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Clinical and Community Action to Address Postpartum Hemorrhage: The Pathfinder International Model

Bangladeshi women learn about planning for a safe delivery from a community health worker.

PHOTO: Pathfinder/Bangladesh staff

PROJECT FUNDING

In 2007, the John D. and Catherine T. MacArthur Foundation provided funding to Pathfinder International to implement the *Continuum of Care: Addressing Postpartum Hemorrhage in India and Nigeria Project*, in collaboration with Dr. Suellen Miller of the University of California, San Francisco, and Dr. Stacie Geller of the University of Illinois at Chicago. In 2009, the Pathfinder Board of Directors directed additional private funds to expand the project to pilot efforts in Bangladesh and Peru, and in 2009, the MacArthur Foundation funded a pilot effort in refugee and displaced persons camps in Tanzania.

Nearly 350,000 women die annually worldwide from complications of pregnancy and childbirth.¹ More than 99 percent of these deaths occur in developing countries, where skilled healthcare providers, quality facilities, and adequate transportation and communication systems are largely unavailable to the poor.² At least one quarter of these maternal deaths are due to postpartum hemorrhage (PPH), but that figure nears 60 percent in the developing world.³

The great majority of maternal deaths are preventable, if women have access to skilled providers in well-equipped facilities. Unfortunately, poverty, isolation, and lack of knowledge and access to a skilled provider or an equipped facility continue to pose serious barriers in many countries. While quality care must be made available, an equal challenge lies in transforming long-held traditions and entrenched misconceptions that hinder the adoption of healthy behaviors.

The Four Delays: Four standard delays in response to obstetric complications are key contributors to maternal mortality. The first is a delay on the part of a woman, her family, or a community birth attendant in recognizing that she is in crisis, often because of excessive bleeding. It is difficult to know how much is too much, as some bleeding is normal during childbirth. The second delay is slowness in deciding and taking steps to seek skilled obstetric care once a crisis is recognized.

¹ The Lancet, "Maternal mortality for 181 countries, 1980-2008: a systematic analysis of progress towards Millennium Development Goal 5," April 12, 2010. (<http://download.thelancet.com/pdfs/journals/lancet/PIIS0140673610605181.pdf?id=e16241398b8eb460:17e29119:128b747f761:4e4e1274390059232>)

² Maternal Mortality in 2005: Estimates Developed by WHO, UNICEF, UNFPA and The World Bank. WHO, 2007, p.15.

³ USAID, Postpartum Hemorrhage Prevention Initiative (POPHI): www.pphprevention.org/pph.php.

This decision may involve money for transportation, the presence of a husband or other key decision-makers, and an understanding of the value of skilled care and where to find it. The woman and her caretakers may not be confident in the care she will receive. The third is a delay in reaching the facility, due to lack of money or transportation, distance, poor roads, or bad weather.

The fourth delay occurs at the facility, which may be poorly staffed and equipped and unable to treat the woman in a timely fashion. The family may not be able to pay for care or have cultural fears about donating needed blood. Blood shortages play a critical role in the fourth delay, as surgery may be postponed for many hours while a willing matched donor is sought.

The Pathfinder International Comprehensive Model to Address PPH

The four delays reflect the many cultural, economic, and infrastructure barriers to quality health care in poor traditional communities. PPH, like many intransigent health challenges, cannot be addressed by clinical interventions alone. For this reason, Pathfinder has developed its *Clinical and Community*

Action to Address PPH (CCA-PPH) Model to provide a roadmap for health officials, providers, civic leaders, and families to address the full spectrum of clinical and psychosocial causes of PPH morbidity and mortality. Three integrated elements of this model address building national government support for the model, enabling essential clinical interventions, and building local government and community-wide knowledge and commitment to developing their own capacity to prevent and manage PPH.

THE THREE CLINICAL AND COMMUNITY ACTION MODEL ELEMENTS

The three elements of the CCA-PPH model can be divided into advocacy activities, clinical interventions, and community engagement activities.

