

DEFINITION, EARLY RECOGNITION AND RAPID RESPONSE USING TRIGGERS

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BACKGROUND AND LITERATURE REVIEW

Postpartum hemorrhage (PPH) affects 1-3% of pregnancies in the first 24 hours after birth and is a leading cause of pregnancy-related mortality in developing and developed countries. Deaths due to PPH have declined in developed countries because hospitals have easier access to blood products, but PPH-related morbidities have remained constant and include massive transfusions, secondary surgical procedures, ICU admissions and fertility loss. (1) The risk of hemorrhage is always present at birth, but early identification creates the potential to intervene and prevent major blood loss. Early intervention requires the following: 1) recognition of risk factors leading to heightened surveillance; 2) standardized approach to estimating blood loss; and 3) the use of clinical evaluative thresholds—typically vital signs—as triggers or alerts.

While efforts to standardize treatment abound, relatively few institutions have created a systematic PPH protocol for early recognition and rapid response. This deficit is due in part to the broad range of clinical risk factors involved in PPH, lack of standardized methods for estimating blood loss and lack of a “gold standard” for defining PPH. (2-6) This document focuses on: 1) providing a consensus definition of early or primary PPH occurring within the first 24 hours after delivery; 2) outlining clinical cues or triggers to quickly identify and respond to prevent progression of heavy bleeding to massive hemorrhage and its potential sequelae: shock, disseminated intravascular coagulation, multi-system organ dysfunction, and death.

Quantified Blood Loss as a Trigger

Whether PPH occurs early (within first 24 hours) or late (≥ 12 weeks postpartum) no single definition of PPH exist that undermines the true incidence of PPH. Various definitions include: ≥ 500 ml of estimated blood loss (EBL) after completion of the third stage; 900 ml of EBL which typically corresponds to a 15% volume deficit; 10% change in hematocrit or need for blood transfusion; and any blood loss from the genital tract > 500 ml. (3-6) The ICD-9-CM: 666.x or ICD-10-CM: 072 give little guidance, leaving the definition of “Postpartum Hemorrhage” to the healthcare provider. (7, 8) In addition, incidence is ambiguous because it is related not only to estimated blood loss but also to the mother’s initial total blood volume and the rapidity of blood loss.

Pritchard et al., in a quantitative study of actual blood loss, noted that approximately 5% of women lost >1000 ml during vaginal delivery. (9) A European study using the 500/1000 ml limit, reported incidence rates of 19% (vaginal) and 4.2% (cesarean). (10) When carefully measured, the average blood loss during delivery is approximately 500 ml for a vaginal delivery and 1000 ml for a cesarean delivery. (2, 3) Findings are difficult to compare across studies due to differing threshold definitions for hemorrhage. Although >500 ml for vaginal birth and >1000 ml for cesarean birth may be the most common clinical definition in the U.S., it is somewhat arbitrary and may not necessarily take into account a woman's initial volume status and may be clinically irrelevant to hemodynamic compromise.

Clinicians typically underestimate true blood loss; therefore, blood loss at and following birth should be quantified. (3, 11-13) Quantitative measures of 500 ml EBL are appropriate "triggers" for heightened surveillance and/or more aggressive treatment in the face of ongoing bleeding; 1000 ml is an appropriate "trigger" for movement toward more emergent efforts. (2, 3) Similarly, 1000 ml can be used a "safety indicator" for hospital and statewide surveillance. This definition captures clinically relevant "near miss" morbidity, is consistently associated with hemodynamic instability and advances coders, clinicians and hospitals toward consistency and standardization. (14, 15)

Vital Signs as Triggers

Clinical triggers can include heart rate, blood pressure and oxygen saturation, among others. "Alert lines" are designed to heighten a clinician's awareness of the patient's changing clinical status that could indicate an impending adverse event, and should prompt consideration of possible underlying causes. "Action lines" are designed to stimulate specific clinical activity and appropriate treatment interventions. (2) The National Health System of the United Kingdom has published a detailed "Obstetric Early Warning Chart" that provides a colored checklist for vital status and a guide for intervention when a patient "triggers" in one red or two yellow scores at any one time and makes use of both numeric and visual clues for care providers (See Best Practice article "Blood Loss: Clinical Techniques for Ongoing Quantitative Measurement"). (16)

RECOMMENDATIONS:

Aggressive treatment of women at clinical trigger points has the potential to prevent the development of serious PPH. To address this CMQCC recommends the following:

1. Use the following as a standard clinical definition of PPH:
 - a) Estimated blood loss greater than 500 ml or hemodynamic instability as a "trigger" for heightened surveillance and/or more aggressive treatment in the face of ongoing bleeding.
2. Use the following standard definition for safety and quality monitoring:
 - a) Blood loss of 1000 ml as a "trigger" for monitoring safety related to maternal health care quality.
3. Birthing facilities adopt and maintain protocols addressing:

- a) Quantification of blood loss at all births (See Best Practice article “Blood Loss: Clinical Techniques for Ongoing Quantitative Measurement”)
 - b) Management of all women with cumulative blood loss ≥ 500 ml (Refer to Hemorrhage Care Guidelines-Checklist Format)
 - i. Nursing personnel should notify the attending physician and proceed with administration of Methergine 0.2 mg IM (if no contraindications) and fundal massage.
 - ii. Clinical Triggers: surveillance and intervention:
 1. Heart Rate ≥ 110
 2. Blood Pressure $\leq 85/45$ ($>15\%$ drop)
 3. Oxygen Saturation $<95\%$
 - c) It is the responsibility and authority of all licensed health care team members, including RNs, to call for help and activate maternal hemorrhage response as clinically indicated.
4. Hospitals and other health care organizations internally monitor and report all cases with EBL >500 ml for internal site-specific quality monitoring to ensure adherence to institutional guideline.
 5. Hospitals and other health care organizations internally monitor and report rates and associated outcomes for all women with cumulative blood loss >1000 ml.

EVIDENCE GRADING

Level of Evidence: II.2. One prospective cohort study; expert consensus opinion (WHO, NHS)

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