Institute for Healthcare Improvement

AIM
ALLIANCE FOR INNOVATION ON MATERNAL HEALTH

Obstetric Hemorrhage Change Package

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Acknowledgments

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Introduction

The Alliance for Innovation on Maternal Health (AIM) is a national data-driven patient safety and quality improvement (QI) initiative. AIM works through state and jurisdiction-based teams to align national, state, jurisdiction, and hospital level QI efforts to reduce preventable maternal mortality and severe maternal morbidity across the United States.

The AIM Patient Safety Bundles are a core part of this work. To promote the successful implementation of these bundles, AIM partnered with the Institute for Healthcare Improvement (IHI) to create a series of associated change packages. This specific change package is designed to support Perinatal Quality Collaboratives (PQCs) and other state- and jurisdiction-based initiatives to leverage the AIM Obstetric Hemorrhage Patient Safety Bundle more effectively.

Why is this important?

The US remains in a maternal mortality crisis. According to a 2022 report by the National Center for Health Statistics, the maternal mortality rate in 2020 was 23.8 deaths per 100,000 live births. When disaggregated by race, the rate of maternal death for non-Hispanic Black people (55.3 deaths for 100,000 live births) was 2.9 times the rate for non-Hispanic White people (19.1 deaths per 100,000) and 3 times that of Hispanic people (18.2 people per 100,000 live births).[1] Maternal death represents a tragic sentinel event with near miss morbidity events growing in number as well. Severe maternal morbidity (SMM) poses great risk to maternal health and provides a greater opportunity to intervene.

Postpartum hemorrhage is a leading cause of preventable, pregnancy-related illness and death with an estimated 54-90% of all OB Hemorrhage related deaths being preventable.[2,3] The aim of this change package is to aid teams implementing the AIM Obstetric Hemorrgage Patient Safety Bundle by preparing them to recognize and respond to hemorrhage at all stages of care, and laying the foundation for respectful, equitable, and supportive care for all.

What is a change package?

A change package is a document listing evidence-based or best practice changes specific to a topic and is usually organized around a framework or model. In this case, the Obstetric Hemorrhage Change Package is structured around the AIM Obstetric Hemorrhage Patient Safety Bundle.[4]

Changes packages, including this one, are structured around the following components:

- **Primary Drivers**: Major processes, operating rules, or structures that will contribute to moving toward the aim. In this change package, the primary drivers are based on AIM's Five Rs Framework (Readiness, Recognition & Prevention, Response, Reporting/Systems Learning, and Respectful Care).
- **Change Concepts:** Broad concepts (e.g., move steps in the process closer together) that are not yet specific enough to be actionable but that will be used to generate specific ideas for change.
- **Change Ideas**: Actionable, specific idea for changing a process. Change ideas can come from research, best practices, or from other organizations that have recognized a problem and have demonstrated improvement on a specific issue related to that problem.

Taken as a whole, a change package has the potential to seem overwhelming. Based on the priorities of your state and community, we encourage you to start small by testing a couple of ideas connected to the aim you set. Through iterative tests of change (also known as Plan-Do-Study-Act (PDSA) cycles), you will have an opportunity to learn what works and what does not in your efforts to improve your processes. Initially, these cycles are carried out on a small scale (e.g., one patient on one day) to see if they result in improvement. Teams can then expand the tests and gradually incorporate larger and larger samples until they are confident that the changes will result in sustained improvement.

How to prioritize changes?

No team is expected to test all the listed change ideas. Consider this a menu of options from which you may choose what to tackle first. Each team will review their baseline data, progress to date, organizational priorities, and select an area(s) to prioritize. For example, some may start with one driver. Others may start by tackling one idea across all drivers. Start by choosing an area that you think could lead to an easy win.

