



Current Trends in Postpartum Hemorrhage Treatments

Margaret Browne BSN, OB-RNC, Legal Nurse Consultant

Keywords: Postpartum hemorrhage, obstetric hemorrhage, quantification of blood loss, uterine balloon tamponade, uterotonics, patient safety bundles

Postpartum hemorrhage (PPH) represents the most frequent and life-threatening childbirth complication and is the primary cause of morbidity and mortality during childbirth (Wormer et al., 2020). It is defined as a loss of 1,000 or more milliliters of blood with evidence of hypovolemia during the 24 hours after delivery, regardless of delivery method (Wormer et al., 2020). For the experienced or novice clinician, uncontrolled bleeding represents one of the most terrifying scenarios in obstetrics.

Between 1-6% of deliveries are complicated by PPH (Wormer et al., 2020). Prompt recognition and intervention by the obstetrical team may avert a catastrophic event. Postpartum hemorrhage may occur with or without the presence of significant risk factors. Worldwide, 27.1% of maternal deaths are attributed to PPH every year (Sebghati & Chandraharan, 2017). In the US, 12% of yearly maternal deaths are caused by excessive blood loss (Wormer et al., 2020).

INTRODUCTION

The incidence of postpartum hemorrhage (PPH) in the United States rose steadily from 1993 to 2014 (Centers for Disease Control and Prevention, 2019). This increase does not appear to be caused by risk factors such as advanced age, hypertension, or diabetes. Researchers suspect that increased use of labor induction and primary cesarean sections have increased the frequency of uterine atony, which has resulted in a higher incidence of PPH (Callaghan et al., 2010).

Women who survive PPH may experience organ damage, loss of fertility, and post-traumatic stress disorder (Sebghati & Chandrabaran, 2017). Improving survival and outcomes requires a swift, coordinated response involving medical, nursing, laboratory, and blood bank staff. Failure to recognize substantial blood loss and quickly implement interventions can lead to loss of life. The non-obstetrical legal nurse consultant may be involved in reviewing cases involving maternal injury or death from PPH.

CURRENT TRENDS

Safety bundles improve outcomes in patient care. As defined by the Institute for Healthcare Improvement (2021), a safety bundle “is a structured way of improving the processes of care and patient outcomes: a small, straightforward set of evidence-based practices — generally three to five — that, when performed collectively and reliably, have been proven to improve patient outcomes” (para. 1).

The use of standardized safety bundles is recommended by The Alliance for Innovation on Maternal Health (AIM) within The Council on Patient Safety in Women's Health Care. The AIM is a national maternal safety and quality improvement initiative that is data informed (AIM, 2020, para. 1). The Council is composed of all the major

Postpartum hemorrhage occurs after the delivery of the placenta and is characterized by excessive bleeding and lack of uterine muscle tone... PPH's significant causes [are] Tone, Trauma, Tissue, and Thrombin.

professional organizations involved in women's health care, including but not limited to the Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN); the American College of Obstetricians and Gynecologists (ACOG); and the Society for Maternal-Fetal Medicine.

The Obstetric Hemorrhage Patient Safety Bundle published by the Council (2015) includes but is not limited to:

Readiness:

- Immediate access to emergency medications (kit)
- Hemorrhage cart with blood tubing, intrauterine balloons, and instructions
- Establishment of a response team
- Massive transfusion protocol
- Annual drills and debriefing

Recognition and Prevention:

- Assessment of every patient for the risk of excessive bleeding
- Accurate measurement of cumulative blood loss for every delivery
- Active third stage management

Response:

- Standardized emergency management plan with checklists
- Communication with patients and family afterward with a support program

Reporting:

- Huddles (communication) for at-risk women and debriefing

- Outcomes monitoring via process improvement committees

BACKGROUND

Labor is divided into three stages. The first stage involves dilation and thinning of the cervix. The second stage begins with the complete opening of the cervix and ends with the delivery of the baby. The placenta is delivered during the third stage. Postpartum hemorrhage occurs after the delivery of the placenta and is characterized by excessive bleeding and lack of uterine muscle tone. Factors associated with increased PPH risk include prolonged labor or induction, infection, uterine fibroids, obesity, multiple gestations, and previous uterine surgery. A helpful mnemonic for identifying and addressing PPH's significant causes is the four T's: Tone, Trauma, Tissue, and Thrombin.

