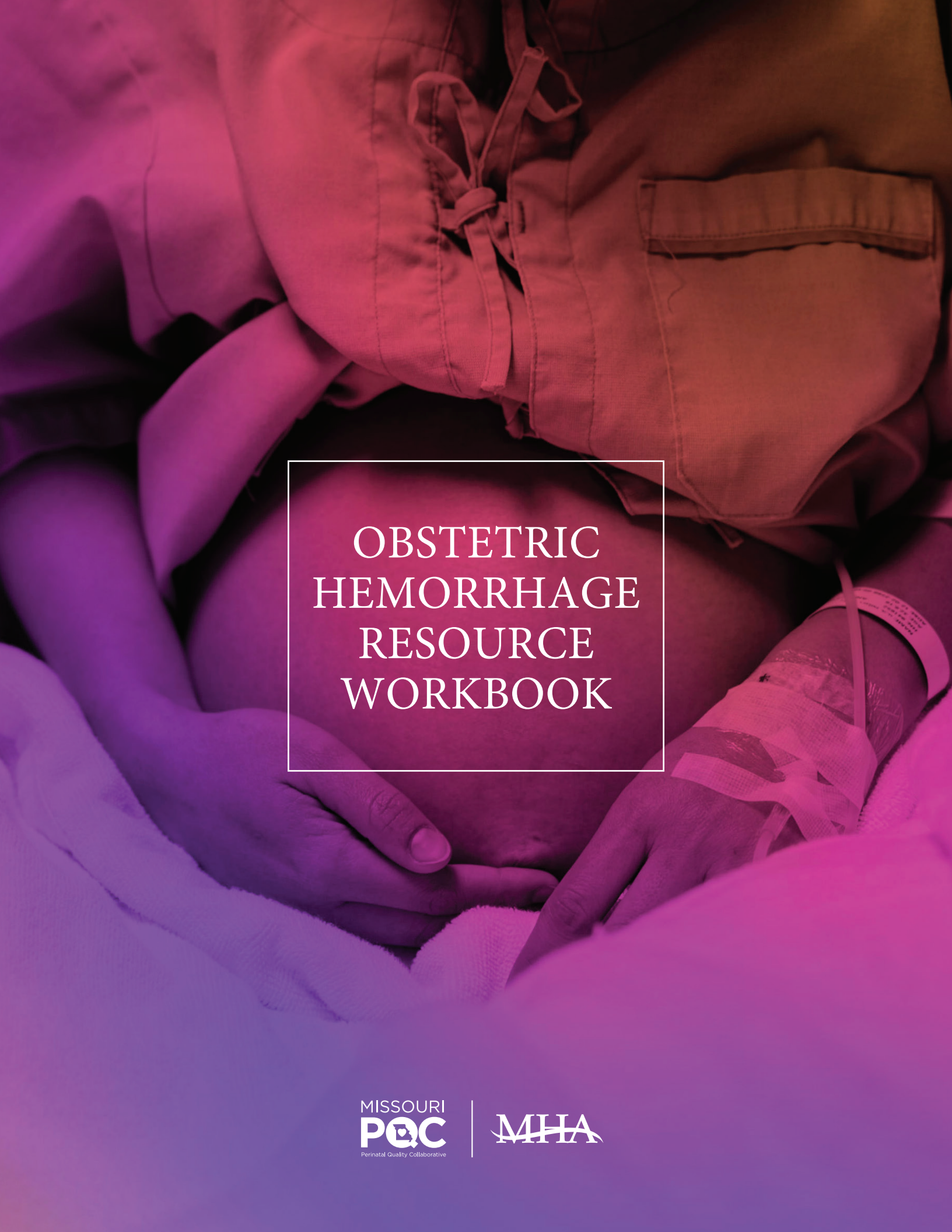

OBSTETRIC HEMORRHAGE RESOURCE WORKBOOK

MISSOURI PQC Perinatal Quality Collaborative | MHA

Acknowledgements

Improving the health outcomes of maternal and infant populations is a critical priority in Missouri. The Missouri Perinatal Quality Collaborative serves as a statewide convener, resource, and change agent to support decreased variations in care and outcomes, support optimized use of evidence-based practice, and support clinical-community integration — all noted gaps in achieving equitable and improved health.

