SUPPLEMENT ARTICLE

Recently Trained Pediatric Subspecialists: Perspectives on Training and Scope of Practice

Gary L. Freed, MD, MPH[a,b], Kelly M. Dunham, MPP[a,b], Kara E. Switalski, MPH[a,b], M. Douglas Jones, Jr, MD[c], Gail A. McGuinness, MD[d], and the Research Advisory Committee of the American Board of Pediatrics

[a]Child Health Evaluation and Research Unit, Ann Arbor, Michigan; [b]Division of General Pediatrics, University of Michigan, Ann Arbor, Michigan; [c]Department of Pediatrics, University of Colorado Denver, School of Medicine, Aurora, Colorado; [d]Executive Vice-president, American Board of Pediatrics, Chapel Hill, North Carolina

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ABSTRACT

OBJECTIVES. Little is known regarding the factors influencing the decision to pursue pediatric subspecialty fellowship training and the timing of when such a decision is made. In addition, there is no information regarding whether the general pediatrics training received in residency is perceived as valuable by subspecialists. This study was conducted to characterize the strengths and weaknesses of residency and fellowship training from the perspective of recently trained pediatric subspecialists and to assess their current and future career goals and intended scope of practice.

METHODS. A random sample of 550 subspecialists whose initial application for pediatric subspecialty certification occurred between 2002 and 2003 (4–5 years out of training) and 550 subspecialists who applied for board certification between 2005 and 2006 (1–2 years out of training) received a structured questionnaire by mail. The survey focused on decision-making in selection of residency and fellowship programs, strength of residency training in preparation for clinical care provision, and scope of current practice.

RESULTS. The overall response rate was 77%. More than half (54%) of the recently trained subspecialists would have shortened either their pediatric residency or fellowship training if given the opportunity, and 7% were unsure. More than one third of the respondents made the decision to pursue subspecialty training before the start of residency (36% [n = 198]), whereas approximately half of them made this decision during the first (19% [n = 106]) or second (27% [n = 150]) year of residency.

CONCLUSIONS. Many subspecialists would have been interested in modifications to their pediatric residency and fellowship training programs, which may reflect changing patterns of professional activities or the preferences of a younger generation of subspecialists. Given that a substantial proportion of subspecialists decide to pursue subspecialty training before or early in residency, greater flexibility in configuring some residency experiences to meet their career goals would be feasible. *Pediatrics* 2009;123:S44–S49

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Abbreviation
ABP—American Board of Pediatrics

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Address correspondence to Gary L. Freed, MD, MPH, University of Michigan, 300 N Ingalls, Building 6E08, Ann Arbor, MI 48109-0456. E-mail: gfreed@med.umich.edu

MOST PEDIATRIC SUBSPECIALISTS in practice in the United States have completed 3 years of general pediatrics residency training. A small number of trainees, who wish to combine training in pediatrics with another specialty or focus their future careers in subspecialty-oriented research, complete alternative training pathways that shorten the time spent in residency and allow for a more rapid transition to additional research training and subspecialty clinical experiences.[1]

Little is known regarding the factors that influence the decision to pursue pediatric subspecialty fellowship training and the timing of when such a decision is made. Previous studies have identified research exposure during residency and academic career goals as important considerations to residents who are contemplating a subspecialist career.[2–4]

In addition, there is no information regarding whether the general pediatrics training received in residency is perceived as valuable by subspecialists and if such training is viewed by some as simply a necessary prerequisite to enter subspecialty training. A better understanding of the utility of residency training from the perspective of subspecialists may help to guide efforts to modify the structure of residency training to provide the greatest possible relevance for pediatricians who undertake fellowship training.

This study was conducted to characterize the strengths and weaknesses of residency and fellowship training from the perspective of recently trained pediatric subspecialists and to assess their current and future career goals and intended scope of practice.

METHODS

Sample

The American Board of Pediatrics (ABP) maintains a database of all physicians who are certified as subspecialists within the field of pediatrics. The list includes all those who have ever applied for board certification and the years in which they applied. From this list, we selected a random sample of 550 subspecialists whose initial application for pediatrics subspecialty certification occurred between 2002 and 2003 (4–5 years out of training) and 550 subspecialists who applied for board certification between 2005 and 2006 (1–2 years out of training).