You can also leverage the following tools to help you decide where to start:

1. Pareto chart: A type of bar chart in which the various factors that contribute to an overall effect are arranged in order according to the magnitude of their effect. This ordering helps identify the "vital few" — the factors that warrant the most attention.[5]
2. Priority matrix: A tool that can better help you to understand important relationships between two groupings (i.e., steps in a process and departments that conduct that step) and make decisions on where to focus.[6]
3. Impact-effort matrix: A tool that helps identify which ideas seem easiest to achieve (least effort) with the most effects (highest impact). The ideas identified via this tool, would be a great place to start.[7]

The IHI QI Workbook: Better Maternal Outcomes: Reducing Harm from Obstetric Hemorrhage, is another great tool to use as you begin this work, containing relevant descriptions, examples, and templates for quality improvement (QI) tools.[8]

Change Package

A Note on Symbols

Respectful, Equitable, and Supportive Care

In the latest revision of the AIM Obstetric Hemorrhage Patient Safety Bundle, a fifth R was added; Respectful, Equitable, and Supportive Care. This R is integrated throughout the change package, and all change ideas that fall under this R are marked with a ◊ symbol.

Additional Considerations

It is understood that every team utilizing this change package will be at a different point in this work. If your organization is further along in your obstetric hemorrhage improvement work and has found reliability in some of the change ideas below, we suggest testing the additional considerations in *italics* and marked by the * symbol.

Readiness

Every Unit/Team

Change Concept	Change Idea	Key Resources and Tools
1. Develop processes for the management of patients with obstetric (OB) 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	Create OB response team with specified roles and responsibilities	Preparing for Clinical Emergencies in Obstetrics and Gynecology, ACOG CO #590 [9] AHRQ TeamSTEPPS Rapid Response Systems Module[10]
	Establish a known phrase (appearing on overhead page or in digital alerts) for hemorrhage emergencies so all disciplines develop situational awareness	
A standardized, facility-wide, stage-based, obstetric hemorrhage emergency management plan with checklists and escalation policy	Develop clear emergency hemorrhage protocol that includes stage-based algorithm and systems of escalation	CMQCC Obstetric Hemorrhage Toolkit V3.0 Appendix C and D (p194-195)[11]
Emergency release and massive transfusion protocols to ensure immediate access to blood products	Create emergency release and massive transfusion protocols *Include communication between OB and blood bank and recommendations for type & screen and type & cross**	CMQCC Obstetric Hemorrhage Toolkit V3.0 Appendix S and T (p235-243)[11]
	Develop blood availability dashboard and protocols specific to shortages with clarity about decision-maker *Identify lead staffer in blood bank to update dashboard (if not automated)**	Blood Bank: Massive Transfusion Protocol (ACOG)[12]
	Document communication from outpatient OB visits about red cell alloantibodies/any abnormalities and expected delivery dates	

	Order blood products to be prepared for high-risk patients as described in stage-based algorithm *Type & screen all patients if feasible in setting**	[How we treat: transfusion medicine support of obstetric services](#)[13] [Obstetric Hemorrhage Checklist (ACOG)](#)[14]
	Establish and maintain site visits between blood bank and OB to gain clarity on respective systems and how to improve use of protocol	
	Establish and maintain OB representation on Transfusion Committee with feedback loop to OB department	
A protocol, including education and consent practices, to collaborate with patients who decline blood products, but may accept alternative approaches	Develop or adapt protocol for declination of blood products and have clear documentation in patient record *For those who decline blood products and have an elevated risk for hemorrhage, arrange for intraoperative cell salvage set-up**	[Guidance Document: Patients Who Decline Blood Products](#)[15] [CMQCC Obstetric Hemorrhage Toolkit V3.0 (p 64-68)](#)[11] [Refusal of Medically Recommended Treatment During Pregnancy, ACOG CO #664](#)[16]
Review policies to identify and address organizational root causes of racial and ethnic disparities in outcomes related to the diagnosis, management, and surveillance of OB hemorrhage ◊	Identify lead staffer for this process and utilize race, ethnicity, and language (REAL) data in prioritization of improvement efforts *Incorporate question about bias into case review** *Incorporate respectful care questions into Team Debrief Tool** *Use patient-reported experience measures (PREMs)** *Create bias reporting system**	[New York City Standards for Respectful Care at Birth](#)[17]
2. Maintain a hemorrhage cart or equivalent with supplies, checklists, and instruction cards	Create supply list for cart with multidisciplinary input *Update supply list annually**	[CMQCC Obstetric Hemorrhage Toolkit V3.0, Hemorrhage Cart Checklist (p 252 - 253)](#)[11]

