Improving the Care and Outcomes for Obstetrical Hemorrhage

Tennessee Initiative for Perinatal Quality Care

Inter-Institutional Quality Improvement Project

Funded under a grant from the Tennessee Department of Health (TDH)

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The Tennessee Initiative for Perinatal Quality Care (TIPQC) would like to thank The California Perinatal Quality Collaborative, Florida Perinatal Quality Collaborative, Massachusetts Perinatal Quality Collaborative and AWHONN. We have learned from their efforts and initiatives and have adapted portions from their work in this area. Together, we can make a difference!

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Introduction: *What are we trying to accomplish?*

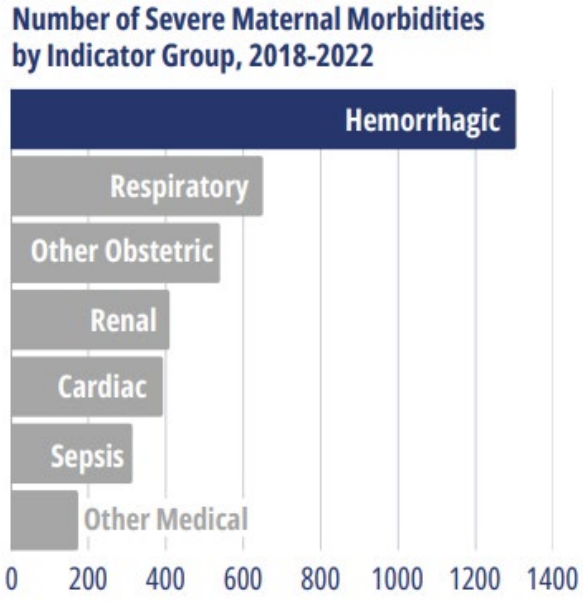
Problem

In Tennessee, between 2018-2022 hemorrhage accounted for 34% of SMM indicators, which is more than double the next leading indicator of respiratory morbidities. Disseminated Intravascular Coagulation (DIC) was the most common SMM, as well as the most common diagnosis-based hemorrhagic indicator. Hemorrhage also accounted for 37% of pregnancy related deaths occurring on the day of delivery from 2018-2022. [1] [2]

Hemorrhage is the leading cause of Severe Maternal Morbidity (SMM) in the United States. A postpartum hemorrhage occurs in 3-5% of all deliveries and is responsible for 11.2% of maternal deaths. It has also been noted that 40% of hemorrhages occur in patients without any risk factors. [2] [3] [4]

The American College of Obstetricians and Gynecologists' (ACOG) reVITALize program defines postpartum hemorrhage as cumulative blood loss greater than or equal to 1,000 mL or blood loss accompanied by signs or symptoms of hypovolemia within 24 hours after the birth process (includes intrapartum loss) regardless of route of delivery. [3] [5]

Figure 1: Number of SMM by Indicator Group, Tennessee



Source: TDH (2025)

Background

Obstetric hemorrhage including postpartum hemorrhage is a common, high-acuity obstetric emergency and a major contributor to preventable severe maternal morbidity (SMM). Hemorrhage can progress rapidly from moderate bleeding to hypovolemic shock, coagulopathy, and multiorgan dysfunction, with downstream outcomes that include ICU admission, disseminated intravascular coagulation, acute renal failure, unplanned hysterectomy, and death. According to ACOG, obstetric hemorrhage requiring blood transfusion(s) is the leading cause of SMM in the United States. [1]

SMM is used for surveillance, benchmarking, and quality improvement because it reflects serious, potentially life-threatening complications during hospitalizations for delivery. At a population level, transfusion is one of the most common SMM indicators and is frequently linked to hemorrhage-related morbidity. This makes hemorrhage a high-yield target for improvement efforts focused on reducing SMM rates, preventing escalation to massive transfusion, and decreasing intensive care utilization. [2 3]

Multiple system factors contribute to hemorrhage-related SMM and create opportunities for improvement. Hemorrhage risk is not static: patients with few or no traditional risk factors may still experience severe bleeding, while those with known risks may decompensate quickly. Delays in recognition can occur when systems rely on visual estimation of blood loss, when escalation criteria are inconsistent, or when response processes (e.g., hemorrhage carts, rapid access to uterotonics/adjuncts, blood bank communication, massive transfusion protocol activation, and role clarity) vary across units or facilities. Standardizing prevention and early recognition processes such as quantitative blood loss measurement, risk-based readiness, and clear escalation triggers supports earlier intervention and can reduce escalation to severe outcomes. [1 2 3]

Reducing obstetric hemorrhage related severe maternal morbidity is a critical priority for the state of Tennessee because hemorrhage remains a leading, preventable cause of maternal harm across diverse birthing settings, from high-volume tertiary centers to smaller community hospitals. State-level surveillance consistently shows that a substantial proportion of delivery hospitalizations complicated by SMM involve blood transfusion, a marker closely tied to hemorrhage and to downstream outcomes such as ICU admission and unplanned surgical intervention. Importantly, these events are not evenly distributed: differences have been noted in populations, access to resources, and variation in readiness and response systems contribute to higher rates of hemorrhage-related morbidity in certain populations and facilities. [2 3]

In 2016, TIPQC began the AIM Obstetric Hemorrhage | AIM Project to standardize approaches to recognizing and responding to maternal hemorrhage in the postpartum period to reduce SMM and mortality, cumulative quantification of blood loss and to report blood transfusions, more than 4 units of packed red blood cells after birth and hemorrhage risk assessment at admission. This project continues to build on work of previous TIPQC teams. [2 3 4 5]

Project Description

TIPQC agrees to the following:

- Provide a toolkit (see attachments) and other resources to participating teams.
- Offer monthly huddles, quarterly learning sessions, and annual statewide meetings.
- Facilitate the sharing between participating teams, allowing them to learn from each other.
- Facilitate capture of data metrics and provide reports to participating teams to show their progress towards improvement.
- Provide guidance and feedback to participating teams, facilitating their achievement of the project aim.

Participating teams will agree to the following:

- Hold regular, at least monthly, team meetings.
- Regularly review and revise team goals, current system, opportunities for improvement, and barriers.
- Plan and conduct tests of the recommended changes detailed in this toolkit.
- After successful testing and adaptation, implement the changes in their facility.
- Attend and actively participate in the monthly huddles, quarterly learning session, and annual statewide meetings.
- Capture and submit the defined project data as required (with minimal to no data lag).

- Submit a monthly report that includes data as well as information on changes being tested and/or implemented.
- Strive to achieve the project aim and the project's process and structure measure goals:
    - At least 90% compliance on all defined process measures.
    - Have all structures (defined by the structure measures) in place by the end of the project.

Rationale

Every Tennessee birthing facility, regardless of size or level, can save lives by implementing the hemorrhage bundle with fidelity. Through TIPQC's collaborative learning network, data infrastructure, simulation support, and coaching, hospitals can standardize the first response, shorten time-to-treatment, and reduce preventable morbidity and mortality from hemorrhage across our state.

Expected Outcomes and Benefits

Overall, successful completion of the TIPQC Hemorrhage project is expected to generate the following benefits:

1. Reduced Mortality and Morbidity
2. Optimized Resource Utilization
3. Shorter Hospital Stay
4. Cost Savings for the Healthcare Systems
5. Earlier Identification of at risk patients
6. Improved maternal quality of life
7. Better psychological outcomes for mothers
8. Reduced need for emergency transfer

Aim Statement

Global AIM: Improve the care and outcomes for all TN moms and thereby reduce severe maternal morbidity (SMM) related to hemorrhage (or complications) by 10% in all participating hospitals.

The Aim of this project is to:

Improve the care and outcomes for pregnant and postpartum women who suffer from an obstetrical hemorrhage by achieving 90-100% compliance on both of the following: the utilization of a postpartum hemorrhage risk assessment (Appendix 3) and measuring blood loss cumulatively and quantitatively for all births by January 2027.

Target population: All pregnant and/or postpartum women in Tennessee birthing hospitals.

Summary of Evidence: *Obstetrical Hemorrhage*

Nationally recognized frameworks support PQC-led hemorrhage work as it relates to SMM. The Alliance for Innovation on Maternal Health (AIM) Obstetric Hemorrhage Patient Safety Bundle (revised 2022) outlines actionable practices across readiness, recognition & prevention, response, and reporting/systems learning, with an explicit emphasis on respectful, equitable, and supportive care integrated throughout the bundle. [1] [2] [3]

Based on other PQC's (CMQCC, Florida), hemorrhage can be addressed as a collaborative with outstanding results. With the standard of cumulative and quantitative blood loss measurement being implemented for every delivery. [5]

TIPQC is uniquely positioned to address these gaps by aligning hospitals around shared, evidence-based practices; reducing unwarranted variation in hemorrhage prevention and response; and supporting reliable implementation of standardized tools such as risk assessment, quantitative blood loss measurement, timely escalation pathways, and multidisciplinary debriefing. By strengthening these systems statewide, this initiative aims to prevent progression from

hemorrhage to severe maternal morbidity, improve equity in maternal outcomes, and ensure that every birthing patient in our state receives safe, timely, and high-quality care when hemorrhage occurs. [3] [4]

Change Ideas for Hemorrhage

All improvement requires change. And while there are many kinds of changes that will lead to improvement, the specific changes are developed from a limited number of *change concepts*. As described in the Model for Improvement, "A change concept is a general notion or approach to change that has been found to be useful in developing specific ideas for changes that lead to improvement." These change concepts are used to design and run tests of change (i.e., Plan-Do-Study-Act (PDSA) cycles) to see if they result in improvement.

A similar idea to change concepts are *Potentially Better Practices* (PBPs), which are a set of clinical practices that have the potential to improve the outcomes of care. They are labeled 'potentially better' rather than 'better' or 'best' because until the practices are evaluated, customized, and tested in your own institution, you will not know whether the practices are truly 'better' or 'best' (or 'worse'). Depending on the circumstances in your facility, you may have to implement other practices or modify existing ones to successfully improve outcomes. The PBPs in this collection are not necessarily the only ones required to achieve the improved outcomes targeted. Thus, this list of PBPs is not exhaustive, exclusive, or all inclusive. Changes in practice, guided by these PBPs, will require testing and adaptation to your circumstances and context to achieve measured improvements in outcomes.

Readiness: Hemorrhage Prepareness

This PBP describes infrastructure, protocols, equipment, and training that must be reliably in place before an obstetric hemorrhage occurs.

Establish a Designated Hemorrhage Rapid Response Team

- Create a **multidisciplinary rapid response team** co-led by **nursing, obstetrics, anesthesia**, and others based on maternal care facility level. [6] [7]
- Ensure clear team activation pathways (e.g., overhead calls, secure messaging).
- Maintain 24/7 team availability with defined roles (team leader, medication RN, runner, recorder, blood bank liaison).

Develop and Maintain a Standardized Facility-Wide Hemorrhage Emergency Management Plan

- Implement a **stage-based hemorrhage protocol** with checklists and escalation policies to ensure consistent response. [6]
- Integrate the National Partnership for Maternal Safety "4 Rs" (Readiness, Recognition, Response, Reporting). [5]
- Align with ACOG recommendations for **routine uterotonic use**, escalation triggers, and inclusion of massive transfusion pathways. [3] [8] [9]

Maintain a Fully Stocked Hemorrhage Cart [10] [11] [12]

- Place identical carts in labor & delivery, OR, and postpartum areas.
- Stock cart per AIM and CMQCC guidance with:
    - Uterotonics

    - TXA access based on protocol updates (CMQCC V3)
    - Balloon tamponade devices
    - Suture materials for uterine/ovarian artery ligation
    - Checklists + step cards
- Ensure daily or shift-based cart checks for readiness.

Ensure Immediate Access to First line and Second-line Medications

- Store uterotonics and emergency meds in a **hemorrhage medication kit** accessible on the unit. [6]
- Include **tranexamic acid (TXA)** as recommended adjunct therapy for hemorrhage control. [10] [11] [12]

Implement and Test Massive Transfusion Protocol (MTP)[3] [6] [13] [14]

- Establish an **MTP coordinated with the blood bank**, including emergency-release processes.
- ACOG recommends clear guidance on **fixed product ratios**, rapid activation, and structured escalation.
- Conduct regular simulations involving the blood bank to test timing, communication, and courier processes.

Standardized Hemorrhage Risk Assessment for All Patients

- Use CMQCC's updated **risk factor assessment tool** with continual re-evaluation (e.g., on admission, intrapartum, postpartum). [10]
- Required by AIM and incorporated into Missouri and multi-state PQCs. [6] [13] [15]
- Ensure documentation in EHR with automated alerts for risk-based preparation.

