AIM

ALLIANCE FOR INNOVATION ON MATERNAL HEALTH

Obstetric Emergency Readiness Resource Kit

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Introduction

The number of hospitals providing obstetric services has declined in the United States since 2014. Closures of labor and delivery units have disproportionately affected rural communities with majority Black and low-income residents.[1] More than 2.2 million people can become pregnant in 1,119 counties across the United States that do not have birth centers, hospitals with obstetric services, or obstetric care professionals.[2]

Maternal mortality is rising in the United States with higher pregnancy-related mortality ratios in rural counties than urban counties.[3] Racial and ethnic disparities in maternal mortality rates persist, as well. Rates of maternal mortality are significantly higher for non-Hispanic Black people than non-Hispanic white and Hispanic people,[4] and the rate of pregnancy-related mortality among non-Hispanic American Indian and Alaska Native people is twice that of non-Hispanic white people.[3] Recent data show pregnancy-related mortality ratios among non-Hispanic Native Hawaiian and Other Pacific Islanders are the highest among all racial and ethnic groups in the United States.[3]

Improving access to high-quality health care is critical to addressing the leading causes of preventable severe maternal morbidity (SMM) and mortality in the United States. **The Alliance for Innovation on Maternal Health (AIM)** at the **American College of Obstetricians and Gynecologists (ACOG)**, which is funded through a cooperative agreement with the Health Resources Services Administration, developed this Obstetric Emergency Readiness Resource kit in response to this need.

The AIM Obstetric Emergency Readiness Resource Kit contains best practices, resources, and planning materials that can be used by teams in healthcare settings where obstetric services are not typically provided to appropriately prepare to care for pregnant and postpartum people experiencing obstetric emergencies.

Resource Kit Information

Resource Kit Scope and Highlights

- This resource kit is not intended to be a response manual but rather provides background and resources for review, planning, prioritization, and adaptation to unique needs and clinical settings to support readiness efforts in advance of an obstetric emergency.
- This resource kit may particularly benefit Family Medicine and Emergency Medicine clinicians, nursing administrators, and other leaders in clinical settings that may not routinely encounter an obstetric emergency.
- Because high quality care is not possible without equitable care, centering equity in quality improvement and implementation of elements of this resource kit is crucial to address inequities that lead to disparities in health outcomes.

Why a resource kit?

To support best practices that make birth safer, AIM and ACOG encourage hospitals providing all levels of care to obstetric patients to develop rapid pregnancy response teams; use standardized communication tools among teams; regularly implement emergency drills and simulations; and ensure that emergency supplies are available and accessible.[5] This resource kit is a collection of best practices to aid in the development of systems and processes to appropriately triage and care for people experiencing obstetric emergencies in Emergency Departments (EDs) and hospitals with limited access to specialist care providers.

Who should use this resource kit?

The resource kit is best used by healthcare professionals, project managers, quality improvement professionals, and hospital leadership charged with preparing to respond to emergencies that may cause or contribute to maternal mortality and SMM. This resource kit may particularly benefit Family Medicine practitioners, Emergency Medicine staff, nursing administrators, and other leaders at small rural hospitals that may rarely encounter an obstetric emergency.

This resource kit may be implemented by a facility-based or regionalized interdisciplinary team that includes clinicians, administrators, quality professionals, and ancillary and supporting staff. Individuals may use the resource kit for professional development and to prepare themselves to be champions for obstetric emergency readiness in their own care settings.

How was this resource kit prepared?

AIM convened a multidisciplinary subject matter expert working group to identify high level recommendations for facilities to prepare for obstetric emergencies. AIM collated resources and information into sections, identifying specific best practices that parallel the AIM patient safety bundle (PSB) format of Readiness, Recognition and Prevention, Response, Reporting and Systems Learning, and Respectful Care. Finally, the multidisciplinary expert workgroup and other experts in obstetric care, emergency medicine, and quality improvement reviewed the resource kit for content and further refinements. **The Acknowledgements Section** contains the names of those involved in the development of the resource kit.

Resource Kit Keys

Use

Information presented in sections of this resource kit can be used in their entirety or as standalone sections for specific quality improvement endeavors. Each section provides information and resources to build systems and structures to deliver evidence-based care. The resource kit also shares examples of protocols, checklists, and policies to improve standardization of procedures and communication, which may reduce patient harm. All resource kit components are descriptive rather than prescriptive to allow for local customization and appropriate clinical judgment in implementation.

This resource kit is not intended to be a response manual but rather provides background and resources to teams for review, planning, prioritization, and adaptation to their needs and specific clinical settings in advance of an obstetric emergency.

Equity

Respectful, equitable, and supportive care concepts are integrated throughout each section of this resource kit as well as explicitly in the **Respectful Care Section**. Because high quality care is not possible without equitable care, centering equity in quality improvement is crucial to address inequities that lead to disparities in health outcomes. Users are encouraged to prioritize health equity, antiracism, and patient lived experience in each step of work undertaken in implementing elements of this resource kit.

Pregnancy Screening

Because recognition of pregnancy status is critical to identifying patients most at risk for SMM and mortality, a frequent recommendation throughout the resource kit and other **AIM resources** is screening for current or recent pregnancy within 12 months.

Variations in laws and restrictions related to reproductive health in the United States by state and jurisdiction may lead to complexity and challenges around this recommendation. While further detailed in the **Recognition Section** of the resource kit, the intention of screening is to contextualize presenting patient symptoms.

Those implementing standardized verbal screening for current or recent pregnancy should note:

- There is no evidence supporting the performance of routine hCG biological pregnancy testing in ED settings outside of clinical indication.
- Timing, not outcome or resolution of a pregnancy, is the impetus behind this verbal screening recommendation. Eliciting details on the outcome of a pregnancy is not required to meet this recommendation.
- As with all potentially sensitive topics, the utmost care should be taken to provide patient privacy and confidentiality in both addressing this topic in triage and care, as well as in documentation of responses.
- Clinicians should remain aware of all state and local laws related to reproductive care and reporting that may impact the setting in which they care for patients.

References

[1]U.S. Government Accountability Office. Maternal Health: Availability of Hospital-Based Obstetric Care in Rural Areas. Accessed April 1, 2023. **https://www.gao.gov/products/gao-23-105515**

[2]March of Dimes. Maternity Care Desert. Accessed April 1, 2023. **https://www.marchofdimes.org/peristats/data?top=23**

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[4]Hoyert DL. Maternal mortality rates in the United States, 2020. NCHS Health E-Stats. 2022. doi: **https://dx.doi.org/10.15620/cdc:113967**

[5]Preparing for clinical emergencies in obstetrics and gynecology. Committee Opinion No. 590. American College of Obstetricians and Gynecologists. Obstet Gynecol 2014;123:722-5. **doi: 10.1097/01.AOG.0000444442.04111.c6**

Identify a Rapid Response Team for Obstetric Emergencies

The establishment and early activation of a rapid response team is associated with improved patient outcomes in other disciplines and has potential to improve response to obstetric emergencies in traditionally non-obstetric settings.[1] Rapid response teams may include onsite healthcare professionals and staff to assess and stabilize patients, as well as remote clinical consultants and team members. In-person and remote rapid response team member composition will be based on facility resources, staffing, and level of care. Examples of rapid response team members can be found in **Table 1**.

Table 1. Suggested Members of a Rapid Response Team for Obstetric Emergencies

Facility Type	Suggested Rapid Response Team Members
Facilities Without Obstetric Services	• Physicians - Emergency Medicine - Family Medicine - Pediatricians - General Surgery • Anesthesiology providers • Advanced Practice Providers *(e.g., Physician Associates, Nurse Practitioners)* • Registered Nurses • Surgical staff - Scrub Technician - Surgical First Assistant • Respiratory therapists • Radiology staff - Ultrasonography • Pharmacy staff • Laboratory/Blood bank staff

Table 1. Suggested Members of a Rapid Response Team for Obstetric Emergencies (cont.)

Facility Type	Suggested Rapid Response Team Members
Facilities With Level 1 Obstetric Services	• Physicians - Obstetricians - Emergency Medicine - Family Medicine - Pediatricians - General Surgery • Anesthesiology providers • Advanced Practice Providers *(e.g., Midwives, Physician Associates, Nurse Practitioners)* • Registered Nurses (OB, ED, ICU) • Surgical staff - Scrub Technician - Surgical First Assistant • Respiratory therapists • Radiology staff - Ultrasonography • Pharmacy staff • Laboratory/Blood bank staff

As members of a rapid response team are identified, protocols and procedures for activating the team should be established. All members of the organization should be aware of how and when to activate the team. The Agency for Healthcare Research and Quality (AHRQ) Safety Program for Perinatal Care has additional considerations[2] for criteria for activation of the team that could be adapted to non-obstetric settings and examples of protocols for a rapid response team are included in **Table 2**. All members of a care team—including patients and their support networks—should feel empowered to activate the rapid response team.[3]

Standardized triggers established by Obstetric Warning Systems may be appropriate to adapt and use as criteria for activation of the rapid response team. Examples of Obstetric Warning Systems and implementation resources are available in the **Recognition and Prevention Section** of this resource kit.

Ensure Rapid Access to Needed Medications, Resources, and Equipment

Teams can proactively review needed medications, resources, and equipment commonly used in recognition of and response to obstetric emergencies, identify gaps in resources, and appropriately plan to obtain needed resources. Equipment and medications to treat specific emergency conditions should ideally be readily accessible and gathered in a single location, such as a box or cart, backpack, or obstetric "go bag." Teams should plan needed refrigeration for medications that should be rapidly available during an emergency. Review and restocking of medications and equipment in these centralized locations should occur regularly and be reflected on standardized checklists. Teams may coordinate with their facility's pharmacy to ensure rapid access to first line medications.

The Equipment Checklists in **Appendix A** contains a list of general supplies to consider having available for any obstetric emergency, as well as equipment checklists specific to 4 major conditions that contribute to maternal mortality and severe maternal morbidity (SMM).

Establish Policies, Procedures, and Checklists to Respond to Obstetric Emergencies

The use of policies, procedures, and checklists in care reduces patient harm and improves outcomes by enhancing standardization and communication.[3] Development of these items should be multidisciplinary and collaborative, and teams may review and build on their facility's existing strengths and resources to create and revise protocols and procedures for response to obstetric emergencies.

Facilities should establish policies and procedures for the evaluation of all pregnant and postpartum patients presenting to emergency settings,[2] including locations of care based on gestational age in settings that include obstetric care units. These policies should include guidelines for risk assessment, evaluation of obstetric early warning signs, and communication and coordination with clinicians.[4] More detail on the evaluation of pregnant and postpartum patients in emergency settings can be found in the **Recognition and Prevention Section** of this resource kit.

Other policies and procedures that facilities may develop or review in relation to their available onsite resources include, but are not limited to, processes for implementing obstetric early warning systems (see the **Recognition and Prevention Section** for more detail); development of emergency response plans; and plans for escalation, consultation, and transport (see the **Transport Subsection** for more detail).

Table 2. Suggested Facility-Wide Protocols, Policies, and Procedures

Related AIM Patient Safety Bundle	Suggested Protocol, Policy, or Procedure	Examples
General	Rapid Response Team	• Agency for Healthcare Research and Quality (AHRQ)'s **Rapid Response for Perinatal Safety: Rapid Response Systems** • AHRQ's **Rapid Response for Perinatal Safety: Facilitator Guide** • **The University of Toledo's Child Birth & Maternal Care in the Emergency Department** Example Policy
Obstetric Hemorrhage	Massive Transfusion Protocol	• The American College of Obstetricians and Gynecologists (ACOG) Example **Massive Transfusion Protocol**
Obstetric Hemorrhage	Blood Products and Blood Product Alternatives	• ACOG District II's **Patients Who Decline Blood Products Guidance Document**
Obstetric Hemorrhage	Obstetric Hemorrhage Order Set	• California Maternal Quality Care Collaborative (CMQCC)'s **Obstetric Hemorrhage Sample Order Set Staged** • The University of Toledo's **Child Birth & Maternal Care in the Emergency Department** Example Policy
Obstetric Hemorrhage	Obstetric Hemorrhage Checklists	• The University of Toledo's **Child Birth & Maternal Care in the Emergency Department** Example Policy

Table 2. Suggested Facility-Wide Protocols, Policies, and Procedures (continued)

Related AIM Patient Safety Bundle	Suggested Protocol, Policy, or Procedure	Examples
Severe Hypertension in Pregnancy	Management of Hypertension in Pregnant or Postpartum Patients Checklist	• ACOG District II's Example **Hypertensive Emergency Checklist**
Severe Hypertension in Pregnancy	Hypertension Treatment Algorithm	• Missouri Hospital Association's Example **Maternal Hypertension Protocol: Clinical Algorithm for EDs** • CMQCC's Example **Acute Treatment Algorithm**
Severe Hypertension in Pregnancy	Preeclampsia and Eclampsia Management Algorithms, Protocols, and Checklists	• ACOG District II's **Example Emergency Department Postpartum Preeclampsia Checklist** • ACOG District II's **Example Eclampsia Checklist** • CMQCC's **Suspected Preeclampsia Algorithm** • CMQCC's **Eclampsia Algorithm** • CMQCC's **Sample Management of Eclampsia and Acute-Onset, Severe Hypertension**
Severe Hypertension in Pregnancy	Magnesium Sulfate Administration	• AHRQ's **Safe Medication Administration: Magnesium Sulfate** • CMQCC's **Sample Magnesium Sulfate Administration Protocols**
Cardiac Conditions in Obstetric Care	Cardiovascular Disease Assessment in Pregnant and Postpartum Women	• CMQCC's **Cardiovascular Disease Assessment in Pregnant and Postpartum Women**
Cardiac Conditions in Obstetric Care	Telemetry Monitoring	• ACOG **Practice Bulletin No. 212: Pregnancy and Heart Disease** • **Don't Break Her Heart: Cardiac Telemetry for the Pregnant and Postpartum Patient - ScienceDirect**
Cardiac Conditions in Obstetric Care	Care for Cardiac Patient	• **Cardiovascular Considerations in Caring for Pregnant Patients: A Scientific Statement From the American Heart Association**
Sepsis in Obstetric Care	Sepsis Assessment Tool	• ACOG District II's **Maternal Safety Bundle for Sepsis in Pregnancy** • The UK Sepsis Trust's **Inpatient Maternal Sepsis Tool**

Table 2. Suggested Facility-Wide Protocols, Policies, and Procedures (continued)

Related AIM Patient Safety Bundle	Suggested Protocol, Policy, or Procedure	Examples
Care for Pregnant and Postpartum People with Substance Use Disorder	Universal Verbal Screening for Substance Use Disorder (SUD)	• Washington State Hospital Association's **Universal Screening Document** • Northern New England Perinatal Quality Collaborative's **Screening for substance use during pregnancy using an SBIRT framework**
Care for Pregnant and Postpartum People with Substance Use Disorder	Pain Protocol for Patients with SUD	• **When Patients Become Pregnant: How to Maintain Chronic Pain Management**
Perinatal Mental Health Conditions	Risk Assessment for Suicidal Ideation	• Montana Department of Health and Human Services' **Suicide Prevention Interactive Toolkit** • Intermountain Healthcare's **Suicide Prevention – Risk Assessment Tool**
Perinatal Mental Health Conditions	Perinatal Mental Health Response Protocol	• Massachusetts Child Psychiatry Access Program's **Assessment and Management of Perinatal Mood and Anxiety Disorders**

Train Healthcare Professionals and Staff to Recognize and Respond to Obstetric Emergencies

Training Programs

Patients experiencing obstetric emergencies may present to the nearest facility for evaluation, which may not be able to provide formal obstetric services or be the facility where the patient intends to give birth. All teams should establish and maintain at minimum annually trained rapid response capacity for obstetric emergencies regardless of the facility's formal capacity for obstetric care. Facilities should make available training programs and resources to support appropriate staff recognition of and response to obstetric emergencies. Supportive activities should include routine and appropriate training of all clinical and non-clinical staff who may be involved in responding to obstetric emergencies.

