JOURNAL OF THE AMERICAN COLLEGE OF CARDIOLOGY
© 2015 BY THE SOCIETY OF PEDIATRIC CARDIOLOGY TRAINING PROGRAM DIRECTORS, AMERICAN COLLEGE OF CARDIOLOGY FOUNDATION, AMERICAN ACADEMY OF PEDIATRICS, AND THE AMERICAN HEART ASSOCIATION, INC.
PUBLISHED BY ELSEVIER INC.

VOL. 66, NO. 6, 2015
ISSN 0735-1097/$36.00
http://dx.doi.org/10.1016/j.jacc.2015.03.013

TRAINING STATEMENT

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

Steven A. Webber, MB, ChB, *Co-Chair*
Daphne T. Hsu, MD, FAAP, FACC, FAHA, *Co-Chair*
D. Dunbar Ivy, MD, FAAP, FACC
Thomas J. Kulik, MD
Elfriede Pahl, MD, FAAP, FACC
David N. Rosenthal, MD
W. Robert Morrow, MD, FAAP, FACC
Jeffrey A. Feinstein, MD

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 information 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

The American College of Cardiology requests that this document be cited as follows: Webber SA, Hsu DT, Ivy DD, Kulik TJ, Pahl E, Rosenthal DN, Morrow R, Feinstein JA. Task force 7: pediatric cardiology fellowship training in pulmonary hypertension, advanced heart failure, and transplantation. J Am Coll Cardiol 2015;66:732-9.

This article is copublished in *Circulation*.

Copies: This document is available on the World Wide Web sites of the Society of Pediatric Cardiology Training Program Directors (www.spctpd.org), the American College of Cardiology (www.acc.org), the American Academy of Pediatrics (www.aap.org), and the American Heart Association (my.americanheart.org). For copies of this document, please contact the Elsevier Inc. Reprints Department, fax (212) 633-3820, e-mail reprints@elsevier.com.

Permissions: Multiple copies, modification, alteration, enhancement, and/or distribution of this document are not permitted without the express permission of the American College of Cardiology. Requests may be completed online via the Elsevier site (http://www.elsevier.com/about/policies/author-agreement/obtaining-permission).

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

TABLE 1 Core Curricular Competencies and Evaluation Tools for Pediatric PH

Medical Knowledge
- Know the difference between PH and PAH.
- Know the use of FDA-approved medications in adults with PAH and medications commonly used in pediatric patients with PAH, including understanding of important drug interactions and adverse effects of medications.
- Know the indications, risks, benefits, and outcomes of lung or heart–lung transplantation in children with PH.

Evaluation Tools: direct observation, conference participation and presentation, procedure logs, and in-training examination

Patient Care and Procedural Skills
- Have the skills to identify the common presenting clinical features of PH.
- Have the skills to interpret pertinent findings on echocardiogram for patients with PH.
- Have the skills to perform key components of an initial evaluation of PH that is due to multiple etiologies, including: persistent PH of the newborn, congenital heart disease (including Eisenmenger physiology), PH associated with left heart disease, PH associated with chronic lung disease, and idiopathic PAH.
- Have the skills to plan an appropriate referral for consultation with a dedicated specialist in pediatric or adult PH.
- Have the skills to apply available outcome data for children treated with targeted PH therapy to the care of a patient with PH.
- Have the skills to counsel families regarding the acute and chronic care of the child with PH.

Evaluation Tools: direct observation, conference participation, and procedure logs

FDA indicates U.S. Food and Drug Administration; PAH, pulmonary artery hypertension; and PH, pulmonary hypertension.

- Normal right ventricular function, as well as acute and chronic right ventricular dysfunction
- Interactions and relationships between the right and left ventricles in normal physiology and in the setting of pulmonary vascular diseases
- Pathophysiology of congenital heart disease with intracardiac or arterial level shunt, including Eisenmenger physiology
- Physiology of the patient with pulmonary artery hypertension (PAH) that is due to pulmonary venous hypertension

2.2.2.2. Clinical Evaluation, Imaging, and Hemodynamics

- Identify the common presenting symptoms and physical examination findings in patients with PH with and without congenital heart disease.
- Identify the common presenting signs and symptoms of right and left heart failure.
- Indications, risks, and benefits of techniques commonly used to evaluate patients with PH, including electrocardiography, echocardiography, cardiac magnetic resonance imaging, cardiac computed tomography, ventilation, and perfusion lung scans
- Indications, risks, and benefits of cardiac catheterization and vasodilator testing

2.2.2.3. Classification

- Understand the World Health Organization Classification of PH.