Ensure Capability for Quantitative Blood Loss (QBL) for Every Birth

- TIPQC-aligned OBH collaboratives emphasize QBL as a core metric.[16]
- Standardize tools (scales, calibrated drapes) and training to ensure consistent practice.

Maintain Readiness for Patients Who Decline Blood Products [6] [7]

- Create a protocol for informed refusal, acceptable alternatives, and care planning for patients declining blood transfusion.
- Conduct prenatal risk counseling for high-risk patients.

Conduct Regular Interprofessional Hemorrhage Drills and Debriefs [6] [7]

- AIM requires **team-based drills** at regular intervals with **timely debriefs**.
- Drills should include:
    - Activation of hemorrhage team
    - Blood bank communication
    - QBL and stage escalation
    - Balloon tamponade placement
    - Massive transfusion execution
    - Trauma-informed, respectful communication (AIM 2022 revision emphasis)

Build Systems for Respectful, Focused Readiness [10 11 12]

- CMQCC V3 integrates strategies to reduce differences in care and include patient experiences.
- TIPQC's "Best for ALL" initiative aligns with respectful care before, during, and after events.
- PBPs include:
    - Bias awareness training
    - Standardized communication protocols
    - Ensuring interpreter access
    - Reviewing differences in outcomes during quality reviews

Ensure Availability of Equipment for Surgical and Nonsurgical Interventions [10 11 12]

- Based on CMQCC and ALPQC guidance:
    - Double setup in L&D + OR
    - Instruments for laceration repair, uterine artery ligation
    - Uterine balloon device(s)
    - Rapid access to point-of-care testing
- Clearly label and store in designated, accessible areas (e.g., cart or wall station).

Create Readiness Dashboards & Continual Monitoring [13 15]

- Use ACOG's severe morbidity screen and review framework to support readiness evaluations.
- Develop dashboards tracking:
    - Time to MTP activation
    - Hemorrhage cart readiness audits
    - Risk assessment compliance
    - QBL completion rates
    - Drill frequency and outcomes

Recognition & Prevention: Obstetrical Hemorrhage & Massive Transfusion Protocol [6 8 10 16 17]

Standardize the recognition and management of obstetrical hemorrhage to prevent morbidity and mortality through timely multidisciplinary action, blood product resuscitation, and team preparedness.

Scope: All obstetrical care providers, labor & delivery nurses, anesthesia, blood bank/transfusion services, surgery/OR, and support departments.

Definitions & Activation Criteria

Postpartum / Obstetrical Hemorrhage

- PPH is traditionally defined as blood loss ≥1000 mL or blood loss with signs of hypovolemia within 24 hours after birth, regardless of delivery mode.

Massive Transfusion Protocol (MTP) [3 6 13 14]

- A protocol facilitating rapid, systematic administration of large volumes of blood products.
- Obstetric MTP may be activated with any of:
    - Estimated blood loss >1500–2000 mL with ongoing bleeding
    - Anticipated need for >4 units RBC within 1–2 hours
    - Hemodynamic instability despite initial resuscitation
    - Provider judgment of impending severe hemorrhage

Readiness – Preparedness Before Event [10] [11] [12] [13] [14] [15]

- Hemorrhage Cart / Kit
  A hemorrhage cart should be immediately accessible on the L&D unit and other obstetric care areas. Contents include:
    - Medications – uterotonics (oxytocin, methylergonovine, carboprost, misoprostol), tranexamic acid (TXA), IV fluids
    - Large-bore IV supplies (16–18G), rapid infusers
    - Instruments for trauma control, tamponade, uterine compression sutures
    - Uterine tamponade devices (Bakri / balloon kit/Jada)
    - Checklists & cognitive aids (PPH algorithm, activation steps, drills)
    - Blood draw kits / lab requisition forms
    - Ensure regular inventory checks and restocking

- Massive Transfusion Protocol
  Coordination between obstetrics, anesthesia, and blood bank to include:
    - Clear activation steps and contacts (e.g., “Code Hemorrhage/MTP”)
    - Pre-defined blood product ratios (e.g., balanced 1:1:1 RBC:FFP:platelets, with cryoprecipitate as indicated)
    - Access to emergency-release blood (e.g., O- neg/uncrossmatched)
    - Lab monitoring plans (CBC, coagulation studies, fibrinogen)
- Team Roles & Communication
  Identify and publish hemorrhage response team members
    - Designate an incident commander/leader, recorder, medication nurse, procedural support roles
    - Rapid notification standards (phone, badge alert, overhead)

- Education & Protocol Awareness
    - Unit-based education on recognition, algorithm steps, hemorrhage cart layout, and MTP activation requirements
    - Orientation for new staff and annual update sessions

Recognition & Initial Response [6] [8] [10] [16] [17] [18] [19] [20]

- Risk Assessment
  Assess for known PPH risk factors on admission:
  Uterine atony, placenta accreta spectrum, prior PPH, anemia, operative delivery history
- Quantitative Blood Loss
    - Use calibrated drapes and weight-soaked materials for cumulative, quantitative measurement

- Immediate Interventions
    - Fundal massage
    - Two large-bore IV lines, begin crystalloids
    - Apply oxygen, vital sign & urine output monitoring
    - Draw stat labs

Activation Process

1. Recognize PPH & Quantify Loss
2. Call Hemorrhage Team per established page/alert
3. Bring Hemorrhage Cart
4. Activate MTP If Indicated
5. Prepare OR & Blood Bank
6. Document Time Stamps for activation and interventions

Massive Transfusion Implementation [3 6 13 14 15]

- Product Administration
    - Use balanced resuscitation to include RBCs, fresh frozen plasma, and platelets
    - Maintain fibrinogen targets, using cryoprecipitate or concentrate as needed
    - Reassess labs frequently to guide component therapy
- Monitoring
    - Continuous hemodynamic monitoring
    - Serial labs (CBC, coagulation profile)
    - Foley catheter with strict output
- Transition of Care
    - Move to ICU or higher-level care post-stabilization
    - Continue monitoring for delayed bleeding/coagulopathy

Post-Event Debrief & Reporting [6 7 10 11 12]

- Conduct multidisciplinary debrief to identify system improvements
- Update protocols when gaps are identified
- Report outcomes through QI committees

Drills & Simulation Participation

- Drill Frequency
    - Conduct drills at least annually, with multidisciplinary participation
- Drill Types
    - In situ simulation on unit to test real-world performance
    - Scenario examples include PPH with coagulopathy, trauma, placenta accreta § includes order workflows, hemorrhage cart use, MTP activation
- Role of Checklists
    - Use structured checklists during practice to improve performance and promote standardization
- Debriefing Components
    - Team communication & leadership
    - Timeliness of cart retrieval and MTP activation
    - Barriers encountered

- Action items for system improvement

Quality Metrics [6] [7]

Track:

- Time to hemorrhage team arrival
- Time to MTP activation
- Blood loss estimations vs actual
- Number of units transfused
- Hysterectomy and ICU rates
- Drill participation and responsiveness

Hemorrhage Risk Assessment [6] [8] [10] [16] [17] [18] [19] [20]

Incorporating a standardized obstetric hemorrhage risk assessment checklist is a critical strategy for preventing hemorrhage-related severe maternal morbidity (SMM). Hemorrhage risk is dynamic and can evolve throughout hospitalization—from admission to labor, delivery, and the postpartum period—making one-time assessment insufficient. A structured checklist prompts consistent, repeated evaluation of both patient-specific and intrapartum risk factors, ensuring that elevated risk is recognized early and communicated clearly across the care team. By stratifying patients into risk categories and linking those categories to concrete readiness actions (e.g., blood type and screen vs. crossmatch, availability of uterotonics and adjunctive medications, hemorrhage cart readiness, and early anesthesia and blood bank notification), risk assessment checklists translate risk recognition into proactive prevention. When reliably implemented, these tools improve situational awareness, reduce delays in escalation, and support timely intervention before bleeding becomes severe, thereby decreasing the likelihood of transfusion, ICU admission, and other hemorrhage-related SMM outcomes.

For this project, TIPQC has chosen to utilize the hemorrhage risk assessment located in Appendix II.

Quantitative Blood Loss vs. Estimated Blood Loss [3] [11] [21] [22] [23] [25] [26]

Obstetric hemorrhage remains one of the leading causes of preventable maternal morbidity and mortality in the United States. Delays in recognition are the most common system failure contributing to adverse outcomes. This document outlines best practices for standardized blood loss measurement using Quantified Blood Loss (QBL) rather than Estimated Blood Loss (EBL).

Definitions

Obstetric Hemorrhage

- Cumulative blood loss ≥1,000 mL or
- Blood loss with signs/symptoms of hypovolemia within 24 hours of birth

Primary postpartum hemorrhage: Occurs within 24 hours of delivery
Secondary postpartum hemorrhage: Occurs 24 hours to 12 weeks postpartum

Why Recognition Fails

Feature	EBL (Estimated Blood Loss)	QBL (Quantified Blood Loss)
Method	Visual guess	Measured using weight & volume
Accuracy	Poor	High
Bias	Underestimates large volumes	Objective
Reproducibility	Variable	Standardized
Recommended by	No longer best practice	ACOG, SMFM, AIM

Traditional hemorrhage recognition is delayed because:

- Visual estimation of blood loss is inaccurate
- Providers underestimate blood loss by 30–50%
- Physiologic compensation masks early shock
- Documentation of EBL lags behind clinical reality

These failures lead to delayed activation of hemorrhage protocols and delayed transfusion.

EBL vs QBL

Evidence: Studies consistently show EBL underestimates blood loss by 30–50%, especially when bleeding exceeds 500 mL. QBL improves early hemorrhage recognition, speeds treatment, and reduces severe maternal morbidity.

How to Perform Quantitate Blood Loss or QBL

- Vaginal Delivery
    - Place calibrated under-buttocks drape immediately after delivery
    - Collect all blood and amniotic fluid in the drape pouch\Measure volume (subtract amniotic fluid if known)
    - Weigh all soaked materials:
        - Chux pads
        - Perineal pads
        - Sponges
    - Convert weight to volume:
        - 1 gram = 1 mL blood
    - Add to collected fluid volume for total QBL

- Cesarean Delivery
    - Measure suction canister contents
        - Subtract irrigation fluid
    - Weigh:
        - Laparotomy sponges
        - Towels

- Apply the same 1 g = 1 mL conversion
- Add all values for total QBL

Why QBL Prevents Hemorrhage-Related Harm

- QBL allows:
  - Earlier detection of abnormal bleeding
  - Timely uterotonic escalation
  - Earlier activation of hemorrhage protocols
  - Faster blood bank notification
  - Reduced transfusion delays
  - Improved team communication

It turns hemorrhage from a **subjective impression** into an **objective diagnosis**.

Hemorrhage Prevention Through Early Recognition

Accurate blood loss measurement must be paired with clinical triggers:

QBL Volume	Action
≥500 mL vaginal or ≥1,000 mL Cesarean	Initiate hemorrhage evaluation
≥1,000 mL	Activate hemorrhage protocol
≥1,500 mL or unstable	Massive transfusion protocol

Integration with Risk Assessment

- QBL is most powerful when combined with hemorrhage risk stratification:
  - On admission
  - In active labor
  - Postpartum

- Patients at medium or high risk should:
  - Have blood type & screen on file
  - Have IV access secured
  - Be delivered in a setting with blood products immediately available

Patient Education

- Patients should be counseled:
  - That hemorrhage is common and treatable
  - That blood loss will be measured carefully

- To report:
  - Saturating a pad in <1 hour
  - Dizziness or weakness
  - Heavy clots
  - Continuous trickling or gushes.

Key Takeaways

- **EBL is outdated. QBL saves lives.**
- Visual estimation delays diagnosis
- Objective measurement enables early treatment
- QBL is a core element of modern obstetric safety systems

Quantified Blood Loss (QBL) Measuring Guide

How Much Do Common OB Items Weigh?
Rule: 1 gram = 1 mL of blood

When weighing soaked materials, **subtract the dry weigh**t to get true blood volume.