1. Advocacy to promote government support

Prior to and throughout the implementation of the PPH project in a country, Pathfinder staff engage with government officials and other stakeholders, outlining the elements of the model and their rationale. With this groundwork, important laws and policies necessary for the project can be sanctioned prior to its launch. Adequate facilities and staffing must be in place, as well as protocols for essential drugs, such as oxytocin and the use of misoprostol to prevent hemorrhage. Because misoprostol is often prohibited as an abortifacient, Pathfinder works closely with officials to develop regulations that conform to local law.

2. Clinical Interventions

Prevention of PPH through the routine use of the active management of the third state of labor (AMTSL):

Uterine atony (failure of the uterus to contract) causes 90 percent of all PPH cases.⁴ Immediately following every delivery, the three steps of AMTSL should include: 1) administration of a uterotonic drug (oxytocin, ergometrine, or misoprostol) to promote contraction of the uterus; 2) delivery of the placenta by controlled cord traction; and 3) uterine massage. AMTSL significantly reduces the incidence of uterine atony. While oxytocin is the drug of choice, recent studies have found misoprostol to be clinically effective, which is a major breakthrough, as it can be administered



Transportation by bicycle rickshaw is often the only means of transportation available to women in rural India or Bangladesh.

PHOTO: Rajni Patni/Pathfinder India

⁴ Ibid.



Left: A nurse measuring the vital signs of a woman wearing the NASG in Nigeria. **Right:** Cleaning the NASG must be done according to protocols that will protect both the facility staff and future wearers of the garment from any possible infection in the blood, especially HIV.

PHOTOS: Left: Akintunde Akinleye; Right: Pathfinder staff/Nigeria

orally, sublingually, buccally, or rectally with positive results and can serve as a potent replacement for drugs requiring injection or cool conditions.

Identification of hemorrhage through accurate estimation of blood loss: Early detection of hemorrhage requires effective estimation of blood loss, and visual estimates by providers are often wildly inaccurate. While providers are trained to recognize basic levels of blood loss, project staff in different countries are developing various tools adapted to local materials and behaviors.

In Bangladesh, more than 85 percent of deliveries are at home. Pathfinder has developed a Safe Delivery Kit⁵ to be given to women in their homes, which includes a Blood Mat.⁶ If this absorbent mat becomes saturated, caretakers know they must seek help immediately, as the woman is hemorrhaging. In India, Pathfinder partners are using a rubberized mat, called a Kelly Pad, which collects and funnels blood into a graduated measuring container. In Tanzania, the standard African length of cloth used for a dress called a Kanga serves as a benchmark for the presence of hemorrhage when it becomes saturated. Pathfinder's Nigerian office is

also using the Blood Drape developed by partner Dr. Stacie Geller of the University of Illinois at Chicago. This plastic sheet is placed under the woman and siphons the blood into a measuring pocket on the sheet.⁷

Management of PPH: A woman with hemorrhage is in grave danger, and providers must be trained to effectively manage blood loss to prevent her from going into shock. Immediate interventions involve the replacement of fluids by IV and the administration of oxytocin or another uterotonic as appropriate. When shock does occur, providers are trained to apply the non-pneumatic anti-shock garment (NASG), a neoprene fabric that is tightly wrapped from ankles to abdomen. This process shunts the blood to the upper body, preserving vital organs and stabilizing the woman for up to 50 hours while waiting for blood replacement and/or emergency obstetric care.

If necessary, surgery can be performed while the garment is in place, and it should not be removed for at least two hours after bleeding ceases. It should be removed **only** by trained staff able to avoid restarting the hemorrhage. While blood pressure is continuously measured, the garment segments are removed gradually

⁵ See p. 5 for description of kit.

⁶ Blood mat was developed by ICDDR,B in Bangladesh, see: <http://www.icddr.org>

⁷ Information on the Blood Drape is included in the Pathfinder CCA/PPH Tool Kit.

from feet to abdomen, waiting 15 minutes between segments to ensure that the hemorrhaging has ceased. Trained staff must then clean, disinfect, and store the garment, and follow procedures to return it to its original facility for reuse.

