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The United States Pediatric Cardiology 2015 Workforce Assessment: A Survey of Current Training and Employment Patterns



A Report of the American College of Cardiology, American Heart Association,
American Academy of Pediatrics Section on Cardiology and Cardiac Surgery,
and Society for Pediatric Cardiology Training Program Directors

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The number of pediatric cardiology trainees in the United States doubled between 2004 and 2015, but there is a lack of information on the current pediatric cardiology workforce. Therefore, a survey was administered to members of the American Academy of Pediatrics Section on Cardiology and Cardiac Surgery and to nonduplicative board-certified or -eligible pediatric cardiologists. Of 2,897 individuals contacted, 823 completed the survey (28%), with a higher response rate among program directors (87%) and division chiefs (71%). Program directors reported that in the academic years of 2013/2014 and 2014/2015, 140 of the 237 (59%) fellows completing the 3-year core training program went on to additional subspecialty training, and of these, 125 (89%)

accepted academic positions. The other 97 graduates accepted positions after the 3-year core fellowship; 51 (53%) of these went into academic settings, whereas 46 (36%) joined a private practice. The most difficult fields in which to find jobs were cardiac catheterization, electrophysiology, and general cardiology. The easiest fields in which to find positions were critical care cardiology, heart failure/transplant, and adult congenital cardiology. Imaging positions were in the middle range of ease of getting a position. No graduates left the field within this time range. On the basis of the responses from the division chiefs, 135 job openings per year are anticipated over the next 2 years, while the number of fellowship match positions has increased steadily to the current number of

The findings and conclusions in this report are those of the writing committee and do not necessarily reflect the official position of the American College of Cardiology, the American Academy of Pediatrics, the American Heart Association, and the Society for Pediatric Cardiology Training Program Directors.

The American College of Cardiology requests that this document be cited as follows: Ross RD, Srivastava S, Cabrera AG, Ruch-Ross HS, Radabaugh CL, Minich LL, Mahle WT, Brown DW. The United States pediatric cardiology 2015 workforce assessment: a survey of current training and employment patterns. A report of the American College of Cardiology, American Heart Association, American Academy of Pediatrics Section on Cardiology and Cardiac Surgery, and Society for Pediatric Cardiology Training Program Directors. *J Am Coll Cardiol* 2017;69:1347-52.

This article has been copublished in *Progress in Pediatric Cardiology*.

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141 openings per year. These graduates will be competing for open positions with faculty who are changing institutions, who have filled 25% of these positions in the past 2 years. In conclusion, the field of pediatric cardiology is very competitive currently, and training programs should consider suspending any increase in fellowship training positions until the next survey is performed. Continued close monitoring at least every 2 years will be crucial to adapt appropriately to workforce fluctuations and needs as they arise.

INTRODUCTION

According to the National Resident Matching Program, the number of pediatric cardiology trainees in the United States has more than doubled over the last decade, with 141 positions in the 2015 Pediatric Cardiology Match, compared with 124 positions in 2011 and 61 positions in 2004. Anecdotal reports of an increase in difficulty encountered by graduating trainees in finding positions in their area of subspecialty have caused leaders in the field to raise concerns about a potential oversupply of pediatric cardiologists. However, accurate and timely data to help inform training programs' decisions about regulating trainee numbers are not readily available. Data on the pediatric cardiology workforce in the United States are obtained infrequently and are limited by varying levels of participation from the wide array of stakeholder groups involved, which include the American Board of Pediatrics (ABP), American Academy of Pediatrics (AAP), American Heart Association, American College of Cardiology, and multiple subspecialty organizations. The most regularly published source of data is an ABP survey of registered board-eligible and/or -certified physicians, but this information is limited to demographic characteristics such as age and regions of practice. The results of the AAP's last workforce survey in pediatric cardiology were published in 2000 (1), and those from the American College of Cardiology's survey appeared in 2009. The latter suggested a shortage of 127 board-certified pediatric cardiologists, or that an additional 6% of the work force would be required over the 2,039 cardiologists who were certified at that time (2). Given the lack of clear, consistent, and recent data, we sought to unite the members of the field and provide a comprehensive assessment of the pediatric cardiology workforce in the current era.

