Learning Outcomes

Upon completion of this activity, the learner will be able to:

1. Examine the risk factors and physiology leading to the diagnosis of peripartum cardiomyopathy (PPCM).
2. Analyze how the diagnostic and management approach may impact outcomes for individuals with PPCM.
3. Evaluate nursing care unique to individuals with PPCM during pregnancy, labor, and postpartum.

Continuing Nursing Education (CNE) Credit

A total of 1.5 nursing contact hours (0.4 may be used as pharmacology hours) may be earned for reading "Early Recognition and Treatment for Optimal Care of Individuals With Peripartum Cardiomyopathy" and for completing an online posttest and participant feedback form through August 5, 2025. A score of 80% or higher on the posttest is required to receive nursing contact hours.

This learning activity is free for AWHONN members and available for purchase by nonmembers. To access it, visit the AWHONN store at https://www.awhonn.org/awhonn-store/ and type NWH into the search box.

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Disclosures

The authors and planners of this learning activity report no conflicts of interest or relevant financial relationships. No commercial support was received for this learning activity.



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Early Recognition and Treatment for the Optimal Care of Individuals With Peripartum Cardiomyopathy CNE

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ABSTRACT: Peripartum cardiomyopathy (PPCM) is a life-threatening pregnancy-associated condition that often develops within the last month of pregnancy and up to 5 months postpartum. Although it is uncommon, the incidence in the United States is on the rise, especially among Black individuals. Early recognition and treatment are crucial for long-term health and the recovery of left ventricular ejection fraction. Most people with PPCM will recover with time, but a multidisciplinary team is needed to help with long-term treatment. Informed contraception counseling is also needed to minimize the incidence of subsequent pregnancy before recovery, which could worsen conditions. The purpose of this article is to review PPCM and discuss early recognition and management options, which may minimize complications and improve outcomes.

doi: 10.1016/j.nwh.2022.05.004

Accepted May 18, 2022; published online June 15, 2022

KEYWORDS: Black, cardiovascular, health equity, heart failure, left ventricular ejection fraction, peripartum cardiomyopathy, pregnancy

The American Heart Association (AHA) defines peripartum cardiomyopathy (PPCM) as a form of heart failure with an onset during the last month of pregnancy or during the first 5 months after childbirth (AHA, 2015). PPCM can be diagnosed when three criteria are present: (a) heart failure that develops within the last month of pregnancy or within 5 months postpartum, (b) left ventricular ejection fraction (LVEF) of less than 45%, and (c) the absence or exclusion of any other identifiable cause of heart failure (AHA, 2015).

As a leading cause of worldwide pregnancy-related mortality, PPCM affects between 1 in 1,149 and 1 in 4,350 live births in the United States (Robbins et al., 2019). In other parts of the world, the rate ranges from as high as 1 in 100 births in Nigeria to as low as 1 in 10,149 births in Denmark (Robbins et al., 2019). Incidence of PPCM is rising in the United States, but it is unclear if this is

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CLINICAL IMPLICATIONS

- Prompt recognition, diagnosis, and treatment are needed to improve recovery and long-term health outcomes for individuals with peripartum cardiomyopathy (PPCM).
- Serious complications of PPCM may include intractable heart failure, arrhythmia, thromboembolism with risk of stroke or pulmonary embolism, cardiogenic shock, and death.
- Comprehensive counseling is needed to educate patients on the risks of recurrent PPCM in subsequent pregnancies. Delaying subsequent pregnancy until left ventricular ejection fraction has recovered to baseline may optimize long-term outcomes, indicating a need for postpartum contraception.
- PPCM is often a traumatic diagnosis for individuals and families, and care should be taken to screen for mental and emotional distress throughout the recovery process.
- From a health equity standpoint, more advocacy is needed to improve PPCM health outcomes for Black individuals

due to better knowledge and recognition of PPCM or to an increase in pregnancies among individuals at greater risk for PPCM (Arany & Elkayam, 2016). Complications of PPCM can be serious, including intractable heart failure, ventricular and atrial arrhythmias, thromboembolisms (which can lead to stroke or pulmonary embolism), cardiogenic shock, and death (Honigberg & Givertz, 2019).