Common OB Item Dry Weights

Item	Dry Weight (grams)	Notes
Laparotomy sponge (lap sponge)	**30g**	Large OR sponge
Ray-tec / 4×4 sponge	**5g**	Small sponge
Abdominal towel	**50g**	Used in C-sections
Perineal pad	**20g**	Standard maternity pad
Chux underpad	**60g**	Blue waterproof pad
Baby blanket	**150g**	Often soaked during delivery
Bed sheet	**500g**	If contaminated with blood
Gown	**300g**	Provider or patient
OR drape	**200g**	Cesarean drape
Vaginal delivery drape	**100g**	Calibrated when dry
Surgical suction tubing	**50g**	Rarely needed

How to Calculate Blood Volume

- Example

Typical QBL Totals by Item

Item soaked	What it usually means
1 saturated lap sponge	~100–150 mL
1 fully soaked chux	~300–400 mL
1 soaked bed sheet	~500–1,000 mL

1 soaked vaginal drape pouch	300–2,000+ mL
1 saturated peripad	~100 mL

Suction Canister Measurement

- For both vaginal and cesarean deliveries:
- **QBL from suction = Total canister volume – irrigation fluid**

Example

When to Act

Total QBL	Clinical Action
≥500 mL vaginal	Evaluate uterine tone & bleeding
≥1,000 mL	Activate hemorrhage protocol
≥1,500 mL or unstable	Massive transfusion protocol

Why This Matters

Studies show visual estimation underestimates blood loss by 30–50%.
A patient who "looks like 600 mL" is often already at 1,000 mL.
QBL makes hemorrhage visible.

Response: Evaluation of Maternal Care Levels [8 27 28 29 30 31]

The purpose of this section is to define how **early recognition and prevention of obstetric hemorrhage** are essential components of evaluating and assigning an appropriate **Maternal Level of Care (MLOC)**. Hemorrhage remains the leading cause of preventable maternal mortality in the United States. Accurate risk stratification, timely escalation, and appropriate facility-based care are core elements of national maternal safety standards.

Maternal Level of Care refers to a **risk-stratified system** that ensures pregnant and postpartum patients receive care in facilities with the resources, staffing, and capabilities appropriate for their clinical needs.

The nationally recognized levels include:

Level	Description
Birth Center / Level I (Basic)	Low-risk obstetric care
Level II (Specialty)	Moderate-risk obstetrics, ability to manage hemorrhage
Level III (Subspecialty)	High-risk obstetrics, on-site subspecialists and ICU
Level IV (Regional Perinatal Health Center)	Highest level; full critical care and surgical capability

Hemorrhage risk directly influences **appropriate MLOC assignment**.

Why Hemorrhage Risk Must Drive Level of Care

Patients at high risk for hemorrhage require access to:

- Rapid blood product availability
- Massive transfusion capability
- Obstetric anesthesia
- Interventional radiology
- Gynecologic and trauma surgery
- ICU-level maternal care

Failure to match hemorrhage risk with facility capability is a major contributor to maternal morbidity and mortality.

Recognition: Hemorrhage Risk Assessment as a Level-of-Care Tool

Hemorrhage risk assessment should occur at:

- Admission
- Onset of labor

- After delivery
- With any clinical change

Risk Stratification

Patients should be classified as:

Risk Level	Examples
Low	Singleton, no prior uterine surgery, no anemia
Medium	Prior cesarean, macrosomia, prolonged labor, anemia
High	Placenta previa/accreta, multiple prior cesareans, coagulopathy, bleeding disorders, severe anemia

High-risk hemorrhage patients require Level III or IV maternal care.

Recognition: Hemorrhage Indicators That Trigger Level Escalation

Clinical Warning Signs

- Persistent vaginal bleeding
- Tachycardia, hypotension
- Rising QBL
- Uterine atony
- Decreasing urine output
- Altered mental status

Laboratory Indicators

- Hemoglobin drop
- Coagulopathy
- Low fibrinogen
- Elevated INR/PTT

These signs indicate the need for **immediate reassessment of maternal level of care** and possible transfer or escalation.

Prevention: Aligning Care Level With Risk

- **Prenatal Phase**
    - Patients with known hemorrhage risks should be:
        - Identified early
    - Planned for delivery at a facility with:
        - Blood bank
        - Anesthesia
        - OB surgery

        - ICU access if needed

- Examples:
    - Placenta previa/accreta → Level III–IV
    - Severe thrombocytopenia → Level III
    - Bleeding disorder → Level III–IV

Admission & Intrapartum Phase

All patients should have:

- Hemorrhage risk documented
- Type & screen or crossmatch if medium/high risk
- IV access appropriate to risk
- Blood product availability matched to risk

High-risk patients should not labor or deliver at Level I or birth centers**.**

Postpartum Phase

Postpartum hemorrhage is the most common cause of maternal ICU admission.

Facilities must ensure:

- Continuous monitoring
- Rapid response teams
- Access to transfusion and surgery
- Ability to transfer if exceeding facility capacity

Facility Capability Mapping

Hemorrhage Capability	Level I	Level II	Level III	Level IV
Quantified Blood Loss	Limited	Yes	Yes	Yes
Blood Bank	Limited	Yes	Yes	Yes
Massive Transfusion	No	Sometimes	Yes	Yes
ICU	No	Limited	Yes	Yes
Interventional Radiology	No	No	Sometimes	Yes
OB Subspecialists	No	No	Yes	Yes

Quality & Safety Metrics

Evaluation of maternal level of care should include:

- Hemorrhage drills
- Time to blood product delivery
- Transfer times
- Compliance with hemorrhage bundles
- Post-event debriefs

Key Safety Principle

- The right patient must be in the right place at the right time.

Accurate hemorrhage risk recognition is one of the most powerful tools for ensuring safe maternal outcomes and appropriate maternal level of care.

Evidence Based Medication Administration [3] [32] [33]

Uterotonic agents are the recommended first-line medications for managing postpartum hemorrhage resulting from uterine atony. Current clinical guidance indicates that, aside from recognized contraindications, no single uterotonic has been shown to be more effective than others in treating uterine atony. Therefore, the choice of agent may be individualized based on patient factors, clinical circumstances, and provider judgment. [jognn.org]

Uterotonic Medications

Oxytocin:

a. IV infusion 10-40 units per 500-1000 mL
b. 10 units IM
c. Mechanism of Action:
    i. Increase in trace lunar Ca stimulating muscle contraction
d. Contraindications: Hypersensitivity, active, or a history of, thromboembolic disease
e. Side effects: n/v, hyponatremia, hypotension

Tranexamic Acid (TXA):

f. 1 gram IV given over 10-20 minutes; may repeat after 30 minutes; ideally within 3 hrs of delivery
g. Mechanism of action: Anti-fibrinolytic; displaces plasminogen from fibrin
h. Contraindications: Hypersensitivity
i. Side effects: n/v, HA, allergic skin reactions. Rarely, seizures or changes in color vision. Rare risk of DVT.

Methylergonovine (Methergine)

j. 0.2 mg IM every 2-4 hours
k. Mechanism of action: Increases tone, rate, amplitude of contractions on smooth muscle
l. Contraindications: HTN, pre-eclampsia, CVD, hypersensitivity
m. Side effects: n/v, HTN; worse when given IV. chest pain, seizures, and dizziness

Misoprostol

n. 600-1000 mcg orally, sublingual, vaginal, rectally
o. Mechanism of Action: Induces uterine contractions
p. Contraindications: Hypersensitivity
q. Side effects: n/v/d, HA, uterine contractions, pain, shivering and fever- associated with 600-800mg dose

15-methyl PGF2 alpha (Hemabate/Carboprost Tromethamine)

r. 0.25 mg (250 mcg)IM or intramyometrial every 15-90 min up to 8 doses (not exceeding total of 2mg)
s. Mechanism of action: Stimulate smooth muscle and uterine contractions
t. Contraindications: Asthma, Relative for active hepatic disease, pulmonary, or cardiac
u. Side effects: n/v/d, fever, chills, shivering, HA, bronchospasm, flushing

Prothrombin Complex- tx for DIC

Fibrinogen Concentrate-PPH in the setting of hypofibrinogenaemia; DIC, consumptive coagulopathy. Strongly consider if plasma fibrinogen is <2 g L−1

Recombinant Factor VII- tx for DIC

Nonpharmacological Interventions [3] [34] [35] [36] [37] [38]

When uterotonics and bimanual uterine massage do not achieve adequate control of bleeding, several **nonpharmacologic mechanical interventions** can be employed to help restore uterine tone and reduce hemorrhage. Effective options include uterine compression techniques, such as manual compression, and **i**ntrauterine tamponade methods, including balloon tamponade devices or intrauterine packing. These approaches have demonstrated high clinical effectiveness in decreasing blood loss associated with uterine atony, with intrauterine balloon tamponade showing reported success rates of approximately 85–90% in resolving refractory hemorrhage. [ajog.org], [uptodate.com]

In addition to traditional tamponade, **newer intrauterine vacuum-based systems (**e.g., the Jada device) have emerged as alternative nonpharmacologic options that mechanically promote uterine contraction and have shown high rates of hemorrhage control in early studies. These interventions serve as important next-step modalities when first-line medical therapy is insufficient, providing timely, minimally invasive methods for stabilizing patients with postpartum hemorrhage due to uterine atony. [ajog.org]

Uterine Tamponades:

Bakri® Balloon

- Intrauterine placement
- Inflate 300-500 mL saline
- Tamponades uterine tissue by compression
- Remove at 12-24 hours
- 87% success rate
- Contraindications: Should not be used in cases of uterine cancer, active pelvic infection, or severe uterine anatomical deformation.
- $$$ 600-700 per unit

Jada®

- Vacuum induced compressive force and vascular constriction

- Intrauterine placement, vacuum at 80 mmHg, 60-120 mL saline intravaginal balloon
- Cervix needs to be 3 cm dilated
- Median time of use 3.2 hours
- 90-94% effective
- $$$$ ($1,700 each)

Foley Catheter (FOCUS- Foley Catheter for Uterine Suction) https://focuspph.com/

- 16-24 Fr catheter with 30 mL balloon; 30 mL saline (holds up to 60 mLs)
- Placed to 80 mmHg suction, increasing gradually as needed to a maximum of 525mmHg. Suction tubing and a standard collection canister are used.
- 1-24 hrs
- Quick resolution, <300 mL EBL/QBL
- Administer antibiotics if available and not previously administered (1g Azithromycin if recently delivered a live infant, or 200mg Doxycycline if the patient had miscarriage or abortion)
- $7-15 per unit
- Limited data

BT-Cath®

- Similar to Bakri® but with the catheter tip flush to the balloon
- 500 mL saline injected through the tubing into the syringe, then into balloon.
- Single-person operation, Allows inflation directly from the fluid bag, and creates a closed system
- 85% success rate in achieving hemostasis
- $$ ($295.00)

Rusch Balloon

- Hydrostatic latex/silicone Foley Catheter (14-24 Fr)
- Saline filled, typically 30-500mL to apply pressure against the uterine wall
- Up to 24 hours placement
- Clinical applications- atonic PPH, placenta previa or accreta. Other uses- acute uterine inversion and vaginal bleeding caused by tumors.
- 75% effective in non-traumatic PPH
- $ 5-25 per unit

Sengstaken-Blakemore Tube (off-label use)

- Gastric balloon is inserted into the uterine cavity and inflated to 50-200 mL of fluid or saline applying direct pressure to the uterine walls to achieve hemostasis.
- Success rate of 71% to 87.5%
- lasting up to 24 hours
- $ about $100 per unit

Ebb® Balloon (GLENVEIGH BELFORT-DILDY OBSTETRIC TAMPONADE SYSTEM)

- dual-balloon system, designed to manage post-partum hemorrhage by creating both uterine and vaginal pressure
- uterine balloon (up to 750 mL) and a vaginal balloon (up to 300 mL)
- $$ 400 per unit

Ellavi Uterine Balloon Tamponade (UBT)(Designed in Africa-for Africa)

- Free flow system using vertical pressure

i. Simply lifting the bag allows water to fill the balloon. Adjusting the vertical height of the bag controls pressure between the balloon and the uterus. This pressure needs to be slightly higher than the blood pressure in the uterus to stop bleeding.

