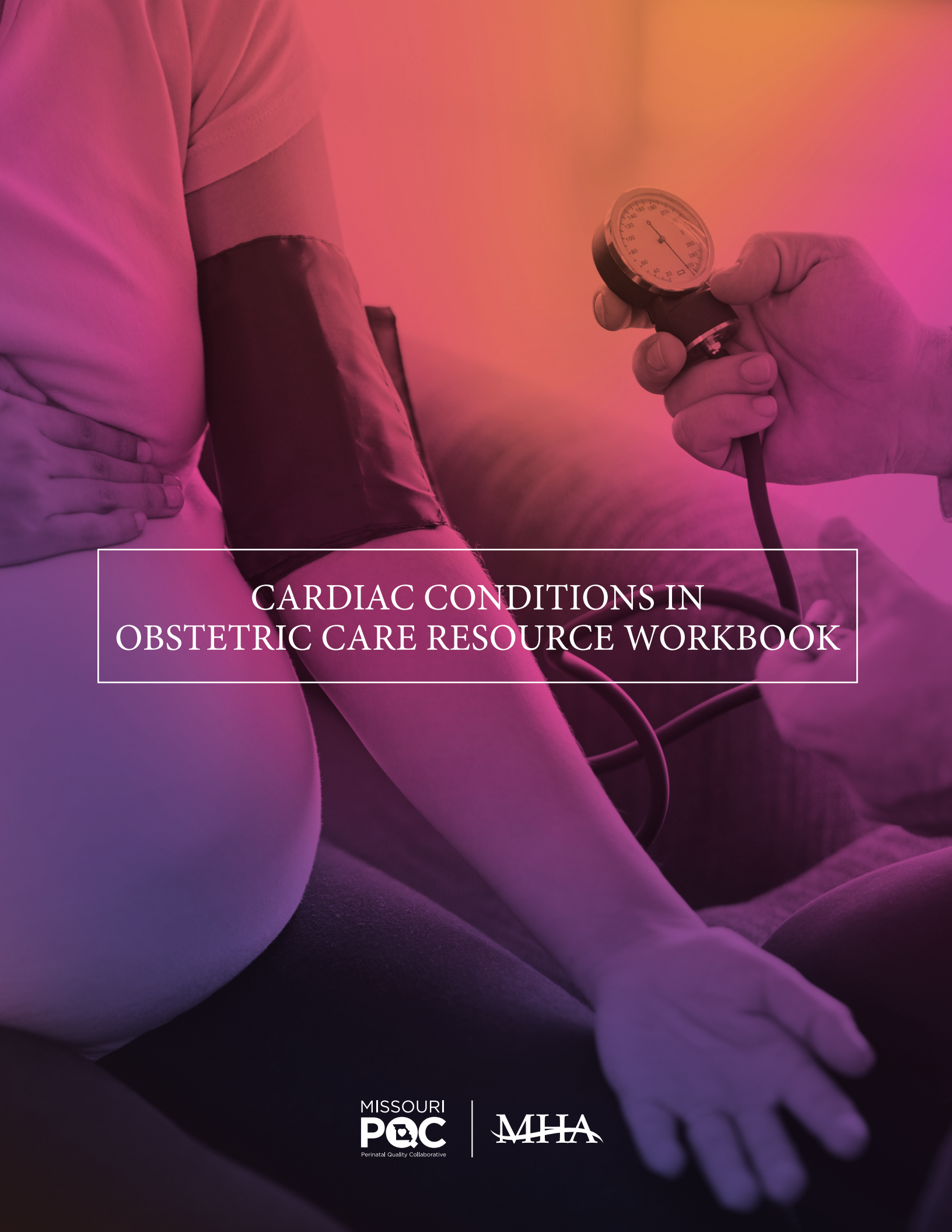