for devices or procedures where antepartum, laboring, and postpartum patients are located		Development of an Obstetric Hemorrhage Response Intervention: The Postpartum Hemorrhage Cart and Medication Kit[18]
	Place carts in all relevant care areas where unplanned birth could occur (e.g., antepartum, labor & delivery, emergency department operating room, postpartum unit) *Adapt to setting with plan to rotate/update materials (could be a single cart in small rural setting)**	
	Have reliable and regular restocking system for both after use and to keep materials up to date *Can mirror restocking process to code cart processes** *Consider restocking as a step after debriefing**	
	Include materials like uterine devices (e.g., Bakri balloon tamponade, Jada uterine vacuum), uterine compression sutures, and quick reference diagrams of the B-lynch procedure technique	Uterine balloon tamponade for the treatment of postpartum hemorrhage: a systematic review and meta-analysis[19] B-Lynch Compression Suture as an Alternative to Peripartum Hysterectomy[20] Florida Obstetric Hemorrhage Initiative Tool Kit (p 22)[21]
3. Ensure immediate access to first- and second-line hemorrhage medications in a kit or equivalent per the unit's obstetric	Localize all key uterotonics and other medications (oxytocin, methylergonovine, hemabate, misoprostol, tranexamic acid, fibrinogen concentrate) together in proximity to labor & delivery, operating room, and emergency departments and ensure appropriate storage *The meds often together are:**	Florida Obstetric Hemorrhage Initiative Tool Kit, Table 4 (p 18)[21]

hemorrhage emergency management plan	*Misoprostol, five 200 mcg tablets* *Oxytocin, 10 to 40 units per 500 to 1000 mL NS 1 bag* *Methylergonovine, 0.2 mg/mL 1 ampule (requires refrigeration)* *Carboprost, 250 mcg/mL 1 ampule (requires refrigeration)* *Include med administration tip sheets (like for fibrinogen)**	
	Have order sets for hemorrhage medications in electronic health record (EHR)	
4. Conduct interprofessional and interdepartmental team-based drills with timely debriefs that include the use of simulated patients	Have drills for use of cart and obtaining medications with use of stage-based algorithm and activation of rapid-response team	[Readiness: Utilizing bundles and simulation](#)[22] [Obstetric Emergency Drills Trainer's Manual](#)[23]
	Have drills for measurement of QBL and use of blood bank dashboard	
	Ensure that simulations include varied forms of patient expression and include processing with patient ◊ *Vary patient race/language/ethnicity in simulations**	
	Ensure that regular drills and simulations are held on all shifts for all OB staff and providers (including anesthesia, blood bank, and support departments) and test all parts of system *Hold drills and simulations at least quarterly, can strive for monthly**	[Simulation: Emergencies in Clinical Obstetrics	ACOG](#)[24] [Video: Quantification of Blood Loss	AWHONN](#)[25]

Recognition and Prevention

Every Patient

Change Concept	Change Idea	Key Resources and Tools
1. 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 & delivery, during the peripartum period, and on transition to postpartum care	Conduct formal assessment for hemorrhage risk at multiple points in prenatal, delivery, and postpartum care and document in EHR with associated alerts	National Partnership for Maternal Safety: consensus bundle on obstetric hemorrhage[26] Obstetric Hemorrhage Outcomes by Intrapartum Risk Stratification at a Single Tertiary Care Center[27]
	Conduct formal assessment for anemia and use anemia protocol *Include iron diffusion logistics for iron deficiency anemia**	CMQCC Obstetric Hemorrhage Toolkit V3.0 (p 41-50)[11]
	Match risk level to intended delivery hospital level *Transfer to a tertiary care center for suspicion of abnormal placentation**	Levels of Maternal Care | AGOC[28]
	Review and document risk during huddles, shift changes, and at times of transfer then note level of risk on census board *Consider color-coding on census board (red, yellow, green) for easy identification**	
	Discuss risk assessment and its implications with patient and family ◊ Include birth trauma history in risk assessment *Consider patient symptoms and concerns voiced as potential serious precursors to hemorrhage event**	City Birth Trauma Scale | City, University of London[18]
	Include "equity pause" to look at bias risk within multidisciplinary care planning and to ask, "What are considerations to ensure respectful care without discrimination?" ◊	

