stage of Labor: Current Evidence, Instructions for Use and Global Programmatic Activities

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INTRODUCTION AND BACKGROUND

Third stage of labor defined

The third stage of labor has traditionally been defined as the time between the birth of the baby and the delivery of the placenta and membranes. It is the third stage that is the most perilous for the woman because of the risk of postpartum hemorrhage (PPH). The third stage of labor typically lasts between 10 and 30 minutes; if the placenta fails to separate within 30 minutes after childbirth, the third stage is considered to be prolonged¹. If the third stage of labor lasts longer than 18 minutes, it is associated with a significant risk of PPH; and there is a six-fold increase in PPH when the third stage of labor lasts longer than 30 minutes².

Management of the third stage of labor

The third stage of labor may be managed expectantly or actively (see Addendum A for a comparison of expectant and active management of the third stage of labor). In expectant (physiological) management, uterotonic drugs are not given prophylactically, the cord may or may not be clamped early, and the placenta is delivered by maternal effort. In active management, uterotonic drugs are given before delivery of the placenta, the cord is usually cut 2–3 minutes after birth, and the placenta is delivered by controlled cord traction (CCT).

Active management of the third stage labor (AMTSL) was challenged because critics felt that (1) there was not a scientific basis for its routine use and (2) it interfered with physiologic processes to the detriment of both the woman and her baby. Criticism of AMTSL led to the seminal Bristol³ (1988) randomized controlled trial that set out to determine whether, in terms of maternal and fetal morbidity, continuing with routine active rather than physiological management of the third stage of labor was justified. The conclusions of the study team were that AMTSL reduced the incidence of PPH, shortened the third stage of labor and resulted in reduced neonatal packed cell volumes.

In 1998, the Hinchingsbrooke⁴ randomized controlled trial compared the effects of active and expectant management of the third stage of labor on maternal and neonatal morbidity, and attempted to address the following three issues raised about the results of previous randomized controlled trials, including the Bristol trial:

- (1) Since active management was the norm in hospitals involved in the controlled trials on AMTSL vs. expectant management, women assigned expectant management might have been at a disadvantage because midwives were less experienced in this approach;
- (2) Many women who choose expectant management of the third stage are encouraged to expel the placenta by adopting an upright posture, and differences in blood loss between active and expectant management could be due to position rather than other factors;
- (3) Hazards of expectant management in the short term may be outweighed by physical and psychological advantages for the mother in the months after childbirth.

The conclusion of the study team was that AMTSL reduces the risk of PPH, whatever the woman's posture, even when midwives are familiar with both approaches.

These two trials showed that active management prevents up to 60% of PPH and provides several benefits for the woman compared to expectant management. Table 1 provides detailed results from these two important studies comparing active and expectant management of the third stage of labor.

These results indicate:

- (1) That for every 12 patients receiving active rather than physiological management, one case of PPH is prevented;
- (2) For every 67 patients so managed, one woman would avoid transfusion with blood products.

Table 1 Bristol and Hinchingsbrooke study results comparing active and physiologic management of the third stage of labor

Factors	Bristol			Hinchingsbrooke		
	Active	Physiologic	OR and 95% CI	Active	Physiologic	OR and 95% CI
PPH (blood loss = 500 ml?)	5.9%	79.9%	3.13 (2.3–4.2)	6.8%	16.5%	2.42 (1.78–3.3)
Average length of the third stage of labor	5 min	15 min	Not performed	8 min	15 min	Not performed
Third stage of labor longer than 30 min	2.9%	26%	6.42 (4.9–8.41)	3.3%	16.4%	4.9 (3.22–7.43)
Blood transfusion required	2.1%	5.6%	2.56 (1.57–4.19)	0.5%	2.6%	4.9 (1.68–14.25)
Additional uterotonic drugs needed to manage PPH	6.4%	29.7%	4.83 (3.77–6.18)	3.2%	21.1%	6.25 (4.33–9.96)

In addition, these studies also confirm that **AMTSL decreases:**

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

Many researchers have since replicated these findings in a variety of settings in different regions of the world. These studies collectively provide a strong evidence base in support of the use of AMTSL as an evidence-based, cost-effective intervention that provides dramatic results to address the single most important cause of maternal mortality globally – PPH.

DISCUSSION OF COMPONENTS OF ACTIVE MANAGEMENT OF THE THIRD STAGE OF LABOR

AMTSL was defined by the Bristol and Hinchingsbrooke trials as:

- (1) Uterotonic drug was administered with the birth of the anterior shoulder;
- (2) Immediate cord clamping;
- (3) CCT with the first contraction.

More recently, the steps of AMTSL have been integrated into routine care for the woman AND her newborn and have been refined to include the following:

- (1) Administration of a uterotonic drug within 1 minute after the baby's birth and after ruling out the presence of another baby;
- (2) Clamping and cutting the cord after cord pulsations have ceased or approximately 2–3 minutes after birth of the baby, whichever comes first;
- (3) CCT during a contraction with counter traction to support the uterus, including gently turning the placenta as it is delivered to prevent tearing of the membranes;

- (4) Massaging the uterus immediately after delivery of the placenta.