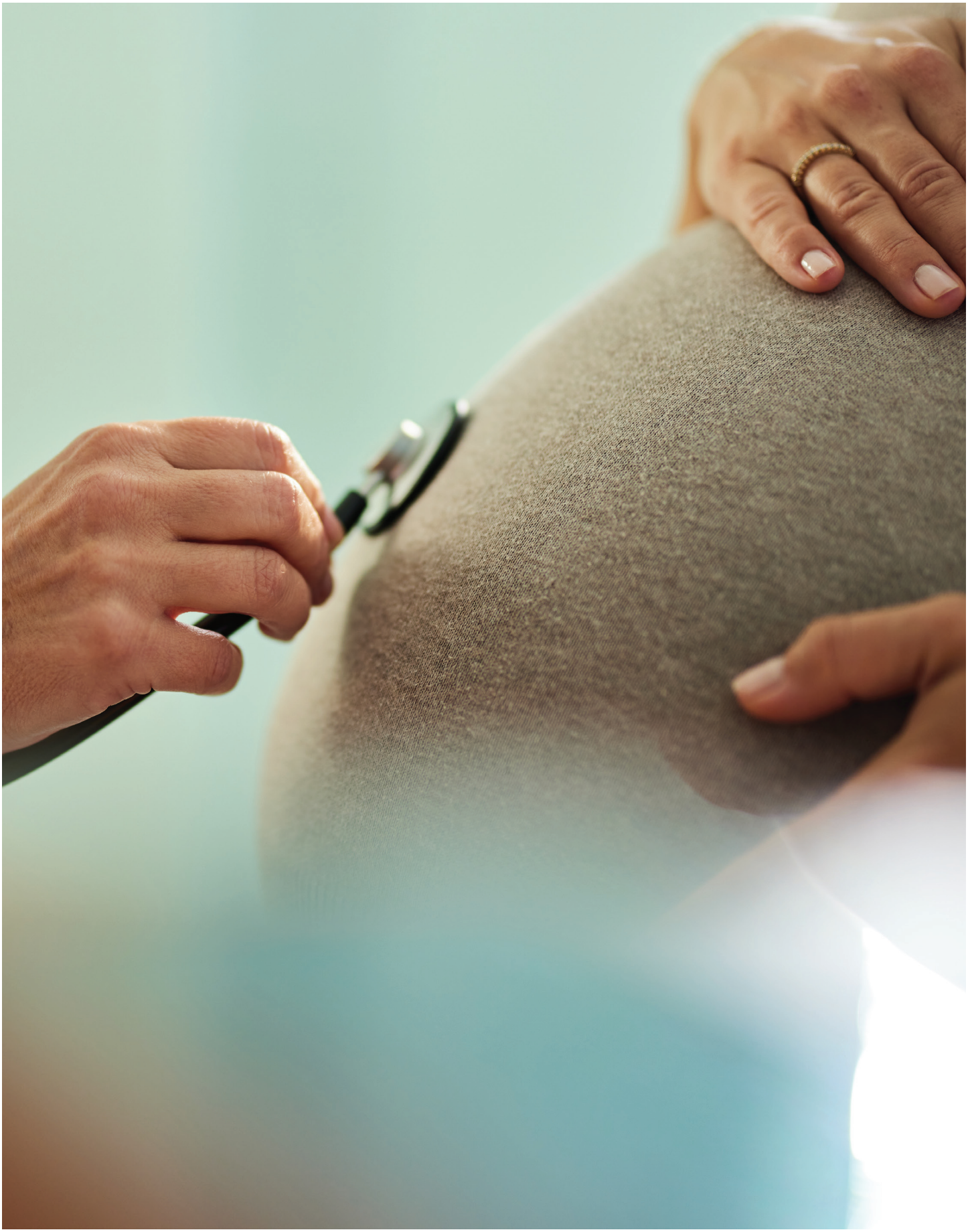


