NASG Frequently Asked Questions for Clinicians

How does the NASG work?

The NASG provides efficient, simple, and safe circumferential counter pressure of the abdomen and legs which reduces the blood volume in the compressed areas while expanding central circulation, reversing shock. Compression decreases the radius of blood vessels, which reduces blood flow through those vessels and thereby reduces blood loss.

What are the indications for using the NASG?

The NASG could be used to manage any condition where there is severe bleeding below the diaphragm and the woman has gone into shock, or is showing signs of hemodynamic instability. Studies have documented use with all forms of obstetric hemorrhage, as long as there is not a viable fetus *in utero*. The NASG can be used at any time during a pregnancy, early (abortion, ectopic, trophoblastic disease), later pregnancy (antepartum hemorrhage[placenta previa], abruption placenta), or during childbirth or postpartum (ruptured uterus, uterine atony, lacerations, post-caesarean bleed, etc.)

What are the contraindications for NASG use?

In treating postpartum hemorrhage with the NASG, there are no absolute contraindications. In trauma patients, the NASG is contraindicated for patients with severe congestive heart failure or preexisting mitral stenosis. In trauma victims with injury to the chest or head, redistribution of blood to the injured area with NASG placement raises the possibility of associated increased hemorrhage. We have no data on uterine blood flow and negative fetal effects of the NASG – it

could be assumed that placing the abdominal portion of the NASG would diminish uterine blood flow and could be detrimental to fetal oxygenation.

Does the NASG cause any discomfort?

Particularly in warm environments, patients may complain of being hot. Fans or air conditioning should be provided when possible. After many hours, some women experience itching. Removing one leg segment at a time and massaging the leg with lotion or powder can relieve this. Do not open the abdominal segment.

Additionally, women who are in the NASG for long periods of time may complain that the smell of the soiled NASG is bothering them. In this case, follow the instructions for "Replacing a Soiled NASG" in the NASG Tips for Clinicians to replace a soiled NASG with a clean NASG on the woman without losing compression.

The NASG is made out of non-breathable fabric. Won't this make the patient to hot, sweaty, and possibly dehydrated?

Women in shock are generally too cold, so the NASG initially will cause no problem. If the NASG is on for a long time, see solutions outlined in the previous question above. Additional fluids may be necessary when it is hot and a woman is in the NASG for a long time. All women in the NASG should have IV fluids running until after the NASG has been removed.

Can the patient breathe normally with the NASG in place?

The patient should not experience difficulty breathing and if general anesthesia is needed, ventilation should not be compromised. Should the patient experience dyspnea, quickly loosen

segments #5/6. If that does not resolve the dyspnea, the NASG should be removed and cardio-respiratory evaluation carried out, if possible.

Won't the NASG cut off all blood supply to the legs?

No, the fabric of the NASG has three-way stretch, which allows it to compress the legs, but still allows for some blood to pass through the veins and arteries. With the NASG applied you should still be able to palpate the patient's pedal pulse. The NASG is NOT a tourniquet.

Patients who are unconscious from shock regain consciousness with the application of the garment and may become frightened when they find themselves in the garment. How do you address that?

The proper care of critically ill, unconscious patients is one-to-one nursing care. However, the reality of some settings is that there will not be one-to-one nursing care available. If this is the case, it is critical that a support person (family member, traditional birth attendant, or other accompanying person) continuously be involved in the patient's care and at her side. The support person must be instructed to reassure the patient that the NASG is something which may have saved her life, and to also call for assistance from a nurse or doctor when needed.

How long can/should the NASG be used on a given patient?

There is no particular time limit. The patient should be stable and comfortable in the NASG for hours or days until the bleeding has been arrested (spontaneously, with medication, mechanically or through surgery), the fluid volume restored, and the blood replaced as needed.

Use of the NASG for as long as 48-72 hours has been reported. Average time in the NASG for women in University of California, San Francisco (UCSF) studies has been 6-8 hours.

Can the patient use a bedpan with the NASG on?

Yes, the majority of patients with the NASG will have a Foley or indwelling catheter. However, the NASG is designed so that a patient can use a bedpan without removing the NASG. Panel #4 can be rolled up (like a skirt), allowing the patient to use the bedpan without soiling the NASG. For complete details, please see the NASG Tips section of the toolkit.

When should be NASG be removed?

If the NASG is applied at the community/PHC level, it must remain in place until definitive care (usually at a referral hospital) has been given.

The NASG should only be removed at a referral center when the source of bleeding has been identified and hemostasis attained. We recommend waiting until bleeding is less than 50 ml per hour for 2 hours and pulse and blood pressure are stable for 2 hours. When the clinical impression is that the blood volume has been restored and the woman is hemodynamically stable, removal can begin.

The removal always begins with the ankle segment pair #1, and the BP and pulse are always checked before opening each segment. There is a "Rule of 20" that prescribes that if the BP decreases by 20 mm HG **or** the pulse rate increases by 20 beats per minute, that is a sign of hemodynamic instability, and all segments should be quickly closed.

For the proper removal procedure, please see the NASG removal section of the NASG toolkit.

Why not remove the top of the NASG first?

The largest portion of capacitance vessels are in the abdominal cavity, rather than the legs. Removal of the abdominal segment first will cause rapid redistribution of blood and the patient may return to a state of shock.

How will you know if the NASG has been removed prematurely?

If the woman is still hypovolemic, her blood pressure will decrease and pulse will increase when a segment if the NASG is removed (See Rule of 20 in the previous question about when the NASG should be removed). If this happens, replace all segments immediately.

Can surgery be performed with the NASG in place?

Vaginal surgery (episiotomy or laceration repair or D&C) and vaginal procedures (such as MVA) can and should be done with the NASG in place. Any vaginal procedure can be performed without opening any segment of the NASG.

The upper segments (#4 and #5/6) of the NASG must be opened for abdominal surgery (laparotomy, caesarean delivery). However, the leg segments should remain in place. The #4, #5, #6 should be closed after abdominal surgery.

Please see the procedures and surgery section of the toolkit for more information.

Does the NASG have to be applied and removed by a doctor?

After a basic training session, anyone who is able to recognize obstetric hemorrhage or hypovolemic shock can place the NASG. However, the decision to remove the NASG is one based on clinical and laboratory assessment. In many settings removal would be a physician-initiated decision. Any skilled health care provider who has been trained can do actual physical removal of the NASG. Removal is a stepwise process, which requires training to assess the stability of vital signs as each segment is removed at 15-minute intervals. Removal also requires the ability to reverse shock by administering additional fluids or blood transfusions.

When a physician is not available, well-trained midwives or clinical officers who have been trained on NASG removal can remove it. But, the important thing to remember is that emergency care must always be available when the NASG is removed.

Can the NASG be reused?

Yes, the NASG can be decontaminated with bleach, washed, and reused at least 40 times.

How can one ensure that a garment that is being reused is free of HIV and the hepatitis virus?

The NASG is wrapped on the outside of the body; it does not go inside the body, so it does not need to be sterile. The NASG must be decontaminated with a 0.01% bleach solution, washed, and dried. These are universal precaution/infection prevention steps.

What is the cost of the NASG?

In July, 2013 there were 3 manufacturers/distributors with slightly different prices. Sometimes the price depends on the number of NASGs ordered, larger orders have lower individual garment prices. For more detailed information, please see the purchasing section of this toolkit. .