Facilities can offer training and education in several different modalities to foster effective learning. Examples include in-person and remote instruction, synchronous and asynchronous learning, and trainings facilitated by facility staff versus those planned and led by external entities. Facilities may consider leveraging the expertise of perinatal regional centers and other facilities in their own health systems as educational and training resources in a collaborative model.

Examples of current training programs on obstetric emergencies are presented in **Table 3**.

Table 3. Examples of Trainings Addressing Obstetric Emergencies

Training Program	Measure of Instruction	Intended Audience
AWHONN Critical Care Obstetrics Education (CCOE)	Online course	Provider and nursing staff in all settings, including ED, intensive care, and medical/ surgical units
ACOG Emergencies in Clinical Obstetrics (ECO)	Online course followed by live simulation training	All healthcare professionals who may assist with obstetric emergencies
AAFP Basic Life Support in Obstetrics (BLSO)	Live course led by an ALSO Approved Instructor	Obstetric care professionals and staff, including those who may not provide obstetric care on a regular basis (such as ED providers and staff, flight nurses, medical students, residents, and physician associates)
AAFP Advanced Life Support in Obstetrics (ALSO)	Live course led by an ALSO Approved Instructor	Obstetric care professionals and family practice providers
Emergency Medicine Curriculum: Complications of Pregnancy Small Group Module	Curriculum with self-directed learnings, case studies, and simulations	Medical students, Emergency Medicine residents, and physicians

Drills and Simulation Exercises

All facility staff who may care for pregnant and postpartum patients should regularly participate in team-based drills and simulations to maintain preparedness for effective recognition and response to obstetric emergencies. Drills may enhance team communication skills, improve response to medical emergencies, and reduce barriers that limit staff communication and patient care.[1] Key features of effective drills are that they are coordinated, supervised, focus on testing a specific operation or function, and take place in real time.[4] Drills and simulations may be conducted in a variety of settings such as in-situ, a lab environment, or virtually. Each environment offers different strengths. For example, drills conducted in-situ may better identify barriers in the physical environment, while virtual drills may support increased staff participation and completion.

Resource—Obstetric In-Situ Drill Program Manual

Supported by AIM, the OB In-Situ Drill Program Manual is a guide to support best practices in implementing a simulation program. The manual is accompanied by a **simulations preparation checklist,** sample case scenarios, team review and debriefing forms, team-based communication training recommendation, **protocol change form, implementation action plan,** and model explanatory presentations for **staff** and **leadership.**

Resource—Bringing Back OB Sim in the Midst of COVID-19 (webinar recording)

In September 2022, AIM hosted a webinar that discussed the purpose of effectively running obstetric drills and simulations despite COVID-19 restrictions and staff turnover. Information on virtual simulation curriculum for postpartum hemorrhage and hypertension were presented, along with a train-the-trainer curriculum.

When planning for drills and simulations, facilities should consider scenarios that can be executed in low-fidelity settings. As the COVID-19 pandemic underscored, challenges such as disrupted supply chains, staffing shortages, and underdeveloped communications strategies can strain even the best-prepared facilities. Developing and implementing drills and simulations that address obstetric emergencies in a variety of challenging settings can support the development of a resilient and adaptable workforce. Facilities may even explore the creation of reusable and cost-effective simulation models using commonly found items.[4]

A variety of digital platforms and programs exist for virtual simulations. One program is Project Extension for Community Healthcare Outcomes (ECHO), a "collaborative model of medical education and care management that helps clinicians provide expert-level care to patients" regardless of geographic location.[6] ECHO clinics across the United States share best practices through case-based learning, peer-to-peer support, and mentoring opportunities, with potential benefits for improving obstetric care.[7]

Example—Comprehensive Drills and Simulation Guide

The Perinatal Quality Collaborative of Vermont with support from the Vermont Child Health Improvement Program and the University of Vermont Medical Center compiled a resource guide for obstetrical drills and simulation. These include a comprehensive binder of resources with AIM tools integrated throughout, a flip book for postpartum hemorrhage drills, and a flipbook for severe hypertension drills:

- **Resource Binder**
- **Postpartum Hemorrhage Flipbook**
- **Severe Hypertension Flipbook**

Plan for Appropriate Patient Transfer to Higher Levels of Care

Timely patient stabilization and transport is key for effective response to obstetric emergencies, the provision of risk-appropriate care, and ultimately reducing preventable morbidity and mortality.[8] Teams without formal obstetric services should establish appropriate plans and pathways for patient stabilization and transport to higher levels of care.

Develop Care Process Models for Appropriate Care of Pregnant and Postpartum People in Non-Obstetric Care Settings

Teams can work with internal partners, such as EDs and hospital ancillary services, and external partners, such as emergency medical service (EMS) providers, to establish shared guidelines for the triage and transport of obstetric patients.[9] Teams can develop a care process model that provides guidelines to quickly and accurately identify obstetric patients who may benefit from transfer to a higher level of care. Teams may develop additional tools, such as decision trees or process checklists, to operationalize their developed care process models.[10]

As teams develop a care process model, they should consider multiple clinical scenarios that may warrant safe stabilization and transfer, such as whether delivery is imminent and patient medical stability. Once care processes and procedures have been developed and tested, facilities should formalize this information into policy and guidelines.

Example—Management of Pregnant Patients in the Emergency Department

Intermountain Healthcare's Women and Newborns Clinical Program partnered with the Emergency Department Operations team to develop a care process model that provides a systematic approach to assessing and monitoring obstetric patients who present to the Emergency Department.

Determine Logistics and Establish Processes for Transfer

Facilities should develop and maintain awareness of their geographic region's perinatal care capacity and resources to identify and coordinate consultation and transfer pathways to a higher level of care. To support identification of and connection with facilities with higher levels of maternal and newborn care, teams may outreach state- and jurisdiction-based entities such as perinatal quality collaboratives and state departments of health. Examples of projects to support regionalized, risk-appropriate care coordination and transportation that have potential to be applied to other settings can be found in **Table 4**.

Table 4: Providing and Improving Access to Regionalized Risk Appropriate Care in Three Case Studies

Case Study	Brief Description
Case Study: Improving Access and Quality of Maternal and Infant Services in Rural Iowa through a Regional Center of Excellence	A rural hospital in Iowa applied for and received an award to be used toward improving access to and quality of maternal and infant care services with a focus on obstetrical care and deliveries.
Providing Maternity Care in a Rural Northern Iowa Community	A rural hospital in Iowa successfully sustained a maternity care practice and identified opportunities for how other similar facilities could ensure local access to perinatal care.
Members in Action Maternal Case Study: Partnering to Improve Birth Outcomes in a Rural Community	A rural hospital in Kansas partnered with a university to improve pregnancy and birth outcomes and sourced outside funding from grants and local businesses to upgrade software and equipment.

As teams develop relationships with facilities within their region and identify risk-appropriate receiving facilities, teams should establish transfer agreements. These transfer agreements should be proactively established, and teams should consider agreements with alternate receiving facilities in case transfer is not possible to initially identified receiving facilities.

Example—Transfer Agreement Example

This two-page Centers for Medicare & Medicaid Services example document outlines a basic transfer agreement between two facilities. The agreement provides structure to the relationship between two facilities regarding patient transfers, and aims to minimize confusion, ensure continuity of care, and clarify responsibilities. Such agreements should be implemented and then reviewed at mutually agreeable intervals by the signers.

Facilities should determine appropriate transfer routes as they establish transfer agreements with primary and alternative receiving facilities. When planning transfer routes, facilities may consider alternative travel routes in case of inclement weather or unexpected traffic patterns. These alternative routes should be communicated in advance with local transport agencies.

Facilities can develop processes and guidelines for appropriate identification and allocation of resources and personnel to support smooth patient transfers, such as flight-kit planning, identifying or creating obstetric transport staff training requirements and qualifications, and securing maternal transport standing orders in partnership with receiving facilities and EMS.[11] Examples of transport guidelines that may be referenced, adapted, or used are in **Table 5**.

Table 5: Examples of State Perinatal Transport Guidelines

Case Study	Brief Description
Indiana Perinatal Transport Guidelines (reaffirmed 2018)	A presentation that describes the nine standards of the Indiana guidelines.
Tennessee Perinatal Care System Guidelines for Transportation (2020)	A manual providing "specific guidelines regarding procedures, staffing patterns, and equipment for the transport of high-risk mothers and infants" in Tennessee.
Recommended Guidelines for Perinatal Care in Georgia (revised 2013)	A comprehensive resource for providers in Georgia offering suggested parameters, medical criteria, example transport agreements, and more.
Best Practice Recommendations for Handoff Communication During Transport from a Home or Freestanding Birth Center To a Hospital Setting (2014)	A guide developed by the Maine Center for Disease Control and Prevention to "provide a uniform standard to guide communication across settings and professionals caring for women and newborns that are transferred from a home or freestanding birth center to a hospital setting."
Washington State Perinatal and Neonatal Level of Care (LOC) 2018 Guidelines	This reference was developed to support Washington-based facilities' increasing access to appropriate care for pregnant people and newborns and optimizing allocation of resources.
The California Perinatal Transport System: Manual of Definitions	A manual providing standard definitions and decision-making tools for facilities and providers in California.
Transport Services Policy and Procedure Manual (2021)	A manual from Arizona's High Risk Perinatal Program, which includes requirements for providing transport services to Arizona's maternal and infant population.

Establish Remote Care Capabilities and Telehealth Consultation Supports

The rapid expansion of telehealth and telemedicine technologies and supportive policies during the COVID-19 pandemic has increased care delivery options and innovation. Direct patient care via telehealth and remote clinical consultation and referral can allow for detection, management of, response to, or avoidance of obstetric emergencies. With advance planning and preparation, facilities can benefit from implementing strategies for remote care and telehealth.

Telemedicine

Telemedicine is clinical care in support of a patient through technology-supported devices. By connecting with patients directly via audio or video, providers can conduct virtual assessments of pregnant and postpartum patients.

Telemedicine is considered an appropriate strategy to improve clinical care in EDs.[12] Examples of telehealth applications in these settings include tele-triage where a remotely-based provider screens patients presenting to the ED; remote clinical consultation where ED physicians consult with peers or specialists through any number of communication methods for real-time guidance (see the **Remote Clinical Consultation subsection** for more details);[13] and tele-pharmacy services.[14]

Example — Mayo Clinic Acute Tele-OB Program

The Mayo Clinic runs a 24/7 service "to improve care quality and help medical centers achieve the standard of care for serious events in pregnant patients, including severe hypertension treatment within 30 minutes." The goal is to offer around-the-clock consultation capability for providers in small or rural emergency departments when confronted with an obstetric emergency.

Remote Clinical Consultation

Remote clinical consultation may expand access to and improve care by connecting providers in lower resourced settings to specialists anywhere in the world for consultation, skills development, peer-to-peer learning, mentoring, and continuing education. Project ECHO, specifically, has emerged as a cost-effective and impactful strategy for improving participant knowledge and patient access to care.[15]

Teams may implement processes for remote clinical consultation through strategies such as Project ECHO, physician consultation phone lines, and phone trees. Other clinical consultation examples include tele-radiology in which radiological studies, such as ultrasounds or x-rays, are read remotely for settings in which that expertise is not present. Teams may also utilize other condition-specific clinical consultation resources, such as Perinatal Psychiatry Access Programs, to care for pregnant and postpartum patients.[16]

Resource—Perinatal Psychiatry Access Programs

Perinatal Psychiatry Access Programs are state- and organization-based programs that provide education to healthcare professionals and staff, real-time psychiatric consultation for professionals caring for people with perinatal mental health conditions, and referrals to community- based mental health resources. Perinatal Psychiatry Access Programs are currently available in 25 states.

Develop and Maintain Referral Resources and Care Coordination Pathways

Developing and maintaining a robust network of referrals and resources is useful for connecting patients with material, emotional, and social support after emergencies. Identifying and sharing community resources before, during, and after pregnancy may reduce risk and improve perinatal outcomes.[17] Referral to community resources and supports may also reduce postpartum ED usage.[18]

Resources should include referrals to local or telehealth specialists such as maternal fetal medicine specialists, genetic counselors, nephrologists, endocrinologists, and psychiatrists; local community-based services such as food and diaper banks and home-visiting programs; mental health supports such as social workers, counselors, and therapists; and substance use disorder treatment options including inpatient and outpatient recovery programs and peer recovery supports.

Resource lists should also include information on accessing medical insurance coverage, such as information cards for local medical insurance or a general information sheet on available assistance for accessing medical insurance.[19] Teams should develop referral networks and identify community resources that can meet a variety of patient needs, including different literacy proficiencies, language preferences, and cultural backgrounds.[20] Examples of national resources that may be included in a resource list are in **Table 7**.

Teams should include social work or case management, if available, to identify resources appropriate for pregnant and postpartum people and care coordination pathways with obstetric care providers. Teams may outreach local health departments, local or regional maternal and child health coalitions, and other community-based organizations to identify available resources.

Teams may consider identifying a "referral champion" at their facility or in their community who can engage staff and healthcare professionals to develop lists and referral pathways for patients and refer patients to these identified resources. Facility staff may consult other healthcare facilities and professionals, including subspecialists, in the area to discuss referrals, and conduct community outreach such as participating in health fairs and expos.[21]

Table 7. Examples of National Resources That May Be Included in a Resource Listing

Resource	Brief Description
Find Help	Online search platform to access wraparound needed services; while not perinatal-specific, may offer information on family planning services and social and structural diver of health needs.
Postpartum Support International HelpLine	A toll-free number that can receive call and text requests for basic information, support, and resources related to postpartum mental health.
National Maternal Mental Health Hotline	A free, confidential, bilingual mental health hotline for pregnant and postpartum people.
Office on Women's Health "Get Help Now"	A collection of hotline, helpline, and lifeline numbers curated by the United States Office of the Assistant Secretary for Health to support people with concerns about abuse, trauma, eating disorders, and more.
Exhale Pro-Voice After-Abortion Textline	A free textline offering information, and resources for people after abortion.
National Parent Helpline	A toll-free telephone service and website to promote parental resilience, social connections, knowledge or parenting and child development, and connections to formal (financial) and informal (social) supports.
MotherToBaby	A free-to-the-public phone, text, email, and chat service for people with questions about medications and other (substance) exposures during pregnancy and breastfeeding.
The National Domestic Violence Hotline	A free and confidential call, chat, text, and online resource providing tools and support for survivors of domestic and intimate partner violence.
HealthCare.gov Marketplace Call Center	A 24/7 helpline for supporting individuals and families with starting and finishing applications, comparing plans, or enrolling in insurance plans.
988 Suicide and Crisis Lifeline	A nationwide phone number for call or text to be connected with mental health professionals during a crisis.

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Screen for Current or Recent Pregnancy in All Care Settings

All reproductive-aged people should be verbally screened upon presentation to any care setting for current or recent pregnancy within the last year, regardless of outcome of that pregnancy. Pregnancy or recent pregnancy status may not be readily apparent to healthcare professionals, and patients may not recognize the potential relevance of a current or recent pregnancy to their current symptoms. Due to physiologic changes that occur during and following pregnancy, understanding a person's pregnancy status can help contextualize signs and symptoms and help identify potentially life-threatening conditions and the need for escalations in care.[1]

Screening for this purpose does not include routine blood or urine testing unless otherwise indicated for diagnosis or treatment. Staff and healthcare professionals should verbally screen for current or recent pregnancy in a private area to maintain patient confidentiality and safety. Healthcare professionals should be mindful of relevant laws and regulations surrounding pregnancy reporting and sharing protected health information as they verbally screen any patient.[2]

Screening for current or recent pregnancy may include asking,

"Are you currently pregnant, or have you been pregnant within the last year?"

