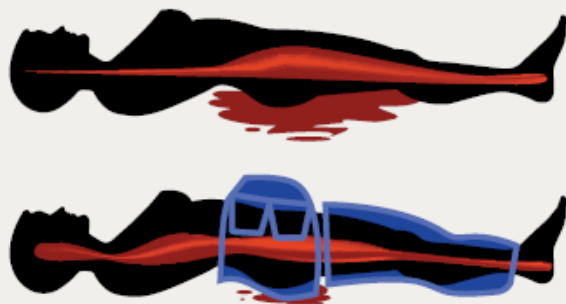


NASG Project

UCSF's Safe Motherhood Program introduced the Non-pneumatic Anti-shock Garment (NASG) to limited-resource settings in 2002. The NASG is a low-technology, low-cost first-aid device used to reverse shock, resuscitate, stabilize, and prevent further bleeding in women with obstetric hemorrhage and subsequent hypovolemic shock. Use of the NASG as part of standard management of shock and hemorrhage has demonstrated promising outcomes for women in settings where appropriate healthcare providers and technologies may be limited. The benefit of the NASG lies in its ability to sustain life while women are transported from clinics and communities to facilities that can provide necessary surgeries, treatments and care.



HOW DOES IT WORK?



The NASG applies circumferential counter pressure to the lower body and uterus which increases circulating blood to the heart, lungs and brain and decreases the rate of blood flow in the abdomen and pelvis, thus decreasing blood loss.

WHO WE ARE

The Safe Motherhood Program at the University of California, San Francisco (UCSF), is committed to saving the lives of women who die from pregnancy and childbirth-related complications. The Safe Motherhood Program was founded in 2002 by its director, Professor Suellen Miller, CNM, PhD. Dr. Miller is a leading expert in maternal health, with over 30 years' experience in low resource settings, and coauthor of the Hesperian Foundation's 'A Book for Midwives', as well as over 50 peer-reviewed journal articles. We work with distinguished colleagues in a variety of countries, all of whom can be viewed on our website.

www.lifewrap.org

"The NASG is a true life saving device for women in shock and close to death due to PPH. This is a major life saving support device, easy to administer by any health personnel and needs to be available for pregnant women everywhere and particularly in low resource countries."

-Andre B. Lalonde, Chair, International Federation of Gynecology and Obstetrics' (FIGO) Committee for Safe Motherhood and Newborn Health (SMNH) Professor, Obs/Gyn, University of Ottawa and McGill University, Canada.



NASG Studies

COMBINED OUTCOMES FROM FIVE STUDIES AT THE TERTIARY LEVEL

We synthesized the data on 3,561 women with severe hemorrhage and shock who participated in our pre-intervention/intervention projects in Nigeria, Egypt, Zambia, Zimbabwe, and India.* Combining the data from these different studies provided a larger sample size and enabled us to examine how the NASG works across a range of countries and situations. We compared outcomes for 1,614 women treated with standard care PLUS NASG and 1,947 women treated

with standard care only. We found 38% fewer deaths among women who received the NASG, showing that at the tertiary hospital level, the NASG plus standard care significantly decreases mortality (OR 0.62, 95% CI 0.44–0.86).

*The India project was conducted with Pathfinder International.

www.lifewraps.org/publications/

RANDOMIZED CLINICAL TRIAL OF THE NASG AT PRIMARY HEALTH CARE CENTERS IN ZAMBIA AND ZIMBABWE

In many limited-resource settings, women deliver at home, often

without skilled attendants, or at clinics that only offer a limited range of services. If a woman bleeds heavily in these settings, she may face delays in receiving definitive care while the decision is made to seek care, transport is organized, during travel to the hospital, and waiting in the hospital for blood or surgery. Many women do not survive these delays. The NASG can buy time for women during these delays. While our previous studies have looked at using the NASG at the tertiary/referral level, we needed to examine if earlier application of the NASG could also make a difference in survival.

The most rigorous study of an intervention is a randomized study, where similar women are treated or not treated with the intervention by chance. We undertook a randomized cluster trial of the NASG in Zambia and Zimbabwe to determine whether applying the NASG at the primary health care level before the woman with hemorrhage and shock was transported to a tertiary care facility for definitive treatment improved the woman's chance of survival. Thirty-eight primary health care centers staffed by midwives were



randomized to either standard treatment before transport or standard treatment plus the NASG before transport. There were no differences in the women or the clinics. All women received the NASG at the referral hospital if they were in the control arm of the study, so the only difference in the groups was the early application (timing) of the NASG before transport. There were 880 women with hemorrhage and shock in the trial, 405 in the NASG group and 475 in the control group. The women who got the NASG before they were transported were 46% less likely to die than the women who only got the NASG after they arrived at the referral hospital. Although these numbers are too small for statistical significance (OR 0.54, 95% CI 0.14–