Pathophysiology

Although there are many theories about the pathophysiology of PPCM, the exact cause is unknown. However, PPCM is its own entity, distinct from other cardiomyopathies (Robbins et al., 2019). Proposed etiologies include hormonal, infectious, inflammatory, autoimmune, hemodynamic, apoptotic, and genetic causes that act synergistically to negatively affect an individual's cardiovascular system.

One accepted theory involves unbalanced oxidative stress and a high level of prolactin. In cases of PPCM, the body is unable to compensate for the physiologic rise of oxidative stress that typically occurs during pregnancy. As a result, individuals with PPCM experience a rise in oxidative stress levels during the end of pregnancy and into the early postpartum period. Through a cascade of cellular processes, oxidative stress cleaves prolactin into a shorter form that inhibits the growth of new blood vessels and blocks pathways causing vasorelaxation. In sequence, these cellular events negatively affect the cardiovascular system (Pfeffer & Hilfiker-Kleiner, 2018). The overall pathophysiology of PPCM is most likely a multifactorial process that includes increased oxidative stress, impaired microvascular function, inflammation, environmental factors, and a genetic predisposition (Kfoury et al., 2014).

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Risk Factors

A combination of modifiable and nonmodifiable risk factors are involved in the development of PPCM (Robbins et al., 2019; see Box 1), and racial disparities have been observed. Nations with larger populations of non-Hispanic Black individuals have greater rates of PPCM compared to those with larger populations of non-Hispanic White populations (Robbins et al., 2019). In the United States, Black individuals have an increased risk of PPCM and account for almost half of all reported PPCM cases, despite making up less than 15% of the U.S. population (Honigberg & Givertz, 2019). It is unclear if the increased risk is related to a genetic influence of African ancestry or to the health implications of social determinants of health and systemic racism affecting Black individuals. It is well known that racism contributes to chronic stress, leading to increased inflammation; additionally, systems of oppression, as well as providers' implicit biases, negatively affect health outcomes for Black individuals (Hall et al., 2015).

Based on the previously mentioned incidence rates by country, socioeconomic factors appear to play a role in PPCM development. Rates of PPCM are rising in high-income countries, perhaps because of increasing rates of other risk factors in these areas, including advanced maternal age, multifetal pregnancies, preeclampsia, and the use of assisted reproductive technologies among individuals with comorbidities that place them at risk for pregnancy complications (Pfeffer & Hilfiker-Kleiner, 2018). Increased PPCM cases may also be attributed to a greater prevalence of cardiovascular risk factors, such as obesity, diabetes, and hypertension, among individuals of reproductive age (Honigberg & Givertz, 2019).

Health Implications for Individuals With PPCM

PPCM can go undetected in late pregnancy because of signs and symptoms that are similar to those that are common in the third trimester of pregnancy. Missed diagnoses increase the risk of delayed cardiac care and progression of the disease. Most patients present with symptoms of PPCM between 1 and 4 weeks postpartum (Arany & Elkayam, 2016), but some present before childbirth. Of those who are diagnosed in the antepartum period, 46% will experience major adverse cardiac events (Stergiopoulos & Lima, 2019), mainly because of the increased metabolic demands and hemodynamic stress of labor and birth. Adverse intrapartum events may include severe preeclampsia, eclampsia, valvular heart disease, and the need for surgical birth (Stergiopoulos & Lima, 2019). Optimal care used a multidisciplinary care approach to help minimize the potential adverse events of PPCM.

BOX 1 FACTORS ASSOCIATED WITH GREATER RISK FOR PERIPARTUM CARDIOMYOPATHY

Chronic hypertension
Preeclampsia
Twin/multiple gestation pregnancy
Age older than 30 years
Family history of heart failure
Prolonged tocolytic use
Low level of education
Low household income
Anemia
Substance use disorder
Obesity
Thyroid dysfunction
African ancestry

Sources: American Heart Association (2015); Honigberg & Givertz (2019); Stergiopoulos et al. (2019).