Resource—Centers for Disease Control and Prevention (CDC)'s Hear Her Campaign

The CDC developed tools to support identification of urgent signs and symptoms in pregnancy and postpartum and the need to seek care. These include **healthcare professional-facing materials,** including posters and palm cards, underlying the importance of asking patients about current or recent pregnancy.

Resource—Reproductive Health National Training Center's Recognize Postpartum Warning Signs Poster

The Reproductive Health National Training Center has a **healthcare professional-facing poster** that educates providers on urgent postpartum warning signs with the reminder to screen for current or recent pregnancy.

Triage and Evaluate for Urgent Signs and Symptoms in Collaboration with Obstetric Care Professionals

Initial assessments of acuity for pregnant and postpartum people informs the overall trajectory of patient care.[3] Emergency Department (ED) professionals may initially use acuity tools for nonpregnant adults to triage pregnant and postpartum people presenting for care and determine priority for evaluation. Teams may also use developed care process models to guide triage of pregnant and postpartum people in the ED. More information on the development of care process models can be found in the **Readiness Section** of this resource kit.

Pregnant and postpartum people may be evaluated by healthcare professionals determined qualified by their institution's policies.[4] Location of obstetric evaluation should be established via facility guidelines, defining appropriate units for evaluation based on patient status, symptoms, and medical conditions and available staff and resources.[4] Ideally, facilities and units where pregnant and postpartum people are referred for evaluation should have the ability to perform basic ultrasonography and fetal monitoring, or have these resources made available.[4]

As pregnant and postpartum people present to the ED or urgent care, healthcare professionals should consider early consultation, including via telehealth, with obstetric care professionals to facilitate accurate triage and evaluation.[4] Obstetric care professionals can support triage decisions, guide evaluation of pregnant and postpartum people, and help determine initial care plans, which may include stabilization and transfer to a higher level of maternal or newborn care.[5]

Resource—Association of Women's Health, Obstetric, and Neonatal Nurses' (AWHONN) Maternal Fetal Triage Index

AWHONN developed a **Maternal Fetal Triage Index** to triage patients in obstetric care settings. Healthcare professionals in EDs should familiarize themselves with obstetric-specific triage tools, as they may provide a common nomenclature to guide transfer discussions with receiving facilities.

Teams can utilize other obstetric-specific resources to identify early warning signs and trigger prompt evaluation and response. Use of obstetric early warning systems has been associated with reductions of severe maternal morbidity (SMM)[6] and may be generalizable to other care settings. Examples of obstetric early warning systems are presented in **Table 1**.

Using obstetric early warning systems, ED staff may review and integrate into their electronic medical record (EMR) triggers based on abnormal vital signs in pregnant and postpartum people. This may help staff identify patients who may need escalations in care and guide transfer discussions with receiving facilities.

Table 1. Obstetric Early Warning Systems Examples*

System	Literature	Implementation Resources
Maternal Early Warning Criteria	**Mhyre et al. 2014**	**Texas Collaborative for Health Mothers and Babies/The University of Texas Health Science Center at Tyler**
Maternal Early Warning Triggers	**Shields et al. 2016**	**Washington State Hospital Association Maternity Watch Program: Early Warning Triggers**
Modified Early Obstetric Warning System	**Singh et al. 2012**	N/A

*Data from Friedman AM, Campbell ML, Kline CR, Wiesner S, D'Alton ME, Shields LE. Implementing Obstetric Early Warning Systems. AJP Rep. 2018 Apr;8(2):e79-e84. **doi: 10.1055/s-0038-1641569**.

Screen for Comorbid Conditions and Risk Factors for Maternal Morbidity and Mortality

Certain conditions and factors may contribute to a pregnant or postpartum person's risk of experiencing morbidity or mortality.[7] As pregnancy or postpartum status is determined during triage, staff may work with patients and consulting obstetric care professionals to determine pre-existing medical conditions and guide evaluation, further consultation with subspecialists, and initial care plans.

Leading underlying causes of pregnancy-related deaths in the United States, which are noted to vary by race and ethnicity, may also have associated risk factors that can be identified through standardized screening. For example, mental health conditions, inclusive of accidental overdose, are the leading underlying cause of pregnancy-related deaths in the United States.[8] Healthcare professionals may consider screening for substance use disorders using validated verbal screening tools to identify people who may be at risk and provide resources to support harm reduction and access to desired treatment.

As the leading cause of pregnancy-related deaths among non-Hispanic Black people in the United States is cardiac conditions,[8] healthcare professionals may consider universal awareness of comorbid conditions and risk factors for future cardiac disease to address disparities in mortality. These comorbid conditions and risk factors for future cardiac disease, which are applicable to all pregnant and postpartum people regardless of race or ethnicity, include preeclampsia and other hypertensive disorders, gestational diabetes, preterm birth, small-for-gestational age newborns, and stillbirth.[9]

Similar screening strategies may be used for other leading underlying causes of pregnancy-related deaths, such as mental health conditions, and suggested screenings and response to positive screens are detailed further in the **Response Section** of this resource kit.

Provide Patient Education on Urgent Signs and Symptoms During Pregnancy and Postpartum and When to Seek Care

Reviews of maternal mortality in the United States highlight the need to provide patient education on the early warning signs of life-threatening complications.[10] Education on warning signs is also reported by patients as an important tool to determine the need to seek care, and these educational materials can be printed and shared with patient support networks.[11]

Education on signs and symptoms should indicate whether concerns may be appropriately addressed in an outpatient setting, or if emergency care is needed. Education opportunities should be extended to the pregnant or postpartum person's support network, which may include partners, family, and friends, and may be incorporated into standard discharge processes from both obstetric care and non-obstetric care settings.

Table 2 provides examples of patient education materials, including their costs to access, if any and whether they are available in other languages. These resources can be given to patients to take home for future reference and posted publicly in triage areas.

Table 2. Examples of Patient Education Materials for Urgent Signs and Symptoms During Pregnancy and Postpartum

Patient Education Material	Costs Associated with Use	Available in Languages Other in English
CDC HEAR HER Campaign	No	Yes—Spanish
AWHONN POST-BIRTH Warning Signs	Yes	Yes—Available in 23 languages
Urgent Maternal Warning Signs	No	Yes—Available in 12 languages

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Response

Response to the broad and variable nature of obstetric emergencies in any setting requires a high level of coordination, planning, and resource development. Specific considerations for care may be generalizable or condition specific. Response should include activation of planned response teams and initiation of standard protocols.

Routine Birth in Non-obstetric Settings

While instances where unplanned or precipitous birth in the Emergency Department (ED) or other non-obstetric care settings may occur, this resource kit is focused on specific clinical conditions that contribute to morbidity and mortality and does not address standard delivery care and management. Preparation for birth in the ED may be supported through many concepts in this resource kit. Concepts discussed in the **Readiness** and **Reporting and Systems Learning** sections of this resource kit, for example, may be particularly helpful to prepare for birth on non-obstetric settings. Routine trainings, such as Basic Life Support in Obstetrics (BLSO) and Advanced Life Support in Obstetrics (ALSO), drill and simulation concepts and exercises, and other fundamental safety concepts such as huddles, debriefs, and action planning may contribute to cultures of quality and safety for all obstetric care provided in non-obstetric settings.

Perimortem Cesarean Delivery

Perimortem cesarean delivery or hysterotomy is the surgical delivery of a fetus at or near the time of death of the pregnant patient.[1] While never a desired outcome, healthcare professionals in non-obstetric settings may be called upon to perform this procedure when providing care to pregnant patients. While it is outside the purview of this resource kit to address procedures that are intended to save the life of the infant in event of a maternal death, there is evidence that the delivery of a fetus from a uterus at umbilicus or more than 20 weeks gestation may improve maternal outcomes in cardiac arrest where resuscitation has not been successful.[2] Resuscitative hysterotomy would optimally occur within minutes of maternal cardiac arrest if there is lack of return of spontaneous circulation, although a 50% injury-free survival rate was noted in maternal and neonatal survival curves as late as 25 minutes after onset of arrest.[2]

While no clear, standardized guideline exists for when this procedure should be performed,[1] consideration and planning for this rare event should be part of readiness planning in all sites that provide emergency care. Perimortem cesarean delivery and resuscitative hysterotomy should be included as part of obstetric focused drills and simulations in emergency care settings and education and training for team members should be provided. Ideally, surgical delivery instruments and equipment should be on hand, including a cord clamp, and training should include that a delivery can be initiated with only a scalpel while additional resources and equipment are gathered.[2]

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AIM Patient Safety Bundles

AIM develops and maintains patient safety bundles (PSBs) that serve as quality improvement tools to address the leading causes of severe maternal morbidity (SMM) and mortality in the United States. AIM PSBs are clinical condition- and event-specific and follow a 5R structure encompassing Readiness, Recognition and Prevention, Response, Reporting and Systems Learning, and Respectful Care. AIM PSBs are evidence-based and, when elements are implemented collectively and reliably, improve quality of care and patient outcomes.

While AIM PSBs are commonly implemented in obstetric care settings, PSB elements can be implemented across the continuum of care and serve as a tool for non-obstetric care settings. By implementing key elements and concepts, teams in non-obstetric care settings may also prioritize resources and equipment needed to care for pregnant and postpartum patients and implement effective processes to appropriately prepare for and respond to emergencies.

This section summarizes key elements and details from 6 of AIM's core PSBs that can be implemented in non-obstetric care settings, such as Emergency Departments (EDs). As elements in AIM's core PSBs cross multiple sections of the resource kit, details in the section may mirror content in other sections of the resource kit.

Obstetric Hemorrhage

Clinical Takeaways

- Uterine atony is the leading cause of obstetric hemorrhage, and uterotonic agents can be a first line treatment to manage bleeding.
- Teams should ensure immediate access to a hemorrhage cart with supplies, checklists, instruction cards for devices or procedures, and to a kit or equivalent with first and second line hemorrhage medications.

Background

- Obstetric hemorrhage (OBH) is the second leading cause of pregnancy-related deaths in the United States.[1]
- OBH is the leading cause of pregnancy-related deaths among non-Hispanic Asian people in the United States.[1]
- In sentinel events among pregnant and postpartum people, OBH is a causal factor in over half of these events.[2]
- Approximately 20% of OBH occur among people with no risk factors.[2]

Definition

AIM's Obstetric Hemorrhage patient safety bundle (PSB) uses the ACOG reVITALize definition for early postpartum hemorrhage, which is defined as cumulative blood loss ≥ 1,000 mL or blood loss accompanied by signs or symptoms of hypovolemia within 24 hours after any birth process, including intrapartum loss, regardless of route of delivery.[3]

Primary and secondary hemorrhage may occur and are differentiated based on the timing of the bleeding. The former occurs within 24 hours of the birth process, and the latter occurs beyond 24 hours after the birth process.[4,5] Healthcare professionals should consider these OBH definitions during triage, as well.

Critical Signs and Symptoms

Obstetric hemorrhage can be identified by determining a patient's pregnancy and postpartum status. Pregnant and postpartum people presenting for care may appear healthy, even while beginning to experience hypovolemia and sustaining significant blood loss.

Quantitative and cumulative techniques should be used to determine patient blood loss whenever possible. Emergency departments can prepare to measure loss cumulatively by preparing scales and documentation of weights of dry pads and other materials to be placed near scales to use to determine blood loss.[3] Triggers in the electronic medical record may aid in calculation and ongoing communication of blood loss.[3]

Less than 500mL of blood loss is considered within the normal range for a vaginal birth.[4] Blood loss of 500-999 mL alone should trigger increased supervision and potential interventions.[6] Awareness of signs and symptoms of hypovolemia, such as tachycardia, hypotension, tachypnea, oliguria, pallor, dizziness, or altered mental status, aids in the identification of excess bleeding, in addition to quantitative, cumulative blood loss measurement.[6]

Response and Clinical Keys

Once an OBH is identified, the response team should determine hemorrhage etiology. This will help teams determine next steps for care in accordance with their facility's stage-based OBH emergency management plan.[4] Utilization of the "Four T's" mnemonic device available in **Table 1** can assist teams in determining etiology.[7] Uterine atony is the leading cause of obstetric hemorrhage,[8] and uterotonic agents can be a first line treatment to manage bleeding.[7]

Table 1. Four T's Mnemonic for the Specific Causes of Postpartum Hemorrhage

Pathology	Specific Cause	Approximate Incidence (%)
Tone	Atonic Uterus	70
Trauma	Lacerations, hematomas, inversion, rupture	20
Tissue	Retained tissue, invasive placenta	10
Thrombin	Coagulopathies	1

Reused with permission from Evensen A, Anderson J, Fontaine P. Postpartum Hemorrhage: Prevention and Treatment. Am Fam Physician. 2017;95(7):442-449. Table 5 in the source is noted as adapted from Evensen A, Anderson J. Chapter J Postpartum hemorrhage: third stage pregnancy. In: Leeman L. Qui-Ian J, Dresang LT, eds. Advanced Life Support in Obstetrics Provider Syllabus. 5th ed. Leawood, Kan: American Academy of Family Physicians; 2014:4.

Appropriate members of the response team should determine evidence-based medication administration based on OBH etiology and their facility's stage-based OBH management plan. When establishing such a plan, teams should assess their available resources, including medications and blood products to treat acute coagulopathies from causes such as placental abruption and amniotic fluid embolism.[4,9]

Medication administration should also be determined with regard for contraindications and availability of non-pharmacological interventions and other resources. Examples of non-pharmacological interventions are in **Table 2**.

Table 2. Examples of Non-Pharmacological Interventions for Obstetric Hemorrhage*

Interventions	Examples
Devices for uterine tamponade	Bakri balloon BT-Cath Foley catheter Sengstaken-Blakemore tube Rusch balloon
Devices for uterine contraction via vacuum	Jada system
Compression techniques	External uterine massage Bimanual compression Aortic compression
Procedures	Bladder emptying Manual vacuum aspiration Manual removal of placenta Manual evacuation of clot Uterine tamponade Uterine artery embolization Laceration repair
Surgery	Curettage Uterine artery ligation Uterine hemostatic compression suturing Hysterectomy

*Data from Alliance for Innovation on Maternal Health. Obstetric Hemorrhage Element Implementation Details. Accessed March 17, 2023. **https://saferbirth.org/wp-content/uploads/HEM_EID_Final_V1_2022.pdf**

Teams should ensure immediate access to a hemorrhage cart with supplies, checklists, and instruction cards for devices or procedures and to a kit or equivalent with first and second line medications.[10] Immediate access to these materials will allow for timely, appropriate treatment based on etiology. Alternatives to a cart may include a kit, box, or bag of bundled supplies and medications. Additional materials teams may consider having rapidly available and an example flowsheet that may be included as part of a hemorrhage cart are included as supplemental materials on the **Obstetric Resource Kit** webpage. Examples of medications used for prevention of or response to OBH are in **Table 3**.

Rapid response teams should work closely with facility laboratory services to understand blood bank policies, access capabilities and limitations, and the availability of products for obstetric patients.[11] Considering the availability and limitations of access for blood and blood products, teams should also consider blood product alternatives.

Response teams can use such alternatives when blood products are declined by patients and in other appropriate scenarios. These alternatives include fibrinogen concentrates and recombinant human FVIIa, especially if timely access to blood and blood products are a barrier and transfer to a facility with a higher level of care is not possible or delayed.