2.05), this difference is clinically significant. Further, women who received the NASG at the clinic recovered from shock 25% faster, this difference was significant ($p=0.03$). At the community or primary health care level there are currently no other tools that can stabilize women with hemorrhagic shock. The NASG buys time and enables more women to survive transport and referral to a place where they can get definitive care. www.lifewraps.org/publications/

GUIDELINES

One way to increase the number of NASGs in limited-resource settings is through endorsement from

international organizations. In 2012, the NASG was included in obstetrical hemorrhage guidelines by the World Health Organization (WHO), the International Federation of Gynecologists and Obstetricians (FIGO), and the Global Library of Women's Medicine (GLOWM). Further in 2013 the WHO disseminated key messages on the NASG for policy makers, program managers, educators, and providers:

1. Ensure NASGs are included in national guidelines.
2. Review training curricula to ensure providers are trained to use NASGs.
3. Procure NASGs.

See all up to date guidelines on our website: www.lifewraps.org/publications/

COST EFFECTIVENESS

A recently published cost effectiveness analysis (Sutherland, 2013) found the NASG not only saved women's lives, but was very cost effective for women in severe shock.



Key Contributors to the Cluster Randomized Trial

University Teaching Hospital, Lusaka Zambia (UTH), University of Zimbabwe-UCSF Collaborative Programme of Women's Health Research (UZ-UCSF), Kitwe and Ndola Central Hospitals; District Health Management Boards and Clinics of Lusaka, Ndola, Kitwe and Kalulushi; Harare Central and Parirenyatwa Hospitals; Harare City Council Clinics. The World Health Organization Reproductive Health Research Unit and the Instituto de Efectividad Clínica y Sanitaria served as data managers. Funding provided by the National Institutes of Health (NIH), Institute for Child Health and Development (NICHHD) and the Bill and Melinda Gates Foundation.

The 2012 WHO Recommendations for the Prevention and Treatment of PPH includes use of the NASG as a temporizing measure until appropriate care is available.



Training / Implementation / Needs Assessment

We are available for technical assistance to professional associations, NGOs, GOs, and agencies wishing to incorporate the NASG into health care delivery systems, protocols and curricula. Please contact us and let us use our experience to inform your planning process.
Email: suellenmiller@gmail.com

NASG STUDIES:

Miller S, Hamza S, Bray E, et al.
FIRST AID FOR OBSTETRIC HEMORRHAGE: THE PILOT STUDY OF THE NASG IN EGYPT. 2006 BJOG, 113(4): 424-9.

Miller S, Fathalla M, Ojengbede O, et al.
OBSTETRIC HEMORRHAGE AND SHOCK MANAGEMENT: USING THE LOW TECHNOLOGY NON-PNEUMATIC ANTI-SHOCK GARMENT IN NIGERIAN AND EGYPTIAN TERTIARY CARE FACILITIES. 2010 BMC Pregnancy Childbirth, 10(64).

Magwali T, Butrick E, Mambo V, et al.
NASG FOR OBSTETRIC HEMORRHAGE: HARARE, ZIMBABWE. Presentation, XX FIGO World Congress. Rome, Italy. 2012.

Maknikar S, Nanda R, Miller S. NASG REDUCES MORTALITY IN INDIAN WOMEN WITH PPH. Presentation, XX FIGO World Congress. Rome, Italy. 2012.

Sutherland T, Downing J, Miller S, et al. USE OF THE NON-PNEUMATIC ANTI-SHOCK GARMENT (NASG) FOR LIFE-THREATENING OBSTETRIC HEMORRHAGE: A COST-EFFECTIVENESS ANALYSIS IN EGYPT AND NIGERIA. 2013 PLoS ONE, 8(4): e62282.

El Ayadi A, Butrick E, Geissler J, et al. COMBINED ANALYSIS OF THE NON-PNEUMATIC ANTI-SHOCK GARMENT ON MORTALITY FROM HYPOVOLEMIC SHOCK SECONDARY TO OBSTETRIC HEMORRHAGE. 2013 BMC Pregnancy Childbirth, In Press.

Miller S, Bergel E, El Ayadi A, et al. NON-PNEUMATIC ANTI-SHOCK GARMENT (NASG), A FIRST-AID DEVICE TO DECREASE MATERNAL MORTALITY FROM OBSTETRIC HEMORRHAGE: A CLUSTER RANDOMIZED TRIAL. 2013 PLoS ONE, 8(10): e76477.

Please see our website for a complete list of publications:
www.lifewrap.org/publications

CLUSTER RANDOMIZED CONTROL TRIAL INFORMATION:
<http://clinicaltrials.gov/ct2/show/NCT00488462>

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