Clinical guidelines for management of the third stage of labor will generally also include careful inspection of the placenta and genitalia to rule out retained placenta/placental fragments and genital lacerations, and careful monitoring of the woman and her newborn for at least the first 6 hours postpartum.

Administration of a uterotonic drug

Administering a uterotonic drug within 1 minute after the baby's birth promotes strong uterine contractions and leads to faster retraction and placental delivery. This decreases the amount of maternal blood loss. More effective uterine activity also leads to a reduction in the incidence of retained placenta. Based on results of efficacy studies, WHO⁵ recommends oxytocin (10 IU by IM injection) as the uterotonic drug of choice for prevention of PPH during the third stage of labor because it is effective 2–3 minutes after injection, has minimal side-effects and can be used in all women. However, if oxytocin is not available:

- Syntometrine[®] (fixed drug combination of 0.5 mg of ergometrine with 5 IU of oxytocin by IM injection) and ergometrine (0.2 mg by IM injection) should be the uterotonic drugs of choice when oxytocin is not available and there are no contraindications to their use
- Misoprostol (400–600 µg by mouth) should be used if the person administering the drug is not authorized or trained to give injections, or if the woman has contraindications to the use of ergometrine or the fixed drug combination of ergometrine and oxytocin.

When choosing a uterotonic drug, the following issues should also be considered:

- Ergometrine (and the fixed drug combination of oxytocin and ergometrine) is contraindicated in women with a history of hypertension, heart disease, pre-eclampsia or eclampsia. The provider must be able to ascertain that these conditions do not exist before administering ergometrine. Therefore, safely to use ergometrine or the fixed drug

combination of oxytocin and ergometrine, the birth attendant must have a functional blood pressure (BP) apparatus and stethoscope, be able to measure BP competently, and be able to ascertain whether there are contraindications to its use before administering it

- Both ergometrine (and the fixed drug combination of ergometrine and oxytocin) and misoprostol have side-effects. Oxytocin has no known side-effects if administered postpartum
 - Major side-effects for ergometrine include nausea, vomiting, headache, elevated blood pressure (diastolic BP >100 mmHg) and tonic-clonic uterine contractions
 - Side-effects for misoprostol include shivering and elevated temperature; in regimens using higher doses, nausea, vomiting and diarrhea occur more frequently
 - If ergometrine or misoprostol is used, then counseling on the side-effects of these drugs should be given
- **Administration costs** of oxytocin in ampoules, ergometrine and the fixed drug combination of oxytocin and ergometrine are likely to be generally equivalent. Administration costs of misoprostol will be less because it does not require a syringe and needle 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 ergometrine⁶. Costs for storage of misoprostol are minimal because it is the most stable of the three uterotonic drugs and can be stored at room temperature, provided that it is protected from humidity
- **Access to injectable** uterotonic drugs is limited to points of care where a skilled birth attendant is trained and authorized to administer injections. Misoprostol is administered orally and does not require refrigeration; therefore it has the potential to increase access in the community level and in births not attended by a skilled birth attendant⁷. Several studies have demonstrated the safety and efficacy of introducing use of misoprostol by health workers⁸, traditional birth attendants⁹, or pregnant women themselves¹⁰ trained in its use.

A theoretical risk of a trapped twin exists if providers administer a uterotonic drug with an undiagnosed twin pregnancy. However, quality clinical assessment in labor and following delivery of the first baby can establish the diagnosis before giving a uterotonic drug.

Cord clamping

Current recommendations for cord clamping are to wait to clamp and cut the cord until 2–3 minutes after the baby's birth¹¹, even if oxytocin is given within 1 minute after birth of the baby.

Immediate cord clamping can decrease the red blood cells an infant receives at birth by more than 50%¹². Studies show that delaying clamping and cutting of the umbilical cord is helpful to both full-term and preterm babies. In full-term babies, there were fewer cases of anemia at 2 months of age and increased duration of early breastfeeding when cord clamping and cutting was delayed¹³. 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 4–6 weeks of life than preterm babies whose cords were clamped and cut immediately after birth.

Giving oxytocin before cord clamping has no known harmful effects. 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. Administering a uterotonic drug immediately after birth also can speed the transfer of blood into the baby from the placenta, thus increasing the infant's red cell mass¹⁰.

Controlled cord traction

CCT assists with rapid delivery of the placenta. 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 remains 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 ('counter pressure' or 'counter traction') helps prevent uterine inversion. CCT should only be performed during a contraction and if counter traction is being applied.