Because of its remarkable effectiveness at reversing life-threatening shock and slowing bleeding, one is tempted to view the NASG as a panacea for PPH, at the risk of ignoring the important services that are essential to its success. The garment only sustains a woman in crisis—she still requires the skilled intervention of a trained physician in a facility equipped to deal with an emergency. Blood replacement is essential, and a reliably available blood bank is optimal.

The NASG has been developed in different sizes to fit women of varying height and stature. The garment may not provide the needed support if it is the wrong size.

3. Community Engagement

Community organization to develop emergency systems: The third delay results from inadequate transportation, which has been documented as a

contributing cause of PPH mortality in many countries.⁸ Pathfinder works with civic and government leaders to engage the community in developing its own shared emergency transportation solutions. In one area in India where ambulances are available, drivers from 108 ambulance services now carry a NASG in their vehicles and have been trained in their use.

Community engagement must also involve the development of a blood bank or a network of willing donors in case of need. This often requires extensive awareness-building to overcome strong traditional superstitions and objections to the giving of blood. A blood bank requires electricity and refrigeration, as well as public confidence in the safety and acceptability of blood donation.

In many countries, clinics and their services are distrusted and avoided for their poor facilities and disrespectful treatment of poor clients. Women want to deliver their babies at home, among family and friends, and to be cared for by a parent or familiar community birth attendant. Work must be done first to improve the quality of the facilities and the skills of providers, and then to bring community attention to the new reality. Family members must be taught to recognize excessive blood loss and respond appropriately. Pathfinder has developed a Birth Planning Card⁹ on which a woman writes her plans for childbirth and possible needs for transportation, blood donations, and other assistance. A high level of community awareness must be developed, so that family and neighbors of a pregnant woman are prepared to respond should she have a problem.

A Work in Progress: Lessons Learned in Five Countries

In 2010, Pathfinder is implementing the model at different phases in five countries: Nigeria, India, Bangladesh, Peru, and Tanzania. Each of these environments offers its own opportunities and poses its own challenges, all of which contribute lessons learned for future implementation.

The CCA-PPH Training Curriculum and Tool Kit

To be effective, the CCA-PPH Model must be understood as a system of elements, all of which must be understood and adopted to address PPH. Pathfinder has developed and published a comprehensive training curriculum—*Prevention, Recognition, and Management of Postpartum Hemorrhage*—and an accompanying Tool Kit to teach this process.

The curriculum covers the components of the model in depth and offers clinical training in AMTSL, early detection and treatment of uterine atony and PPH, and the use of the NASG. It also describes the basics of community mobilization and offers important guidelines on data collection and record keeping.

The *Tool Kit* provides a series of helpful wall charts on AMTSL, the use of the NASG, and other steps in the care of PPH.

This material is available in hard cover from Pathfinder International or on a CD for the user to copy and adapt. All of it may be found and downloaded from the Pathfinder website at: [www.pathfind.org/publications/maternal health](http://www.pathfind.org/publications/maternal_health).

⁸ Kawuwa MB, Mairiga AG, Usman HA, "Community Perspective of Maternal Mortality: Experience from Konduga Local Government Area, Borno State, Nigeria." *Ann Afr Med*. 2007 Sep;6(3):109-14.

⁹ Available in the Pathfinder *CCA-PPH Tool Kit*.

LESSONS IN ADVOCACY

To ensure project scale-up and sustainability, project offices in all five countries invested considerable time at the outset in building understanding and buy-in with government and health officials to establish them as the users and ultimate owners of the approach. Government leaders must be made confident in the safety and efficacy of the garment, and health officials have to approve the use of misoprostol and other medications. The PPH training is now being incorporated by the National Midwifery Council of Nigeria into their national curriculum, which will introduce the CCA-PPH model to all midwifery students in 88 schools across the country. Such comprehensive training will alleviate the constant problems of staff turnover and the frequent absence of someone trained to properly apply quality AMTSL, treat PPH, and use the NASG. The state-level ministries of health have also taken steps to develop a pool of master trainers who will continue to spread knowledge of the CCA-PPH approach.