Tone: Uterine atony, or lack of uterine tone, contributes to 70-80% of PPH cases (ACOG, 2017). Medications commonly used during labor such as magnesium sulfate and nifedipine for hypertension may impair uterine contractility. The ACOG currently recommends active (versus expectant) management of the third stage of labor. Active management measures include prophylactic oxytocin with the delivery of the baby's anterior shoulder, or soon after, and uterine massage (ACOG, 2017). In addition, a full bladder displaces the uterus and interferes with uterine contractility, so the insertion of an indwelling urinary catheter may help improve tone.

A patient's initial hemorrhage risk assessment...may increase over time due to prolonged labor, infection, and extended hours of oxytocin administration. These factors may impair uterine contractility after delivery.

Trauma: The obstetrical (OB) team should consider whether any tissue trauma may be contributing to the PPH. Trauma to the genital tract could be caused by operative delivery via vacuum or forceps or a laceration from fetal delivery.

Tissue: Tissue refers to any retained placental fragments or clots that prevent the uterus from contracting effectively. The uterus will need to be explored manually, preferably with analgesia.

Thrombin: The obstetrical team should consider whether any coagulopathies may be causing the PPH. Clotting alterations may be inherent (e.g., Von Willebrand disease) or acquired. Severe pre-eclampsia with HELLP syndrome (hemolysis, elevated liver enzymes, and low platelet count) is one form of acquired coagulopathy. Massive PPH itself leads to a consumptive type of coagulopathy (i.e., disseminated intravascular coagulation) in which clotting factors are depleted intravascularly (Su & Chong, 2012).

Nursing care of obstetrical patients includes assessing hemorrhage risk upon admission, placing a large-bore intravenous catheter, and obtaining baseline labs including a type and screen or cross-match for at-risk patients. A patient's initial hemorrhage risk assessment is not fixed and may increase over time due to prolonged labor, infection, and extended hours of oxytocin administration. These factors may impair uterine contractility after delivery. Patient education is needed to illuminate the rationale for having venous access available and drawing lab work. Some clients desire minimal

interventions during labor and should be fully informed by their providers of the risks of refusing interventions. Patients who do not wish to receive any blood products for religious or other reasons should be identified upon admission.

For the initial 30 to 45 minutes after delivery until the mother is stable, staffing recommendations are to have one nurse caring for the mother and a separate nurse assigned to the baby. The new mother's vital signs and the height and consistency of her fundus should be evaluated and documented every fifteen minutes. The amount of lochia (vaginal bleeding) should be carefully assessed. Continuous nursing care at the bedside during the first two postpartum hours is considered best practice (Simpson, 2015). Changes in vital signs, tachycardia, and low blood pressure are late signs of PPH (Nathan et al., 2014).

QUANTIFICATION OF BLOOD LOSS

The AWHONN (2015) recommends that blood loss be formally measured after every delivery. Prior practice has been documentation of estimated blood loss. However, most clinicians vastly underestimate blood loss after delivery, and the lack of early recognition of significant blood loss leads to increased morbidity and mortality. Overestimation of blood loss leads to risky interventions and potential exposure to infectious diseases from blood products.

Current practice is the quantification of blood loss (QBL), which requires planning and a group effort. The delivery nurse and provider document

dry weights for pads, gauze, and lap sponges. Calibrated drapes (drapes with a calibrated pouch for fluid collection) may be useful. The QBL recording begins immediately after the infant's birth, with amniotic fluid and irrigation fluids subtracted. Blood-soaked materials are weighed, and their dry weight is subtracted. Quantified blood loss is then determined using this ratio: one gram of weight = one milliliter of blood loss (AWHONN, 2015).

