Uterine Balloon Tamponade (UBT) is a locally available and effective device that national and county health services can use to avert deaths and disability arising from uncontrolled uterine bleeding after childbirth. County governments in Kenya can integrate locally assembled UBT kits into their regular procurement processes alongside other essential lifesaving commodities, at very little additional cost. This brief discusses the advantages of integrating UBT in the cascade of care for maternal health services, and how counties can scale up its use.

Introduction

Uncontrolled, excessive bleeding after childbirth is a major cause of death and disability for women in Kenya and elsewhere in Africa. It is estimated that primary post-partum haemorrhage (excessive bleeding occurring within 24 hours after birth) directly contributes to 44% of all maternal deaths in Kenya (NCPD, 2015¹), and associated disabilities that include hysterectomy. The direct causes of post-partum haemorrhage (PPH) include the failure of the uterus to contract after delivery, trauma and lacerations in the birth canal, retained placenta, and blood clotting disorders (MoH, 2016²). The Ministry of Health (MoH) recommends a cascade of proven interventions to manage PPH, including: giving medication (usually oxytocin or misoprostol) to the mother to induce uterine contractions and stem the flow; placental delivery and uterine massage to expel retained products; uterine balloon tamponade (UBT) to apply pressure on the uterine wall; and occasionally surgery to remove the uterus as a last resort to save her life (MoH, 2016). Blood transfusion is often required in addition to these interventions, to replace lost blood. The Ministry’s Reproductive & Maternal Health Services Unit issued a communique in February, 2018, during the launch of the Confidential Enquiry into Maternal Deaths in Kenya report, committing to roll out UBT to all 47 counties, as an innovation proven to be safe and effective in managing uncontrolled PPH when other first line interventions fail.

However, women’s ability to benefit from these interventions is affected by a host of factors that include delays in getting to the health facility (due in part, to long distances and lack of transport); and preferences for traditional births at home with unskilled attendants. Results of Kenya’s 2014 demographic and health survey (KNBS, 2015³) show that about 62% of births in Kenya were under a skilled provider, and only about 51% of mothers received a postnatal check-up in the first two days after their last live birth, a critical step to detect and manage secondary bleeding that may follow hours after birth.

Even when a woman delivers at the health facility, her chance of having PPH correctly managed depends on the presence of highly skilled health workers in well-equipped facilities, and the availability of essential commodities. However, in 2017, research showed that only 33% of the staff in maternity and new-born units in selected facilities in 18 high burden counties had received training in Basic Emergency Obstetric and New-born Care (Measure Evaluation, 2017⁴). In addition, only 57% of facilities had Caesarean Section sets, which are critical for the emergency removal of the uterus and other surgical procedures to repair tears and stop bleeding. While 57% of the facilities had the capacity to offer blood transfusion, there was wide variation with only 27% availability in some areas.

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Availability of oxytocin and misoprostol is also varied. In 2017, about 25% of health centres and dispensaries in Busia, Kisumu and Mandera counties did not have oxytocin in stock (Measure Evaluation, 2017). Misoprostol (capsules or tablets) was available in only 10% of the facilities in an earlier study (MoH and WHO, 2013). In one county (Kiambu) 63% of birth attendants drawn from 52 facilities worked in a facility that did not have a refrigerator, which is required for storage of oxytocin (Felarmine, 2016).

To contribute to the global goal of a reduction of the maternal mortality ratio to less than 70 per 100,000 live births by 2030, as outlined in the Sustainable Development Goals, and attain their own targets, county governments and other stakeholders need to scale up interventions and innovations that help health workers to manage PPH, and which can make the difference between life and death for the mother. These include the uterine balloon tamponade (UBT), recommended by the World Health Organisation to control PPH due to uterine atony (WHO, 2012).

The UBT kit: The World Health Organisation recommends the use of UBT as a feasible measure in the treatment of PPH to “avoid surgery or as a temporizing measure while awaiting transfer to a higher level facility”, particularly if other treatment options are not available (WHO, 2012, pg 20). Since 2012, Kisumu Medical and Education Trust (KMET) and the Massachusetts General Hospital have been implementing activities in Kenya to avert deaths due to PPH using a low-cost, easy to use UBT kit. The ‘Every Second Matters for Mothers and Babies - Uterine Balloon Tamponade’ (ESM-UBT) consists of a condom tied to a silicon catheter. Once inserted into the uterus, it is slowly filled with clean water using a 60cc syringe through a one-way valve. It is inflated to the shape of the uterus, causing it to press against the bleeding uterine wall and apply pressure until the bleeding stops. If correctly used, bleeding is arrested and the likelihood of surgical removal of the uterus reduced. It also reduces the need for blood transfusion.