Table 3. Medications Used for Prevention and Treatment of Postpartum Hemorrhage

Medication	Dosage	Prevention	Treatment	Contrain-dications & cautions	Mechanism of action	Adverse effects	Cost*
First-line agent **Oxytocin (Pitocin)**	Prevention: 10 IU IM or 5 to 10 IU IV bolus Treatment: 20 to 40 IU in 1 L normal saline; infuse 500 mL over 10 mins then 250 mL per hour	+	+	Overdose or prolonged use can cause water intoxication Possible hypotension with IV use following cesarean delivery	Stimulates the upper segment of the myometrium to contract rhythmically, constricting spiral arteries and decreasing blood flow through the uterus	Rare	$1 ($13) for 10 units of injectable solution
Second-line agents **Carboprost (Hemabate) a prostaglandin $F_{2\text{-alpha}}$ analogue**	250 mcg IM or into myometrium, repeated every 15–90 mins for a total dosage of 2mg	-	+	Avoid in patients with asthma or significant renal, hepatic, or cardiac disease	Improves uterine contractability by increasing the number of oxytocin receptors and causes vasoconstriction	Nausea, vomiting, and diarrhea	NA ($270) for 250 mcg of injectable solution
Methylergonovine (Methergine)	0.2mg IM, repeat every two to four hours	-	+	Avoid in hypertensive disorders of pregnancy, including chronic hypertension	Causes vasoconstriction and contracts smooth muscles and upper and lower segments of the uterus tetanically	Nausea, vomiting, and increased blood pressure	$9 (NA) for 0.2 mg of injectable solution
Misoprostol (Cytotetc),†, a prostaglandin E1 analgoue	Prevention: 600 mcg orally Treatment: 800 to 1,000 mcg rectally or 600 to 800 mcg sublingually or orally	Use only when oxytocin is unavailable	+	Use with caution in patients with cardiovascular disease	Causes generalized smooth muscle contraction	Nausea, vomiting, diarrhea, pyrexia, and shivering	$1 ($5) per 200-mcg tablet

IM = intramuscularly; IV = intravenous; NA = not available.

*Estimated retail price based on information obtained at **http://online.lexi.com/action/home** (login required; accessed June 10, 2016). Generic price list brand price listed in parentheses.

†Misoprostol is not approved by the U.S. Food and Drug Administration for use in prevention or treatment of postpartum hemorrhage.

Reused with permission from Evensen A, Anderson J, Fontaine P. Postpartum Hemorrhage: Prevention and Treatment. Am Fam Physician. 2017;95(7):442-449. Table 4 in the source is noted as adapted from Evensen A, Anderson J. Chapter J Postpartum hemorrhage: third stage pregnancy. In: Leeman L. Qui-Ian J, Dresang LT, eds. Advanced Life Support in Obstetrics Provider Syllabus. 5th ed. Leawood, Kan: American Academy of Family Physicians; 2014:4

Resources—Obstetric Hemorrhage

- California Maternal Quality Care Collaborative (CMQCC)'s **Medications for Postpartum Hemorrhage**
- CMQCC's **Checklist: Carts, Kits, and Trays**
- CMQCC's **Checklist for Patients Who May Decline the Use of Blood Products**
- CMQCC's **Obstetric Hemorrhage Risk Factor Assessment Screen**

Examples—Obstetric Hemorrhage

- American College of Obstetricians and Gynecologists (ACOG) District II's **Obstetric Hemorrhage Checklist**
- ACOG District II's **Example Massive Transfusion Protocol**
- ACOG District II's **Obstetric Hemorrhage Bundle Resources**

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Severe Hypertension in Pregnancy and Postpartum

Clinical Takeaways

- Severe hypertension is a systolic blood pressure of 160mm Hg or greater or a diastolic blood pressure of 110 mm Hg or greater, or both, during pregnancy and the postpartum period and is a medical emergency.
- As patients are stabilized to be discharged, healthcare professionals should ensure patients receive condition-specific education on hypertensive emergencies and when to seek immediate care.

Background

- Hypertensive disorders in pregnancy (HDP) are the underlying cause of 6.5% of pregnancy-related deaths in the United States.[1]
- 60% of pregnancy-related deaths due to HDP occur 0-6 days postpartum.[2]
- Around 1 in 25 pregnant and postpartum people experience preeclampsia.[3]
- HDP rates are increasing in the United States and are highest among non-Hispanic Black people.[4]

Definition

Severe hypertension is a systolic blood pressure of 160mm Hg or greater or a diastolic blood pressure of 110 mm Hg or greater, or both, during pregnancy and the postpartum period and is a medical emergency.[5] **Table 1** contains additional key definitions of hypertensive disorders in pregnancy.

Table 1. Hypertensive Disorders of Pregnancy

Hypertensive Disorder	Definition
Gestational hypertension	Systolic blood pressure of 140 mm Hg or more or a diastolic blood pressure of 90 mm Hg or more, or both, on 2 occasions at least 4 hours apart after 20 weeks gestation in a patient with previously normal blood pressure. In cases of severe hypertension (a systolic blood pressure of 160mm Hg or greater or a diastolic blood pressure of 110 mm Hg or greater, or both), follow up blood pressure may need to be taken within 15 minutes to facilitate timely antihypertensive treatment.

Table 1. Hypertensive Disorders of Pregnancy (continued)

Hypertensive Disorder	Definition
Preeclampsia	New-onset hypertension that most often appears after 20 weeks gestation and is often accompanied by new-onset proteinuria. Some pregnant and postpartum people may experience hypertension and other signs of preeclampsia (see **Boxes 1** and **2** for diagnostic criteria) without proteinuria.
Eclampsia	Acute onset of tonic-clonic, focal, or multifocal seizures in the absence of other conditions such as epilepsy, intercranial hemorrhage, or other differential diagnosis.

*Data from Gestational Hypertension and Preeclampsia. ACOG Practice Bulletin 222. American College of Obstetricians and Gynecologists. Obstet Gynecol 2018;135:237-260.

Critical Signs and Symptoms

All healthcare professionals and staff who care for patients should be regularly trained on appropriate blood pressure measurement and systolic and diastolic blood pressure ranges that signal hypertension and severe hypertension in pregnant and postpartum people, as well as on signs of HDP.[5]

Resource—Oklahoma Perinatal Quality Improvement Collaborative

The Oklahoma Perinatal Quality Improvement Collaborative developed a **healthcare professional-facing flyer** to serve as a reminder for correct blood pressure measurement and severe range hypertension in pregnant and postpartum patients. Content may be adapted for other care settings.

As a pregnant or postpartum person with **hypertension (a systolic blood pressure of 140 mm Hg or greater or a diastolic blood pressure of 90 mm Hg or greater, or both)** presents for care, healthcare professionals should consult with onsite or remote obstetric care professionals for an evaluation of preeclampsia and other HDP,[6] which should include assessing laboratory results as well as presence of proteinuria.[5]

Particularly if patients have hypertension without proteinuria, healthcare professionals should evaluate other signs and symptoms of hypertensive emergencies such as acute-onset headache that is unresponsive to medication, edema, epigastric pain, altered mental status in a patient with no prior mental health concerns, and vision changes.[7,8] Critical signs and symptoms of preeclampsia can be found in **Box 1**. Additional signs and symptoms of preeclampsia with severe features can be found in **Box 2**.

If a patient with **severe hypertension (a systolic blood pressure of 160 mm Hg or greater or a diastolic blood pressure of 110 mm Hg or greater, or both)** presents for care, healthcare professionals should confirm persistence of severe hypertension by measuring blood pressure again after 15 minutes.[5] If persistent severe hypertension is confirmed, immediate response by initiating antihypertensive treatment within 60 minutes should occur regardless of underlying HDP.[9] More detail on appropriate response to persistent severe hypertension is in the **Response and Clinical Keys** section below.

Box 1. Diagnostic Criteria for Preeclampsia

Blood pressure

- Systolic blood pressure of 140 mm Hg or more or diastolic blood pressure of 90 mm Hg or more on two occasions at least 4 hours apart after 20 weeks of gestation in a woman with a previously normal blood pressure
- Systolic blood pressure of 160 mm Hg or more or diastolic blood pressure of 110 mm Hg or more. (Severe hypertension can be confirmed within a short interval (minutes) to facilitate timely antihypertensive therapy).

and

Proteinuria

- 300 mg or more per 24 hour urine collection (or this amount extrapolated from a timed collection)

  or
- Protein/creatinine ratio of 0.3 or more

  or
- Dipstick reading of 2+ (used only if other quantitative methods not available)

Or in the absence of proteinuria, new-onset hypertension with the new onset of any of the following:

- Thrombocytopenia: Platelet count less than 100X 10^9/L
- Renal insufficiency: Serum creatinine concentrations greater than 1.1 mg/dL or a doubling of the serum creatinine concentration in the absence of other renal disease
- Impaired liver function: Elevated blood concentrations of liver transaminases to twice normal concentration
- Pulmonary edema
- New-onset headache unresponsive to medication and not accounted for by alternative diagnoses or visual symptoms

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Box 2. Preeclampsia with Severe Features

- Systolic blood pressure of 160 mm Hg or more, or diastolic blood pressure of 110 mm Hg or more on two occasions at least 4 hours apart (unless antihypertensive therapy is initiated before this time)
- Thrombocytopenia (platelet count less than 100 X 10^9/L
- Impaired liver function that is not accounted for by alternative diagnoses and as indicated by abnormally elevated blood concentrations of liver enzymes (to more than twice the upper limit normal concentrations), or by severe persistent right upper quadrant or epigastric pain unresponsive to medications
- Renal insufficiency (serum creatinine concentration more than 1.1 mg/dL or a doubling of the serum creatinine concentration in the absence of other renal disease)
- Pulmonary edema
- New-onset headache unresponsive to medication and not accounted for by alternative diagnoses
- Visual disturbances

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Response and Clinical Keys

When a pregnant or postpartum patient has severe range hypertension, preeclampsia, eclampsia, or other hypertensive emergencies, a facility's obstetric rapid response team should be activated and provide care in accordance with established policies and procedures. Ideally, these policies and procedures would include consult and transfer procedures and assessment of fetal status.[5] Examples of policies and procedures for these emergencies are in the **Readiness section** of the resource kit, and additional practice resources are located at the **end of this subsection**.

Patients with **persistent severe hypertension** should be treated as soon as possible or within 60 minutes of the first severe-range blood pressure reading.[10] Appropriate first line antihypertensive medications include IV labetalol and hydralazine and oral nifedipine if IV access cannot be established. Teams should work with their pharmacy services to ensure rapid access to these antihypertensive medications, as well as appropriately formulated magnesium sulfate for infusion or intramuscular injection to prevent seizures.[5]

As healthcare professionals administer first line antihypertensive medications, they should be in contact with obstetric care professionals to determine next steps for treatment, particularly for patients who are unresponsive to first line therapy.[11] If a patient with severe hypertension does not respond within 30-60 minutes, healthcare professionals should begin processes for transfer to a higher level of care.[5]

Specific information on these antihypertensive medications can be found in **Table 2**. Magnesium sulfate is not recommended as an antihypertensive agent.

Table 2. Antihypertensive Agents Used for Urgent Blood Pressure Control in Pregnancy

Drug	Dose	Comments	Onset of Action
Labetalol	10-20 mg IV, then 20-80 mg every 10-30 minutes to a maximum cumulative dosage of 300 mg; or constant infusion 1-2 mg/min IV	Tachycardia is less common with fewer adverse effects Avoid in women with asthma, preexisting myocardial disease, decompensated cardiac function, and heart block and bradycardia	1–2 minutes
Hydralazine	5 mg IV or IM, then 5-10 mg IV every 20-40 minutes to a maximum cumulative dosage of 20 mg; or constant infusion of 0.5-10mg/hr	Higher or frequent dosage associated with maternal hypotension, headaches, and abnormal fetal heart rate tracings; may be more common than other agents	10–20 minutes
Nifedipine (immediate release)	10-20 mg orally, repeat in 20 mins if needed; than 10-20 mg every 2-6 hours; maximum daily does is 180 mg	May observe reflex tachycardia and headaches	5–10 minutes

Abbreviation: IM, intramuscularly; IV, intravenously

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Healthcare professionals should respond to patients with **preeclampsia, preeclampsia with severe features, and eclampsia** by following protocols and procedures for administering magnesium sulfate for the prevention and treatment of seizures.[8] In instances in which magnesium sulfate is contraindicated or unavailable, healthcare professionals may consider treatment using benzodiazepines or phenytoin.[8]

Healthcare professionals should respond to patients with **eclampsia** through immediate consultation with an obstetric care professional and initiation of standard policies and procedures for eclampsia. This may include initial supportive measures, such as prevention of patient injury, placement in appropriate position, prevention of aspiration, administration of oxygen, and monitoring of vital signs, including oxygen saturation.[8] After initial supportive measures, administration of magnesium sulfate should be prioritized.[8] As for all hypertensive emergencies, logistics for transfer including needed treatment prior, medications, and delivery status should be determined with consulting obstetric care professionals.[5]

Collaboration with obstetric care professionals to determine whether expectant management or immediate delivery is most appropriate for patients experiencing HDPs should be prioritized, as well as determining optimal timing and location of such care. Such determinations are dependent on severity of HDP, gestational age, and patient and fetal conditions.[8]

As patients are stabilized to be discharged, healthcare professionals should ensure patients receive condition-specific education on hypertensive emergencies and when to seek immediate care.[11] Follow-up appointments or referral coordination to obstetric care professionals for ongoing, outpatient management of the patient's HDP is essential to maintaining patient safety.[5]

Resources—Severe Hypertension in Pregnancy and Postpartum

- California Maternal Quality Care Collaborative (CMQCC)'s **Accurate Blood Pressure Measurement toolkit**
- American College of Obstetricians and Gynecologists District II's **Safe Motherhood Initiative's Severe Hypertension Resources**
- Preeclampsia Foundation's **Patient Education Materials**

Examples—Severe Hypertension in Pregnancy and Postpartum

- CMQCC's **Preeclampsia Screening Tools**
- CMQCC's **Sample Acute-Onset, Severe Hypertension and Eclampsia Medication Kit**
- New York State Department of Health's **Antepartum and Postpartum Preeclampsia and Eclampsia Management in the Emergency Department** Algorithm
- Florida Perinatal Quality Collaborative's **Management of Eclampsia Algorithm**

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Perinatal Mental Health Conditions

Clinical Takeaways

- All pregnant and postpartum patients should be provided with education and materials on mental health warning signs and symptoms, as well as crisis resources, due to the prevalence of mental health conditions in the perinatal period.
- As a patient screens positive from a screening tool or as healthcare professionals determine the need, procedures should be initiated to address suicide risk and assess a patient's risk of psychosis and harm to self or others.

Background

- Perinatal mood disorders are estimated to affect up to 20% of pregnant and postpartum people in the United States.[1]
- Mental health conditions, including substance use disorder, have been identified as major drivers of maternal mortality.[2] Specifically, suicide and overdose have been recognized as leading causes of preventable deaths.[1]
- Maternal suicide occurs most frequently in the late postpartum period between 43 days through 1 year after the end of pregnancy.[3]
- While the majority of pregnancy-related deaths by suicide occur among non-Hispanic white people,[2] racial inequities in care for perinatal mental health conditions have been identified.
- Black and Latina people have lower rates of receiving treatment for postpartum depression in comparison to whites.[4]
- People residing in rural areas also face barriers accessing perinatal mental health services related to geography and provider availability.[5]

Definition

In the context of the AIM Perinatal Mental Health Conditions (PMHC) patient safety bundle (PSB), perinatal mental health conditions refer to mood, anxiety, and anxiety-related disorders that occur during pregnancy or within one year of delivery and are inclusive of mental health conditions with onset that predates pregnancy. These conditions include and are not limited to depression, anxiety and anxiety-related disorders like posttraumatic stress disorder and obsessive-compulsive disorder, bipolar disorder, and postpartum psychosis.

