

## TRAINING STATEMENT

# Task Force 7: Pediatric Cardiology Fellowship Training in Pulmonary Hypertension, Advanced Heart Failure, and Transplantation



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## 1. INTRODUCTION

### 1.1. Document Development Process

The Society of Pediatric Cardiology Training Program Directors (SPCTPD) board assembled a Steering Committee that nominated 2 chairs, 1 SPCTPD Steering Committee member, and 5 additional members from a wide range of program sizes, geographic regions, and subspecialty focuses. Representatives from the American College of Cardiology (ACC), American Academy of Pediatrics (AAP), and American Heart Association (AHA) participated. The Steering Committee member was added to provide perspective to each Task Force as a “nonexpert” in that field. Relationships with industry and other entities were not deemed relevant to the creation of a general cardiology training statement; however, employment and affiliation in-

formation for authors and peer reviewers are provided in [Appendixes 1 and 2](#), respectively, along with disclosure reporting categories. Comprehensive disclosure information for all authors, including relationships with industry and other entities, is available as an [online supplement](#) to this document.

The writing committee developed the document, approved it for review by individuals selected by the participating organizations ([Appendix 2](#)), and addressed their comments. The final document was approved by the SPCTPD, AAP, and AHA in February 2015 and approved by the ACC in March 2015. This document is considered current until the SPCTPD revises or withdraws it.

### 1.2. Background and Scope

The availability of effective pharmacological and surgical treatments for children with pulmonary hypertension (PH) or advanced heart failure has grown rapidly over the past decade ([1-3](#)). Although the care of children with these diseases is often coordinated by specialized centers, pediatric cardiologists are increasingly called upon to evaluate and participate in the care of children with PH or advanced heart failure and those who have undergone thoracic organ transplantation. Thus, core training in pediatric cardiology must include sufficient clinical exposure and didactic opportunities for the trainee to gain competency in the evaluation and management of children with these diseases. In addition, for the general pediatric cardiologist to counsel patients and make appropriate referrals, core training must include exposure to key concepts in advanced care of these diseases, including the indications, risks, and benefits of

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pulmonary vasodilator therapy, mechanical circulatory support, and heart, lung, or heart-lung transplantation (3). The requirements for core training in PH and advanced heart failure for all trainees seeking board certification in pediatric cardiology are outlined in the next sections. Advanced requirements are much more comprehensive, require a dedicated period of training, and apply only to practitioners planning to subspecialize in the care of children with these diseases.

Our revised training recommendations describe the program resources and environment that are required for training pediatric cardiology fellows, together with a competency-based system promulgated by the Accreditation Council of Graduate Medical Education (ACGME), to implement specific goals and objectives for training pediatric cardiology fellows. This system categorizes competencies into 6 core competency domains: Medical Knowledge, Patient Care and Procedural Skills, Systems-Based Practice, Practice-Based Learning and Improvement, Professionalism, and Interpersonal and Communication Skills, along with identification of suggested evaluation tools for each domain. Core competencies unique to pediatric PH and heart failure are listed in Sections 2.2 and 3.2, respectively (see the “2015 SPCTPD/ACC/AAP/AHA Training Guidelines for Pediatric Cardiology Fellowship Programs [Revision of the 2005 Training Guidelines for Pediatric Cardiology Fellowship Programs]: Introduction” for additional competencies that apply to all Task Force reports).

### 1.3. Levels of Expertise—Core and Advanced

Core training must be available at all centers with a fellowship program in pediatric cardiology. The core curriculum described in Sections 2.2 (PH) and 3.2 (heart failure) is intended to be sufficient for fellows who do not plan a formal career in PH, advanced heart failure, or cardiac transplantation. Core training is required for all trainees and is intended to ensure that fellows acquire the knowledge base and skills necessary to become a pediatric cardiologist referring his/her patient for specialized care in these areas. Advanced training guidelines are recommended for fellows who wish to specialize in PH, advanced heart failure, and cardiac transplantation training. Advanced training should only take place at select centers with a sufficient patient volume that prepares the trainee for clinical practice involving invasive procedures.

## 2. PULMONARY HYPERTENSION

### 2.1. Program Resources and Environment

Training in PH should be performed in a program approved by the ACGME. The pediatric faculty responsible for teaching this curriculum should have expertise in PH, critical care medicine, neonatal medicine, cardiology,

echocardiography, cardiac catheterization, genetics, and pulmonary medicine. In some centers, the primary service caring for PH patients will be the pulmonary service; thus, training may occur under the supervision of the pulmonary medicine service. Trainees optimally will participate in evaluation and treatment in multiple inpatient and outpatient settings. The following are venues for providing care in pediatric PH: the outpatient clinic, consultation service, ward and intensive care units (pediatric and neonatal), noninvasive imaging laboratory, and cardiac catheterization laboratory.

### 2.2. Core Training: Goals and Methods

In formulating core training requirements, it is expected that all board-certified pediatric cardiologists should be able to: 1) perform the initial evaluation and management of the child with PH in the outpatient ambulatory setting; 2) perform the initial evaluation and stabilization of the hemodynamically compromised patient with PH; 3) understand the indications, risks, and benefits of medications used for the treatment of PH; and 4) understand the indications and appropriate timing of referral to a dedicated specialist in pediatric or adult PH for advanced care.

#### 2.2.1. General Requirements

At the end of the 3-year pediatric cardiology fellowship, the board-eligible pediatric cardiologist should be able to evaluate and provide the initial treatment of neonates, infants, children, and adolescents with PH of various etiologies described in Table 1. Suggested evaluation tools to assess competence are denoted in the table.

#### 2.2.2. Specific Areas of Knowledge and Competence

The board-eligible pediatric cardiologist should have knowledge in the following areas of PH physiology, evaluation, and treatment and be able to apply specific knowledge to the care of an infant, child, and adolescent with PH.

##### 2.2.2.1. Physiology

- Normal pulmonary vascular physiology, including the “neonatal transition” in pulmonary vascular resistance
- Distinction between PH and elevated pulmonary vascular resistance (i.e., hypertensive pulmonary vascular disease)
- Pulmonary vascular pathophysiology, including the physiological and clinical meaning of “reactivity” to vasodilators as reactivity relates to suitability for surgical repair as opposed to indications for calcium channel blocker therapy in the outpatient setting
- Indications/contraindications for repair of congenital cardiac lesions in the presence of pulmonary vascular disease

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