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## **Cardiac Conditions in Obstetric Care Bundle**



*Implementation Resources*






# Cardiac Conditions in Obstetric Care Bundle Implementation Resources


Section	Resource	Description	Link
<b>Readiness</b>			
<b>Readiness</b>	<p>ACOG Practice Bulletin #212: Pregnancy and Heart Disease, May 2019</p> <p>ACOG, 2019</p>	<p>Abstract: Maternal heart disease has emerged as a major threat to safe motherhood and women’s long-term cardiovascular health. In the United States, disease and dysfunction of the heart and vascular system as “cardiovascular disease” is now the leading cause of death in pregnant accounting for 4.23 deaths per 100,000 live births, a rate almost twice that of the United Kingdom. The most recent data indicate that cardiovascular diseases constitute 26.5% of U.S. pregnancy-related deaths. Of further concern are the disparities in cardiovascular disease outcomes, with higher rates of morbidity and mortality among nonwhite and lower-income women. Contributing factors include barriers to pre-pregnancy cardiovascular disease assessment, missed opportunities to identify cardiovascular disease risk factors during prenatal care, gaps in high-risk intrapartum care, and delays in recognition of cardiovascular disease symptoms during the puerperium. The purpose of this document is to 1) describe the prevalence and effect of heart disease among pregnant and postpartum women; 2) provide guidance for early antepartum and postpartum risk factor identification and modification; 3) outline common cardiovascular disorders that cause morbidity and mortality during pregnancy and the puerperium; 4) describe recommendations for care for pregnant and postpartum women with preexisting or new-onset acquired heart disease; and 5) present a comprehensive interpregnancy care plan for women with heart disease.</p>	




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<p><b>Readiness</b></p>	<p>Pregnancy in congenital heart disease: risk prediction and counselling</p> <p><i>BMJ, 2020</i></p>	<p>Abstract: Pregnancy is a major life event for almost every woman. However, for women with heart disease pregnancy is associated with additional risks and deserves special attention. The number of pregnancies in women with congenital heart disease has increased over the past decades and is expected to rise further in the coming years. Physiological changes in the cardiovascular system during pregnancy may bear a risk for those with congenital heart disease who are not able to sufficiently adapt. Subsequently, heart failure, arrhythmias and worsening of the cardiac condition may complicate pregnancy and expose mother and child to an increased risk of morbidity and mortality. Congenital heart disease is often already diagnosed and treated at the time women start thinking about pregnancy, and hence counselling and risk prediction can be offered. In contrast to acquired heart disease, congenital heart disease bears a relatively low risk of complications during pregnancy. This is partly attributable to good counselling and close follow-up in specialized centers. Dedicated guidelines on pregnancy and heart disease have become available in the past decade, enabling the physician to provide standard and individualized care during pregnancy. A multidisciplinary ‘pregnancy heart team’ is required to support management of counselling, follow-up and delivery. This review addresses risk stratification and counselling in women with congenital heart disease contemplating pregnancy.</p>	
<p><b>Readiness</b></p>	<p>In cardio-obstetrics, clinicians must think ‘outside the box’ on CV issues in pregnancy</p> <p><i>Cardiology Today, 2020</i></p>	<p>“We are realizing more now than ever that we need collaboration between cardiology and maternal-fetal medicine, as mortality rates are worsening for women with cardiovascular disease who are pregnant,” Cardiology Today Next Gen Innovator Ki Park, MD, clinical assistant professor of medicine (interventional cardiology) at University of Florida in Gainesville and director of women’s cardiovascular health services at UF Health, said in an interview.</p> <p>Increased awareness is needed among cardiologists and other health care professionals such as maternal-fetal medicine specialists and obstetricians who are part of a cardio-obstetrics team so that CV symptoms are not confused with routine pregnancy-associated symptoms.”</p>	