2.2.2.4. Genetics

- Understand patterns of heritable PAH.
- Understand genetic tests relevant to heritable PH.

2.2.2.5. Treatment

- Cardiovascular pharmacology. Understand the indications, mechanisms of action, appropriate routes of administration, and adverse effects of the following medications used to treat PAH and understand the potential drug-drug interactions between the specific PAH therapies and other medications used to treat PAH. Currently relevant medications include:
  - PDE-5 inhibitors (sildenafil, tadalafil)
  - Endothelin receptor antagonists (bosentan, ambrisentan, macitentan)
  - Prostacyclin analogues (epoprostenol, treprostinil, iloprost)
  - Inhaled nitric oxide
  - Diuretics
  - Warfarin
  - Soluble guanylate cyclase stimulators (riociguat)
- Indications, risks, benefits, and outcomes of short- and long-term mechanical circulatory support in the treatment of patients with PH, including extracorporeal membrane oxygenator and ventricular assist devices
- Indications, risks, benefits, and outcomes of lung or heart lung transplantation in the treatment of patients with PH

2.2.3. Evaluation and Documentation of Competence

All training programs should include written goals and objectives for evaluation and care of patients with PH with performance goals set according to the fellow's level of training. These will serve as the basis for formative feedback. A copy of these goals and objectives should be supplied and explained to the trainee at the onset of fellowship training and reviewed at the beginning of each year. Evaluation of fellows should be performed midway through, and at the completion of, each rotation; evaluations should be directed toward whether the fellow met those prespecified aims. The fellow evaluation should assess the fellow's performance in each of the 6 areas of core competencies, as appropriate for the level of training, and should be based on direct observation of the fellow. Evaluation of competency in preparation, performance, and interpretation of the results of a procedure should be given more consideration than a focus on the

number of procedures performed. Evaluation of competency should be done in person with the trainee and documented in the fellowship record. If the trainee is not progressing as expected, remedial actions should be arranged and documented in accordance with institutional procedures. All fellows should maintain a log (preferably electronic) of all PH patients. Trainees should participate in diagnosis and treatment of a minimum of 20 patients (10 inpatient and 10 outpatient) during the 3 years of training to ensure adequate clinical exposure and enable sufficient opportunities for assessment by the clinical competency committees and their program directors.

2.3. Advanced Training: Goals and Methods

Advanced trainees in PAH require a dedicated 6- to 12-month time period working with a comprehensive pediatric PH program. All advanced trainees should have a rigorous (bench, clinical, or translational) research training experience pertinent to PH as part of (or prior to) their advanced training.

At the completion of the advanced training fellowship, the trainee should undergo a competency assessment that establishes the ability to independently perform a comprehensive evaluation of a patient with PH. The trainee should be able to formulate and execute a treatment plan based on the evaluation in conjunction with a PH subspecialist. Clinical competence should be assessed using a combination of direct observation of clinical performance and structured interviews by a PH subspecialist.

3. ADVANCED HEART FAILURE

3.1. Program Resources and Environment

Training in pediatric heart failure and transplantation should be performed in a program approved by the ACGME. Although not all programs will have a dedicated team for the management and treatment of advanced pediatric heart failure and transplantation, clinical expertise can be found in the subspecialties of general cardiology, noninvasive imaging, cardiac catheterization, electrophysiology, critical care, neonatology, cardiothoracic surgery, and genetics. Training programs should have a relationship with a center that provides advanced heart failure care (ventricular assist devices and transplantation). Faculty from these specialized centers may enhance fellowship training by providing didactics or clinical experience in advanced heart failure and transplantation. Trainees should participate in the treatment of patients with heart failure and transplantation, including the evaluation and treatment in multiple inpatient and outpatient settings. The following are venues for providing training in pediatric heart failure and transplantation: the outpatient clinic, the consultation service, the ward and the intensive care unit, and the noninvasive and cardiac catheterization laboratory.

