

# Referring Patients for Advanced Heart Failure Therapies

This guideline was created by a multidisciplinary team based on ACCF/AHA Guideline for the Management of Heart Failure<sup>ACCF</sup> and recently published literature. It summarizes these guidelines and provides recommendations for applying them in the Intermountain Healthcare system. This guideline should provide clarity around the question of when to refer, with the goal of improving outcomes and promoting the best use of system resources.

## ▶ ADVANCED HEART FAILURE

Some heart failure (HF) patients with reduced ejection fraction (HFrEF) develop advanced disease and persistently limiting symptoms. A profile of these patients appears in the table below. This may happen despite guideline-directed medical therapy\* including cardiac resynchronization therapy when indicated†. These patients may be appropriate candidates for evaluation for advanced HF therapies, including heart transplantation and left ventricular assist device (LVAD).

To guide the appropriate recognition and timely referral of these patients, the 2013 ACCF/AHA Heart Failure Guidelines have outlined clinical events and findings useful for identifying patients with advanced heart failure.

### CLINICAL EVENTS AND FINDINGS USEFUL FOR IDENTIFYING PATIENTS WITH ADVANCED HEART FAILURE<sup>ACCF</sup>

- Two or more hospitalizations or ED visits for HF in the past year
- Progressive deterioration in renal function (e.g., rise in BUN and creatinine)
- Weight loss without other cause (e.g., cardiac cachexia)
- Intolerance to ACE inhibitors due to hypotension and/or worsening renal function
- Intolerance to beta blockers due to worsening HF or hypotension
- Frequent systolic blood pressure < 90 mm Hg
- Persistent dyspnea with dressing or bathing requiring rest
- Inability to walk 1 block on level ground due to dyspnea or fatigue
- Recent need to escalate diuretics to maintain volume status, often reaching daily furosemide equivalent dose >160 mg/d and/or use of supplemental metolazone therapy
- Progressive decline in serum sodium, usually to <133 mEq/L
- Frequent ICD shocks

ACE indicates angiotensin-converting enzyme; BUN, blood urea nitrogen; ED, emergency department; HF, heart failure; and ICD, implantable cardioverter-defibrillator.

\*Guideline-directed medical therapy (GDMT) represents optimal medical therapy as defined by ACCF/AHA guidelines (primarily Class I); it should be the mainstay of pharmacological therapy for HFrEF.<sup>1</sup>

†Appropriate use guidelines for cardiac resynchronization therapy can be found at <https://kr.ihc.com/kr/Dcmnt?ncid=521441066&tfrm=default>

## ▶ WHY FOCUS ON ADVANCED HEART FAILURE THERAPIES

- Approximately 10% of the 6 million Americans with heart failure have advanced disease.
- Advanced heart failure is associated with poor quality of life, repeated hospitalizations, and high mortality.
- Patients with heart failure have a 50% mortality after 5 years. Patients with advanced HF have up to a 50% mortality rate after 1 year.
- Outcomes following a heart failure hospitalization are particularly poor, with readmission rates of approximately 20% at one month and 50% at 6 months. Mortality increases with each heart failure hospitalization, with survival of less than 1 year with the third hospitalization.
- **Early referral leads to improved outcomes.** When unsure whether a patient is sick enough for advanced treatment, it's better to refer for an evaluation.

## ▶ GOALS & MEASUREMENTS

- The goals of this clinical guideline are to promote timely and appropriate referral for advanced therapies and to improve patient outcomes.
- To measure success in these goals, Intermountain will measure number of referrals, length of stay after surgery, and rate of complications.



These guidelines apply to common clinical circumstances, and may not be appropriate for certain patients and situations. The treating clinician must use judgment in applying guidelines to the care of individual patients.

► KEY POINTS

- **Early referral leads to improved outcomes.** Patients who are less sick at the time of LVAD surgery have shorter hospital stays and better long-term survival.<sup>K1R</sup>
- **There is a trend toward earlier referral and implant.** Current guidelines state that whenever possible, LVAD implant surgery should be elective and not emergent.<sup>SLA1</sup>

► CONTRAINDICATIONS

- Systemic, non-cardiac illness with a life expectancy of less than 2 years
- Irreversible renal or hepatic dysfunction
- Severe obstructive pulmonary disease
- Major bleeding diathesis
- Severe peripheral vascular or cerebrovascular disease
- Poor social support structure
- Active mental illness

► LVAD SURVIVAL STATISTICS

The table below shows survival statistics for continuous-flow LVAD devices, the HeartMate II and the HeartWare.

