Factors Influencing Pediatric Nephrology Trainee Entry into the Workforce

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Background and objectives: Emerging needs in pediatric nephrology (PN) have made the number of nephrologists entering the workforce of critical importance. This study aimed to discern factors that influence PN fellows to choose their career path and decide to enter the PN workforce.

Design, setting, participants, & measurements: A survey was sent to the American Society of Pediatric Nephrology list of PN fellows (n = 103) in 2008. The 57 fellows (55%) who completed the survey were representative of the group.

Results: The majority decided on a career in PN as senior residents, most commonly due to their interest in renal physiology and academics. They felt residents chose other fields due to lack of interest/exposure to PN, financial constraints, and perceived PN workload. Fellows identified workload and their perception of faculty dissatisfaction as important concerns with PN. None of the respondents planned to leave fellowship, but 21% have considered this. Twenty-eight percent knew a PN fellow who resigned, thought to be due to workload, personal conflicts, and perceived faculty dissatisfaction.

Conclusions: Exposing residents to PN earlier in training and emphasizing positive features may create greater interest in PN. PN programs should be cognizant of workload and the influence of faculty dissatisfaction. Ongoing evaluation of PN fellow perceptions can assist in efforts to enhance recruitment and retention.

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Increasing demand for pediatric nephrology (PN) services in the U.S. has made the size of the PN workforce a significant concern. Nephrology workforce concerns are not restricted to pediatrics. Internal medicine nephrology workforce shortages have become an international issue (1,2). A recent survey-based analysis regarding recruitment in nephrology identified negative job experiences, workload, and financial compensation as key factors causing eligible trainees to exclude nephrology careers (2).

The American Society of Pediatric Nephrology maintains that all children with renal disease should have access to care by pediatric nephrologists to maximize their clinical and psychosocial outcomes. This endorsement is highlighted by differences in practice patterns and time allocation between pediatric and internal medicine nephrologists, (3,4) emphasizing the need for a PN workforce to meet the growing needs of the U.S. children (3).

The prevalence of childhood kidney disease in the U.S. (5) and the world (6,7) is increasing. This is due to improved survival of children with primary kidney disease and those with other diseases who acquire kidney disease as a complication. Sophisticated technological advances have added to the complexity of the field. Teaching, research, and administration demands also continue to claim pediatric nephrologists' attention.

PN training programs, like other pediatric subspecialties, have seen an increase in entering class size over the past decade (8,9). Despite this increase, concerns remain that there are insufficient graduates to fulfill the needs of the PN workforce. In 2008 there were an estimated 40 unfilled PN faculty positions in the U.S. Furthermore, the average age of American Board of Pediatrics certified PN diplomats was 55.7 years in 2008, with 22.2% older than 65, and an additional 29.4% to reach that age within the next decade (9). Retirement of these senior leaders will require replacement by a suitable number of junior colleagues.

The ability to retain PN fellows to meet workforce demand is a concern (10). For the last decade, American Board of Pediatrics data indicates that 22% of PN fellows did not complete their training. This is higher than attrition rates in similar pediatric subspecialties, which ranged from 11% to 19% over this time (9). The number of trainees needed to fulfill looming workforce requirements is not defined, but appears greater than the recent average of 32 board-certified pediatric nephrologists per year (9,10).

Information on career decisions specific to PN or other pediatric subspecialty fellows has not been reported. To better understand the issues confronting PN fellows and promote

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entry into the field, we evaluated their experiences. This survey and analysis form the basis for the recommendations that follow.

Materials and Methods

A pilot survey was sent to PN fellows in June 2008. After evaluating the results, a refined survey was sent to the ASPN list of fellows in the United States and Canada (n = 103) in September 2008.

The survey (http://www.aspneph.com/t&c/Main.asp) assessed: 1) what factors encourage pediatric residents to choose careers in PN; and 2) what features affect fellows' interest to pursue careers in PN. The survey evaluated demographic information about the fellow and his/her training program (Tables 1 and 2). We define "Large" PN programs as those with four or more fellows. We define "Large Faculty" size as programs with seven or more faculty. These criteria were designed to divide the respondents into two similarly sized groups based on results obtained in the pilot survey and data on existing programs. In 2008, 16 of the 37 ACGME-approved PN fellowship programs were "Large" (four or more fellows) while 12 had "Large Faculty" size (seven or more faculty) (8).