These efforts would not be possible without the collective vision and collaboration of the Missouri Department of Health and Senior Services, Missouri Hospital Association, and members of the Missouri Maternal-Child Learning and Action Network. MC LAN members represent a diverse group of stakeholders from clinical backgrounds, professional associations, government agencies, community-based organizations and community representatives who have committed support to reducing maternal morbidity and mortality in Missouri, including the March of Dimes, Missouri Section of the American College of Obstetricians and Gynecologists, Missouri Chapter of the American Academy of Pediatrics, Missouri Primary Care Association, Missouri DHSS, Missouri Department of Social Services MO HealthNet Division, Missouri Foundation for Health, Missouri Chapter of the Association of Women's Health, Obstetric and Neonatal Nurses, Nurse Practitioners in Women's Health Association, Missouri Chapter of the Amniotic Fluid Embolism Foundation, Generate Health, St. Louis Integrated Health Network, Bootheel Perinatal Network, Healthy Blue MO, Home State Health, United Healthcare, Nurture KC, Promise 1000, M-Brace Birthing, SafiMoms365, the Doula Foundation and Simply Strategy. These partners successfully aligned efforts to bring Alliance for Innovation on Maternal Health initiatives to Missouri in 2019 and connect directly to the Missouri Pregnancy-Associated Mortality Review Board, which identifies leading causes of morbidity and mortality.

The MO PQC also acknowledges the contributions of AIM, the national, cross-sector commitment designed to lead in developing and implementing patient safety bundles to promote safe care for every U.S. birth. Founded in 2014 through a cooperative agreement funded by the Health Services Resources Administration, and executed by ACOG, the AIM program provides expert technical support and capacity building to multidisciplinary state-based teams, most often perinatal quality collaboratives, leading targeted rapid-cycle quality improvement via implementation of patient safety bundles. An AIM patient safety bundle is a structured way of improving the process of care and patient outcomes: a small, straightforward set of evidence-based practices that, when performed collectively and reliably, have been proven to improve patient outcomes. Patient safety bundles are developed by expert multidisciplinary working groups, supported by the AIM staff at ACOG. Working groups include representatives appointed by professional member organizations, known experts and researchers specializing in the clinical topic, and patients with lived experience. The bundle development process includes design of measures and metrics for implementation and multiple levels of review from engaged stakeholders.[1,2]

The MO PQC leverages AIM patient safety bundles as one option to support implementation of evidence-based practice and care delivery redesign for birthing units, providers, and communities throughout the state.

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The Evidence

This section includes information on key evidence-based practices for improving the recognition of and response to obstetric hemorrhage.

Hemorrhage risk assessments not only are to be completed on admission to the birthing unit and post-delivery, but also during the intrapartum phase prior to delivery to include key changes noted during labor (e.g., infection or prolonged labor). Risk factors are categorized as low, medium and high risk (see risk factors in table on page 5). Identifying risk factors for hemorrhage, such as multiple gestation, prior cesarean section/uterine surgery, or known or suspected placenta accreta, helps the clinical team develop a plan of care to include additional support, supplies, blood products or transfer to a facility with advanced services and blood bank reserves as appropriate. For those who refuse blood products, it is imperative that the team develop a comprehensive plan during the prenatal period.[3] AWHONN and the California Maternal Quality Care Collaborative developed hemorrhage risk assessment tools. Naval Medical Center Portsmouth developed a tool based on the CMQCC tool and ACOG recommendations for a retrospective cohort study.[4] All tools are included in the Resources section of this document.