Critical Signs and Symptoms

Perinatal mental health conditions may present with a variety of overt and discrete symptoms. As patients present for care, healthcare professionals and staff may begin to assess for perinatal mental health conditions by inquiring about a patient's personal and family mental health history at intake.[6]

Consideration should be given to asking, "During the past month, have you been bothered by feeling down, depressed, or hopeless," and, "During the past month, have you been bothered by having little

interest or pleasure in doing things?"[6] Asking these questions may further indicate a need for formal mental health screening and help reduce false-positive or false-negative results of such screens.[6]

All pregnant and postpartum people should be screened for depression and anxiety using a standardized, validated tool.[7] Examples of validated screening tools are available in **Table 1**; the Patient Health Questionnaire 9 and Edinburgh Postnatal Depression Scale are validated for use in pregnant and postpartum people.[6]

Table 1. Examples of Validated Screening Tools for Depression

Screening Tool	Number of Items	Time to Complete (minutes)	Sensitivity and Specificity	Spanish Available
Edinburgh Postnatal Depression Scale	10	Less than 5	Sensitivity 59-100% Specificity 46-100%	Yes
Postpartum Depression Screening Scale	35	5–10	Sensitivity 91-94% Specificity 72-98%	Yes
Patient Health Questionnaire 9	9	Less than 5	Sensitivity 75% Specificity 90%	Yes
Beck Depression Inventory	21	5–10	Sensitivity 47.6-82% Specificity 85.9-89%	Yes
Beck Inventory-II	21	5–10	Sensitivity 56-57% Specificity 97-100%	Yes
Center for Epidemiologic Studies Depression Scale	20	5–10	Sensitivity 60% Specificity 92%	Yes
Zung Self-Rating Depression Scale	20	5–10	Sensitivity 45-89% Specificity 77-88%	No

Reprinted with permission from Screening for Perinatal Depression. ACOG Committee Opinion 757. American College of Obstetricians and Gynecologists. Obstet Gynecol 2018;132:208-212. **doi:10.1097/AOG.0000000000002927**

As a patient screens positive for depression and before initiating treatment, healthcare professionals should consider screening patients for other mental health conditions including bipolar disorder to avoid misdiagnosis and inappropriate treatment.[6]

Healthcare professionals should be aware of and prepared to address racial disparities in PMHC screening and subsequent linkages to treatment. Pregnant and postpartum people who are African American, Asian, Native American, and multi-racial are less likely to be screened for mental health conditions than white people and are therefore not linked to appropriate care.[8]

Response and Clinical Keys

As a patient screens positive from a screening tool or as healthcare professionals determine the need, procedures should be initiated to address suicide risk and assess a patient's risk of psychosis and harm to self or others.[9] If a patient screens positive for any of these features, a management plan for patients experiencing a mental health emergency should be enacted per facility standards and guidelines to improve outcomes for patients and their infants.[10] Examples of sample policies and procedures for response to perinatal mental health emergencies are in the **Readiness Section** of the resource kit.

If a patient's risk of harm to themselves or others is determined to be very likely and an initial diagnosis is determined such as severe depression; psychotic features such as auditory, visual, olfactory, or tactile hallucinations; delirium; or mania, consultation will likely be required. Following the initial diagnosis, healthcare professionals should determine and coordinate an emergency psychiatric consultation and next steps for treatment.[6] If in-person psychiatric consultation is unavailable, healthcare professionals may remotely consult with psychiatric care professionals who are part of their state's perinatal psychiatry access program or other predetermined pathways. More details on perinatal psychiatry access programs are in the **Readiness Section** of this resource kit.

Response to mental health emergencies should be tailored based on diagnosis, illness severity, and risk of harm and may include psychotherapy, initiation of pharmacotherapy, enacting an emergency referral protocol for suicidal or homicidal ideations, transport to a higher level of care, or admission.[6]

As a history of exposure to trauma is a predictive factor in engagement in mental health services,[11] all healthcare professionals should provide trauma-informed care to patients experiencing a mental health crisis and their support network. Attitudes and judgments related to people in mental health crises can negatively affect patient care though under-diagnosis, under-treatment, and re-traumatization.[11] Such experiences may result in patients not seeking care when in crisis in the future.[11]

Professionals can take a trauma-informed approach to caring for patients experiencing such crises by increasing their awareness of how trauma is a contributing factor to mental health.[11] De-stigmatizing language when speaking about and to patients should be used.[11] Clinicians may form therapeutic alliances with patients and their support networks by engaging with them in private, confidential triage and evaluation areas and avoiding threatening language.[11] More detail on trauma-informed care can be found in the **Respectful Care Section** of this resource kit.

As patients receive initial treatment and are stabilized for discharge, healthcare professionals and staff should seek opportunities to coordinate follow-up appointments or referrals to mental health and psychiatric care professionals. Healthcare professionals should also educate patients and their support networks on signs and symptoms of a mental health emergency during pregnancy and postpartum, and when to seek immediate care.[6] Patients should also be screened for social and structural determinants of health and provided linkages to material, emotional, and social supports. More details on the development of resource and referral pathways for patients are in the **Readiness Section** of this resource kit.

Resources—Perinatal Mental Health Conditions

- American College of Obstetricians and Gynecologists' **Perinatal Mental Health Toolkit**
- Health Resources and Services Administration's **National Maternal Mental Health Hotline Materials**
- Postpartum Support International's **Perinatal Psychiatric Consult Line**
- Mental Health Technology Transfer Center Network's **Perinatal Mental Health Products and Resources**
- UMass Chan Medical School's **List of Perinatal Psychiatry Access Programs by State**

Example—Perinatal Mental Health Conditions

- Provincial Council for Maternal and Child Health's Example **Care Pathway for the Management of Perinatal Mental Health**

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Sepsis in Obstetric Care

Clinical Takeaways

- Due to normal physiological changes associated with pregnancy and the postpartum period, some signs and symptoms of infection and sepsis can be difficult to differentiate as abnormal.
- Healthcare professionals must consider sepsis in pregnant and postpartum people as a differential diagnosis, particularly among patients with a deteriorating status and even in the absence of a fever or hypotension.

Background

- Infection is the second-leading cause of pregnancy-related deaths in the United States.[1]
- The risk and severity of specific infections are increased during pregnancy due to normal physiological and immunological changes.[2]

Definition

Sepsis is a life-threatening condition with organ dysfunction resulting from infection during pregnancy, childbirth, post-abortion, or postpartum period (up to 42 days).[2] Infection beyond 42 days postpartum can still occur and result in sepsis if left unidentified and untreated.[1]

Critical Signs and Symptoms

Due to normal physiological changes associated with pregnancy and the postpartum period, some signs and symptoms of infection and sepsis can be difficult to differentiate as abnormal. For example, by the second trimester there are increases in heart rates and decreases in diastolic blood pressures that are within the range of normal for a pregnancy but may be indicative of sepsis in other circumstances.[3] Additionally, leukocyte counts have been noted to increase from 6,000 to 15,000 cells/mm^3 during the second and third trimesters,[4] and lactic acid has been noted to be elevated during active labor.[5] Vital sign thresholds alone are not appropriate for determining sepsis. Healthcare professionals must consider sepsis as part of a differential diagnosis, particularly among patients with a deteriorating status and even if a patient does not have a fever.[6]

Pregnancy-adjusted sepsis screening tools should be used with patients between 20 weeks gestation and up to 3 days postpartum. For those who are prior to 20 weeks gestation or after 3 days postpartum, healthcare professionals can use non-obstetric specific screening criteria for sepsis.[7]

In settings that may not have access to obstetric or specialist care, healthcare professionals and staff may consider sepsis screening that is more sensitive for more rapid identification of sepsis and timely consultation and care. Examples of pregnancy-adjusted screening tools and criteria for sepsis are in **Table 1**.

Table 1. Examples of Pregnancy-Adjusted Screening Tools for Sepsis

Organization	Type of Screening	Criteria
California Maternal Quality Care Collaborative*	Modified SIRS	• Oral temp <36 °C (96.8 °F) or >38 °C (100.4 °F) • Heart rate >110 beats/minute • Respiratory rate >24/minute • WBCs>15,000/mm^3 or <4,000/mm^3 or<10% bands Positive if any 2 of 4 criteria are met (sustained for 15 minutes)
Safe Motherhood Initiative†	Modified Maternal Early Warning Criteria	• Systolic BP (mm Hg) <90 or >160 • Diastolic BP (mm Hg) >100 • Heart rate <50 or >120 • Respiratory rate <10 or >24 • O2 sat on room air <95% • Oliguria <35 mL/h × 2 h • Temperature <36 °C or >38 °C • WBC <4,000 or >15,000 • Maternal agitation, confusion, or unresponsiveness Positive if any one criterion is met (sustained for 20 minutes)
United Kingdom Obstetric Surveillance System‡	Modified SIRS	• Temperature of <36 °C or >38 °C • Heart rate >100 beats/minute • Respiratory rate >20/minute • White cell count >17 × 10^9/L or <4 × 10^9/L or with 10% immature band forms Positive if any 2 of 4 criteria are met if measures on two occasions (at least 4 hours apart for Temperature, Heart rate, Respiratory rate)

* Data from Gibbs R, Bauer M, Olvera L, Sakowski C, Cape V, Main E. Improving diagnosis and treatment of maternal sepsis: a quality improvement toolkit. California Maternal Quality Care Collaborative; 2019. Accessed December 6, 2022. **https://paclac.org/wp-content/uploads/2020/03/CMQCC_SepsisToolkit.pdf**

† Data from American College of Obstetricians and Gynecologists District II. Safe Motherhood Initiative: maternal safety bundle for sepsis in pregnancy. Accessed December 6, 2022. **https://www.acog.org/community/districts-and-sections/district-ii/programs-and-resources/safe-motherhood-initiative**

‡ Data from National Perinatal Epidemiology Unit. UK Obstetric Surveillance System (UKOSS). Accessed December 6, 2022. **https://www.npeu.ox.ac.uk/ukoss**

Additionally, teams may consider integrating alerts for sepsis in pregnant and postpartum people into their electronic medical records using obstetric early warning systems. Further details and examples of such tools are in **the Recognition and Prevention Section** of this resource kit.

Considerations of leading causes of sepsis in the antepartum period, intrapartum, or immediate postpartum, and post-discharge may aid in recognition of sepsis and heightened awareness among healthcare professionals. During the antepartum period, leading causes of sepsis include septic abortion,

chorioamnionitis/intraamniotic infection, pneumonia/influenza, pyelonephritis, and appendicitis, whereas during the intrapartum period or immediately postpartum leading causes may include chorioamnionitis/intraamniotic infection, endometritis, pneumonia/influenza, pyelonephritis, and wound infection/necrotizing fasciitis.[8] Post-discharge from birth, leading causes of sepsis may include pneumonia/influenza, pyelonephritis, wound infection/necrotizing fasciitis, mastitis, and cholecystitis.[8]

Response and Clinical Keys

As a patient is suspected or confirmed to have sepsis, a facility's obstetric rapid response team should be activated, consultations with obstetric care professionals and subspecialists should be initiated, and escalations in care should begin based on facility standard protocols and procedures.

Rapid response protocols for the treatment of patients who may have sepsis should include:

- Antimicrobial initiation within 1 hour
- Fluid resuscitation
- Appropriate vasopressor initiation
- Evaluation of source
- Assessment of severity of end organ injury
- Determination of need to transfer to a higher level of care, such as the need for intensive care supports.[9,10]

Resource—American College of Emergency Physicians' Detect, Act, Reassess, Titrate Tool

The American College of Emergency Physicians convened an Expert Panel on Sepsis to develop a tool to guide the early recognition and treatment of sepsis and septic shock. This tool contains additional specificity on timely treatment and ongoing monitoring of patients experiencing sepsis and septic shock. Since this tool is intended for the general population, it should only be utilized in pregnant patients prior to 20 weeks gestation and after 3 days postpartum. Refer to **Table 1** for obstetric-specific sepsis screening criteria.

Effective use of protocols and policies require staff education, accessible step-by-step instructions, and practical simulation. Examples of policies and procedures are in the **Readiness Section** of this resource kit.

Teams should collaborate early with their laboratory services to determine a process to prioritize laboratory results for patients with suspected sepsis during pregnancy and postpartum.

Additionally, rapid response teams should work with their pharmacy services to ensure rapid access to appropriate antimicrobials within 1 hour after diagnosis, followed by rapid access to additional antimicrobials.[11] Teams can consider other methods to ensure rapid initiation of antimicrobials, such as establishing automated medication dispensing systems; prioritizing orders with the nursing team; ensuring additional IV access to allow administration of multiple therapies; and immediate administration of antimicrobials, even if the patient is being prepared for transfer.[7]

If a patient with a uterine infection or sepsis is appropriately stabilized, cesarean birth is only necessary for normal obstetric indications.[12] However, if surgical source control for uterine infections and sepsis is necessary, the rapid response team should communicate urgently with the operating room regarding expediency needed of source control measures.[5]

Resources—Sepsis in Obstetric Care

- California Maternal Quality Care Collaborative (CMQCC)'s **Improving Diagnosis and Treatment of Maternal Sepsis** toolkit
- CMQCC's **Lactation Safety of Antimicrobials Used for Treatment of Sepsis**
- American College of Obstetricians and Gynecologists District II's **Safe Motherhood Initiative's Sepsis in Pregnancy Resources**
- **UK Obstetric Surveillance System Resources**

Examples—Sepsis in Obstetric Care

- CMQCC's **Maternal Sepsis Evaluation Flow Chart**
- **Sepsis in Obstetrics Score:** Model to Identify Risk of Morbidity from Sepsis in Pregnancy
- The UK Sepsis Trust's **Inpatient Maternal Sepsis Tool**
- Washington State Hospital Association's Example **Unit Based Standard: Sepsis and chorioamnionitis: Maternal Early Identification and Treatment Protocol in Obstetrics**
- Washington State Hospital Association's Example **Code Sepsis Checklist**

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Care for Pregnant and Postpartum People with Substance Use Disorder

Clinical Takeaways

- Screening all pregnant and postpartum people for substance use disorders (SUDs) using a validated self-reported verbal screening method is critical for recognizing SUDs and providing referral to appropriate treatment.
- Administering naloxone to pregnant and postpartum people in emergency settings and developing naloxone kit distribution programs can directly save lives and prevent fatal opioid overdoses.

Background

- Mental health conditions, including substance use disorders (SUDs) and associated accidental overdoses, are the leading cause of pregnancy-related deaths in the United States.[1]
- Though evidence supports prescription of medications for opioid use disorder (MOUD) as treatment for pregnant and postpartum people,[2] non-Hispanic Black women with opioid use disorder (OUD) are less likely to receive MOUD than white women.[3,4]
- Rural and American Indian people face major barriers in access to treatment due to a lack of providers, failure of existing providers to accept Medicaid, limited treatment options (e.g., not offering certain MOUDs), and long distances between perinatal care and addiction medicine providers.[5]
- Deaths from SUDs occur most frequently in the late postpartum period between 43 days through 1 year after the end of pregnancy.[6] The second most frequent timing of substance use-related deaths is during pregnancy.[7]

Definition

For the purposes of quality improvement measurement and standardized data collection and reporting, AIM includes the following substances as part of its definition of SUD: opioids, amphetamines/stimulants, sedatives, and cocaine. While this definition does not encompass the range of substances that comprise all SUDs, it should be acknowledged that other substances may contribute to morbidity and mortality.

