AWHONN
PROMOTING THE HEALTH OF
WOMEN AND NEWBORNS

PRACTICE BRIEF

CLINICAL MANAGEMENT GUIDELINES FOR WOMEN'S HEALTH AND PERINATAL NURSES

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Quantification of Blood Loss

> **Recommendation:**
> AWHONN recommends that blood loss be formally measured or quantified after every birth.

Magnitude of the Problem
- A leading cause of maternal morbidity and mortality is failure to recognize excessive blood loss during childbirth (The Joint Commission, 2010).
- Women die from obstetric hemorrhage because effective interventions are not initiated early enough (Berg et al., 2005; Della Torre et al., 2011).
- New York State Department of Health (2004, 2009) issued health advisories informing health care providers to pre-vent maternal deaths by improving recognition of and response to hemorrhage.

Inaccuracy of Visual Estimation of Obstetric-Related Blood Loss or Estimated Blood Loss (EBL)
Visual estimation of blood loss (EBL) is common practice in obstetrics; however, the inaccuracy of EBL has been well established:
- As early as the 1960s, researchers demonstrated that visual EBL resulted in underestimation and overestimation (Brant, 1967; Pritchard, 1965).
- Visual EBL most commonly results in errors of underestimation (Al Kadri, Anazi, & Tamim, 2011; Brant, 1967; Duthie et al., 1990; Patel et al., 2006; Pritchard,1965).
- Visual estimation consistently resulted in underestimation of large volumes (Brant, 1967; Duthie et al., 1990; Stafford, Dildy, Clark, & Belfort, 2008) of >1000 ml (Stafford et al., 2008). With smaller volumes, EBL resulted in overestimation compared to direct measurement (Dildy et al., 2004).
- The use of visual EBL can result in underestimation of blood loss by 33- 50% (Patel et al., 2006).
- With training, clinicians initially improved accuracy with visual EBL (Dildy et al., 2004) but experienced skill decay within nine months of training completion (Toledo, Eosakul, Goetz, Wong, & Grobman, 2012).
- Provider specialty, age, or years of experience were not related to accuracy of visual EBL (Al Kadri et al., 2011; Toledo, McCarthy, Hewlett, Fitzgerald, & Wong, 2007), and medical students as well as experienced clinicians made similar errors (Dildy et al., 2004).

Implications of Inaccurate Evaluation of Blood Loss
- Accurate and timely recognition of excessive blood loss by clinicians is crucial because it leads to the initiation of blood transfusions and other maternal resuscitative efforts.
- Many clinicians rely on the flawed, imprecise method of visual EBL.
- Inaccurate measurement of postpartum blood loss has the following implications:
  — Overestimation can lead to costly, invasive, and unnecessary treatments such as blood transfusions that expose women to unnecessary risks.
  — Underestimation can lead to delay in delivering lifesaving hemorrhage interventions.

Quantification of Blood Loss (QBL)
- QBL is an objective method used to evaluate excessive bleeding.
- Methods to quantify blood loss, such as weighing, are significantly more accurate than EBL (Al Kadri et al., 2011). The use of a calibrated drape had an error rate of less than 15% (Toledo et al., 2007).
- QBL reduces the likelihood that clinicians will underestimate the volume of blood lost and delay early recognition and treatment.

Table 1. Tips for Quantification of Blood Loss (QBL)
Quantification of maternal blood loss is a team effort.
1. Create a list of dry weights for delivery items that may become blood-soaked with directions on how to calculate blood loss.
2. Begin QBL immediately after the infant's birth (prior to delivery of the placenta) and assess and record the amount of fluid collected in a calibrated under-buttocks drape or suction canister. Keep in mind that most of the fluid collected prior to birth of the placenta is amniotic fluid, urine, and feces. If irrigation is used, deduct the amount of irrigation from the total fluid that was collected.
3. Record the total volume of fluid collected in the under-buttocks drape or suction canister.
4. Subtract the pre-placenta fluid volume from the post-placenta fluid volume to more accurately determine the actual blood lost. Keep in mind that most of the fluid collected after the birth of the placenta is blood.
5. Add the fluid volume collected in the drapes and canister to the blood volume measured by weighing soaked items to determine the cumulative volume of blood loss or QBL.
6. Weigh all blood-soaked materials and clots to determine cumulative volume.
   1 gram weight = 1 milliliter blood loss volume
7. The equation used when calculating blood loss of a blood soaked item is:
   WET *Item Gram Weight* – **DRY** *Item Gram Weight* **=** *Milliliters of Blood within the item*