CARDIAC CONDITIONS IN OBSTETRIC CARE RESOURCE WORKBOOK

MISSOURI PQC Perinatal Quality Collaborative | MHA



Acknowledgements

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

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

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

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

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The Evidence

Cardiovascular disease, or CVD, has emerged as the leading cause of maternal mortality and morbidity in the first year postpartum, accounting for more than one-fourth of all maternal deaths in the United States.[2] Studies indicate that more than 70% of cardiovascular pregnancy-related deaths also were determined to be preventable.[2] According to data from the Missouri PAMR annual report, Black women are disproportionately affected, with maternal mortality rates nearly three times higher than those of white women.[3]

Recent national data on maternal mortality by race confirm a statistically significant increase in deaths per 100,000 live births each year from 2018 to 2020.[4] There is an urgent need to mobilize resources to care for pregnant and postpartum birthing people with known and newly diagnosed CVD.

During the course of pregnancy, the cardiovascular system undergoes significant structural and hemodynamic changes. There are major increases in cardiac output and blood volume. Also, there is a decrease in maternal systemic vascular resistance, the renin-angiotensin-aldosterone system is significantly activated, and the heart and vasculature undergo remodeling.[5] While these adaptations allow adequate fetal growth and development, they may exacerbate preexisting conditions or lead to the development of new cardiac disorders like peripartum cardiomyopathy. Understanding the normal cardiovascular changes in pregnancy is essential to caring for patients with or at risk for cardiovascular disease. While pregnancies happen in young, healthy individuals, symptoms like shortness of breath, fatigue and swelling can be attributed to either a normal pregnancy or cardiac disease — highlighting the importance and the need for detailed cardio-obstetric screening. It is crucial for health care providers treating pregnant patients to recognize risk factors, warning signs and physical symptoms that might indicate an underlying heart condition needing thorough evaluation. Timely diagnosis and intervention are essential because many birthing people face significant short- and long-term health issues when cardiovascular disease goes undetected or is diagnosed late.

Missouri's Call to Action

The Missouri PAMR Board reviews all deaths of women and birthing people while pregnant or within one year of the end of the pregnancy. Pregnancy-associated death is the overarching term used when referring to maternal deaths. Within this broad categorization are more specific terms to describe the cause of death, including pregnancy-related death; pregnancy-associated, but not related (PANR) death; and pregnancy-associated, but unable to determine relatedness.[3] See definitions below.

Pregnancy-related death: Death occurring during or within one year of the end of pregnancy from a pregnancy complication, a chain of events initiated by pregnancy, or the aggravation of an unrelated condition by the physiological effects of pregnancy[3]

PANR: Death during or within one year of pregnancy from a cause that is not related to pregnancy[3] (e.g., pregnant person who dies in a natural disaster)

Pregnancy-associated, but unable to determine relatedness: Cases when the board was unable to determine if a death was pregnancy-related or PANR[3]

Maternal morbidity: Any health condition attributed to and/or aggravated by pregnancy and childbirth that negatively impacts women's health short-term or long-term (Updated June 2024)[3]

Maternal mortality: The World Health Organization defines a maternal death as "a death while pregnant or within 42 days of the end of the pregnancy from any cause related to or aggravated by pregnancy or its management, but not from accidental or incidental causes."[6] In Missouri, the term maternal mortality is used to describe the death of a person during pregnancy, childbirth and the postpartum period up to 365 days from the end of the pregnancy (Updated June 2024).[3]

To combat these alarming statistics, many states, including Missouri, have begun to implement the AIM Cardiac Conditions in Obstetric Care patient safety bundle, a standardized set of practices designed to improve care, reduce disparities and ultimately save lives. This approach has been adopted across the nation to ensure early diagnosis, prevent complications and offer comprehensive cardio-obstetric care.

In Missouri, cardiovascular-related maternal deaths are a significant concern. According to the latest Missouri PAMR report, from 2017 to 2021, cardiovascular disease and conditions were responsible for 30% of pregnancy-related deaths, making it the leading causes of maternal mortality in the state.[3] The report highlights that most of these deaths were preventable, emphasizing the importance of early recognition and management of cardiovascular conditions during pregnancy and postpartum. Black women in Missouri were found to be at higher risk, with significantly higher rates of both severe maternal morbidity and mortality.

The following overview of the AIM CCOC patient safety bundle provides guidance for establishing a system to manage the complex health needs of pregnant and postpartum birthing people with cardio-obstetric complications. The goal is to provide recommendations with associated examples and references to facilitate pregnancy cardiovascular risk assessment, appropriate diagnostic testing, early recognition of cardiac emergencies and creation of a cardio-obstetrics team. Implementing structures such as checklists, protocols and multidisciplinary management are included with an emphasis on respectful care to support reduction of health disparities.

