

Active Management of the Third Stage of Labor in Health Care Facilities: Results of a National Study in Ghana, 2007

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The Rational Pharmaceutical Management Plus (RPM Plus) Program, works in more than 20 developing countries to provide technical assistance to strengthen medicine and health commodity management systems. The program offers technical guidance and assists in strategy development and program implementation both in improving the availability of health commodities—pharmaceuticals, vaccines, supplies, and basic medical equipment—of assured quality for maternal and child health, HIV/AIDS, infectious diseases, and family planning and in promoting the appropriate use of health commodities in the public and private sectors. This document does not necessarily represent the views or opinions of USAID. It may be reproduced if credit is given to RPM Plus.

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 Gynecologists and Obstetricians (FIGO), and the International Confederation of Midwives (ICM).

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Key Words

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ACRONYMS

AMTSL	active management of the third stage of labor
CMS	Central Medical Stores
EML	Essential Medicines List
FIGO	International Federation of Gynecology and Obstetrics
GHS	Ghana Health Service
GNDP	Ghana National Drug Programme
GRMA	Ghana Registered Midwives Association
GSS	Ghana Statistical Service
ICM	International Federation of Midwives
IM	intramuscular injection
IU	international units
IV	intravenous
JHSPH	Johns Hopkins Bloomberg School of Public Health
MoH	Ministry of Health
PATH	Program for Appropriate Technology in Health
POPHI	Prevention of Postpartum Hemorrhage Initiative
PPH	postpartum hemorrhage
RCHU	Reproductive and Child Health Unit
RPM Plus	Rational Pharmaceutical Management Plus (Program)
SOPMP	Society of Private Medical Practitioners
STG	standard treatment guideline
USAID	U.S. Agency for International Development
WHO	World Health Organization

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This report was prepared by Dr. Ivy Osei in collaboration with POPPHI through the Management Sciences for Health, Rational Pharmaceutical Management (RPM) Plus Program. The Ghanaian Study Team was made up of Dr. Ivy Osei, study coordinator, Dr. Henrietta Odoi-Agyarko, technical adviser, and Jane Amponsah, data manager.

EXECUTIVE SUMMARY

Postpartum hemorrhage is one of the world's leading causes of maternal mortality. Active management of the third stage of labor (AMTSL) is a feasible and inexpensive intervention that can help save millions of women's lives.

AMTSL involves three basic procedures—

1. Use of an uterotonic agent (preferably oxytocin) within one minute following the delivery of the baby
2. Delivery of the placenta with controlled cord traction
3. Massage of the uterus after delivery of the placenta.

Based on conclusive evidence from clinical trials, the International Confederation of Midwives (ICM) and the International Federation of Gynecology and Obstetrics (FIGO) issued a joint statement in 2003 stating that every woman should be offered AMTSL as a means of reducing the incidence of postpartum hemorrhage (International Confederation of Certified Midwives 2003). The World Health Organization (WHO) *Making Pregnancy Safer Technical Update on Prevention of Postpartum Haemorrhage by AMTSL* recommends that “AMTSL should be offered by all skilled attendants at every birth to prevent postpartum haemorrhage” (World Health Organization 2006).

The aim of this study is to provide Ghana Health Service and Ministry of Health and their international partners with the descriptive information necessary to assess AMTSL practices and identify major barriers to its use. Currently, very little is known about the actual practice of AMTSL.

The study responds to the following specific questions—

- In what proportion of deliveries is AMTSL used nationally?
- What are the AMTSL practices in Ghana which do not conform to the ICM/FIGO definition of AMSTL?
- What are the facility- and policy-level barriers and facilitators to using AMTSL?

To address the questions above, facility-based deliveries were sampled nationally and involved review of the standard treatment guidelines (STGs), the Essential Medicines List (EML), and the medical and midwifery school curricula; visits to the Central Medical Stores, pharmacies in the health facilities selected for the study, and interviews with hospital directors, pharmacists, and health care providers.

The study results illustrate that an uterotonic medicine was used during the third or fourth stage of labor in 100 percent of facility-based deliveries in the sample, with oxytocin used in more

than 80 percent of deliveries. The practice of AMTSL according to the ICM/FIGO definition was observed in 3 percent of deliveries. If the definition of AMTSL is modified to allow the administration of the uterotonic medicine within three minutes of delivery of the fetus, then the proportion receiving AMTSL increases to about 5 percent.

The study also documented that potentially-harmful procedures were practiced in approximately 20 percent of deliveries. Such practices include: the application of fundal pressure or fundal massage while awaiting the delivery of placenta, and use of controlled cord traction without manually supporting the uterus.

The national policy environment is favorable for the practice of AMTSL. The National Reproductive Health Service protocols promote and provide clear guidelines on the practice of AMTSL. These guidelines include the medicine used (oxytocin and ergometrine) and cord traction but do not address uterine massage following delivery of placenta. The protocols recommend giving 0.5 milligram (mg)/intramuscular injection (IM) of oxytocin on delivery of the anterior shoulder or immediately after the baby is delivered. The current version is being revised to reflect the FIGO/ICM recommendations.

Ergometrine 0.5 mg oral tablets, ergometrine 0.5 mg/millileter (ml) injection, oxytocin 5 international units (IU)/ml injection, and misoprostol 200 microgram (mcg) vaginal tablets are listed under the oxytocic therapeutic class in the Essential Medicines List. At the time of the visit to the Central Medical Stores, oxytocin was available but ergometrine was out of stock. At the time of the site visit, oxytocin and ergometrine were found in all but one¹ of the health care facilities' pharmacies that participated in the study. There were also variations in the manufacturer's storage recommendations for all the uterotonic medications.

The practice of AMTSL, as recommended by WHO, ICM, and FIGO, is not widely used in the study health care facilities. Mothers in 3 percent of these health care facilities benefited from the correct use of AMTSL.

¹ In this case, although oxytocin was not available at the pharmacy, it was available in the labor ward.

BACKGROUND

Postpartum hemorrhage is one of the world's leading causes of maternal mortality. Recent WHO estimates indicate that approximately 34 percent of maternal mortality in Africa is caused by postpartum hemorrhage (WHO 2007). Ghana, like other countries within sub-Saharan Africa, is faced with the problem of high maternal deaths. A large community-based study conducted by the Ghana Statistical Service in 1993 (Ghana Statistical Services 1994) using the sisterhood method determined the national maternal mortality ratio to be 214/100,000 live births and a lifetime risk of dying from a maternal death to be 1 in 71. Though very high, this figure is still considered as underestimated as not all maternal deaths occur in health facilities nor are they recorded by the routine vital statistics. Other studies have indicated regional variations for maternal mortality ranging between 100 and 800 per 100,000 live births (Aboagye 2000). In general, national maternal mortality ratios estimates derived from the institutional data have shown small but progressive decline over time, from 2.5/1000 live births in 1999 to 1.87/1000 live births in 2006.

Postpartum hemorrhage is listed as one of the major causes of maternal mortality in Ghana. Other causes of maternal mortality in Ghana include antenatal hemorrhage, severe anemia, pregnancy-induced hypertension and eclampsia, unsafe abortions, and obstructed labor. Other broader factors that have been identified as contributing to maternal deaths include poverty, high fertility, malnutrition, and traditional beliefs and practices.

Most of the causes of maternal mortality could be managed by simple and cost-effective medicines and procedures. Active management of the third stage of labor (AMTSL) is one of the procedures to prevent postpartum hemorrhage and can help save over hundreds of thousands of women's lives.

AMTSL involves three main components—

- Use of an uterotonic agent within one minute following the baby's birth
- Delivery of the placenta with controlled cord traction
- Massage of the uterus after delivery of the placenta (ICM and FIGO 2003)

This definition is endorsed by the FIGO, the ICM, and WHO. It differs from the original research protocol in the Bristol (Prendiville 1988) and Hinchingsbrooke trials (Rogers et al. 1998) because the original protocols include immediate cord clamping and did not include massage of the uterus. The FIGO/ICM Joint Statement and *Managing Complications in Pregnancy and Childbirth*, produced by WHO do not include immediate cord clamping (WHO 2000).

Clinical trials in developed countries have shown that the use of AMTSL, in contrast to physiologic management of the third stage of labor—in which oxytocic medicines are not used and the placenta separates spontaneously (delivered by gravity and maternal effort)—significantly reduces postpartum hemorrhage. When compared to AMTSL, the use of physiologic management has a higher rate of severe postpartum hemorrhage, the need for blood transfusion, the need for therapeutic oxytocics, and the duration of the third stage of labor. A

Cochrane review of these trials concludes by recommending AMTSL for all women delivering in a hospital and anticipating the vaginal birth of a single infant (Rogers et al. 1998).