ADMISSION AND LABOR RISK FACTORS		
LOW	**MEDIUM**	**HIGH**
Routine Obstetric Care	Communicate Risk With Care Team Be prepared to intervene.	Multidisciplinary Care Team Notification Plan for additional personnel to be present for delivery.
Consider Type and Screen	Type and Screen	Type and Cross, 2 Units On Hold
No Previous Uterine Incision Singleton Pregnancy ≤ 4 Vaginal Births No Known Bleeding Disorder No Postpartum Hemorrhage History	Prior Cesarean Section or Uterine Surgery Multiple Gestation > 4 Vaginal Births Intraamniotic Infection History of PPH Large Uterine Fibroids Platelets 50,000-100,000 Hematocrit < 30% (Hemoglobin < 10) Polyhydramnios Gestational age < 37 weeks or > 41 weeks Prolonged Labor/Induction (> 24 hours)	Placenta Previa, Low-lying Placenta Suspected/Known Placenta Accreta Spectrum Abruption or Active Bleeding (> than normal bloody show) Known Coagulopathy History of > 1 PPH Hemolysis, Elevated Liver Enzymes and Low Platelet Syndrome PLTs < 50,000 2 or More Medium Risk Factors
ONGOING RISK FACTORS		
	INCREASED MONITORING AND TEAM PREPARATION	
	Cesarean Delivery This Birth Admission, Special Caution if Procedure Was Urgent, Emergent or 2nd Stage Operative Vaginal Delivery Genital Tract Trauma — 3rd and 4th Degree Lacerations Quantitative Blood Loss 500-1000 ml With a Vaginal Delivery	Active Bleeding (filling > 1 pad/hour or passing clots ≥ 6 cm) Retained Placenta Non-lower Transverse Uterine Incision for Cesarean Delivery QBL ≥ 1000 ml or Treated for Hemorrhage Received General Anesthesia Uterine Rupture

Table adapted from CMQCC OB Hemorrhage Toolkit V3.0- Appendix K[5]

Postpartum hemorrhage occurs for low-risk birthing people about 40% of the time. Consequently, it is imperative for care providers to remain attentive during ***every*** delivery and recovery period for ***every*** patient. Reliable data have demonstrated the historical use of estimating blood loss is highly imprecise, leading to delays in needed care. Therefore, to ensure early identification of increased blood loss, quantification of cumulative blood loss for ***every*** patient is best practice.[3]

Quantification of blood loss (QBL) is the organized utilization of volumetric containers, weighing scales or computerized image recognition to calculate blood loss for medical procedures and conditions. Generally, teams use a combination of weighing blood-soaked items and measuring volume in volumetric containers to calculate the cumulative QBL. Every one gram of weight is equal to one mL of fluid/blood. For weighed blood-soaked items, QBL is calculated by subtracting the dry weight from the wet weight. QBL requires a multidisciplinary collaboration to achieve success.[6] Sample QBL calculators, techniques and resources for success are included in the Resources section of this document.

OB hemorrhage is an incredibly traumatic experience for everyone involved, especially for the birthing person and designated support person(s). It is essential the clinical team provide the birthing person and designated support person(s) with a timely debrief to review the event and provide resources for ongoing support.[3]

Multiple studies report birthing people, particularly Black women and people of color, feel unheard by their care providers when they report concerns. These care team failures to listen and respond to patients' concerns prevent prompt identification of and response to obstetric hemorrhage. Birthing people's awareness of, these failures to, listen and related delays in treatment could increase the trauma they experience.[5]

Furthermore, a recent prospective study demonstrated a significant and clinically relevant increased risk of developing PTSD after a severe PPH.[7] It is critical the care team deliver individualized support, in a trauma-informed manner, to provide needed answers to the birthing person's questions and resources for ongoing support. The care team should monitor the birthing person closely for depression, dissociation or other signs of trauma so prompt treatment and connection to ongoing support is provided.[5] Tools and resources for communicating and documenting discussions with birthing people after a hemorrhage event are included in the Resources section of this document.

Beyond hemorrhage risk assessment, QBL and patient debrief after OB hemorrhage, teams are encouraged to implement the complete AIM Patient Safety Bundles. All PSB best practice implementation tasks are listed below. The minimum standard of care for obstetric teams' hemorrhage readiness, response and management includes the following.