	Please note, an equity pause is an emerging idea being tested in different fields. If you are interested in trying it, start small and consider testing on admission, during shift change, or at transfer to postpartum. It mirrors an operating room time out to prevent harm.	
	Have anesthesia consult (depending on setting) for high-risk patients (antepartum if high risk determination is antepartum) ◊ *May need to first establish an anesthesia consult protocol**	
	Screen and treat for anemia antenatally and implement a protocol for IV iron therapy in those with moderate to severe iron deficiency anemia	[Recommendations to prevent and control iron deficiency in the United States | CDC](#)[29] [Anemia in Pregnancy: ACOG Practice Bulletin, Number 233](#)[30] [Global nutrition targets 2025: policy brief series | WHO](#)[31] [Anemia | WHO](#)[32]
	Discuss option of epidural analgesia with high-risk patients ◊	
2. Measure and communicate cumulative blood loss to all team members, using quantitative approaches	Perform quantifiable blood loss (QBL) as part of patient assessment in and across care settings (adapted to capability of hospital): emergency department, operating room, labor & delivery, postpartum, intensive care unit *Assign QBL lead**	[Quantification of Blood Loss: AWHONN Practice Brief Number 13](#)[33]
	Pair specific QBL total with stage-based algorithms (including on postpartum unit with triggering of rapid-response team when threshold is met)	
	Calculate and provide real-time QBL updates to team	

	Have specific method for calculating volume of amniotic and irrigation fluids	CMQCC Obstetric Hemorrhage Toolkit V3.0 Appendix M (p226-232)[11]
	Make sure scales are available in appropriate rooms with tared weights of pads and drapes	
	Use calculation tools and have laminated listed dry weights on cart or use apps with similar information	
	Use QBL alerts in EHR *Include estimated blood loss data if delivery occurred in transit**	
	Continue QBL in recovery phase to assess for active on-going blood loss	
3. Actively manage the third stage of labor per department-wide protocols	Establish, disseminate, and verify use of a protocol to actively manage third stage of labor	Active versus expectant management for women in the third stage of labor[34] WHO recommendations for the prevention and treatment of postpartum hemorrhage[35] Guidelines for Active Management of the Third Stage of Labor using Oxytocin: AWHONN Practice Brief Number 12[36]
4. Provide ongoing education to all patients on obstetric hemorrhage risk and causes, early warning signs, and risk for postpartum complications		

Response

Every Event

Change Concept	Change Idea	Key Resources and Tools
1. Utilize a standardized, facility-wide, stage-based, 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, etc.)	Designate a patient and identified support network liaison to provide updates in real-time and include these communications on emergency checklist ◊	Florida Obstetric Hemorrhage Initiative Tool Kit (p 33)[21] Preparing for Clinical Emergencies in Obstetrics and Gynecology, ACOG CO #590 [9]
	Perform multi-disciplinary debriefing at the following timepoints: • After resolution of an acute hemorrhage • At the time of transfer to reassess hemorrhage risk and to convey risk to the postpartum team	Obstetric Team Debriefing Form	ACOG[37]
Evaluate patients for etiology of hemorrhage		
Use of obstetric rapid response team		
Evidence-based medication administration or use of nonpharmacological interventions	Communicate directly with patient about clinical concerns and planned management, prior to performing any physical interventions such as bimanual pelvic exam, tamponade placement, or speculum exam ◊	The SHARE Approach	AHRQ[38] Partnering in healthcare: A framework for better care and outcomes[39]
	Include patient-reported pain in assessment and have clear plans for pain management	

	Increase staff awareness of atypical pain that may represent concealed bleeding*	
	Using respectful care training, respond in real time to staff and providers' cultural assumptions about pain, which can show up as positive bias and negative bias ◊ *Increase reliable use of standardized pain assessment tool to mitigate bias**	
	Ensure that qualified interpreters are being used with patients and identified support network who need them ◊ *Do not rely on family to do interpretation** *Recognize that a patient's language needs may change in midst of crisis**	
	Following transfer, continue to monitor patient with emergency management checklist	
2. 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	Have clear mechanism with a designated provider to ensure all family support processes are completed following hemorrhage	[National Partnership for Maternal Safety: Consensus Bundle on Support After a Severe Maternal Event](#)[26] [CMQCC Obstetric Hemorrhage Toolkit V3.0 Appendix W](#)[11]
	Provide written summary of events following hemorrhage to patient and family ◊ *If patient is in intensive care unit (ICU), provide ICU diaries to family to be able to share with patient later**	
	Ensure processes to support infant feeding preferences following hemorrhage	