Critical Signs and Symptoms

Screening all pregnant and postpartum people for SUDs using a validated self-reported verbal screening method is critical for recognizing these and providing referral to appropriate treatment. Screening should be provided universally as part of a comprehensive conversation between the patient and provider. Screening should not be provided solely based on the presence of risk factors, actual or perceived. Urine toxicology (i.e., urine drug testing) is not an appropriate or recommended method of SUD screening and can discourage pregnant and postpartum people from seeking necessary care.[2]

Examples of validated screening tools for pregnancy include the Substance Use Risk Profile, AUDIT-C (alcohol only), CRAFFT (for those under age 26), AASIS, NIDA Quick Screen, and 4Ps.[8] Further examples and resources that discuss screening tools in more detail are in the **Readiness Section** of this resource kit.

Response and Clinical Keys

While all people may experience significant barriers to care for SUDs, pregnant and postpartum people with SUDs often face greater barriers to entering treatment. Healthcare professionals should consider assisting pregnant and postpartum people with SUDs through brief interventions and referrals to evidence-based, person directed treatment.

Healthcare professionals and staff can proactively identify community resources and SUD treatment programs that are welcoming and accessible to pregnant and postpartum people in anticipation of the need to facilitate patient referrals, including those available through telehealth. Such treatment programs and referral pathways may include pharmacotherapy, such as MOUD; behavioral health treatment; peer support groups; social support services; and harm reduction programs.[8] As teams develop resources and referral pathways as detailed in the **Readiness Section** of the resource kit, they should include treatment pathways for SUDs.

One example of a harm reduction strategy available to Emergency Department (ED) settings is initiating MOUD for patients with opioid use disorder as part of facilitating referrals to more formal treatment.[9] While not always safe or feasible in a current pregnancy, this initiation may have advantages in rural areas, as it may help remove logistical barriers patients experience accessing this and other treatment.[10]

Initiation of MOUD during pregnancy should be individualized and in alignment with safe induction protocols for pregnant and postpartum patients.[2] Careful considerations for initiation and dosages can help prevent withdrawal signs and symptoms that can cause fetal stress or the patient's relapse and discontinuation of treatment.[2] Healthcare professionals should be prepared to undergo additional training in MOUD initiation and to collaborate with their facility's pharmacy services to appropriately stock MOUD.

Resource—Substance Abuse and Mental Health Services Administration (SAMHSA)

SAMHSA developed an evidence-based resource guide, **Use of Medication-Assisted Treatment in Emergency Departments**, that provides evidence for initiating MOUD programs in Emergency Departments, implementation suggestions, and examples of existing Emergency Department programs that initiate MOUD and referrals to continuing care.

Pregnant women experiencing opioid overdoses who present to EDs have 81% lower odds of receiving naloxone than non-pregnant women,[11] and only 24% of women with a history of perinatal OUD report receiving a naloxone kit during pregnancy and postpartum.[12] Naloxone is a life-saving medication and can be prescribed and used for pregnant and postpartum people, despite the potential of induced withdrawal and fetal stress.[2] Administering naloxone to pregnant and postpartum people in emergency settings and developing naloxone kit distribution programs can directly save lives and prevent fatal opioid overdoses.[12]

ED point of care distribution of naloxone to all patients, but particularly those with SUDs, is a feasible harm reduction strategy.[13] Teams can develop an opioid overdose education and naloxone distribution protocol that includes patient screening, order sets, patient training videos, direct dispensing of a naloxone kit, and written discharge instructions.[13] If direct provision of naloxone is not feasible, teams can consider other strategies, like text message follow ups, to encourage patient acquisition of prescribed life-saving medications.[14]

Resource—Prescribe to Prevent Naloxone Implementation Resources

Prescribe to Prevent developed resources to support Emergency Department teams through implementation and logistics of naloxone distribution at their institutions. These include implementation guides, sample policies, and patient education materials.

Pregnant and postpartum people with SUDs may be screened as appropriate for potential comorbidities, such as hepatitis C virus, hepatitis B virus, human immunodeficiency virus, perinatal mental health conditions, and intimate partner violence.[8] Details on screening for perinatal mental health conditions are in the associated **Response Section** of this resource kit.

Healthcare professionals and staff should remain aware of their state statutory and regulatory requirements regarding substance use during pregnancy and postpartum and work with their facility's social services providers to determine appropriate reporting and to facilitate clear communication with families.[8] In balancing state statutory and regulatory requirements, healthcare professionals should be aware of racial inequities in reporting to child welfare among people with SUDs.[15]

People with SUDs experience stigma and bias at many levels, including within the healthcare system.[16] This stigma may be amplified when individuals have additional historically marginalized identities and cause patient hesitancy to seek future care.[17] Healthcare professionals and staff can take a trauma-informed approach to caring for patients with SUDs by increasing their awareness of how trauma is associated with substance use.[8] Additionally, de-stigmatizing language should be used when referring to patients[17] and dyad-centered care should be encouraged as a way to improve outcomes.[8] More detail on trauma-informed care can be found in the **Respectful Care Section** of this resource kit.

Resources—Care for Pregnant and Postpartum People with Substance Use Disorder

- Academy of Perinatal Harm Reduction's **Pregnancy and Substance Use: A Harm Reduction Toolkit**
- Addition Technology Transfer Center Network's **Perinatal Provider Toolkit**
- Northern New England Perinatal Quality Improvement Network's **A Toolkit for the Perinatal Care of Pregnant and Postpartum People with Substance Use Disorders**
- National Center on Substance Abuse and Child Welfare's **Substance-Specific Resources**
- Centers for Disease Control and Prevention's **Treatment for Opioid Use Disorder Before, During, and After Pregnancy**
- Substance Abuse and Mental Health Services Administration's **Clinical Guidance for Treating Pregnant and Parenting Women with Opioid Use Disorder and Their Infants**

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Cardiac Conditions in Obstetric Care

Clinical Takeaways

- Among pregnant and postpartum people who die from cardiac conditions, most do not have a diagnosis of cardiac disease prior to their deaths.
- Most pregnant and postpartum people who die from cardiac conditions have underlying risk factors and present for care with signs and symptoms indicative of cardiac disease.
- Due to normal physiological changes associated with pregnancy and the postpartum period, some signs and symptoms of cardiac disease can be difficult to differentiate as abnormal.

Background

- Incidence of cardiac conditions are rising due to more people with congenital heart disease (CHD) living to adulthood, advancing maternal age, population increases in cardiovascular disease, and other increasing risk factors such as diabetes, hypertension, and multifetal pregnancies.[1]
- Cardiac conditions are the third leading cause of pregnancy-related deaths in the United States.[2]
- Among non-Hispanic Black people, cardiac conditions are the leading cause of pregnancy-related deaths in the United States.[2]
- Among pregnant and postpartum people who die from cardiac conditions, most do not have a diagnosis of cardiac disease prior to their deaths.[3]
- Most pregnant and postpartum people who die from cardiac conditions have underlying risk factors and present for care with signs and symptoms indicative of cardiac disease.[3]
- Most pregnancy-related deaths due to cardiac conditions and cardiomyopathy occur between 42-365 days postpartum. Deaths due to cerebrovascular conditions typically occur during pregnancy and within the 42-day postpartum period. Deaths due to cardiomyopathy are common between 43 and 365 days postpartum.[4]

Definition

AIM's Cardiac Conditions in Obstetric Care (CCOC) patient safety bundle defines cardiac conditions as disorders of the cardiovascular system that may affect maternal health. These conditions may include CHD and heart disease acquired during pregnancy or within the 12 months postpartum, including cardiac valve disorders, cardiomyopathies, arrhythmias, coronary artery disease, pulmonary hypertension, and aortic dissection.

Critical Signs and Symptoms

Pregnant and postpartum people who present for care may have a known diagnosis of cardiac disease or may have new onset of signs, symptoms, and risk factors indicative of cardiac disease or a cardiac emergency. Patients who have known cardiac conditions and become pregnant may be at substantial risk of serious complications.[5] Both patients who have a history of cardiac conditions and those with new onset signs and symptoms can experience heart failure.[5]

Due to the physiologic changes of pregnancy, there is overlap between "common" pregnancy symptoms and symptoms associated with cardiac disease that may lead to delays in diagnosis and treatment.[6] **Table 1** is a cardiovascular disease screening toolkit and triage table that can be adapted to different care settings to determine nonemergent or emergent evaluation for cardiac disease during pregnancy and postpartum.

Table 1. How to Differentiate Between Common Signs and Symptoms of Normal Pregnancy Versus Those That Are Abnormal and Indicative of Underlying Cardiac Disease

	ROUTINE CARE Reassurance	**CAUTION**[*†] Nonemergent Evaluation	**STOP**[†‡] Prompt Evaluation Pregnancy Heart Team
History of CVD	None	None	Yes
Self-reported symptoms	None or mild	Yes	Yes
Shortness of breath	No interference with activities of daily living; with heavy exertion only	With moderate exertion, new-onset asthma, persistent cough, or moderate or severe OSA[§]	At rest; paroxysmal nocturnal dyspnea or orthopnea; bilateral chest infiltrates on CXR or refractory pneumonia
Chest pain	Reflux related that resolves with treatment	Atypical	At rest or with minimal exertion
Palpitations	Few seconds, self-limited	Brief, self-limited episodes; no lightheadedness or syncope	Associated with near syncope
Syncope	Dizziness only with prolonged standing or dehydration	Vasovagal	Exertional or unprovoked
Fatigue	Mild	Mild or moderate	Extreme
Vital Signs	Normal		
HR (beats per minute)	<90	90-119	≥120
Systolic BP (mm Hg)	120-139	140-159	≥160 (or symptomatic low BP)
RR (per minute)	12-15	16-25	≥25
Oxygen saturation	>97%	95-97%	<95% (unless chronic)
Physical examination	Normal		
JVP	Not visible	Not visible	Visible > 2 cm above clavicle
Heart	S3, barely audible soft systolic murmur	S3, systolic murmur	Loud systolic murmur, diastolic murmur, S4
Lungs	Clear	Clear	Wheezing, crackles, effusion
Edema	Mild	Moderate	Marked

Abbreviations: BP, blood pressure; CVD, cardiovascular disease; CXR, chest x-ray; HR, heart rate; JVP, jugular venous pressure;

OSA, obstructive sleep apnea; RR, respiratory rate.
*If unclear, any combination of factors in the yellow column that add up to 4 or more should prompt further evaluation.
†Data in this column from Afshan B. Hameed, Christine H. Morton, and Allana Moore. Improving Health Care Response to Cardiovascular Disease in Pregnancy and Postpartum. Developed under contract #11-10006 with the California Department of Public Health, Maternal, Child and Adolescent Health Division. Published by the California Department of Public Health, 2017. Available at **https://www.cmqcc.org/resources-toolkits/toolkits/improving-health-care-response-cardiovascular-disease-pregnancy-and**
‡History of CVD or signs and symptoms in the red column should lead to urgent evaluation by the Pregnancy Heart Team.
§ Should raise concern about heart failure and should promptly be evaluated.
Reused with permission from Pregnancy and Heart Disease. ACOG Practice Bulletin 212. American College of Obstetricians and Gynecologists. Obstet Gynecol 2019;133:320-356. Table 5 in the source is noted as modified from Thorne S. Pregnancy and native heart valve disease. Heart 2016;102-1410-7.

Pregnant or postpartum people who present for care in an Emergency Department (ED) or other non-obstetric setting with symptoms such as shortness of breath at rest, persistent palpitations, or exertional chest pain, should undergo an immediate assessment for cardiomyopathy with appropriate multidisciplinary consultations.[6]

As a pregnant or postpartum status can increase the risk for cardiovascular disease, healthcare professionals and staff should ask all patients whether they are currently pregnant, have been pregnant within the past year, and if they have a history of cardiovascular disease.[6] Further detail on standardized screening for current and recent pregnancy can be found in the **Recognition and Prevention Section** of this resource kit.

Response and Clinical Keys

As it is determined that a pregnant or postpartum patient has any signs and symptoms in the "Caution" or "Stop" columns of **Table 1**, appropriate facility-wide standard policies and protocols for the assessment, treatment, and escalation of care for pregnant and postpartum people with cardiac conditions should be initiated. Examples of policies and procedures are in the **Readiness Section** of this resource kit and the **Practice Resources** below.

Timing and type of assessment, treatment, and escalation are dependent on the underlying cardiac condition and acuity.[6] Such responses may include immediate consultation with obstetric and cardiovascular care professionals and initiation of cardiac testing, such as an electrocardiogram, B-type natriuretic peptide test, or echocardiogram, or a combination of these, if they are available in a facility.[6]

Healthcare professionals can activate their facility's obstetric rapid response team to initiate response to cardiac emergencies, determine initial treatment plans, and consult with obstetric and cardiac care professionals. Members of the obstetric response team and clinical consultants may be remote.[7]

As the obstetric rapid response team begins initial treatment and consultation, they should determine whether their facility has appropriate resources to care for the pregnant or postpartum patient with cardiac conditions and determine appropriate logistics for stabilization and transport.[8] More details on developing pathways for appropriate patient transport are in the **Readiness Section** of this resource kit.

As facilities prepare for obstetric emergencies, they should build capacity to effectively recognize and respond to cardiac emergencies in pregnant and postpartum people throughout all planning processes. This may include establishing referral pathways and relationships with local and regional cardiology and maternal fetal medicine specialists via telehealth. This will ensure patients receive risk-appropriate, comprehensive care during and following the cardiac emergency.

Resources—Cardiac Conditions in Obstetric Care

- **Cardiovascular Considerations in Caring for Pregnant Patients: A Scientific Statement from the American Heart Association**
- California Maternal Quality Care Collaborative (CMQCC)'s **Resources When Caring for Women With Adult Congenital Heart Disease or Other Forms of Cardiovascular Disease**

Examples - Cardiac Conditions in Obstetric Care

- (CMQCC)'s **Cardiovascular Disease Assessment in Pregnant and Postpartum Women Algorithm**
- **Cardiac Arrest in Pregnancy In-Hospital ACLS Algorithm**

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Conduct Huddles and Post-Event Debriefs to Identify Successes, Opportunities for Improvement, and Action Planning for Future Events

Huddles

Daily huddles or safety huddles are an essential component of safety culture in high reliability organizations. Huddles are "standing meetings" that occur at a consistent time, ideally twice in a 24-hour period for 5–7 minutes and may coincide with the start of a new staffing shift.[1] During daily huddles leaders can share critical information with the entire team, such as changes in staffing, supplies, or processes.[2]

Leaders can also share key reminders about special populations, such as obstetric patients, during huddles.[2] Topics such as screening for pregnancy in triage, screening for intimate partner violence, and management of obstetric complications or other low volume, high risk events may be routinely integrated into huddles. Multidisciplinary and multidepartment involvement may enhance huddles and build situational awareness and a shared mental model for the entire team.[2]

Daily Safety Huddle Example

Facility-Readiness Medical Center

Location-Anywhere, USA

Date and Time- 4/17/2023 07:00

ED team convenes at desk, including oncoming nurses and providers. Off-going shift charge nurse alerts the team that:

- Current patient census in the ED and bed availability in the rest of the facility.
- The night team had a lull in patient flow and checked rooms for outdated supplies while restocking.
- There is a nurse staffing gap at 11 am.
- Their monthly "clinical focus topic" is quantified blood loss in obstetric patients. The team is directed to where the OB Ready box that contains a scale is located and the EMR area to document quantified blood loss.