Additional resources are linked in this toolkit to further support knowledge, implementation and patient education.

Birthing organizations interested in implementing the AIM Cardiac Conditions in Obstetric Care patient safety bundle may register with the MO PQC.

AIM Bundle Components[7]

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

For the purpose of this bundle, cardiac conditions refer to disorders of the cardiovascular system which may impact maternal health. Such disorders may include congenital heart disease or acquired heart disease, including but not limited to cardiac valve disorders, cardiomyopathies, arrhythmias, coronary artery disease, pulmonary hypertension and aortic dissection.

For resources and additional links for all CCOC bundle components, please review the CCOC Change Package.

Readiness — Every Unit/Team

- ☐ Train all obstetric care providers to perform a basic Cardiac Conditions Screen. Determine which screening tool will be used and train providers to use it. A cardiac conditions screening tool should include the following.
  - ☐ patient history of cardiac conditions
  - ☐ patient-reported symptoms
  - ☐ vital signs
  - ☐ physical examination
- ☐ Establish a protocol for rapid identification of potential pregnancy-related cardiac conditions in all practice settings into which pregnant and postpartum people may present.
  - ☐ In rural and other remote tertiary center settings, recognize that the lack or unavailability of a cardio-obstetrical team does not remove presentation of pregnant and postpartum patients.
  - ☐ Build in screening and obstetrical emergency readiness at points of entry and construct a pathway to mobilize a multidisciplinary team.
  - ☐ Develop and test the protocol across care settings to affirm it is working as intended.
- ☐ Develop a patient education plan based on the pregnant and postpartum person's risk of cardiac conditions.
  - ☐ Emphasize occurrence of adverse obstetrical events based on the modified World Health Organization (WHO) Risk Criteria in Pregnancy, including those patients with known CVD, given that the normal cardiovascular changes in pregnancy can result in decompensation of CVD.[8]
  - ☐ Emphasize shortness of breath, tachycardia, and other chief complaints as key issues, and know when to prompt immediate consultation.
  - ☐ Inform and educate physicians and nurses to not presume that patients with adult congenital heart disease know the signs and symptoms of worsening cardiac conditions imposed by their pregnancy experience.

- [ ] Establish a multidisciplinary "Pregnancy Heart Team" or consultants appropriate to their facility's designated Maternal Level of Care to design coordinated clinical pathways for people experiencing cardiac conditions in pregnancy and the postpartum period.
    - [ ] Identify team members with specified roles and responsibilities.
    - [ ] Run drills for the team with scenarios in different hospital settings, including in situ, clinical settings and operating rooms.
    - [ ] Establish a known code phrase (appearing on overhead page or in digital alerts) for cardiac emergencies so all disciplines develop situational awareness.
- [ ] Establish coordination of appropriate consultation, co-management and/or transfer to appropriate level of maternal or newborn care.
    - [ ] Ensure access to blood pressure cuffs of all sizes for home measurement and telehealth in rural settings.
    - [ ] Use the hub-and-spoke model to increase access with predetermined referral and transport system with appropriate transport personnel.
- [ ] Develop trauma-informed protocols and training to address health care team member biases to enhance quality of care.
- [ ] Develop and maintain a set of referral resources and communication pathways between obstetric providers, community-based organizations, and state and public health agencies to enhance quality of care.