PPCM is a leading cause of pregnancy-related death worldwide (Thompson & Hartsilver, 2016). Researchers estimate that in the United States, the 1-year mortality rate may be as great as 4% (Stergiopoulos & Lima, 2019), whereas mortality in developing countries is as great as 17% (Ntusi et al., 2015). Complications for individuals with PPCM in the postpartum period include intractable heart failure, ventricular and atrial arrhythmias, and thromboembolisms, which can lead to transient ischemic attacks, stroke, cardiogenic shock, and sudden cardiac death (Honigberg & Givertz, 2019). A summary of clinical outcomes and adverse cardiac events of PPCM, as well as factors associated with poor LVEF recovery, is provided in Table 1.

After initial diagnosis, individuals may have concerns regarding whether they will regain full heart function. As many as 70% of individuals in the United States will recover LVEF to greater than 50% on standard medical therapy for heart failure (Stergiopoulos & Lima, 2019). However, researchers have reported that greater left ventricle enlargement at initial presentation is related to a lower rate of full recovery at the 6- and 12-month follow-up. When evaluated together, LVEF and the degree of left ventricle enlargement at diagnosis are two strong predictors of the likelihood of cardiac recovery (McNamara et al., 2015).

PPCM diagnosis has been linked to an increased rate of morbidity and mortality with subsequent pregnancies. Sliwa et al. (2018) found that the overall relapse rate for individuals with an LVEF of less than 50% at the onset of a subsequent pregnancy was 56%; those individuals also had a 12% mortality rate. Individuals who had full LVEF recovery before subsequent pregnancies had lower mortality and improved cardiac function at their follow-up examination. Researchers have also reported no mortality with subsequent pregnancies when individuals had full LVEF recovery before conception (Sliwa et al., 2018).

Beyond physical complications, PPCM can also cause mental health challenges due to illness burden and complications (Sliwa et al., 2018). In a cross-sectional study done by Rosman et al. (2019), 53.7% of individuals diagnosed with PPCM reported clinical symptoms of generalized anxiety disorder, whereas 70.5% of individuals feared that PPCM would shorten their life expectancy. The most common worry, reported by 48.3% of individuals in the study, was persistent concern about their heart health despite normal follow-up test results.

Health Implications for Neonates

PPCM can also carry neonatal health implications. Stergiopoulos and Lima (2019) reported that neonates born to individuals with PPCM were at greater risk for prematurity, low or very low birth weight, and lower 5-minute Apgar scores compared to neonates born to individuals without PPCM. PPCM may also disrupt breastfeeding, which provides nutritional, immunologic, and developmental advantages (McNamara et al., 2015) as well as infant survival in many lower-resource countries, where access to alternative infant nutrition and clean water is scarce (Honigberg & Givertz, 2019).

TABLE 1 OUTCOMES IN PERIPARTUM CARDIOMYOPATHY

Clinical Outcomes	Risk Factors for Adverse Cardiac Events	Factors Associated With Poor LVEF Recovery
• Heart failure • Arrythmias • Thromboembolism • Sudden cardiac death/arrest • Pulmonary embolism • Mitral regurgitation • Right ventricular dysfunction	• Severe preeclampsia, eclampsia • Valvular (mitral and tricuspid) disease • Cesarean birth	• LVEF ≤ 30% • Left ventricle end diastolic diameter > 6.0 cm • Social determinants of health affecting Black individuals • Late presentation (>6 weeks postpartum)

Note. LVEF = left ventricular ejection fraction. Sources: McNamara et al. (2015); Stergiopoulos and Lima (2019).

