Clinical Policy: Ventricular Assist Devices

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Coding Implications
Revision Log

Description
A ventricular assist device (VAD) is a mechanical pump that helps a person's heart that is too weak to pump blood through the body. The VAD is designed to provide sufficient blood flow to the damaged or diseased heart. It is sometimes referred to as a "bridge to transplant" since it can help a patient survive until a heart transplant can be performed.

Policy/Criteria

I. It is the policy of Pennsylvania Health and Wellness® that all FDA approved VADs, when used according to their FDA labeled indications (including body size recommendations), are considered **medically necessary** when meeting the following:

A. For implantable VADs, none of the following contraindications:
   1. Life expectancy in the absence of heart disease ≤ 2 years;
   2. Malignancy within 5 years that is expected to significantly limit survival;
   3. Irreversible renal or hepatic dysfunction, severe obstructive pulmonary disease, or other systemic disease with multi-organ involvement;
   4. A pattern of demonstrated noncompliance or lack of sufficient care-giver support which would place a VAD at serious risk of failure;
   5. Active substance abuse, including alcohol.

B. Has one of the following indications:
   1. Member is post-cardiotomy for support of blood circulation; *or*
   2. As a bridge to transplant for members who are awaiting heart transplantation and not expected to survive until a donor heart can be attained; *or*
   3. As destination therapy for members with end-stage heart failure (NYHA Class IV end-stage left ventricular failure for at least 90 days with a life expectancy of < 2 years) who are ineligible for heart transplantation due to age or co-morbidities and all of the following:
      a. Meets one of the following:
         i. Failure to respond to optimal medical management (including beta-blockers and ACE inhibitors if tolerated) for at least 45 of the last 60 days, or
         ii. Has been balloon pump-dependent for ≥7 days, or
         iii. IV inotrope-dependent for ≥14 days *and*
      b. Left ventricular ejection fraction (LVEF) < 25%, and
         c. Functionally limited with a peak oxygen consumption of ≤ 14 ml/kg/min unless balloon pump- or inotrope-dependent or physically unable to perform the test.

II. Pediatric VADs are considered **medically necessary** under the FDA Humanitarian Device Exemption (HDE) guidelines for the following devices:

A. Berlin Heart EXCOR® Pediatric VAD as a bridge to cardiac transplantation when meeting the following criteria:
   1. Members ≤ 16 years, and

2. Severe isolated left ventricular or biventricular dysfunction, and
3. Is a candidate for cardiac transplant and requires circulatory support.

B. HeartAssist® Pediatric VAD as a bridge to cardiac transplantation when meeting the following criteria: [16]
   1. Members 5 to 16 years old;
   2. Body surface area > 0.7 m^2 and < 1.5 m^2;
   3. In NYHA Class IV end-stage heart failure refractory to medical therapy;
   4. Listed as a candidate for cardiac transplantation;
   5. None of the following contraindications:
      a. Unable to tolerate anticoagulation therapy;
      b. Anatomical features which prevent the implantable components of the device from fitting properly.

III. Any requests for VADs not meeting the above criteria will be considered **not medically necessary**.

Note: HDE is granted by FDA. A Humanitarian Use Device (HUD) is a device that is intended to benefit patients in the treatment or diagnosis of a disease or condition that affects fewer than 4,000 individuals in the United States annually. An HUD may only be used in facilities that have established a local institutional review board to supervise clinical testing of devices and after an IRB has approved the use of the device to treat or diagnose the specific disease.

Background

VADs have shown beneficial effects on myocardial function through improvement in myocardial contractile performance; reversal of down regulation of betareceptors seen in heart failure (HF), with restoration in the ability of the heart to respond to the inotropic effects of sympathetic stimulation; and normalization of chamber geometry, and reduction of myocardial fibrosis, hypertrophy, and disruption in cytoskeletal proteins.

This suggests that failing human myocytes have the capability of undergoing beneficial functional and electrophysiologic changes and an increase in contractile strength in the presence of hemodynamic unloading and improved neurohumoral and circulatory derangements. This remodeling generally is complete by about 40 days, with evidence of clinical benefit and an improvement in quality of life.

Since 2000, there have been improved outcomes in VAD implantation in the pediatric population. Early experience involved the most critically ill children who often were near death at the time of VAD implantation. More recently, centers' increasing experience with the surgical techniques, timing, and postoperative care; the use of more long-term devices over time; and refinements in patient selection, have resulted in improved outcomes despite the increasing use of VADs in smaller and more complex patients. Further study is warranted to optimize criteria for pediatric patient and device selection.

In one study reported by Blume, et al, 86% of pediatric patients who received a VAD were successfully bridged to transplantation from 2000 to 2003. Prior to 2000, only 63% of pediatric patients were successfully bridged to transplantation. The subgroups of patients with congenital

heart disease and in smaller, younger patients, who rarely are large enough for most long-term assist devices, did not have as successful applications as the rest of the population.

