

# Training Experiences of U.S. Combined Internal Medicine and Pediatrics Residents

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## Abstract

### Purpose

To investigate the demographics and training experiences of internal medicine and pediatrics (med-peds) physicians.

### Method

A cross-sectional survey addressing demographics, training experiences, and career plans of fourth-year residents graduating from combined internal medicine and pediatrics programs that were identified in the American Academy of Pediatrics database was initiated in May 2003. Questionnaires were mailed up to four times to nonresponders through August 2003.

### Results

Valid responses were received from 212 of the 340 graduating residents (62% response rate). The majority (186/208

[89%]) reported that they would choose med-peds training again. Career planning (135/210 [64%]), office management (173/212 [82%]), and outpatient procedures (155/211 [73%]) were the only areas where the majority desired more training. Neonatal intensive care training was the only topic area that the majority of residents (142/212 [67%]) reported could have been carried out in less time. Nearly all residents (183/196 [93%]) planned to care for children and adults. Residents' self-assessment of their preparation was good to excellent for evidence-based medicine (192/210 [91%]), caring for patients with special health care needs (179/209 [86%]), and use of information technology (169/208 [81%]). Residents felt equally well prepared for postgraduate activities in internal medicine and pediatrics primary

care (170/212 [80%]) versus 163/211 [77%],  $p = .305$ , NS) and internal medicine and pediatric fellowships (186/207 [90%]) versus 181/208 [87%],  $p = .058$ , NS). Only 112 of 209 residents (54%) felt their preparation for research was good to excellent.

### Conclusions

The study findings suggest that med-peds residents are satisfied with their decision to train in med-peds and with their level of preparation. They feel equally well prepared to care for adults and children, and well prepared to care for patients that may transition to adulthood with complex needs, to assess evidence, and to use information technology.

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Since its inception in 1967 combined internal medicine and pediatrics (med-peds) has become the career choice for a significant minority of applicants choosing primary care training. In 2005, 7% of those matching to internal medicine and 13% of those matching to pediatrics chose dual training in combined med-peds residency programs.<sup>1</sup>

The pediatrics and internal medicine communities have recently articulated workforce and training issues, prompting a refocus of training.<sup>2-5</sup> Those issues include changing demographics, the use of evidence-based practice, changes in health economics and practice

management, the growing percentage of children and adults with chronic illnesses, changes in the physician workforce (including the need for more physicians from underrepresented minorities), and the role of subspecialists (including the subspecialty workforce, training issues, and the future scope of subspecialist activities). Recent graduates from internal medicine training programs desire training that more closely resembles practice: less inpatient and more outpatient training, and more emphasis on systems-based practice, including quality of care, patient safety, and resource allocation.<sup>6</sup> Some of these issues are not well captured by traditional measures and require self-evaluation by trainees.

The demographics and degree to which graduating med-peds residents are confident that they possess the core skills of a pediatrician and an internist have not been studied. This information is important, as it may affect residents' choices of career paths after residency,

and hence the constitution of the future pediatrics and internal medicine workforce. Their reflections on curricular adequacy and desirable curricular modification, which might embellish confidence and self-perceived competence, were last surveyed six years before the med-peds curriculum was last updated, 12 years before the Future of Pediatric Education II (FOPE II) was published, and 17 years prior to the evolving refocus of internal medicine training.<sup>7-9</sup> The literature on the outcomes of med-peds programs has been recently reviewed; however, the data available at the time of the review were old and there was an overreliance on surveys of program directors.<sup>10</sup> There has been rapid growth in number and size of med-peds programs in the last 15 years, and the majority of med-peds physicians trained after these studies were conducted. Hence, the authors of that article called for more recent data on the outcomes of training directly from the trainees. With that need in mind, we carried out the research reported here.

Please see the end of this report for information about the authors.

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## Method

We conducted a survey of senior, fourth-year residents from all U.S. internal med-peds programs in 2003. The questionnaire is a modified version of the American Academy of Pediatrics (AAP) Survey of Third-Year Categorical Pediatrics Residents.<sup>11</sup> Our questionnaire contained 38 items; 27 items were adapted from the AAP Third-Year Pediatrics Resident Survey, and an additional 11 items that we created were added to address med-peds-specific training issues. The questionnaire addressed demographics, training experiences, satisfaction with training, and career plans. Residents were identified from the AAP database of all residents who were eligible to receive the Pediatrics Review and Education Program. The target pool consisted of 380 residents from 98 different med-peds programs. The questionnaires were mailed up to four times during the summer that residents completed training. Two mailings were conducted before and two mailings were conducted after residents had left their residencies. U.S. Postal Service mail

forwarding was relied upon to reach residents who moved.