Endorsement and Use of AMTSL

Based on this body of evidence, ICM and FIGO issued a joint statement in November 2003 stating that every woman should be offered AMTSL “as a means of reducing the incidence of postpartum hemorrhage due to uterine atony” (ICM and FIGO 2003). The inclusion of AMTSL in the WHO evidence-based manual *Managing Complications in Pregnancy and Childbirth* also attests to the international acceptance of this practice as the standard of care.

Evidence regarding adoption of this practice, however, is scarce. Evaluations of donor-funded projects incorporating AMTSL tend to be limited to reporting on the numbers of providers trained and the percent achieving competence following training. Apart from anecdotal information, a 2003 article by the Global Network for Perinatal and Reproductive Health (Festin et al 2003) offers a limited glimpse into the adoption of this practice. Their results, based on an evaluation of 15-university-based referral obstetric centers in developed and developing countries, show substantial variation between and within hospitals. Overall, only 25 percent of observed deliveries included AMTSL. Only one (in Dublin, Ireland) consistently used all three components of the practice. Variation in the prophylactic use of oxytocic medicines ranged from 0 to 100 percent; the practice of controlled cord traction ranged from 13 to 100 percent; and the number of women who received additional doses of oxytocin during the third stage of labor ranged from 5 to 100 percent. There is insufficient evidence for drawing conclusions about the effectiveness of this practice in its altered states. These results do suggest, however, that the use of AMTSL is quite low and, where it is practiced, the definition varies within and between countries (Prendiville 2003).

Since 1997, the Safe Motherhood Initiative has stated that maternal mortality is an issue of health infrastructure. AMTSL is a highly measurable, evidence-based, life-saving aspect of this health infrastructure. In Ghana, AMTSL has long been part of the standard care of delivery; however, adherence to international standards varies widely among providers. In 2005, POPPHI sponsored the training of AMTSL practice for representatives of the Society of Private Medical Practitioners and the Ghana Registered Midwives Association. Since then, providers have begun to follow new standards for AMTSL and are using oxytocin as the medicine of choice (U.S. Agency for International Development 2005). Given that postpartum hemorrhage is a leading cause of maternal death in many countries with high maternal mortality, including Ghana, there is an important and urgent need for information on current practices regarding AMTSL.

About This Study

As a complement to work undertaken by the Global Network for Perinatal and Reproductive Health, the survey discussed in this report was designed to advance understanding of current AMTSL practices in Ghana. This survey is part of ten-country Global Survey on AMTSL practices which focuses on policy, provider-related factors, and supplies and logistics. When

viewed together, these components provide important insights on routine use of AMTSL (Figure 1).

Policy

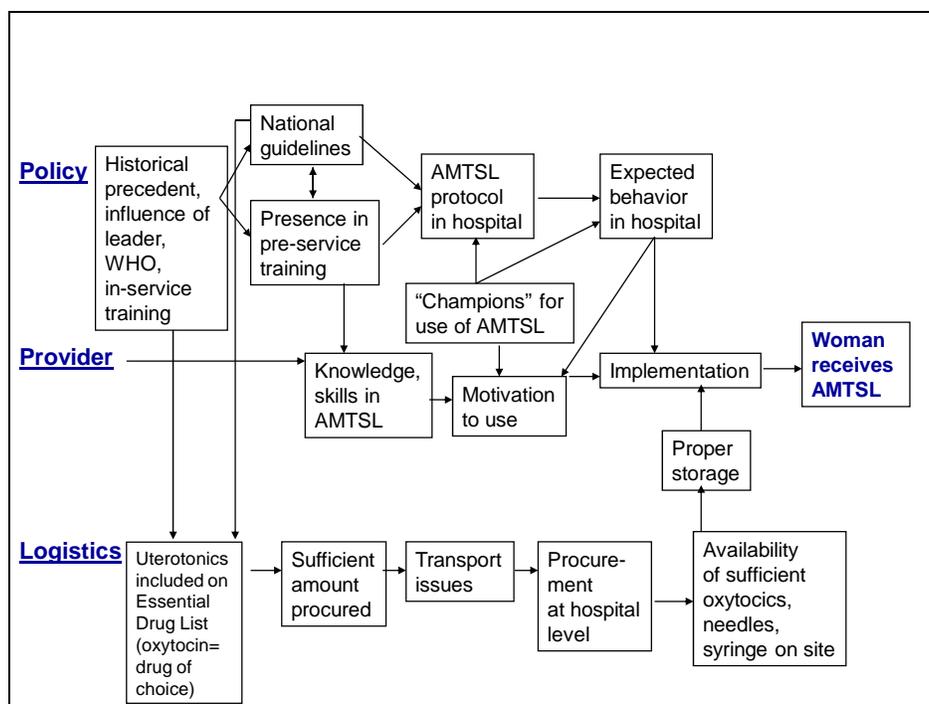
At the national level, a number of influences determine the priority given to AMTSL. For example, given that AMTSL has been a standard of care in the United Kingdom for many years, some researchers have hypothesized that AMTSL is more common in former British colonies and among providers who have trained in the United Kingdom. Likewise, effective leaders from national or international agencies may have been able to influence national policies, the inclusion of medicines in the essential medicine list and country formulary, and health provider education regarding AMTSL. In turn, such training may influence facility-based policies and behavioral expectations.

Provider-Related Factors

The knowledge and skills required to perform AMTSL are essential for routine use of the practice. Provider motivation, which is influenced by facility-based behavioral expectations, is also key.

Supplies and Logistics

The sufficient availability of good quality, safe, and effective uterotonic medicines, needles, and syringes at national and local levels is essential for routine use of AMTSL. Effective use of AMTSL is also supported by supply chain that guarantees appropriate conditions of transport, handling and storage of uterotonics, sterile needles, and syringes.



Created by the Prevention of Post-Partum Hemorrhage Initiative

Figure 1. Determinants of routine use of AMTSL

This study’s goal was to provide the Ministry of Health (MoH)/Ghana Health Service (GHS) and their international partners with the descriptive information necessary to assess AMTSL practices and identify major barriers to its use. The findings will inform interventions that improve adoption and implementation of AMTSL and provide policymakers with the information they need to promote skilled attendance at birth. A third aim of this study is to produce tools and a method that others could employ to document the current practice of AMTSL.

The study’s specific research questions are—

- For what proportion of deliveries is AMTSL used at the national level? Which components of AMTSL (e.g., prophylactic use of oxytocic agents, controlled cord traction, fundal massage) are practiced, and how consistently are they practiced?
- Is AMTSL formally promoted in the STGs in Ghana at national and/or facility levels? If so, since when? How is AMTSL defined in the standards?
- How is the need for AMTSL medicines quantified at national and facility levels?
- Which uterotonic medicine (e.g., oxytocin, ergometrine, or a prostaglandin) is used? How is it stored?
- At the facility level, is enough oxytocin available to allow for routine use of AMTSL?

- What are the major barriers to correct use of AMTSL, as defined by WHO and FIGO/ICM in their Joint Statement on Prevention of Postpartum Hemorrhage?

METHODS

This study is part of multiple country study to assess the practice of AMTSL in facility-based deliveries. The study protocol was first reviewed by the Johns Hopkins Bloomberg School of Public Health (JHSPH) committee for human research for studies conducted in Ethiopia, Tanzania, Indonesia, El Salvador, Honduras, Guatemala, and Nicaragua, and was determined to be exempt from human subjects research because no personal identifiers were collected and the study consisted only of the observation of procedures considered a standard of care. The JHSPH committee did require that informed consent be obtained from pregnant women at admission to the hospital and not in the labor and delivery room. PATH's independent review board deferred to the committee for human subjects research at JHSPH for these initial studies.

In Ghana, the country coordinator together with a team from the Reproductive and Child Health Unit of the Ghana Health Service, reviewed and adapted the proposal and submitted it to the Ghana Health Service Ethical Committee in January 2007. Approval was subsequently given in February 2007. Furthermore, to request hospital participation, a letter endorsing the study from the Ghana Health Service was presented to the directors of all study facilities. Expectant women and health care providers were verbally asked if they could be observed and no signatures were obtained.

Questionnaire Development

The survey team in Ghana reviewed and adapted questionnaires which were used in the global survey. They were developed based on the processes and outcomes identified in the conceptual framework for the study (Figure 1) and also determined the content and number of questionnaires required for the study. In all, three questionnaires were adapted.

- **National-level questionnaire.** This questionnaire captured the policy environment for AMTSL. It includes questions regarding the content of the essential medicines list, STGs, pre- and in-service training curricula, procurement practices for uterotonic medicines and supply, and storage conditions for uterotonic medicines at the central pharmaceutical storage site. Completing this questionnaire required document review, interviews with MoH staff and other policymakers, and a visit to the pharmaceutical storage site. The study's country coordinator administered the national-level questionnaire.
- **Facility-level questionnaire.** This questionnaire captured the policy environment at the individual facility level. It includes questions on the availability of an essential medicine list and STGs in the facility, provision of in-service training (including AMTSL), and the cost of uterotonic medicines to the facility and to patients, access to the facility pharmacy, procurement practices for uterotonic medicines, and supply and storage conditions at the facility. Completing this questionnaire required interviews with hospital administrators, other key personnel at the facility such as staff in charge of the maternity unit and the pharmacist, and a visit to the facility pharmacy. One of the two members of the data collection team completed this questionnaire during their visit to selected facilities.