- $ 1/20th the cost of expensive UBTs
- 1 liter of saline
- https://ellavi.com/wp-content/uploads/2021/04/Ellavi-Training-Poster-2021.pdf

Condom Catheter (low-resource settings as a second-line, non-surgical intervention for atonic bleeding)

- A condom is secured over a Foley catheter (typically 24 French) using thread or silk sutures, inserted into the uterine cavity, and inflated with 300-500 mL of saline or sterile water.
- provides a low-pressure system that conforms to the uterus, offering a cost-effective alternative to, or bridge to, surgery.
- in place for 12–24 hours, with 20 units of oxytocin added to the IVF for uterine tone.
- Monitor for 15 minutes; if bleeding continues, remove and consider surgical options.
- Deflate gradually after 12-24 hours
- Success rates 84-97%
- $0.65 per unit

2. Uterine artery embolization
   - Interventional radiology
   - Fluoroscopically placed absorbable gelatin sponges, gelatin, or coils in uterine arteries
   - Median success 89%
   - Complications
     i. Infertility 43%
     ii. PTB 5-15%
     iii. FGR 7%
     iv. DVT, Thrombosis, neuropathy rare
3. Surgical
   - B-lynch or other compressive sutures
     i. Uterine compression with suture
   - Uterine artery ligation
     i. ligate uterine vessels to decrease pulse pressure
   - Hysterectomy
   - Hypogastric artery ligation
     i. a surgical procedure to tie off the hypogastric (internal iliac) arteries
     ii. Usually performed at facilities by the vascular team or gyn oncology
     iii. Would also need access to interventional radiology

- Disclaimer: Hypogastric artery ligation (internal iliac artery ligation) is a high-stakes, fertility-sparing procedure for severe, uncontrollable pelvic hemorrhage, but it carries risks of severe ischemic complications (approx. 22.6%) like buttock necrosis, bladder injury, or nerve damage. It is not a guaranteed fix; success rates vary (42–93%). NIH.gov

Management of Anemia [17 32 39 40 41 42 43 44 45]

Maternal anemia, especially iron deficiency anemia (IDA), is a major modifiable risk factor for severe postpartum hemorrhage and maternal mortality.Iron-deficiency anemia affects 38%–40% of pregnant women globally. [ashpublications.org]. IDA increases the risk for preeclampsia, cesarean delivery, infection, preterm birth, postpartum depression, and poor lactation, all of which heighten vulnerability to hemorrhage complications. IDA has been shown to be independently associated with increased PPH risk. Data from the WOMAN-2 trial (10,561 women) demonstrate that moderate to severe maternal anemia significantly increases PPH rates.

Screening for Anemia During Pregnancy
ACOG diagnostic thresholds (PB 233):

- 1st trimester: Hgb < 11 g/dL
- 2nd trimester: Hgb < 10.5 g/dL
- 3rd trimester: Hgb < 11 g/dL [opqic.org],

WHO definition: Hgb < 11 g/dL at any time in pregnancy.

What to screen and when

- Initial prenatal labs: CBC early pregnancy
- Repeat CBC: at 24–28 weeks and again at 32–36 weeks

Ferritin: ACOG recommends confirming iron deficiency with iron studies when anemia is detected.

- Risk-based early ferritin may be used for high-risk patients (e.g., teens, low BMI, vegetarians, multiparas). UCSF algorithm suggests ferritin assessment and repeating if elevated or abnormal.

Prevention: Universal Iron and Folic Acid Supplementation
WHO Guidelines (2024 update):

- Daily oral iron 30–60 mg elemental iron
- Plus folic acid 400 mcg/day
- Reduces maternal anemia, puerperal sepsis, low birth weight, preterm birth. [who.int]

USPSTF position (2024):

- Evidence insufficient to recommend routine supplementation in asymptomatic pregnant people, but does not apply to those with symptoms, documented anemia, or high risk.
  ➡️ Clinical practice still relies on WHO and ACOG guidance for active supplementation when anemia or risk is present.

Treatment of Iron Deficiency Anemia (IDA)
First-Line: Oral Iron

- ACOG endorses presumptive treatment for suspected IDA in pregnancy.
- **Common regimen**: Ferrous sulfate 325 mg (≈65 mg elemental iron) once daily

- Improve tolerance: take with vitamin C, avoid calcium, consider alternate-day dosing.

When to Switch to IV Iron
Use IV iron if:

- Unable to tolerate oral iron (GI side effects)
- Poor response after 2–4 weeks
- Late-pregnancy, moderate–severe IDA, where rapid repletion is needed before delivery
  According to ASH, IV iron is an effective alternative and often indicated late in pregnancy or when oral iron fails.
- UCSF guidelines also recommend IV iron over oral for intolerance or when ferritin >50 but anemia persists.

Rationale for IV iron:

- Faster correction of Hgb
- Improves delivery-day hemoglobin → reduces transfusion risk
- Supports peripartum stability if hemorrhage occurs

Management of Severe Anemia Before Delivery
Severe anemia: Hgb < 8 g/dL or symptomatic anemia

- Heightens risk of hemodynamic collapse in PPH.
- WOMAN-2 demonstrated that severe anemia was associated with higher blood loss and increased PPH incidence. [thelancet.com]

Recommended actions

- Urgent IV iron (preferred over oral)
- Consider erythropoietin in select cases (if chronic disease or non-iron deficiency etiology—Hematology consult)
- Prepare blood products early (type & crossmatch) in late pregnancy
- Co-manage with MFM/hematology in complex cases

Intrapartum Management for Anemic Patients to Reduce PPH Mortality
AWHONN & PPH readiness

- Patients with anemia should be classified as medium or high risk for PPH in risk assessment tools. [cdn-links.lww.com]
- Implement PPH preparedness steps:
  - Ensure blood bank aware
  - Place a second IV if moderate/severe anemia
  - Have uterotonics immediately available
  - Use quantitative blood loss (QBL) measurement in real time (AWHONN QBL map).

Active Management of the Third Stage of Labor (AMTSL)

Oxytocin after delivery of shoulder/placenta reduces blood loss. [washington...awhonn.org]

Postpartum Management of Anemia to Reduce Secondary PPH

- Screening postpartum
- Reassess Hgb in:
    - Women with antenatal anemia
    - Those who experienced significant blood loss
    - Symptomatic postpartum fatigue, dizziness

Treatment

1. Continue iron therapy for at least 6–12 weeks postpartum
2. Use IV iron postpartum if:
    - Hgb < 9
    - Ongoing symptoms
    - Patient breastfeeding and intolerant to oral iron

Why postpartum treatment matters

- Untreated postpartum anemia increases risk of:
    - Infection
    - Poor maternal functioning
    - Delayed recovery
    - Depression
    - Low milk supply
    - And increases vulnerability to secondary PPH.

How Correcting Anemia Reduces PPH-Related Mortality

Mechanisms

- Improves maternal oxygen-carrying capacity
- Increases ability to withstand inevitable delivery-related blood loss
- Reduces need for emergency transfusion
- Lowers risk of decompensation and shock
- Enhances response to hemorrhage interventions (e.g., TXA, uterotonics)

Direct evidence

- Management of IDA shown to be protective against PPH.
- WOMAN-2 shows strong association between pre-birth Hgb levels and PPH severity.

Practical Clinical Algorithm (Summary)

FIRST TRIMESTER

- CBC + ferritin
- Start iron + folic acid (WHO)
- Identify risk factors (nutrition, heavy menses, multiparity)

SECOND TRIMESTER

- Repeat CBC
- Treat IDA (oral or IV)
- Reassess ferritin if unclear

THIRD TRIMESTER

- CBC at 28–36 weeks
- Switch to IV iron if moderate/severe anemia
- Prepare PPH readiness for delivery

LABOR & DELIVERY

- High-risk PPH precautions (AWHONN risk scoring)
- AMTSL
- QBL from birth

POSTPARTUM

- Recheck Hgb
- Continue iron 6–12 weeks
- Evaluate for secondary causes if persistent anemia

Reporting & Systems Learning: Case Reviews [6 7 46 47]

The purpose of this process is to standardize the recognition, response, review, and reporting of postpartum hemorrhage (PPH) across all obstetric care settings and modes of birth. This process applies to all areas where obstetric patients may receive care, including Labor and Delivery, the Operating Room, Post-Anesthesia Care Unit (PACU), postpartum units, and the Emergency Department.

Structured case review using the AIM hemorrhage reporting framework establishes a consistent approach for multidisciplinary learning, system evaluation, and quality improvement. These reviews support shared learning among providers, nurses, and interprofessional team members, identify opportunities for improvement in hemorrhage management, and reinforce evidence-based practices. The process also supports simulation training, team debriefing, and continuous quality improvement initiatives aimed at improving maternal outcomes and reducing morbidity related to obstetric hemorrhage.

This standardized approach aligns with national patient safety guidance from Alliance for Innovation on Maternal Health and resources available through Safer Birth in California, ensuring that hemorrhage events are systematically evaluated and used to inform ongoing clinical education, protocol refinement, and systems-based improvement.

Patient-Centered Communication & Support: Event Debriefs [48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64]

Postpartum hemorrhage (PPH) is a leading cause of maternal morbidity and mortality worldwide, but its impacts extend beyond physical health to profound emotional and mental effects. Research indicates that PPH can precipitate obstetric trauma, leading to posttraumatic stress disorder (PTSD) in up to 6% of affected women, with symptoms persisting for years and affecting 12-20% of survivors through anxiety, depression, and fear of future pregnancies. Studies show that women experiencing severe PPH report higher rates of PTSD-related symptoms (e.g., nightmares, avoidance of medical settings) compared to controls, with partners also at elevated risk. These effects are exacerbated in vulnerable populations, including those with pre-existing mental health conditions, other demographic factors and contributing to health differences.

The societal importance of addressing this trauma cannot be overstated: untreated emotional sequelae from PPH contribute to broader public health burdens, including increased healthcare costs, family disruptions, reduced workforce participation, and intergenerational impacts on child development. By prioritizing emotional support, we can mitigate long-term mental health issues, enhance maternal recovery, and promote care—aligning with calls for trauma-informed approaches to reduce preventable maternal deaths.

Key organizations emphasize this: The American College of Obstetricians and Gynecologists (ACOG) in Committee Opinion No. 825 (2021) advocates for universal trauma-informed care in obstetrics, recognizing that traumatic births like PPH can cause PTSD in 3-16% of women and urging stigma-free, resilience-focused support. The Society for Maternal-Fetal Medicine (SMFM) highlights mental health in high-risk pregnancies, including PPH, in consult series on maternal morbidity (e.g., #54 and #55, 2021). The California Maternal Quality Care Collaborative (CMQCC) in its Obstetric Hemorrhage Toolkit (Version 3.0, 2022) integrates respectful maternity care (RMC) principles, stressing debriefing, emotional validation to address trauma and improve outcomes.

When debriefing a PPH event, use the SPIKES strategy for compassionate delivery of information:

- **S**etting (private, uninterrupted space)
- **P**erception (assess understanding)
- **I**nvitation (gauge desired detail)
- **K**nowledge (share facts simply)
- **E**motions (validate feelings)
- **S**trategy (outline next steps and support).

1. **Initial Setup (S: Setting)**

   Choose a quiet, private room; include patient-approved support persons. Sit at eye level, introduce yourself/team, and ensure no interruptions (e.g., silence phones). Use interpreters if needed for cultural/language respect.

2. **Assess Patient Understanding (P: Perception)**

   "Can you tell me in a few words what you understand about what happened during/after your delivery? What is your biggest concern right now?"

3. **Invitation to Discuss (I: Invitation)**

   "Would it be helpful to go over the details of the hemorrhage and what we did? How much information would you like—broad overview or specifics?"

4. **Overarching Description and What Happened (K: Knowledge)**

   Deliver info in small chunks, pausing for questions. Use simple terms:

   "Postpartum hemorrhage is heavy bleeding after birth. Normally, your uterus contracts after the placenta delivers, closing off blood vessels. In PPH, the uterus has trouble contracting, leaving vessels open. We assessed your risks on admission, but even without factors, it can happen—about 40% of cases are unpredictable.

   Your team stopped the bleeding by massaging your belly, giving IV medications and a shot in your leg, and placing a balloon inside your uterus for pressure. These help the uterus contract. We also gave you [X] units of blood to ensure oxygen delivery for healing. I know the massage and balloon can be uncomfortable—I apologize for any pain, and we provided extra relief through your epidural."

5. **Acknowledge Emotions (E: Emotions/Empathy)**

   Pause; validate: "This can be scary and overwhelming—it's normal to feel anxious or upset. How are you feeling right now? We're here to listen and support."

6. **What to Expect and Strategy Forward (S: Summary/Strategy)**

   Summarize key points; outline plan:

   "Your nurse will check frequently, monitoring blood work for anemia (hemoglobin levels). The balloon should come out soon—likely in hours—with pain meds safe for breastfeeding if needed. Most don't re-bleed, but we'll watch closely. Your IV stays for any needed fluids/meds/blood. You likely won't stay longer than planned.