Advocates of CCT argue that when expectant management is used, the placenta may be detached but remain at the level of the internal os. If this occurs, blood trapped behind the placenta in this position can distend the uterus, preventing further retraction and increasing the likelihood of PPH. CCT, however, requires the presence of a birth attendant trained in its use, thus severely limiting access to the life-saving effects of AMTSL. This has led international researchers to study the effects of managing the third stage of labor with a uterotonic drug in the absence of CCT. In 2006, WHO, the International Federation of Gynecology and Obstetrics (FIGO) and the International Confederation of Midwives (ICM) recommended that in the absence of AMTSL (that is active

management without CCT), a uterotonic drug (oxytocin or misoprostol) be offered by a health worker trained in its use for prevention of PPH¹⁴. This was based on two randomized trials that reported the use of oxytocin in the absence of active management¹⁵ and one trial with misoprostol⁸. More recently (2011), WHO conducted a hospital-based, multicenter, individually randomized controlled trial to assess the ‘non-inferiority’ of a ‘simplified package’ for actively managing the third stage of labor (use of uterotonic *without* CCT) compared to the ‘full package’ for actively managing the third stage of labor (use of uterotonic *and* CCT). Based on findings of this study, the investigators made the following two inferences from the trial: ‘1. CCT is safe and in settings where it is routinely practised it can be continued; and 2. the main component of active management is the uterotonic and in settings where it is not possible to employ the full package one can safely focus on the uterotonic component’¹⁶. Study results give strength to earlier WHO, FIGO and ICM recommendations and, by avoiding the need for a manual procedure that requires training, the third stage management can be implemented in a more widespread and cost-effective manner around the world even at the most peripheral levels of the health care system.

Some authors advocate the use of uterine massage and CCT if a uterotonic agent is not available for prophylactic use. No good evidence supports this recommendation. The risks of cord traction when the uterus is not well contracted are substantial, including uterine inversion and ruptured cord.

Uterine massage

Once the placenta is delivered, the uterus may have a tendency to relax slightly which could result in heavy bleeding. Although the prophylactic use of a uterotonic drug helps ensure that the uterus continues to contract and retract, the provider must continue to palpate the abdomen to assess and monitor uterine tone and size, and massage the uterus as needed. Massaging the uterus stimulates uterine contractions and may help expel blood and clots that might prevent contraction. As uterine massage can be uncomfortable; it is important to explain the rationale to the patient. Teaching the woman how to assess and massage her own uterus will prevent finding the woman in a ‘pool’ of her own blood during routine monitoring.

ACTIVE MANAGEMENT OF THE THIRD STAGE OF LABOR WITHOUT CONTROLLED CORD TRACTION

Numerous research trials and studies have shown the clinical efficacy of AMTSL in preventing PPH, but the evidence supported a package of interventions with few data on the contribution of each of the components of AMTSL. Little was known about the contribution of controlled cord traction. In 2007, WHO initiated a randomized non-inferiority controlled trial with the primary objective being to determine

whether the simplified package of oxytocin 10 IU IM/IV, without CCT, is not less effective than the full AMTSL package with regard to reducing blood loss of 1000 ml or more in the third stage of labor. If the ‘simplified package’ was not worse than the ‘full package’ by more than the margin in terms of efficacy, the ‘simplified package’ would be valuable and could be implemented in settings without the manual skills needed for CCT.

Recruitment began in June 2009 and the trial ran to November 2010. The multicenter trial was conducted in 16 hospitals and two primary health care centers in eight countries: Argentina, Egypt, India, Kenya, the Philippines, South Africa, Thailand and Uganda. A total of 24,390 women (36,131 assessed for eligibility with 11,741 excluded) enrolled in the trial.

Based on agreed assumptions, a trial of 22,908 women would have 80% power to show non-inferiority of the simplified package within 0.45% of the full AMTSL package’s PPH rate (i.e. $(1 - 0.70) \times (3.0 - 1.5)$), with a two-sided CI of 95%, and an alpha of 2.5%. In relative terms, this gives a margin of non-inferiority of 1.3, i.e. $(1.5 + 0.45)/1.5 = 1.95/1.5$.

The main findings of the study are:

- The policy of the simplified package was on the borderline of non-inferiority (2.06% vs. 1.88%, RR 1.09, 95% CI 0.91–1.31) for severe hemorrhage
- There was more blood loss of 500 ml or more (13.75% vs. 12.85%, RR 1.07, CI 1.00–1.14) and manual removal (1.30% vs. 0.89%, RR 1.45, CI 1.14–1.86) with the simplified package.
- In sensitivity analyses excluding Philippine data, severe hemorrhage (1.63% vs. 1.49%, RR 1.9, CI 0.87–1.37) was still borderline, while hemorrhage (10.5% vs. 9.84%, RR 1.07, CI 0.98–1.16) and manual removal (0.65% vs. 0.68%, RR 0.97, CI 0.68–1.37) were clinically similar
- Overall, one woman (full package) had uterine inversion.

The findings confirm the key role the uterotonic plays in PPH prevention and suggest that the omission of CCT results in little increased risk of severe PPH. In calculating the numbers needed to harm, for every 581 women who receive the simplified package, there would be only one additional woman who would have a severe PPH than if all received the full AMTSL package. While borderline for non-inferiority and the experts agreeing with the above stated results, the fact that the study results crossed the pre-stated upper limit of the confidence interval of 1.30 with a risk ratio of 1.09 (95% CI 0.91–1.31) must be acknowledged as leaving a very small possibility of chance results. Another issue for the trial was with the quality of the data from one of the Philippine sites which required a sensitivity analysis. The sensitivity analysis was performed after the protocol was written but before the outcome data were analysed. In addition to frequent closures during the study period, one of the

Philippine sites continued their routine policy of using ergometrine as part of third stage management during the study. For these reasons and the association of ergometrine with placental retention identified earlier in the literature, the trial steering committee decided that the sensitivity analyses were justified.