TREATMENT OF POSTPARTUM HEMORRHAGE

Medications are an integral part of blood loss mitigation in PPH. Some labor and delivery units have prepared OB hemorrhage kits containing frequently used agents, such as oxytocin, tranexamic acid, misoprostol, methylergonovine, and carboprost. These may be available at the bedside during an at-risk delivery. The use of uterotonics (uterine stimulants) after delivery is a common practice. Tranexamic acid may be used in the first



Image 1

Reproduced with permission from Cook Medical (2021)

three hours after delivery and does not appear to increase the risk of thromboembolic events (Shakur et al., 2018).

Uterine balloon tamponade may be useful for addressing bleeding from the placental implantation site. Balloon catheters may be used for women who do not respond to medications and may be used after cesarean or vaginal deliveries. See Images 1 and 2 for an example of a uterine balloon catheter and how it is placed. They are relatively inexpensive devices to purchase and have on hand. Balloon tamponade may work by applying pressure directly to the placental bed and/or lowering uterine artery perfusion pressure (Belfort et al., 2011).

In areas of low resources, the B-Lynch suture may be employed. This method

involves uterine compression sutures typically placed during a cesarean section. Both balloon placement and the B-Lynch suture preserve the uterus and are considered fertility-sparing (Kaya et al., 2016).

Facilities with interventional radiology may perform uterine artery embolization to address bleeding while sparing the uterus (Aoki et al., 2018). Hysterectomy is indicated for continued bleeding in patients who do not respond to interventions.

The utilization of a massive transfusion protocol during a severe obstetrical hemorrhage is of value. In the absence of a known blood type, administration of O negative blood is an acceptable practice. The California Maternal Quality Care Collaborative's OB Hemorrhage Toolkit recommends an OB hemorrhage pack

consisting of four to six units of packed red blood cells, four units of fresh frozen plasma, and one unit of apheresis platelets (2015). A cooler may be used for storing the blood products before use, minimizing delays from multiple trips to the blood bank to pick up products. Lab values should be evaluated every 30 minutes and should include a complete blood count with platelets, prothrombin time (PT), international normalized ratio (INR), partial thromboplastin time (PTT), fibrinogen, and ionized calcium. The target values for these labs are hematocrit over 24%; platelets

over 50,000 μL ; international normalized ratio less than 1.5; fibrinogen over 100,000 mg/dL; and ionized calcium levels 4.4 to 5.4 mg/dL (Shields et al., 2015). Care should be taken to maintain blood pH at or above 7.2 and temperature above 95° Fahrenheit. Maintaining lab values at or above these targets is important to avoiding coagulopathy. The use of a blood warmer is recommended when infusing large volumes of blood products (Shields et al., 2015).

SUMMARY

Postpartum hemorrhage represents a real obstetric emergency and requires a coordinated, skilled response to prevent maternal morbidity or mortality. When reviewing an OB hemorrhage case, the legal nurse consultant should consider the following questions. Was the patient assigned a risk score upon admission? If she was deemed at high risk for bleeding, was a type and screen ordered? Did her risk change during labor? Was she on oxytocin for over 24 hours, or did she become febrile? Were her vital signs and fundus checked frequently? Was the provider notified in a timely manner, or was the chain of command activated? Were uterotonics administered emergently (if part of a standing order) prior to the delivering provider's arrival at the bedside? Was the birth facility compliant with clinical recommendations that were in effect at the time of the incident in question? Understanding postpartum hemorrhage and its treatments and considering these questions will help the legal nurse consultant conduct a thorough analysis of these cases.