- ☐ Stage-based management plan for pregnant and postpartum patients having obstetric hemorrhage
- ☐ Hemorrhage supply cart with all needed supplies
- ☐ Immediate access to all hemorrhage medications
- ☐ Standardized education for all members of the obstetric team regarding hemorrhage procedure and management plan
- ☐ Perform multidisciplinary drills to practice skills and pinpoint any system issues or barriers to effective care
- ☐ Establish standards for reviewing patient cases of hemorrhage and complete reviews to assess care and treatment provided, identify issues and improve processes to enhance the quality of care[8]

Resources for key processes and PSB components are included in the Resources section of this document.

Missouri's Call to Action

The Missouri Pregnancy-Associated Mortality Review Board reviews all deaths of women and birthing people while pregnant or within one year of the end of the pregnancy. Pregnancy-associated death is the overarching term used when referring to maternal deaths. Within this broad categorization are more specific terms to describe the cause of death, including pregnancy-related death; pregnancy-associated, but not related (PANR) death; and pregnancy-associated, but unable to determine relatedness.[10] See definitions below.

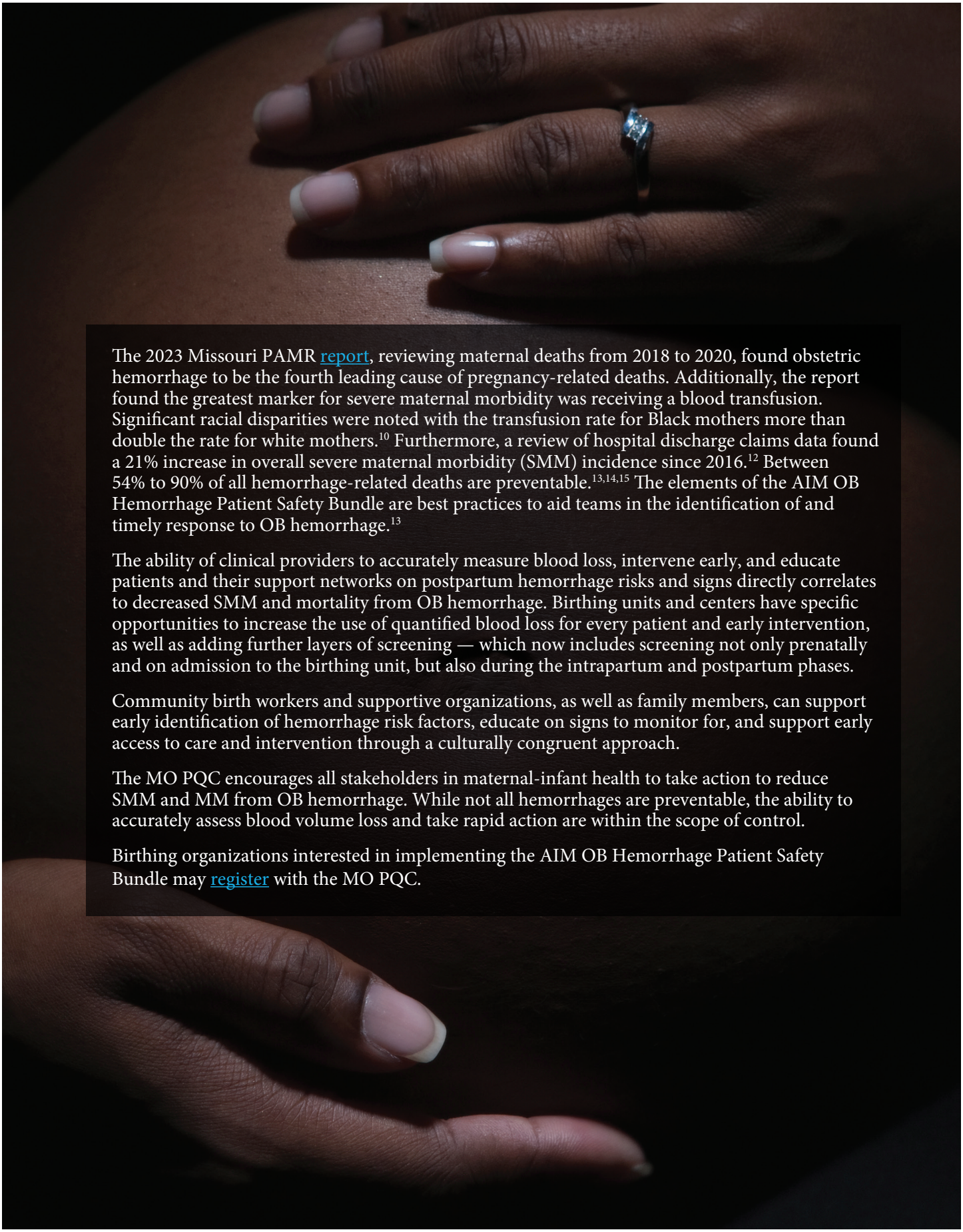
Pregnancy-related death: Death occurring during or within one year of the end of pregnancy from a pregnancy complication, a chain of events initiated by pregnancy, or the aggravation of an unrelated condition by the physiological effects of pregnancy[10]

