Pediatric Chief Residents' Experiences as Inpatient Attending Physicians

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Abstract

Background: Some pediatric chief residents perform supervisory clinical duties during chief residency, but these activities are highly variable and descriptions are limited. Our goals were to characterize inpatient service performed by pediatric chief residents and to explore factors that influence their experiences as inpatient attending physicians.

Methods: Pediatric chief residents at Accreditation Council for Graduate Medical Education–accredited programs in 2016 were invited to complete a 40-item electronic questionnaire about their inpatient service obligation as well as attitudes regarding this experience. Data were analyzed using Chi-square, analysis of variance tests, and logistic regression. Open-ended responses underwent content analysis.

Results: There were 116 completed surveys from a national sample of 223 (response rate 52%); 66% served as inpatient attending physicians during chief residency. On average, chief residents spent 5.5 weeks (range 1–16) in this role with a daily census of 11.5 patients (range 5–20). Those entering primary care were significantly less likely to spend time as an inpatient attending compared with chiefs entering fellowship or hospital medicine (45.7 vs 67.3 vs 83.3%, $P = .01$). Overall, 92% regarded their inpatient clinical experience positively and indicated they would like the same (40%) or more time (52%) in this role. The average favorability rating was 8.2 of 10, and this was not associated with clinical workload or career choice.

Conclusions: Most chief residents serve as inpatient attending physicians during chief residency. They rate their inpatient experience positively despite wide variability in clinical experiences, patient population, and clinical load. Further studies should examine the value of this experience and its impact on chief residents' future practice.

Keywords: chief residency; hospital medicine; graduate medical education; professional development

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What's New

Two thirds of chief residents serve as inpatient attending physicians. On average they perform 5.5 weeks of service and represent 20% of a clinical full-time equivalent. They rate their inpatient experience positively, and most desire more time in this clinical role.

Chief Residency Presents an opportunity for residents to gain experiential learning through service to both hospital and graduate medical education interests. Chief residents serve a number of roles, including health care administration, personnel management, educational and clinical pedagogy, and leadership training.[1-8] Despite recent trends toward increasing administrative burden in lieu of teaching and clinical roles, most chief residents view the overall experience favorably.[9,10]

Chief residents also perform supervisory clinical duties in a variety of settings, although a description of the range and impact of these activities is limited. Pediatric chief residents during the years 1972 to 1992 estimated spending 30% to 40% of their time in inpatient and outpatient clinical activities, although no details were provided regarding the nature of this clinical work.[10] Beyond this work, we are unaware of any other studies focused on characterizing the pediatric chief resident's clinical role. A 2009 study of internal medicine programs found that 56% of chief residents served as inpatient physician of record, each working on average 10.4 weeks per year.[4] This information is relevant to residency program directors and medical directors to better understand how chief residents are used in the clinical workforce and how to optimize their experience. In addition, the movement toward pediatric hospital medicine fellowship may raise requirements for pediatric inpatient providers, effectively reducing the role of chief residents in this clinical setting.

Given the importance of this question and the lack of data within pediatrics, we performed a national survey of pediatric chief residents to understand their inpatient clinical experiences during chief residency. The aims of this study were to characterize inpatient service performed by chief residents and to explore factors that may influence the experiences of chief residents as inpatient attending physicians.

METHODS

PARTICIPANTS

The study population included chief residents during the 2015 the 2016 academic year at accredited pediatric residency programs in the United States. One hundred ninety-nine accredited programs were identified based on a published list of the Accreditation Council for Graduate Medical Education (ACGME) in June 2015.[11] Investigators attempted to contact each residency program using information provided on the individual program Web sites. Based on response to this initial contact, 223 discrete e-mail addresses from 137 programs were compiled and used for study communication. The e-mail addresses varied between shared accounts and individual accounts, and multiple chief residents per program were allowed to participate.

SURVEY INSTRUMENT

We first searched the medical literature for similar previous studies but found no existing questionnaires. The research team developed survey items de novo, focusing on exploring attitudes and experiences of attending on the inpatient service during chief residency. The questionnaire was comprised of 25 multiple-choice and 5 Likert-style items, as well as 10 open-ended prompts which were included to explore respondents' successes and challenges in greater depth. The electronic questionnaire (Qualtrics Software, Provo, UT) used branching logic so that different respondents may have completed different numbers of items depending on their responses to specific questions. This instrument first underwent expert content validation with 2 pediatric program directors. Subsequently, 3 individuals in the target population (3 previous chief residents) participated in cognitive interviews to provide response process validity and pilot-tested the tool.