Survey Instrument

In collaboration with the ABP Research Advisory Committee, we developed a structured questionnaire to be administered by mail. The survey contained 21 items and was designed to be completed in 10 minutes or less. The survey focused on decision-making in selection of residency and fellowship programs, strength of residency training in preparation for their clinical care provision, and scope of current practice. The questionnaire was a composite of fixed-choice and Likert-scale questions.

Questionnaire Administration

The first mailing of questionnaires was sent via priority mail to the 1100 physicians in the sample in August of 2007. The survey packet contained a personalized cover letter, the instrument, a business reply mail envelope, and a $5 bill as an incentive to complete the questionnaire. Two additional mailings were sent to nonrespondents in September and October 2007. The second and third mailings were sent via first-class mail and contained a personalized cover letter, the instrument, and a business reply mail envelope.

Data Analysis

Frequency distributions were calculated for all survey items. Next, χ^2 statistics were used to compare responses for those who had completed training 1 to 2 years previously and those who had completed training 4 to 5 years previously. Comparisons were also made according to gender and between neonatal and critical care subspecialists and all other subspecialties.

The study was approved by the University of Michigan Medical School Institutional Review Board.

RESULTS

Response Rate

Of the initial 1100 survey packets mailed, 88 were returned as undeliverable by the postal service, and 781 physicians returned the survey; this yielded an overall response rate of 77%. Twelve respondents were ineligible because they were no longer working in the field of pediatrics or its subspecialties.

Two-hundred eighteen subspecialists were determined to be ineligible for the survey because they had completed subspecialty training before 2002. These subspecialist data were removed from the study, which left a total of 551 respondents for analysis.

The total number of each question may differ slightly because not every pediatrician responded to every question.

Respondent Characteristics

More than half (52% [n = 286]) of the respondents were female, and approximately one quarter (23% [n = 126]) of them were international medical school graduates. Twenty-five percent (n = 138) of the respondents were neonatal-perinatal subspecialists, and 11% (n = 59) were pediatric critical care subspecialists.

Practice Setting

A majority (85% [n = 470]) of the respondents reported that they are currently working in pediatrics as a subspecialist only and are not providing any general pediatric care. Thirteen percent (n = 70) of the respondents indicated that they provide both general and subspecialty care, whereas 2% (n = 10) reported providing only general pediatric care.

No differences were observed for any variables between subspecialists who completed training 1 to 2 years previously and those who completed training 4 to 5 years previously.

All respondents reported that they are involved in clinical care in some capacity. A majority of the physicians described their current clinical practice as either pediatric inpatient care with little or no outpatient care (35% [n = 193]) or pediatric outpatient care with substantial inpatient care (32% [n = 177]). Neonatal and critical care subspecialists were more likely than other subspecialists to report that they provide inpatient care with little or no outpatient care (92% vs 3%; $P < .0001$) (Table 1).

A majority (64% [n = 354]) of the subspecialists reported that their current clinical practice setting is an academic health center, whereas 15% (n = 84) reported providing care in a private practice. Neonatal and critical care subspecialists were less likely than other subspecialists to provide care primarily in an academic health center (57% vs 68%; P = .0029) and more likely to provide care in a private hospital (17% vs 7%; P = .0029).

More than half (56% [n = 307]) of the subspecialists reported that they serve an equal mix of populations that are privately and publicly insured. More than one quarter (28% [n = 156]) of the subspecialist respondents reported that their primary population is mostly publicly insured or underserved. More than half (57% [n = 315]) of the subspecialist respondents reported that they hold a full-time academic appointment, whereas 20% (n = 110) did not report holding any type of academic appointment. A majority (74% [n = 410]) of the respondents regularly teach or precept for students, residents, or fellows. Neonatal and critical care subspecialists were less likely to hold an academic appointment and to teach or precept.