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<p><b>Readiness</b></p>	<p>Improving Health Care Response to Cardiovascular Disease in Pregnancy and Postpartum Toolkit</p> <p>CMQCC, 2017</p>	<p>Cardiovascular disease (CVD) is the leading cause of maternal mortality in the United States and California.</p> <p>CVD accounts for &gt;33% of all pregnancy-related deaths in the US and 25% of pregnancy-related deaths in CA (2002–2006).</p> <p>Data from the California Pregnancy Associated Mortality Review (CA-PAMR) of deaths occurring from 2002–2006 show that.</p> <p>Only a small fraction of these women had a known diagnosis of cardiovascular disease prior to death.</p> <p>Most women who died had presented with symptoms either during pregnancy or after childbirth.</p> <p>A significantly higher proportion of women sustain short- and long-term morbidity due to undiagnosed or delayed diagnosis of cardiovascular disease as evidenced by the fact that one of every three intensive care admissions in pregnancy and postpartum period are related to cardiac disease.</p> <p>25% of these deaths may have been prevented if heart disease was diagnosed earlier.</p> <p>To address these issues, CMQCC together with the California Department of Public Health: Maternal, Child and Adolescent Health Division published the Improving Health Care Response to Cardiovascular Disease in Pregnancy and Postpartum Toolkit in 2017.</p> <p>The toolkit is available to download in the “Resources” section of our website:</p> <p>Improving Health Care Response to Cardiovascular Disease in Pregnancy and Postpartum Toolkit</p>	
<b>Recognition</b>			
<p><b>Recognition</b></p>	<p>Modified WHO Classification of Maternal Cardiovascular Risk: Application</p> <p>CMQCC, 2017</p>	<p>Cardiovascular Disease in Pregnancy and Postpartum Toolkit</p>	



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Recognition	Pregnancy Risk Assessment Using ESC Guidelines  <i>European Society of Cardiology, 2017</i>	Risk assessment and counselling should be performed in all women with heart disease, preferably before pregnancy. This allows women to make an informed decision on whether or not to get pregnant. Maternal and fetal risk should be addressed, including genetic aspects. The possibility to decrease maternal risk through a pre-pregnancy intervention (e.g. aortic replacement when severe aortic dilatation exists) should be considered. Cardiac medication should be revised and if necessary changed to ensure fetal safety. A follow-up plan during the pregnancy should be discussed.	
Recognition	Resources When Caring For Women With Adult Congenital Heart Disease Or Other Forms Of Cardiovascular Disease  <i>CMQCC,2017</i>	A summary of guidelines published by the American College of Cardiology and the American Heart Association in conjunction with other professional groups that manage adult cardiovascular disease. These guidelines are based on scientific evidence reviewed by experts in their field of practice. The purpose of the guidelines is to give clinicians the most current evidence upon which to base management of adults with specific cardiac disease. This synopsis is intended to provide information to clinicians who care for women with cardiac disease about current resources and management strategies. Key components of comprehensive, evidence based care include resources consisting of diagnostic testing, imaging and experienced multidisciplinary staff. Recommendations for appropriate resources when providing care for adults with cardiac disease are also included.	





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<p><b>Recognition</b></p>	<p>Maternal Heart Failure <i>Journal of the American Heart Association, 2021</i></p>	<p>Abstract: Heart failure (HF) remains the most common major cardiovascular complication arising in pregnancy and the postpartum period. Mothers who develop HF have been shown to experience an increased risk of death as well as a variety of adverse cardiac and obstetric outcomes. Recent studies have demonstrated that the risk to neonates is significant, with increased risks in perinatal morbidity and mortality, low Apgar scores, and prolonged neonatal intensive care unit stays. Information on the causal factors of HF can be used to predict risk and understand timing of onset, mortality, and morbidity. A variety of modifiable, non-modifiable, and obstetric risk factors as well as comorbidities are known to increase a patient’s likelihood of developing HF, and there are additional elements that are known to portend a poorer prognosis beyond the HF diagnosis. Multidisciplinary cardio-obstetric teams are becoming more prominent, and their existence will both benefit patients through direct care and increased awareness and educate clinicians and trainees on this patient population. Detection, access to care, insurance barriers to extended postpartum follow-up, and timely patient counseling are all areas where care for these women can be improved. Further data on maternal and fetal outcomes are necessary, with the formation of State Maternal Perinatal Quality Collaboratives paving the way for such advances.</p>	