Of the 380 residents surveyed, 212 residents (56%) returned valid questionnaires. An additional 40 residents either could not be contacted due to bad addresses or indicated they were not fourth-year med-peds residents. When these ineligible cases were removed from the denominator, the adjusted response rate to the survey was 62% (212 of 340).

To assess potential response bias, respondents were compared to nonrespondents for several demographic variables. Respondents to the survey were slightly younger than nonrespondents (mean = 32;  $n = 210$  versus mean = 33;  $n = 127$ )  $p < .001$ . They were also more likely to be women (97/212 [46%] versus 44/128 [34%],  $p = .039$ ), which is consistent with other AAP surveys.<sup>12</sup>

Frequencies or means were computed for the various survey questions. Chi-square tests for categorical variables and  $t$  tests for continuous variables were used to

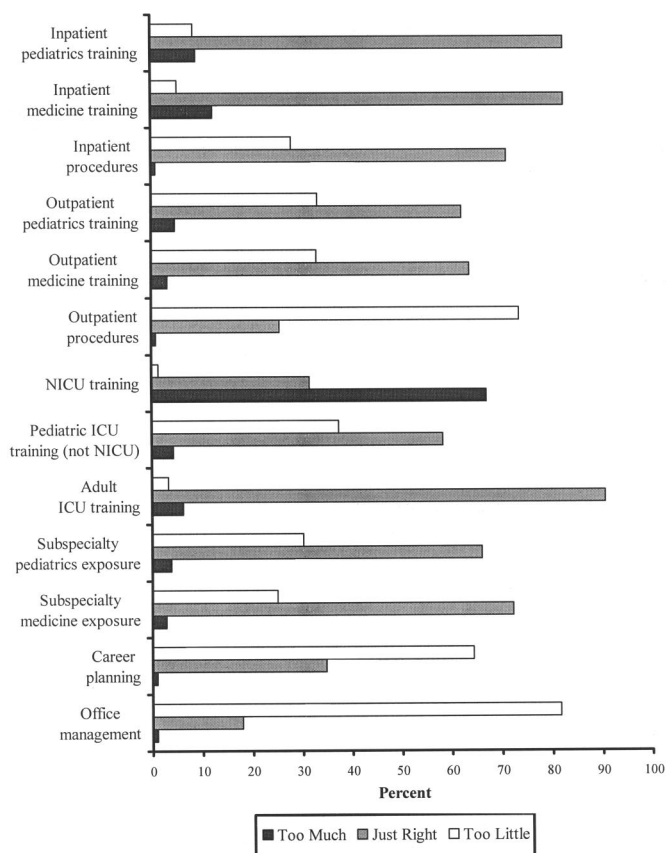
examine specific relationships between variables. A repeated-measures analysis of variance was also used to compare residents' preparation for various future activities, measured on a five-item scale (1 = poor to 5 = excellent). To protect against inflated alpha levels, follow-up comparisons were conducted only if the omnibus results were significant. The number of cases for each analysis varied slightly based on the number of missing cases for each variable. A  $p$  value less than or equal to .05 was considered significant for all inferential analyses.

Our survey instrument, the 2003 Med-Peds Resident Survey, was reviewed and approved by the AAP Institutional Review Board.

## Results

Of the 212 survey respondents, 97 of 212 (46%) were women, 70 of 209 (33%) were nonwhite, 12 of 209 (6%) were underrepresented minorities, and 10 of 212 (5%) were international medical graduates. Additionally, 160 of 211 of the med-peds residents (76%) reported being married or living with a partner, and just over a third had children (74/208 [36%]). The vast majority of residents (171/209 [82%]) or their spouses had educational debt from medical school and/or college. For those who reported debt, the average indebtedness was \$119,433 (range \$6,000 to \$400,000).

