Women do not have to die from postpartum hemorrhage (PPH). Whether they give birth with a skilled provider at home or in a facility, most cases of PPH can be prevented using safe, low-cost, evidence-based practices. Knowing how to prevent PPH, however, is not enough. This knowledge must be translated into action when implementing essential maternal and newborn health care and basic emergency obstetric and newborn care interventions (Int J Gynaecol Obstet 96: 5–19).

- Ensuring that national policies and clinical guidelines are in place to support the use of active management of the third stage of labour.
- Incorporating the knowledge and skills needed to perform AMTSL into pre-service education and providing in-service training for skilled providers.
- Ensuring that supplies of uterotonics and other items needed for clean and safe birth are available.
- Bringing essential maternal and newborn health care and basic emergency obstetric and newborn care as close to the family as possible through community health workers and skilled providers.
- Mobilizing the community to help women and their families prepare for birth with a skilled provider and be ready for complications should they occur.

WHAT IS POSTPARTUM HEMORRHAGE?
Uterine atony causes up to 70% of PPH. Other causes include ruptured uterus; lacerations of the cervix, vagina or perineum; and retained placenta or placental fragments. Two-thirds of PPH cases occur in women with no known risk factors (Akins 1994). The most commonly used definition of immediate PPH is blood loss of 500 mL or more in the first 24 hours following childbirth; severe PPH is defined as blood loss of 1,000 mL or more (Prendiville and Elbourne 1998). However, it is difficult to accurately assess the amount of blood that a woman has lost because it is mixed with amniotic fluid or dispersed on sponges or linens, in buckets or on the floor. In addition, slow bleeding from an episiotomy or tear may go unnoticed. Clinical estimates of blood loss, where no special efforts are made to physically measure it, are generally thought to be underestimated by 34–50% (Prendiville et al. 2003). Blood measurement systems suitable for facility and home births in low-resource settings are being tested, including the BRASS-V drape used in PPH research in rural India. This is a plastic drape with a calibrated collection device that is placed under the woman after the birth of the baby. Since blood loss can be quantified objectively with this device, providers are more apt to intervene appropriately before life-threatening hemorrhage occurs (Patel 2003).

Because of the difficulty in accurately measuring blood loss, even in a clinical setting, work is being done to determine the best way to measure blood loss in the home setting where there is no skilled provider. In Tanzania, traditional providers were trained to recognize excessive bleeding using a local garment known as a “kanga.” In this study, it was determined that two kangas soaked with blood after birth of the baby indicated blood loss of slightly more than 500 mL (Prata et al. 2005).

Each year in developing countries:
14 million women experience postpartum hemorrhage (WHO 1999).
Hemorrhage accounts for over 25% of maternal deaths in Latin America and the Caribbean, 30.8% in Asia and 33.9% in Africa (Khan et al. 2006).
Nearly half of all postpartum deaths are due to immediate postpartum hemorrhage (Li et al. 1996). Millions of women suffer acute or chronic disability following immediate postpartum hemorrhage (Murray and Lopez 1998).
WHO 2005). A woman may give birth alone or in the presence of an untrained birth attendant or family members. If a woman begins to hemorrhage, the birth attendant and family are often unprepared to recognize and handle the emergency. Long delays may occur in making the decision to seek help and in transporting the woman to a hospital or center equipped to treat PPH.

PREVENTION OF POSTPARTUM HEMORRHAGE WHERE THERE IS A SKILLED PROVIDER

One of the most important measures, therefore, is having a skilled provider present at birth. In addition to using the World Health Organization (WHO) partograph to monitor labor (to avoid obstructed labor and thus uterine rupture), the appropriately trained skilled provider is less likely to perform procedures such as episiotomy or operative vaginal delivery without clear indications. Finally, the skilled provider can administer muscular contractions of the uterine stomy, the most common cause of immediate PPH.

Active Management of the Third Stage of Labor

In order to understand how to prevent uterine atony, it is necessary to understand the physiologic processes that occur during the third stage of labor (the period of time from the birth of the baby to delivery of the placenta).