Anonymous survey responses were tabulated and compared by demographic subsets. Variations between subsets were tested for statistical significance ($P < 0.05$) using the chi-square test. Statistical analysis was limited by the necessary small sample size.

Results

Demographics of the respondents are shown in Tables 1 and 2 and are compared with the entire population tracked by the ACGME. The survey was completed by 55% of the fellows in training.

What Factors Affect a Resident's Decision to Choose PN?

The majority of fellows chose PN in their senior resident years or later. Notably, of those who chose PN in their intern year, the majority chose "Divided Clinical" programs in which their clinical training was spread out over 3 years of fellowship, rather than "One Year Clinical" programs in which the majority of clinical training was done within 1 year ($P \leq 0.003$).

Renal physiology, the academic setting, critical care nephrology, and outpatient nephrology were attractive features to the majority. PN fellows felt their pediatric colleagues chose other fields largely because they were not interested in the PN subject. Financial burden and workload were also perceived as deterrents. Although mentioned less frequently, the rarity of nonacademic positions was felt to dissuade some from PN. Comments observed that the lack of exposure to PN early in residency contributed to lack of interest and/or avoidance of the subject.

What Features Affect Fellows' Decisions to Pursue a PN Career?

Characteristics of training that fellows believe strengthened their interest in PN include critical care nephrology, the academic setting, and outpatient/chronic care. All were listed as high value by >50% of respondents.

The demographic subsets reveal interesting trends related to this question. Teaching and mentoring were listed more frequently at Large Faculty as compared with Small Faculty programs. Conversely, collaboration/collegiality was identified more at Small programs. Additionally, >90% of fellows younger than 31 years old felt that collaboration/collegiality enhanced their interest. These younger fellows were less likely to list research among the 'strong' points as compared with their older colleagues.

Factors that diminished fellow interest in PN include workload and perceived faculty dissatisfaction, followed by research. No other factor had more than a 20% response rate.

Fellows at Small programs particularly listed these concerns as compared with those at Large programs. Third-year fellows identified faculty dissatisfaction as a concern ($P < 0.05$) significantly more than their junior colleagues. Fellows at "One Year Clinical" programs and first-year fellows especially perceived research as decreasing their interest. Comments emphasized financial burden, low salary, and restricted geographic job opportunities as disincentives for practicing PN.

We also assessed the aspects of training in which fellows felt

Table 1. Pediatric nephrology fellow demographics (total = 57/103 [55%])

Characteristic	*n*	Comparison to 2008 ACGME Composite Data (total = 103 fellows)[a]
1st year	15/57 (26%)	15/53 (28%)
2nd year	24/57 (42%)	24/29 (83%)
3rd year or greater	18/57 (32%)	18/21 (86%)
Male[b]	20/53 (38%)	20/35 (57%)
Female[b]	33/53 (62%)	33/68 (49%)
Under 30 years old[b]	12/51 (24%)	NA
31 to 35 years old[b]	30/51 (59%)	NA
Over 36 years old[b]	9/51 (18%)	NA
American Medical Graduate[b]	18/37 (49%)	18/52 (35%)
International Medical Graduate[b]	19/37 (51%)	19/51 (37%)

NA = Data not available.

[a]In 2008, there were 53 first-year fellows, 29 second-year fellows, and 21 third-year fellows; 35 male fellows and 68 female fellows; and 52 American and 51 International Medical Graduates (total = 103 fellows).

[b]Some respondents abstained from providing certain personal demographics.

Table 2. Pediatric nephrology fellowship program demographics (total = 57/103 [55%])

Characteristic	*n*	Comparison to 2008 ACGME Composite Data (total = programs)
Large Programs (4 or more fellows)	32/57 (56%)	16/37 (43%)
Small Programs (3 or less fellows)	25/57 (44%)	21/37 (57%)
Large Faculty (7 or more faculty)[a]	22/57 (39%)	12/37 (32%)
Small Faculty (6 or less faculty)	35/57 (61%)	25/37 (68%)
One year primarily clinical (others primarily research)	43/57 (75%)	NA
Clinical service divided across all 3 years	14/57 (25%)	NA

NA = Data not available.
[a]"Large Faculty" programs were more likely to have fellowship programs in which the fellow's clinical rotations are done primarily in one year ("One Year Clinical").

well-supported. PN fellows described near unanimous agreement (90% to 100%) that broad clinical exposures, access to research opportunities, development of procedural skills, and supervision and mentorship were supported in their programs. Comparatively fewer fellows felt supported in identifying and assessing job opportunities (57%), the transition to faculty (68%), work hours (75%), and attention to personal life (80%). There were no significant differences in these opinions between the fellow subsets.