PANR: Death during or within one year of pregnancy from a cause that is not related to pregnancy[10] (e.g., pregnant person who dies in a natural disaster)

Pregnancy-associated, but unable to determine relatedness: Cases when the board was unable to determine if a death was pregnancy-related or PANR[10]

Maternal morbidity: Unexpected negative outcomes of childbirth resulting in short- or long-term health impacts[10]

Maternal mortality: The World Health Organization defines a maternal death as "a death while pregnant or within 42 days of the end of the pregnancy from any cause related to or aggravated by pregnancy or its management, but not from accidental or incidental causes."[11] In Missouri, the term maternal mortality is used to describe deaths that occur during pregnancy, at delivery and up to one year after the end of a pregnancy.[10]



The 2023 Missouri PAMR report, reviewing maternal deaths from 2018 to 2020, found obstetric hemorrhage to be the fourth leading cause of pregnancy-related deaths. Additionally, the report found the greatest marker for severe maternal morbidity was receiving a blood transfusion. Significant racial disparities were noted with the transfusion rate for Black mothers more than double the rate for white mothers.[10] Furthermore, a review of hospital discharge claims data found a 21% increase in overall severe maternal morbidity (SMM) incidence since 2016.[12] Between 54% to 90% of all hemorrhage-related deaths are preventable.[13,14,15] The elements of the AIM OB Hemorrhage Patient Safety Bundle are best practices to aid teams in the identification of and timely response to OB hemorrhage.[13]

The ability of clinical providers to accurately measure blood loss, intervene early, and educate patients and their support networks on postpartum hemorrhage risks and signs directly correlates to decreased SMM and mortality from OB hemorrhage. Birthing units and centers have specific opportunities to increase the use of quantified blood loss for every patient and early intervention, as well as adding further layers of screening — which now includes screening not only prenatally and on admission to the birthing unit, but also during the intrapartum and postpartum phases.

Community birth workers and supportive organizations, as well as family members, can support early identification of hemorrhage risk factors, educate on signs to monitor for, and support early access to care and intervention through a culturally congruent approach.

The MO PQC encourages all stakeholders in maternal-infant health to take action to reduce SMM and MM from OB hemorrhage. While not all hemorrhages are preventable, the ability to accurately assess blood volume loss and take rapid action are within the scope of control.

Birthing organizations interested in implementing the AIM OB Hemorrhage Patient Safety Bundle may register with the MO PQC.

AIM Bundle Components[9]

An AIM patient safety bundle is a structured way of improving the process of care and patient outcomes: a small, straightforward set of evidence-based practices that, when performed collectively and reliably, have been proven to improve patient outcomes.