The investigators make the following two inferences from the trial: '1. CCT is safe and in settings where it is routinely practised it can be continued; and 2. the main component of active management is the uterotonic and in settings where it is not possible to employ the full package one can safely focus on the uterotonic component'¹⁶.

STEPS IN ACTIVE MANAGEMENT OF THE THIRD STAGE OF LABOR

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

(1) Thoroughly dry the baby, assess its breathing and perform resuscitation if needed, and then place the baby in skin-to-skin contact with the mother:

- (a) After birth of the baby, immediately dry the infant and assess its breathing. If the baby requires resuscitation you may need to cut the cord immediately to care for the baby.
- (b) Then place the reactive infant, prone, in skin-to-skin contact, on the mother. If the umbilical cord is long enough, place the baby directly on the mother's chest. If the umbilical cord is short, place the baby on the mother's abdomen until after cutting the cord. Be careful to leave some slack on the umbilical cord and do not unduly stretch the cord.

Note: If the baby has poor color or needs resuscitation, the cord may be cut immediately so that adequate resuscitation can be performed immediately.

- (c) Remove the cloth used to dry the baby.
- (d) Cover both the mother and infant with a dry, warm cloth or towel to prevent heat loss.
- (e) Cover the baby's head with a cap or cloth (Figure 1).

(2) Administer a uterotonic drug within 1 minute of the baby's birth:

- (a) 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.
- (b) If another baby is not present, begin the procedure by giving the woman 10 IU of oxytocin by IM injection in the upper thigh. This should be done within 1 minute of childbirth. If available, a qualified assistant should give the injection.

- (c) In patients with intravenous access in place, 10–20 IU may be placed in 500–1000 ml of crystalloid and run quickly or 5 IU may be administered as an intravenous bolus, followed by a similar infusion.

Note: Ergometrine should not be used in the absence of CCT because of the risk of retained placenta associated with tonic-clonic contractions induced by ergometrine (Figure 2).

(3) Clamp and cut the umbilical cord:

- (a) Place one clamp 4 cm from the baby's abdomen after cord pulsations have ceased or approximately 2–3 minutes after birth of the baby, whichever comes first.

Note: If national guidelines for newborn interventions to prevent/reduce the risk of maternal-to-child transmission of HIV/AIDS include early clamping of the cord, then the protocol for AMTSL may have to be revised.



Figure 1 Place the baby in skin-to-skin contact with the mother. From POPPHI. Managing the third stage of labor in peripheral health care settings: a guide to train auxillary midwives. Seattle, WA: PATH, with permission



Figure 2 Administer a uterotonic within 1 minute of the baby's birth. From POPPHI. Managing the third stage of labor in peripheral health care settings: a guide to train auxillary midwives. Seattle, WA: PATH, with permission

- (b) Gently milk the cord towards the woman's perineum and place a second clamp on the cord approximately 2 cm from the first clamp.
- (c) 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 (Figure 3).

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.

- (d) Place the baby on the woman's chest, in skin-to-skin contact, and encourage breastfeeding (Figure 4).
- (4) Perform CCT:

WHO, FIGO and ICM recommend that in the absence of a skilled provider, third stage should be managed by administering a uterotonic drug (oxytocin or misoprostol) without CCT for the prevention of PPH.

- (a) Place the clamp near the woman's perineum to make CCT easier.
- (b) Hold the cord close to the perineum using a clamp.

- (c) Place the palm of the other hand on the lower abdomen just above the woman's pubic bone to assess for uterine contractions. If a clamp is not available, CCT can be applied by encircling the cord around the hand.
- (d) Wait for a uterine contraction. Only perform CCT when there is a contraction (Figure 5)
- (e) When there is a contraction, apply external pressure on the uterus in an upward direction



Figure 4 Place the baby on the woman's chest and encourage breastfeeding. From POPPHI. Managing the third stage of labor in peripheral health care settings: a guide to train auxillary midwives. Seattle, WA: PATH, with permission



Figure 3 Clamp and cut the umbilical cord. From POPPHI. Managing the third stage of labor in peripheral health care settings: a guide to train auxillary midwives. Seattle, WA: PATH, with permission



Figure 5 Place the palm on the lower abdomen to assess for a uterine contraction. From POPPHI. Managing the third stage of labor in peripheral health care settings: a guide to train auxillary midwives. Seattle, WA: PATH, with permission

(toward the woman's head) with the hand just above the pubic bone.

- (f) 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 6).

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

- (g) 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.
- (h) With the next contraction, repeat CCT with counter traction.
- (i) Do not release support on the uterus until the placenta is visible at the vulva. Deliver the

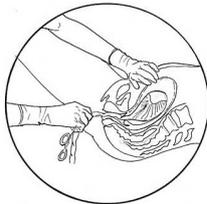


Figure 6 Perform controlled cord traction with counter traction. From POPPHI. Managing the third stage of labor in peripheral health care settings: a guide to train auxillary midwives. Seattle, WA: PATH, with permission

placenta slowly and support it with both hands (Figure 7).