Collaborators from the AAP Division of Workforce and Medical Education Policy, the AAP Section on Cardiology and Cardiac Surgery, the ABP Sub-Board of Pediatric Cardiology, the American College of Cardiology Section on Adult Congenital and Pediatric Cardiology, the American Heart Association Council on Cardiovascular Disease in the Young, and the Society of Pediatric Cardiology Training Program Directors developed and analyzed the

results of this questionnaire, which is the most comprehensive survey of the American pediatric cardiology workforce since 2009 (2).

METHODS

To allow for comparisons of responses between subspecialty groups, questions common to all pediatric subspecialists were developed by the AAP Division of Workforce and Medical Education Policy. These 39 questions addressed training, clinical practice, and demographic characteristics, and allowed for comparisons with both prior published and future planned surveys of pediatric subspecialty groups. We created an additional 41 questions specifically tailored to pediatric cardiologists, which were reviewed and refined by representatives from all of the organizations listed in the previous text. All respondents were asked 21 questions pertaining to their background and current practice in pediatric cardiology. Questions pertaining to trainees and job searches were asked only of fellowship program directors (PDs) (12 questions). Questions regarding plans for physician staffing and hiring were asked only of division or department chiefs (DCs) (8 questions). Although surveys are subjective in nature, all questions were vetted by the AAP Division of Workforce and Medical Education Policy. The survey is available as an [online supplement](#).

Surveys were sent out electronically in March 2015 to all pediatric cardiologists with active e-mail addresses who were registered as board eligible or board certified in pediatric cardiology with the ABP. Surveys were also sent out to nonduplicative e-mail addresses of members of the AAP Section on Cardiology and Cardiac Surgery. Current categorical fellows in training were not included, although board-eligible fourth-year fellows were, by definition, included. Three reminder e-mails were sent to nonresponders over a 3-month period.

Data analysis was performed with descriptive statistics, including frequency distributions and measures of central tendency, to summarize the responses to the survey. Results are expressed as counts with percentages and median (range) or mean \pm SD.

The survey was deemed exempt by the Institutional Review Board of the AAP because survey respondents were anonymous and their zip codes were protected.

RESULTS

Surveys were sent to 2,897 individuals and 823 (28%) responded. Of the 1,656 pediatric cardiologists contacted via e-mail from the AAP Section on Cardiology and Cardiac Surgery, 524 (32%) responded, and of the non-duplicative 1,241 board-certified or -eligible cardiologists contacted through the ABP, 284 (24%) responded. The response from the PDs was remarkably high at 87%

TABLE 1 Survey Data Comparison With the 2000 FOPE II Project

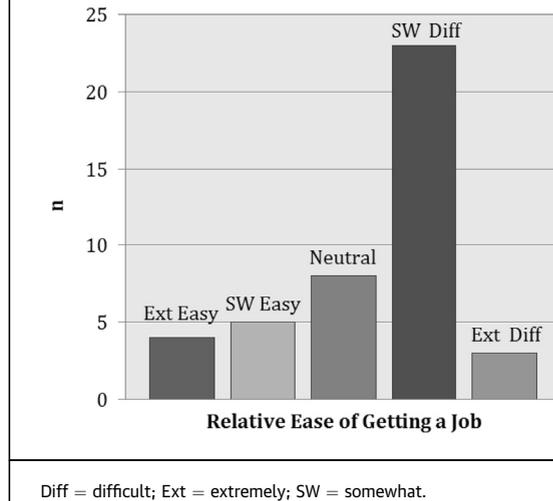
	FOPE II	Current Survey
Eligible pediatric cardiologists, n	1,112	2,897
Years since medical school, mean ± SD	22 ± 10	23 ± 10
Male, %	80	65
Caucasian, %	83	75
Employment site, %		
Medical school hospital	57	66
Group practice	28	23
Solo practice	3	3
Employment location, %		
Urban, inner city	34	34
Urban, not inner city	48	47
Suburban	14	17
Rural	4	2
Distribution of work time, %		
Direct patient care	66	70
Administration	10	10
Teaching	11	10
Clinical research	5	5
Basic science research	3	3
Other	5	4
Face competition in geographic area, %	84	77

Data from Stoddard et al. (1).
 FOPE II = Future of Pediatric Education II.