- **Observation-of-deliveries questionnaire.** This questionnaire documented provider practices during the third stage of labor and the first 30 minutes of the fourth stage of labor for all vaginal deliveries. The questionnaire (Festin et al 2003) documents the availability of uterotonic medicines and other supplies in the unit as well as storage conditions for uterotonic medicines. The data collection team visited selected facilities and completed the questionnaire after observing deliveries.

Training Data Collectors

In close collaboration with the Ghana Health Service, Northern Zonal Coordinator of the Reproductive and Child Health Unit a team of 12 experienced midwives was recruited to administer the facility-level and observation-of-deliveries questionnaires. The country coordinator, assisted by one master trainer for the Safe Motherhood Program, a social scientist, and a public health physician, provided a four-day training (June 11–15, 2007) in Accra. The training involved presentations and discussions on AMTSL, interview and observation technique as part of the data collection process, demonstrations and practice using an anatomical model on AMTSL, review of data collection tools and field practice that provided an opportunity for pre-testing the questionnaires and supervised experience for the data collectors. The results from the pre-test were used to modify the data collection instruments for the field work.

Study Sample

To meet study objectives, the team needed a nationally representative sample of facility-based deliveries. For budgetary and logistical reasons, the sample was restricted to facilities with five or more deliveries per day. As a result, 25 such facilities were selected, representing nine out of the ten regions in Ghana. One facility was excluded because it was not functional at the time of the survey. A team of two data collectors visited each selected health facility for two days. Each data collector observed all deliveries over a 12-hour period on the first and second day, thus ensuring a 24-hour observation for 2 days. The expected number of births in our sample was 254.5, however, a total of 322 deliveries were observed in 24 health facilities during the survey.

Fieldwork

The country coordinator contacted the selected health facilities in advance to get permission for the facility to participate in the study and to ensure that the facilities were well informed prior to the arrival of the data collectors. The data collectors in turn sought permission from the staff in charge of the facility or facility administrator before they began data collection in each facility. The teams ran a 12-hour shift per day in each facility and completed observations over 2 days; this was deemed necessary to maximize the opportunity of observing as many deliveries as possible and also to observe the possible variations of quality of services during the day and night. Each team visited a facility in Accra to enable the study coordinator to closely monitor the initial fieldwork and assist in harmonizing the data collection. The study coordinator subsequently supervised field work by with daily telephone calls to the observers to discuss and solve emerging issues and challenges. Observation of deliveries and in-depth interviews at the facility level started on June 18 and ended on July 10, 2007. Within each team, the senior

member was assigned additional duties of supervision, including initiating contact with hospital administrators and reviewing all completed questionnaires daily.

Data Entry, Quality Control and Analysis

Using Epi Info (version 6), the team adapted data-entry programs developed for the global study to the Ghanaian context. An experienced data manager of the Health Research Unit of the Ghana Health Service led the double data entry and preliminary cleaning process. Final data cleaning was accomplished through a team effort during a data analysis workshop held in Accra (October 22 to November 2, 2007). Data analysis was carried out using STATA statistical software (version 9.2).

Weighted Results

To reduce bias, report results were weighted by correcting for the number of observed deliveries which were not proportional to the number of reported deliveries per year. If the number of deliveries during the observation period was less than the facility's average number of deliveries per day for the entire year, the value was adjusted to match the number of deliveries per day for the entire year. On the other hand, if the number of deliveries during the observation period was greater than the average number of deliveries per day, the value was adjusted downward.

FINDINGS REGARDING NATIONAL AND FACILITY-LEVEL POLICY AND LOGISTICS

This chapter describes the policy environment and logistical support for AMTSL at the national and facility levels.

National Policy Environment

The study team reviewed three main documents to assess the National Policy Environment for AMTSL implementation.

National Reproductive Health Service Protocols

The National Reproductive Health Service Protocols was developed and distributed by the Reproductive and Child Health (RCH) unit of the Ghana Health Service in 1999. This document specifically stipulates AMTSL as routine management. Both oxytocin and ergometrine are indicated in the active management of third stage of labor in the protocol. The steps listed under AMTSL in the protocol are similar to the current FIGO/ICM recommendations for use of oxytocin and ergometrine for the prevention of postpartum hemorrhage.

The AMTSL protocols developed by the Ghanaian RCH unit had a few variations which were endorsed by FIGO, ICM, and WHO. The Ghanaian protocol allows that an oxytocic be given with the delivery of the anterior shoulder or the delivery of the whole baby while FIGO/ICM recommendation is within one minute following delivery of the baby. Secondly, the protocol does not mention uterine massage after delivery of the placenta. The protocol's definition of AMTSL is as follows—

A routine designed to decrease the chance of postpartum hemorrhage and involves giving oxytocin with the delivery of the anterior shoulder or whole baby, early clamping and cutting of cord, and assisted delivery of the placenta through controlled cord traction while supporting or holding the uterus.

The team reviewed the 1999 edition but has subsequently learned that there was a revision of the document in 2004–2005. However, the 2004–2005 version is still in a draft form and is not available to the frontline service providers.

National Standard Treatment Guidelines

The study team reviewed the 2004 national standard treatment guidelines (STGs) on common illnesses prepared by Ghana National Drugs Programme (GNDP) of the Ministry of Health. Management of postpartum hemorrhage is specifically listed among the common obstetric and gynecological illnesses in these manuals.

Ghana EML

The fifth edition (2004) of the Ghanaian EML contains the following medications listed under oxytocic therapeutic class—

- Ergometrine 0.5 mg oral tablets
- Ergometrine 0.5 mg/ml injection
- Oxytocin 5 IU/ml injection
- Misoprostol 200 mcg vaginal tablets

The oral formulations of ergometrine tablets are approved for use at the community level of care while the injections are approved for use at health centers where there is no doctor. Oxytocin injections and misoprostol vaginal tablets are approved for use only from the level of district hospitals² and higher. Specific indications for these medicines are not stated in the EML.

Availability and Storage of Uterotonic Medicines at Central Storage Site

In Ghana, there is a CMS, which procures and distributes medicines including uterotonics to mostly public health facilities. The CMS routinely procures oxytocin and ergometrine. The study team found only supplies of oxytocin 5 IU/ML ampoules available during their visit to the CMS. The manufacturer's recommendation for storage temperature was from 15 to 25°C and away from light. However, at the time of the site visit, oxytocin was stored in the dark at room temperature, the pharmacist present at the time explained that the air conditioner had broken down. There was no ergometrine in stock at the time of visit. The estimate for the quantity of medicines to be procured is based on past consumption quantities.

Table 1. Availability and Storage Conditions for Uterotonic Medicine at the CMS

Storage Conditions	Uterotonic Medicines	
	Oxytocin	Ergometrine
Storage temperature recommended by manufacturer	15–25°C	Not available at the time of visit
Actual storage temperature	Room temperature	
Light conditions recommended by manufacturer	Store away from light	
Actual light conditions	In the dark	
How is quantity of medicine determined for procurement	Based on past consumption	

² The EML provides guidelines on the circulation of essential medicines to specific and appropriate settings and levels of health care delivery: community, health center without doctor, health centre with doctor, district hospital, regional/teaching hospital, specialist medicines, and program medicines.

Pre- and In-Service Training

Pre-Service Training

The pre-service curriculum for nursing and midwifery schools mentions AMTSL but no detailed description was provided. The curriculum for teaching medical students was described as guidelines on major topics to be covered and, as such, is not explicit. Lecturers usually update their teaching materials with new information from the field. A key informant of the medical faculty reported that their current teaching is in line with FIGO/ICM recommendations.

In-Service Training

Of the 24 facilities visited, 16 indicated that their midwives had participated in in-service training that included AMTSL during the year preceding the survey. Nurses and doctors benefited from similar in-service training in 2 and 8 facilities respectively.

Discussion with a zonal reproductive health coordinator suggest that currently in-service training in relation to AMTSL is based on the guidelines specified in the 2004-revised version of the National Reproductive Health Service Protocols developed by the MoH in 1999. The revised document recommends the use of 0.2 mg ergometrine instead of 0.5 mg stated in the 1999 version. However, the new version has yet to be circulated to the frontline service providers.

Facility-Level Environment

In this section, we present findings from interviews conducted with key staff including pharmacist and pharmacy assistants of the facilities visited to document the availability and storage conditions of uterotonic medicines.