	*Ensure breast pump is accessible and lactation support available**	
	Begin trauma care in postpartum setting with conversation and referral to trauma specialist ◊	
	Screen for maternal depression and PTSD and depression following trauma *Use PREMs survey**	Birth Place Lab website[40] Edinburgh Postnatal Depression Scale[41]
	Ensure that patient can talk with a provider who was at the event ◊ *Increase understanding that the above change idea is in support of patient and provider**	
	Ensure private space for family meetings ◊	
	Have protocol for patients experiencing infant loss *Hand sign on door indicating infant loss** *Move patient out of L&D and avoid postpartum unit**	
	Understand if family has any equity concerns about care given and screen for equitable care with scales (Mother's Autonomy in Decision Making (MADM), Mothers on Respect Index (MORI)) after each delivery ◊	The Mother's Autonomy in Decision Making (MADM) scale[42] The Mothers on Respect (MOR) index[43]

Reporting and Systems Learning

Every Unit

Change Concept	Change Idea	Key Resources and Tools
1. 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.	Conduct huddles in conjunction with stage-based algorithm to be responsive to evolving clinical scenarios *Include patients and families in bedside huddles if they want to participate*◊*	
	Have immediate post-event debrief (with equity lens) for support and learning *Establish standardized briefing documentation to capture successes and actionable follow-up**	[Severe Maternal Morbidity Review Form | AIM](#)[44]
	Have more formal after-action review with designated leader and standardized content *Reflect on the equity in case as part of review**	
	Archive debriefing documentation for OB hemorrhage events and review systematically with unit-specific and QI leadership teams *Establish unit-specific and QI leadership teams to review and address quality and safety issues**	
	Have health equity rounds (like department grand rounds) led by someone with appropriate experience *Start with at least quarterly equity rounds**	
2. Perform multidisciplinary reviews of serious complications per established facility criteria to identify systems issues.	Have formal review following serious hemorrhage to assess alignment with standard policies and procedures (with appropriate updates) and to identify opportunities for improvement (including identification of discriminatory practices)	[Severe Maternal Morbidity Review Form | AIM](#)[44]

	Include REAL data to identify potential bias and need for systemic changes* *Use reporting pathways to communicate and document consistent issues**	
	Establish, review, and update as needed facility criteria and processes for review of serious hemorrhages	
	Include execution of QBL in review	
3. 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	Identify key processes and outcomes for quality improvement data collection *Include staff training metrics among run charts** *Align quality improvement data collection with a perinatal quality collaborative**	
	Collaborate with health information technology (HIT) or appropriate staff to modify EHR and automate data collection and reporting	
	Set specific goals for closing identified disparities using the SMARTIE format (strategic, measurable, ambitious, realistic, time-bound, inclusive, and equitable)	
	Collect and analyze REAL data *Have staff training on importance of REAL data and respectful collection** *Assess quality of REAL data and develop processes for improved data collection**	
	Review all process and outcome data disaggregated by REAL to assess for disparities with unit-specific and QI leadership teams	

	*Identify alternative strategies to integrate equity considerations into reporting and systems learning in settings where use of disaggregated data may cause potential patient identifiability or unstable data**	
4. 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	Include race/ethnicity data in the analysis of OB hemorrhage morbidity review and debriefing documentation to identify potential bias and need for systemic changes or staff education *Educate staff on metrics used in run charts for quality improvement**	
	Establish and maintain health equity rounds (like department grand rounds) led by someone with appropriate experience *Start with quarterly equity rounds**	
	Develop run charts and reports for staff with both outcome and process measures *Include REAL data in reports and run charts**	
	Disaggregate data to inform content of health equity and clinical rounds and other staff education opportunities *Start with quarterly rounds** *Share data during rounds and staff education opportunities**	

