


Ventricular Assist Device Implantation: Perioperative Nursing Considerations 3.5

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Purpose/Goal

To provide the learner with knowledge specific to ventricular assist device (VAD) implantation.

Objectives

1. Discuss cardiomyopathy.
2. Describe mechanical circulatory support.
3. Identify the complications related to VAD implantation.
4. Describe the nursing care of patients undergoing VAD implantation.

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Barbara H. Nowotny, BSN, BA, RN; Dee H. Boner, MSN, RN, CNOR; and Simon Maltais, MD, PhD, have no declared affiliations that could be perceived as posing potential conflicts of interest in the publication of this article.

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ABSTRACT

Treatment for patients in end-stage heart failure has been revolutionized by the development of the ventricular assist device (VAD), an implantable heart pump used for long-term mechanical circulatory support. These devices are now small, lightweight, and efficient continuous-flow pumps that have replaced the larger, heavier, fill-to-empty predecessors. Management of the VAD case requires interdisciplinary effort across a diverse continuum of care and an understanding of new implantation techniques. This article describes current advances in VAD technology, indications for use, and perioperative nursing considerations related to patients who have undergone VAD implantation. *AORN J* 103 (April 2016) 389-403. © AORN, Inc, 2016. <http://dx.doi.org/10.1016/j.aorn.2016.02.002>

Key words: cardiomyopathy, heart failure, LVAD, ventricular assist device, VAD.

Heart failure, or cardiomyopathy (CMP), is a disease that affects approximately 5.1 million patients in the United States and millions more worldwide.¹ The American Heart Association defines CMP as “a serious disease in which the heart muscle becomes inflamed and weakened.”² Cardiomyopathy is further defined as myocardial disease related to mechanical or electrical dysfunction that causes ventricular dilation.³ Cardiomyopathy may be primary (ie, it occurs in the absence of other cardiac conditions) or secondary (ie, it occurs as a result of a medical condition), and it is classified into four basic categories:

- dilated CMP,
- hypertrophic CMP,
- restrictive CMP, and
- arrhythmogenic right ventricular CMP/dysplasia.²

Dilated CMP is the most common type and comprises 60% of all cardiomyopathies. Dilated CMP is characterized by a dilated left ventricle and impaired systolic function.³ Although viral infections, coronary artery disease, or disorders involving other organs may

be to blame, CMP is often idiopathic, with no identifiable underlying cause.³ As the disease progresses, it may lead to end-stage heart failure, arrhythmias, and heart-valve problems.³

Physicians commonly treat heart failure using beta-blockers, angiotensin-converting enzyme (ACE) inhibitors, and diuretic therapy. Additionally, patients with CMP may require an implantable cardioverter defibrillator and biventricular pacemaker to control the risk of lethal cardiac arrhythmias, including atrio-ventricular (AV) block, symptomatic bradycardia, atrial fibrillation, and ventricular tachycardia.³ Although medical management remains the first line of therapy for heart failure, surgical intervention using mechanical circulatory support becomes necessary when the extent of the failure progresses beyond pharmacotherapy treatment options.⁴ Mechanical circulatory support is used to sustain and improve quality of life.⁴⁻⁷

MECHANICAL CIRCULATORY SUPPORT

For decades, surgeons have performed successful heart transplantations for patients with end-stage myocardial disease. The

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