- (j) As the placenta is delivered, hold and gently turn it with both hands until the membranes are twisted.
 - (k) Slowly pull to complete the delivery. Gently move membranes up and down until delivered (Figure 8).
- 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.
- (5) Massage the uterus:
 - (a) Massage the uterus immediately after delivery of the placenta and membranes until it is firm.
 - (b) After stopping massage, it is important that the uterus does not relax again.
 - (c) Palpate for a contracted uterus every 15 minutes and repeat uterine massage as needed during at least the first 2 hours after childbirth (Figure 9).
 - (d) Instruct the woman how to massage her own uterus, and ask her to call if her uterus becomes soft (Figure 10).
 - (6) Examine the placenta and membranes for completeness.



Figure 7 Only release support of the uterus when the placenta is visible at the vulva. From POPPHI. Managing the third stage of labor in peripheral health care settings: a guide to train auxillary midwives. Seattle, WA: PATH, with permission



Figure 8 Hold and gently turn the placenta as it is delivered. From POPPHI. Managing the third stage of labor in peripheral health care settings: a guide to train auxillary midwives. Seattle, WA: PATH, with permission

- (7) Examine the genitalia and repair lacerations/episiotomy if necessary.
- (8) Evaluate blood loss.
- (9) Explain all examination findings to the woman and, if she desires, her family.

GLOBAL RECOMMENDATIONS BASED ON CLINICAL EVIDENCE

In 2003, a global push was made to promote AMTSL. This initiative was part of the world’s effort to achieve Millennium Development Goal 5, which calls for a 75% reduction in the maternal mortality ratio between 1990 and 2015. At that time, there were three clear ‘categories’ of practitioners:

- (1) Practitioners in the UK and Commonwealth countries and much of Europe who were aware of the evidence supporting the use of AMTSL and practiced it routinely;
- (2) Practitioners in Latin America, the United States, Franco-phone Africa and other non-Commonwealth countries who were either



Figure 9 Massage the uterus until it is firm. From POPPHI. Managing the third stage of labor in peripheral health care settings: a guide to train auxillary midwives. Seattle, WA: PATH, with permission



Figure 10 Instruct the woman how to massage her own uterus. From POPPHI. Managing the third stage of labor in peripheral health care settings: a guide to train auxillary midwives. Seattle, WA: PATH, with permission

unaware of AMTSL or if aware, unconvinced or against the its application;

- (3) Practitioners in countries where AMTSL was part of routine care during childbirth, who were either not applying AMTSL or applying it incorrectly, because they were not trained in its correct application or because they lacked the necessary supplies, medications and consumables.

In an effort to reach political leaders, opinion leaders and decision-makers, FIGO, ICM and WHO

developed two important policy documents: (1) 2003 Joint statement by FIGO and ICM on the *Management of the Third Stage of Labor to Prevent Postpartum Haemorrhage*¹⁷ and (2) *WHO Recommendations for the Prevention of Postpartum Haemorrhage*⁵.

Joint Statement by FIGO and ICM on Management of the Third Stage of Labor to Prevent Postpartum Hemorrhage

The 2003 Joint Statement was a pivotal document that provided a platform upon which to build a global effort to save women from dying of PPH¹⁷. Signed in Chile by the leaders of both organizations, it was later ratified by the respective leadership councils and members, and has served as a seminal document for joint efforts and collaboration with WHO and others.

The two premier professional organizations responsible for leadership in maternity care pledged to work through their national membership organizations to promote the practice of AMTSL and ensure that obstetricians, other physicians, midwives and those caring for women during childbirth offered women this evidence-based practice. FIGO and ICM, in collaboration with partners, became leaders in an effort to share data on the efficacy and effectiveness of this intervention and increase the uptake by countries.

During the process of developing the Joint Statement, data were presented on the importance of delayed cord clamping for the newborn. Recognizing that the definition used in the Bristol and Hinchings-brooke trials included immediate cord clamping, FIGO and ICM experts determined that 'immediate cord clamping' was unlikely to be a key component of AMTSL, and its removal would have little impact on the incidence or severity of PPH. Immediate cord clamping was removed from the definition of AMTSL in the 2006 joint statement¹⁸.

The importance of surveillance of a woman in the immediate postpartum period was highlighted and immediate massage of the fundus of the uterus after delivery of the placenta until the uterus was contracted was included in the definition as well as palpation for a contracted uterus every 15 minutes for 2 hours.

WHO guidance

WHO staff drafted questions on the various interventions used or suggested for prevention of atonic PPH and shared them for review by an international panel of experts. WHO commissioned an external organization to review and grade the evidence to answer the questions using the GRADE methodology. When completed, WHO held a Technical Consultation in Geneva in 2006 to review the evidence provided by the GRADE process and to discuss the various issues related to the prevention of PPH. Based on the data, the experts developed recommendations. Key recommendations from the report are listed below⁵. For a complete report on the WHO PPH Technical

Consultation, visit http://whqlibdoc.who.int/hq/2007/WHO_MPS_07.06_eng.pdf.

