OPTN

Guidance for Pediatric Heart Exception Requests

Diagnoses addressed in this Guidance

The guidance document was drafted with the goal of helping the members of the National Heart Review Board for Pediatrics standardize decision-making when reviewing exceptions requests for certain Status 1A and Status 1B candidates. The document provides guidance on the following pediatric heart diagnoses:

- Dilated cardiomyopathy
- Restrictive or hypertrophic cardiomyopathy
- Single ventricle heart disease
- Coronary vasculopathy allograft and retransplant

Standard Information for Inclusion with Pediatric Heart Exception Requests

The following information provides useful guidance for transplant program staff responsible for completing the clinical narrative portion of an initial exception request or an extension exception request on behalf of a pediatric heart candidate. Transplant programs are expected to demonstrate that a candidate has both the medical urgency and potential for benefit comparable to that of other candidates at this status.[1]

Transplant programs are strongly encouraged to submit the following information as part of each exception request:

- Contain specific description of the candidate's current diagnoses and methods of support, inclusive of inotropes and mechanical circulatory support;
    - Describe inotrope escalation and/or failure to wean
- Specifically describe how:
    - The candidate meets the exception criteria, or
    - Why standard therapies may not be ideal for the candidate and why the candidate's condition is not addressed by the pre-specified exception criteria
    - Describe why the current policy does not adequately account for the candidate's particular situation and high risk of waitlist mortality
    - Provide timing of symptom changes in relation to exception request

This resource is not OPTN Policy, so it does not carry the monitoring or enforcement implications of policy. It is not an official guideline for clinical practice, nor is it intended to be clinically prescriptive or to define a standard of care. This resource is intended to provide guidance to transplant programs and the National Heart Review Board.

Category 1: Dilated Cardiomyopathy Patients

Most candidates with dilated cardiomyopathy, in the absence of specific criteria below, are appropriately categorized based on the need for inotropes as Status 1B or for mechanical circulatory

[1] OPTN, Adult heart status 2 exception criteria justification form. Accessed in UNet℠ October 29, 2019.

support as Status 1A. Table 1 provides useful guidance for the review board asked to approve upgraded listing urgency by exception for children with dilated cardiomyopathy.

Table 1: Recommended criteria for status exceptions

If the candidate has dilated cardiomyopathy and meets this criteria:	Then the candidate may be eligible for:

Is admitted to the transplant hospital that registered the candidate on the waiting list and meets *all* of the following criteria:
• Weighs less than 5kg
• Supported by *one* of the following with either an escalation from lower dosage or a failure to wean from listed dose:
  ○ A continuous infusion of at least one high-dose intravenous inotrope:
  ▪ Dobutamine greater than or equal to 7.5 mcg/kg/min
  ▪ Milrinone greater than or equal to 0.50 mcg/kg/min
  ▪ Epinephrine greater than or equal to 0.02 mcg/kg/min
  ○ A continuous infusion of at least two intravenous inotropes:
  ▪ Dobutamine greater than or equal to 3 mcg/kg/min
  ▪ Milrinone greater than or equal to 0.25 mcg/kg/min
  ▪ Epinephrine greater than or equal to 0.01 mcg/kg/min
  ▪ Dopamine greater than or equal to 3 mcg/kg/min
	Status 1A exception

Is admitted to the transplant hospital that registered the candidate on the waiting list and meets *all* of the following criteria:
• Weighs less than 10kg
• Supported by *one* of the following with either an escalation from lower dosage or a failure to wean from listed dose:
  ○ A continuous infusion of at least one high-dose intravenous inotrope:
  ▪ Dobutamine greater than or equal to 7.5 mcg/kg/min
  ▪ Milrinone greater than or equal to 0.50 mcg/kg/min
  ▪ Epinephrine greater than or equal to 0.02 mcg/kg/min
  ○ A continuous infusion of at least two intravenous inotropes:
  ▪ Dobutamine greater than or equal to 3 mcg/kg/min
  ▪ Milrinone greater than or equal to 0.25 mcg/kg/min
  ▪ Epinephrine greater than or equal to 0.01 mcg/kg/min
  ▪ Dopamine greater than or equal to 3 mcg/kg/min
• Has poor systemic perfusion as evidenced by *any* of the following:
  ○ Need for non-invasive positive pressure ventilation
  ○ Feeding intolerance requiring total parenteral nutrition
  ○ A decline in end-organ function (e.g. Acute kidney injury)
	Status 1A exception

Among older and larger patients, the primary reason to provide a 1A exception should be the presence of contraindications to mechanical circulatory support. Such contraindications are often subjective and based on center experience. However, among the relevant considerations (even in the adolescent population who are overall likely to do well with a VAD) are: recurrent or severe gastrointestinal bleeding, recent or recurrent embolic or hemorrhagic stroke, dialysis-dependent patients requiring simultaneous heart-kidney transplant, hypercoagulable disorder, or the presence of a mechanical prosthetic valve.

Of note, given that there are no reliable predictors of RV failure after LVAD placement in pediatric patients, the concern for the need for biventricular support would not generally be deemed a contraindication to VAD placement.