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<p><b>Recognition</b></p>	<p>Cardiovascular Disease Assessment in Pregnant And Postpartum Women <i>CMQCC,2018</i></p>	<p>The goal of the algorithm is to assist providers in distinguishing between signs and symptoms of cardiac disease and those of normal pregnancy and to guide clinicians in the triage of further cardiac evaluation, appropriate referrals and follow-up of pregnant and postpartum women who may have cardiovascular disease. Drawing from the literature and analysis of cardiovascular deaths reviewed in the California Pregnancy Associated Mortality Review (CA-PAMR), the authors created this algorithm based on risk factors, symptoms, vital sign abnormalities, and physical examination findings commonly identified in women who die of various types of cardiovascular disease. The most severe symptoms and vital sign abnormalities are labeled as “Red Flags” and include shortness of breath at rest, severe orthopnea necessitating four or more pillows, resting heart rate <math>\geq 120</math> beats per minute, resting systolic blood pressure <math>\geq 160</math> mm Hg, resting respiratory rate of <math>\geq 30</math> breaths per minute and an oxygen saturation <math>\leq 94\%</math>. The presence of Red Flags or a personal history of cardiovascular disease in pregnant or postpartum women should lead clinicians to conduct a prompt evaluation and seek consultations with specialists in maternal fetal medicine and primary care or cardiology. If other less severe symptoms and vital sign abnormalities are identified, then risk factors and physical examination findings may need to be combined to stratify the women who require further work-up or routine follow-up.</p>	




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<b>Response</b>			
Response	<p>Cardiovascular Considerations in Caring for Pregnant Patients: A Scientific Statement From the American Heart Association</p> <p><i>American Heart Association, 2020</i></p>	<p>Cardio-obstetrics has emerged as an important multidisciplinary field that requires a team approach to the management of cardiovascular disease during pregnancy. Cardiac conditions during pregnancy include hypertensive disorders, hypercholesterolemia, myocardial infarction, cardiomyopathies, arrhythmias, valvular disease, thromboembolic disease, aortic disease, and cerebrovascular diseases. Cardiovascular disease is the primary cause of pregnancy-related mortality in the United States. Advancing maternal age and preexisting comorbid conditions have contributed to the increased rates of maternal mortality. Preconception counseling by the multidisciplinary cardio-obstetrics team is essential for women with preexistent cardiac conditions or history of preeclampsia. Early involvement of the cardio-obstetrics team is critical to prevent maternal morbidity and mortality during the length of the pregnancy and 1 year postpartum. A general understanding of cardiovascular disease during pregnancy should be a core knowledge area for all cardiovascular and primary care clinicians. This scientific statement provides an overview of the diagnosis and management of cardiovascular disease during pregnancy.</p>	
Response	<p>Heart Disease &amp; Pregnancy</p> <p><i>Cleveland Clinic, 2019</i></p>	<p>Patient Education and link to Cleveland Clinic Cardio-Obstetrics Clinic: If you have a heart condition you may need to take special precautions before and during pregnancy. Some heart conditions can increase a woman's risk of complications. In addition, some women have heart or blood vessel conditions that are not identified until pregnancy. The mother's health and wellbeing are critical because if something bad happens to her, the baby is unlikely to survive.</p>	
Response	<p>Ensuring a Heart-Healthy Pregnancy</p> <p><i>BIDMC, 2020</i></p>	<p>Collaborating with specialists in BIDMC's Division of Maternal and Fetal Medicine and in the Department of Anesthesia, Feinberg and colleagues in the Women's Cardiovascular Health program provide a highly specialized treatment approach for women with underlying cardiovascular issues who want to become pregnant as well as for women who develop cardiac problems during pregnancy. "By working together, we can identify potential problems and carefully coordinate care before, during and after a woman's pregnancy and delivery," says Feinberg.</p>	