Residents were asked for their assessments of the amount of time allocated in their programs to various activities. For most training areas, the majority of residents reported that the amount of time was appropriate (Figure 1). However, 135 of 210 (64%) desired more career planning, 155 of 211 (73%) more outpatient procedures training, and 173 of 212 (82%) more training in office management. There was no significant difference in the desire for more training in outpatient procedures between those planning a primary care career and those not (86/111 [77%] versus 64/95 [67%],  $p = .104$ , NS). The graduating med-peds residents had been exposed to a mean of seven (range zero to 30) practicing med-peds physicians during their training. Although 169 of 212 (80%) had a physician mentor who provided career advice, the majority of respondents (135/210 [64%]) desired more assistance with career planning. Residents with a mentor



**Figure 1** Graduating residents' ( $n = 212$ ) assessment of the adequacy of the time allocated to various components of their training. These were fourth-year graduates of U.S. combined programs in internal medicine and pediatrics (med-peds) in 2003.

were more likely to report adequate time devoted to career planning (66/167 [40%] versus 9/43 [21%],  $p = .023$ ). Likewise, those who had the availability of a career planning seminar during their residency were also more likely to report adequate time devoted to career planning (63/153 [41%] versus 11/56 [20%],  $p = .004$ ). Neonatal intensive care unit training was the lone area where most residents reported too much training time was devoted (144/212 [67%]), too much, versus 70/212 [33%] just right or too little,  $p < .001$ .

In addition to their core categorical training, most residents reported being offered various med-peds educational opportunities (Figure 2). The most frequent activities were journal clubs and med-peds ambulatory clinics. Med-peds grand rounds and med-peds visiting professors were less commonly utilized

by training programs. Roughly half of residents (104/211 [49%]) reported that interdisciplinary subspecialty electives were offered in their program (Table 1). Fewer residents reported that med-peds subspecialty fellowships were offered at their institutions.

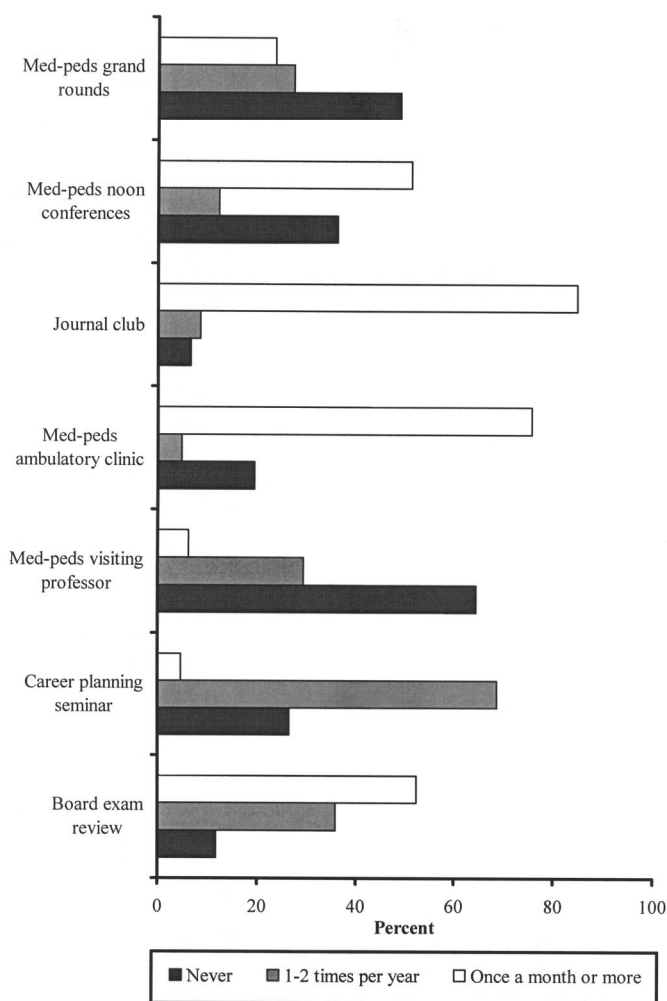
When residents were asked about their level of preparation for various postresidency activities, most residents felt well prepared. For nine of the ten topics investigated, over three quarters of residents indicated that their preparation was good, very good, or excellent (Figure 3). Preparation for evidence-based medicine (192/210 [91%]) and internal medicine fellowship training (186/207 [90%]) were the highest-rated activities. Residents also reported good, very good, or excellent preparation for caring for children with special health care needs (179/209 [86%]) and the use of