The WHO technical consultation made five key recommendations to prevent PPH:

- (1) AMTSL should be offered by skilled attendants to all women (strong recommendation, moderate quality evidence).
- (2) Recommendations for choice of uterotonic drug in the context of AMTSL:
 - (a) If all injectable uterotonic drugs are available, skilled attendants should offer oxytocin to all women for prevention of PPH in preference to ergometrine/methylergometrine (strong recommendation, low quality evidence).
 - (b) If oxytocin is not 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 (strong recommendation, low quality evidence).
 - (c) Skilled attendants should offer oxytocin for prevention of PPH in preference to oral misoprostol (600 µg) (strong recommendation, high quality evidence).
 - (d) Skilled attendants should not offer sublingual misoprostol, rectal misoprostol, or carboprost/sulprostone for prevention of PPH in preference to oxytocin (strong recommendation, very low quality evidence).
- (3) In the absence of AMTSL, a uterotonic drug (oxytocin or misoprostol) should be offered by a health worker trained in its use for prevention of PPH (strong recommendation, moderate quality evidence).
- (4) Because of the benefits to the baby, the cord should not be clamped earlier than necessary for applying cord traction in AMTSL (weak recommendation, low quality evidence).
 - (a) For the sake of clarity, it is estimated that this will normally take around 3 minutes.
 - (b) Early clamping may be required if the baby is asphyxiated and requires immediate resuscitation.
- (5) Given the current evidence, the panel recommends no change in the practice of CCT as one of the components of AMTSL (strong recommendation, low quality evidence). However, further research was recommended.

THE PREVENTION OF POSTPARTUM HEMORRHAGE INITIATIVE (POPHI): A GLOBAL EFFORT TO TACKLE THE BIGGEST MATERNAL KILLER

In August 2004, the US Agency for International Development developed and funded the Prevention

of Postpartum Hemorrhage Initiative (POPPHI). It was a 5 year project focused on the reduction of PPH, the single most important cause of maternal deaths worldwide. Partners in the effort were the Program for Appropriate Technology in Health (PATH), Research Triangle International (RTI), FIGO, ICM and EngenderHealth.

POPPHI started with one simple but immensely challenging mandate: to catalyze the expansion of AMTSL practices worldwide as a key step to reducing maternal mortality by preventing PPH. As evidence emerged about the effectiveness of misoprostol to prevent PPH, POPPHI participated in global discussions about and evaluation of the research on this promising intervention. In addition to its work to expand the use of AMTSL, POPPHI began prioritizing (supporting) community-based strategies for preventing PPH, particularly as data demonstrated the effectiveness of misoprostol, and the Uniject™ device prefilled with oxytocin became commercially available.

One of POPPHI's first activities was to conduct national surveys in ten diverse developing countries. The survey helped to advance understanding of current AMTSL practices, and to provide Ministries of Health (MOHs) and their international partners with the descriptive information necessary to assess AMTSL practices and to identify major barriers to and enabling factors for its use (<http://pphprevention.org/Surveytools.php>). The research used nationally representative samples of observed facility-based deliveries. The survey results showed that correct use of AMTSL was low: only 0.5–32% of observed deliveries (Figure 11). These findings suggest that as many as 1.4 million women per year who gave birth vaginally did not receive AMTSL.

As part of the development of the survey tools, POPPHI identified the determinants to the use of AMTSL and requirements for introduction and expansion/scale-up of the use of AMTSL in a country (Figure 12).

After identifying the determinants to use, POPPHI and its partners identified key activities and approaches that proved to be highly effective in increasing the uptake of AMTSL. The approaches used by POPPHI included:

- Partnering with global leaders of maternal health
- Partnering with MOH and in-country professional organizations
- Strengthening policy
- Conducting pilot and demonstration projects and programs
- Strengthening provider practice through innovations and standardized trainings
- Expanding monitoring and evaluation systems to include PPH and AMTSL
- Strengthening and updating uterotonic drug storage and logistics systems

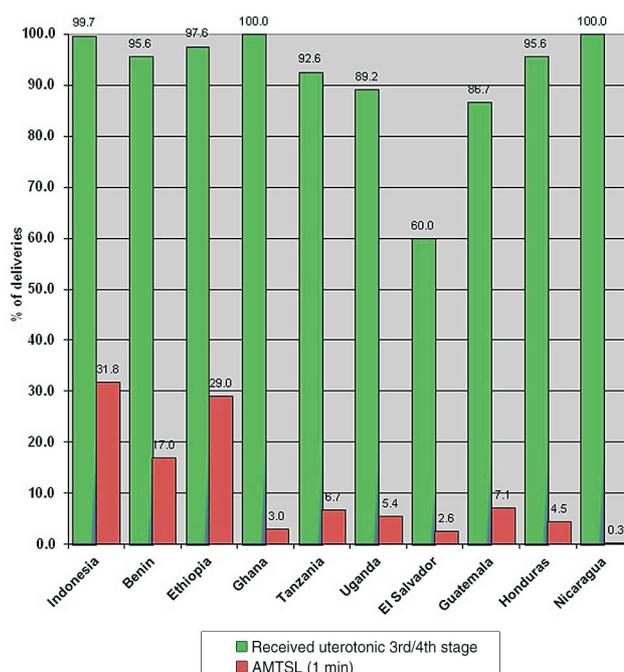


Figure 11 Percentage of observed deliveries in which uterotonic drugs were given during the third/fourth stages of labor and AMTSL was used correctly (including uterotonic administration within 1 minute). From POPPHI. Managing the third stage of labor in peripheral health care settings: a guide to train auxiliary midwives. Seattle, WA: PATH, with permission