Immediately after the birth of the baby, the muscles of the uterus contract and the placenta separates from the uterine wall as the surface of the uterus becomes smaller. At the end of a term pregnancy, 500–800 mL of blood flow through the blood vessels at the placental site every minute (WHO 1996). As the placenta separates, these vessels break and bleeding occurs. Continuous, coordinated contractions of the uterus compress these blood vessels to control bleeding at the placental site and allow formation of a retroplacental clot. When the uterus fails to have coordinated contraction, it is said to be atonic; in this case, blood vessels at the placental site are not constricted and hemorrhage occurs.

Active management differs from physiologic or expectant management. In the latter, the placenta is allowed to deliver spontaneously, by gravity or maternal effort. Four, large-scale randomized controlled trials (RCTs) compared active and expectant management of the third stage of labor (Bagley 1998; Khan et al. 1997; Prendiville, Elbourne and McDonald 2003). In 2003, the International Confederation of Midwives (ICM) and the International Federation of Gynecology and Obstetrics (FIGO) issued their first International Joint Statement endorsing the use of AMTSL by a skilled provider. The Joint Statement highlights the importance of successful uterotonic therapy to prevent the occurrence of PPH, the quantity of blood loss, and loss of blood transfusion.1

Choice of Uterotonic Drug for AMTSL

Giving a uterotonic drug within one minute of birth is the component of AMTSL that has the greatest impact on the prevention of PPH.

Oxytocin and syntometrine (ergometrine plus ergonovine maleate) are both effective in preventing PPH (McDonald, Prendiville and Blair 2001). However, the use of syntometrine is consistently associated with an increased incidence of side effects such as nausea, vomiting, headache and increased blood pressure. In addition, ergonovine cannot be given to women with hypertension (a common problem during pregnancy). Oxytocin is therefore the preferred drug for use in AMTSL performed by a skilled provider.

Oxytocin and syntometrine, although effective in preventing PPH, can have disadvantages. In addition to the side effects mentioned above, these drugs must be handled and stored properly. They are unstable when exposed to tropical conditions of temperature and light, although oxytocin is more stable than ergometrine and may be stored at room temperature for up to three months without losing potency (WHO 1993). Furthermore, these drugs must be injected. This requires that the provider be trained and qualified to administer the drug, and have access to the drug and a readily available supply of sterile syringes and needles, which must be handled and disposed of properly.

An alternative uterotonic drug is misoprostol (Cytotec®), manufactured by G.D. Searle & Co, Skokie, IL, a progestational E1 analog. Misoprostol is inexpensive and readily available; it is easy to use; does not require special storage or transfer conditions (can be stored at room temperature, is light stable); and has a shelf life of several years (Gaud and Comors 1992; Karafili et al. 1991). In addition, it can be given orally or rectally. Two RCTs found that misoprostol (administered either orally or rectally) was comparable to syntometrine for preventing PPH (Bhutta et al. 2001; Ng et al. 2001). However, a large WHO multicenter RCT and a Cochrane Review found that, in hospital settings, oxytocin is preferable to oral misoprostol (Gulmezoglu et al. 2004, 2001).

A skilled provider can perform AMTSL in the home. However, when the necessary supplies are not available to give a injection of oxytocin or severe PPH, decreased need for blood transfusion, (to avoid obstructed labor and thus uterine rupture), the appropriately trained skilled provider is less likely to perform procedures such as episiotomy or operative vaginal delivery without clear indications. Finally, the skilled provider can administer muscular contractions of the uterine stomy, the most common cause of immediate PPH.