Readiness — Every Unit/Team

- ☐ Develop processes for the management of patients with obstetric hemorrhage, including:
  - ☐ a designated rapid response team co-led by nursing, obstetrics and anesthesia with membership appropriate to the facility's Level of Maternal Care
  - ☐ a standardized, facility-wide, stage-based obstetric hemorrhage emergency management plan with checklists and escalation policy
  - ☐ an emergency release and massive transfusion protocols to ensure immediate access to blood products
  - ☐ a protocol, including education and consent practices, to collaborate with patients who decline blood products, but may accept alternative approaches
  - ☐ a review of policies to identify and address organizational root causes of racial and ethnic disparities in outcomes related to the diagnosis, management and surveillance of obstetric hemorrhage
- ☐ Maintain a hemorrhage cart or equivalent with supplies, checklists and instruction cards for devices or procedures where antepartum, laboring and postpartum patients are located.
- ☐ Ensure immediate access to first- and second-line hemorrhage medications in a kit or equivalent per the unit's obstetric hemorrhage emergency management plan.
- ☐ Conduct interprofessional and interdepartmental team-based drills with timely debriefs that include the use of simulated patients.

Recognition and Prevention — Every Patient

- ☐ Assess and communicate hemorrhage risk to all team members as clinical conditions change or high-risk conditions are identified; at a minimum, on admission to labor and delivery, during the peripartum period, and on transition to postpartum care.
- ☐ Measure and communicate cumulative blood loss to all team members, using quantitative approaches.
- ☐ Actively manage the third stage of labor per department-wide protocols.
- ☐ Provide ongoing education to all patients on obstetric hemorrhage risk and causes, early warning signs, and risk for postpartum complications.

Response — Every Event

- ☐ Utilize a standardized, facility-wide obstetric hemorrhage emergency management plan, with checklists and escalation policies for stage-based management of patients with obstetric hemorrhage, including:
  - ☐ advance preparations made based on hemorrhage risk (e.g., cell saver, blood bank notification)
  - ☐ evaluating patients for etiology of hemorrhage
  - ☐ use of obstetric rapid response team
  - ☐ evidence-based medication administration or use of nonpharmacological interventions
  - ☐ appropriate activation of expanded care team and clinical resources as necessary
- ☐ Provide trauma-informed support for patients, identified support network, and staff for all obstetric hemorrhages, including discussions regarding birth events, follow-up care, resources and appointments.

Reporting and Systems Learning — Every Unit

- ☐ Establish a culture of multidisciplinary planning, huddles and post-event debriefs for every obstetric hemorrhage, which identify successes, opportunities for improvement and action planning for future events.
- ☐ Perform multidisciplinary reviews of serious complications per established facility criteria to identify system issues.
- ☐ Monitor outcomes and process measures related to obstetric hemorrhage, with disaggregation by race and ethnicity due to known racial and ethnic disparities in obstetric hemorrhage outcomes.
- ☐ Establish processes for data reporting and the sharing of data with the obstetric rapid response team, care providers and facility stakeholders to inform care and change care systems as necessary.

Respectful, Equitable and Supportive Care — Every Unit/Provider/Team Member

- ☐ Include each patient who experienced an obstetric hemorrhage, along with their identified support network, as respected members of and contributors to the multidisciplinary care team and as participants in patient-centered huddles and debriefs.
- ☐ Engage in open, transparent, and empathetic communication with pregnant and postpartum people and their identified support network to understand diagnoses, options and treatment plans, including consent regarding blood products and blood product alternatives.