The laboratory services lead joins the huddle to let the team know that they are currently low on PRBCs, with just 2 current units of O negative blood, but they expect a delivery of blood products around 12:00. The team is encouraged to proactively alert the lab if there is a trauma or another actively bleeding patient who presents via EMS or triage.

Huddle ends.

Total time of huddle: 6 minutes

Event or occurrence huddles are ad hoc, brief standing meetings in cases when there is a change in patient status, change in resources for care, or other acute topics which require team awareness and planning.[3] This type of huddle allows for shared understanding of changing events and team ability to rapidly plan for care.[4] Huddles specific to events or occurrences may include all or just a few team members and can be called by any team member. When appropriate, patients and their designated support team should be included in this type of huddle as their plan of care is determined or altered.

Event or Occurrence Huddle Example

Facility-Readiness Medical Center

Location-Anywhere, USA

Date and Time- 4/17/2023 10:02

EMS is en route to the facility with Ms. R, an otherwise healthy 38 y.o. G5P4 who delivered a term infant via planned, attended vaginal homebirth approximately 3.5 hours ago who now has brisk vaginal bleeding with uterine atony despite administration of oxytocin injection and laceration repair. EBL currently 1000 mL and ongoing. EMS is unable to place IV. ETA is 12 minutes.

The provider, nurse accepting patient, and charge nurse call a huddle. Laboratory services are called to attend the huddle via speaker phone:

- Essentials of the case are summarized.
- Lack of blood availability is reviewed.
- Next steps are determined by the team, and action steps are discretely assigned to appropriate members of the care team:
  - Prioritize IV placement and fluid resuscitation.
  - Proactively call an anesthesia provider to assist with IV placement or surgical intervention if needed.
  - Ensure urine catheter kit is in the room.
  - Ensure OB Ready box is in the room to start QBL and manage bleeding.
  - Alert pharmacy of possible need for OB hemorrhage medication kit delivery or mixing of Tranexamic acid for infusion.
  - Contact supplier of blood to expedite delivery or seek other sources of blood products.
  - Contact closest perinatal regional center to alert of possible need for transfer.

  Huddle ends.

Total time of huddle: 4 minutes

Resources—Huddles

- **IHI Patient Safety Essentials Toolkit: Huddles**
- Agency for Healthcare Research and Quality (AHRQ)'s **Daily Huddle Component Kit**
- AHRQ's **Improving Patient Safety and Team Communication through Daily Huddles**
- Washington State Hospital Association's **Huddle Toolkit**

Debriefs

Post-event debriefs in healthcare are brief, directed conversations that should be held following all patient safety issues, errors, near misses, or significant clinical events.[3] This type of conversation, which should include as many of those who provided care or were involved in the event as possible, reviews the timeline of an event and summarizes actions taken during care. Next, a debrief identifies successes, barriers, and opportunities that can be rapidly addressed to improve care in the future.[5]

Post-Event Debrief Example

Facility-Readiness Medical Center

Location-Anywhere, USA

Date and Time- 4/17/2023 14:52

EMS has just departed to a local perinatal regional care center with Ms. R who was seen and stabilized using a Bakri balloon uterine tamponade system in the ED following an obstetric hemorrhage after a planned homebirth.

The provider reminds the charge nurse and bedside nurse that it is time to debrief, and the anesthesia provider attends by phone. The charge nurse is otherwise busy. The nurse manager is called and agrees to cover for the charge nurse to allow for participation in the debrief. The charge nurse agrees to attend the debrief to take notes in a template.

The timeline and facts of events are fully reviewed, including decision points. A plus (+)/delta (Δ) model debriefing template is used.

Identified +s - What Went Well

- The team held a proactive event huddle.
- The team was aware of blood availability for advance planning.
- The team placed the IV quickly.
- The team communicated with homebirth provider and communications felt collaborative.
- There were no medication delays.

Identified Δs - Opportunities for Improvement

- The OR team was not notified until midway through patient admission.
- The OB Ready box had wrong equipment to use with the Bakri balloon.
- Nurse staffing gap delayed transfer, as a nurse was not available to transport patient per policy.

The team discusses how all feel about the event, and the team is offered support. The team discusses how to follow-up with the homebirth provider and patient.

Debrief ends.

Total time of huddle: 15 minutes

A debrief after an event is not a root cause analysis (RCA) but rather a preliminary component to be held as close following the event as possible for rapid improvements and shared understanding of the event.[6] Debriefs allow teams to identify operational and process difficulties and successes.[5]

Resources—Debriefs

- Agency for Healthcare Research and Quality's **Debriefing for Clinical Learning**
- **Debriefing in the Emergency Department After Clinical Events: A Practical Guide**
- **TALK Debriefing Card**
- Clinical Excellence Commission **Post Event Safety Huddles**

Examples

- **Plus(+)/Delta(Δ) Template Example**
- **Nebraska Coalition for Patient Safety Debriefing, Structures to Plan and Standardize the Debrief Program**

Action Planning

Action planning are the steps taken after a debrief or RCA to address identified gaps in care, processes, and equipment or supplies. This should be inclusive of all members of the care team to reinforce that patient safety and high-quality care is each team member's responsibility. Facilities can design a system to allow team members to document issues and review processes discussed during debriefs. Each facility should identify a formal pathway to share knowledge gained from the event with leadership and staff. Teams should determine formal ownership for improvements as part of actional planning.

Resources—Agency for Healthcare Research and Quality's Action Planning Tool

- **Agency for Healthcare Research and Quality's Action Planning Template**

Action Planning Example

Facility-Readiness Medical Center

Location-Anywhere, USA

Date and Time- week of 5/1/2023

The ED team at Readiness Medical Center communicates identified needs from the debrief to nurse and physician leadership, following established processes.

Action Planning Example (continued)

The nurse and physician leader review +/Δ in their weekly check-in meeting. They agree the nurse manager will own implementing the following 3 identified opportunities for improvement with the hospital Quality Department. Both agree an RCA is not needed at this time.

- In future events the care team needs to notify the supervising nurse administrator to better prepare the OR team in case an anesthesia provider is unable to respond due to actively providing care.

  After discussion with physician leadership in the ED, they decide to form a rapid OB response team at Readiness Medical Center.
- They create a checklist of staff to contact in case of a known obstetric emergency en route to the facility, which includes:
  - ED clinician
  - Anesthesia provider
  - Bedside ED nurse
  - Charge ED nurse
  - Supervising Nurse Administrator
  - Laboratory services
  - Pharmacy services
- Over the course of multiple meetings, they determine roles and responsibilities and develop a document describing them.
- They introduce and reinforce the developed document and rapid OB response team structure during the daily huddle for 2 weeks; email the information to all ED, anesthesia, and staff who fulfill the Supervising Nurse Administrator role; and post the information in the ED breakroom.
- They plan to debrief each instance an OB rapid response team is activated for the first 3-6 months and evaluate its effectiveness.
- OB Ready box equipment needs a 60 cc luer lock syringe not a catheter tip syringe to use Bakri balloon properly.
- They amend the OB Ready Box supply checklist to show this with a photo of each for identification.
- During an ED staff meeting and daily huddle they remind staff about checking the supply list and ensuring that the box is secured (indicating it is stocked) each shift.
- All staff are reminded that missing or incorrect items should be noted and an incident report filed to track and monitor ongoing processes.
- Nurse staffing gap resulting in delayed transfer may highlight a need to reconsider staffing coverage models.
- Nurse manager retrospectively reviews delayed transfers due to nurse availability for all patients.
- Based on analysis noting consistent delays over the last 6 months, they work with ED Shared Governance committee and nursing union to institute a voluntary on-call roster for the ED to pilot.
- They plan to reanalyze transport times and assess for any delays in 6 months.

Perform Multidisciplinary Reviews of Serious Complications Per Established Facility Criteria to Identify System Issues

Review of care beyond an initial debrief is critical to improving obstetric care. Multidisciplinary case reviews evaluate obstetric care and how systems and structures contributed to positive and negative outcomes.[7] These reviews of can inform process improvements in settings without obstetric services. This section provides best practices to perform multidisciplinary reviews of serious complications in obstetric patients to support quality improvement.

Case Identification and Selection

Facilities can determine cases for review based on their volume of obstetric patients seen in their ED. In very low-volume settings, facilities may track all instances of obstetric care and review charts to identify successes and opportunities for improvement. Such chart reviews could be performed by a quality improvement committee or during a medical staff meeting, and internal quality and safety leaders could be engaged during the process. Reviews can consider key elements of care, such as transport times, patient outcomes, and any team concerns. All reviews should be seen as a learning opportunity to improve care.[8]

Each facility should work with facility and system leadership and transfer centers to determine a minimum list of criteria to consider during chart review. These considerations should be consistent across all obstetric chart reviews and potentially integrated into a facility tool or checklist. A list of possible elements of a chart review for obstetric patients in non-obstetric facilities are in **Box 1**. This list is not exhaustive or intended to be interpreted as formal guidance, and teams should review and adapt elements in **Box 1** in relation to their quality improvement priorities and needs.

Box 1. Examples of Chart Review Elements for Obstetric Patients

- Reason for review
- Gestational age (GA)
- Admission diagnosis
- Outcome (e.g., delivery, transport)
- Triage accuracy
- Timely establishment pregnancy status or GA
- Recognition of critical symptoms in obstetric context (e.g., hypertension, hemorrhage, ectopic pregnancy)
- Appropriate transfer
- Appropriate consultation with obstetric care professionals
- Evaluation and determination of whether any decision or action on the part of providers could have resulted in reduced or avoided morbidity or mortality.

Teams may include or collaborate with facilities with obstetric services to inform reviews of obstetric care and can determine in advance the criteria for cases to be collaboratively reviewed. Models for this may range from collaboratively reviewing all obstetric cases to reviewing only those with high morbidity or mortality, such as cases requiring ≥ 4 units of blood products transfused, any transfers requiring intensive care admission, all deaths, instances of uterine rupture, or unexpected newborn complications.[9]

Interfacility chart review can be undertaken in a variety of ways using virtual technology and meetings. This type of review may have legal and peer review considerations for discoverability, confidentiality, and legal agreements, and facilities should establish needed agreements prior to collaboratively reviewing cases. Any chart review undertaken should be anchored in a Just Culture approach. A Just Culture can be modeled by evaluating systems and processes that may have contributed to a negative outcome and avoiding shame and blame directed toward individuals for systems failures.

Example - Confidential Review & Improvement Board

The Northern New England Perinatal Quality Improvement Network's (NNEPQIN) **Confidential Review & Improvement Board (CRIB)** provides independent and confidential case review of unanticipated perinatal outcomes for member hospitals who are part of their perinatal quality collaborative in Vermont, New Hampshire, and Maine.

Resources—Teach-Back Tools

- NYC Health Department's **A Guide to Integrating Severe Maternal Morbidity Case Review into Hospital Quality Improvement Committees** and **Supplemental Online Content**
- **Facility-Based Identification of Women with Severe Maternal Morbidity**
- **Standardized Severe Maternal Morbidity Review: Rationale and Process**
- **Implementing Just Culture to Improve Patient Safety**
- Agency for Healthcare Research and Quality's **Comprehensive Unit-based Safety Program**

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Respectful, Equitable, and Supportive Care

Ongoing challenges in rural communities such as low patient volume and geographic isolation contribute to growing inequities that systematically affect marginalized groups.[1] Respectful care is an overarching framework for health equity and quality of care that can be translated across disciplines. Other sections of the resource kit include additional guidance on actionable practices to support respectful care and promote health equity.

Provide Education and Training to Healthcare Professionals on Health Equity and Respectful Care

Healthcare professionals can be trained in trauma-informed care, implicit bias, and antiracism to optimize their approaches to clinical care and increase awareness of patient groups who are vulnerable to discrimination based on race, ethnicity, education level, insurance coverage, English language proficiency, or other identities and factors that can affect care.[2] The resources provided in **Table 1** are starting points for such education and training.

Table 1. Examples of Free Educational Resources on Health Equity and Respectful Care

Resources	Brief Description
March of Dimes' **Beyond Labels**	This webpage provides interactive educational materials on how stigma can impact healthcare, as well as practical tools and resources to reduce stigma in healthcare settings. Includes links to additional websites, tools and toolkits, and evidence.
Association of Women's Health, Obstetric, and Neonatal Nurses' **Insights Podcast**	This podcast series, which targets obstetric care professionals, has several episodes focused on respectful care and health equity in obstetrics and gynecology. Episodes of note include **Perinatal Bereavement**, **Native American and Alaska Native Heritage Month**, **Respectful Maternity Care**, **The Impact of Implicit Bias in Healthcare**, and **Shared Decision Making**.
University at Albany School of Public Health's **Bridging Gaps: The Vital Role of Cultural Competence in Healthcare**	This recorded webinar and accompanying activity materials presents fundamental concepts on cultural and linguistic competence for medical and public health professionals.
Office of Minority Health – Department of Health and Human Services' **Fundamentals of the National Standards for Culturally and Linguistically Appropriate Services in Maternal Healthcare**	This recorded webinar explores culturally and linguistically appropriate services (CLAS), why they matter, and how the National CLAS Standards can be implemented by healthcare organizations.
Office of Minority Health – Department of Health and Human Services' **Culturally and Linguistically Appropriate Services in Maternal Health Care**	This 2-hour e-learning program is designed for providers seeking knowledge and skills related to cultural competency, cultural humility, person-centered care, and combating implicit bias across the continuum of maternal health care.

Table 1. Examples of Free Educational Resources on Health Equity and Respectful Care (continued)

Resources	Brief Description
American College of Obstetricians and Gynecologists' **Respectful Care eModules**	These courses provide a breadth of knowledge that will help clinicians more effectively offer respectful care in obstetrics, gynecology, and overall patient health.
Institute for Perinatal Quality Improvement's **SPEAK UP Training Modules**	This e-learning program is designed for healthcare professionals who care for Black, Indigenous, and people of color who are or may become pregnant and focuses on implicit and explicit biases that contribute to inequities in care.
Michigan Department of Health & Human Services' **Health Equity, Implicit Bias, Stigma, and Antiracism Resources**	This compilation of resources provides several educational opportunities for healthcare providers to incorporate into their ongoing professional development and work.

Engage in Open, Transparent, and Empathetic Communication with Pregnant and Postpartum People and Their Identified Support Network to Understand Diagnoses, Options, and Treatment Plans

Healthcare professionals must convey information to patients and their support networks in an understandable and patient-centered manner. Clarity in communications with patients has been shown to positively influence patient health behaviors and attitudes,[3] and poorly communicated health information may result in significant risks to patient safety and quality of care.[3] This section describes a few strategies to improve communication with patients and shares implementation resources for healthcare professionals.