Recognition and Prevention — Every Unit

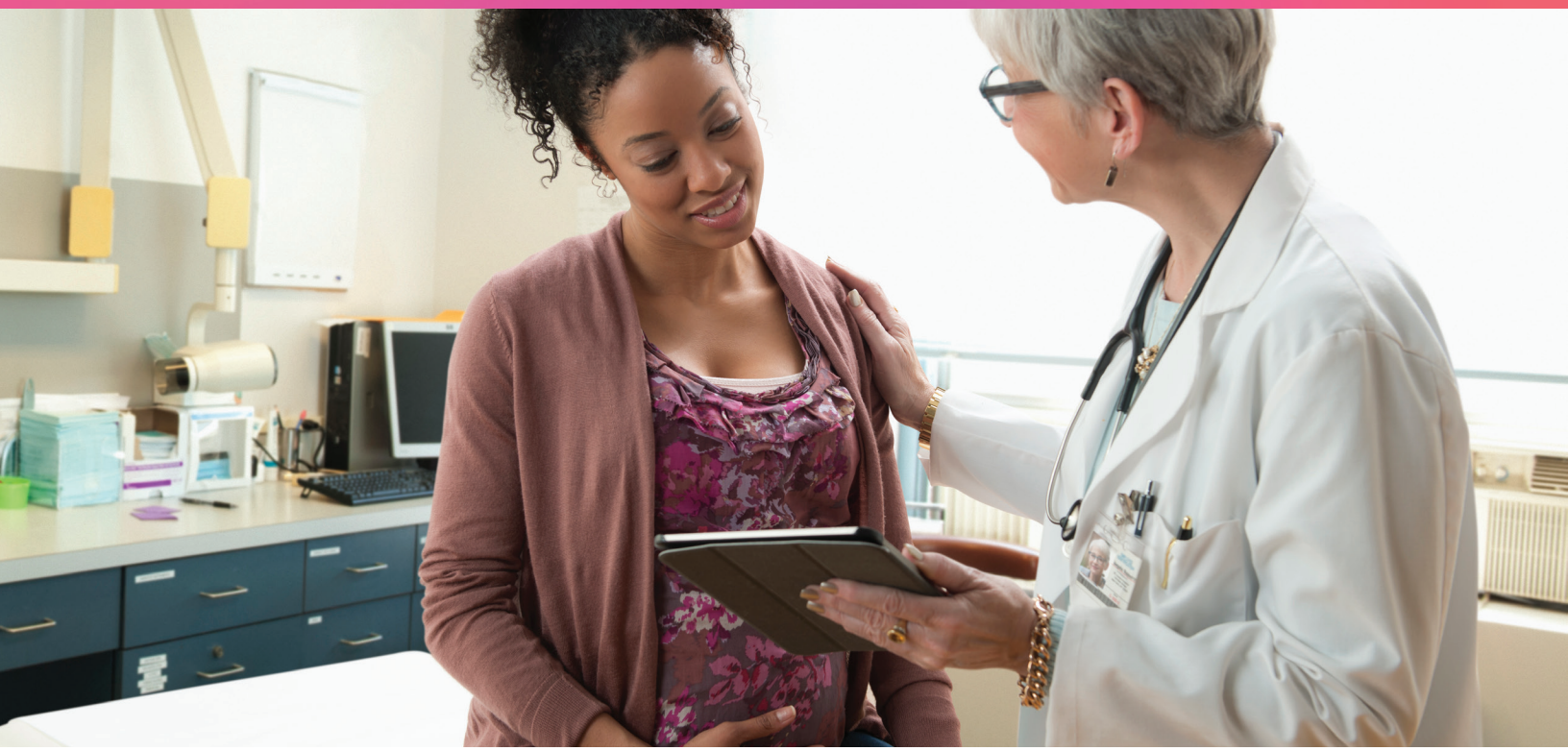
- [ ] Obtain a focused pregnancy and cardiac history in all care settings, including emergency department, urgent care and primary care.
    - [ ] Staff triage (OB and emergency) with skilled nurses for identification of cardiac issues.
    - [ ] Ensure that elements of cardiac history are understood beyond just pregnancy-related assessment.
- [ ] In all care environments assess and document if a patient presenting is pregnant or has been pregnant within the past year.
    - [ ] Build inquiry into all entrance portals for care and ensure gender inclusivity in assessment.
    - [ ] Encourage and inquire about information associated with recent pregnancies to the entire health care team, including physicians and nurses.
- [ ] Assess if escalating warning signs for an imminent cardiac event are present.
- [ ] Utilize standardized cardiac risk assessment tools to identify and stratify risk. Utilize the cardiac risk assessment tools. (Most cases ultimately are risk-assessed individually; however, the tools exist to provide guidance).
    - [ ] mWHO
    - [ ] CARPREG I
    - [ ] CARPREG II
    - [ ] Pregnancy in congenital heart disease: risk prediction and counselling | Heart
- [ ] Conduct a risk-appropriate workup for cardiac conditions to establish a diagnosis and implement the initial management plan.
- [ ] Screen each person for condition-associated risk factors and provide linkage to community services and resources.