Resources Section

General Resources

AIM: OB Hemorrhage Patient Safety Bundle

AIM: OB Hemorrhage Element Implementation Details

AIM: OB Hemorrhage Implementation Resources

AIM: OB Hemorrhage Change Package

Agency for Healthcare Research and Quality (AHRQ):
Toolkits to Reduce Hypertension in Pregnancy and Obstetric Hemorrhage

CMQCC: OB Hemorrhage Toolkit V3.0

The Joint Commission:
R[3] Report Issue 24: Provision of Care, Treatment and Services Standards for Maternal Safety

Educational Resources

AHRQ: Hemorrhage Emodules

MHA: QBL Terms and Techniques

MHA: QBL Implementation, Integration and Toolkits for Implementation

Hemorrhage Cart Development

The Joint Commission Journal on Quality and Patient Safety:
Development of an Obstetric Hemorrhage Response Intervention: The Postpartum Hemorrhage Cart and Medication Kit

CMQCC: OB Hemorrhage Toolkit:
Appendix E: Checklist: Carts, Kits and Trays

Hemorrhage Risk Assessment

Anesthesia & Analgesia: National Partnership for Maternal Safety: Consensus Bundle on Obstetric Hemorrhage

CMQCC: OB Hemorrhage Toolkit: Appendix K: Obstetric Hemorrhage Risk Factor Assessment Screen

Cureus: Obstetric Hemorrhage Outcomes by Intrapartum Risk Stratification at a Single Tertiary Care Center
— tool based on ACOG guidelines and CMQCC

Scientific Reports: Obstetric hemorrhage risk assessment tool predicts composite maternal morbidity
— includes AWHONN tool

Quantification of Blood Loss

CMQCC: OB Hemorrhage Toolkit: Appendix M: Sample QBL Worksheet

CMQCC: OB Hemorrhage Toolkit: Appendix N: Techniques for Quantitative Assessment of Blood Loss

CMQCC: OB Hemorrhage Toolkit: Appendix O: Terms and Techniques for Describing Blood Loss

CMQCC: OB Hemorrhage Toolkit: Appendix P: Sample Paper Calculators for Quantifying Blood Loss

Journal of Obstetric, Gynecologic, & Neonatal Nursing (JOGNN):
Quantification of Blood Loss: AWHONN Practice Brief Number 13

Active Management of the Third Stage of Labor

JOGNN: Guidelines for Active Management of the Third Stage of Labor using Oxytocin: AWHONN Practice Brief Number 12

The Cochrane Database of Systematic Reviews: Active versus expectant management of women in the third stage of labor

World Health Organization: WHO recommendations for the prevention and treatment of postpartum hemorrhage

Stage-Based Obstetric Hemorrhage Guidelines

CMQCC: Obstetric Hemorrhage Toolkit: Appendix B: Obstetric Hemorrhage Care Guidelines: Checklist Format

CMQCC: Obstetric Hemorrhage Toolkit: Appendix C: Obstetric Hemorrhage Care Guidelines: Table Format

CMQCC: Obstetric Hemorrhage Toolkit: Appendix D: Obstetric Hemorrhage Care Guidelines: Flowchart Format

Simulation-Based Training

CMQCC: Obstetric Hemorrhage Toolkit: Appendix F: Simulations and Drills: Guidelines for Simulation Scenario Development

CMQCC: Obstetric Hemorrhage Toolkit: Appendix G: Simulations and Drills Sample Scenarios

AIM: Obstetric In-Situ Drill Program Manual

AIM: Simulation and Drills for Patient Safety
— includes sample case scenarios, case videos and team-based communication resources

Patient Event Debriefing

CMQCC: Obstetric Hemorrhage Toolkit: Appendix Z: Sample Patient Summary Form: Obstetric Hemorrhage Event

CMQCC: Obstetric Hemorrhage Toolkit: Appendix AA: Sample Script: Provider-Patient Postpartum Hemorrhage Post-Event Discussion

Oklahoma Perinatal Quality Improvement Collaborative: Birth Hospital Clinical Summary

Amniotic Fluid Embolism Foundation: Survivor Clinical Summary Form

References

1. Health Resources & Services Administration. (n.d.). Alliance for innovation on maternal health (AIM) capacity. Retrieved November 10, 2023, from https://www.hrsa.gov/grants/find-funding/HRSA-23-066

2. American College of Obstetricians & Gynecologists. (n.d.). AIM patient safety bundles. Retrieved November 10, 2023, from https://saferbirth.org/patient-safety-bundles/