3.2. Core Training: Goals and Methods

In formulating the core training requirements, it is expected that all board-certified pediatric cardiologists would be proficient in the following: 1) evaluation and treatment of the ambulatory child with heart failure; 2) initial evaluation and stabilization of the hemodynamically compromised patient with heart failure; 3) administration of medications approved or commonly used for the treatment of heart failure; 4) appropriate referral to dedicated specialist for consideration of advanced management options, including mechanical circulatory support and transplantation evaluation; and 5) shared cardiology care, with a specialized center, of a recipient who has undergone transplantation (4,5).

3.2.1. General Requirements

At the end of the 3-year pediatric cardiology fellowship, the board-eligible pediatric cardiologist should be able to perform the competencies shown in **Table 2**. Suggested evaluation tools to assess competence are denoted in the table.

3.2.2. Specific Areas of Knowledge and Competence

The board-eligible pediatric cardiologist will have the following areas of knowledge and be able to apply the knowledge to the care of an infant, child, or adolescent with heart failure:

3.2.2.1. Physiology

- Understand the pathophysiology of heart failure in children with congenital and acquired heart diseases.
- Recognize the impact of the systolic and diastolic function of the left and right ventricles on cardiac output.
- Understand the interactions and relationships between the right and left ventricles in normal physiology and in the setting of congenital heart disease and cardiomyopathies.
- Understand the effect of congenital heart defects on the manifestations of heart failure.

3.2.2.2. Diagnostic Techniques

- Recognize the symptoms and identify the signs of heart failure, including right-sided congestion, pulmonary overcirculation and edema, low cardiac output, and rhythm disorders.
- Interpret results of noninvasive techniques commonly used to evaluate patients with heart failure (e.g., biomarkers, echocardiography, exercise testing, cardiac magnetic resonance imaging).

TABLE 2 Core Curricular Competencies and Evaluation Tools for Advanced Pediatric Heart Failure

Medical Knowledge
■ Know the signs and symptoms of heart failure in children.
■ Know the role of extracorporeal membrane oxygenator support, ventricular assist device support, and transplantation in the treatment of end-stage heart failure.
■ Know the indications, mechanism of actions, risks, and benefits associated with the FDA-approved medications for use in adults with heart failure and medications commonly used in pediatric patients with heart failure.
Evaluation Tools: direct observation, conference participation and presentation, procedure logs, and in-training examination
Patient Care and Procedural Skills
■ Have the skills to evaluate and provide initial treatment for pediatric patients with heart failure of various etiologies.
■ Have the skills to develop a differential diagnosis in a child with heart failure.
■ Have the skills to establish an accurate diagnosis for the child with heart failure utilizing noninvasive imaging, genetic evaluation, endomyocardial biopsy, and cardiac catheterization.
■ Have the skills to evaluate the clinical condition of the heart failure patient and interpret the results of arrhythmia testing, exercise testing, biomarker levels, noninvasive imaging, and cardiac catheterization to plan the appropriate treatment.
■ Have the skills to initiate medical therapies to treat heart failure, including anticongestive medications, antiarrhythmic medications, inotropic support, and neurohormonal blockade (e.g., angiotensin-converting enzyme inhibitors, beta-blockers).
■ Have the skills to plan appropriate consultation with a dedicated specialist in pediatric advanced heart failure therapies.
Evaluation Tools: direct observation, conference participation, and procedure logs

FDA indicates U.S. Food and Drug Administration.

- Know the indications, risks, and benefits of cardiac catheterization and endomyocardial biopsy in the evaluation of children with heart failure or cardiomyopathy.
- Know the hemodynamic findings associated with systolic and diastolic heart failure.
- Know how to evaluate pulmonary vascular resistance in heart failure patients.
- Understand the uses and limitations of serial monitoring with currently available biomarkers for heart failure.