Availability of Facility Procurement List

Procurement lists for essential medicines was available in about 80 percent of the facilities visited. All lists mentioned oxytocin and ergometrine, while about half of the facility procurement lists cited misoprostol. Syntometrine was not mentioned in any of the procurement lists.

Table 2. Availability of Procurement List and Inclusion of AMTSL Medicines

Availability of procurement list and the inclusion of AMTSL medicines in the list	Yes/No	Number of facilities (N = 24)	%
Availability of procurement list	Yes	19	79.2
Uterotonic mentioned in the list			
Misoprostol	Yes	11	79.2
Oxytocin	Yes	19	79.2
Ergometrine	Yes	19	0
Syntometrine	Yes	0	41.7

Availability of AMTSL-Specific Clinical Guidelines

A variety of clinical guidelines were available in the health facilities visited. These included the National Reproductive Health Service Protocols, Life Saving Skills Manual for Midwives, Managing Complications in Pregnancy and Childbirth, and AMTSL Guidelines. Table 3 demonstrates the availability of guidelines for delivery at the facility level and the components of AMTSL specifically mentioned in the guidelines. Approximately 58 percent of facilities visited had clinical guidelines available at the time of visit and 50 percent of the facilities had guidelines which specifically mentioned AMTSL.

A third of the guidelines examined at the facility level mention other practices such as immediate cord clamping (29 percent), immediate examination of the placenta (13 percent), putting baby to the breast (4 percent) and palpation to rule out the presence of another baby (4 percent).

A number of facilities also had quick-reference treatment guidelines on various topics under labor and delivery including AMTSL which were either developed at the facility level or adapted from other sources. These were usually pasted on the walls in the labor ward for easy reference.

Table 3. Availability of Clinical Guidelines for Delivery in Facilities and Inclusion of AMTSL Practices in the Guidelines

AMTSL in the guidelines	%	N = 24
Availability of guidelines		
Available	58.3	14
Not available	41.7	10
AMTSL specifically cited in the guidelines		
Yes	50.0	12
No	8.3	2
N/A	41.7	10
10 IU oxytocin mentioned in the guidelines		
Yes	33.3	8
No	16.7	4
N/A	50.0	12
One minute after delivery of baby mentioned in the guidelines		
Yes	33.3	8
No	16.7	4
N/A	50.0	12
Timing of uterotonic administration mentioned in the guidelines		
Yes	16.7	4
No	33.3	8
N/A	50.0	12
Controlled cord traction mentioned in the guidelines		
Yes	50.0	12
No	0.0	0
N/A	50.0	12
Manual support to uterus mentioned in the guidelines		
Yes	45.8	11
No	4.2	1
N/A	50.0	12
Fundal massage immediately after delivery of placenta		
Yes	33.3	8
No	16.7	4
N/A	50.0	12
Palpation/massage for 2 hours mentioned in the guidelines		
Yes	29.2	7
No	20.8	5
N/A	50.0	12

Accessibility of the Pharmacy and Pharmaceuticals at the Facility Level

All of the 24 health facilities visited had pharmacies located on the premises. Almost all of the pharmacies set aside enough medicines and supplies for the next day with the exception of two that operated a 24-hour service. None of the facilities visited required women or their relatives to purchase any supplies or medicines for delivery themselves.

Oxytocin and ergometrine are routinely procured in all facilities visited while misoprostol is routinely procured in half of the facilities visited. At the time of the survey, oxytocin was available in all but one facility pharmacy although it was available in all the labor and delivery wards.

Ergometrine was available in all 24 facilities while misoprostol was found in only 12 of the 24 facilities. Only one facility reported a stock-out of oxytocin for three days during the three-month period prior to the study. Reasons given for the stock-out include delay of supply, not requesting order on time, and supplier sending less than the amount ordered.

Almost all the facilities surveyed reported that the estimates for future needs for uterotonic medicines are based on previous consumption.

The purchase price of uterotonics for the health facilities varied considerably. Misoprostol is the most expensive uterotonic. The average cost of oxytocin (10 IU/ml) and ergometrine (0.5 mg/ml) was 0.15 Ghana cedis (GHC) (0.15 U.S. dollar [USD]) and GHC 0.18 (USD 0.18) per ampoule respectively while misoprostol (200 mcg) was 0.50 (USD 0.52) per tablet. Oxytocin and ergometrine were sold at an average cost of GHC 0.24 (USD 0.24) and GHC 0.27 (USD 0.27) per ampoule to the patient. Misoprostol was the most expensive at GHC 1.21 (USD 1.25) per tablet ranging from GHC 0.50 (USD 0.52) to GHC 6.50 (USD 6.70).

Table 4. Uterotonic Procurement and Availability

	Oxytocin	Ergometrine	Misoprostol
	Facilities, % (N = 24)	Facilities, % (N = 24)	Facilities, % (N = 24)
Medicine routinely procured			
• Yes	100.0	100.0	50.0
• No	0.0	0.0	50.0
Medicine available on visit			
• Yes	95.8	100.0	50.0
• No	4.2	0.0	50.0
How quantity of medicine is determined:			
• Based on consumption	83.3	87.5	50.0
• Standard quantity central level	0.0	0.0	0.0
• Standard quantity perpetual need	8.3	8.3	0.0
• Fixed quantity ordering form	4.2	4.2	0.0
• Other	0.0	0.0	0.0
• Not applicable	4.2	0.0	50.0
Months covered with available stock			
• <1 month	29.2	25.0	8.3
• 1–3 months	45.8	25.0	8.3
• 4–6 months	12.5	12.5	4.2
• Greater than 6 months	4.2	33.3	16.7
• Missing	4.2	4.2	4.2
• Not applicable	4.2	-	50.0
• No information	-	-	8.3
Number consumed last 3 months			
• 1–500	12.5	75.0	37.5
• 501–1999	70.8	20.8	4.2
• 2000+	4.2	0.0	4.2
• Not applicable	0.0	0.0	50.0
• No information	4.2	4.2	4.2
Days out of stock over last 3 months			
• 0 days	95.8	100.0	50.0
• 3 days	4.2	0.0	0.0
• Not applicable	0.0	0.0	50.0
Reasons out of stock			
• Could not pick up supply from supplier	0.0	0.0	0.0
• Supplier sent less than the amount ordered	0.0	0.0	0.0
• Supply delayed	4.2	0.0	0.0
• Consumption was greater than expected	0.0	0.0	0.0
• Order request was incorrect	0.0	0.0	0.0
• Order was not requested on time	4.2	0.0	0.0
• Not applicable	95.8	100.0	100.0

Average price in GHC per ampoule/tablet (range)	Facility	Patient	Facility	Patient	Facility	Patient
	0.15 (0.02– 0.30)	0.24 (0.12– 0.50)	0.18 (0.1– 0.30)	0.27 (0.12– 0.50)	0.50 (0.42– 0.60)	1.21 (0.50– 6.50)
In USD (range)	0.15 (0.02– 0.30)	0.24 (0.12– 0.50)	0.18 (0.1– 0.30)	0.27 (0.12 – 0.50)	0.50 (0.42– 0.60)	1.21 (0.50– 6.50)

Storage Conditions for Uterotonic Medicines at the Facility Level

There was a wide variation in the manufacturer’s storage recommendations for oxytocin. In half of the facilities (50 percent), the storage recommendation for oxytocin was *to store in a cool dry place* (described as other in table 5 below); in 17 percent of facilities the recommendation was from 15°C to 25°C. In certain facilities the manufacturer’s storage recommendation for oxytocin was less than 15°C and at room temperature respectively. The average room temperature in Ghana (July-September) ranges from 21°C to 32°C.³

In 75 percent of the facilities visited, the manufacturer’s storage recommendation for oxytocin was that it should be stored away from direct light. There was no indication regarding light conditions in 8.3 percent of facilities and the recommendation in 12.5 percent facilities was to store in a dark place. For ergometrine, the recommended storage temperature and light conditions in almost all the facilities (96 percent) was from 2°C to 8°C and away from direct light.

There were differences in the actual storage temperature conditions for oxytocin and ergometrine. The storage temperature was determined by readings on the storage area thermometers where available or from reports of the officer present at the time of visit. Twenty-one percent of the facilities stored oxytocin between 2°C and 8°C, while 29 percent stored the medicines at between 15 °C to 25°C. A fifth of the facilities stored oxytocin at room temperature. Half of the facilities stored ergometrine at temperatures below 15°C and 21 percent stored it between 15°C to 25°C, while about 13 percent stored oxytocin at room temperature. In terms of storage light conditions, both oxytocin and ergometrine were kept in the dark or stored away from direct sunlight (table 5).

There was a variation in the manufacturers’ recommendations for storage temperature—between (13 percent) and room temperature (13 percent). Other recommended temperatures were below or above 30°C. Misoprostol was stored at room temperature in about a third of facilities and between 15°C to 25°C in about 13 percent facilities.