Respectful, Equitable, and Supportive Care

Every Unit, Provider, and Team Member

Change Concept	Change Idea	Key Resources and Tools
1. Include each patient that experienced an obstetric hemorrhage and their identified support network as respected members of and contributors to the multidisciplinary care team and as participants in patient-centered huddles and debriefs	Schedule time for a formal debrief including the patient and family prior to discharge ◊ *Incorporate perspectives of patients and people with lived experience into reviews in a trauma-informed and equitable manner*◊	[Achieving Health Equity: A Guide for Health Care Organizations](#)[45]
2. 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.	Provide communication in the patient's preferred language and support access to interpretation services; provide educational materials for patients in common languages spoken in your community ◊	[National Standards for Culturally and Linguistically Appropriate Services (CLAS) in Health and Health Care](#)[46]
	Educate clinicians on providing respectful care by engaging in the life-long learning of cultural humility, understanding that individuals cannot learn all aspects of any culture, including their own ◊	[AWHONN Respectful Maternity Care Implementation Toolkit](#)[47] [ACOG Respectful Care eModules](#)[48] [The Cycle to Respectful Care: A Qualitative Approach to the Creation of an Actionable Framework to Address Maternal Outcome Disparities](#)[59]

Appendix

1. Maternal Mortality Rates in the United States, 2020. Published February 22, 2022. Accessed May 2, 2022. https://www.cdc.gov/nchs/data/hestat/maternal-mortality/2020/maternal-mortality-rates-2020.htm

2. Berg CJ, Harper MA, Atkinson SM, et al. Preventability of pregnancy-related deaths: results of a state-wide review. *Obstetrics & Gynecology*. 2005;106(6):1228-1234. doi:10.1097/01.AOG.0000187894.71913.e8

3. Della Torre M, Kilpatrick SJ, Hibbard JU, et al. Assessing preventability for obstetric hemorrhage. *American Journal of Perinatology.* 2011;28(10):753-760. doi:10.1055/s-0031-1280856

4. Obstetric Hemorrhage AIM Patient Safety Bundle | AIM Program (Previously Council on Patient Safety). Accessed April 13, 2022. https://saferbirth.org/psbs/obstetric-hemorrhage/

5. Pareto Chart | IHI - Institute for Healthcare Improvement. Accessed April 13, 2022. https://www.ihi.org/resources/tools/pareto-chart

6. Priority Matrix: An Overlooked Gardening Tool | IHI - Institute for Healthcare Improvement. Accessed April 13, 2022. https://www.youtube.com/watch?v=PtEMrYVGGgI

7. Impact Effort Matrix | ASQ. Accessed April 13, 2022. https://asq.org/quality-resources/impact-effort-matrix

8. Better Maternal Outcomes Quality Improvement Workbooks | IHI - Institute for Healthcare Improvement. Accessed April 21, 2022. https://www.ihi.org/resources/tools/better-maternal-outcomes-quality-improvement-workbooks

9. Preparing for clinical emergencies in obstetrics and gynecology. Committee Opinion No. 590. *American College of Obstetricians and Gynecologists*. Published online 2014.

10. TeamSTEPPS: Rapid Response Systems. Published online March 2019. https://www.ahrq.gov/teamstepps/rrs/index.html

11. Lagrew D, J NcNulty, Sakowski C, Cape V, McCormick E, Morton C. *Improving Health Care Response to Obstetric Hemorrhage, a California Maternal Quality Care Collaborative Toolkit.*; 2022. Accessed April 20, 2022. https://www.cmqcc.org/resources-tool-kits/toolkits/ob-hemorrhage-toolkit

12. Blood Bank: Massive Transfusion Protocol. American College of Obstetricians and Gynecologists. Published online January 2019. https://www.acog.org/-/media/project/acog/acogorg/files/forms/districts/smi-ob-hemorrhage-bundle-poster-massive-transfusion-protocol.pdf

13. Goodnough LT, Daniels K, Wong AE, Viele M, Fontaine MF, Butwick AJ. How we treat: transfusion medicine support of obstetric services. *Transfusion*. 2011;51(12):2540-2548. doi:10.1111/j.1537-2995.2011.03152.x