information technology (169/208 [81%]). The lone outlier was research, where only about half of residents (112/209 [54%],  $p < .001$ ) reported good to excellent preparation. There was no statistically significant difference between the percentage of residents who felt their preparation for primary care activities in internal medicine (170/212 [80%]) and pediatrics (163/211 [77%]) was good, very good, or excellent ( $p = .305$ ). Similarly, there was no statistically significant difference between the percentage of residents who felt well prepared for fellowships in pediatric (181/208 [87%]) and internal medicine (186/207 [90%]) subspecialties, although this approached significance ( $p = .058$ ).

Finally, residents answered several questions about their satisfaction with their choice to train in med-peds and their future plans (Table 2). The overwhelming majority (186/208 [89%]) reported that they would choose med-peds training again. Almost all residents (207/211 [98%]) planned to take both the internal medicine and the pediatrics board examinations, and 183 of 196 residents (93%) intend to care for infants, children, adolescents, and adults, with no statistical difference between age subgroups ( $p = .471$ ). More than half of the residents said they plan to practice primary care (112/207 [54%]) or primary care plus subspecialty care (13/207 [6%]), with the rest spread among subspecialty, hospitalist, and nonclinical opportunities.

**Discussion**

Despite the challenges associated with completing two three-year residency programs in four years, med-peds programs continue to be the career choice for 300–400 graduating medical students each year. Studies of graduates show that the combined programs have been successful in training graduates who achieve dual certification and who are seeing both adults and children. These programs have also contributed to solutions in physician shortage areas and pediatrics subspecialty shortage areas.<sup>13</sup> Med-peds graduates practice in a wide variety of settings, including ambulatory centers, inpatient wards, and intensive care units.<sup>14</sup> In the present study, we examined the residents' training experiences and whether these combined training programs are meeting the diverse educational needs of med-peds residents



**Figure 2** Educational opportunities available during residency to residents in combined internal medicine–pediatrics (med-peds) residency programs. These were fourth-year graduates ( $n = 212$ ) of U.S. combined programs in internal medicine and pediatrics (med-peds) in 2003.

Table 1

**Interdisciplinary Subspecialty Opportunities Offered in Combined Training Programs for U.S. Internal Medicine and Pediatrics (Med-Peds) Residents, 2003\***

Subspecialty offered	Residents in programs offering elective	Residents at institutions offering fellowship
	No. (%)	No. (%)
Med-peds cardiology	16 (8)	11 (5)
Med-peds endocrinology	47 (22)	20 (9)
Med-peds gastroenterology	14 (7)	1 (1)
Med-peds hematology/oncology	2 (1)	6 (3)
Med-peds infectious disease	17 (8)	10 (5)
Med-peds pulmonary	8 (4)	8 (4)
Med-peds nephrology	8 (4)	19 (9)
Med-peds rheumatology	55 (26)	15 (7)
Combined adolescent and sports medicine	54 (26)	5 (2)

\*The authors surveyed graduating fourth-year U.S. med-peds residents identified in the American Academy of Pediatrics database. Valid responses were received from 212 of the 340 graduating residents.

and fostering the future plans of med-peds residents.

Our findings show that the vast majority of graduates were happy with their career choices and felt that the amount of training they received was just right for most of the key components in inpatient and outpatient care in internal medicine and pediatrics. The respondents were equally comfortable with their preparation for internal medicine and pediatrics practice. They were also equally comfortable with their preparation for fellowships in both specialties. These data are in contrast to recently published data from a study focusing on practicing med-peds physicians. Those data suggest that med-peds physicians are more comfortable caring for adults than for children.<sup>15</sup> Differing results of these two studies might be explained by differences in study methodology (including sampling and recall bias), changes in med-peds training (including program requirements, mentoring, and supervision), or changes in demographics (including age and gender). These two studies taken together suggest that if there are differences in the levels of confidence for providing care to adults versus to children among some practicing physicians, the differences are likely to be the result of experiences in the workforce rather than experiences during training.