Manufacturers’ recommendations on lighting storage conditions were not stated in about a fifth of the facilities visited while in about a third of facilities manufacturers recommended storage away from light. In all facilities, misoprostol was stored in the dark or away from direct sun.

³ <http://www.nationsencyclopedia.com/Africa/Ghana-CLIMATE.html>

Table 5. Distribution of Uterotonic Medicines by Manufacturer Recommendation and Actual Storage

Storage Conditions		Uterotonic Medicines		
		Facilities with oxytocin, % N = 24	Facilities with ergometrine, % N = 24	Facilities with misoprostol, % N = 24
Storage temperature recommended by manufacturer	• 2–8°C	0.0	95.8	0.0
	• <15°C	16.7	0.0	0.0
	• 15–25°C	16.7	0.0	12.5
	• Room temperature	4.2	0.0	12.5
	• Not located	8.3	4.2	0.0
	• Other	*50.0	0.0	**25.0
	• Not applicable	4.2	0.0	50.0
Light conditions recommended by manufacturer	• Not stated	8.3	0.0	20.8
	• Store away from light	75.0	95.8	29.2
	• Not located	0.0	4.2	0.0
	• Other	12.5	0.0	0.0
	• Not applicable	4.2	0.0	50.0
Storage temperature which medicine is actually stored:	• 2–8°C	20.8	41.7	0.0
	• <15°C	12.5	8.3	4.2
	• 15–25°C	29.2	20.8	12.5
	• Room temperature	20.8	12.5	29.2
	• Not located	0.0	0.0	4.2
	• Other	12.5	16.7	0.0
	• Not applicable	4.2	0.0	50.0
Light conditions which medicine is actually stored	• Kept in dark	62.5	75.0	12.5
	• In daylight, away from sun	33.3	25.0	29.2
	• Indirect sunlight	0.0	0.0	0.0
	• Other	0.0	0.0	8.3
	• Not applicable	4.2	0.0	50.0

* Cool Place – 45.8%; 2-20°C – 4.2%; ** 30°C or below

FINDINGS REGARDING THE MANAGEMENT OF THE THIRD STAGE OF LABOR

The principal objectives of the study were to measure the use of AMTSL according to FIGO/ICM criteria and to measure the current practices regarding the management of the third and fourth stages of labor outside this definition. This section describes the management of the third and fourth stages of labor, focusing on—

- The overall use of uterotonic medicines
- The timing, mode of administration, and dose of these medicines
- The correct use of AMTSL
- The practices in use of the individual components of AMTSL
- The observation of potentially harmful practices

Study Sample

The study team observed a total of 322 deliveries in 24 health facilities. Table 6 provides an overview of these facilities and the women who delivered there.

Most of the observed deliveries occurred in district hospitals; about one fifth were in regional hospitals and the rest were in teaching hospitals, polyclinics, health centers, and maternity homes. As a result of the sampling procedure that restricted the selection of facilities to those with at least 5 deliveries per day, only facilities in 9 out of the 10 regions were sampled.

About two thirds of the observations were observed in facilities with more than 2,000 deliveries per year. More than half of the observed deliveries were in the Greater Accra (39 percent) and Eastern (21 percent) regions.

The study teams observed a diverse category of health providers. Midwives were responsible for more than nine out of every ten (96 percent) observed deliveries, with obstetricians and other categories of physicians each attending to about two percent each of the observed deliveries. Uncertified midwives (these comprised of midwifery students and those on orientation after their midwifery course and ward assistant) were responsible for approximately 3 percent of observed deliveries.

The observed deliveries were mainly among women aged 20–34 years (75 percent). Thirty-six percent of the deliveries occurred among primiparous (first pregnancy) women and about 6 percent of the deliveries were by women with five or more deliveries. Almost all the observed deliveries were spontaneous (95 percent). In 18 percent of deliveries, the women received an uterotonic medicine prior to the third stage; 4 percent received a uterotonic for induction and 14 percent for augmentation, respectively.

In all the deliveries we observed, women received an uterotonic medication during the third or fourth stage. Oxytocin was used in the majority of deliveries (81 percent); 4 percent received ergometrine only and 14 percent received both oxytocin and ergometrine. Combination

medicines such as syntometrine and prostaglandins such as misoprostol were not used at all during the third or fourth stage.

Table 6: Distribution of Observed Deliveries by Facility and Mother Characteristics

Facility characteristics	%	N = 322
Type of facility		
• Teaching hospital	6.04	19.46
• Regional hospital	22.11	71.19
• District hospital	57.16	184.05
• Health Center	0.63	2.02
• Maternity home	3.38	10.87
• Other hospital	6.98	22.49
• Polyclinic	3.70	11.92
Deliveries per year		
0-999	0.9	6.45
1000-1999	28.6	81.23
2000+	70.5	234.33
Time of deliveries (hrs)		
• Morning	21.51	69.27
• Afternoon	30.82	99.24
• Evening	47.67	153.49
Region		
Greater Accra	39.40	126.87
Eastern	20.78	66.90
Northern	6.04	19.46
Upper West	3.17	10.21
Upper East	6.80	21.90
Brong Ahafo	6.60	21.25
Ashanti	9.02	29.05
Western	4.75	15.30
Central	3.43	11.06
Authority		
Government	69.06	222.36
Quasi-government	6.98	22.49
Mission	23.96	77.15
Provider qualification		
• Obstetrician	0.61	1.95
• Other physician	0.68	2.17
• Midwife	95.84	308.62
• Nurse	0.32	1.02
• Others	2.56	8.23
Area		
• Urban	95.72	308.23
• Rural	4.28	13.77
More than one assistant during delivery		
• Yes	82.77	266.52
• No	17.23	55.48

Mother's characteristics	%	N = 322
Mother's age (years)		
<20	11.69	37.65
20–34	75.21	242.16
35+	13.10	42.12
Parity		
0	36.86	118.70
1-4	56.74	182.72
5+	6.39	20.59
Gravidity		
1	34.24	110.25
2-4	52.99	170.63
5+	12.77	41.13
Received uterotonic medicines prior to third stage of labor		
For induction	4.60	14.82
For augmentation	14.19	45.71
No medicines prior to 3rd stage	81.20	261.48
Type of labor		
Spontaneous	95.4	307.18
Induced	4.6	14.82
Received uterotonic medicines at 3rd or 4th stage of labor		
Oxytocin only	81.37	262.00
Ergometrine only	4.28	13.77
Oxytocin and ergometrine	14.36	46.24

Components of AMSTL Use

The components of AMTSL promoted by FIGO/ICM and observed during deliveries include the following—

1. Administration of 10 IU of oxytocin (the medicine of choice) via (IM) one minute following the delivery of the fetus. In cases where oxytocin is not available, 0.2 mg of ergometrine IM is recommended.
2. Controlled cord traction.
3. Immediate uterine massage following delivery of the placenta and palpation of the uterus to assess the need for continued massage every 15 minutes over the next 2 hours.

For this study, we consider the criteria for correct use of AMTSL to include all three elements of the FIGO/ICM recommendation for AMTSL. However, the results presented also take into consideration two additional definitions of AMTSL as follows—

- Definition B includes all elements listed in the FIGO/ICM recommendation of AMTSL with a variation in the timing of the administration of the uterotonic medicine, which is extended to within three minutes of the delivery of the baby.
- Definition C includes all elements of the FIGO/ICM recommendation but considers the correct dose of ergometrine as 0.5 mg as recommended in the 1999 edition of the National Reproductive Health Service Protocols in contrast to the ICM/FIGO recommendation of 0.2 mg

Use of Uterotonic Medications

The first component of AMTSL is the administration of a uterotonic medication and for this to be considered as having taken place, four criteria need to be met. These are—

1. Correct mode of administration—the uterotonic medication must be administered IIM. If labor has been induced or augmented, then administration via IM injection, intravenous drip, or intravenous push are all considered correct.
2. Correct dose—10 IU of oxytocin or 0.2 mg of ergometrine
3. Correct stage of labor—the uterotonic medication should be administered after the delivery of the baby and before the delivery of the placenta
4. Correct timing—the uterotonic medication should be given within one minute following the delivery of the baby

All the women in the observed deliveries received an uterotonic medication during the third and fourth stage of labor. Table 7 shows the percentage of deliveries in which the uterotonic medications were correctly used. Although all deliveries received an uterotonic medication during the third or fourth stage of labor only about 16 percent of deliveries received an uterotonic medication correctly for the purpose of AMTSL according to FIGO standards. This figure increased to about 37 percent when the uterotonic was administered within three minutes of the delivery of the baby. The proper dose of oxytocin given at the correct stage of administration was observed in approximately 70 and 67 percent of observed deliveries, respectively.