 doi: 10.1016/j.nwh.2022.05.004

TABLE 2 PERIPARTUM CARDIOMYOPATHY SIGNS, SYMPTOMS, AND POSSIBLE ABNORMALITIES ON DIAGNOSTIC TESTING

Signs	Symptoms
• Hypotensive, normotensive, or hypertensive • Tachypnea • Hypoxia • Tachycardia • Jugular venous distension • Third heart sound (S3) • Laterally displaced point of maximal impulse (PMI) • Right ventricular heave • Murmur of mitral or tricuspid valve regurgitation • Marked edema • Rales	• Dyspnea • Orthopnea • Paroxysmal nocturnal dyspnea • Cough • Chest pain/pressure • Palpitations • Edema • Abdominal pain/discomfort • Activity intolerance • Fatigue

Abnormalities on diagnostic tests
• **Brain natriuretic peptide:** elevation above the upper limit of normal (>100 pg/ml) • **Electrocardiogram:** ST-T wave abnormalities, sinus tachycardia, left bundle branch block, left ventricular hypertrophy, new-onset atrial or ventricular arrythmias, conduction abnormalities • **Chest x-ray:** cardiomegaly, pulmonary congestion, interstitial infiltrates, pleural effusion(s) • **Echocardiogram:** left ventricular systolic dysfunction (LVEF < 45%) with or without dilation, right ventricular enlargement with reduced function, mitral and tricuspid valve regurgitation, pulmonary hypertension • **Cardiac magnetic resonance imaging:** thrombus (early finding), fibrosis (later finding)

Note. LVEF = left ventricular ejection fraction. Sources: Jackson et al. (2018); Stergiopoulos & Lima (2019).

Because of insufficient data, there is no clear recommendation at this time as to whether individuals with PPCM should attempt or abstain from breastfeeding. McNamara et al. (2015) found no significant diminished LVEF recovery at 12 months between individuals who breastfed and those who did not. Other investigators have suggested that breastfeeding hinders LVEF recovery; prolactin that is altered by oxidative stress can directly impede cardiac remodeling and healing, meaning that breastfeeding should perhaps be avoided (Stergiopoulos & Lima, 2019). Additionally, any medications being used to treat PPCM should also be assessed for safe use during lactation. Every individual and PPCM case is unique; therefore, shared decision making and a multidisciplinary team approach are best when setting breastfeeding and neonatal nutrition goals.

Diagnosis

PPCM is a diagnosis of exclusion, making it potentially challenging to identify. The four key diagnostic criteria are heart failure that develops between the end of pregnancy and 5 months postpartum, an LVEF of less than 45%, the absence of cardiac symptoms before the third trimester, and the absence of another identifiable cause of heart failure (Thompson & Hartsilver, 2016). Signs, symptoms, and diagnostic tests are summarized in Table 2.

Many of the signs and symptoms of PPCM overlap with common third trimester and postpartum findings; therefore, it is especially important for health care providers to distinguish between normal physiologic changes of pregnancy and potential pathology. Commonly observed findings in pregnancy include dyspnea, lower-extremity edema, palpitations, fatigue, decreased physical activity tolerance, and tachycardia, all of which can range from mild to severe in presentation. These signs and symptoms are also common in occult or overt heart failure. However, any individual presenting with persistent cardiac symptoms, any new or worsening orthopnea, paroxysmal nocturnal dyspnea, significant pedal edema, or auscultation of rales in the lung fields should be promptly evaluated (Jackson et al., 2018). There should be a low threshold for suspicion for PPCM, especially among individuals with known risk factors.

The initial workup should include a complete blood count, liver function tests, a comprehensive metabolic panel, thyroid markers, a 12-lead electrocardiogram, and chest x-ray to first rule out differential diagnoses, including preeclampsia, severe anemia, thyroid dysfunction, or arrhythmia. The absence of significant abnormalities on initial blood work should prompt more targeted diagnostics, including evaluation of B-type natriuretic peptide (BNP) and serial troponins followed by transthoracic echocardiogram (Kim & Shin, 2017). BNP is a useful screening test because levels are not affected by normal pregnancy; a BNP level of greater than 100 pg/ml is considered abnormal and should prompt further investigation with cardiac imaging (Jackson et al., 2018). The most valuable diagnostic tool is echocardiogram, which identifies impaired left ventricle function, a crucial diagnostic criterion.