A majority (92% [n = 506]) of the respondents were

TABLE 1 **Subspecialist Practice Setting**

	Overall ($N = 551$), % (n)	Neonatal and Critical Care ($N = 197$), % (n)	All Other Subspecialties ($N = 354$), % (n)	Female ($N = 286$), % (n)	Male ($N = 265$), % (n)
Clinical practice					
Inpatient care with little or no outpatient care	35 (193)	92 (182)[a]	3 (11)[a]	35 (102)	35 (91)
Outpatient care with substantial inpatient care	32 (177)	3 (6)[a]	48 (171)[a]	29 (82)	36 (95)
Outpatient care with little or no inpatient care	20 (110)	1 (1)[a]	31 (109)[a]	23 (65)	17 (45)
Research/administrative with some clinical care	13 (70)	4 (8)[a]	18 (62)[a]	13 (37)	12 (33)
Clinical practice setting					
Academic health center	64 (354)	57 (112)[a]	68 (242)[a]	71 (203)[a]	57 (151)[a]
Private practice	15 (84)	15 (29)[a]	16 (55)[a]	10 (30)[a]	20 (54)[a]
Private hospital	11 (60)	17 (24)[a]	7 (26)[a]	11 (31)[a]	11 (29)[a]
Community-based health center	6 (34)	8 (16)[a]	5 (18)[a]	4 (12)[a]	8 (22)[a]
Other	4 (19)	3 (6)[a]	4 (13)[a]	4 (10)[a]	4 (9)[a]
Primary patient population					
Equal publicly and privately insured	56 (307)	55 (108)[a]	57 (199)[a]	55 (156)	57 (151)
Mostly publicly insured/underserved	28 (156)	34 (67)[a]	25 (89)[a]	30 (84)	27 (72)
Mostly privately insured	13 (70)	9 (17)[a]	15 (53)[a]	13 (38)	12 (32)
Military	3 (16)	2 (5)[a]	3 (11)[a]	2 (6)	4 (10)
Current academic appointment status					
Full-time academic faculty	57 (315)	51 (100)[a]	61 (215)[a]	60 (173)[a]	54 (142)[a]
Part-time academic faculty	8 (43)	7 (14)[a]	8 (29)[a]	11 (31)[a]	5 (12)[a]
Adjunct/volunteer/courtesy faculty	15 (83)	14 (27)[a]	16 (56)[a]	10 (29)[a]	20 (54)[a]
No academic appointment	20 (110)	28 (56)[a]	15 (54)[a]	19 (53)[a]	21 (57)[a]
Frequency teach or precept for students, residents, or fellows					
Regularly	74 (410)	68 (134)[a]	78 (276)[a]	77 (221)	71 (189)
Occasionally	20 (110)	21 (42)[a]	19 (68)[a]	18 (50)	23 (60)
Not at all	6 (31)	11 (21)[a]	3 (10)[a]	5 (15)	6 (16)
Current employment status					
Full-time	92 (506)	96 (190)[a]	90 (316)[a]	87 (247)[a]	98 (259)[a]
Part-time	8 (44)	4 (7)[a]	10 (37)[a]	13 (38)[a]	2 (6)[a]

[a] $P \leq .05$.

currently employed full-time. Male subspecialists were more likely to be employed full-time (98% vs 87%; $P < .0001$).

Factors That Influence Career Choice

When asked to indicate the 2 most important factors in the decision to become a subspecialist, the largest proportion (63% [$n = 345$]) of respondents reported interest in a specific disease or organ system. Approximately half (48% [$n = 367$]) of the subspecialists identified their interest in a specific patient population to be a driving factor in this decision. Neonatal and critical care subspecialists were more likely than others to cite interest in a specific patient population (76 vs 33%; $P < .0001$) and earning potential (21% vs 10%; $P = .0008$) as the 2 most important factors in becoming a subspecialist. Compared with neonatal and critical care, other subspecialties were more likely to indicate interest in a specific disease or organ system (75% vs 40%; $P < .0001$) and structured hours or lifestyle (31% vs 9%; $P < .0001$) as most important (Table 2).

TABLE 2 **The 2 Most Important Factors in Decision to Become a Subspecialist**

	Overall ($N = 551$), % (n)	Neonatal and Critical Care ($N = 197$), % (n)	All Other Subspecialties ($N = 354$), % (n)
Interest in specific disease or organ system	63 (345)	40 (78)[a]	75 (267)[a]
Interest in specific patient population	48 (267)	76 (150)[a]	33 (117)[a]
Research/academic environment	32 (176)	29 (58)	33 (118)
Structured hours/lifestyle	23 (126)	9 (18)[a]	31 (108)[a]
Earning potential	14 (78)	21 (41)[a]	10 (37)[a]
Location	2 (9)	1 (2)	2 (7)
Loan repayment	1 (7)	2 (4)	1 (3)

[a] $P \leq .05$.