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<p><b>Response</b></p>	<p>Maternal Cardiac Teams <i>UR Medicine</i></p>	<p>UR Medicine has two new, unique multidisciplinary programs for pregnant people with cardiac disease. These are the only programs of their kind in Upstate New York.</p> <p>Although having a baby is an exciting time, having cardiac disease can put both parent and baby at risk for complications before and during delivery. There are a number of normal changes that women undergo during pregnancy to support the developing baby; however, for women with cardiac disease, these changes can put additional strain on the heart.</p> <p>Women with cardiac conditions who are considering pregnancy or are pregnant need to be followed and cared for by a team of specialists to help parent and baby have the best outcomes possible.</p> <p>Women with cardiac conditions are followed by these two special teams:</p> <p>UR Medicine Maternal-Fetal Care &amp; UR Medicine’s Women’s Heart Program—For women with cardiac conditions that they were not born with, but developed later in life.</p> <p>UR Medicine Maternal-Fetal Care &amp; UR Medicine Adult Congenital Heart Program—For women born with cardiac conditions that were previously followed by Pediatric Cardiology.</p>	
<b>Reporting &amp; Systems Learning</b>			
<p><b>Reporting &amp; Systems Learning</b></p>	<p>Integrated Approach to Reduce Perinatal Adverse Events: Standardized Processes, Interdisciplinary Teamwork Training, and Performance Feedback <i>Health Services Research, 2016</i></p>	<p>Communication breakdown and poor teamwork are major risks in perinatal units, associated with 70 percent of perinatal injury (The Joint Commission 2004) and increasing the risk of error 10-fold while accounting for approximately 55 percent of all active failures in a hospital setting. Overall, it is estimated that 30 percent of obstetric complications are preventable, and growing evidence suggests that applying reliability principles to health care has the potential to reduce flaws in care processes and increase the consistency with which appropriate care is delivered leading to improved patient outcomes. These strategies are aimed toward achieving high reliability, defined as defect-free operations for long periods of time in a hazardous environment.</p>	

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<b>Reporting &amp; Systems Learning</b>	<p>Checklists, Huddles, and Debriefs: Critical Tools to Improve Team Performance in Obstetrics</p> <p><i>Washington State Health Care Authority</i></p>	<p>Checklists, huddles, and debriefs are tools being more commonly adopted in health care with the goal to achieve a safer health system. Details regarding what, how and when to implement these tools in different circumstances related to women’s health are described in this review.</p>	
<b>Reporting &amp; Systems Learning</b>	<p>Improving situation awareness to reduce unrecognized clinical deterioration and serious safety events</p> <p><i>Patient Safety Network, 2013</i></p>	<p>Communication failures among healthcare personnel are significant contributors to medical errors and patient harm. When used consistently, huddles—a technique to enhance team communication—are an effective and efficient way for healthcare teams to share information, review their performance, proactively flag safety concerns, increase accountability, and ensure that safety interventions are hardwired into the system. Huddles empower and engage frontline staff in problem identification and build a culture of collaboration and quality, thereby enhancing the ability to deliver safer care.</p>	
<b>Respectful, Equitable &amp; Supportive Care</b>			
<b>Respectful, Equitable &amp; Supportive Care</b>	<p>Respectful Maternity Care: The Universal Rights of Childbearing Women</p> <p><i>White Ribbon Alliance, 2021</i></p>	<p>White Ribbon Alliance: WRA was one of the first global organizations to define respectful maternity care and outline the rights of childbearing women.</p>	
<b>Respectful, Equitable &amp; Supportive Care</b>	<p>The Cycle to Respectful Care: A Qualitative Approach to the Creation of an Actionable Framework to Address Maternal Outcome Disparities</p> <p><i>National Birth Equity Collaborative (NBEC), 2021</i></p>	<p>NBEC defines respectful care in an American context based on qualitative interviews done with Black women and offers methods for providers to operationalize the framework into practice.</p>	