Management Plan

Lifestyle Modifications

Lifestyle modifications, such as a heart-healthy diet, light exercise, maintaining a healthy weight, and the treatment of other comorbidities such as chronic hypertension, can be used in conjunction with medication to manage PPCM symptoms. There is little research regarding the use of complementary and alternative therapies for PPCM; further research is needed on mind–body interventions such as yoga, tai chi, and meditation and their effects on LVEF recovery and mental

health relative to PPCM. When planning for subsequent pregnancies, there is no prevention for recurrent PPCM, but lifestyle modifications, such as tobacco cessation, limiting alcohol consumption to no more than moderate consumption, and regular exercise to strengthen the heart (AHA, 2015) may mitigate the risk of recurrence.

Medications

The mainstays of medication treatment include oral heart failure medications, such as beta blockers, angiotensin-converting enzyme inhibitors, angiotensin receptor blockers, diuretics, vasodilators, and anticoagulants (Robbins et al., 2019). Individuals who are diagnosed during pregnancy and are symptomatic should, at a minimum, receive diuretic therapy to achieve hemodynamic stability (Jackson et al., 2018). Additionally, pregnant individuals may also be prescribed hydralazine, isosorbide dinitrate, and beta blockers, which are all commonly used in pregnancy. After birth, standard heart failure drug regimens are recommended, with angiotensin-converting enzyme inhibitors prescribed for as long as LVEF remains impaired (Thompson & Hartsilver, 2016).

> If PPCM is suspected, diagnostic testing should be done as soon as possible to allow for prompt referrals and rapid initiation of targeted treatment

Anticoagulation is recommended for individuals with an LVEF of less than 30% to prevent thrombotic adverse events (Stergiopoulos & Lima, 2019); heparin is recommended to treat PPCM in the antepartum period, whereas low-molecular-weight heparin or warfarin is used in the postpartum period (Jackson et al., 2018). Some researchers have suggested that the use of the prolactin blocker bromocriptine in addition to standard treatment may improve LVEF recovery. A randomized controlled trial of 63 participants showed promising LVEF improvement in patients with PPCM when bromocriptine was used in conjunction with standard heart failure treatment (Hilfiker-Kleiner, Haghikia, Berliner, et al., 2017). Because of an elevated risk of thrombosis, bromocriptine should be used concurrently with anticoagulants (Arrigo et al., 2017). More research is needed on this relatively new PPCM treatment to determine exact dosing and timing.

Medication therapy should continue for at least 6 months after LVEF recovery for optimal outcomes (Kim & Shin, 2017). Individuals with PPCM who do not recover an LVEF of greater than 50% should remain on a medication regimen long term, potentially for the rest of their lives. Consideration can be made for each individual case for slowly weaning from medications with a re-evaluation of left ventricle function, but more research is needed on when to completely discontinue heart failure medications after recovery (Arany & Elkayam, 2016).

Surgical Intervention

Most patients do not require surgical intervention and can be treated with lifestyle modifications and medications alone. Risk factors for surgical intervention include the failure of medication management, development of cardiogenic shock, and failure to wean from temporary assistive devices (Robbins et al., 2019). Limited research has been done on the use of wearable and implantable defibrillator devices in individuals with PPCM (Jackson et al., 2018), so these interventions may be used on a case-by-case basis at the discretion of cardiology experts.

Antepartum Surveillance

Ideally, patients with PPCM diagnosed during pregnancy should be followed by a multidisciplinary care team, including consultation with cardiology, neonatology, and anesthesiology, and be treated in a tertiary hospital with access to specialized care. Although PPCM is a high-risk obstetric condition, care can be appropriately comanaged between obstetricians and appropriately trained advanced practice registered nurses (APRNs), including nurse practitioners and certified nurse-midwives. Nurses are also critical members of the care team because they may be the first to notice subtle changes in an individual's symptoms and presentation. To ensure fetal well-being, serial sonography for growth should be done at least every 4 weeks starting at the time of diagnosis (Sliwa et al., 2018).