A prospective multi-institutional investigational device exemption trial compared patients with the Berlin Heart EXCOR with a control group supported on extracorporeal membrane oxygenation (ECMO). Between May 2009 and December 2010, a total of 48 patients ≤16 years of age met the inclusion criteria and were separated into 2 cohorts according to body surface area (cohort 1, <0.7 m2; cohort 2, ≥0.7 m2) with 24 patients in each group. The median survival time for cohorts 1 and 2 (>174 and 144 days, respectively) far exceeded that of ECMO (cohort 1, 13 days; cohort 2, 10 days; *P*<0.001 by log-rank test). Based on the results of this trial, the Berlin Heart EXCOR was granted HDE approval as a device to provide long-term mechanical circulatory support as a bridge to cardiac transplantation in children with severe left or biventricular dysfunction. [19]

American College of Cardiology Foundation/American Heart Association
Nondurable mechanical circulatory support including the use of a percutaneous and extracorporeal ventricular assist device is reasonable as a 'bridge to recovery'. [17]

National Health Service
This organization currently funds the use of long-term VADs as bridge-to-transplant to support heart transplant candidates who are too unwell to undergo the procedure or are unlikely to survive in a good clinical state until a suitable donor heart becomes available. [18]

Coding Implications
This clinical policy references Current Procedural Terminology (CPT®). CPT® is a registered trademark of the American Medical Association. All CPT codes and descriptions are copyrighted 2016, American Medical Association. All rights reserved. CPT codes and CPT descriptions are from the current manuals and those included herein are not intended to be all-inclusive and are included for informational purposes only. Codes referenced in this clinical policy are for informational purposes only. Inclusion or exclusion of any codes does not guarantee coverage. Providers should reference the most up-to-date sources of professional coding guidance prior to the submission of claims for reimbursement of covered services.

CPT® Codes	Description
33975	Insertion of ventricular assist device; extracorporeal, single ventricle
33976	Insertion of ventricular assist device; extracorporeal, biventricular
33977	Removal of ventricular assist device; extracorporeal, single ventricle
33978	Removal of ventricular assist device; extracorporeal, biventricular
33979	Insertion of ventricular assist device, implantable intracorporeal, single ventricle
33980	Removal of ventricular assist device, implantable intracorporeal, single ventricle
33981	Replacement of extracorporeal ventricular assist device, single or biventricular, pump(s), single or each pump

CPT® Codes	Description
33982	Replacement of ventricular assist devices pump(s); implantable intracorporeal, single ventricle, without cardiopulmonary bypass
33983	Replacement of ventricular assist devices pump(s); implantable intracorporeal, single ventricle, with cardiopulmonary bypass
33990	Insertion of ventricular assist device, percutaneous including radiological supervision and interpretation; arterial access only
33991	Insertion of ventricular assist device, percutaneous including radiological supervision and interpretation; both arterial and venous access, with transseptal puncture
33992	Removal of percutaneous ventricular assist device at separate and distinct session from insertion

HCPCS Codes	Description
Q0478	Power adapter for use with electric or electric/pneumatic ventricular assist device, vehicle type
Q0479	Power module for use with electric or electric/pneumatic ventricular assist device, replacement only
Q0480	Driver for use with pneumatic ventricular assist device, replacement only
Q0481	Microprocessor control unit for use with electric ventricular assist device, replacement only
Q0482	Microprocessor control unit for use with electric/pneumatic combination ventricular assist device, replacement only
Q0483	Monitor/display module for use with electric ventricular assist device, replacement only
Q0484	Monitor/display module for use with electric or electric/pneumatic ventricular assist device, replacement only
Q0485	Monitor control cable for use with electric ventricular assist device, replacement only
Q0486	Monitor control cable for use with electric/pneumatic ventricular assist device, replacement only
Q0487	Leads (pneumatic/electrical) for use with any type electric/pneumatic ventricular assist device, replacement only
Q0488	Power pack base for use with electric ventricular assist device, replacement only
Q0489	Power pack base for use with electric/pneumatic ventricular assist device, replacement only

ICD-10-CM Diagnosis Codes that Support Coverage Criteria

ICD-10-CM Code	Description
I50.1	Left ventricular failure
I50.20	Unspecified systolic (congestive) heart failure
I50.82	Biventricular heart failure

ICD-10-CM Code	Description
I50.84	End stage heart failure
I50.9	Heart failure, unspecified (biventricular) heart failure NOS
I97.0	Post-cardiotomy syndrome
Z94.1	Heart transplant status
Z95.811	Presence of heart assist device

Reviews, Revisions, and Approvals	Date	Approval Date
References reviewed and updated. Codes reviewed and updated.	02/18	

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