Category 2: Restrictive or Hypertrophic Cardiomyopathy Patients

Patients with restrictive and hypertrophic cardiomyopathy may have higher mortality on the waitlist when not receiving Status 1A exceptions. The following table (Table 2) provides useful guidance for the review board when evaluating exception requests for candidates with these diagnoses.

Table 2: Recommended criteria for status exceptions

If the candidate has restrictive or hypertrophic cardiomyopathy and meets this criteria:	Then the candidate may be eligible for:

Is admitted to the transplant hospital that registered the candidate on the waiting list and meets *any* of the following criteria:
• Supported by *one* of the following with either an escalation from lower dosage or a failure to wean from listed dose:
  ○ A continuous infusion of at least one high-dose intravenous inotrope:
  ▪ Dobutamine greater than or equal to 7.5 mcg/kg/min
  ▪ Milrinone greater than or equal to 0.50 mcg/kg/min
  ▪ Epinephrine greater than or equal to 0.02 mcg/kg/min
  ○ A continuous infusion of at least two intravenous inotropes:
  ▪ Dobutamine greater than or equal to 3 mcg/kg/min
  ▪ Milrinone greater than or equal to 0.25 mcg/kg/min
  ▪ Epinephrine greater than or equal to 0.01 mcg/kg/min
  ▪ Dopamine greater than or equal to 3 mcg/kg/min
• Has had an episode of sudden death or recurrent prolonged runs of hemodynamically significant arrhythmia that are not controlled by medical therapy
• Has had syncopal episodes felt to be related to restricted ventricular filling
• Has evidence of increased pulmonary vascular resistance (exceeding 6 WU*m^2)
	Status 1A exception

Category 3: Single Ventricle Heart Disease

Patients with congenital heart disease are not generally disadvantaged by the current allocation system, where they receive 1A status as long as they are admitted and supported on continuous inotrope infusions. However, because certain single ventricle adult transplant candidates have had an increase in status (adult Status 4 [equivalent to pediatric 1B] for all congenital patients, with increased status assignments under specific circumstances), this has resulted in the incongruous circumstance where the same patient will have lower listing status as a child (< 18 years old) than as an adult (≥ 18 years). Accordingly, it appears appropriate to consider more urgent listing for many patients with single ventricle congenital heart disease, even where not supported by inotropes as an inpatient.

To provide more congruity between adult and pediatric listings, the following table should assist the National Heart Review Board members with evaluating exception requests for single ventricle congenital heart disease patients:

Table 3: Recommended criteria for status exceptions

If the candidate has single ventricle congenital heart disease and meets this criteria:	Then the candidate may be eligible for:
Is admitted to the transplant hospital that registered the candidate on the waiting list and is experiencing complications related to their congenital heart disease (including but not limited to: protein-losing enteropathy, plastic bronchitis, or Fontan circuit thrombosis), and is actively receiving therapy for said complication, without regard for change in the candidate's cardiac support	Status 1A exception
Has been palliated through a Fontan procedure, is listed for heart transplantation, and has ongoing complications of the Fontan (including, but not limited to: protein-losing enteropathy, plastic bronchitis, or Fontan circuit thrombosis) and is actively receiving therapy for said complication but does not require hospital admission.	Status 1B exception

Category 4: Coronary Allograft Vasculopathy and Retransplantation

Patients with a prior transplant do not have specific criteria within policy for qualifying for an urgency status higher than Status 2. However, many patients with coronary allograft vasculopathy develop a significant component of restrictive physiology and may not benefit from inotropes. Many patients with coronary allograft vasculopathy may have poor outcomes and a high-risk for sudden cardiac death without significant systolic dysfunction.

Per policy, all patients must be admitted to the hospital where registered to be eligible for Status 1A exception.[2]

[2] OPTN, 6.4 Adult and Pediatric Status Exceptions. Accessed October 27, 2020. https://optn.transplant.hrsa.gov/media/1200/optn_policies.pdf

Table 4: Recommended criteria for status exceptions

If the candidate has a prior heart transplant and evidence of chronic rejection or significant coronary allograft vasculopathy and meets this criteria:	Then the candidate may be eligible for:
A history of recent cardiac arrest, or signs or symptoms placing patients at high-risk for sudden cardiac death, including any of the following: • A diagnosis of severe CAV similar to ISHLT CAV 3[3] • Significant restrictive hemodynamics • Non-sustained ventricular tachycardia • Unexplained syncope • Inotrope dependence	Status 1A exception
A history of revascularization (either surgical or transcatheter) for coronary allograft vasculopathy	Status 1B exception

#

[3] Mehra, Mandeep R, Crespo-Leiro, Maria G, Dipchand, Anne, Ensminger, Stephan M, Hiemann, Nicola E, Kobashigawa, Jon A, Madsen, Joren, Parameshwar, Jayan, Starling, Randall C, and Uber, Patricia A. "International Society for Heart and Lung Transplantation Working Formulation of a Standardized Nomenclature for Cardiac Allograft Vasculopathy—2010." The Journal of Heart and Lung Transplantation 29, no. 7 (2010): 717-27.