Labor and Birth

Birth should occur in a tertiary care setting equipped for high-risk obstetric care (Kim & Shin, 2017). There is no exact recommendation for birth timing, especially because PPCM presentation can vary greatly from mild to severe illness. Researchers generally agree that timing should be determined by the care team with input from the childbearing individual. If the individual is hemodynamically stable and symptoms are well managed with medication, birth is usually not urgently indicated (Davis et al., 2020). Any evidence of decompensation, such as a significant increase in blood pressure or heart rate, is an indication for urgent birth. Antenatal corticosteroids are safe to administer for fetal lung maturity if birth is expected before 37 weeks of gestation (Jackson et al., 2018).

As with decisions about the timing of birth, the mode of birth is also determined on a case-by-case basis with the input of the care team and consideration of the patient's preferences. Spontaneous vaginal birth is the preferred option for hemodynamically stable individuals (Davis et al., 2020), with careful monitoring of blood pressure, heart rate, and oxygen saturation throughout the labor course. For those with a goal of spontaneous vaginal birth, Thompson and Hartsilver (2016)

 doi: 10.1016/j.nwh.2022.05.004

recommend early epidural placement during labor to minimize excessive cardiovascular stress caused by painful contractions. The use of forceps or a vacuum assist during birth may shorten the second stage of labor to minimize the pushing effort and heart strain (Kim & Shin, 2017). However, decisions regarding birth interventions are made on an individual basis.

Surgical birth is recommended for individuals with PPCM who are not hemodynamically or cardiovascularly stable (Jackson et al., 2018). Depending on an individual's condition, regional or general anesthesia may be used. Invasive monitoring, such as via an arterial line for blood pressure and cardiac output monitoring, will be required because of the cardiovascular stress of major surgery (Thompson & Hartsilver, 2016). Postoperative admission to the intensive care unit is indicated for the continued medical management of individuals who are medically unstable.

Postpartum Surveillance

A majority of PPCM cases present in the first 4 weeks postpartum (Arany & Elkayam, 2016), so surveillance even after an uncomplicated birth is necessary. Many providers see individuals at 6 weeks postpartum, at which point the disease may already be quickly progressing. Visits earlier than 6 weeks may be helpful in the earlier identification of early PPCM, although this may not be feasible for all individuals. Before discharge home after their birth, all individuals should be educated on concerning postpartum signs and symptoms and when to contact their provider to facilitate prompt assessment and initiation of a diagnostic workup. Once identified, PPCM can be surveilled and treated with the medication regimens previously discussed (Arrigo et al., 2017).

For those diagnosed during pregnancy, ongoing assessment in the postpartum period should continue to include a multidisciplinary care team approach. In addition to medication management for the duration of impaired LVEF and at least 6 months after recovery (Kim & Shin, 2017), there are other assessments that are needed for overall health and well-being. Obstetric providers should continue to monitor patients for signs of worsening heart failure, thrombosis, and decompensation. Continued follow-up with a cardiology specialist is recommended, including echocardiograms every 6 months while the LVEF is recovering (Stergiopoulos & Lima, 2019) and then annually once the LVEF has recovered (Davis et al., 2020). Further follow-up recommendations may be made at the discretion of the cardiologist.

Implications for Practice

The treatment of PPCM is multidisciplinary and requires collaboration from several specialties, including APRNs and registered nurses (RNs). It is important for providers of care in the antepartum period to understand the signs and symptoms of PPCM. This can contribute to early recognition, diagnosis, and referral for treatment and, ultimately, the best chance for optimal recovery of LVEF (Lewey et al., 2020). For individuals at greater risk of PPCM, signs and symptoms of PPCM should be assessed at every third trimester antepartum appointment, as well as during intrapartum care and at postpartum visits. If PPCM is suspected, diagnostic testing should be done as soon as possible to allow for prompt referrals and the rapid initiation of targeted treatment.