Advantages of the UBT device:

- It is effective and safe to use in treating PPH and averting risk of hysterectomy or death: Evidence in a four-country study that included Kenya found that using UBT averted death and contributed to the survival of women who had uncontrolled PPH. In the study, only three women lost their lives, out of 201 who had uncontrolled PPH, in 307 facilities where providers had been trained in ESM-UBT and where the device kits, manuals and other informational materials for service providers were available (Burke et al, 2015). A follow up study published in 2018 found that the ESM-UBT was safe and averted surgical removal of the uterus - of 184 women who were treated with the UBT, in only one case did the woman have a hysterectomy and none experienced uterine rupture, serious or minor infection, or latex allergy after placement of the device (Aparna et al, 2018).

- Its use is easy to learn, can be managed by the nurse/midwife and does not always require a medical officer/doctor: One study found that 59% of all UBT insertions in Kenya were performed by a registered nurse/midwife, compared to 26% by doctor/medical officer (Burke et al, 2015), an advantage in a country with a shortage of medical doctors.

- It is affordable and saves money for the health system: The ESM-UBT utilises very low-cost appliances and is made specifically for use in low-resource settings. One study estimated that for the price of KShs 515 (USD5) per piece, the UBT would save the healthcare system in Kenya almost KShs 47 million (USD 453,884), accruing from averted costs associated with initial attempts to halt PPH, fees for transfers, hospitalizations, and surgery for an estimated 10,230 cases, which would have been classified as severe (Mvundura et al, 2017).

Assebling UBT at the KMET Centre for Maternal Health Innovations
Scaling up the innovation – from pilot to national program

By March 2019, KMET and MGH had rolled out the ESM-UBT innovation to over 1,300 facilities in 20 counties, including 11 counties funded by UKAid through the County Innovations Challenge Fund (CICF). The 20 counties where UBT has been rolled out are shown on the Figure 1.

Over 6,600 health workers across the country have received training on use of ESM-UBT and the clinical management of PPH as recommended by the WHO. Preliminary documented data reported shows that over 620 UBT kits have been used with a 98% success rate, the number of usage on the kits could go much higher if we achieve 100% timely reporting. To ensure sustainability and affordability of the kits, KMET set up a social enterprise, the Centre for Maternal Health Innovations (CMHI), where the ESM-UBT is assembled and distributed to facilities in Kenya and the region. By the end of 2018, the Centre had produced over 9,000 ESM-UBT kits of which 1,000 had been distributed to the four CICF-supported counties and 3,000 more sold across the country. UBT has also been included in the national list of essential health commodities, with efforts underway in 2019 to include it in the county lists of essential commodities for easy procurement.

Some of the challenges faced during implementation include meeting demands from health providers on UBT training, and sustaining the trained providers within some facilities that have high staff turnover. KMET and partners established a pool of UBT trainers of trainers drawn from existing BEmONC trainers, who are responsible for training new providers across different counties and facilities. They also provide regular medical education to existing UBT providers, to refresh their skills and knowledge and help them to mentor other staff on how to use the innovation.

To scale up UBT and integrate it into their maternal health services, county governments in Kenya and county health departments should consider implementing the following actions:

- Give priority to basic emergency obstetric and new-born care and ensure that the county has enough staff trained in the service and able to apply the recommended high impact interventions in emergency cases, including the UBT;
- Ensure that health facilities are prepared for timely emergency response, to reduce delays in initiating treatment following the identification or diagnosis of a birth-related complication;
- Increase budget allocation to health services, to enable staff to receive regular training, and ensure facilities are well equipped with the required infrastructure to provide emergency care (e.g. having blood transfusion services, cold chain storage and another emergency commodities);
- Include UBT as an essential component in the package of health products and technologies for PPH and ensure that funds are allocated for its purchase, so that all county facilities handling deliveries can have it in stock;
- Address socio-cultural issues that lead women to deliver at home, and encourage them to take up skilled care at birth.
in facilities. Women’s decisions to have a baby at home are influenced by many factors, including perceptions about poor quality of care offered in the facilities. County governments can address this as a part of a comprehensive quality improvement programme.

In addition, counties should encourage women to enrol in available universal health coverage programmes, such as Linda Mama and local county initiatives, to ensure that any financial barriers to accessing skilled care at birth are eliminated.

Footnotes
4 Measure Evaluation PIMA. 2017. Availability and Quality of Emergency Obstetrical and Newborn Care Services in Kenya - Results of Three Annual Health Facility Assessments. Measure Evaluation, Chapel Hill
10 1USD estimated at Kshs 103
12 The authors based this on an assumed 10 230 cases of PPH, which would have been classified as severe, (10% of all estimated PPH cases in Kenya in 2015). The study observed that with no uterine packing, there would have been 1390 transfers from health centres to hospitals, 462 hysterectomies to treat severe PPH, and 412 deaths.