In India, state and district health leaders join project staff in selecting sites, choosing trainers, and jointly monitoring progress and quality. Government and health leaders attend all clinic openings and are fully conversant on project goals. New Project Advisory Committees, consisting of Pathfinder staff with government and influential community leaders, advocate on behalf of clinics and providers involved in the program. Like Nigeria, the PPH training curriculum has been incorporated into state-level basic emergency obstetric care training in Tamil Nadu and Maharashtra, and is now part of continuing education for private providers. The PPH project is an active partner in country-wide medical organizations such as national and state chapters of the Federation of OBGYN Society of India and the Indian Medical Association for private providers.

Pathfinder's Peru office has a long history of close collaboration with the Ministry of Health, as well as with the UNFPA and professional medical societies and schools of medicine. Still in its initial stages in Peru, the PPH Model has been welcomed by clinical colleagues. Considerable advocacy with MOH and key leaders in medical education and professional medical



The Blood Mat developed in Bangladesh has been effectively used by families and community health workers to signal hemorrhage in women giving birth at home. This tool is invaluable as a way to precipitate prompt decisions to seek help.

PHOTO: Pathfinder staff/Bangladesh

associations has established their comfort with the process and use of the NASG. This groundwork will ensure the project's eventual adoption and sustainability on a national level. By bringing the model into medical schools, future doctors will begin their professional careers with a comprehensive approach to PPH, and they will introduce the thinking and the procedures to their colleagues.

LESSONS FOR CLINICAL INTERVENTIONS

Home deliveries: The PPH project in Bangladesh, called *Mayer Shasthya* (Mother's Health), is focused specifically on helping women who deliver at home to prevent PPH. More than 85 percent of deliveries in the project areas occur at home and only 18 percent of births are attended by a skilled provider.¹⁰ PPH accounts for 28 percent of maternal deaths.¹¹

Every pregnant Bangladeshi woman in the project area is registered and tracked by a government or NGO community worker, and at 32 weeks gestation, she is given a PPH bag containing three misoprostol tablets, a blood measuring mat, and safe delivery kit. As of March 31, 2010, more than 8,590 women had been registered, 4,298 had received PPH bags, and 3,879

¹⁰ Bangladesh Demographic & Health Survey, 2008.

¹¹ Ibid.



At 32 weeks of gestation, every pregnant woman receives a PPH bag containing a blood mat, misoprostal tablets, and safe delivery kit in Bangladesh project areas.

PHOTO: Pathfinder staff/Bangladesh

had delivered using the bag contents and taking the misoprostol. Of these deliveries, eight cases of PPH were identified with the use of the blood mat and successfully managed.

Indian providers have been adopting AMTSL protocols, estimation of blood loss, and infection prevention in great numbers, having seen such remarkable results by their application in their clinics. The CCA-PPH Model is being enthusiastically disseminated and added to training programs in medical colleges and facilities. The Indian project has developed a Shock Kit which is stored in clinical facilities that use the NASG. The kit contains:

1. Cupboards with glass door and lock
2. Big washing tubs for NASG
3. Clutches for NASG
4. Manual suction kit
5. Emergency trays, each containing:
Oropharyngeal airways, Ambubag kit, laryngoscope set, Ventimask or oxygen mask, endotracheal tube, pelvic exam tray, Sim's speculum, sponge holders, anterior vaginal wall retractors, right angle retractor, Alli's forceps, curved artery forceps, straight artery forceps, ovum forceps, needle holder, curved needle holder, episiotomy scissors, curved scissors, and Magill's forceps.

Throughout the India project, effective record-keeping forms provided by Pathfinder enhance the quality of supervision and gathering of information, which helps managers and providers learn from performance feedback. Pathfinder has incorporated these forms in its CCA-PPH Tool Kit and training curriculum.