3.2.2.3. Cardiovascular Pharmacology

The trainee should learn mechanisms, indications for use, and side effects of pharmacologic agents used to treat pediatric heart failure:

- Diuretics
- Inotropic agents
- Vasodilators
- Vasoconstrictors
- Inhaled nitric oxide
- Anticoagulants
- Antiarrhythmics
- Neurohormonal blockade
- Cardiac glycosides

3.2.2.4. Classification (6,7)

- Know the common classifications of cardiomyopathies (e.g. morphological, genetic, physiological).
- Know the clinical classifications of heart failure commonly used in children and know the stages of heart failure.

3.2.2.5. Arrhythmia Management

- Identify the arrhythmias associated with heart failure.
- Plan the pharmacological management of arrhythmias.
- Understand the indications, risks, and benefits of implantable defibrillator and resynchronization therapy.

3.2.2.6. Mechanical Circulatory Support (8)

- Know the indications, risks, and benefits of extracorporeal membrane oxygenator support and ventricular assist devices.
- Understand the physiology of extracorporeal membrane oxygenator support and ventricular assist devices.
- Know the outcomes of extracorporeal membrane oxygenation and mechanical circulatory support in heart failure.

3.2.2.7. Understand the Consensus Guidelines for the Treatment of Heart Failure

- 2013 ACCF/AHA Guideline for the Management of Heart Failure (9)
- ISHLT: Practice Guidelines for Management of Heart Failure in Children (4)

3.2.2.8. Heart Transplantation (10,11)

- Know the outcomes of heart transplantation, including mortality and major morbidities.
- Know the indications and contraindications for heart transplantation.
- Know the incidence of the common complications associated with heart transplantation.
- Understand the physiology of the denervated, transplanted heart.
- Know the common adverse events and drug interactions associated with immunosuppressive medications used in patients following heart transplantation.
- Know the uses and limitations of techniques commonly used to evaluate heart transplant patients for rejection (clinical, echocardiogram, electrocardiogram, cardiac catheterization, endomyocardial biopsy).

3.2.2.9. Genetics (12)

- Understand patterns of heritable cardiomyopathies.
- Understand genetic tests relevant to cardiomyopathies.

3.2.3. Evaluation and Documentation of Competence

All training programs should include written goals and objectives for evaluation and care of patients with heart failure with performance goals set according to the fellow's level of training. These will serve as the basis for formative feedback. A copy of these goals and objectives should be supplied and explained to the trainee at the onset of fellowship training and reviewed at the beginning of each year. Evaluation of fellows should be performed midway through, and at the completion of, each rotation; evaluations should be directed toward whether the fellow met those prespecified aims. The fellow evaluation should assess the fellow's performance in each of the 6 areas of core competencies, as appropriate for the level of training, and should be based on direct observation of the fellow. Evaluation of competency in preparation, performance, and interpretation of the results of a procedure should be given more consideration than a focus on the number of procedures performed. Evaluation of competency should be done in person with the trainee and documented in the trainee's fellowship record. If the trainee is not progressing as expected, remedial actions should be arranged and documented in accordance with institutional procedures. All fellows should maintain a log (preferably electronic) of all heart failure patients. Trainees should participate in the care of at least 10 patients with advanced heart failure during the 3 years of fellowship to ensure adequate clinical exposure and enable sufficient opportunities for assessment by the clinical competency committees and their program directors.

3.3. Advanced Training: Goals and Methods

Advanced training in pediatric heart failure and transplantation requires a dedicated 12 months working with a comprehensive pediatric advanced heart failure service. The trainee should participate in the care of patients receiving advanced medical therapies, mechanical assist device support, and heart transplantation. The training program should have a United Network for Organ Sharing-approved pediatric transplantation program and allow the trainees to gain sufficient experience in the management of pediatric transplant candidates and recipients. All advanced trainees should have a rigorous (bench, clinical, or translational) research training experience pertinent to advanced heart failure and transplantation as part of (or prior to) their advanced training.

