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EXPERT OPINION

National Partnership for Maternal Safety: Consensus Bundle on Obstetric Hemorrhage

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Hemorrhage is the most frequent cause of severe maternal morbidity and preventable maternal mortality and therefore is an ideal topic for the initial national maternity patient safety bundle. These safety bundles outline critical clinical practices that should be implemented in every maternity unit. They are developed by multidisciplinary work groups of the National Partnership for Maternal Safety under the guidance of the Council on Patient Safety in Women's Health Care. The safety bundle is organized into four domains: *Readiness, Recognition and Prevention, Response,* and *Reporting and Systems Learning*. Although the bundle components may be adapted to meet the resources available in individual facilities, standardization within an institution is strongly encouraged. References contain sample resources and potential best practices to assist with implementation.

Obstetric hemorrhage is the most common serious complication of childbirth and is the most preventable cause of maternal mortality (Berg et al., 2005; Main, McCain, Morton, Holtby, & Lawton, 2015). Furthermore, recent data suggest that rates of obstetric hemorrhage are increasing in developed countries, including the United States (Callaghan, Kuklina, & Berg, 2010), and that rates of hemorrhage-associated severe maternal morbidity exceed the morbidities associated with other obstetric and medical conditions (Callaghan, Creanga, & Kuklina, 2012; Grobman et al., 2014).

Standardized, comprehensive, multidisciplinary programs have demonstrated significant reductions in morbidity (Einerson, Miller, & Grobman, 2015; Shields, Wiesner, Fulton, & Pelletreau, 2015). Therefore, a workgroup of the Partnership for Maternal Safety, within the Council on Patient Safety in Women's Health Care and representing all major women's health care professional organizations, has developed an obstetric hemorrhage safety bundle (Council on Patient Safety in Women's Health Care, 2015). The goal of the partnership is the adoption of the safety bundle by every birthing facility in the United States. A patient safety bundle is a set of straightforward, evidence-based recommendations for practice and care processes known to improve outcomes (Institute for Healthcare Improvement, 2015). Such a bundle is not a new guideline but rather represents a selection of existing guidelines and recommendations in a form that aids implementation and consistency of practice. The consensus bundle on obstetric hemorrhage is organized into four action domains: *Readiness, Recognition and Prevention, Response*, and *Reporting and System Learning*. There are 13 key elements within these four action domains (see Table 1). It is anticipated that few, if any, hospitals will have 100% of these elements in place at the start of this quality improvement process, and this document should serve as a checklist from which to work. Low-resource hospitals should be able to accomplish most of these recommendations, but if some are not achievable (e.g., sufficient blood bank inventory), consideration should be given to directing higher-risk patients to another facility. Furthermore, given the wide diversity of birthing facilities, we are not recommending a single national protocol, but we are asking that every facility address each domain and use our examples to assist them in their journeys to improved maternal safety. This document was developed by official representatives from the American Association of Blood Banks, the

Table 1: Obstetric Hemorrhage Safety Bundle from the National Partnership for Maternal Safety, Council on Patient Safety in Women's Health Care

Readiness (Every Unit)
1. Hemorrhage cart with supplies, checklist, and instruction cards for intrauterine balloons and compression stitches
2. Immediate access to hemorrhage medications (kit or equivalent)
3. Establish a response team-who to call when help is needed (blood bank, advanced gynecologic surgery, other support and tertiary services)
4. Establish massive and emergency-release transfusion protocols (type-O negative or uncrossmatched)
5. Unit education on protocols, unit-based drills (with postdrill debriefs)
Recognition and Prevention (Every Patient)
6. Assessment of hemorrhage risk (prenatal, on admission, and at other appropriate times)
7. Measurement of cumulative blood loss (formal, as quantitative as possible)
8. Active management of the 3rd stage of labor (department-wide protocol)
Response (Every Hemorrhage)
9. Unit-standard, stage-based obstetric hemorrhage emergency management plan with checklists
10. Support program for patients, families, and staff for all significant hemorrhages
Reporting and Systems Learning (Every Unit)
11. Establish a culture of huddles for high-risk patients and postevent debriefs to identify successes and opportunities
12. Multidisciplinary review of serious hemorrhages for systems issues
13. Monitor outcomes and process metrics in perinatal quality improvement committee

Note. Modified from http://www.safehealthcareforeverywoman.org/

American Academy of Family Physicians, the American College of Nurse-Midwives, the American College of Obstetricians and Gynecologists (the College), the Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN), the Society for Maternal-Fetal Medicine, and the Society for Obstetric Anesthesia and Perinatology.

Historically, estimated blood loss of more than 500 mL after vaginal birth and more than 1,000 mL after cesarean birth were widely used to define postpartum hemorrhage, but these estimates are hindered by the near-universal tendency to underestimate blood loss at birth (Toledo, Eosakul, Goetz, Wong, & Grobman, 2012; Patel et al., 2006). These volumes are actually close to the average blood loss for vaginal and cesarean births. The College's nomenclature consensus conference (reVITALize) recently revised the definition of early postpartum hemorrhage as "cumulative blood loss of ≥1,000 mL OR blood loss accompanied by signs and symptoms of hypovolemia within 24 hours following the birth process," with a note that "cumulative blood loss of 500–999 mL alone should trigger increased supervision and potential interventions as clinically indicated" (Menard, Main, & Currigan, 2014). Therefore, careful and cumulative assessment of blood loss is a crucial component of this safety bundle. The twin themes of *denial* and *delay* are a recurrent finding in case reviews of severe hemorrhage events and represent important quality improvement opportunities addressed throughout the bundle (Main et al., 2015).

READINESS (EVERY FACILITY)

The *Readiness* domain includes five areas of focus to be addressed by every facility to prevent delays and prepare for the optimal management of obstetric hemorrhage cases. Delays in diagnosis or treatment of hemorrhage account for most adverse outcomes and present an opportunity for significant improvement (Driessen et al., 2011; Main et al., 2015).

1. Hemorrhage Cart

A cart containing the necessary supplies should be immediately available on the birthing unit, with similar materials available on antepartum and postpartum floors. Cart contents should be determined with input from obstetric, anesthesiology, nursing, midwifery, and pharmacy providers. It is also valuable for the cart to contain cognitive aids for infrequently performed technical procedures, such as placement of uterine tamponade balloons and uterine compression sutures. Unit leadership must determine a system to ensure consistent cart stocking and maintenance. Examples of cart contents have been published (Bingham, Melsop, & Main, 2010; Lyndon et al., 2010).

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