In northern Tanzania, Pathfinder is working to bring RH care to women in the Nyarugusu refugee camp, which houses more than 38,000 Congolese refugees expected to be there for the foreseeable future. Fifty midwives, nurses, and physicians have been trained in family planning counseling and method use, PPH, emergency obstetric care, and use of the NASG. Selected clinicians have also learned blood replacement, performing emergency procedures with the NASG in place, and procedures for removal, cleaning, and storage of the garment. The project is working closely with the Tanzanian Red Cross Society to ensure the transfer of knowledge and project sustainability.

LESSONS FOR COMMUNITY ENGAGEMENT

Every country project has worked with the local national government to be allowed to train and engage their community health workers (CHWs) as outreach

Solar Power for Blood Bank Refrigeration

The absence of a safe blood bank and transfusion service seriously limits treatment of PPH, as well as many other medical crises. Electricity and refrigerators are erratic or absent in many clinics. In Nigeria, the Cloverleaf Foundation is funding a cost-effective modern blood transfusion service powered by three solar panels and a battery that will provide refrigerated storage of up to 200 pints of blood, and serve as a power source to the labor and delivery rooms and the laboratory. Pathfinder will pursue funding to launch similar facilities once this effort is fully operational.

Blood banks depend on reliable donors, and many Nigeria misconceptions and myths prevent people from donating willingly.

agents. In India, the ASHAs¹² carry flipbooks with PPH messages about birth preparation, safe delivery, seeking ANC and PNC, and recognizing danger signs. The staff use laptop computers to collect program data which is used to regularly review and improve programming. By collecting pregnant women's cell numbers, as well as those of service providers and referral centers, providers can make timely referrals and women and their families can immediately seek advice from skilled providers. Women are also given the cell numbers of taxi drivers in case of an emergency.

The CCA-PPH project in Bangladesh has a strong focus on empowering women, their families, and communities to prevent and respond effectively to PPH. A reliable community-based referral system links women to facilities quickly. Comprehensive community mobilization activities include community group meetings, where teachers and Imams (religious leaders) join civic leaders and NGO workers in public gatherings with villagers to discuss the elements of PPH prevention and response. More than 11,000 family members of pregnant women have attended similar discussions in their homes with trained *dais* (community birth attendants) and government and NGO health workers.

The Tanzanian project in refugee camps is supporting a network of existing CHWs in Health Information Teams (HITs), who are being trained in self-care during pregnancy, how to develop birth plans, and the danger signs and symptoms in pregnancy, labor, and delivery. HITs will use job aids already developed in the India and Nigeria PPH projects, focusing on training the refugee community on the first two delays in childbirth.

Looking Forward

The CCA-PPH Model has attracted the attention of health officials and providers in many countries, because it acknowledges the reality that PPH must be dealt with as both a clinical and a social/behavioral challenge. The model enables service providers, local leaders, community members, and health officials to jointly address the full spectrum of clinical and social causes of PPH-related morbidity and mortality.

Pathfinder is especially focused on gaining government buy-in and effective ownership of the entire



Women post emergency cell numbers for taxi and ambulance drivers in this clinic in Nigeria.

PHOTO: Akintunde Akinleye

model in all five countries. To this end, the training curriculum and tool kit will be integrated into all interventions aimed at sharing the garment and the model. Providers without proper training can—and do—make serious mistakes in preventing and managing PPH and in the use of the NASG.

Sustainability also depends on funding commitments. Governments are encouraged to include the purchase of the NASG as a budget line item, and to develop a cadre of master trainers who can ensure adoption and expansion of the continuum of care approach. Ideally, introduction of the CCA-PPH model and skills at the pre-service level will ensure that all future providers will understand the importance of community and clinical interventions and have the skills and knowledge to provide their clients with both quality services and counseling in preventive care.

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¹² ASHAs are government trained community health workers who focus on women's health needs.

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