14. Obstetric Hemorrhage Checklist. American College of Obstetricians and Gynecologists. Published online September 2020. https://www.acog.org/-/media/project/acog/acogorg/files/forms/districts/smi-ob-hemorrhage-bundle-hemorrhage-checklist.pdf

15. Guidance Document: Patients Who Decline Blood Products. American College of Obstetricians and Gynecologists. Published online February 2019. https://www.acog.org/-/media/project/acog/acogorg/files/forms/districts/smi-ob-hemorrhage-bundle-patients-who-decline-blood.pdf

16. Refusal of Medically Recommended Treatment During Pregnancy, Committee Opinion No. 664. American College of Obstetricians and Gynecologists. Published online June 2016. https://www.acog.org/en/clinical/clinical-guidance/committee-opinion/articles/2016/06/refusal-of-medically-recommended-treatment-during-pregnancy

17. New York City Standards for Respectful Care at Birth. https://www1.nyc.gov/assets/doh/downloads/pdf/ms/respectful-care-birth-brochure.pdf

18. Ayers S, Wright D, Thornton A. Development of a Measure of Postpartum PTSD: The City Birth Trauma Scale. *Front Psychiatry*. 2018;9(409). https://blogs.city.ac.uk/citybirthtraumascale/

19. Suarez S, Conde-Agudelo A, Borovac-Pinheiro A, et al. Uterine balloon tamponade for the treatment of postpartum hemorrhage: a systematic review and meta-analysis. *American Journal of Obstetrics and Gynecology*. 2020;222(4):293.e1-293.e52. doi:10.1016/j.ajog.2019.11.1287

20. Balogun-Lynch C, Javaid TA. *B-Lynch Compression Suture as an Alternative to Paripartum Hysterectomy*. IntechOpen; 2015. doi:10.5772/61295

21. Florida Obstetric Hemorrhage Initiative Toolkit: A Quality Improvement Initiative for Obstetric Hemorrhage Management. Published online October 2015. https://health.usf.edu/publichealth/chiles/fpqc/~/media/5EB396812B504B2ABC336812AE82D412.ashx

22. Spiegelman J, Sheen JJ, Goffman D. Readiness: Utilizing bundles and simulation. *Seminars in Perinatology.* 2019;43(1):5-10. doi:10.1053/j.semperi.2018.11.002

23. Obstetric Emergency Drills Trainer's Manual. Maternal Health Task Force. Published June 2, 2016. Accessed May 26, 2022. https://www.mhtf.org/document/obstetric-emergency-drills-training-manual/

24. Emergencies in Clinical Obstetrics. Accessed April 20, 2022. https://www.acog.org/en/education-and-events/simulations/eco

25. AWHONN. *Quantification of Blood Loss.*; 2014. Accessed April 20, 2022. https://www.youtube.com/watch?v=F_ac-aCbEn0

26. Main EK, Goffman D, Scavone BM, et al. National Partnership for Maternal Safety: consensus bundle on obstetric hemorrhage. *Anesthesia and Analgesia.* 2015;121(1):142-148. doi:10.1097/AOG.0000000000000869

27. Hussain SA, Guarini CB, Blosser C, Poole AT. Obstetric Hemorrhage Outcomes by Intrapartum Risk Stratification at a Single Tertiary Care Center. *Cureus.* 2019;11(12):e6456. doi:10.7759/cureus.6456

28. Levels of Maternal Care. American College of Obstetricians and Gynecologists. Accessed April 20, 2022. https://www.acog.org/en/clinical/clinical-guidance/obstetric-care-consensus/articles/2019/08/levels-of-maternal-care

29. Recommendations to prevent and control iron deficiency in the United States. Centers for Disease Control and Prevention. *Morbity and Mortality Weekly Report Recommendations and Report.* 1998;47(RR-3):1-29.