Table 7. Deliveries with Correct Use of Uterotonics for AMTSL Purposes

	N = 322	%
Mode of administration		
Oxytocin users by IM	240.58	74.7
Oxytocin users (labor induced)	.83	.3
Oxytocin users (labor augmented)	3.82	1.2
Ergometrine users by IM	19.49	6.1
Incorrect administration	57.29	17.8
Dose by FIGO standards		
Correct dose(10 IU for oxytocin users)	229.20	71.2
Incorrect dose	92.80	28.8
Dose by Ghana standards		

Findings Regarding the Management of the Third Stage of Labor

Correct dose		
10 IU for oxytocin users	229.20	71.2
0.5 mg for ergometrine users	39.48	12.3
Incorrect dose	53.32	16.6
Stage of administration		
Correct stage (after delivery of baby)	215.55	66.9
Incorrect stage	106.45	33.1
Time of administration		
Correct time (<=1 minute after delivery of fetus)	63.91	19.9
Correct time (1–3 minutes after delivery of fetus)	145.59	45.2
Incorrect time	112.49	34.9
Uterotonic utilization by FIGO standards		
Correct utilization (<=1 minute)	52.59	16.3
Correct utilization (1–3 minutes)	119.07	37.0
Incorrect utilization/no utilization	150.34	46.7
Uterotonic utilization by Ghana standards		
Correct utilization (<=1 minute)	60.09	18.7
Correct utilization (1–3 minutes)	136.01	42.2
Incorrect utilization/no utilization	125.90	39.1

Table 8 below shows the percent of deliveries in which uterotonics were used at some point during the third and fourth stage of labor by characteristics of the woman and the facility. Women were more likely to receive oxytocin (81 percent) than ergometrine only (4 percent) or both (14 percent). With the exception of women delivering in the health center, polyclinic, and maternity homes, all other women received ergometrine only or with oxytocin. The use of ergometrine only was slightly higher among women with numerous children (8 percent) and numerous pregnancies (10 percent). Women delivering in urban and government facilities were more likely to receive oxytocin only compared to women delivering in rural, or quasi-governmental or mission facilities. Exclusive use of oxytocin (100 percent) was observed in one region (Brong Ahafo); in another region (Upper East), women were more likely to receive oxytocin together with ergometrine (95 percent).

Table 8. Use of Uterotonic Medications During Labor (third and fourth stage) and the Immediate Postpartum Period by Characteristics of Mother and Facility

	Oxytocin only, %	Ergometrine only, %	Oxytocin and ergometrine, (%)	Total, %	Number	P
Total	81.4	4.3	14.4	100	322	
Age of woman						
<20 years	72.7	7.4	19.9	100	37.65	0.499
20–34 years	81.6	4.1	14.4	100	242.2	
35+ years	88.1	2.7	9.2	100	42.19	
Parity						
0	82.4	5.5	12.1	100	118.7	0.434
1–4	80.0	3.1	16.9	100	182.7	
5+	87.5	8.0	4.4	100	20.6	
Gravidity						
1	82.9	4.0	13.1	100	110.2	0.457
2–4	81.3	3.0	15.7	100	170.6	
5+	77.3	10.3	12.3	100	41.1	
Day of delivery						
Sunday	91.8	0.0	8.2	100	12.4	0.718
Monday	72.1	4.3	23.6	100	39.5	
Tuesday	86.3	3.7	10.0	100	71.4	
Wednesday	78.3	7.5	14.2	100	71.5	
Thursday	75.1	7.3	17.6	100	55.2	
Friday	80.7	0.0	19.3	100	41.1	
Saturday	96.7	0.0	3.3	100	31.0	
Time of birth						
0–7.59	79.8	6.5	13.7	100	99.7	0.656
8–13	78.2	3.0	18.8	100	69.3	
13.0–20	84.2	2.9	13.0	100	99.2	
20.0–24	83.1	4.4	12.5	100	53.8	
Type of facility						
Teaching hospital	94.7	0.0	5.3	100	19.5	0.974
Regional hospital	84.6	0.0	15.4	100	71.2	
District hospital	78.2	6.6	15.2	100	184.0	
Health center	100.0	0.0	0.0	100	2.0	
Maternity home	100.0	0.0	0.0	100	10.9	
Other hospital	65.2	7.0	27.8	100	22.5	
Polyclinic	100.0	0.0	0.0	100	11.9	
Provider qualification						
Obstetrician	100.0	0.0	0.0	100	2.0	0.950
Other physician	100.0	0.0	0.0	100	2.2	
Midwife	80.9	4.5	14.7	100	308.6	
Nurse	100.0	0.0	0.0	100	1.0	
Others	88.5	0.0	11.5	100	8.2	
Region						
Greater Accra	91.2	1.2	7.6	100	126.9	0.064
Eastern	85.2	8.1	6.8	100	66.9	
Northern	94.7	0.0	5.3	100	19.5	
Upper West	90.9	0.0	9.1	100	10.2	
Upper East	0.0	5.4	94.6	100	21.9	

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Brong Ahafo	100.0	0.0	0.0	100	21.3	
Ashanti	79.1	0.0	20.9	100	29.1	
Western	56.7	36.6	6.7	100	15.3	
Central	78.6	0.0	21.4	100	11.1	
Area						
Urban	83.5	2.7	13.9	100	308.2	0.002
Rural	34.7	40.7	24.6	100	13.8	
Deliveries per year						
0-999	100.0	0.0	0.0	100	6.5	0.037
1000–1999	57.7	14.5	27.8	100	81.2	
2000+	89.1	0.9	10.1	100	234.3	
Authority						
Government	87.4	2.1	10.5	100	222.4	0.469
Quasi-government	65.2	7.0	27.8	100	22.5	
Mission	68.6	9.9	21.5	100	77.2	

In most of the deliveries observed, oxytocin was administered via intramuscular injection (74 percent) after delivery of the baby as recommended. Ergometrine was administered after the delivery of the placenta via the IM route. Ten IU of oxytocin was administered in seventy percent of all the deliveries according to the FIGO/ICM dosage recommendations. In almost all the deliveries receiving ergometrine, the dosage administered was 0.5 mg contrary to the FIGO/ICM dosage recommendation but following the recommendation by the Ghana Reproductive Health Service protocols.

Table 9 presents the distribution of observed deliveries by the timing, mode of administration, and dose of uterotonic medications.

Table 9: Timing, Mode of Administration, and Dose of Uterotonic Medicines

	Among deliveries receiving oxytocin only		Among deliveries receiving ergometrine only	
Timing of administration, %				
During delivery of the baby		11.60		0.0
After delivery of the baby		64.94		4.34
During delivery of the placenta		4.55		0.99
After delivery of the placenta		1.70		13.30
Other		12.93		0.0
Not applicable		4.28		81.37
Total		100.0		100.0
Mode of administration, %				
IM*		74.71		17.74
IV** push/injection		1.11		0.46
IV drip		1.12		0.15
IM and IV drip		18.79		0.28
Not applicable		4.28		81.37
Total		100.0		100.0
Dose, %				
Dose	5 IU	6.03	0.5 mg	17.98
Dose	10 IU	71.18	1 mg	0.37
Dose	11-29 IU	6.46	1.5 mg	0.28
Dose	30+ IU	12.05	-	-
Not applicable				81.37
Total		100.0		100.0
Number		322		322

*IM = intramuscular administration; **IV = intravenous administration.

Controlled Cord Traction and Uterine Massage

For the purpose of this study, controlled cord traction is defined as the application of gentle traction of the umbilical cord, with upward, manual support of the uterus, as a means of delivering the placenta. Study data collectors observing the deliveries could not realistically determine if this action was done only after the uterus started to contract as specified in the FIGO/ICM recommendation. However, controlled cord traction was observed in 85 percent of the 322 deliveries which featured in the study.

Overall, only 27 percent of all deliveries benefited from immediate uterine massage following the delivery of placenta and palpation of the uterus at least two times following the delivery of the placenta (table 10).

Table 10. Application of Controlled Cord Traction and Uterine Massage

	N=322	%
Controlled cord contraction		
Traction applied to the cord while awaiting placenta with uterus supported		
Yes	272.27	84.6
No	49.73	15.5
Massage and palpation		
Immediate massage and palpation of uterus		
Yes	87.18	27.1
No	234.82	72.9

Use of AMTSL

For the purpose of this study, three definitions of AMTSL are considered. Nevertheless, the definition endorsed jointly by FIGO, ICM, and WHO is considered the global standard for AMTSL.

- **Definition A**—This is the FIGO/ICM definition, which involves administration of 10 IU of oxytocin/ergometrine within 1 minute following the delivery of the fetus, controlled cord traction, immediate uterine massage following delivery of the placenta, and palpation of uterus every 15 minutes.
- **Definition B**—This is based on the same criteria as A but considers a less restrictive timing for the administration of the uterotonic medication with an extension to within three minutes of the delivery of the baby.
- **Definition C**—This is based on the same criteria as A but considers the dose of ergometrine as 0.5mg as recommended in the Ghana National Reproductive Health Service protocols.