3. Main, E. K., Goffman, D., Scavone, B. M., Low, L. K., Bingham, D., Fontaine, P. L., Gorlin, J. B., Lagrew, D. C., & Levy, B. S. (2015). National partnership for maternal safety: Consensus bundle on obstetric hemorrhage. *Anesthesia & Analgesia, 121*(1),142-148. https://doi.org/10.1097/AOG.0000000000000869

4. Hussain, S. A., Guarini, C. B., Blosser, C., & Poole, A. T. (2019). Obstetric hemorrhage outcomes by intrapartum risk stratification at a single tertiary care center. *Cureus, 11*(12), e6456. https://doi.org/10.7759/cureus.6456

5. Lagrew, D., McNulty, J., Sakowski, C., Cape, V., McCormick, E., & Morton, C. H. (2022). Improving health care response to obstetric hemorrhage, a California maternal quality care collaborative toolkit. https://www.cmqcc.org/resources-tool-kits/toolkits/ob-hemorrhage-toolkit

6. January, E. C. (2023). OB hemorrhage part 1: QBL terms and techniques. [PowerPoint Presentation]. https://web.mhanet.com/wp-content/uploads/2021/03/MHA-OB-Hemorrhage-Part-1-QBL-Terms-and-Techniques-v2.pdf

7. van Steijn, M. E., Scheepstra, K. W. F., Zaat, T. R., van Rooijen, D. E., Stramrood, C. A. I., Dijksman, L. M., Valkenburg-van den Berg, A. W., Wiltenburg, W., van der Post, J. A. M., Olff, M., & van Pampus, M. G. (2021). Severe postpartum hemorrhage increases risk of posttraumatic stress disorder: A prospective cohort study. *Journal of Psychosomatic Obstetrics and Gynecology, 42*(4), 335-345. https://doi.org/10.1080/0167482X.2020.1735343

8. The Joint Commission. (2019). Provision of care, treatment, and services for maternal safety. *R^3 Report, 24*, 1-6. https://www.jointcommission.org/-/media/tjc/documents/standards/r3-reports/r3-issue-24-maternal-12-7-2021.pdf

9. American College of Obstetricians and Gynecologists. (2022). Alliance for innovation on maternal health: Obstetric hemorrhage patient safety bundle. https://saferbirth.org/wp-content/uploads/U2-FINAL_AIM_Bundle_ObstetricHemorrhage.pdf

10. Missouri Department of Health and Senior Servies. (2023). Missouri Pregnancy Associated Mortality Review 2018-2020 Annual Report. Retrieved from https://health.mo.gov/data/pamr/pdf/2020-annual-report.pdf

11. Hoyert, D. L. (2023). Maternal mortality rates in the United States, 2021. National Center for Health Statistics Health E-Stats. https://www.cdc.gov/nchs/data/hestat/maternal-mortality/2021/maternal-mortality-rates-2021.htm#ref1

12. Hospital Industry Data Institute. (2023). Severe maternal morbidity and mortality monitoring and trends [PowerPoint Presentation].

13. Adams, K. M., & Meadows, A. (2022). Obstetric hemorrhage change package. https://saferbirth.org/wp-content/uploads/Hemorrhage-Change-Package-FINAL-VERSION-3.30.23-002.pdf

14. Berg, C. J., Harper, M. A., Atkinson, S. M., Bell, E. A., Brown, H. L., Hage, M. L., Mitra, A. G., Moise Jr., K. J., & Callaghan, W. M. (2005). Preventability of pregnancy-related deaths: Results of a state-wide review. *Obstetrics & Gynecology, 106*(6), 1228-1234. https://doi.org/10.1097/01.AOG.0000187894.71913.e8

15. Della Torre, M., Kilpatrick, S. J., Hibbard, J. U., Simonson, L., Scott, S., Koch, A., Schy, D., & Geller, S. E. (2011). Assessing preventability for obstetric hemorrhage. *American Journal of Perinatology, 28*(10), 753-760. https://doi.org/10.1055/s-0031-1280856

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