Residency and Fellowship Training

Residency and Fellowship Program Selection

When asked to identify the 2 most important factors in the selection of their specific residency program, subspecialists most commonly chose location (61% [$n = 331$]) and prestige (44% [$n = 242$]) of the program. When asked to identify the 2 most important factors in the selection of their specific fellowship program, the largest proportion (63% [$n = 347$]) of respondents reported the subspecialty expertise or training opportunities at a particular program to be 1 of the 2 most important factors; program location (47% [$n = 255$]) and program prestige

TABLE 3 The Most Important Factors in Residency and Fellowship Program Selection

	Overall ($N = 546$), % (n)	Female ($N = 286$), % (n)	Male ($N = 265$), % (n)
The 2 most important factors in selecting residency program			
Location	61 (331)	59 (167)	62 (164)
Prestige of program	44 (242)	47 (133)	41 (109)
Subspecialty expertise/training opportunities	35 (191)	34 (95)	37 (96)
Lifestyle/call schedule/family-friendly/overall fit	27 (149)	26 (74)	29 (75)
Potential employment for spouse/partner	12 (63)	15 (42)[a]	8 (21)[a]
Patient population	10 (54)	10 (29)	10 (25)
Program flexibility	7 (37)	6 (17)	8 (20)
The 2 most important factors in selecting fellowship program			
Subspecialty expertise/training opportunities	63 (347)	61 (173)	66 (174)
Location	47 (255)	49 (138)	44 (117)
Prestige of program	46 (254)	45 (128)	48 (126)
Lifestyle/call schedule/family-friendly/overall fit	18 (97)	18 (52)	17 (45)
Potential employment for spouse/partner	11 (60)	14 (40)[a]	8 (20)[a]
Patient population	7 (37)	7 (19)	7 (18)
Program flexibility	5 (26)	4 (12)	5 (14)

[a] $P \leq .05$.

(46% [$n = 254$]) were also frequently identified factors (Table 3).

Female subspecialists were more likely than male subspecialists to report that potential employment for a spouse or partner was a key factor in selecting their specific residency (15% vs 8%; $P = .0122$) and fellowship program (14% vs 8%; $P = .0148$).

More than one third (36% [$n = 198$]) of the respondents made the decision to pursue subspecialty training before the start of residency, whereas approximately half of them made this decision during the first (19% [$n = 106$]) or second (27% [$n = 150$]) year of residency.

Potential Use of Additional Flexibility in Residency Training

Subspecialists were asked what they would have done differently if given 6 to 12 months of additional flexibility in their 3-year residency program. Approximately one third of the respondents reported that they would have added additional outpatient subspecialty experiences (37% [$n = 203$]) and additional inpatient general or subspecialty rotations (30% [$n = 166$]).

Neonatal and critical care subspecialist respondents were more likely than other subspecialty respondents to report that they would have added additional inpatient general or subspecialty care (40% vs 25%; $P = .0003$), additional time in the NICU (40% vs 1%; $P < .0001$), and additional time in the PICU (35% vs 15%; $P < .0001$). Other subspecialists were more likely to report that they would have chosen additional outpatient subspecialty experiences (49% vs 15%; $P < .0001$) and outpatient general rotations (14% vs 4%; $P = .0003$) (Table 4).

TABLE 4 Given 6 to 12 Months of Additional Flexibility in Residency Program, How Subspecialists Would Spend Time

	Overall ($N = 548$), % (n)	Neonatal and Critical Care ($N = 196$), % (n)	All Other Subspecialties ($N = 352$), % (n)
Additional outpatient subspecialty care	37 (203)	15 (30)[a]	49 (173)[a]
Additional inpatient general or subspecialty care	30 (166)	40 (78)[a]	25 (88)[a]
Additional time in the PICU	22 (121)	35 (69)[a]	15 (52)[a]
Nothing different	16 (90)	14 (27)	18 (63)
Additional time in the NICU	15 (84)	40 (79)[a]	1 (5)[a]
Additional outpatient general care	10 (57)	4 (8)[a]	14 (49)[a]
Don't know	8 (42)	5 (10)	9 (32)

[a] $P \leq .05$.