> Lifestyle modifications, such as a heart-healthy diet, light exercise, maintaining a healthy weight, and treatment of other comorbidities such as chronic hypertension, can be used in conjunction with medication to manage PPCM symptoms

Early recognition of and screening for mental health disorders and psychological distress by APRNs and RNs are also important in the postpartum period after PPCM diagnosis (Donnenwirth et al., 2020). Many individuals have reported feeling depressed or stressed or had a decreased quality of life after a diagnosis of PPCM. Rosman et al. (2019) and Donnenwirth et al. (2020) documented that psychological distress from PPCM can adversely affect heart failure prognosis. The use of screening tools, such as the Edinburgh Postnatal Depression Scale (Cox et al., 1987) and the Generalized Anxiety Disorder–7 screening tool (Spitzer et al., 2006), along with open communication during postpartum appointments, can help clinicians recognize mental and emotional distress (Caropreso et al., 2020) and initiate the referral process to mental health professionals as needed.

APRNs and RNs are also able to counsel individuals with PPCM on the risks of subsequent pregnancies and the importance of reliable contraception until full LVEF recovery is achieved (Pfeffer & Hilfiker-Kleiner, 2018). Previously,

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individuals were advised against ever having subsequent pregnancies, but more recently, researchers have demonstrated that subsequent pregnancies can be safe if pregnancies can be spaced out to allow for LVEF improvement and cardiac healing (Codsi et al., 2018). Although there is an overall greater risk of PPCM recurrence with subsequent pregnancies (Kim & Shin, 2017), outcomes improve when subsequent pregnancies can be delayed. PPCM recurrence rates can decrease from approximately a 50% incidence in those with an LVEF of less than 50% to a 21% incidence in individuals with a recovered LVEF (Codsi et al., 2018). Individuals and their partners should be counseled on the risk of recurrent PPCM and its health implications, and reasons for any difficulties in delaying subsequent pregnancies should be explored (Sliwa et al., 2018). Providers should invite individuals to openly discuss their reproductive plans so that education can be targeted toward risk reduction and health preservation.

Because of the increased risk of embolism and fluid retention, the use of estrogen-containing contraception, including all combined hormonal contraceptives, is contraindicated for individuals within 6 months of a PPCM diagnosis (Centers for Disease Control and Prevention, 2021). For patients with any history of PPCM, combined hormonal contraceptives are a Category 3 contraception method and are generally advised against by the Centers for Disease Control and Prevention (2021). Long-acting reversible contraception, such as intrauterine devices and subdermal implants, are very effective for individuals with PPCM because they reliably prevent pregnancy, do not affect future fertility, and do not carry the risks of estrogen-containing methods.

From a health equity standpoint, more advocacy is needed to improve PPCM health outcomes for Black individuals. In the United States, Black PPCM patients have poorer recovery rates and greater mortality rates (Stergiopoulos & Lima, 2019) and are often diagnosed later in the course of their disease (Lewey et al., 2020), perhaps because of difficulty accessing care or because providers do not recognize patients' concerns as clinically significant. Additionally, Hilfiker-Kleiner, Haghikia, Masuko, et al. (2017) found in their study that Black participants were more likely to begin subsequent pregnancies with reduced LVEF, which is associated with worsened maternal and fetal health outcomes and increased morbidity and mortality. Providers must not only be educated on the increased risk of PPCM among Black individuals but also advocate for access to comprehensive and equitable care. Additionally, providers must assess their own implicit bias and behaviors that may contribute to inequitable health care.

Conclusion

Peripartum cardiomyopathy is a life-threatening pregnancy-associated condition with a rising incidence in the United States, possibly due to increased awareness and diagnosis, advancing maternal age, and increasing rates of multifetal pregnancies. Diagnostic criteria include idiopathic life-threatening cardiomyopathy, onset during the last month of pregnancy or during the first 5 months postpartum, absence of recognizable preexisting heart disease, and an LVEF of less than 45% on echocardiography. Management of PPCM is individualized based on symptomatology and requires the input of several health specialties to optimize outcomes. Subsequent pregnancies can worsen complications if LVEF remains impaired, so it is important for providers to counsel individuals and their partners on these risks and to recommend pregnancy prevention until cardiac function has recovered. Recovery of PPCM and LVEF can be prolonged but is possible with prompt diagnosis and management from a multidisciplinary team.

