



TIPS FROM EXPERIENCE

Have you made best use of the Bakri balloon in PPH?

➡ Reach for the balloon often and, for greatest benefit, apply it early in the postpartum hemorrhage treatment algorithm

Obstetricians know that postpartum hemorrhage (PPH) must be treated decisively and swiftly.¹ To review:

Active management of the third stage after vaginal delivery, with a uterotonic such as oxytocin, helps to reduce the frequency of PPH²; in a recent randomized trial involving vaginal delivery, the rate of PPH was 10% in women who received postpartum oxytocin and 17% in those who did not ($P < .001$).³

When hemorrhage occurs despite oxytocin, having been given postpartum, the standard treatment algorithm (see the **TABLE** on page 8) calls for:

- uterine massage
- additional uterotonics
- identification and repair of vaginal and cervical lacerations
- removal of any retained products of conception.

Instant Poll

Reader: What are your tips and tricks for effective use of intrauterine balloon tamponade in postpartum hemorrhage? Tell us by e-mail: obg@qhc.com. Include your name, city, and state.

We'll publish a sampling of contributions in an upcoming issue, with appreciation.

Placing an intrauterine balloon, such as the Bakri Postpartum Balloon (Cook Medical) or the BT-Cath (Utah Medical Products), is strongly recommended if these steps do not control bleeding.

In this Editorial, I review tips and tricks for using the Bakri balloon, building on my earlier OBG MANAGEMENT Editorial (February 2009, available at www.obgmanagement.com), in which I outlined a basic approach to intrauterine balloon tamponade.⁴

TIP Place the Bakri balloon early in the PPH treatment algorithm

For postpartum hemorrhage after vaginal delivery, typical initial steps include, as noted, fundal massage, administration of uterotonics, and curettage to remove retained products of conception. If these steps are ineffective, don't wait: **Immediately consider placing a Bakri balloon.** Time is precious, and wasting time with less effective interventions results in excessive blood loss and consumption of clotting factors and increases the risk of a coagulopathy.

I've found that clinicians often spend too much time trying to determine whether postpartum bleeding originates in the uterus or from a cervical or vaginal laceration. But heavy bleeding can obscure anatomic

structures, making it difficult to identify the site of bleeding with precision. Fruitlessly perseverating to differentiate uterine, cervical, and upper vaginal sources of bleeding can waste valuable time and lead to unnecessary blood loss.

By placing a Bakri balloon and inflating it early in the PPH treatment algorithm, you will significantly reduce uterine bleeding. You will also be able to assess the cervix and upper vagina more effectively for lacerations.

My recommendation. Place the Bakri balloon as soon as it is apparent that bleeding is so heavy that you are going to have difficulty assessing the cervix and upper vagina for lacerations. Note that this stands in contrast to the usual recommendation that you assess the cervix and vagina for lacerations before you place the Bakri balloon.

TIP Have 3 clinicians place the balloon

Teamwork is a key to success here: The Bakri balloon is most quickly and elegantly inserted and inflated when three clinicians team up, as follows:

Clinician #1 scans the uterus, assessing for retained products of conception and providing real-time imaging as the balloon is placed and inflated. This team member provides

Sequential interventions for managing postpartum hemorrhage

This sequence of steps applies 1) after vaginal delivery (*including the left hand-side interventions*) and 2) after cesarean delivery, with the abdominal incision still open (*including the right hand-side interventions*).

Hemorrhage after vaginal birth	Hemorrhage after cesarean delivery
Administer oxytocin	
Perform uterine massage	
Administer additional uterotonics (methergine, misoprostol, carboprost [Hemabate])	
Bring 2 units of packed RBCs and 2 units of fresh frozen plasma (FFP) to point of care	
Transfuse based on the clinical condition	
Consider transfusing RBCs and FFP at a 1:1 ratio until clotting parameters are evaluated	
Obtain Stat clotting studies	
Start an additional intravenous line	
Move the patient to the operating room	<ul style="list-style-type: none"> • Inspect the broad ligament and posterior uterus • Check for retained placental tissue
Repair any tears	<ul style="list-style-type: none"> • Place uterine devascularization sutures • Ligate the uterine artery • Ligate uterine vessels below the insertion of the fallopian tube
<ul style="list-style-type: none"> • Perform dilation and curettage to rule out, or treat, retained placental tissue • Perform ultrasonography to assess the uterine cavity for retained placental tissue 	Place uterine compression suture(s), such as a B-Lynch suture
Place an intrauterine balloon	Consider bilateral ligation of the internal iliac artery
If indicated, call for additional specialists: second anesthesiologist, gyn surgeon, interventional radiologist, blood bank director	
Selective embolization by interventional radiology	Hysterectomy
Exploratory laparotomy—follow steps (<i>along the right-hand side of this table</i>) for treating hemorrhage after cesarean delivery	Pelvic packing

Adapted from: California Maternal Quality Care Collaborative (www.CMQCC.org).

feedback to the others about correct placement and filling of the balloon. **Clinician #2 inserts the balloon into the uterus** by placing her hand into the vagina and guiding the balloon into the proper intrauterine position. (Most often, clinician #2 is the delivering clinician.) This technique is performed in a manner similar to

how one places an intrauterine pressure catheter.⁵

Clinician #2 stabilizes the balloon in position by maintaining her hand in the vagina. She ensures that the balloon does not “pop” out of the lower uterus as the balloon is filled (**FIGURE**).