Perceptions of Adequacy of Residency Training

The majority of subspecialists reported that their residency training was adequate in the areas of patient safety, coordination of care, and patient communication. Neonatal and critical care subspecialists were more likely to report that they could have used additional training in patient safety (26% vs 12%; $P = .0003$) and patient communication (17% vs 10%; $P = .0364$) (Table 5).

More than half of the subspecialists reported routine use of the training gained through general inpatient service (54% [$n = 294$]) and intensive care experience (64% [$n = 548$]) during their pediatrics residency. Half

TABLE 5 Adequacy of Residency Training in Preparation for Current Practice

	Overall ($N = 547$), % (n)	Neonatal and Critical Care ($N = 196$), % (n)	All Other Subspecialties ($N = 351$), % (n)
Patient safety			
Do not use training	3 (16)	2 (4)[a]	4 (12)[a]
Training was adequate for my needs	80 (436)	72 (141)[a]	84 (295)[a]
Could have used additional training	17 (93)	26 (50)[a]	12 (43)[a]
Coordination of care for complex illnesses			
Do not use training	2 (12)	2 (3)	3 (9)
Training was adequate for my needs	81 (439)	79 (154)	81 (285)
Could have used additional training	17 (95)	19 (38)	16 (57)
Patient communication			
Do not use training	2 (11)	1 (2)[a]	3 (9)[a]
Training was adequate for my needs	86 (467)	82 (161)[a]	87 (306)[a]
Could have used additional training	12 (68)	17 (33)[a]	10 (35)[a]

[a] $P \leq .05$.

TABLE 6 **Perspectives on Scope of Training and Future Practice**

	Overall ($N = 551$), % (n)
Plan to practice general pediatrics in future	
Yes, some general and some subspecialty care	14 (79)
Yes, general pediatrics exclusively	0 (0)
No	70 (384)
Unsure	16 (85)
Views on training and board certification	
Would have shortened general pediatrics residency before fellowship	29 (159)
Would have chosen 2-y fellowship without research	42 (228)
Importance of initial board certification in general pediatrics	84 (461)
Important to maintain general pediatrics board certification throughout career	34 (188)

(52% [$n = 284$]) of the subspecialist respondents reported that they never or rarely use their residency training in community and child advocacy, and 41% ($n = 223$) reported that they never or rarely use the training they received in continuity clinic.

Future Scope of Practice and Board Certification

Seventy percent ($n = 384$) of the subspecialists reported that they do not plan to practice any general pediatrics in the future. However, 14% ($n = 79$) planned to practice some general pediatrics and some specialty care, and a similar number were unsure (16% [$n = 85$]) (Table 6).

A majority (65% [$n = 356$]) of the subspecialists would not have shortened their general pediatrics residency if given the option. However, if given the option, 42% ($n = 228$) of subspecialist respondents would have chosen a 2-year fellowship without research or scholarly activity. Sixteen percent ($n = 89$) of the subspecialists reported that they would have shortened both their general pediatrics residency and fellowship, whereas 39% ($n = 212$) of subspecialists would not have changed the length of either part of their pediatrics training.

A majority (84% [$n = 461$]) of the subspecialist respondents reported that it is important to be initially board certified in general pediatrics. However, only 34% believed that it is important to maintain board certification in general pediatrics throughout their careers (34% [$n = 188$]).

DISCUSSION

A major finding from this study was that 54% of the recently trained subspecialists would have shortened either their pediatrics residency or fellowship training if given the opportunity; 7% were unsure. Approximately one third of the subspecialists would have shortened their residency, and 42% of respondents would have chosen a 2-year fellowship without research or scholarly activity had they been presented with this option.

In contrast to internal medicine subspecialties, pediatrics requires 3 years to complete subspecialty training. The third year is designed to allow for scholarly activity and the creation of new knowledge. The positive influence of research experience on clinical competence was a key part of discussions that formalized the current 3-year fellowship training structure in the late 1980s.[5] However, other researchers have questioned the validity of such assumptions when few data exist regarding the impact of this additional year on educational and clinical outcomes.[6]

Pediatric subspecialists usually provide care for a large geographic area. This is a result of several factors. The paucity of children who require subspecialty care relative to the general population and the resultant density of population required to support the practice of the subspecialist have tended to support aggregation of subspecialists in large referral centers. Such centers can provide the support needed to care for patients in both inpatient and outpatient settings[7] as they simultaneously provide for the education of subspecialist fellows and the ongoing education of practicing subspecialists.