Note: Although a gram is a unit of mass and a milliliter is a unit of volume, the conversion from one to the other is simple.

Table 2. Tips for Quantification of Blood Loss (QBL) During Cesarean Births
1. Begin the process of QBL when the amniotic membranes are ruptured or after the infant is born.
2. Suction and measure all amniotic fluid within the suction canister of collected fluid before delivery of the placenta.
3. After delivery of the placenta, measure the amount of blood lost in the suction canister and drapes. At this point, most of the blood will be accounted for. Notify the team and document the amount of blood lost in milliliters.
4. Prior to adding irrigation fluid, ensure that the scrub team communicates when irrigation is beginning. Remember that some of the normal saline will be absorbed into the tissues. For this reason, not all of the fluid will be suctioned out of the abdomen and accounted for.
5. One of two methods can be used to suction the irrigation fluid:
   —Continue to suction into the same canister and measure the amount of irrigation fluid
   OR
   —Provide another suction tube to collect the irrigation separately into another canister.
6. Weigh all blood-soaked materials and clots. Calculate the weight and convert to milliliters.
7. At the conclusion of the surgery, add the volume of quantified blood calculated by weight with the volume of quantified blood in the suction canister to determine total QBL.
8. Note that lap pads dampened with normal saline contain minimal fluid. When they become saturated with blood, weigh them as you would a dry lap pad.
9. QBL will never be exact. However, it is more accurate to do some measurements than to rely solely on visual estimates.

Suggested Equipment:
- Calibrated under-buttocks drapes to measure blood loss
- Dry weight card, laminated and attached to all scales, for measurement of items that may become blood-soaked when a woman is in labor or after giving birth
- Scales to weigh blood-soaked items, ideally in every labor and operating room and on the postpartum unit; save costs by using the scales used to weigh newborns
- Formulas inserted into the electronic charting system that automatically deduct dry weights from wet weights of standard supplies such as chux and peri-pads

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Additional Resources

Brace, R. A., & Wolf, E. J. (1989). Normal amniotic fluid volume changes throughout pregnancy. *American Journal of Obstetrics and Gynecology, 161*(2), 382-388.

Gabel, K. T., & Weeber, T. A. (2012). Measuring and communicating blood loss during obstetric hemorrhage. *Journal of Obstetric, Gynecologic, & Neonatal Nursing, 41*(4), 551-558.

About AWHONN

The Association of Women's Health, Obstetric, and Neonatal Nurses (AWHONN) is the foremost nursing authority that advances the health care of women and newborns through advocacy, research and the creation of high quality, evidence-based standards of care. AWHONN represents 350,000 clinicians, educators and executives who serve as patient care advocates focusing on the needs of women and infants. A leader in professional development, AWHONN holds the distinction of twice receiving the Premier Program award by the American Nurses Credentialing Center (ANCC) for innovation and excellence in Continuing Nursing Education (CNE).

AWHONN Postpartum Hemorrhage Project

The AWHONN Postpartum Hemorrhage Project (PPH) is designed to reduce clinician errors associated with mortality and morbidity resulting from obstetric hemorrhage by improving clinicians' recognition of, readiness for, and response to postpartum hemorrhage events. Hospitals in the District of Columbia, Georgia, and New Jersey will be selected to participate in a quality improvement collaborative. The participating hospital leaders will receive expert coaching from the multi-disciplinary Quality Improvement Expert Panel, comprised of physicians, nurses, and AWHONN staff, and peer coaching and guidance from other participating hospitals. Learn more at www.pphproject.org