Med-peds residents have a variety of med-peds training experiences available

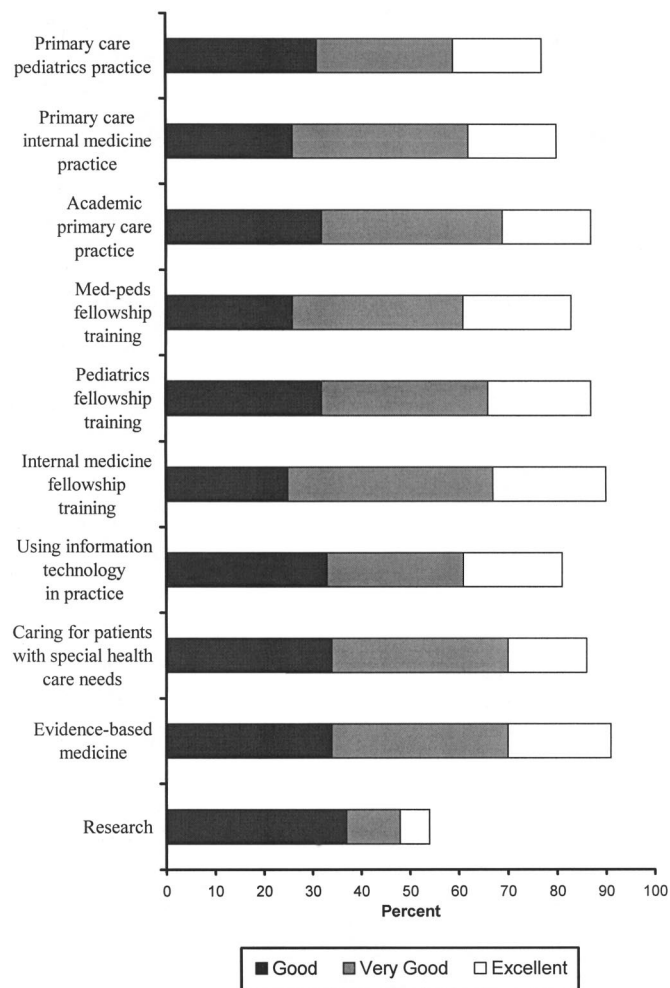
to them, including med-peds conferences and grand rounds, combined clinic experiences and combined rotations in a wide variety of specialties. Roughly three quarters (152/210; 72%) of all responding residents attended a combined clinic at least once a week during their residencies. This is an increase from that found by older reports, suggesting that a minority of residents trained in combined clinics.<sup>10</sup> The overwhelming majority (183/196; 93%) of graduating residents in our study planned to care for patients of all ages. This percentage is on the upper end of the range of 77% to 95% reported in previous studies.<sup>8,9,13-17</sup> This higher percentage of residents planning to care for adults and children may be related to a number of factors; for example, there are increasing numbers of med-peds physicians in practice in the community available to work with, there are greater numbers of residents training in combined clinics, and there is a greater availability of med-peds role models.

Graduates felt they were well prepared for a variety of postresidency activities, including a number of emerging areas emphasized by the pediatrics and internal medicine communities. The vast majority of graduating residents felt well prepared for the practice of primary care pediatrics (163/211; 77%) and internal medicine (170/212; 80%) and for the use of evidence-based medicine (192/210; 91%) in their practices. Med-peds training continues to offer a variety of possibilities. It prepares graduates for careers in the

primary care of adults and children, for careers in hospital care, or prepares graduates for continued training in subspecialty fellowships. Med-peds graduates are comfortable in their preparation for each of these careers and may help solve manpower shortages that currently exist in both primary care and in pediatrics subspecialties.

The care of children, adolescents, and adults with chronic illnesses is an issue increasingly emphasized by educational organizations.<sup>2-5</sup> The med-peds residency curriculum provides in-depth pediatrics and adult subspecialty exposure as well as significant experience in the primary care management of children, adolescents, and adults with chronic illnesses. It is not surprising, then, that the majority of graduating residents feel that they were well prepared to care for these populations. Med-peds trained physicians may be uniquely prepared to care for young adults with chronic childhood illnesses as they transition to adult health care systems. A recent study of med-peds practitioners showed that more than 60% of the med-peds generalists and almost 75% of med-peds subspecialists were involved in such care.<sup>15</sup> Given their high level of comfort in providing care to individuals of all ages with special health care needs, methods should be explored to further use med-peds graduates as a resource for this population.