Subspecialists are also responsible for creating the new knowledge, through research, that improves care. Pediatrics subspecialty fellowship training is designed to prepare pediatrics subspecialists for clinical care, education, and research, as well as for a career of evaluation of new research in rapidly developing subspecialty disciplines. However, as the number of pediatrics subspecialists has increased,[3,4] our results indicate that many would prefer to adopt the role of clinician educator or clinician only and forgo the year of research experience.

This finding deserves further investigation. If the sole purpose of the third year is preparation for an academic career, it will not be seen as useful by substantial numbers of pediatric subspecialists. If the purpose is conceived more broadly as a means of familiarizing fellows, through a research experience, with competencies that they will need for evaluating research developments for later incorporation into clinical care, it might be viewed differently. It is important to note that the Subspecialties Committee of the ABP broadened the scope of scholarly activity requirements for fellowships beginning after July 1, 2004.[8] Our respondents would have completed their fellowships before this point, so it is unknown how this recent change in flexibility would have influenced their response to this question.

One potential unintended consequence of changing to a 2-year fellowship requirement would be what is now being observed in the career choices of internal medicine residency graduates. There has been a continued decline in those pursuing generalist careers over the past decade,[9] and enthusiasm for careers in general internal medicine have remained low, with only 25% pursing this career direction.[10] If a larger proportion of pediatricians began to pursue abbreviated subspecialty training, there would be a substantial impact on the availability of general pediatricians.

Patient Safety and Communication

The overwhelming majority of the subspecialists who completed training within the previous 5 years believed that the training received in residency regarding patient safety and patient communication was adequate for their needs. This finding is of interest because of the

recent attention to these issues in the medical and lay literature and the increased efforts of residency programs to improve their training in these areas. It is unclear whether physicians are the best judge of their own competence in these areas.[11] These are 2 of the core competencies for patient care identified by the Accreditation Council for Graduate Medical Education[12] and were recently included as part of the subject matter to be tested in every subspecialty certifying examination by the ABP.

Scope of Practice

Some subspecialists provide only subspecialty care to their patients; others become the sole provider of care for both general and subspecialty needs.[10,11] Still other subspecialists may maintain a general pediatrics practice in addition to their subspecialty patients,[13] either by their own choice or, more likely, because of an insufficient number of subspecialty patients in their market to maintain the viability of their practice. Others may have relocated to areas that do not support pediatrics subspecialty care or may have decided for other reasons (eg, lifestyle) to practice only general pediatric. Because of perceived relative shortages of many pediatrics subspecialists, a significant reduction among those practicing subspecialty care would be of concern not only because of the resources expended in training but also for patient access to care. The fact that 85% of our respondents reported that they provide no generalist care demonstrates that most subspecialists continue to provide the care for which they were trained.

Selection of Residency and Fellowship Programs

Compared with other studies that have asked participants to select among multiple factors that influenced their decision regarding program selection,[3,4] we asked our respondents to identify the 2 most important factors in their decision process. As such, we believe these findings will represent a more nuanced assessment of the issues that are most important in this process. For fellowship training, subspecialty expertise or training opportunities was the most commonly selected factor (63%), followed by program location (47%) and program prestige (46%). This was in contrast to the selection of residency program, for which location (61%) was the most commonly cited factor of importance.

The timing of the decision to enter subspecialty training has implications for the structure of residency training.[14] If the goal is to ensure that residents have enough exposure to subspecialties before making their decision, then specific components must be put into place at targeted points in the educational program. Half of our respondents made the decision to pursue subspecialty training in their first (19%) or second (27%) year of residency, whereas 36% decided before residency training.

CONCLUSIONS

Many subspecialists would have been interested in modifications to their pediatrics residency and fellowship training programs, specifically an option to decrease the time of training to 2 years at the expense of scholarly activity. This may reflect changing patterns of professional activities or the preferences of a younger generation of subspecialists.[15]

Given that a substantial proportion of subspecialists decide to pursue subspecialty training before or early in residency, greater flexibility in configuring some residency experiences to meet their career goals would be feasible.

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