Overall, 3 percent of observed deliveries received AMTSL according to the FIGO/ICM definition, i.e., the correct dose of medicine was given at the appropriate stage of labor and within one minute of the delivery. The percentage increases to about 16 percent when using the definition allowing administration of uterotonic medication within 3 minutes of delivery of baby.

Applying the recommendation in the Ghana National Reproductive Health Service protocols of 0.5mg of ergometrine within 1 minute of delivery of the baby gives approximately 5 percent correct use of AMTSL and about 21 percent when the time of administration is extended to within 3 minutes after delivery of baby.

Table 11 provides the percentage of observed deliveries receiving correct AMTSL based on preceding definitions.

Table 11. Percent of Observed Deliveries Receiving Correct AMTSL

	N = 322	%
Practice of AMTSL ≤1 MIN		
AMTSL by FIGO standard		
Correct practice of AMTSL	10.26	3.2
Incorrect practice of AMTSL	311.74	96.8
AMTSL by Ghana standard		
Correct practice of AMTSL	15.66	4.7
Incorrect practice of AMTSL	306.34	95.2
Practice of AMTSL ≤3 MIN		
AMTSL by FIGO standard		
Correct practice of AMTSL	50.90	15.8
Incorrect practice of AMTSL	271.09	84.2
AMTSL by Ghana standard		
Correct practice of AMTSL	67.38	20.9
Incorrect practice of AMTSL	254.62	79.1

As shown in table 12, the differences observed in the correct use of AMTSL by various characteristics of the mother and facility were not statistically significant.

Table 12. Deliveries Using AMSTL by Characteristics of Facility and Mother

Characteristics	% Correct AMSTL	N	Total	P
Area				0.744
Urban	3.33	10.26	308.2	
Rural	0.0	0.0	13.77	
Total	3.19	10.26	322	
Day of delivery				0.575
Sunday	0.0	0.0	12.42	
Monday	2.35	0.93	39.47	
Tuesday	6.82	4.87	71.39	
Wednesday	1.43	1.02	71.46	
Thursday	2.02	1.11	55.15	
Friday	2.26	0.93	41.06	
Saturday	4.49	1.39	31.04	
Total	3.19	10.26	322	
Time of delivery				0.454
Morning	4.16	2.88	69.27	
Afternoon	2.44	2.42	99.24	
Night	3.23	4.96	153.5	
Total	3.19	10.26	322	
Age of woman				0.852
<20	3.70	1.39	37.65	
20–34	2.89	7.01	242.2	
35 +	4.40	1.86	42.19	
Total	3.19	10.26	322	
Parity				0.803
0	2.82	3.35	118.70	
1–4	3.27	5.98	182.70	
5+	4.51	0.93	20.59	
Total	3.19	10.26	322	
Gravidy				0.793
1	3.04	3.35	110.2	
2–4	3.51	5.98	170.6	
5+	2.26	0.93	41.13	
Total	3.19	10.26	322	
Type of Facility				0.609
Teaching hospital	10.53	2.05	19.46	
Regional hospital	9.97	7.10	71.19	
District hospital	0.60	1.11	184.00	
Health center	0.0	0	2.02	
Maternity home	0.0	0	10.87	
Other hospital	0.0	0	22.49	
Polyclinic	0.0	0	11.92	
Total	3.19	10.26	322	
Qualification of provider				0.968
Obstetrician	0.0	0.0	1.95	
Other physician	0.0	0.0	2.17	
Midwife	3.32	10.26	308.60	
Nurse	0.0	0.0	1.02	
Others	0.0	0.0	8.23	
Total	3.19	10.26	322	

Factors which serve as barriers to the correct use of AMTSL

In all the deliveries observed in this study, an uterotonic medication was administered while controlled cord traction and immediate uterine massage and palpation was done in 85 and 27 percent of observed deliveries, respectively. However, the correct use of AMTSL is relatively low.

The use of AMTSL decreases incrementally as each restriction regarding timing, administration mode, oxytocin dose, and controlled cord traction and massage are taken into consideration as part of the definition, although no single practice accounts for the decrease from approximately 82 percent of deliveries benefiting from the correct mode of administration of an uterotonic medication to approximately 3 and 5 percent to meet the criteria for the correct use of AMTSL as endorsed by the FIGO/ICM and Ghana standards respectively.

Figure 2 provides an overview of the individual components which contribute to a high incidence of improper use of the correct AMTSL practice.

The information in Figure 2 is expected to assist in the identification of barriers to the proper use of AMTSL as a way highlighting where efforts should be channeled to improve the compliance with the use of AMTSL.

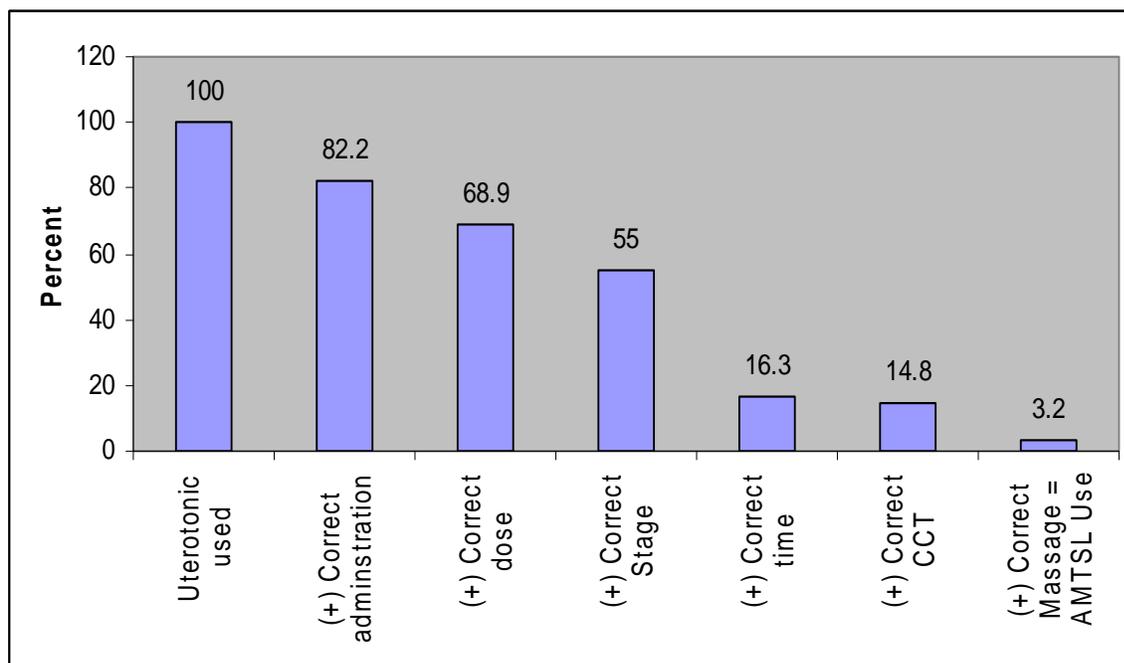


Figure 2. Percent of deliveries with components of AMTSL

Patterns of Cord Clamping

According to FIGO/ICM definition, immediate cord clamping is not an element of AMTSL and debate continues about the ideal timing for cord clamping for maximum benefit to mother and baby. Table 13 shows that in 67 percent of observed deliveries, cord clamping occurred in less than one minute.

Table 13. Time Elapsed Between the Delivery of the Baby and Cord Clamping

Time	% of cases	N
Less or equal to 1 minute	67.2	216.25
More than 1 minute but less or equal to 2 minutes	29.3	94.32
More than 2 minutes	3.6	11.43
Total	100	322

Duration of the Third Stage of Labor

Table 14 shows the average duration of the third stage of labor in relation to AMTSL practice using both the strict and relaxed definitions. When AMTSL is correctly practiced according to FIGO/ICM standards, the average duration is significantly shorter (3.71 minutes, 95% CI, 1.69–5.72) than when AMTSL was not practiced (7.20, 95% CI, 6.01–8.39). We observe the same pattern when we apply the Ghana standards.