   I've shared a lot—what questions do you have? What are your expectations?

   For recovery and safety: Understand this for long-term health. If bleeding increases at home, tell ER staff about your recent birth and PPH. For future pregnancies, discuss this with your provider—it's intense, so we'll give written info to take home.

   I'll check with your nurse each shift; she'll report anything unusual. I'll (or my partner) return tomorrow. Write questions on the whiteboard or tell your nurse—we can talk more. I can connect you to support resources and a contact for ongoing questions."

   End positively: "You're not alone; our team is committed to your recovery."

Patient Event Debrief Form example- Appendix 5

Patient Education [2 6 17 55]

To address high rates of maternal mortality by raising awareness of danger signs in the postpartum period, Tennessee passed a state law (HB 0572)in 2025 requiring all hospitals and birthing centers to provide mothers with education on urgent maternal warning signs before discharge. This legislation aims to reduce preventable postpartum deaths by ensuring mothers and their families recognize symptoms of life-threatening conditions up to one year after delivery. Educating patients and their support networks about obstetric hemorrhage is a critical, evidence-based strategy to reduce preventable maternal morbidity and mortality. National safety bundles emphasize that patient education is not optional, the AIM Obstetric Hemorrhage Patient Safety Bundle explicitly includes ongoing education on risks, causes, early warning signs, and postpartum complications as a required element of high-quality care. Similarly, the CDC's Hear Her® campaign highlights that many pregnancy-related deaths occur after birth and can be prevented when women and families recognize urgent warning signs early and seek care immediately, underscoring the lifesaving impact of clear, timely patient education.

Inadequate understanding of postpartum warning signs remains a documented contributor to delayed treatment and adverse outcomes. Research shows that patients often misinterpret dangerous symptoms as "normal" after childbirth, and standardized education, especially when supported by plain-language materials and the teach-back method, dramatically improves comprehension and timely action. By equipping patients with clear, accessible information tailored to diverse literacy levels, healthcare teams empower families to recognize hemorrhage early, communicate concerns effectively, and access emergency care without hesitation. This shared knowledge strengthens safety, improves outcomes, and aligns care with national and global best-practice guidelines.

See appendix for infographic sample

Measures: *How will we know that a change is an improvement?*

The following outlines the target population and the Outcome, Balancing, Process, and Structure Measures for this QI project. More specific data definitions and what data elements will need to be extracted from your EMR are provided in the project "EMR Data Guide."

Target population

All pregnant and/or postpartum women in Tennessee birthing hospitals

Outcome measures

Frequency of collection & reporting: monthly

#1. Percent of Birth Admissions with a Completed Hemorrhage Risk Assessment Documented (report Disaggregate by race and ethnicity, payor)

- Numerator: Number of birth admissions that had a hemorrhage risk assessment completed with risk level assigned, performed at least once between admission and birth
- Denominator: All birth admissions

#2. Percent of Birth Admissions with Documentation of Cumulative and Quantitative Blood Loss from Birth Through Recovery (report Disaggregate by race and ethnicity, payor)

- Numerator: Number of birth admissions that had a cumulative and quantitative blood loss documented from birth through recovery
- Denominator: All birth admissions

Process measures

Frequency of collection & reporting: quarterly

- Unit Drills- Number of Drills
  - During this reporting period, **how many total OB drills** (In Situ and/or SIM Lab) were performed on your unit for any maternal safety topic?
- Unit Drills-Topics
  - During this reporting period, what topics were covered in the OB drills?
    - Hemorrhage
    - Hypertension
    - Other
- Provider Education on Obstetric Hemorrhage
  - At the end of this reporting period, what cumulative proportion of OB physicians and other advanced practice clinicians† at your institution has received in the last 2 years an education program on Obstetric Hemorrhage that includes the unit standard protocols and measures?
  - Report estimates in 10% increments (0%, 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90%, 100%)
- Nursing Education on Obstetric Hemorrhage
  - At the end of this reporting period, what cumulative proportion of OB nurses‡ has received in the last 2 years an education program on Obstetric Hemorrhage that includes the unit standard protocols and measures?
  - Report estimates in 10% increments (0%, 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90%, 100%)

†The overarching intention of this measure is to capture all physicians and advanced practice clinicians who work in a primarily inpatient OB service line or on an L&D, Antepartum, or Postpartum unit. These clinicians will likely be interdisciplinary and could be inclusive of, but not limited to, OB/GYNs and subspecialists, advance practice nurses, nurse midwives, physician associates, and Family Medicine physicians or other specialties with delivering privileges at your institution

‡The overarching intention of this measure is to capture all nurses who work in a primarily inpatient OB service line or on an L&D, Antepartum, or Postpartum unit.

Balancing measures

Frequency of collection & reporting: monthly

#1. Percent of ICU/CCU Transfers

- Numerator: Among the denominator, patients who required a transfer to an ICU/CCU
- Denominator: All patients with postpartum hemorrhage defined as ≥1,000 mL blood loss (with or without transfusion)

#2. Percent of patients that had the Massive Transfusion Protocol Implemented

- Numerator: Among the denominator, patients who required escalation beyond first-line uterotonics (e.g., MTP activation, additional procedures)
- Denominator: All patients with postpartum hemorrhage defined as ≥1,000 mL blood loss (with or without transfusion)

#3. Percent of patients who require surgical intervention due to hemorrhage (Surgical intervention could include procedures such as hysterectomy, uterine artery ligation, or other invasive approaches to control bleeding).

- Numerator: Among the denominator, The number of patients who required surgical intervention for hemorrhage
- Denominator: All patients with postpartum hemorrhage defined as ≥1,000 mL blood loss (with or without transfusion)

Structure measures

Frequency of collection & reporting: quarterly

Participating hospitals report the level of "completion" (from 1 = 'Not Started' to 5 = 'Fully In Place) of each Structure Measure at the end of every quarterly reporting period.

- Hemorrhage Cart
    - Does your hospital have obstetric hemorrhage supplies readily available in a cart or a mobile box?
- Unit Policy & Procedure
    - Does your hospital have obstetric hemorrhage policies and procedures (reviewed and updated in the last 2 years) that contain the following:
        - An obstetric rapid response team appropriate to the facilities Maternal Level of Care
        - A standardized, stage based obstetric hemorrhage emergency management plan with checklist and escalation policy
        - Emergency release and massive transfusion protocols
        - A protocol for patients who decline blood products but may accept alternative approaches
- Quantitative Blood Loss
    - Does your facility have the resources and supplies available to quantify cumulative blood loss for both vaginal and cesarean births?
- Patient Event Debriefs
    - Has your department established a standardized process to conduct debriefs with patients after a severe event?
- Clinical Team Debriefs
    - Has your department established a system to perform regular formal debriefs with the clinical team after cases with major complications?
- Multidisciplinary Case Reviews

    - Has your hospital established a process to perform multidisciplinary systems-level reviews of cases of severe maternal morbidity (including, at a minimum, pregnant and postpartum patients admitted to the ICU or who received ≥ 4 units RBC transfusions)?
- Patient Education Materials on Urgent Postpartum Warning Signs
    - Has your department developed/ curated patient education materials on urgent postpartum warning signs that align with culturally and linguistically appropriate standards?

Data Collection

Your team should determine the process in which they will collect and capture the outcome, process, and structure measures for this project.

Each participating team will enter monthly and quarterly data into the Simple QI platform. All data and graphs will be available to teams for viewing and downloading at the time of data entry. A detailed Data Collection Plan and EMR Guide are provided for this project.

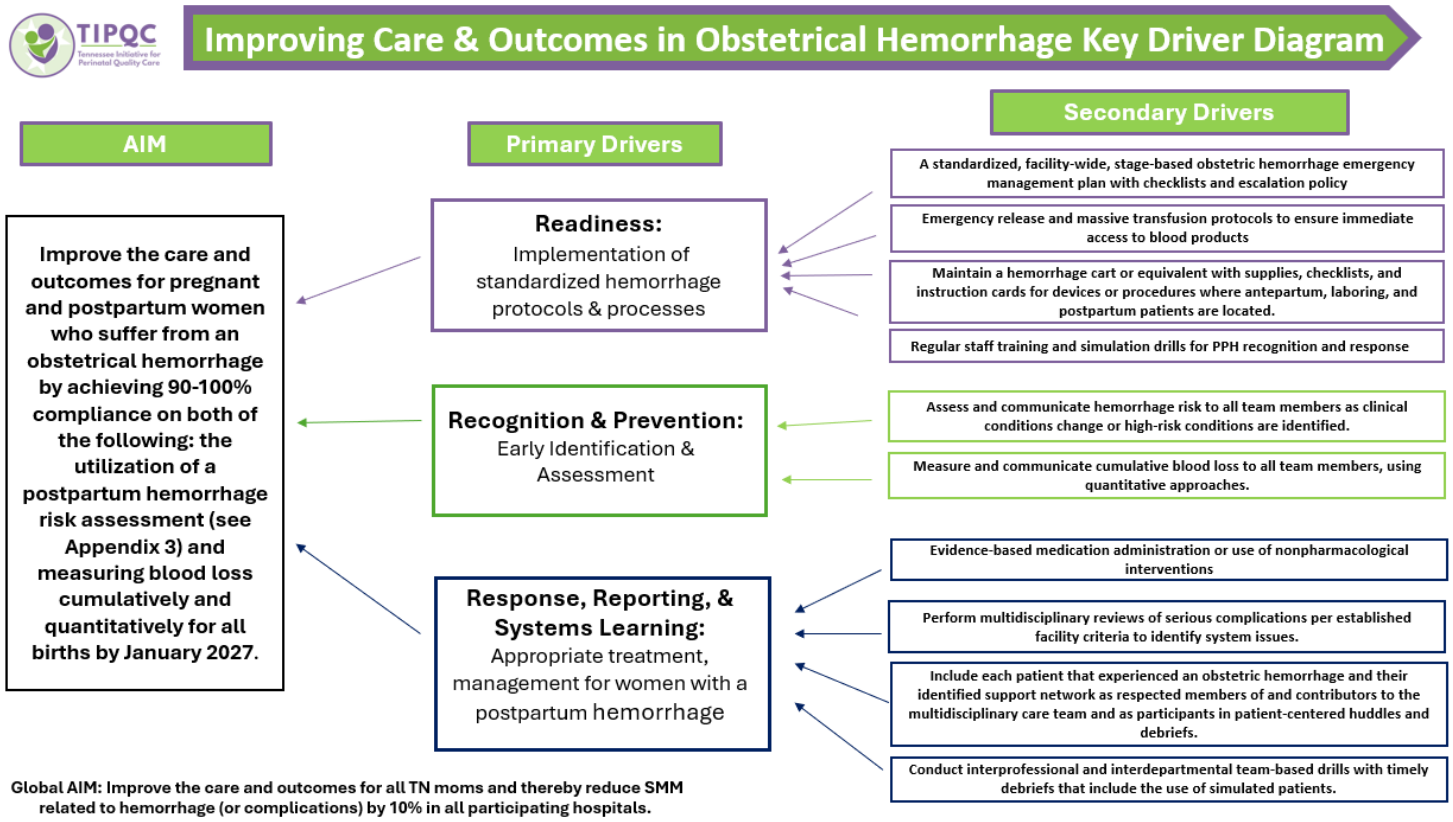
Submission of data to AIM:

TIPQC will periodically enter the captured Outcome, Process, and Structure Measures in the AIM Data Center for each of the participating hospitals. The AIM Data Center is a secure online system used to capture data from every state participating in any of the AIM maternal safety bundles. The identity of each participating hospital is masked in the Data Center – only TIPQC and each participating hospital will know the identity of each masked hospital. Each participating hospital will be able to generate any number of reports in the Data Center on their data.

Additional Severe Maternal Morbidity (SMM) outcome measures are also required to be captured in the AIM Data Center for participation. This data will be calculated by the Tennessee Department of Health (TDH) for each participating hospital team using specific ICD-10 codes pulled from claims data. TIPQC will receive the tallied counts from TDH (on a 2-quarter lag basis) and upload them into the AIM Data Center on behalf of each participating hospital. TIPQC will provide TDH with the list of participating hospitals. The participating hospital teams have granted permission for TDH to calculate the required measures and for TIPQC to submit the measures to the AIM Data Center. TIPQC will label each participating hospital teams' data with their masked identifier prior to uploading.

Key Driver Diagram

A driver diagram is a visual display of a QI collaborative's (or team's) theory of what "drives," or contributes to, the achievement of the project aim – that is, the project's "theory of change." The far-right column of the driver diagram lists the specific *change ideas to test* using PDSA cycles.



