Anti-shock Garment for Postpartum Hemorrhage

Technology as a Catalyst for Health Systems Strengthening

Summary of a Full Report to the
John D. and Catherine T. MacArthur Foundation

INTRODUCTION

Since 2003, the Population and Reproductive Health Program of the MacArthur Foundation has invested more than 17 million dollars in programs aimed at reducing postpartum hemorrhage in countries where maternal mortality is high. One focus of these programs has been on the use of the anti-shock garment, a tool they believed would help achieve three goals: reduce deaths due to hemorrhage; revitalize work on maternal mortality; and demonstrate MacArthur's leadership on the topic. The Foundation's portfolio included major grants to Pathfinder International for program implementation, the University of California San Francisco for clinical research on the anti-shock garment, as well as grants to other agencies. An external evaluation of these programs was conducted during the summer and fall of 2011. The evaluators traveled to India and Nigeria to observe Pathfinder's work to introduce the anti-shock garment and conducted detailed interviews with other grant recipients. This is a brief summary of the full evaluation report.

The anti-shock garment…

The anti-shock garment can assist in the treatment of postpartum hemorrhage because it can stabilize a severely bleeding woman, giving health care providers time to seek and apply definitive treatment. The garment is a neoprene and Velcro half-suit that is strapped on a woman's legs and abdomen. It works by creating pressure that forces blood from the lower extremities to the vital organs of the body and by applying pressure directly on the uterus.

…is clearly a lifesaving device…

The anti-shock garment is an important clinical tool, giving staff extra time to access treatment for women who go into shock as a result of hemorrhage and making it possible to transport patients who need more advanced care. Many clinicians relayed stories about the dramatic, life-saving impact of the garment. Their experiences using this simple technology invariably turned them into champions for the garment. Research has confirmed the clinical effectiveness of the garment.

FRANCINE COEYTAUX, MPH AND ELISA WELLS, MPH

AUGUST 2012

…but what is its potential to significantly reduce maternal mortality?

Promoting just the garment is not likely to have a large impact on mortality because the garment is used in only the most extreme cases (only 2% of postpartum hemorrhage cases lead to shock) and simply placing garments in facilities is of no use if treatments (such as blood banks or surgeons) are not in place. In contrast, preventing the hemorrhage in the first place (as opposed to treating it when it gets out of hand) helps many, many more women.

WHAT DID WE FIND?

Hemorrhage in the facilities is decreasing…

Although the focus of the evaluation was on the anti-shock garment, which aids in treating postpartum hemorrhage, the most striking evaluation finding relates to preventing hemorrhage. In both India and Nigeria, the rates of postpartum hemorrhage are decreasing in the government facilities where Pathfinder has been working. Provider after provider reported seeing fewer cases of postpartum hemorrhage during facility deliveries, with some facilities not ever needing to use the anti-shock garment. Significant resources were invested in data collection to evaluate the program and monitor the services and the data being collected in these facilities confirmed the providers' reports: the incidence of postpartum hemorrhage in the program facilities is on a downward trend.

> ***"Women used to come here and die during delivery. We just don't see that kind of bleeding anymore."***
>
> Leela Kumari, Midwife, Korabad Community Health Center, India

What can explain the reduced rates of postpartum hemorrhage in the facilities where the program is being implemented? The answer, in both India and Nigeria, was the implementation of the provider training and the systems strengthening that accompanied the introduction of the anti-shock garment.

By itself, the garment has had a limited impact on reducing mortality

Although the anti-shock garment has clearly saved lives, based on the low number of times the garment has been applied in both India and Nigeria, it seems apparent that efforts to prevent hemorrhage from occurring in the first place hold far greater potential for saving lives than using the anti-shock garment. Between the inception of the program, in November 2007 for Nigeria and April 2010 for India, and early fall 2011, the garment had been used a total of 2,357 times (2,213 in Nigeria and 144 in India). This is across a total of 113 facilities (60 in Nigeria and 53 in India) and over 46 months in Nigeria and 18 months in India.

Provider training is making a difference

When asked to explain what was making a difference in their facilities, providers in both India and Nigeria overwhelmingly singled out active management of the third stage of labor (AMTSL)—a set of three basic interventions performed immediately after delivery—as the key intervention leading to falling rates of postpartum hemorrhage. While acknowledging that they had been trained in active management of labor prior to the implementation of the Pathfinder program, they explained that it was only once AMTSL was introduced as part of a continuum of care approach, and with the hands-on training that Pathfinder provided, that the practice and its importance stuck. It became clear that it was the championing of a coordinated and comprehensive approach to care, focused on the **prevention** of postpartum hemorrhage—not just the stabilization of women suffering from extreme hemorrhage—that made the difference.

The continuum of care package strengthens existing health systems

Pathfinder chose to embed the introduction of the anti-shock garment in a "continuum of care" package of services that emphasizes that a woman may have increasing need for intervention as she progresses through the stages of delivery and that early interventions can help to prevent later sequelae. The power of the continuum of care model is that it addresses a full range of complementary interventions that give providers tools to use at each stage of need, from prevention to treatment. Although most of the interventions included in this continuum of care model are not new approaches (for instance, AMTSL has been widely promoted), Pathfinder's packaging of the full range of interventions to address the problem of postpartum hemorrhage, including the anti-shock garment, was unique and we believe was what made a difference.