Clinician #3 simultaneously begins

to instill sterile fluid into the balloon. This team member can be a nurse, medical assistant, or surgical technician.

My recommendation. Consider using simulation training to practice the team approach to placing the Bakri balloon. This is an effective method of improving team coordination.

TIP Instill at least 150 mL of fluid

In short, use more fluid, not less. Although one study showed that most clinicians fill the balloon to a median volume of 300 mL,⁶ I've observed that some timidly instill the balloon with 80 to 120 mL of fluid. I think this is too little to maximize the effectiveness of the balloon for a postpartum patient who has massive hemorrhage.

Studies have shown that **filling the balloon to at least 150 mL** noticeably increases tamponade pressure.⁷

TIP Place a pack in the upper vagina to stabilize the balloon in position

It usually takes only a few minutes after the Bakri balloon is filled to determine whether it is going to control uterine bleeding—what is called a tamponade test. If the balloon does control bleeding, you can place a vaginal pack of ribbon gauze to help ensure that the balloon does not slip down through the dilated postpartum cervix.

To avoid obscuring continued bleeding, however, do not place vaginal packing until you have obtained a positive tamponade test.

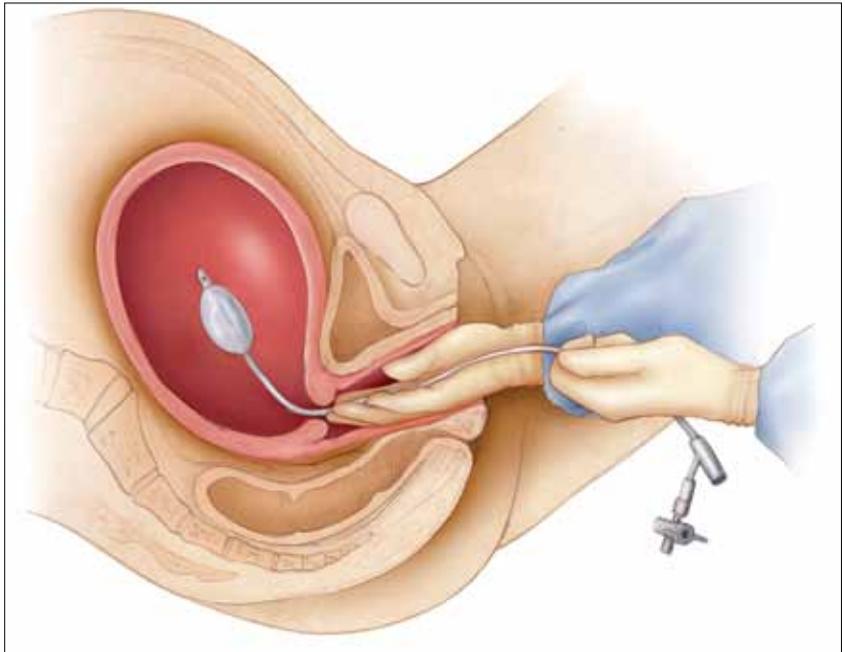
TIP Check the hemoglobin concentration, platelet count, and coagulation status

The trauma literature demonstrates that optimal patient outcomes are realized when the following targets are maintained during resuscitation of patients who have massive hemorrhage⁸:

- hematocrit, $\geq 21\%$
- platelet count, $\geq 50 \times 10^3/\mu\text{L}$
- fibrinogen $\geq 100 \text{ mg/dL}$
- International Normalized Ratio (INR) ≤ 1.5 .

These targets are achieved by appropriate transfusion of red blood cells, platelets, fresh frozen plasma,

Manual insertion of a Bakri balloon



Insert the balloon into the uterus by 1) placing your hand into the vagina and guiding the balloon into the proper intrauterine position (similar to the manner in which an intrauterine pressure catheter is placed),⁵ 2) stabilizing the balloon in position by maintaining the hand in the vagina, and 3) ensuring that the balloon does not “pop” out of the lower uterus as the balloon is filled.

cryoprecipitate, and purified recombinant fibrinogen concentrate (RiaSTAP). Many trauma specialists recommend transfusion of a 1:1 ratio of RBCs and fresh frozen plasma in cases of major hemorrhage until coagulation status is normalized.

My recommendation. Often, it takes as long as 1 hour (sometimes, longer) to get results of Stat coagulation tests from the lab. While you are waiting, obtain clinical evidence of clotting function by filling a red-top tube with the patient's blood. Adequate function is signaled by formation of a stable clot within 10 minutes.

TIP Practice your team's response to PPH with simulation

Last, I urge clinicians in every birthing unit to use simulation exercises

to improve all facets of their response to severe postpartum hemorrhage.⁹

Summing up

Death following PPH remains a major cause of maternal mortality in developed and developing countries. The appropriateness of your response **within 10 minutes of the onset of PPH** is critical to ensuring a successful outcome and minimizing adverse events.¹⁰ To help, use the Bakri Postpartum Balloon often, and use it early. 📌

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The author reports no financial relationships relevant to this article.

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