REFERENCES

- Alliance for Innovation on Maternal Health. (2020). *What is AIM?* [https://safehealthcareforeverywoman.org/AIM/#:~:text=The%20Alliance%20for%20Innovation%20on%20Maternal%20Health%20\(AIM\),mortality%20and%20severe%20morbidity%20across%20the%20United%20States](https://safehealthcareforeverywoman.org/AIM/#:~:text=The%20Alliance%20for%20Innovation%20on%20Maternal%20Health%20(AIM),mortality%20and%20severe%20morbidity%20across%20the%20United%20States)
- American College of Obstetricians and Gynecologists' Committee on Practice Bulletins

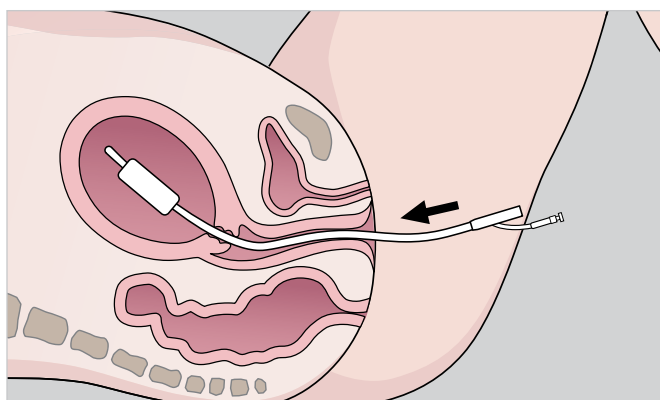


Figure 1: Transvaginal placement, postvaginal delivery

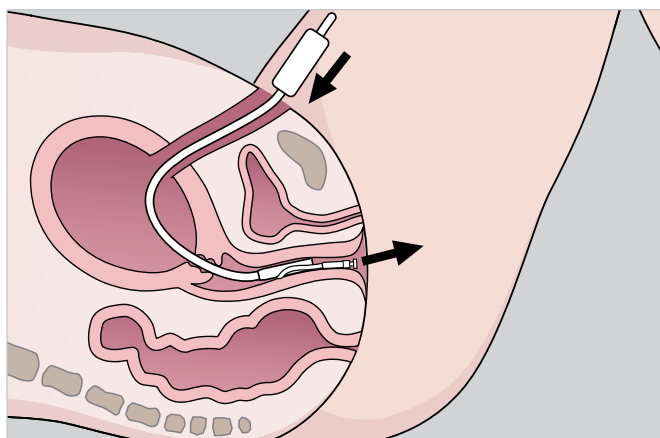


Figure 2: Transabdominal placement, postcesarean delivery

Image 2

Reproduced with permission from Cook Medical (2020)

–Obstetrics. (2017). Practice bulletin no. 183: Postpartum hemorrhage. *Obstetrics & Gynecology*, 130(4), e168–e186. doi:10.1097/aog.0000000000002351

Aoki, M., Tokue, H., Miyazaki, M., Shibuya, K., Hirasawa, S., & Oshima, K. (2018). Primary postpartum hemorrhage: Outcome of uterine artery embolization. *British Journal of Radiology*, 91(1087). doi:10.1259/bjr.20180132

Association of Women's Health, Obstetric and Neonatal Nurses. (2015). Quantification of blood loss: AWHONN practice brief number 1. *Journal of Obstetric, Gynecologic, & Neonatal Nursing*, 44(1), 158–160. doi:10.1111/1552-6909.12519

Belfort, M. A., Dildy, G. A., Garrido, J., & White, G. L. (2011). Intraluminal pressure in a uterine tamponade balloon is curvilinearly related to the volume of fluid infused. *American Journal of Perinatology*, 28(8), 659–666. doi:10.1055/s-0031-1276741.

California Maternal Quality Care Collaborative. (2015). OB hemorrhage toolkit V 2.0. <https://www.cmqqc.org/resources-tool-kits/toolkits/ob-hemorrhage-toolkit>

Callaghan, W. M., Kuklina, E. V., & Berg, C. J. (2010). Trends in postpartum hemorrhage: United States, 1994–2006. *American Journal of Obstetrics and Gynecology*, 202(4), 353.e1–6. doi:10.1016/j.ajog.2010.01.011

Centers for Disease Control and Prevention. (2019). *Data on selected pregnancy complications in the United States*. <https://www.cdc.gov/reproductivehealth/maternalinfanthealth/pregnancy-complications-data.htm>