Table 14. Average Duration of the Third Stage of labor Among Deliveries With and Without Use of AMTSL

Use of AMTSL	Average duration of third stage of labor	95% confidence intervals	n	P value
Definition (FIGO STANDARD)				
Administration of 10 IU of oxytocin/ergometrine <u>within 1 minute</u> following the delivery of the fetus, controlled cord traction, immediate uterine massage following delivery of the placenta and palpation of uterus every 15 minutes.				
Use of AMTSL	3.71 minutes	1.69–5.72	10.26	0.004
Non-use of AMTSL	7.20 minutes	6.01–8.39	311.70	
Definition (GHANA STANDARD)				
Administration of 10 IU of oxytocin/ergometrine <u>within 1 minute</u> following the delivery of the fetus, controlled cord traction, immediate uterine massage following delivery of the placenta and palpation of uterus every 15 minutes.				
Use of AMTSL	4.11 minutes	2.59–5.63	15.66	0.002
Non-use of AMTSL	7.24 minutes	6.05–8.44	306.30	

Potentially Harmful Practices

This study also identified potentially harmful practices such as the application of fundal pressure during delivery of placenta (21 percent), performing uterine massage while awaiting delivery of

the placenta (22 percent) and application of traction without counter pressure (10 percent). All of these practices can increase the risk of PPH or cause problems such as uterine inversion.

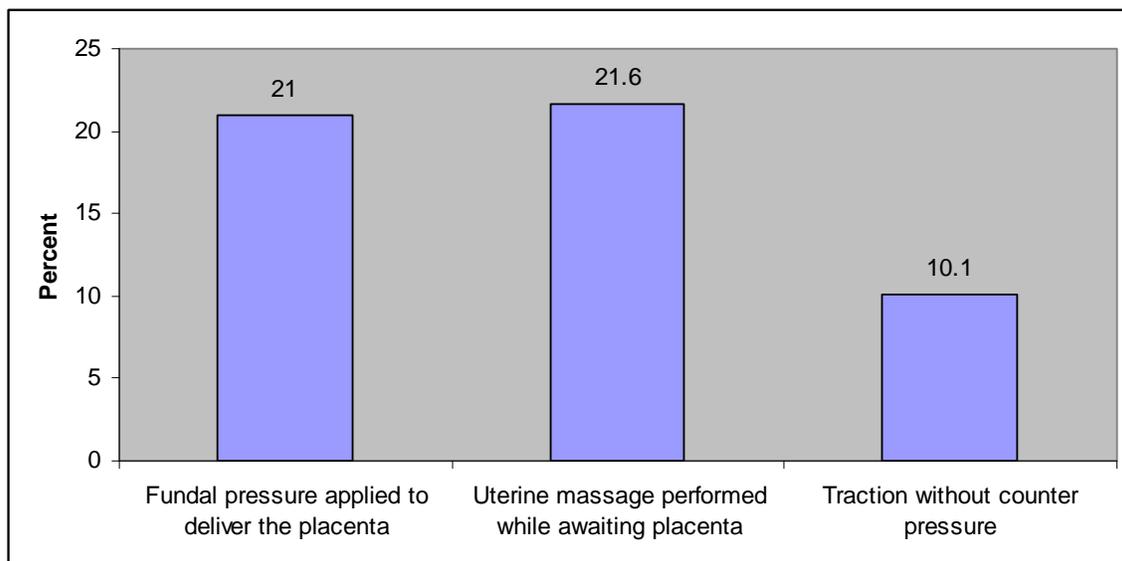


Figure 3. Potential harmful practice observed during delivery

CONCLUSIONS AND RECOMMENDATIONS

The aim of this study was to document the practices during the third and fourth stages of labor through a nationally representative sample in Ghana. It also assessed the policy environment for the practice of AMTSL.

The results illustrate that in all the deliveries observed, women received an uterotonic medication during the third or fourth stages of labor. Oxytocin was used in more than about 80 percent of the deliveries, and ergometrine was used singly (4 percent) or together with oxytocin (14 percent).

Three definitions of AMTSL were considered for this study—the first, endorsed by FIGO, ICM, and WHO, involves the administration of an uterotonic medication within one minute following the birth of the baby. The second definition allows for the administration of the uterotonic within up to three minutes after the delivery of the baby; the third, based on the recommendations which appear in the National Reproductive Health Service protocol, takes into consideration the administration of a 0.5 mg dose of ergometrine.

In spite of (and probably because of) the existence of these three definitions of AMTSL, there is still a high incidence of improper use of AMTSL. Three percent of deliveries comply with the strict FIGO/ICM standard, approximately five percent with the Ghana standard, with an increase to 16 percent and 21 percent with the more relaxed definitions, respectively.

Several practices account for the relatively low use of AMTSL. These include the delayed administration of oxytocin following the delivery of the baby fetus, lack of controlled cord traction, and lack of uterine massage immediately following delivery of the placenta.

The study also documented certain potentially harmful practices carried out during delivery. They include the application of fundal pressure and uterine massage while awaiting delivery of the placenta, and application of traction without counter pressure. These practices were observed in about 20 percent of deliveries observed.

The national policy environment is favorable for the practice of AMTSL. The National Reproductive Health Service protocols promote and provide clear guidelines on AMTSL. These guidelines include the medicine used (oxytocin or ergometrine) and cord traction but do not provide any guidance on uterine massage following delivery of placenta. The current version is being revised to reflect the FIGO/ICM recommendations. Considering the fact that a wide range of guidelines were being followed at the facility level (some of which do not describe all the components of AMTSL), it is essential that the revised document is made available to providers at the facility level.

Oxytocin, ergometrine, and misoprostol are listed as uterotonic medicines in the Essential Medicines List, however only oxytocin and ergometrine are procured routinely by the Central Medical Stores (CMS). Although, misoprostol is not routinely procured by the CMS, it was available in 50 percent of facilities visited.

At the facilities visited, there was a wide variation of storage recommendations for uterotonic medications, especially in terms of temperature and light. This indicates that there are a number of procurement sources for these uterotonic medications in Ghana. One facility documented a stock-out of oxytocin for a three-month period before the survey was conducted.

Recommendations

The research team proposes the following recommendations based on the results of this study and input from stakeholders at a dissemination meeting held February 4, 2008 in Accra.

Policy

The following recommendations are expected to improve policy issues with regards to the practice of AMTSL—

- The Reproductive Health Service protocols should be updated to reflect the FIGO/ICM recommendations
- The Reproductive and Child Health Unit of the Ghana Health Service should advocate for the use of misoprostol for AMTSL at community level
- There should be additional efforts to ensure the availability of updated service protocols for all frontline providers nationwide at public and private health institutions
- There should be a revision of the pre-service curriculum on AMTSL by statutory and regulatory bodies such as Nurses and Midwives' Council
- Standard pre-service and in-service training materials should be developed and included in the training of physicians and midwives and community health nurses training schools
- A mechanism needs to be established to communicate the need to include AMTSL in every reproductive health training initiative in the country

Provider Practice

The following recommendations are expected to improve the quality of AMTSL practice—

- Provide practice-based AMSTL training to health care providers to improve knowledge and skills; priority should be given to front-line providers.
- Provide regular updates including logistics management to health care providers to improve skills and performance for clinical preceptors and tutors of training institutions.
- Identify and address barriers to the proper use of the intervention to ensure the continued use of AMTSL among trained providers

- Develop a mechanism for informing public and private providers about updates and changes in protocols for prevention and treatment of PPH
- Clinicians, managers, and pharmacists should collaborate to ensure and maintain adequate supply and management of medicines needed for AMTSL
- Institute mandatory audits of provider practice of AMTSL to ensure quality of care.
- Ensure regular supportive supervision and monitoring of providers

Logistics

The following recommendations are expected to improve the management of medications used for AMTSL—

- Develop and distribute job aids and posters which provide adequate information on storage conditions of uterotonic medications to providers as a way of improving the standard of storage practices
- Update medication management policies for oxytocin and other uterotonic medications
- Introduce an information management tool for effective communication between the various service delivery levels and the CMS as a way to enhance the procurement process
- Expand the procurement process to include the participation of medicine and therapeutic teams at the facility level
- Develop clear and specific storage guidelines for procuring uterotonic medications
- In view of the FIGO/ICM recommendation for the dosing requirement for oxytocin, make efforts to procure 10 IU of oxytocin instead of 5 IU

Monitoring and Evaluation

The following recommendations may strengthen monitoring and evaluation of the correct practice of AMTSL—

- The AMTSL protocols should be reviewed to establish the proper definition of AMTSL and then communicated to health facilities where AMTSL is practiced.
- Mothers who have recently received AMTSL during delivery should be surveyed using feedback forms provided in the facility to assess the AMTSL practice.
- The steps taken to provide AMTSL in the labor ward should be documented by the midwife as part of routine delivery report

- Facility managers should validate documented AMTSL practices through periodic observation.
- A routine monitoring and evaluation of the AMTSL practice should be conducted by integrating AMTSL into existing supervisory tools, medical records, and registers.
- Facility-based quality assurance programs should introduce innovative techniques to reinforce AMTSL practice

There is a low use of AMTSL in Ghana, with only three percent of deliveries in health facilities benefiting from correct AMTSL. Efforts to increase AMTSL practice must be focused on Behavior Communication Change, and improving the skill and knowledge of providers through training as well as supervision. Given that uterotonic medicines were available at the facility level, efforts to strengthen supply management must focus on handling/storage requirements.

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