30. American College of Obstetricians and Gynecologists' Committee on Practice Bulletins—Obstetrics. Anemia in Pregnancy: ACOG Practice Bulletin, Number 233. *Obstetrics & Gynecology.* 2021;138(2):e55-e64. doi:10.1097/AOG.0000000000004477

31. Global nutrition targets 2025: policy brief series. Accessed April 20, 2022. https://www.who.int/publications-detail-redirect/WHO-NMH-NHD-14.2

32. Anaemia. World Health Organization. Accessed April 20, 2022. https://www.who.int/health-topics/anaemia

33. Quantification of Blood Loss: AWHONN Practice Brief Number 13. *Journal of Obstetric, Gynecologic, & Neonatal Nursing.* 2021;50(4):503-505. doi:10.1016/j.jogn.2021.04.007

34. Begley CM, Gyte GM, Devane D, McGuire W, Weeks A, Biesty LM. Active versus expectant management for women in the third stage of labour. *The Cochrane Database of Systematic Reviews.* 2019;2:CD007412. doi:10.1002/14651858.CD007412.pub5

35. WHO recommendations for the prevention and treatment of postpartum haemorrhage. World Health Organization, 2012. https://apps.who.int/iris/bitstream/handle/10665/75411/9789241548502_eng.pdf

36. Guidelines for Active Management of the Third Stage of Labor using Oxytocin: AWHONN Practice Brief Number 12. *Journal of Obstetric, Gynecologic, & Neonatal Nursing*. 2021;50(4):499-502. doi:10.1016/j.jogn.2021.04.006

37. Obstetric Team Debriefing Form. Published online March 2019. https://www.acog.org/-/media/project/acog/acogorg/files/forms/districts/smi-ob-hemorrhage-bundle-debriefing-form.pdf

38. The SHARE Approach. Accessed April 21, 2022. https://www.ahrq.gov/health-literacy/professional-training/shared-decision/index.html

39. Horvat L. Partnering in healthcare: A framework for better care and outcomes. Published online 2019. https://www.bettersafercare.vic.gov.au/sites/default/files/2019-02/Partnering%20in%20healthcare%20framework%202019_WEB.pdf#:~:text=Partnering%20in%20healthcare.%20This%20framework%20is%20designed%20for,will%20do%2C%20to%20deliver%20outstanding%20healthcare%20for%20Victorians

40. Birth Place Lab. Published February 1, 2016. Accessed April 20, 2022. https://www.birthplacelab.org/

41. Edinburgh Postnatal Depression Scale (EPDS) Calculator. Accessed April 21, 2022. https://perinatology.com/calculators/Edinburgh%20Depression%20Scale.htm

42. Vedam S, Stoll K, Martin K, et al. The Mother's Autonomy in Decision Making (MADM) scale: Patient-led development and psychometric testing of a new instrument to evaluate experience of maternity care. *PLOS ONE*. 2017;12(2):e0171804. doi:10.1371/journal.pone.0171804

43. Vedam S, Stoll K, Rubashkin N, et al. The Mothers on Respect (MOR) index: measuring quality, safety, and human rights in childbirth. *SSM - Population Health*. 2017;3:201-210. doi:10.1016/j.ssmph.2017.01.005

44. Severe Maternal Morbidity Review Form | Alliance for Innovation on Matenrnal Health. Accessed August 22, 2024. https://saferbirth.org/wp-content/uploads/AIM_SMM_Review_Form.pdf

45. *Achieving Health Equity: A Guide for Health Care Organizations.* Institute for Healthcare Improvement. Accessed May 26, 2022. https://www.ihi.org/resources/white-papers/achieving-health-equity-guide-health-care-organizations

46. National Culturally and Linguistically Appropriate Services (CLAS) Standards. Think Cultural Health. US Department of Health & Human Services. Accessed April 20, 2022. https://thinkculturalhealth.hhs.gov/

47. Respectful Maternity Care Implementation Toolkit. Association of Women's Health, Obstetric and Neonatal Nurses. Accessed April 20, 2022. https://www.awhonn.org/respectful-maternity-care-implementation-toolkit/

48. Respectful Care eModules. American College of Obstetricians and Gynecologists. Accessed April 20, 2022. https://www.acog.org/en/education-and-events/emodules/respectful-care

49. Green CL, Perez SL, Walker A, et al. The cycle to respectful care: a qualitative approach to the creation of an actionable framework to address maternal outcome disparities. International Journal of Environmental Research and Public Health. 2021;18(9):4933. doi:10.3390/ijerph18094933