Cook Medical. (2020). *Bakri® postpartum balloon with rapid instillation components*. https://www.cookmedical.com/data/resources/RH-D54670-EN-F_M3_1585061971661.pdf

Cook Medical. (2021). *Bakri® postpartum balloon with rapid instillation components*. https://www.cookmedical.com/products/wh_sosr_webds/

Council on Patient Safety in Women's Health Care. (2015). *Patient safety bundle: Obstetric hemorrhage*. <https://safehealthcareforeverywoman.org/wp-content/uploads/safe-health-care-for-every-woman-Obstetric-Hemorrhage-Bundle.pdf>

Journal of Obstetrics and Gynaecology, 122(2), 268–275. doi:10.1111/1471-0528.13206

Sebghati, M., & Chandrachan, E. (2017). An update on the risk factors for and management of obstetric haemorrhage. *Women's Health*, 13(2), 34–40. doi:10.1177/1745505717716860

Shakur, H., Beaumont, D., Pavord, S., Gayet-Ageron, A., Ker, K., & Mousa, H. A. (2018). Antifibrinolytic drugs for treating primary postpartum haemorrhage. *Cochrane Database of Systematic Reviews*, 2(2). doi:10.1002/14651858.cd012964

Shields, L. E., Wiesner, S., Fulton, J., & Pelletreau, B. (2015). Comprehensive maternal hemorrhage protocols reduce the use of blood products and improve patient safety. *American Journal of Obstetrics and Gynecology*, 212(3), 272–280. doi:10.1016/j.ajog.2014.07.012

Simpson, K. R. (2015). Nurse staffing and care during the immediate postpartum recovery period. *MCN: The American Journal of Maternal/Child Nursing*, 40(6), 403. doi:10.1097/nmc.0000000000000182

Su, L. L., & Chong, Y. S. (2012). Massive obstetric haemorrhage with disseminated intravascular coagulopathy. *Best Practice & Research Clinical Obstetrics & Gynaecology*, 26(1), 77–90. doi:10.1016/j.bpobgyn.2011.10.008

Wormer, K. C., Jamil, R. T., & Bryant, S. B. (2020). *Acute postpartum hemorrhage*. StatPearls. <https://www.statpearls.com/articlelibrary/viewarticle/27638/>

FOR FURTHER INFORMATION

<https://safehealthcareforeverywoman.org/aim/patient-safety-bundles/maternal-safety-bundles/obstetric-hemorrhage-patient-safety-bundle-2/>
<https://www.cmqqc.org/>
<https://awhonn.org/postpartum-hemorrhage-pph/>



Margaret "Lisa" Browne BSN, OB-RNC, has been a labor and delivery nurse for over 33 years and is currently working full-time at Providence Cedars-Sinai Tarzana Medical Center in Tarzana, CA. She is a member of AALNC as well as the online WVUOV Chapter. Lisa can be reached at mbrowne7654@gmail.com.

Keep your business at your fingertips.

Business Assets Continuity of Services
Engagement Management



Mila Carlson
Phone: (815) 339-0390
mila@successionsolutions.us

Order Your Guidebook Today!
successionsolutions.us

Institute for Healthcare Improvement. (2021). *Evidence-based care bundles*. <http://www.ihl.org/topics/Bundles/Pages/default.aspx>

Kaya, B., Guralp, O., Tuten, A., Unal, O., Celik, M. O., & Dogan, A. (2016). Which uterine sparing technique should be used for uterine atony during cesarean section? The Bakri balloon or the B-Lynch suture? *Archives of Gynecology and Obstetrics*, 294(3), 511–517. doi:10.1007/s00404-016-4015-z

Nathan, H. L., El Ayadi, A., Hezelgrave, N. L., Seed, P., Butrick, E., Miller, S., Briley, A., Bewley, S., & Shennan, A. H. (2014). Shock index: An effective predictor of outcome in postpartum haemorrhage? *British*