Shared Decision Making

Shared decision making is a patient-centered, individualized approach to the informed consent process and medical care.[4] Under this approach, healthcare professionals share and discuss the potential risks and benefits of treatment options with the patient in a way the patient can understand. Patients can share their values and priorities that influence their medical decision-making and inform the treatment plan. This allows patients to receive personalized information about treatment options, thus supporting their ability to make an autonomous decision in alignment with their own values.[4]

Healthcare professionals can integrate shared decision making into their practice by utilizing teach-back methods.[1] **Teach-back methods** help healthcare professionals assess how clearly they communicated information to patients and their support networks[5] and help establish trust and rapport.[6] As healthcare professionals utilize the teach-back method and other forms of decision making, they should be mindful to speak in plain language by avoiding medical jargon[1] and pause and check for understanding frequently.[6]

Resources—Teach-Back Tools

- Institute for Healthcare Advancement (IHA)'s **10 Elements of Competence for Using Teach-back Effectively**
- IHA's **Always Use Teach-back! Training Toolkit**
- IHA's **Teach-Back Quick Guide**
- IHA's **AHRQ's Tool Teach-Back**
- AHRQ's **Use the Teach-Back Method: Tool #5**

Decision aids are another tool that can be used to promote shared decision making between healthcare professionals, patients, and their support networks.[1] Decision aids can improve a patient's knowledge of their care as well as their comfort during decision making processes by exploring treatment options in relation to patients' values and priorities.[1] Teams may review and adapt decision worksheets to guide patients and their support networks through structured conversations regarding options for care.[7]

Resources—Decision Aids

- Washington State Health Care Authority's **How to Identify a High-Quality Patient Decision Aid (PDA)**
- OHRI's **Patient Decision Aids Development Toolkit**

Example—Decision Aids

- Massachusetts General Hospital **Decision Worksheets**

In some emergency scenarios, shared decision making may not be feasible. In instances in which medical treatment is limited to one option, healthcare professionals may need to use compassionate persuasion, informed consent, or informed refusal to guide care.[8] In communicating with patients about limited treatment options and their values, healthcare professionals should balance positive information sharing with respect for patient autonomy.[8]

In other instances, patients may not have the capacity to engage in shared decision making due to physical deterioration or other factors. In these instances, a patient's identified support network should be engaged in care, as appropriate, to align treatment with a patient's values and wishes before resorting to physician-led decision making.[8] Because time to treatment may be of critical importance for life-saving care, healthcare professionals should engage patient support networks as early as possible to ensure interventions align with the patient's values.[8]

Resources—Shared Decision Making in Emergency Settings

- AHRQ's **SHARE Approach Curriculum Tools**
- **Shared Decision-making in the Emergency Department: A Guiding Framework for Clinicians**
- **Shared Decision-making in the Emergency Department: Respecting Patient Autonomy when Seconds Count**

Language Assistance, Interpretation, and Translation Services

Patients requiring language interpretation services have significantly more ED visits and hospitalizations than

patients who do not need such services.[9] Patients with limited English proficiency report lower satisfaction from medical encounters, differential rates in diagnostic testing, and fewer communications from their healthcare providers regarding their care.[10] As such, easily accessible language assistance services are essential to delivering high-quality care and improving health outcomes.[11]

Language Assistance Services (LAS) via translation or interpretation facilitate effective written and verbal communication between healthcare professionals, staff, and patients.[3] These services are often part of national Culturally and Linguistically Appropriate Services Standards,[12] accreditation standards,[13] and other legal requirements.[14]

Teams can determine appropriate LAS based on their patient population and available resources. For example, facilities with a patient population that primarily speaks one or two non-English languages may select different approaches to providing LAS than facilities whose patient population speaks multiple languages.[11] Additionally, facilities may consider whether onsite interpretation services are feasible, or if they should use telephonic or video interpretation.[11]

Teams should develop consistent pathways to ensure interpretation services are rapidly available as patients present for care. In some instances, communications via qualified bilingual healthcare professionals may be appropriate.[13] Healthcare professionals should avoid using members of a patient's support network or other untrained individuals as interpreters.[1]

As teams determine appropriate pathways for LAS, they should develop standard policies and procedures for determining whether patients need interpretation services and coordinating LAS[15] and train all healthcare professionals and staff involved in patient care.[11]

Likewise, teams can determine which languages may be most appropriate for translation of printed educational materials, as well as translate documents such as discharge summaries, consent forms, and other key documents into most spoken languages other than English.[11] Examples of written patient education materials on urgent maternal warning signs are in the **Recognition & Prevention Section** of this resource kit.

Resources—Language Assistance Resources

- Think Cultural Health's **Working Effectively with an Interpreter**
- Massachusetts General Hospital's **Working with an Interpreter: A Guide for Health Care Professionals**
- Centers for Medicare and Medicaid Services' **Providing Language Services to Diverse Populations: Lessons from the Field**
- Rural Health Information Hub's **Enhancing Services for Deaf, Hard of Hearing, and Deafblind Patients in Rural America**
- National Association of the Deaf's **Questions and Answers for Health Care Providers**

Provide Trauma-Informed Care for Patients, Their Identified Support Network, and Staff

Immediate and long-term responses to trauma are unique to each patient and can negatively affect health outcomes.[16] **Trauma-informed care (TIC)** is an approach that assumes that each patient more likely than not has a history of trauma. This type of care recognizes and acknowledges the role trauma may play in an individual's life, including their interactions with medical and healthcare institutions.[17] TIC acknowledges a patient's life experiences to deliver effective care and has the potential to improve patient engagement, treatment adherence, health outcomes, and provider and staff wellness.[18]

Support and services should be evidence-based and foster patient engagement, empowerment, and collaboration.[19] This approach involves attention to six key principles rather than prescriptive practices or procedures.[20] These principles can be generalized across many settings and can be effective tools in providing TIC:

1. Safety
2. Trustworthiness and Transparency
3. Peer Support
4. Collaboration and Mutuality
5. Empowerment, Voice, and Choice
6. Cultural, Historical, and Gender Issues

ED settings may develop appropriate, actionable strategies to provide TIC for pregnant and postpartum patients. As EDs are critical entry points for care, teams may implement routine and universal screening for traumatic experiences.[21] As a patient screens positive, teams may provide resource listings, educational materials, and other supports to facilitate referrals in care.[16] More details on developing resource listings and referral pathways are in the **Readiness Section** of this resource kit.

Healthcare professionals can contribute to a culture of TIC by using psychologically safe practices, such as confirming a patient's name, pronunciation, and pronouns; confirming whether patients want others in the exam room, as appropriate; and sitting level with patients while communicating.[21]

As healthcare professionals begin patient evaluation and exams, they should be mindful of factors that may contribute to a patient's feelings of safety, such as respect for patient modesty and privacy.[21] Healthcare professionals may also guide patients through exams and procedures using person-centered language, describing the exam or procedure in detail, giving warning before touching patients, and ensuring they remain in the patient's line of sight.[21]

Healthcare professionals can use shared decision making as a practical way to integrate TIC into practice as they determine initial care plans with patients and their support networks.[21] More detail on patient-centered communication strategies can be found **earlier in this section**.

Healthcare professionals should be regularly trained in principles of TIC. Such education can include information on the epidemiology of trauma, its health impacts, trauma responses, and clinical skills for TIC care.[22]

As healthcare professionals may experience workplace trauma following a severe event, teams may implement peer support programs to support professionals and develop a just, non-punitive culture following severe events.[23]

Resources—Trauma-Informed Care

- Substance Abuse and Mental Health Services Administration (SAMHSA)'s **Concept of Trauma and Guidance for a Trauma-Informed Approach**
- **Trauma-Informed Care Implementation Resource Center**
- **Trauma-Informed Care in the Emergency Department: Concepts and Recommendations for Integrating Practices Into Emergency Medicine**
- **Trauma-Informed Care Interventions in Emergency Medicine: A Systematic Review**
- **National Partnership for Maternal Safety: Consensus Bundle on Support After a Severe Maternal Event**
- Georgetown University Center for Child and Human Development's **Trauma Informed Care: Perspectives and Resources**
- When Survivors Give Birth's **Educator Training**
- Alliance for Innovation on Maternal Health (AIM)'s **Patient Support After a Severe Event: The Importance of Providing Trauma-Informed Care**
- AIM's **Implementing a Clinician and Staff Peer Support Program**
- Crisis Prevention Institute's **3 Keys to Help Staff Cope with Secondary Trauma**
- SAMHSA's **6 Principles of Trauma-Informed Care**

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- **Trauma-Informed Care Implementation Resource Center**
- **Trauma-Informed Care in the Emergency Department: Concepts and Recommendations for Integrating Practices Into Emergency Medicine**
- **Trauma-Informed Care Interventions in Emergency Medicine: A Systematic Review**
- **National Partnership for Maternal Safety: Consensus Bundle on Support After a Severe Maternal Event**
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Appendix A. Condition- and Event-Specific Equipment and Medications for Care of Obstetric Patients in the Emergency Department

This list of medications and equipment was developed by the resource kit workgroup and is not intended to be exhaustive or serve as formal clinical guidance. This list is meant to serve as a tool that may be used by teams to review their pre-existing resources and equipment, identify gaps in materials, and plan for acquisition of appropriate materials.

Key Points

- Obstetric equipment, supplies, and medications are appropriate for obstetric patients, easily accessible, clearly labeled, and organized.
- Emergency Department staff is educated on the location of all items.
- Daily verification of the proper location and function of equipment in place.

Medications Ideally Stocked in ED

- Anticonvulsants
- Antihypertensives
- Antipyretics
- Atropine, Adenosine, Amiodarone
- Broad spectrum antimicrobial agents
- Bronchodilators
- Corticosteroids
- Inotropic agents
- Insulin/glucose
- Lidocaine
- Magnesium sulfate
- Calcium gluconate
- Naloxone
- Tocolytics: terbutaline, nitroglycerin
- Topical, oral, and parenteral analgesics
- Uterotonics: misoprostol, oxytocin, carboprost tromethamine, methylergonovine
- Tranexamic acid

General Equipment

- Electronic fetal monitoring (EFM) equipment or a handheld doppler
- Ultrasound
- Electrocardiography
- Pulse oximeter
- Stirrups, equipment for pelvic exam positioning
- Thermometer
- Blood pressure cuffs: all sizes
- Sterile speculum
- Urinary catheter kit
- Flashlight if speculums do not have a light source
- Lubricating jelly
- Assorted sizes of sterile gloves
- Infant warmer
- Bulb syringe
- Cord clamps
- Neonatal resuscitation wall chart and flowsheet

Vascular Access

- Catheter over the needle device, gauge 14-24 [14-18 gauge optimal for resuscitation]
- Arterial Line if site has monitoring capability
- IV administration sets with calibrated chambers and extension tubing
- Infusion device with ability to regulate rate and volume of infusate
- Central venous catheters, 4.0F to 7.0F
- Intravenous solutions:
    - Normal Saline
    - Lactated Ringers
    - Dextrose 10% in water

OB-Specific: Hemorrhage Cart, Bag, or Box

Many OB-specific supplies and materials are commonly collected in carts, bags, or boxes to improve ready access and response to obstetric hemorrhages. Because of the condition-specific nature of a hemorrhage cart, bag, or box, additional examples of commonly used supplies to respond to an obstetric hemorrhage are included in **Appendix B**. An example documentation flowchart that may be part of an obstetric hemorrhage cart, bag, or box is included on the **Obstetric Readiness Resource Kit** webpage, as well.

OB-Specific: Hemorrhage

- Long right angle retractors
- Long weighted speculum
- Long needle holder
- Uterine forceps
- Sponge forceps (ring forceps)
- Absorbable sutures
- Vaginal packing options
- Intrauterine balloon (i.e. Bakri, BT-Cath)
- Foley catheter
- B-Lynch or Uterine Compression Suture Kit
- Emergency Hysterectomy Surgical Tray
- Medications:
    - Oxytocin
    - Carboprost tromethamine
    - Misoprostol
    - Methylergonovine
    - Tranexamic Acid

Hypertensive Disorders of Pregnancy

- Blood pressure monitor, cuff sizes child to thigh
- Labetalol
- Hydralazine
- Nifedipine
- Magnesium sulfate IV/IM (can be provided IM if unable to obtain rapid IV access)
- Calcium Gluconate IV
- Lorazepam IV/IM (can be provided IM if unable to obtain rapid IV access)
- Diazepam IV or Phenytoin IV
- Keppra IV or PO
- Urine collective device for protein/creatinine ratio or dipstick if unavailable

Cardiac Disorders of Pregnancy

- Red Flags Checklist: Shortness of breath at rest, orthopnea, resting heart rate >119 bpm, O2 sat <95%
- Electrocardiogram
- Echocardiogram
- BNP (B-type Natriuretic Peptide) testing supplies
- Troponin testing supplies
- Medications:
  - Antiarrhythmic: Adenosine; amiodarone (avoid if pregnant or lactating), flecainide, procainamide, quinidine
  - Nitrates
- Beta blockers: Labetalol, metoprolol, propranolol, carvedilol, atenolol, sotalol
- Calcium channel blockers: Nifedipine, verapamil
- Inotrope: Digoxin
- Diuretics (Furosemide, hydrochlorothiazide)
- Vasodilator: Hydralazine, sodium nitroprusside

Sepsis

- Electronic fetal monitoring (EFM) equipment
- Pulse oximetry
- Blood pressure monitor, varied cuff sizes
- Thermometer
- Foley catheter with urometer
- Culture vials for blood and wound
- IV fluids
- Non-invasive cardiac output monitoring (stroke volume, cardiac output)
- Vasopressors: Norepinephrine
- Inotrope: Dobutamine
- Glucose
- Antipyretics: acetaminophen and cooling blankets
- Fetal lung maturity steroids
- DVT prophylaxis: sequential compression device (SCD)
- Antibiotics

Appendix B. Example Supplies Lists for an Obstetric Hemorrhage Cart, Bag, or Box

Examples of Supplies, Equipment, and Medications	Source
Recommended Supplies ► IV start supplies ► Angiocaths ► IV tubing ► IV extension set ► Blood product transfusion tubing ► Blood warmer tubing ► Urinary catheter kit with urometer ► Flashlight ► Lubricating jelly ► Assorted sizes sterile gloves ► Lab tubes: CBC, coagulation studies, etc. ► Venipuncture supplies ► Pressure infuser bags ► Chux ► Peri-pads ► Vaginal packing (consider arm banding to indicate packing used) ► Hemorrhage balloon and supplies ► Skin marker ► Syringes ► Needles ► Tegaderm ► 2x2 gauze ► Adhesive bandages ► Alcohol swabs ► Paper tape ► Cloth tape ► Manual BP cuff ► Stethoscope ► Povidone iodine ► Personal Protection Equipment (PPE) ► Operating room towels ► Sterile speculum ► Diagrams depicting various procedures (e.g., B-Lynch, uterine artery ligation, balloon placement) ► IV fluids for administration and hemorrhage balloons as your institution permits	**California Maternal Quality Care Collaborative's OB Hemorrhage Toolkit V3.0 – Appendix E: Checklist: Carts, Kits and Trays**

Examples of Supplies, Equipment, and Medications	Source
Recommended Instruments ► Set of vaginal retractors (long right angle); long weighted speculum ► Sponge forceps (minimum: 2) ► Sutures (for cervical laceration repair and B-Lynch) ► Banjo curettes, several sizes ► Long needle holder ► Uterine forceps **Rapid Access Medications** ► Oxytocin (Pitocin) ► Methylergonovine (Methergine) ► Carboprost (Hemabate) ► Tranexamic Acid (TXA) ► Misoprostol (Cytotec)	**California Maternal Quality Care Collaborative's OB Hemorrhage Toolkit V3.0 – Appendix E: Checklist: Carts, Kits and Trays**
Vaginal Birth ► Vaginal retractors ► Long weighted speculum ► Long instruments (needle holder, scissors, Kelly clamps, sponge forceps) ► Intrauterine balloon ► Banjo curette ► Bright task light ► Procedural instructions (balloon) **Cesarean/Laparotomy** ► Hysterectomy tray ► #1 chromic or plain catgut suture & reloadable straight needle for B-Lynch sutures ► Intrauterine balloon ► Procedural instructions (balloon, B-Lynch, arterial ligations) **Rapid Access Medications** ► Oxytocin (Pitocin) ► Carboprost (Hemabate) ► Misoprostol (Cytotec) ► Methylergonovine (Methergine)	American College of Obstetricians and Gynecologists District II's Safe Motherhood Initiative **Example Obstetric Hemorrhage Recommended Instruments Checklist**

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