We evaluated fellows' perceived workload while on the clinical service during each year of fellowship and as a hypothetical faculty member at their program. During their first year, approximately 40% of fellows recalled averaging 75 or more hours per week at work ("intense workload") while on clinical service rotations. Approximately 50% recalled having a "moderate workload," averaging between 60 and 75 hours per week, whereas about 10% noted working less than 60 hours per week ("friendly workload"). There were no differences noted when comparing subsets of program types.

In the senior years of fellowship, 24% of fellows reported working 75 or more hours per week, on average, during clinical months. Remarkably, 50% of fellows at Large Faculty programs described this "intense" workload as compared with 8% at Small Faculty programs ($P < 0.02$). Of fellows at Large Faculty programs, 25% thought their faculty worked 75 or more hours per week compared with 8% at Small Faculty programs ($P = 0.058$). Similarly, only 18% of PN fellows at Large programs felt their faculty worked <60 hours per week as compared with 58% of fellows at Small programs ($P < 0.02$).

Considered Leaving Fellowship

To better understand the reasons PN fellows decide to not practice PN, we analyzed the subset of responders (12/57, 21%) who have considered leaving their fellowship. Eleven of these fellows came from "One Year Clinical" programs.

They describe higher workload trends compared with the overall group: 57% responded they worked 75 or more hours per week in their first year (compared with 40% overall), 43% in their senior years (24% overall), and 33% perceived they would be doing so as faculty (15% overall). These fellows acknowledged workload and faculty dissatisfaction as aspects that diminished their interest in PN. The minority felt supported in assessing job opportunities, the transition to faculty, work hours, and personal life issues.

Of the total respondents, 28% (16/57) stated they knew someone who had left fellowship. Fifteen came from "One Year Clinical" programs ($P = 0.08$). Workload, family concerns, and the need to practice in a particular location were cited as factors that resulted in attrition.

Discussion

Growing clinical, research and educational needs in PN have made the number of nephrologists entering the workforce of critical importance. We describe a successful mechanism to assess fellow opinion on the factors affecting their future careers. More than half of all fellows responded, although first-year fellows were underrepresented, perhaps due to the timing of the survey. Otherwise this reflects a reasonable distribution of American PN fellow demographics (8–10). We examine the factors that appeared to influence pediatric resident and fellow decisions to pursue a career in PN and present them in recommendation form.

Factors that Could Attract Residents to a PN Career

Recommendation 1. Pediatric Residents with Potential Interest Should be Encouraged to Do a PN Rotation within the First Half of Residency. Features that attracted PN fellows to the field—renal physiology, critical care nephrology, outpatient nephrology, and the academic setting—may be experienced on an elective. Apart from such an elective, residents receive inconsistent exposure to these facets of PN. Moreover, topics such as renal physiology and critical care nephrology may seem intimidating to those without the opportunity to experience them. Many fellows commented that a lack of exposure to PN in early residency years and "fears" of renal concepts may encourage their colleagues to choose other careers paths.

The majority of fellows chose PN in their senior resident years or later. Nevertheless, many residents make career decisions during the first half of residency, without the benefit of direct exposure to PN or many other outpatient-based pediatric subspecialties (11,12). To enter fellowship directly from residency, the NRMP Match in PN requires trainees to choose the

field by mid-training. Evaluation of the Match process may provide feedback regarding the current Match date as it relates to recruitment (13). Similar issues have been raised regarding Match dates in internal medicine nephrology fellowships (14).

We suggest incorporating outpatient opportunities for subspecialty experiences earlier in pediatric training. This could be done by introducing a half-day subspecialty 'continuity' experience during certain rotations. Invitations to seminars in subspecialty areas may prove helpful. Mentorship and clinical interaction between first-year residents and PN faculty will help identify those residents with the interests and skills for a career in PN. Such discussion could encourage early subspecialty electives, maximize direct experiences in the field, and develop relationships vital for long-term success.