PREVENTION OF POSTPARTUM HEMORRHAGE WHERE THERE IS NO SKILLED PROVIDER

Misoprostol may also offer a solution for home births attended by a provider not qualified to perform AMTSL. The Maternal and Neonatal Health Program (1998–2004), funded by the U.S. Agency for International Development, established the safety of sublingual administration of misoprostol (600 μg) for prevention of PPH through a study conducted in rural Indonesia (Wijiwijasto et al. 2004). Community health volunteers (kades) were trained to provide counseling about the importance of giving birth with a skilled provider, the danger signs of PPH and the need to seek care immediately should the woman experience severe bleeding. Counseling also included information about the importance and safe use of misoprostol and its side effects. Pregnant women participating in the study received packets of misoprostol tablets and a safety reminder card in their eighth month of pregnancy with instructions to take the misoprostol immediately after the birth of the baby. The community-based approach was found to be safe and acceptable to the women studied. Based on the study’s results, the Government of Indonesia has implemented plans to scale up community-based distribution of misoprostol as an effective strategy for reducing the risk of PPH when skilled care is not available. In situations where this approach is used, a careful monitoring and evaluation component should be included in order to demonstrate the impact on public health. (For a complete summary of research on use of misoprostol to prevent and treat PPH, please see the Prevention of Postpartum Hemorrhage Initiative [POPPHI] Web site www.ppnhemorrhage.org).

REFERENCES

WHO (2005). A woman may give birth alone or in the presence of an untrained birth attendant or family members. If a woman begins to hemorrhage, the birth attendant and family are often unprepared to recognize and handle the emergency. Long delays may occur in making the decision to seek help and in transporting the woman to a hospital or center equipped to treat PPH.

**PREVENTION OF POSTPARTUM HEMORRHAGE WHERE THERE IS A SKILLED PROVIDER**

One of the most effective measures to reduce hemorrhage is, therefore, having a skilled provider present at birth. In addition to using the World Health Organization (WHO) partograph to monitor labor (to avoid obstructed labor and thus uterine rupture), the appropriately trained skilled provider is less likely to perform procedures such as episiotomy or operative vaginal delivery without clear indications. Finally, the skilled provider can control muscular contractions of the uterus, thus the most common cause of immediate PPH.

**Active Management of the Third Stage of Labor**

In order to understand how to prevent uterine atony, it is necessary to understand the physiologic processes that occur during the third stage of labor (the period of time from the birth of the baby to delivery of the placenta).

Immediately after the birth of the baby, the muscles of the uterus contract and the placenta separates from the uterine wall as a result of an increase in uterine tone. If delivery of the placenta is delayed for more than 20 minutes after delivery of the baby, the mother is at risk of hemorrhage due to uterine atony. The community-based approach was found to be safe and acceptable to women in low-resource settings and has the potential to demonstrate the impact on public health. (For a complete summary of research on use of misoprostol to prevent and treat PPH, please see the Prevention of Postpartum Hemorrhage Initiative [POPPHI] Web site [www.pphprevention.org]).

A second Joint Statement from ICM and FIGO was issued in 2006, addressing advances in the prevention and treatment of PPH in low-resource settings. The statement endorses the widespread use of misoprostol for prevention of PPH in settings where oxytocin is not available and/or birth attendants do not perform AMTSL, as well as states that there is no skilled attendant, stating “administering misoprostol soon after the birth of the baby reduces the occurrence of haemorrhage.”

AMTSL by skilled providers (using misoprostol when oxytocin is not feasible) and use of misoprostol by unskilled providers or the woman herself are life-saving interventions that can make an impact on maternal mortality in low-resource settings.

**REFERENCES**


In countries with high maternal mortality and limited resources, introducing safe, low-cost, evidence-based practices that prevent postpartum hemorrhage can save women’s lives.

Each year in developing countries:
14 million women experience postpartum hemorrhage (WHO 1998).

Postpartum hemorrhage accounts for over 25% of maternal deaths in Latin America and the Caribbean, 30.8% in Asia and 33.9% in Africa (Khan et al. 2006).

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Hemorrhage, if uncontrolled or untreated, can quickly lead to shock and death. Most deaths due to PPH occur within the first seven days after childbirth (Li et al. 1996). One study in Egypt found that 88% of these deaths occur within the first four hours postpartum (Kane et al. 1992). Death from PPH may occur within two hours of onset of hemorrhage. Many factors influence whether or not PPH is fatal. Anemia, estimated to affect half of all pregnant women in the world, contributes to the high death toll (Brabin, Hakimi and Pelletier 2001). A woman who is anemic is unable to tolerate the amount of blood loss that a healthy woman can (Tsu 1993).

Another important consideration is that 66% of births in the least developed countries occur in the home without a skilled provider.