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Appendix 1 - Hemorrhage Response Checklist

Obstetrical Hemorrhage Response Checklist

Purpose:

Provide a stepwise, standardized response to obstetrical hemorrhage to reduce delays and variation.

INITIAL RECOGNITION

- ☐ Quantitative blood loss initiated
- ☐ Vital signs assessed (BP, HR, O2 sat)
- ☐ Identify cause (Tone, Tissue, Trauma, Thrombin)
- ☐ Call for help / activate hemorrhage response

IMMEDIATE ACTIONS

- ☐ Fundal massage / bimanual compression
- ☐ Two large-bore IVs (16–18G)
- ☐ Oxygen via non-rebreather
- ☐ Foley catheter placed – strict I&O
- ☐ Stat labs: CBC, PT/INR, aPTT, fibrinogen, type & cross

MEDICATIONS (per protocol)

- ☐ Oxytocin infusion
- ☐ Methylergonovine (if no HTN)

☐ Carboprost (if no asthma)

☐ Misoprostol

☐ Tranexamic acid (within 3 hours of bleeding onset)

ESCALATION

☐ Hemorrhage cart at bedside

☐ Uterine tamponade device placed if indicated

☐ OR team notified

☐ Anesthesia present

☐ MTP activated if criteria met

DOCUMENTATION

☐ Total QBL documented

☐ Time of hemorrhage recognition

☐ Time of MTP activation

☐ Blood products administered

☐ Patient response

2. Massive Transfusion Protocol – Obstetrics Specific

Activation Authority: OB provider, anesthesia provider, charge nurse per policy

ACTIVATION CRITERIA (ANY)

- QBL ≥1500–2000 mL with ongoing bleeding
- Hemodynamic instability unresponsive to fluids
- Anticipated transfusion ≥4 units PRBC in 1–2 hours
- Provider concern for catastrophic hemorrhage

INITIAL BLOOD PRODUCT PACK

(Delivered immediately by blood bank)

- 4 units PRBC
- 4 units FFP
- 1 apheresis platelet unit
- Consider cryoprecipitate early if fibrinogen <200 mg/dL

Target Strategy: Balanced 1:1:1 resuscitation

LAB MONITORING

☐ CBC q30–60 min

☐ Coagulation studies

☐ Fibrinogen

☐ Ionized calcium

SAFETY MEASURES

☐ Blood warmer used

☐ Calcium replacement as indicated

☐ Strict intake/output

☐ Temperature monitoring (prevent hypothermia)

DEACTIVATION

☐ Hemostasis achieved

☐ Hemodynamics stabilized

☐ Labs normalized

☐ Blood bank notified

3. Hemorrhage Cart – Standardized Inventory Checklist

Cart Location: _____

Checked: ☐ Daily ☐ Weekly ☐ After each use

TOP DRAWER – MEDICATIONS

☐ Oxytocin

☐ Methylergonovine

☐ Carboprost

☐ Misoprostol

☐ Tranexamic acid

☐ Calcium gluconate

SECOND DRAWER – IV & FLUIDS

☐ 16G & 18G IV catheters

☐ Pressure bags

☐ Rapid infuser tubing

☐ IV start kits

THIRD DRAWER – PROCEDURAL

☐ Uterine balloon tamponade kit

☐ Syringes, stopcocks

☐ Suture scissors

☐ Vaginal packing

FOURTH DRAWER – DOCUMENTATION

☐ Hemorrhage algorithm
☐ MTP activation instructions
☐ QBL reference guide
☐ Event documentation forms

BOTTOM / SIDE

☐ Calibrated under-buttocks drape
☐ Scale for weighing blood loss
☐ Portable suction setup

4. Obstetrical Hemorrhage Drill & Simulation Framework

Frequency:

- **Minimum annual multidisciplinary drills**
- **Recommended biannual for high-volume L&D units**

REQUIRED PARTICIPANTS

☐ L&D nursing
☐ OB provider
☐ Anesthesia
☐ Blood bank (tabletop or live)
☐ OR staff

SCENARIO EXAMPLES

- Uterine atony with rapid decompensation
- Placenta accreta spectrum
- Delayed postpartum hemorrhage
- Coagulopathy with massive transfusion

EVALUATION METRICS

☐ Time to hemorrhage recognition
☐ Time to cart arrival
☐ Time to TXA administration
☐ Time to MTP activation
☐ Communication clarity
☐ Role assignment effectiveness

DEBRIEF QUESTIONS

What went well? What can we improve?

1. What caused delays?

2. Were roles clearly assigned?
3. Did staff know where supplies were located?
4. What system change is needed?

Appendix 2 – Staff Code Assignments

STAFF ASSIGNMENT	CODE BLUE	CODE DELTA SHOULDER DYSTOCIA	CODE C EMERGENT C/S	CODE H HEMORRHAGE	CODE PINK INFANT ABDUCTION	CODE SHIPP HYPERTENSIVE EMERGENCY
A Primary Nurse	**Remains** with patient and initiates CPR **Presses** Code Blue button in room **Calls** out to PSC to page code blue **Gives** report of patient status to code team on arrival	**Calls out** to PSC to page **Code Delta** **Initiates** proper position (McRoberts) **Provides** suprapubic pressure if ordered **Notes** time of Head delivery	**Remains** with patient **Calls out** to PSC to page **Code C** **Inserts** Foley Catheter if needed **Calls out** for pre-ops & ensure administration of pre-ops	**Remains** with patient **Calls out** to PSC to page **Code H** **Administer** Medications/Blood as ordered	**Remains** with patient	**Remains** with patient **Calls out** to PSC to call CODE SHIPP **Gives report** on patient status to code team on arrival **Administer** medications
B Patient Service Clerk	**Pages** Code Blue overhead/Call box **Notifies** hospital operator to page overhead Code **Notifies** Attending OB/Anesthesia via pager **Remains** at desk to facilitate communication	**Page Code Delta** overhead/call box **Notifies** OB attending and anesthesia via pager **Notifies** NICU per hotline 5-2331 **Remains** at desk to facilitate communication	**Pages** Code C overhead/call box **Notifies** Attending/Anesthesia via pager **Book** Surgery Case in Cerner	**Notifies** attending OB/Anesthesia via pager **Remains** at desk to facilitate communication **Calls** blood bank to initiate hemorrhage protocol **Prints** Blood release and/or Red Tag blood form	**Remains** at desk to facilitate communication	**Pages** CODE SHIPP overhead/call box **Remains** at desk to facilitate communication
C Patient Care Coordinator	**Coordinate's** activities/assist circulator **Brings** supplies/monitors to bedside and applies **Directs** non-essential personnel to leave area	**Coordinates** activities/assists circulator **Assists** anesthesia as necessary	**Coordinates** activities/assists circulator **Assists** anesthesia as necessary	**Coordinates** activities/assists circulator **Assists** anesthesia in blood and volume resuscitation	**Responsible** for covering the door by the transport elevator	**Coordinates** activities/assist circulator **Brings** supplies/monitors to bedside and applies to pt.
D Registered nurse OB Technician	**Prepares/administers** medications as ordered Acts as runner as necessary (OBT)	**Reports** to room to provide assistance **Acts** as a runner as necessary **Prepares** OR if necessary (OBT)	**Obtains and administers** pre-ops (if not given by Primary RN) **Assist** primary nurse/circulator in pre-op, OR, and RR **Proceeds** to OR to set up case (OBT)	**Acts** a runner as necessary (RN, OBT)	**Responsible** for covering the back door by anesthesia work room (RN) **Responsible** for covering hallway doors by call rooms (OBT)	**Prepares/administers** medications as ordered **Acts** as runner as necessary (OBT)
E Registered Nurse	Recorder	**Assist Primary RN as Recorder** **Calls out** time in 30 second intervals **Confirms** notes with provider &Primary RN after delivery for accurate documentation	**Takes** chart to OR **Sets up** OR radiant warmer for resuscitation **Calls** PEDS to OR **Assist** OBT to open case (if no other OBT available) **Turns** on fetal monitor	**Acts** as a runner as necessary	**Responsible** for covering Lobby entrance	**Assist** primary RN as necessary (start IV, administer medications, etc.) **Acts** as runner
F Anesthesia	**Manages** airway on arrival May assist with line placement/medication administration	**Assists** as needed to provide additional anesthesia	**Assists** moving patient to OR **Coordinates** anesthesia methods with surgeon	**Assists** as needed to provide additional IV access, arterial lines, and administration of products	**Responsible** for covering ambulance entrance (OB ED) with OB ED-RN	**Assists** as needed to provide additional IV access, arterial lines, etc.

Appendix 3 - Hemorrhage Risk Assessment

OBSTETRIC HEMORRHAGE RISK ASSESSMENT CHECKLIST

Patient Name: _____ MRN: _____ GA: _____

Date/Time: _____ Assessed by: _____

_____

A. **ON ADMISSION TO LABOR & DELIVERY**

☐ LOW RISK – No identified risk factors

☐ MEDIUM RISK – One or more medium-risk factors

☐ HIGH RISK – One or more high-risk factors

Risk Factors

Medium Risk (check all that apply)

☐ Prior cesarean or uterine surgery

☐ Multiple gestation

☐ Induction or prolonged labor
☐ Chorioamnionitis
☐ Macrosomia (>4000 g)
☐ BMI ≥40
☐ History of postpartum hemorrhage
☐ Prolonged oxytocin (>24 hrs)
☐ Operative vaginal delivery anticipated

High Risk

☐ Placenta previa or low-lying placenta
☐ Suspected placenta accreta spectrum
☐ Placental abruption
☐ Known bleeding disorder
☐ Platelets <100,000
☐ Hemoglobin <9 g/dL
☐ Active vaginal bleeding
☐ ≥2 medium-risk factors

Orders Based on Risk

Risk	**Required Order**
Low	Type & Screen
Medium	Type & Screen + Hemorrhage cart ready
High	Type & Cross ≥2 units, anesthesia & blood bank alerted

B. INTRAPARTUM REASSESSMENT

Reassess if any of the following occur:

☐ Prolonged or arrested labor
☐ Oxytocin > 24 hours
☐ Operative vaginal delivery
☐ Intra-amniotic infection
☐ Preeclampsia/HELLP
☐ Significant perineal trauma
☐ Uterine overdistension
☐ New vaginal bleeding

Current Risk Level:

☐ Low ☐ Medium ☐ High

If upgraded → update blood orders & team readiness.

C. POSTPARTUM REASSESSMENT

Reassess:

- ☐ After delivery
- ☐ After placental delivery
- ☐ With QBL ≥500 mL (vaginal)
- ☐ With QBL ≥1000 mL (cesarean)
- ☐ With any ongoing bleeding

Postpartum Risk Factors

- ☐ Uterine atony
- ☐ Retained placenta
- ☐ Lacerations
- ☐ Hematoma
- ☐ Coagulopathy
- ☐ Rising QBL
- ☐ Hemodynamic instability

Current Risk Level:

☐ Low ☐ Medium ☐ High

Escalation Triggers (Call OB Hemorrhage Team)

- ☐ QBL ≥1000 mL
- ☐ Ongoing bleeding despite use of uterotonics
- ☐ Hypotension or tachycardia
- ☐ Falling hemoglobin or platelet count
- ☐ Clinical concern by any team member