Recommendation 2. Subspecialty Salary and Workload Data Should be Available to Pediatric Trainees. PN fellows felt their residency colleagues chose other fields due to perceived undercompensation and heavy workload. There are few objective resources available to residents that provide them with helpful data on PN salaries and workload in comparison to other pediatric subspecialties (15). If these were available, residents may find that pediatric nephrologists' compensation and work hours are reasonable compared with other academic pediatric subspecialties.

Factors that Could Allay PN Fellow Concerns and Encourage Entry into the PN Workforce

Recommendation 3. Pediatric Nephrologists Should Highlight Areas that Attract Fellows to the Field. Critical care nephrology and the academic setting appear to enhance fellow interest in the field. PN program directors should be familiar with the strengths of their programs. Ongoing emphasis of these features throughout fellowship may reinforce the desire to practice in the field. Program directors should be certain that pediatric trainees get exposure to these aspects of PN during rotations as residents.

Recommendation 4. Pediatric Nephrologists Should Address Fellows' Concerns about Faculty Dissatisfaction and Research and Understand Their Impact on Attracting New Physicians into the Field. PN fellows expressed a troubling perception of faculty dissatisfaction. This was more pronounced at Small programs and among third-year fellows. These concerns appear to discourage trainees at a critical junction in their careers. Pediatric nephrologists need to openly address these perceptions and assess why it increases with time in fellowship.

First-year fellows, fellows at One Year Clinical programs, and those at Small/Small Faculty programs more frequently reported research as a negative factor. Program directors should be certain their fellows receive adequate support and mentorship during entry into scholarly activities. Fellows should be advised regarding the breadth of options available for scholarly activities, including those in basic, clinical, and translational science. Early and ongoing assessments of trainee experiences may assist program directors in allaying these fears before they contribute to attrition.

Recommendation 5. Pediatric Nephrologists Should Develop Educational Materials to Help Fellows in Job Searches, Faculty Transition, and Work-Life Balance. PN fellows feel that their training excels in the necessary clinical exposures, research skills, and academic opportunities. Areas where fellows express less comfort include the identification of job opportunities, transition to faculty, workload support, and attention to personal life. Educational materials are needed to guide the search for positions and outline interview/negotiation processes. Mentorship centered on academic expectations and faculty development can smooth the transition into the workforce (16,17). Finally, it is critical that the expectations of our trainees regarding work-life balance are understood by PN program directors and pediatric departments. Educators in PN and other fellowship areas should strive to include mentorship and career development into broad pediatric subspecialty curricula.

Recommendation 6. Attention to PN Fellow Workload Is Necessary. Research is needed to assess whether mixing clinical and scholarly activities over the three years of training would be preferable to the common "One Year Clinical" arrangement.

Nearly half of first-year fellows report working at least 75 hours per week during their clinical months. This pattern persisted into later years at Large Faculty programs. Not surprisingly, workload was noted as a negative factor influencing subspecialty choice and interest in remaining in nephrology. At this clinical intensity, workload could be a relevant factor in attrition, especially considering the attention to duty-hours pediatric trainees experience during their residency. Accordingly, pediatric nephrologists should be cognizant of the workload demands on their fellows and focus on activities that maximize learning skills important to a career in PN. Interestingly, fellows in Divided Clinical Years programs describe many of the same workload concerns, but did not seem to consider leaving the field to the same extent as those at One Year Clinical programs. Further research aimed at the benefits and drawbacks of these arrangements may provide helpful insights into the interaction between attrition and workload.

Recommendation 7. PN Program Directors Should be Aware that Many Fellows Consider Leaving the Field. Over the last decade, PN fellow attrition during their 3 years of training has averaged at 22%, the highest rate among all pediatric subspecialities (9). Furthermore, 21% of our survey respondents have considered leaving PN training. While we are unable to assess the depths of these considerations, we note that most occur in One Year Clinical Programs in which trainees describe: 1) higher workload; 2) less support in work-life balance; and 3) less support in transition to faculty practice and assessing job opportunities.

Additionally, nearly 30% of fellows knew a colleague who decided not to continue in the field. All but one were reported by fellows at One Year Clinical programs, citing workload as a factor. Although the numbers are small, the combination of a more intense workload concentrated in one full year may have impacted enthusiasm for PN. While their accuracy may be considered hearsay, such concerns are important to note. An

unhappy trainee in a seemingly isolated program may negatively influence others in the small PN community.