Demographic data were collected regarding the participant's training, location (region) and size of residency program, as well as type of affiliated hospital. Respondents were deliberately not asked to identify their training program's name in an attempt to maintain anonymity and minimize coercion or bias. The questionnaire was administered in April 2016, intentionally near the end of the academic year. All chief residents received one initial invitation via e-mail and one e-mail reminder to complete the questionnaire. Participants provided informed consent by choosing to complete the questionnaire. Questionnaires were submitted anonymously online and investigators remained blinded to individual responses. No incentives were provided to participants.

DATA ANALYSIS

Data are presented as proportions for categorical data and were analyzed using Chi-square. Means and frequency distributions were calculated for numerical data. Continuous data were analyzed using analysis of variance tests. Univariate statistics were calculated for ratio-scale items. We used multivariate logistic regression to determine factors associated with wanting more time on inpatient service; factors initially included in the model were number of weeks of service, patient mix, career choice, and type of residency completed. Because of the instability of the model, patient mix and type of residency were removed from the final model. Quantitative analyses were performed using SPSS, version 25.0 (IBM Corp, Armonk, NY).

Free-text responses underwent content analysis and were coded individually by the investigators (S.L.B., A.B., R.R.O.), with differing codes being reconciled through analyst triangulation. Codes were subsequently categorized into general themes. At the end of this process, an inquiry audit was conducted by an independent individual with qualitative research experience to ensure dependability. Participants were limited by the number of chief residents annually and the response rate; thus, we did not seek thematic saturation. Individual analysts maintained their own audit trail of codes to ensure confirmability and used this to guide triangulation efforts. This project was approved by the institutional review board at Columbia University.

RESULTS

The response rate per e-mail address contacted was 54% (121 of 223). Five responses were deemed incomplete, yielding 116 completed questionnaires (96% completion rate; final response rate 116/223 = 52%). Respondent program size and location are compared to all ACGME-certified pediatric programs for the same academic year (Table 1). Respondent demographics are summarized in Table 2.

INPATIENT RESPONSIBILITIES

Seventy-six respondents (66%) indicated that they had inpatient attending responsibilities during their chief year. Factors contributing to chief residents' likelihood of serving as inpatient attending physicians were program size ($P = .002$), geographic region ($P = .001$), and individual career choice ($P = .01$). These findings are summarized in Table 3. Only one respondent received specific preparation for the inpatient attending role, whereas 64 (84%) indicated they attended a general leadership training program at a local, regional, or national level targeted toward chief residents.

On average, pediatric chief residents served as inpatient attending for 5.5 weeks (standard deviation [SD] = 3.1; range 1−16) and 6.0 weekends (SD = 3.5; range 1−14), and spent 9.25 hours per day (SD = 3.1; range 4−16) on patient care-related activities such as direct patient care, bedside teaching, documentation, and billing. This equates to a mean of 365 clinical hours per year. They cared for 11.5 patients per day (SD = 2.6; range 5−20), categorized as 60% general pediatrics, 18% subspecialty patients, and 22% children with medically complexity. The majority of respondents (79%) performed this role at a tertiary-care hospital site (Supplementary Table 1), although were more likely to spend more weeks as inpatient attending if they served at a community hospital compared with those only attending at tertiary care hospitals (7.4 weeks vs 5.0 weeks; $P = .005$).

Table 1. Demographic Characteristics of Respondents' Programs

Program Characteristic	Respondents* (N = 116), n (%)	All ACGME-Accredited Pediatric Residency Programs (n = 199), *n* (%)	*P*
Program size			<.01
Small (≤30 residents)	12 (10.3)	72 (36.2)	
Medium (31–60 residents)	48 (41.4)	80 (40.2)	
Large (≥60 residents)	56 (48.3)	47 (23.6)	
Geographic region†			.53
Mid-America	18 (15.5)	25 (12.6)	
Mid-Atlantic	6 (5.2)	16 (8.0)	
Midwest	21 (18.1)	28 (14.4)	
New England	10 (8.6)	11 (5.5)	
New York	15 (12.9)	37 (18.6)	
Southeast	19 (16.4)	43 (21.6)	
Southwest	9 (7.8)	13 (6.5)	
Western	18 (15.5)	26 (13.1)	

*Responses may represent more than 1 chief resident per institution.
†Geographic regions defined by Association of Pediatric Program Directors.