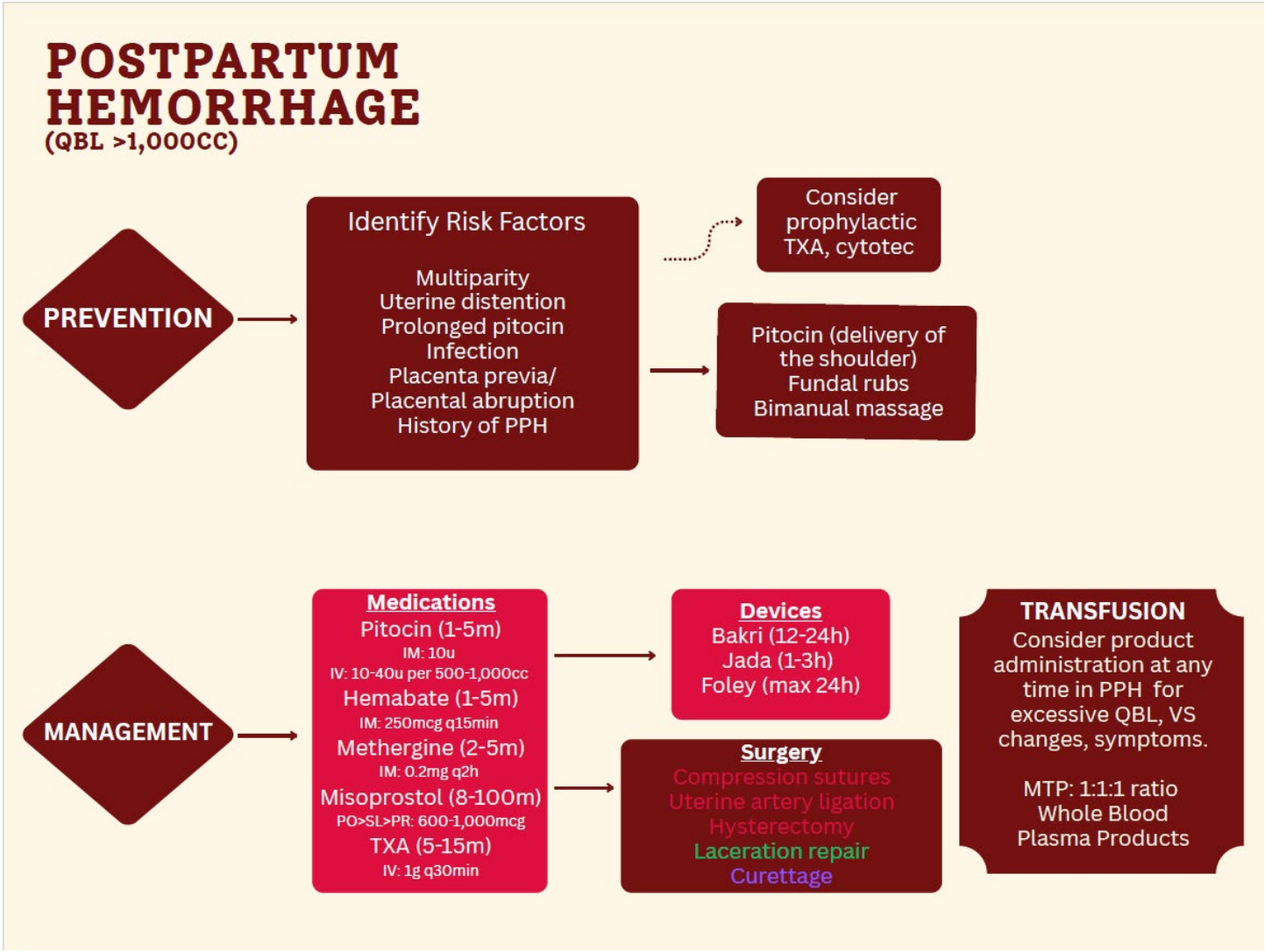
Why This Works

Most maternal deaths from hemorrhage are due to:

- Failure to identify risk
- Underestimation of blood loss
- Delayed escalation

This checklist fixes all three.

Appendix 4 - PPH Risk Assessment Algorithms

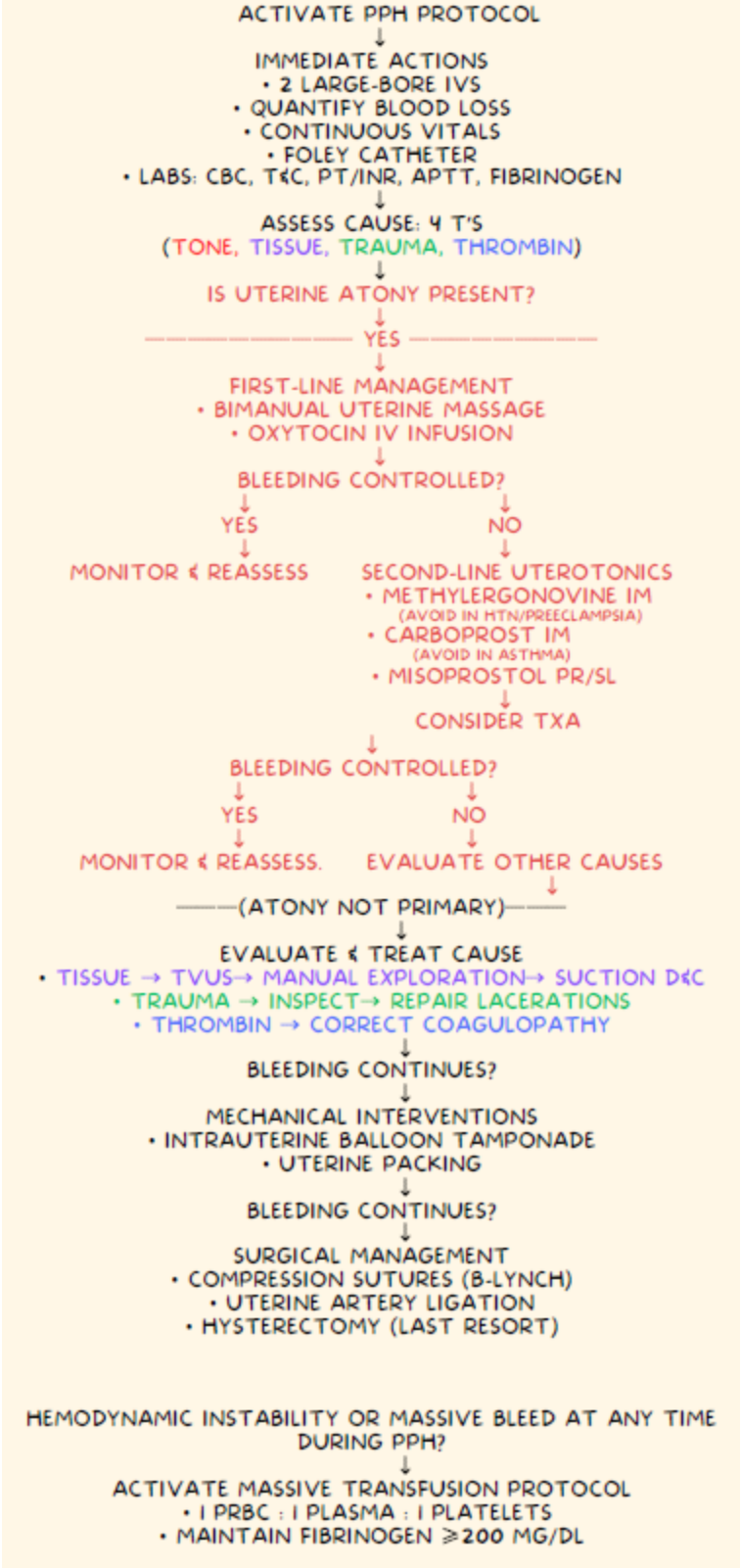


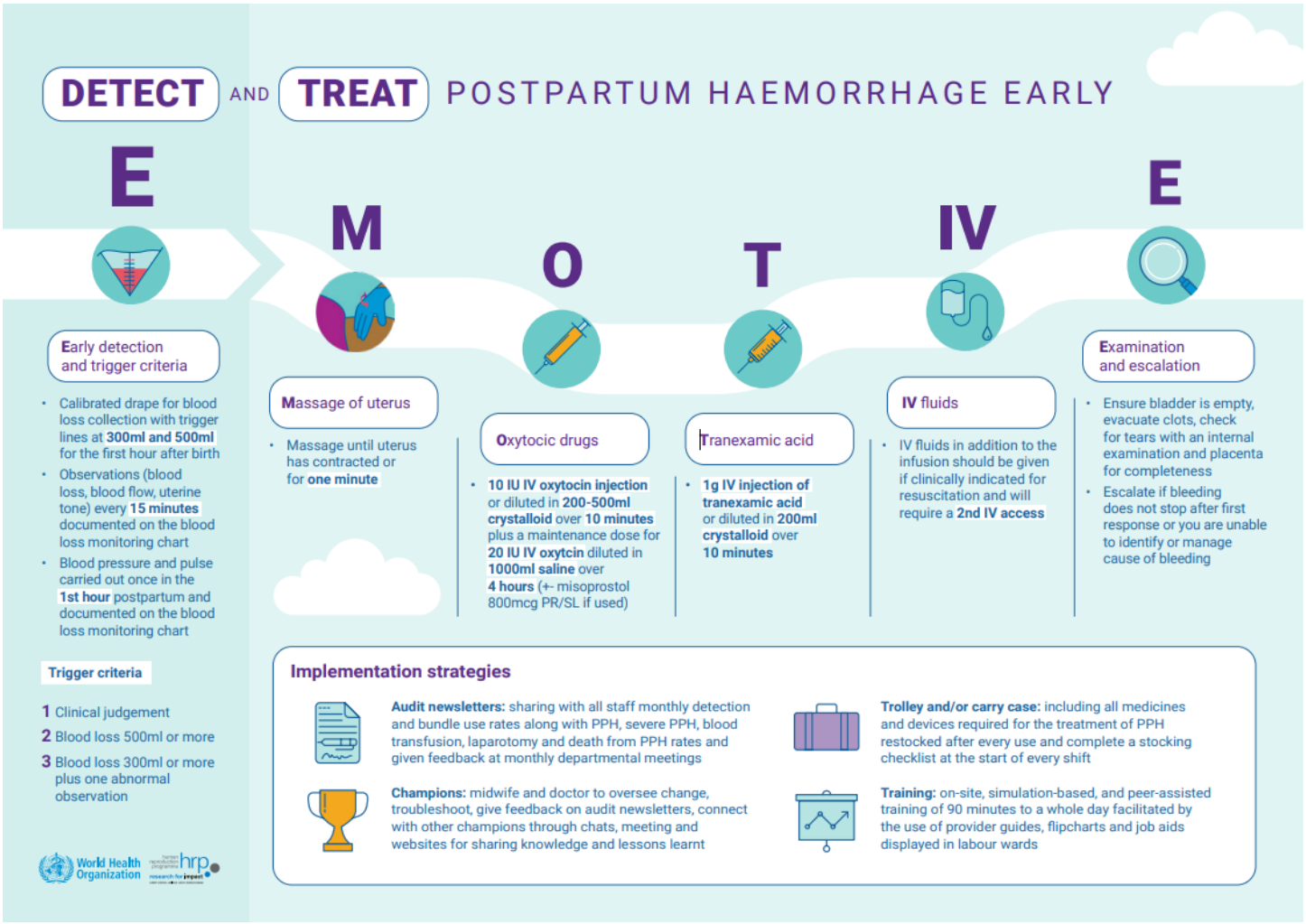
POSTPARTUM HEMORRHAGE
(QBL >1,000CC)

2 Large-bore IVs
Quantify blood loss
Continuous vitals
Foley catheter
STAT CBC, T&C, PT, aPTT, fibrinogen

Tone:	Trauma:	Tissue:	Thrombin:
Bimanual uterine massage	Manual and visual exploration	Evaluation of placenta	Stat Labs
Medication management	Visualization (lighting) Repair and extra hands for retraction	Manual exploration TVUS	Appropriate product replacement
Intrauterine devices Surgical management Transfusion	If bleeding unresolved with repair, consider extensions and OR	Adequate anesthesia Suction D&C	Surgery if no improvement or unstable

POSTPARTUM HEMORRHAGE
(QBL >1,000CC OR SIGNS OF HYPOVOLEMIA)





https://cdn.who.int/media/docs/default-source/reproductive-health/maternal-health/who-hrp-e-motive-poster.pdf?sfvrsn=d0c58356_4

Appendix 5- Patient Event Debrief Checklist

This checklist guides obstetric providers in delivering respectful, trauma-informed care during PPH events, emphasizing dignity, autonomy, empathy, and cultural sensitivity to support emotional recovery.

Supporting patients and families during a PPH event is vital. Use this checklist to ensure emotional needs are met through respectful care principles: clear communication, informed consent, bias-free interactions, and inclusion of patient preferences.

Prior to the Event (Readiness and Prevention)

☐ Identify a lead provider for emotional support coordination; discuss during morning huddles or prenatal visits, incorporating patient input on support persons and cultural needs.

☐ Screen for pre-existing mental health risks (e.g., history of trauma, anxiety) using respectful, non-judgmental questions; offer resources like counseling referrals early.

☐ Educate patients antenatally on PPH risks and management in plain language, respecting literacy and language preferences; emphasize autonomy in decision-making (e.g., blood product consent).

☐ Train team on respectful maternity care (RMC): Address implicit biases, ensure empathetic communication, and prepare for trauma-informed responses (e.g., narrating actions calmly during emergencies).