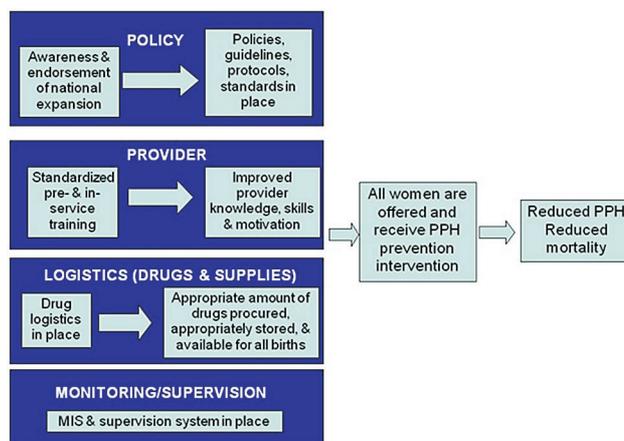


Figure 12 Determinants of uptake and use of PPH prevention interventions. MIS, management information system. From POPPHI. Managing the third stage of labor in peripheral health care settings: a guide to train auxiliary midwives. Seattle, WA: PATH, with permission

- Providing small grants to national professional associations to promote PPH prevention initiatives
- Supporting expansion or scale-up of AMTSL in multiple countries.

The POPPHI project also developed tools and resources to strengthen providers' skill in the practice. These included AMTSL learning materials, a toolkit for providers, on-site and individual learning package, website, CD-ROM, fact sheets, job aids, posters and more. The website (www.pphprevention.org)

remains active and contains all of these documents and many more.

POPPHI created a consistent message on AMTSL using the strong evidence base for its use, demonstrated that AMTSL could have a large impact on maternal mortality, and provided clear examples for how countries could implement programs to prevent PPH. Overall, POPPHI and its various partners had a 'footprint' in more than 40 countries by conducting activities, collaborating with various groups or providing virtual or on the ground support to the various organizations working to save lives through prevention of PPH.

It is likely that POPPHI's most significant work was in the area of policy and advocacy where it continued the momentum and catalyzed additional work by WHO, FIGO, ICM, USAID, other research institutions, such as the US National Institute for Health, and others. Country governments and national professional associations were key partners, and many of the efforts and activities of POPPHI continue through government programs.

Although POPPHI was successfully terminated in 2010, FIGO has made a 10 year commitment to pursue the decrease in mortality and severe morbidity from PPH and with these efforts and many others, the efforts to save women from dying of PPH continues.

COUNTRY EXAMPLES

Benin

The Benin Government made a commitment to scale up AMTSL throughout the country after the practice was introduced in 2002 and 2003. POPPHI's AMTSL survey conducted in 2007 found that while 84% of women in Benin gave birth in a facility where providers had received training in AMTSL and 62% of health districts had a PPH/AMTSL initiative, only 18% of women in the sample received AMTSL that was practiced according to standard. Results of the survey catalyzed several key activities:

- In 2008, a national task force developed a set of recommendations and a national action plan for improving AMTSL practice. Some of these recommendations included:
 - Development of a national-level post for a person responsible for promoting and monitoring AMTSL use
 - AMTSL is now integrated into the national safe motherhood plan
 - AMTSL is integrated into pre-service education programs for nurses, midwives and physicians as well as other in-service training programs, such as those for emergency obstetric and newborn care
 - To improve monitoring, evaluation and tracking of AMTSL coverage rates, the three elements of AMTSL were integrated into the partograph,

and AMTSL was integrated into the delivery register

- In 2008, survey results and recommendations made by the national task force were disseminated regionally. Each district subsequently developed action plans to improve AMTSL practice and improve quantification and storage of oxytocin
- In 2008, national protocols related to PPH prevention and management were reviewed and updated to include evidence-based practices
- In 2009, national protocols were developed for quantification, transport and storage of uterotonic drugs
- In 2009, the Beninese midwifery association and the Beninese and Togolese Society for Obstetrics and Gynecology ratified revised protocols and signed a joint statement on the prevention of PPH and rational use of uterotonic drugs
- In 2009, Benin's Minister of Health made a commitment to increasing the number of midwives hired by the government to ensure that all women giving birth in facilities would be assisted by a skilled birth attendant and receive AMTSL.