The residency program guidelines of the American Board of Internal Medicine and the American Board of Pediatrics and the program requirements of the Accreditation Council for Graduate Medical Education seek a balanced educational experience. Careful attention has been paid to protecting med-peds residents from excessive requirements and duplication of intensive care training.<sup>18-20</sup> Nearly all residents surveyed felt that the amount of training in adult critical care was just right. A majority (123/211; 55%) also felt that the amount of training in the pediatric intensive care units was just right, though a significant minority (79/211; 37%) desired more training in this area. In contrast, the majority of graduates (142/211; 67%) felt too much time was spent in neonatal intensive care unit (NICU) training. The current guidelines require three months of training in neonatology and a maximum total of eight months of



**Figure 3** Graduating residents ( $n = 212$ ) reporting good, very good, or excellent preparation for postresidency activities. These were fourth-year graduates of U.S. combined programs in internal medicine and pediatrics (med-peds) in 2003.

required critical care experiences divided equally between internal medicine and pediatrics, leaving one month available for a required pediatrics intensive care experience.<sup>20</sup> Residents, however, may use elective time to rotate for an additional month in the pediatric intensive care unit (PICU). In designing the med-peds guidelines the boards determined that PICU was an area where significant overlap existed with adult intensive care unit experiences and that additional time in the PICU beyond one month should not be required. On the other hand, the boards determined that the NICU experience is unique to being a pediatrician and that three months would be required to become a certified pediatrician, just as that length of time is required for categorical pediatrics residents. These NICU requirements are also supported by program outcomes

showing more med-peds graduates are providing inpatient care of newborn infants at some level than are providing pediatric critical care. A study of med-peds graduates in the 1990s that looked at intensive care unit activities showed that more than 40% were caring for newborns in a level 1 or 2 nursery, and approximately 20% were caring for patients in the PICU.<sup>14</sup> Our study suggests that residents would prefer to have their pediatric critical care experience more evenly divided between neonatal intensive care and pediatric intensive care.

The majority of med-peds graduates (150/211; 71%) are comfortable with the amount of training in inpatient procedures. In contrast, the majority (155/211; 73%) felt that they needed more training in outpatient procedures. Our study did not identify which procedures they desired more training in.

There is little information available on the level of satisfaction of pediatrics residents with procedure training. However, studies of internal medicine and family medicine training programs also report a similarly large portion of graduating residents who desire more training and experience with ambulatory procedures.<sup>21–25</sup> A recent study of family medicine residents demonstrated that few residents felt very competent in most of the procedures surveyed but most felt at least somewhat competent in 25 of the 31 procedures surveyed.<sup>26</sup> Several obstacles to achieving competence in outpatient procedures have been identified. Lack of faculty experience, skills, and confidence; low volume of procedures; and scheduling problems have been the most commonly identified barriers to the teaching of procedures in residency.<sup>26–28</sup> Family medicine and internal medicine residents found that continuity clinics and subspecialty rotations were the most useful venues for learning outpatient procedures.<sup>28</sup> Further study is needed to identify the specific outpatient procedures residents feel they need more training in and their training experiences with each procedure.

Although (169/212; 80%) of the responding residents reported having a mentor who provided career advice, the majority of the respondents (135/210; 64%) desired more assistance with career planning. Due to the growth of med-peds programs in recent years, many med-peds faculty are recent graduates themselves and may not yet have the career experience to optimally advise residents. Nevertheless, those residents who had a mentor were more likely to report a sufficient amount of time devoted to career planning. Our survey asked only about the availability of a career advisor but did not ask about how often the resident met with this person. Formalizing specific mentorship assignments and increasing the frequency of residents' meetings focused on career planning may further improve residents' satisfaction in this area. Roughly three quarters of the residents in our study (155/211; 73%) had career planning seminars in their program. Those that had career planning seminars available to them more often reported a sufficient amount of time devoted to career planning, suggesting that this may also be an effective way to begin addressing this need.