(48 of 55), as was the response from DCs at 71% (85 of the 120 programs listed in the 2014 edition of *Congenital Cardiology Today* listing providers in North America that offer open heart surgery for children) (3).

Respondent demographics were similar to the data from the FOPE II (Future of Pediatric Education II) project, which was published in 2000 (Table 1) (1), except for a lower percentage of male and Caucasian cardiologists and a trend toward academic centers from private practice. A total of 65% of respondents were male, 75% Caucasian, 19% Asian, 4% Hispanic, 1% African American, and 1% American Indian. Most attended medical schools in the United States (78%), with 2% having attended Canadian medical schools and 20% having received their degrees in other locations. When practice types were evaluated, 66% reported employment in a hospital affiliated with a medical school and/or a university, whereas 15% practiced in a specialty group practice, 6% in a multispecialty group, and 2% in a health maintenance organization group setting. A total of 47% of respondents' practices were located in urban but non-inner city settings, 34% in the inner city, and 17% in suburban settings. The number of hours worked

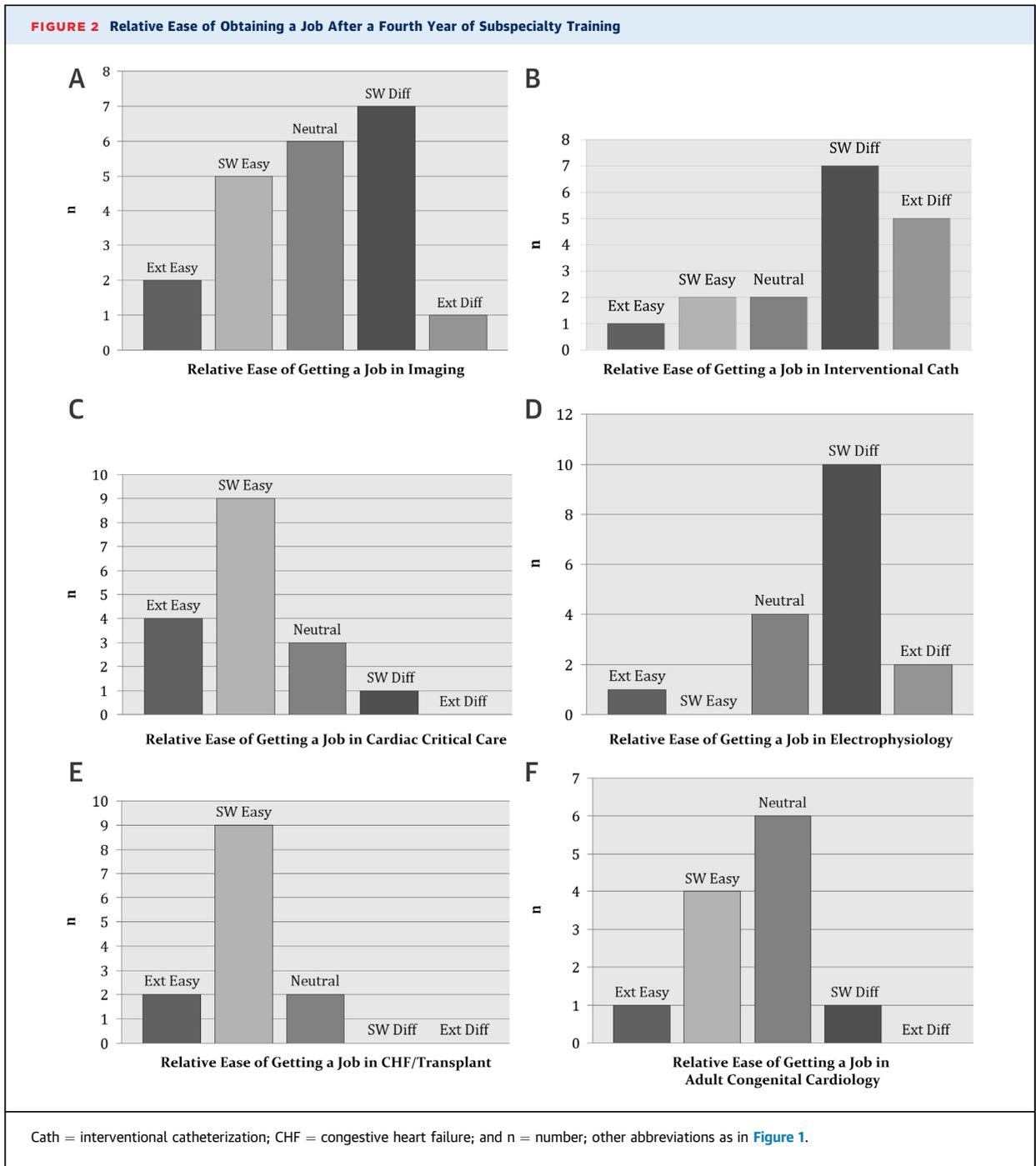
FIGURE 1 Relative Ease of Obtaining a Job After 3 Years of Core Training