Immediately Following the Event (Recognition and Response)

☐ Introduce yourself and role; acknowledge the trauma empathetically (e.g., "This was frightening, and we're here to support you").

☐ Include patient and approved support persons in discussions; obtain verbal consent for procedures where possible, explaining options respectfully.

☐ Provide real-time updates using simple, reassuring language; avoid jargon and validate emotions (e.g., "It's normal to feel overwhelmed right now").

☐ If relocating (e.g., to a clean room), explain reasons compassionately (e.g., for accurate blood loss measurement) while respecting patient comfort.

☐ Act as liaison: Coordinate with multidisciplinary team, ensuring cultural interpreters if needed; facilitate family involvement without compromising safety.

If the Patient is in Critical Care

☐ Prepare patient and family for what to expect (e.g., intubation, monitors) with sensitivity; discuss what the patient knows to avoid re-traumatization.

☐ Offer emotional support tools (e.g., whiteboard for communication if intubated); assess understanding and fears respectfully.

☐ Involve patient in care decisions (e.g., breastfeeding support); connect with social worker, psychologist, or chaplain for immediate trauma debrief.

☐ Provide updates on baby (e.g., photos, visits if possible); prioritize bonding while honoring patient preferences.

☐ Monitor for signs of acute distress; use trauma-informed language (e.g., "You're safe now; we're monitoring closely").

Prior to Discharge (Reporting, Systems Learning, and Recovery)

☐ Acknowledge the event's trauma; provide anticipatory guidance on physical/emotional recovery, including PTSD signs (e.g., flashbacks, anxiety).

☐ Conduct a respectful debrief: Use patient-centered questions to review events, clarify facts, and address concerns; involve support network.

☐ Offer resources (e.g., Life After Postpartum Hemorrhage from PQCNC; mental health referrals); schedule early follow-up (within 1-3 weeks).

☐ Encourage scheduling a provider debrief post-discharge; document contact person and plan clearly.

☐ Promote self-care: Discuss societal impacts like family roles; ensure discharge info is culturally appropriate and literacy-friendly.

(Adapted from CMQCC Appendices AA and W, incorporating RMC principles.)

Case-Review Audit Form (Use one per event)

1. Was the risk assessment completed and updated?
2. Was QBL measured and cumulative totals communicated?
3. Were staging criteria recognized and documented with times?
4. Uterotonics sequence appropriate with contraindications respected?
5. TXA given ≤3 h from birth when PPH recognized? If not, why?
6. Timely use of balloon/surgical escalation per checklist?
7. MTP activation criteria met and hemostatic targets achieved?
8. Fibrinogen nadir and replacement documented?
9. Team activation, roles, and closed-loop communication documented?
10. Respectful care and equity considerations addressed (language access, preferences re: blood products)?
11. Outcomes: SMM-hemorrhage, hysterectomy, ICU, readmission
12. Action items and owners set; simulation planned if gaps noted

Reviewer(s): _____ Date: _____

Actions/Owners/Deadlines:

_____

_____

_____

_____

_____

Appendix 6- Quantitative Blood Loss Worksheet

Quantified Blood Loss (QBL) Worksheet

Patient Name: _____

MRN: _____

Date/Time of Delivery: _____

A. Immediately after the birth of the baby, the practitioner will evaluate the baseline volume by using the graduated markers on the under the buttocks drape.
B. After the delivery of the placenta, the Practitioner will evaluate the fluid loss accumulated in the under the buttocks drape using the graduated markers
C. The baseline volume is then subtracted from the fluid loss. This difference will equal quantitative blood loss (fluid loss – baseline = actual blood loss). This number is entered in the quantitative blood loss calculator in the electronic health record (EHR)
D. Weigh all blood-soaked items (laps, bedding, clots, etc.) immediately after delivery and enter into the QBL calculator in the EHR
E. The EHR calculates cumulative blood loss as new entries are made

Item	**Weight (g)**	**Volume (mL)**
Underpad		
Sponges		
Drapes		
Canister (Minus irrigation)		
Total		

Quantification of Blood Loss (QBL) Calculator

Appendix 7. Patient Education

Existing Patient-Education Resources

AWHONN POST-BIRTH Warning Signs Education Program

- Comprehensive, evidence-based patient-education materials (POST-BIRTH acronym, videos, standardized scripts, infographics).
- Updated December 2023 and designed specifically for pre- and post-discharge education to reduce postpartum morbidity.
  [awhonn.org]

CDC *Hear Her*® Campaign – Urgent Maternal Warning Signs

- National, plain-language patient education on urgent maternal warning signs during pregnancy and up to one year postpartum.
- Includes printable posters, digital resources, videos, conversation guides, and patient-facing tools for families and support persons. [cdc.gov], [cdc.gov]

AIM Obstetric Hemorrhage Patient Safety Bundle (Patient Education Components)

- The AIM bundle (revised 2022) requires *ongoing patient education* on hemorrhage causes, early warning signs, and postpartum complications.
- Provides implementation resources that include education expectations and templates facilities may adapt.
  [saferbirth.org], [saferbirth.org]

CMQCC Obstetric Hemorrhage Toolkit (V3) – Patient-Centered Materials

- Includes updated hemorrhage risk-screening tools, guidance on concealed bleeding, and materials addressing inequities and patient lived experiences—useful for patient education and staff scripting.
  [cmqcc.org]

WHO "Bleeding After Birth" Training Materials

- Flipcharts, action plans, provider booklets, and demonstration videos that can be adapted into simple, visual patient-facing explainers.
- Emphasizes prevention, recognition of warning signs, and early treatment.
  [who.int]

Cleveland Clinic Patient Education: Postpartum Hemorrhage Overview

- Plain-language explanation of what PPH is, symptoms, causes, and when to seek emergency care—useful as a reference for patient-friendly phrasing.
  [my.clevela...clinic.org]

Mount Auburn Hospital: Postpartum Discharge Instructions—Warning Signs

- Patient-ready materials detailing specific bleeding thresholds, danger signs, mental-health red flags, incision concerns, and when to call vs. call 911.
- Excellent template for discharge packets. [mountaubur...spital.org]

AWHONN Patient Education Resources (Healthy Mom & Baby, Infographics, Post-Birth Signs)

- AWHONN hosts downloadable, evidence-based infographics and patient handouts suitable for clinical spaces, discharge folders, and prenatal classes.
  [awhonn.org]

CDC Clear Communication Index & Plain-Language Tools

- While not clinical content themselves, these tools help providers ensure all patient-facing materials meet national literacy and clarity standards (including ≤ 6th-grade level).
  [cdc.gov]

Teach-Back Method Evidence & Implementation Guides

- Systematic reviews and guidance for using teach-back to ensure patient comprehension—providers can integrate validated question prompts into their education processes. [journals.plos.org], [hsrd.research.va.gov]

SAMPLES of PATIENT EDUCATION:

What Every Pregnant Patient & Family Should Know

Obstetric hemorrhage means **heavy bleeding** during pregnancy, during birth, or after delivery.
It is one of the **most common emergencies in childbirth**, but when it is **recognized early and treated quickly, it is very manageable.**
This flyer explains:
✓ What hemorrhage is
✓ Who is at risk
✓ Warning signs
✓ How your care team keeps you safe

What is normal vs. too much bleeding?

After birth, some bleeding is normal:

- After a vaginal birth, bleeding like a heavy period is expected

- After a cesarean birth, bleeding is often a little more

Bleeding is dangerous if you are:

- 🚨 Soaking more than one pad per hour
- 🚨 Passing large clots (bigger than a golf ball)
- 🚨 Feeling dizzy, faint, or weak
- 🚨 Having shortness of breath or a fast heartbeat

When can hemorrhage happen?

Heavy bleeding can occur:

- During pregnancy
- During labor and delivery
- Most commonly: in the first 24 hours after birth

That's why your nurses and doctors check you very closely after delivery.

What causes heavy bleeding?

The most common causes include:

1. The uterus not contracting well
   - After birth, the uterus should tighten to stop bleeding.
   - If it stays relaxed, heavy bleeding can happen.
2. Retained placenta
   - Small pieces of placenta left behind can cause bleeding.
3. Tears
   - Tears in the cervix, vagina, or uterus may bleed heavily.
4. Blood-clotting problems

   Some medical conditions make it harder for blood to clot.

Who is at higher risk?

You may have a higher risk if you have:

- A prior hemorrhage
- Twins or triplets
- Long or very fast labor
- Labor induction
- Infection
- Prior cesarean birth
- Placenta previa or accrete (Abnormal placenta attachment)
- Anemia (low blood count
- A large baby

Even people with no risk factors can have hemorrhage — that's why everyone is carefully monitored.

How does the hospital keep me safe?

Your care team uses a hemorrhage safety system that includes:

✓ Risk checks

You are assessed for bleeding risk:

- When admitted
- During labor
- After delivery

✓ Measuring blood loss

We don't guess — we measure:

- Weighing pads, sponges, and drapes
- Using special collection containers

This helps us act faster and more safely.

✓ Frequent monitoring

After birth, nurses regularly check:

- Bleeding
- Blood pressure
- Heart rate
- Uterus firmness

✓ Fast treatment if bleeding starts

This may include:

- Medications to help the uterus contract
- IV fluids
- Blood transfusion (if needed)
- Procedures or surgery (rare, but lifesaving)

🚨 Tell your nurse or doctor right away if you feel:

- Lightheaded or dizzy
- Weak or shaky
- Short of breath
- Chills
- Heavy bleeding or large clots
- "Something isn't right"

You are never bothering us — your voice helps save lives.

🏠 After you go home — get help if you have:

Call your doctor or go to the ER if you have:

- 🚨 Bleeding soaking more than one pad per hour
- 🚨 Large clots
- 🚨 Fever
- 🚨 Fainting or severe weakness
- 🚨 Chest pain or shortness of breath

💔 The Bottom Line

Obstetric hemorrhage is serious —but hospitals are trained, equipped, and ready.

Your care team is watching closely so that if bleeding starts, it is **caught early and treated fast.**
You are not alone — and you are protected.

Sample:(Based on 5th grade level of comprehension)

Obstetrical Hemorrhage: What You Need to Know

(Heavy Bleeding During or After Pregnancy)

What Is Obstetrical Hemorrhage?

Obstetrical hemorrhage is **serious, heavy bleeding** that happens during pregnancy, during labor, or after the baby is born. While light spotting can be normal, **heavy bleeding is a medical emergency** and needs quick treatment.

Why Heavy Bleeding Is Dangerous

Losing too much blood can cause:

- Low blood pressure
- Dizziness, fainting, or weakness
- Fast heartbeat
- Organ damage
- Shock (life-threatening)

Early care can prevent serious complications.

Causes During Pregnancy

- **Placenta previa:** placenta covers the cervix
- **Placental abruption:** placenta separates too early
- **Miscarriage or ectopic pregnancy**

Causes During Labor & Birth

- Very long or very fast labor
- Tears in the cervix or vagina
- Uterine rupture (rare)
- Placenta not delivering fully

Causes After Birth (Postpartum Hemorrhage)

Most bleeding happens within the first 24 hours, but it can occur days or weeks later.

Common reasons include:

- **Uterine atony:** uterus does not tighten
- **Retained placenta:** tissue left inside
- **Tears or cuts** in birth canal

- **Blood clotting problems**

Warning Signs—Seek Help Immediately

Call your healthcare provider or **911** if you have:

- Heavy bleeding soaking a pad in **1 hour or less**
- Large clots (bigger than a quarter)
- Dizziness, fainting, or weakness
- Fast heartbeat or shortness of breath
- Severe abdominal or pelvic pain
- Bleeding that increases instead of slowing

How Doctors Treat Heavy Bleeding

Treatment depends on the cause and may include:

- **Medications** to help the uterus contract
- **IV fluids** or **blood transfusions**
- **Removing retained placenta**
- **Repairing tears**
- **Ultrasound** to find the cause
- **Surgical procedures** if needed

The goal is always to **stop bleeding quickly and keep you safe**.

How You Can Reduce Your Risk

- Attend all **prenatal visits**
- Report **any bleeding**, even small amounts
- Share your pregnancy history with your provider
- Know your **blood type** and medical history
- After delivery, monitor your bleeding closely

When to Call 911

Call **right away** if you are:

- Soaking **2 pads in an hour**
- Feeling faint, confused, or extremely weak
- Having trouble breathing
- Experiencing severe abdominal pain

Remember

Obstetrical hemorrhage is serious, but **quick treatment saves lives**. Trust your instincts, if something feels wrong, get help right away.