**Survival rates for patients receiving continuous-flow LVAD devices**

Time after implant	Percent of patients surviving who received implant anywhere in the U.S. (INTERMACS)	Percent of patients surviving who received implant at Intermountain (n=130)*
30 days	95%	96%
1 year	80%	92%
2 years	70%	69%
3 years	59%	62%
4 years	47%	49%

\*Although the Intermountain Heart Institute has implanted over 300 mechanical circulatory support devices (including a variety of LVADs, and artificial hearts), these statistics apply only to the newer generation of continuous-flow devices shown at right.

► INDICATIONS FOR LEFT VENTRICULAR ASSIST DEVICE (LVAD)

A left ventricular assist device (LVAD) is a form of mechanical circulatory support (MCS) designed to assist the native heart. These devices are used in three ways:

- As a bridge to transplantation for heart transplant candidates who are either too sick to wait for a donor to be identified, or who have contraindications to transplantation which are deemed to be transient.
- As a destination therapy, or lifelong support for patients deemed ineligible for transplant.
- As a bridge to myocardial recovery.

**Intermountain recommends referring all patients with HFrEF meeting the following criteria:**

- **Left ventricular ejection fraction (LVEF) <25%**
- **Advanced heart failure symptoms** (Stage D and/or NYHA class III to IV) despite guideline-directed medical therapy, including cardiac resynchronization therapy when indicated
- **Demonstrated functional limitation**, including
  - Peak VO<sub>2</sub> <14 ml/kg/min, OR
  - Dependence on continuous intravenous inotropic support
- **High predicted 1-year to 2-year mortality**

**Intermountain currently uses these continuous-flow LVAD devices**



**HeartMate II**

*The Intermountain Heart Institute has used this device since January 2004.*



**HeartWare**

*The Intermountain Heart Institute has used this device since September 2010.*

► **INSUFFICIENT INDICATIONS**

- Low LVEF with NYHA class I or II heart failure symptoms
- Untreated NYHA class III to IV heart failure symptoms
- Untreated ventricular tachyarrhythmias
- Preclusion from coronary revascularization
- Preclusion from valve replacement

► **CONTRAINDICATIONS**

- Significant pulmonary hypertension despite treatment. (Pulmonary hypertension may respond to prolonged unloading with a left ventricular assist device.)
- Active infection
- Irreversible hepatic, renal, or pulmonary disease (dual organ transplant may be considered in certain circumstances)
- Recent malignancy
- Age >72 years
- Severe peripheral vascular or cerebrovascular disease
- Severe diabetes with end-organ damage
- Morbid obesity
- Active substance abuse
- Poor social support structure
- Active mental illness or psychological instability

► **INDICATIONS FOR CARDIAC TRANSPLANTATION**

Cardiac transplantation is the gold standard treatment for select patients with end-stage advanced heart failure. The eligibility criteria and traditional contraindications for cardiac transplantation have evolved over time. Currently, Intermountain recommends referring all patients meeting these major indications for cardiac transplantation:

- High mortality risk (>50% at 1 year) who are likely to survive with a meaningful quality of life following transplantation
- Stage D and/or NYHA class III to IV heart failure symptoms despite guideline-directed medical therapy
- Intractable angina
- Intractable, life-threatening ventricular tachycardia

Patients referred for consideration for transplantation undergo an extensive evaluation by a multidisciplinary team, which includes transplant cardiologists, cardiothoracic surgeons, cardiac intensivists, social workers, and nutritionists. This evaluation includes an assessment of heart failure severity and a thorough screening for comorbidities that can impact perioperative and/or long-term survival.

► **TRANSPLANTATION SURVIVAL STATISTICS**

Survival rates for patients receiving cardiac transplantation		
Time after transplant	Percent of patients surviving who received transplant anywhere in the U.S. (SRTR)	Percent of patients surviving who received transplant at Intermountain
1 year	90.6% (n=4588)	100% (n=29)
3 years	83.3% (n=4303)	100% (n=35)

► **HOW TO REFER A PATIENT FOR AN ADVANCED THERAPY EVALUATION**

**Intermountain Medical Center Heart Failure and Transplant Clinic**

- Call the clinic at 801-507-4000, or
- Use Intermountain’s Message Log system, or
- Call the answering service at 801-408-5060 and ask for the Heart Failure physician on call

LVAD and transplant surgeries and initial follow-up are done at Intermountain Medical Center. Initial consultations and shared long-term follow-up are available at McKay-Dee Hospital and Dixie Regional Medical Center.

**McKay-Dee Hospital  
Heart Failure Clinic**

801-387-3850

**Dixie Regional Medical Center  
Heart Failure Clinic**

435-251-2500

## ► REFERENCES

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For more information visit [Intermountain Heart Institute at Intermountain Medical Center](#).