per week ranged from 0 to 100, with a median of 60 h and a mean of 57 h. Most respondents provided direct patient care (98%), and this was solely in pediatric cardiology for 86%, while 6% also worked in primary care pediatrics, 4% in cardiac surgery, and 8% in another specialty.

The majority (77%) reported competition in their geographic area from other pediatric cardiologists (93%) or from adult cardiologists (17%). As a result of this competition, 42% modified their practices—predominantly by increasing office hours (65%) and increasing the number of physicians (53%), but also by increasing support staff numbers (35%) and employing advanced practice nurses (31%). (Note that these practice modifications are not mutually exclusive.) In terms of perceptions of the local workforce, 49% of respondents thought that the number of pediatric cardiologists in their area was adequate, whereas 29% thought the numbers were excessive, and only 6% said the numbers were inadequate.

The PDs from the 48 programs responding reported that in the last 2 years, 237 fellows completed the 3-year core training program (119 fellows/year). Only 7 fellows left the program during that period. Of those who completed 3 years of training, 41% were employed directly out of fellowship, and 59% went on to additional training, predominantly a fourth year in a cardiac subspecialty. The breakdown of areas for additional subspecialty training was: 27% imaging, 22% catheterization, 16% electrophysiology, 11% critical care, 8% adult/congenital, 8% heart failure/transplant, 3% research, 1% pulmonary hypertension, and 4% other areas.



Of those employed after the 3-year core training, 53% accepted positions in an academic setting, whereas 36% joined a private practice, and 6% went to an international setting. Those who did a fourth year of subspecialty training went into an academic setting 89% of the time, with only 5% joining a private practice and 4% going international. PDs were asked to rank the ease of obtaining these jobs (Figures 1 and 2A to 2F). The majority of those

seeking a job after the 3-year core training found obtaining a job to be “somewhat difficult.” Figures 2A to 2F detail the relative ease of obtaining a position after a fourth year of subspecialty training. Those who completed a fourth year had the most trouble finding positions in cardiac catheterization and electrophysiology, whereas those specializing in critical care cardiology and heart failure/transplant had the easiest time.

Adult congenital cardiology was rated as “neutral” to “somewhat easy,” whereas finding a position in imaging ranged from “somewhat difficult” to “somewhat easy.”

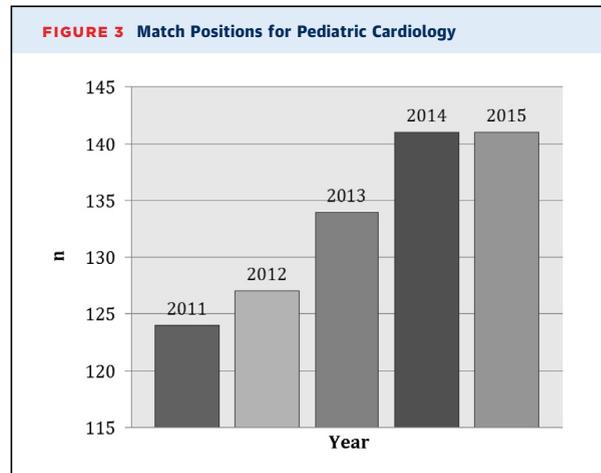
Despite these challenges, over the last 2 years, no third- or fourth-year pediatric cardiology graduate has chosen a position outside of the field. When the responses from the DCs were analyzed, there were found to be 284 new hires over the last 2 years (142 new hires/year). Pediatric cardiology fellows with 4 or more years of training were hired for 53% of the positions, faculty from another institution for 26%, and 3-year core fellowship graduates for 21%. When asked about anticipated openings for the next 2 years, DCs responded that 102 positions would open in the next 12 months and 103 in the following year. The anticipated openings were either due to new positions created by program expansion (53%) or to replace physicians leaving for other institutions or retiring (47%).