At the completion of the advanced training, the trainee should undergo a competency assessment that establishes the ability to independently perform a comprehensive evaluation of a patient with advanced heart failure, including an evaluation for heart transplantation. The trainee should be able to formulate and execute a treatment plan based on the evaluation in conjunction with an advanced heart failure specialist. Clinical competence should be assessed using a combination of direct observation of clinical performance and structured interviews by an advanced heart failure subspecialist.

REFERENCES

1. Ivy DD, Abman SH, Barst RJ, et al. Pediatric pulmonary hypertension. J Am Coll Cardiol. 2013;62:D117–26.

2. Galie N, Hoeper MM, Humbert M, et al. Guidelines for the diagnosis and treatment of pulmonary hypertension. Eur Respir J. 2009;34:1219–63.

3. McLaughlin VV, Archer SL, Badesch DB, et al. ACCF/AHA 2009 expert consensus document on pulmonary hypertension a report of the American College of Cardiology Foundation Task Force on Expert Consensus Documents and the American Heart Association. In collaboration with the American College of Chest Physicians, American Thoracic Society, Inc., and the Pulmonary Hypertension Association. J Am Coll Cardiol. 2009;53:1573–619.

4. Rosenthal D, Chrisant MR, Edens E, et al. International Society for Heart and Lung Transplantation: practice guidelines for management of heart failure in children. J Heart Lung Transplant. 2004;23:1313–33.

5. McMurray JJ, Adamopoulos S, Anker SD, et al. ESC guidelines for the diagnosis and treatment of acute and chronic heart failure 2012: the Task Force for the Diagnosis and Treatment of Acute and Chronic Heart Failure 2012 of the European Society of Cardiology. Eur Heart J. 2012;33:1787–847.

6. Elliott P, Andersson B, Arbustini E, et al. Classification of the cardiomyopathies: a position statement from the European Society of Cardiology Working Group on Myocardial and Pericardial Diseases. Eur Heart J. 2008;29:270–6.

7. Maron BJ, Towbin JA, Thiene G, et al. Contemporary definitions and classification of the cardiomyopathies: an American Heart Association Scientific Statement from the Council on Clinical Cardiology, Heart Failure and Transplantation Committee; Quality of Care and Outcomes Research and Functional Genomics and Translational Biology Interdisciplinary Working Groups; and Council on Epidemiology and Prevention. Circulation. 2006;113:1807–16.

8. Feldman D, Pamboukian SV, Teuteberg JJ, et al. The 2013 International Society for Heart and Lung Transplantation guidelines for mechanical circulatory support: executive summary. J Heart Lung Transplant. 2013;32:157–87.

9. Yancy CW, Jessup M, Bozkurt B, et al. 2013 ACCF/AHA guideline for the management of heart failure: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. J Am Coll Cardiol. 2013;62:e147–239.

10. Costanzo MR, Dipchand A, Starling R, et al. The International Society of Heart and Lung Transplantation guidelines for the care of heart transplant recipients. J Heart Lung Transplant. 2010;29:914–56.

11. Stewart S, Winters GL, Fishbein MC, et al. Revision of the 1990 working formulation for the standardization of nomenclature in the diagnosis of heart rejection. J Heart Lung Transplant. 2005;24:1710–20.

12. Ackerman MJ, Priori SG, Willems S, et al. HRS/EHRA expert consensus statement on the state of genetic testing for the channelopathies and cardiomyopathies. Heart Rhythm. 2011;8:1308–39.

KEY WORDS SPCTPD/ACC/AAP/AHA Training Statement, clinical competence, Eisenmenger physiology, fellowship training, heart failure, heart transplantation, pediatric cardiology, pulmonary hypertension

JACC VOL. 66, NO. 6, 2015
AUGUST 11, 2015:732–9

APPENDIX 1. AUTHOR RELATIONSHIPS WITH INDUSTRY AND OTHER ENTITIES (RELEVANT)—TASK FORCE 7: PEDIATRIC CARDIOLOGY FELLOWSHIP TRAINING IN PULMONARY HYPERTENSION, ADVANCED HEART FAILURE, AND CARDIAC TRANSPLANTATION