Author Disclosures

The authors and planners of this learning activity report no conflicts of interest or relevant financial relationships. No commercial support was received for this learning activity.

Funding

None. **NWH**

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Posttest Questions

Instructions: This learning activity is free for AWHONN members and available for purchase by nonmembers. To access it, visit the AWHONN store at https://www.awhonn.org/awhonn-store/ and type NWH into the search box.

1. Which of the following is included in the diagnosis of peripartum cardiomyopathy (PPCM)?
   a. Development of symptoms in the last month of pregnancy and up to 5 months postpartum
   b. Left ventricular ejection fraction < 55%
   c. Presence of multiple causes of heart failure

2. Which of the following is thought to contribute to the multifactorial processes leading to PPCM?
   a. Increased oxidative stress
   b. Mental stress
   c. Reduced prolactin

3. Which of the following factors are among those associated with increased risk for PPCM?
   a. Anemia, social determinants of health including low household income, and low level of education
   b. Malnutrition, history of substance use disorder, thyroid disfunction
   c. Underweight, chronic hypertension, preeclampsia

4. Which of the following is thought to be the leading cause of rising rates of PPCM in high-income countries?
   a. Cardiovascular comorbidities among individuals of reproductive age
   b. Lack of access to high-risk obstetrical care
   c. Younger maternal age

5. What is the most common time for individuals with PPCM to present with symptoms?
   a. In the first 1 to 4 days postpartum
   b. In the first 1 to 4 weeks postpartum
   c. In the last month of pregnancy

6. Identify whether each condition in the top list is a clinical outcome for PPCM, risk factor for adverse cardiac event, or a factor associated with poor recovery of left ventricular ejection fraction.
   a. Arrythmias
   b. Cesarean birth
   c. Late presentation (>6 weeks postpartum)

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   a. Clinical outcome of PPCM
   b. Factor associated with poor recovery of left ventricular ejection fraction
   c. Risk factor for adverse cardiac events

7. Which is the most important factor that may reduce risk for maternal mortality with subsequent pregnancies?
   a. Early identification and treatment of PPCM with subsequent pregnancy
   b. Full recovery of left ventricular ejection fraction before conception
   c. Partial recovery of left ventricular ejection fraction before conception

8. The following breastfeeding education should be provided to individuals with PPCM:
   a. Importance of exclusive breastfeeding for the first 6 months
   b. Individualized care based on a multidisciplinary team approach and shared decision-making
   c. Refraining from breastfeeding altogether due to increase in oxidative stress

9. Which of the following are signs of PPCM? (Select all that apply.)
   a. Hypoxia
   b. Orthopnea
   c. Rales
   d. Tachypnea

10. What is the most valuable diagnostic tool for diagnosing PPCM?
    a. Cardiac magnetic resonance imaging (MRI)
    b. Chest x-ray
    c. Echocardiogram

11. At a minimum, individuals diagnosed with PPCM during pregnancy should receive which of the following heart failure medications?
    a. ACE inhibitors
    b. Beta blockers
    c. Diuretics
    d. Vasodilators

12. What is the recommendation for birth timing for individuals with PPCM?
    a. Birth is urgently indicated for all individuals with PPCM.
    b. Birth should always be delayed as long as possible.

 doi: 10.1016/j.nwh.2022.05.004

c. Birth timing should be determined on an individual basis by the care team with input from the childbearing individual.

13. What is an important component of nursing care for individuals with PPCM in the postpartum period?
    a. Counsel patients to avoid all subsequent pregnancies.
    b. Recommend combined oral contraceptives.
    c. Screen for mental health disorders and emotional distress.

14. How can nurses impact health equity for individuals with PPCM? Check all that apply.
    a. Advocate for access to comprehensive and equitable care.
    b. Assess their own implicit bias and behaviors that may contribution to inequitable health care.
    c. Understand the factors that contribute to increased risk of PPCM among individuals of various races and ethnicities.