Response — Every Patient

- [ ] Develop facility-wide standard protocols with checklists and escalation policies for management of cardiac symptoms.
    - [ ] Develop a protocol and escalation policy in accordance with maternal levels of care with defined roles, triggers, treatment algorithms and referral/follow-up plans.
    - [ ] Involve patients with lived experience in the development of protocols.
    - [ ] Create individualized plans for discharge from the emergency department or postpartum using specific criteria and with follow-up plans.
    - [ ] Designate a provider to take the lead on patient and family communication during a crisis and ensure the use of an interpreter when needed.
- [ ] Create facility-wide standard protocols with checklists and escalation policies for management of people with known or suspected cardiac conditions.
    - [ ] Develop a protocol and escalation policy in accordance with maternal level of care with defined roles, triggers, treatment algorithms and referral/follow-up plans.
    - [ ] Involve patients with lived experience in the development of protocols.
    - [ ] Designate a provider to take the lead on patient and family communication during a crisis and ensure the use of an interpreter when needed.
- [ ] Coordinate transitions of care, including the discharge from the birthing facility to home and transition from postpartum care to ongoing primary and specialty care.
    - [ ] Provide access to a shared EHR across settings.
    - [ ] Maintain a list of cardiologists willing to focus on pregnant and postpartum patients and OB-GYN and primary care providers who are comfortable with cardiac conditions.
    - [ ] Create treatment plans readily accessible in an EHR.
    - [ ] Standardize hand-off tools and communications for transitions of care.
- [ ] Offer reproductive life planning discussions and resources, including access to a full range of contraceptive options in accordance with safe therapeutic regimens.
- [ ] Provide patient education focused on general life-threatening postpartum complications and early warning signs, including instructions of who to notify if they have concerns, and the time and date of a scheduled postpartum visit.
    - [ ] Engage community-based organizations in the development of culturally appropriate and language-specific materials.
    - [ ] Use teach-back to assess patient understanding of discharge communication.
    - [ ] Use infographics to help educate all patients and their support network and include in the discharge packet in each facility.

Reporting and Systems Learning — Every Unit

- ☐ For pregnant and postpartum people at high risk for a cardiac event, establish a culture of multidisciplinary planning, admission huddles and post-event debriefs.
    - ☐ Have a formal review following a serious cardiac event to assess alignment with standard policies and procedures (with appropriate updates) and to identify opportunities for improvement (including identification of discriminatory practices).
        - ☐ Establish standardized briefing documentation to capture successes and determine actionable follow-up.
        - ☐ Maintain awareness of how disparaging labels like "frequent flyer," "noncompliant," etc., can undermine care and trust in the system.
        - ☐ Identify improvement champions in each setting.
    - ☐ Archive debriefing documentation for OB cardiac conditions events and review systematically with unit-specific and quality improvement leadership teams. Establish unit-specific and QI leadership teams to review and address quality and safety issues.
    - ☐ Conduct huddles in conjunction with a stage-based algorithm to be responsive to evolving clinical scenarios. Include patients and families in bedside huddles if they want to participate.
    - ☐ Have an immediate post-event debrief (with equity lens) for support and learning. Establish standardized briefing documentation to capture successes and determine actionable follow-up.
    - ☐ Have a more formal after-action review with the designated leader and standardized content. Include reflections on equity as part of the review.
    - ☐ Include an assessment of transfers to higher levels of care and multidisciplinary planning and treatment as part of the review. Emphasize excellence in transferring patients and collaborating across teams to help remove stigma for referral and transfer.
- ☐ Perform multidisciplinary reviews of serious complications (e.g., ICU admissions for other than observation) to identify systems issues.
    - ☐ Have a formal review following care of those at highest risk and those who experienced complications to assess alignment with standard policies and procedures (with appropriate updates) and to identify opportunities for improvement (including identification of discriminatory practices).
    - ☐ Include involved providers (specialists and generalists) in the review process with a focus on ways to improve care.
    - ☐ Identify key processes and outcomes for QI data collection; include staff training metrics among run charts. Align QI data collection with a perinatal quality collaborative (such as the MO PQC) and with a hospital quality committee/officer.
- ☐ Monitor outcomes and process data related to cardiac conditions, with disaggregation by race and ethnicity due to known disparities in rates of cardiac conditions experienced by Black and Indigenous pregnant and postpartum people.
    - ☐ Collaborate with health information technology or appropriate staff to modify EHRs and automate data collection and reporting.
    - ☐ Set specific goals for closing identified disparities using the SMARTIE format (strategic, measurable, ambitious, realistic, timebound, inclusive and equitable).
    - ☐ Collect and analyze REAL (Race, Ethnicity and Language) data.
    - ☐ Review all process and outcome data disaggregated by REAL to assess for inequities with unit-specific and QI leadership teams.
    - ☐ Assess quality of REAL data and develop processes for improved data collection.