<p><b>Respectful, Equitable &amp; Supportive Care</b></p>	<p>Disparities in Cardiovascular Disease Outcomes Among Pregnant and Post-Partum Women</p> <p><i>Journal of the American Heart Association, 2020</i></p>	<p>Abstract: The incidence of cardiovascular disease among pregnant women is rising in the United States. Data on racial disparities for the major cardiovascular events during pregnancy are limited.</p> <p>Pregnant and post-partum women hospitalized from January 2007 to December 2017 were identified from the Nationwide Inpatient Sample. The outcomes of interest included: in-hospital mortality, myocardial infarction, stroke, pulmonary embolism, and peripartum cardiomyopathy. Multivariate regression analysis was used to assess the independent association between race and in-hospital outcomes. Among 46,700,637 pregnancy-related hospitalizations, 21,663,575 (46.4%) were White, 6,302,089 (13.5%) were Black, and 8,914,065 (19.1%) were Hispanic. The trends of mortality and stroke declined significantly in Black women, but however, were mostly unchanged among White women. The incidence of mortality and cardiovascular morbidity was highest among Black women followed by White women, then Hispanic women. The majority of Blacks (62.3%) were insured by Medicaid while the majority of White patients had private insurance (61.9%). Most of Black women were below-median income (71.2%) while over half of the White patients were above the median income (52.7%). Compared with White women, Black women had the highest mortality with adjusted odds ratio (aOR) of 1.45, 95% CI (1.21–1.73); myocardial infarction with aOR of 1.23, 95% CI (1.06–1.42); stroke with aOR of 1.57, 95% CI (1.41–1.74); pulmonary embolism with aOR of 1.42, 95% CI (1.30–1.56); and peripartum cardiomyopathy with aOR of 1.71, 95 % CI (1.66–1.76).</p> <p>Significant racial disparities exist in major cardiovascular events among pregnant and post-partum women. Further efforts are needed to minimize these differences.</p>	
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<p><b>Respectful, Equitable &amp; Supportive Care</b></p>	<p>Pregnancy and Heart Disease <i>ACOG, 2019</i></p>	<p>Abstract: Maternal heart disease has emerged as a major threat to safe motherhood and women’s long-term cardiovascular health. In the United States, disease and dysfunction of the heart and vascular system as “cardiovascular disease” is now the leading cause of death in pregnant women and women in the postpartum period accounting for 4.23 deaths per 100,000 live births, a rate almost twice that of the United Kingdom. The most recent data indicate that cardiovascular diseases constitute 26.5% of U.S. pregnancy-related deaths. Of further concern are the disparities in cardiovascular disease outcomes, with higher rates of morbidity and mortality among nonwhite and lower-income women. Contributing factors include barriers to pre-pregnancy cardiovascular disease assessment, missed opportunities to identify cardiovascular disease risk factors during prenatal care, gaps in high-risk intrapartum care, and delays in recognition of cardiovascular disease symptoms during the puerperium.</p> <p>The purpose of this document is to 1) describe the prevalence and effect of heart disease among pregnant and postpartum women; 2) provide guidance for early antepartum and postpartum risk factor identification and modification; 3) outline common cardiovascular disorders that cause morbidity and mortality during pregnancy and the puerperium; 4) describe recommendations for care for pregnant and postpartum women with preexisting or new-onset acquired heart disease; and 5) present a comprehensive interpregnancy care plan for women with heart disease.</p>	
<p><b>Respectful, Equitable &amp; Supportive Care</b></p>	<p>Experiences of women with cardiac disease in pregnancy: a systematic review and metasynthesis <i>BMJ, 2018</i></p>	<p>There is a lack of integrated and tailored healthcare services and information for women with cardiac disease in pregnancy. The experiences of women synthesized in this research has the potential to inform new evidence-based guidelines to support the decision-making needs of women with cardiac disease in pregnancy. Shared decision-making must consider communication across the clinical team. However, coordinated care is challenging due to the different specialists involved and the limited clinical evidence concerning effective approaches to managing such complex care.</p>	
<p><b>Respectful, Equitable &amp; Supportive Care</b></p>	<p><i>WHO: Respectful Maternity Care Project</i></p>	<p>Universal rights of childbearing women.</p>	

<b>Respectful, Equitable &amp; Supportive Care</b>	<i>Columbia School of Public Health: Respectful Maternity Care</i>	Disrespect during childbirth brief.	
		Robust tools to help define and study disrespect and abuse during childbirth.	
<b>Respectful, Equitable &amp; Supportive Care</b>	Healthy Newborn Network  <i>HNN, 2021</i>	Respectful Maternity Care and Maternal Mental Health are Inextricably Linked: Much is still unknown about the connections between respectful maternity care and maternal mental health outcomes, said Patience Afulani, Assistant Professor at the University of California, San Francisco. Nevertheless, existing research indicates that women who have negative birth experiences are at higher risk of developing post-traumatic stress disorder, postpartum depression, and other perinatal mental health issues.	

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