Pathfinder's Continuum of Care Model

For Prevention and Treatment of Postpartum Hemorrhage (PPH)

1. Active Management of the Third Stage of Labor (AMTSL) for preventing postpartum hemorrhage
- Using uterotonics (drugs that cause the uterus to contract), controlled cord traction, uterine massage

2. Early detection of hemorrhage
- Using blood loss estimation methods

3. Early fluid and drug (oxytocin or misoprostol) treatment of postpartum hemorrhage
- To prevent shock

4. Community organization of transport
- For rapid referral and safe transfer of obstetric emergencies to facilities that can treat postpartum hemorrhage and shock

5. Anti-shock garment
- To resuscitate and stabilize women in shock until comprehensive care for postpartum hemorrhage and shock is available

6. Treatment of shock with rapid replacement of blood volume
- Including establishing reliable sources of blood supply

By addressing the entire process rather than focusing on a specific intervention (such as the garment), this approach spotlights multiple aspects of the health care infrastructure that require strengthening, including provision of active management of the third stage of labor and availability of a reliable blood and drug supply. And because the anti-shock garment can only stabilize a woman—and does not treat the problem—the deficiencies in the system become glaringly obvious to staff as they witness women in the garment waiting, often for hours, for care.

The model puts emphasis on the role of uterotonics (drugs such as oxytocin and misoprostol which cause the uterus to contract) and on estimating blood loss for early detection of hemorrhage. Pathfinder also mobilized significant resources to establish improved access to a consistent blood supply (this was mainly in Nigeria, where access to blood is a pressing issue). Most importantly, the Pathfinder model introduced the notion of accountability and the importance of monitoring and evaluation for program improvement. Finally, the focus on system improvement was maintained by continuous supervision provided by Pathfinder staff. Equally important to the implementation of these interventions was Pathfinder's advocacy among government officials, local leaders, organizations, and professional societies to champion this coordinated approach to care.

WHAT ROLE DID THE GARMENT PLAY?

We heard loud and clear, from almost everyone we talked to, that it was (and continues to be) the anti-shock garment that made the introduction of the continuum of care model possible. Several people referred to it as "the political game changer," providing access into health systems in a way that is rarely possible. AMTSL and the continuum of care model are neither new nor particularly innovative. In fact, all the model does is systematically highlight the various steps that need to be followed to provide very basic obstetrical care. But it is precisely because the required interventions are so basic, old and "ho-hum" (as one member of the Maternal Health Task Force described it) that the introduction of the anti-shock garment—a new, cutting edge yet simple, technology—was so important.

Provided an entrée into health systems

The anti-shock garment provided an effective entrée into the medical systems of both India and Nigeria; it served as the "admission ticket" for the introduction of the continuum of care model. Using the appeal of the garment to gain access into these large and complex health systems, Pathfinder reinvigorated and greatly improved the entire provision of obstetric care during delivery. This was no small achievement, especially given the fatigue that has set in among the international community in regard to maternal health and the seemingly intractable problem of maternal mortality. Whether the same level of entrée into these health systems could have been achieved by Pathfinder without the allure of the garment can be disputed. But what is undeniable is the role the garment played in introducing the continuum of care model—a model that definitely strengthened the government health systems in both countries.

At the policy level

The anti-shock garment also played an important role at the policy level, serving as a tool that inspired interest and collaboration across public sectors. As a new technology, it bred champions and inspired interest and collaboration from governments, non-profit and private-sector partners, and donors. It provided a compelling and visual "hook" that was effective in drawing attention to the issue of maternal mortality. And it proved particularly successful in leveraging additional resources from both the private and public sectors. (Note: The full report details the additional resources and partnerships that were leveraged).

CHALLENGES GOING FORWARD

The Pathfinder program has reached an important decision point in the promotion of its program. While it has amassed an impressive amount of buy-in from country governments and others by using the garment as a successful door opener, it has also demonstrated, through its continuum of care model, that the most effective way to address postpartum hemorrhage is not through the application of the anti-shock garment but by strengthening the quality and availability of basic obstetrical care, including active management of the third stage of labor. Furthermore, analysis of the expected costs and health impact of scaling up the garment suggests that the costs would be relatively large with only a small corresponding impact on health and that efforts to strengthen basic obstetrical care would be much more cost-effective. An additional variable in the discussion of how best to address postpartum hemorrhage is the potential contribution of misoprostol, an alternative uterotonic drug that, because it is widely available, easy to administer, and does not require refrigeration, shows promise for the prevention and treatment of postpartum hemorrhage at the community level and in situations where other drugs are not available.

The challenge Pathfinder and the governments of India and Nigeria now face as they scale up this program, is how to refocus interventions on strengthening the health systems infrastructure and improving management of labor and delivery while reducing the focus on the garment itself. This is no small task given the fact that the garment has been actively and successfully used to generate interest in collaboration, and that a substantial number of state governments and other partners in both countries are poised to move forward with broader implementation of the garment.

CONCLUSION

The MacArthur Foundation's portfolio of grant making related to the anti-shock garment appears to have made an impact on maternal health as the rates of postpartum hemorrhage in the facilities where the program has been implemented are decreasing. The garment provided an entrée into the health systems of both India and Nigeria and the associated training program strengthened the capacity to provide quality obstetrical care in major facilities. By investing in the anti-shock garment, the MacArthur Foundation accomplished all three of the goals it had laid out for itself: deaths due to postpartum hemorrhage have been reduced; work on maternal mortality has been revitalized; and the Foundation has demonstrated its leadership on the topic of maternal mortality.

Note: The full report also includes sections on: the use of the garment in refugee settings; the operational challenges specific to the deployment of the garment; the potential of misoprostol as an alternative approach to addressing postpartum hemorrhage; and the need to improve the quality of care women receive in the facilities.

Photo Credits: Elisa Wells (p. 1), Farouk Jega (p. 2)
Graphic Design: Erica Stupfel, e*design