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

- ☐ Screen for structural and social drivers of health that might impact clinical recommendations or treatment plans and provide linkage to resources that align with the pregnant or postpartum person's health literacy, cultural needs and language proficiency.
  - ☐ Ensure that providers have information and resources to screen for social drivers of health.
  - ☐ Educate clinicians on providing respectful care by engaging in the lifelong learning of cultural humility, understanding that individuals cannot learn all aspects of any culture, including their own.
- ☐ Engage in open, transparent and empathetic communication with pregnant and postpartum people and their identified support network to understand diagnoses, options and treatment plans.
  - ☐ Clarify goals and values for pregnancy that are essential to include in a patient's treatment plan.
  - ☐ Refer patients who have experienced significant cardiac events for trauma follow-up care and consider referral to a support group (such as SCAD Alliance).
  - ☐ Include the patient's support network contact information in the EHR.
- ☐ Include each pregnant or postpartum person and their identified support network as respected members of and contributors to the multidisciplinary care team.

Resources

General Resources

MO PQC: Cardiac Conditions in Obstetric Care
MO PQC: MO PQC CCOC Data Specification Manual
AIM: Cardiac Conditions in Obstetric Care
AIM: CCOC Patient Safety Bundle
AIM: CCOC Implementation Details
AIM: CCOC Implementation Resources
AIM: CCOC Change Package
AIM: CCOC Learning Modules
Peripartum Cardiomyopathy Registry: PPCM Fast Facts

Educational Resources

California Maternal Quality Care Collaborative: Improving Health Care Response to Cardiovascular Disease in Pregnancy and Postpartum
Georgia Perinatal Quality Collaborative: Cardiac Education
Centers for Disease Control and Prevention: Maternal Mortality Prevention

Risk Assessment and Screening Tools

Heart: Pregnancy in Congenital Heart Disease: Risk Prediction and Counselling
European Heart Journal: 2018 ESC Guidelines for the Management of Cardiovascular Diseases During Pregnancy
Circulation: Prospective Multicenter Study of Pregnancy Outcomes in Women With Heart Disease
Journal of the American College of Cardiology: Pregnancy Outcomes in Women With Heart Disease: The CARPREG II Study
Global Library of Women's Medicine: Pregnancy in the Woman With Preexisting Cardiovascular Disease
Heart: Prospective Validation and Assessment of Cardiovascular and Offspring Risk Models for Pregnant Women With Congenital Heart Disease

Teamwork, Communication and Debriefing

American Hospital Association: Houston Methodist Willowbrook TeamSTEPPS Success Story
AHA: Debrief: AHA TeamSTEPPS Video Toolkit

Patient Engagement

CDC: Hear Her® Campaign
Maternal Mortality and Morbidity Advocates: MoMMAs Voices

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