Mali

Mali developed a national commitment to scaling up AMTSL for all providers attending births in health care facilities since the practice was introduced in 2002 and 2003. The PPH prevention initiative was launched in 2007 and national and regional plans for preventing PPH were developed. Since then, the government has implemented the following activities that are part of the national and regional plans:

- A national task force with members from the National Department of Health and international partners was established to develop a plan for scaling up AMTSL and monitoring progress. Achievements include:
 - Procurement of oxytocin in the Uniject® device was included in the national plan for AMTSL scale-up
 - The three elements of AMTSL were integrated into the partograph
 - AMTSL was integrated into pre-service education programs for nurses, midwives and physicians and in other in-service training programs, such as emergency obstetric and newborn care
 - AMTSL is tracked in districts and regions targeted by USAID
- In 2006, an operational research study in three districts (Gao, Koulikoro and Sikasso) on the feasibility and safety of training auxiliary midwives (*matrones*) to use AMTSL. On April 2, 2009, Mali's Minister

of Health authorized *matrones* to provide AMTSL and use oxytocin when practicing AMTSL

- In 2008, PPH was featured as the theme for the National Midwifery Day. At this event, a joint statement on the prevention of PPH and rational use of uterotonic drugs was signed by the Malian Midwifery Association (the Association des Sages-Femmes du Mali, or ASFM) and the Malian Society for Obstetrics and Gynecology
- In 2009, the National Order of Midwives published a bulletin on PPH prevention and rational use of uterotonic drugs.

CONCLUSIONS: CURRENT GUIDANCE FOR CLINICIANS

AMTSL is a highly effective intervention that decreases the incidence of PPH from uterine atony by approximately 60%, decreases the cost of maternity care as shown in studies in Guatemala and Zambia, and decreases the use of additional uterotonic drugs or other more invasive interventions to manage PPH. It also decreases the length of the third stage of labor – which is important in very busy labor and delivery wards or in short-staffed facilities. All skilled birth attendants – obstetricians/gynecologists, midwives and other practitioners – should therefore become competent to practice AMTSL through their pre-service education or simple in-service training programs.

While the proportion of deliveries attended by skilled health personnel rose from 58% in 1990 to 68% in 2008, it has remained low in the WHO African Region and the WHO South-East Asia Region where only around 50% of deliveries were attended by skilled health personnel¹⁹, meaning a large percentage of women are not being cared for by a skilled birth attendant during the third stage of labor. In these situations, two strategies should be promoted: (1) fewer skilled birth attendants should be trained to actively manage the third stage of labor without CCT and (2) community health workers and pregnant women should be trained in the use of misoprostol to prevent PPH. These strategies will increase the number of women having uterotonic coverage through simplified AMTSL and have great potential to save additional women's lives and markedly decrease maternal mortality and serious morbidity associated with PPH.

New research identifies the uterotonic as the key component of AMTSL's effectiveness. If not already a focus of program managers' and clinicians' activities, the importance of procuring sufficient quality medication is highlighted. Adequate training on proper storage and management of the medication is also necessary. It is critical to ensure that the system can complete appropriate quantification exercises, procure from manufacturers using current good manufacturing practices (cGMP), distribute in a timely fashion to all facilities and eliminate stock-outs. All facilities providing childbirth services must keep quality uterotonic

drugs on hand at all times and use them consistently, as per protocol.

The Millennium Development Goal (MDG) 5 is to achieve a 75% reduction in maternal mortality between 1990 and 2015. Despite global efforts to reduce mortality, WHO reports that the global maternal mortality ratio (i.e. the number of maternal deaths per 100,000 live births) declined by only 2.3% per year between 1990 and 2008²⁰. This is far from the annual decline of 5.5% required to achieve MDG 5. Achieving MDG 5 will continue to be an overwhelming challenge and an elusive goal if we cannot address the biggest killer in childbirth, PPH. Implementation of strategies to prevent PPH at all points of care where women are giving birth will significantly contribute to reductions in maternal morbidity and mortality.

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Addendum A: Comparison of physiologic (expectant) and active management of the third stage of labor (AMTSL)

	<i>Physiologic (expectant) management</i>	<i>Active management*</i>
Uterotonic	Uterotonic is not given before the placenta delivered	Uterotonic is given within 1 minute of the baby's birth (after ruling out the presence of a second baby)
Cord clamping	The cord is neither clamped nor cut early	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
Signs of placental separation	Wait for signs of separation: Gush of blood Lengthening of cord Uterus becomes rounder and smaller as the placenta descends	Do not wait for signs of placental separation. Instead: Palpate the uterus for a contraction Wait for the uterus to contract Apply CCT with counter traction
Delivery of the placenta	Placenta delivered by gravity assisted by maternal effort	Placenta delivered by CCT while supporting and stabilizing the uterus by applying counter traction
Uterine massage	Massage the uterus after the placenta is delivered	Massage the uterus <i>after</i> the placenta is delivered
Advantages	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	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	Length of third stage is longer compared to AMTSL Blood loss is greater compared to AMTSL Increased risk of PPH	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. In the Hinchingsbrooke trial, midwives used either CCT or maternal effort to deliver the placenta.

CCT, controlled cord traction; PPH, postpartum hemorrhage