Table 2

**Future Plans of U.S. Internal Medicine and Pediatrics (Med-Peds) Residents, 2003\***

Plan	Residents
	No. (%)
<b>Specialty; boards</b>	
Would choose med-peds again	186/208 (89)
Plan to take pediatrics boards	209/211 (99)
Plan to take internal medicine boards	209/211 (99)
Plan to take both pediatrics and internal medicine boards	207/211 (98)
<b>Plan to care for the following patients</b>	
Infants	194/202 (96)
Children	199/204 (98)
Adolescents	206/209 (99)
Adults	200/205 (98)
All patient groups	183/196 (93)
<b>Future clinical practice goal</b>	
Primary care practice	112/207 (54%)
Primary and subspecialty practice	13/207 (6%)
Subspecialty practice	38/207 (18%)
Hospitalist	34/207 (16%)
Not entering clinical practice	10/207 (5%)

\* The authors surveyed graduating fourth-year U.S. med-peds residents identified in the American Academy of Pediatrics database. Valid responses were received from 212 of the 340 graduating residents.

Senior residents and graduates of primary care disciplines have frequently felt unprepared for the transition to practice and have desired more training in practice management.<sup>29,30</sup> The med-peds graduates in our survey felt similarly unprepared for practice management. There are only a few studies in the literature that address the effectiveness of curricular elements in developing practice management skills. Family medicine residency programs are required to have at least 60 hours of practice management training in classroom and practice settings.<sup>31</sup> The majority of family medicine programs are meeting this requirement, and the majority of family medicine program directors feel that their practice management curricula are effective.<sup>32</sup> That is not corroborated by the only study of residents in these programs, which showed that most have been dissatisfied with their training in this area.<sup>29</sup> Dr. Rose and his colleagues have suggested that this discrepancy may be due to several factors, including the fact that practice management is complex and changing, postresidency practice is probably the best teacher of practice management, and residents prioritize practice management education lower

than clinical education during residency.<sup>32</sup> Practice management tracts have been developed in internal medicine and in pediatrics programs at some institutions and have been successful in increasing the residents' level of confidence in practice management.<sup>33-35</sup>

The med-peds residents who responded did not feel that they were well prepared for work in research. Low ratings of research skills have similarly been shown among categorical pediatrics residents.<sup>36</sup> While promoting the development of research skills during residency is desirable,<sup>37</sup> the current results underscore the difficulty for programs in finding the time to add those skills to a four-year combined curriculum. Residents did show greater confidence in their ability to interpret and apply the results of research studies, as the vast majority reported being well prepared to practice evidence-based medicine.

This study has several limitations that should be considered in making recommendations. First the response rate, although higher than that in most surveys of physicians,<sup>38</sup> is far from ideal. A comparison of respondents to nonrespondents showed that the

respondents were more likely to be women and tended to be younger, although this mean one-year difference is very small. Second, the majority of training questions included in this report are unique to med-peds residents and do not appear on either AAP or American College of Physicians resident questionnaires.<sup>39,40</sup> As a result, no direct comparison to categorical pediatrics or internal medicine residents is possible with respect to many of the issues discussed here. Third, this survey was conducted by the AAP, and respondents may have been more interested in pediatrics than were the nonrespondents. For this reason, our study may overestimate the level of confidence and interest in caring for children. Fourth, this is a study of residents' opinions. The level of competence achieved by the residents was only assessed indirectly through residents' self-reports. There may be important differences between the resident's self-reflections and opinions about the appropriate amount of training and the actual amount required to achieve the expected levels of competence. Finally, the residents surveyed were just entering practices and fellowships and may not have had a clear idea of which skills they would be using.

## Conclusions

Our study findings suggest that the graduates from combined internal medicine and pediatrics residency training programs feel that their training was appropriate in the areas that are essential to the practice of internal medicine and pediatrics and that they are well prepared for a wide variety of career choices, including primary care practice and subspecialty fellowship training. Graduating med-peds residents feel well prepared in a number of areas emphasized by FOPE II and other groups and may be uniquely prepared to care for young adults with chronic illnesses from childhood. Med-peds residency programs should consider increasing the time spent on outpatient procedures, career planning, research exposure, and practice management. Further studies should be undertaken to compare the training experiences of med-peds residents with the categorical pediatrics and internal medicine residents' experiences and to evaluate the med-peds graduates' competence in neonatology to determine whether this

time might be better spent developing other skills.

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