Conclusion

We have detected factors that encourage pediatric residents and PN fellows to pursue careers as pediatric nephrologists. Earlier and ongoing attention to renal physiology and the benefits of an academic career may enhance and maintain interest in PN. Greater awareness of the influence of perceived faculty dissatisfaction and a heavy workload, together with more consistent mentoring in the job search and faculty transition may favor entry into the workforce.

It is unclear whether the experiences highlighted in this report can be generalized to other pediatric subspecialties. Given the concerns about workforce shortages in many pediatric subspecialties, additional assessment of these issues would be encouraged.

Ongoing evaluation of PN fellow perceptions may assist in program development and workforce recruitment. We acknowledge that subspecialty training is highly individualized. The structures, expectations, and "personalities" of PN training programs are quite diverse. We do not anticipate that all programs can meet the needs of all trainees. Nevertheless, attention to fellow perceptions and expectations may maximize the outcomes of our efforts to attract, train, and retain sufficient numbers of pediatric nephrologists to meet the needs of our children.

Disclosures

None.

References

1. Lane CA, Healy C, Ho MT, Pearson SA, Brown MA: How to attract a nephrology trainee: Quantitative questionnaire results. *Nephrology* 13: 116–123, 2008
2. Lane CA, Brown MA: Nephrology: A specialty in need of resuscitation? *Kidney Int* 76: 594–596, 2009
3. Stapleton FB, Andreoli S, Ettenger R, Kamil E, Chesney R: Future workforce needs for pediatric nephrology: An analysis of the nephrology workforce and training requirements by the workforce committee of the American Society of Pediatric Nephrology. *J Am Soc Nephrol* 8[Suppl 9]: S5–S8, 1997
4. Ad Hoc Committee on Nephrology Manpower Needs: Estimating workforce and training requirements for nephrologists through the year 2010. *J Am Soc Nephrol* 8[Suppl 9]: S1–S32, 1997
5. U.S. Renal Data Systems: USRDS 2007 Annual Data Report. In: *Atlas of Chronic Kidney Disease and End-Stage Renal Disease in the United States*, Bethesda MD, NIH, NIDDK, 2007, pp 173–190
6. Warady BA, Chadha V: Chronic kidney disease in children: The global perspective. *Pediatr Nephrol* 22: 1999–2009, 2007
7. Querfeld U: Chronic renal failure in children. In: *Oxford textbook of clinical nephrology*, edited by Davison AM, Cameron JS, Grünfeld J-P, Ponticelli C, Ritz E, Winearls CG, Oxford, UK, Oxford University Press, 2005, pp 2141–2164
8. Accreditation Council for Graduate Medical Education. Pediatric Nephrology Programs. Available at: https://www.acgme.org. Accessed July 30, 2009
9. American Board of Pediatrics Workforce Data 2008–2009. Available at: https://www.abp.org/abpwebsite/stats/wrkfrc/workforce08.pdf. Accessed January 31, 2010
10. Althouse LA, Stockman JA: Pediatric workforce: A look at pediatric nephrology data from the American Board of Pediatrics. *J Pediatr* 148: 575–576, 2006
11. Freed GL, Dunham KM, Switalski KE, Jones MD Jr, McGuinness GA: Research Advisory Committee of the American Board of Pediatrics: Pediatric fellows: perspectives on training and future scope of practice. *Pediatr* 123[Suppl 1]: S31–37, 2009
12. Freed GL, Dunham KM, Switalski KE, Jones MD Jr, McGuinness GA: Research Advisory Committee of the American Board of Pediatrics: Recently trained pediatric subspecialists: Perspectives on training and scope of practice. *Pediatr* 123[Suppl 1]: S44–S49, 2009
13. Stapleton F, Lux C: A uniform third-year application and offer date for pediatric fellow applicants: Pro and con. *J Pediatr* 149: 587–588, 2006
14. Kohan DE, Rosenberg ME: Nephrology training programs and applicants: A very good match. *Clin J Am Soc Nephrol* 4: 242–247, 2009
15. Goodman DC: The pediatrician workforce: Current status and future prospects. *Pediatr* 116: e156–e173, 2005
16. Drotar D, Avner ED: Critical choices in mentoring the next generation of academic pediatricians: Nine circles of hell or salvation? *J Pediatr* 142: 1–2, 2003
17. Jobe AH, Abramson JS, Batshaw M, Boxer LA, Lister G, McCabe E, Johnston R: Recruitment and Development of Academic Pediatricians: Departmental Commitments to Promote Success. *Pediatr Research* 51: 662–664, 2002