Committee Member	Employment	Consultant	Speakers Bureau	Ownership/ Partnership/ Principal	Personal Research	Institutional/ Organizational or Other Financial Benefit	Expert Witness
Steven A. Webber *(Co-Chair)*	Vanderbilt University School of Medicine—James C. Overall Professor and Chair, Department of Pediatrics; Monroe Carell Jr. Children's Hospital at Vanderbilt—Pediatrician-in-Chief	None	None	None	None	None	None
Daphne T. Hsu *(Co-Chair)*	Albert Einstein College of Medicine—Professor of Pediatrics; Children's Hospital at Montefiore—Division Chief, Pediatric Cardiology; Co-Director, Pediatric Heart Center	None	None	None	None	None	None
Jeffrey A. Feinstein	Stanford University—Professor, Pediatrics and by courtesy BioEngineering; Lucile Packard Children's Hospital, Stanford—Director, Pediatric Pulmonary Hypertension Service, Dunlevie Family Chair in Pulmonary Vascular Disease	None	None	None	None	None	None
D. Dunbar Ivy	Children's Hospital Colorado—Director, Pediatric Pulmonary Hypertension Program; University of Colorado School of Medicine—Chief, Pediatric Cardiology; Selby's Chair of Pediatric Cardiology; Professor of Pediatrics	None	None	None	None	None	None
Thomas J. Kulik	Boston Children's Hospital—Senior Associate in Cardiology; Director, Pulmonary Hypertension Program, Department of Cardiology; Harvard Medical School—Associate Professor of Pediatrics	None	None	None	None	None	None
W. Robert Morrow	Children's Medical Center, Dallas—Executive Vice President; Chief Clinical Officer	None	None	None	None	None	None
Elfriede Pahl	Ann & Robert H. Lurie Children's Hospital—Medical Director, Heart Transplantation and Heart Failure; M.E. Wodika Research Chair; Northwestern Feinberg School of Medicine—Professor of Pediatrics	None	None	None	None	None	None
David N. Rosenthal	Lucille Packard Children's Hospital, Stanford University—Professor of Pediatrics	None	None	None	None	None	None

For the purpose of developing a general cardiology training statement, the American College of Cardiology (ACC) determined that no relationships with industry (RWI) or other entities were relevant. This table reflects authors' employment and reporting categories. To ensure complete transparency, authors' comprehensive healthcare-related disclosure information—including RWI not pertinent to this document—is available in an online data supplement. Please refer to http://www.acc.org/guidelines/about-guidelines-and-clinical-documents/relationships-with-industry-policy for definitions of disclosure categories, relevance, or additional information about the ACC Disclosure Policy for Writing Committees.

APPENDIX 2. PEER REVIEWER RELATIONSHIPS WITH INDUSTRY AND OTHER ENTITIES (RELEVANT)—TASK FORCE 7: PEDIATRIC CARDIOLOGY FELLOWSHIP TRAINING IN PULMONARY HYPERTENSION, ADVANCED HEART FAILURE, AND CARDIAC TRANSPLANTATION

Name	Employment	Representation	Consultant	Speakers Bureau	Ownership/ Partnership/ Principal	Personal Research	Institutional/ Organizational or Other Financial Benefit	Expert Witness
Regina Lantin-Hermoso	Texas Children's Hospital	ACC ACPC Council	None	None	None	None	None	None
Carole Warnes	Mayo Clinic—Professor, Medicine	ACC BOT	None	None	None	None	None	None
Eric S. Williams	Indiana University School of Medicine—Professor (Cardiology) and Associate Dean; Indiana University Health, Cardiology Service Line Leader	ACC CMC Lead Reviewer	None	None	None	None	None	None

For the purpose of developing a general cardiology training statement, the ACC determined that no relationships with industry or other entities were relevant. This table reflects peer reviewers' employment, representation in the review process, as well as reporting categories. Names are listed in alphabetical order within each category of review. Please refer to http://www.acc.org/guidelines/about-guidelines-and-clinical-documents/relationships-with-industry-policy for definitions of disclosure categories, relevance, or additional information about the ACC Disclosure Policy for Writing Committees.

ACC indicates American College of Cardiology; ACPC, Adult Congenital and Pediatric Cardiology; BOT, Board of Trustees; and CMC, Competency Management Committee.