Figure 3 shows that there has been a steady increase in positions offered in the Pediatric Cardiology Match (4)—from 124 positions in 2011 to 141 positions in 2014 and 2015. A total of 96% of these positions were filled by the match, and the remaining few were filled after match day. The data for the current job market presented in the previous text reflect the workforce of the 124 fellows who matched in 2011 and graduated in 2014 or 2015.

DISCUSSION

Recently, a growing apprehension has been expressed by some leaders in the field of pediatric cardiology that we are currently training too many fellows for the current job market. As noted in Table 1, the number of pediatric cardiologists in the United States has more than doubled since the FOPE II survey was performed in 2000. The response rate to the survey of 28% was likely lower in part from sending it to all AAP board-certified cardiologists, many of whom are no longer in practice. However, over 75% of the respondents to our survey believe that their area has an adequate or excessive number of pediatric cardiologists. This is concerning, particularly in light of the increased numbers of fellows being trained (compared with 4 years ago), with the addition of new fellowship programs and the expansion of existing programs.

It is difficult to know how many jobs will actually be available in the near future; however, several inferences can be made from this study. If we assume that the 29% of DCs who did not respond to the survey will have a similar number of job openings as those who responded, there would be roughly 150 positions per year for the next 2 years, 40 of which would go to faculty recruited from other institutions. If we also assume that the positions vacated by faculty changing institutions go to fellow graduates at the same rate, 135 jobs per year will be available for fellows in the next 2 years.



As we are now accepting 141 fellows per year, the survey finding that “no pediatric cardiology fellow has left the field upon graduation” may not hold true in the near future. Fellows with advanced training in catheterization and electrophysiology, and those seeking jobs after the 3-year core training, are already having difficulty finding employment; moreover, those in imaging are beginning to struggle. Conversely, fellows found positions more easily in critical care cardiology, heart failure and transplant, and adult congenital cardiology. There has been an increase in advanced training positions in these areas of need recently, suggesting that training programs are working at meeting the demands of the field as our patients age and the complexity of care evolves (5). However, a large number of fellows are still pursuing advanced training in imaging and cardiac catheterization, where there are fewer job opportunities.

This study has several limitations. Although the response rates were excellent for PDs and DCs, the overall response rate of 28% fell well short of our goal of 50%. To estimate the number of DCs, only programs listed in the directory as offering heart surgery were included. It is possible that cardiology groups who refer elsewhere for surgery were under-represented and that more positions may open up in private practice settings. Although this may benefit those seeking a job after the 3-year core fellowship, the majority of trainees are undergoing additional training in a cardiology subspecialty, and nearly all will be looking for academic positions. Only a small number of graduates reported accepting international positions, but this may increase as job-related work visa requirements evolve. Several respondents pointed out that we did not ask specifically about retirement status, either anticipated or taken, which would be useful information for future workforce surveys. Additionally, the authors recognize that survey questions and corresponding answers are subjective in nature.

After input from authors, survey respondents, colleagues, and peer reviewers, we plan to refine the survey on the basis of this experience and send it out every 2 years to keep our field up to date on workforce needs and trends.

CONCLUSIONS

The 2015 pediatric cardiology workforce survey results confirm a tightening of the job market in the field while at the same time showing that all recent graduates found employment. Data regarding the subspecialties in which it was easiest and most difficult to find positions should be useful for career counseling for current and

incoming pediatric cardiology fellows. Due to an increase in fellowship positions since 2011, there is concern that those graduating in the next few years may have more trouble finding jobs in their area of interest. Recognizing the limitations of the survey, the data support curtailing any increase in fellowship positions in all North American training programs in pediatric cardiology at this time. It will be crucial to continue to track the cardiology workforce to be able to optimize the training numbers relative to available positions. By monitoring these survey results every 2 years, we should be able to adjust to workforce demands in a dynamic fashion to optimally fit the number of trainees to the job opportunities.

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KEY WORDS congenital heart disease, pediatrics, physician's practice patterns, trends, workload