SATISFACTION WITH INPATIENT EXPERIENCE

Respondents rated their experience as an inpatient attending during chief residency as 8.2 on a 10-point favorability scale, where 0 is very poor and 10 is excellent (SD = 1.1; range 5–10). The rating was not associated with daily census, hours spent on patient care, number of weeks on service, patient mix, or intended career (Supplementary Table 2). Seventy-two (63%) wished to reduce nonclinical administrative duties (eg, scheduling, administrative meetings), whereas 2 chief residents (2%) wanted more.

From the overall pool of respondents, 60 (52%) wished they spent more time as an inpatient attending during chief residency, of which 27 had no service requirement and 33 performed inpatient service for an average of 4.2 weeks (SD = 2.3; range 1–12). Eight chief residents (7%) indicated they wanted less time and had completed 8.1 weeks on service (SD = 3.8; range 3–15). The remaining respondents indicated they wanted no change in service requirement, of which 13 had no service requirement and 33 were hospitalists for an average of 6.1 weeks (SD = 3.0; range 2–16). Additional factors leading to chief residents wanting more attending time include fewer weekends on service, greater proportion of patients with general pediatric diagnoses, subspecialty fellowship or hospital medicine career plans compared with primary care, and completion of a combined medicine-pediatrics residency (Table 4). Logistic regression demonstrated that chief residents who had career plans of subspecialty fellowship or hospital medicine had greater odds of wanting more weeks than those going into primary care (aOR = 8.3, 95% confidence interval [CI], 2.6–26.5, $P < .001$ and aOR = 8.6, 95% CI, 2.0–35.8, $P = .003$, respectively) as well as that chiefs performing more inpatient service weeks had lower odds of wanting more time (aOR = −0.68, 95% CI, 0.57–0.81, $P < .001$).

Content analysis of chief residents' responses to open-ended prompts are summarized in Table 5. Key challenges included finding balance with other administrative tasks and establishing self-identity; key themes in successes included increased comradery with residents, professional growth from clinical experiences, and harnessing opportunities to teach. Elements that would have improved their inpatient clinical experience included changes in the amount of clinical time to better fit their needs, increased faculty mentorship, and more trainings including general orientation to the role of inpatient

Table 2. Characteristics of Chief Residents Completing Study Questionnaire (N = 116)*

Characteristic	n	%
Program size		
Large (>60 residents)	56	48
Medium (30–60 residents)	48	42
Small (<30 residents)	12	10
Hospital affiliation		
Tertiary hospital only	66	57
Community hospital only	2	2
Both tertiary and community settings	48	41
Geographic region†		
Mid-America	18	16
Mid-Atlantic	6	5
Midwest	21	18
New England	10	8
New York	15	13
Southeast	19	16
Southwest	9	8
Western	18	16
Type of residency completed		
Categorical pediatrics	105	91
Combined medicine–pediatrics program	11	9
Chief residency as additional year		
Yes	110	95
No	6	5
Career plan		
Subspecialty fellowship	49	43
Hospital medicine	24	21
Primary care	35	30
Other/undecided	7	6
Plan to pursue academic role		
Yes	93	80
No	23	20

*Responses may represent >1 chief resident per institution
†Geographic regions defined by Association of Pediatric Program Directors.

Table 3. Factors Contributing to Chief Residents' Likelihood of Performing Inpatient Service (N = 116)

Variable	Inpatient Service Opportunity, n (%)		*P*
	Yes	No	
Program size			.002†
Large (>60 residents)	45 (80.4)	11 (19.6)	
Medium (30–60 residents)	27 (56.3)	21 (43.8)	
Small (<30 residents)	4 (33.3)	8 (66.7)	
Geographic region*			.001†
Mid-America	5 (29.4)	12 (70.6)	
Mid-Atlantic	6 (100)	0 (0)	
Midwest	15 (68.2)	7 (31.8)	
New England	7 (70.0)	3 (30.0)	
New York	6 (40.0)	9 (60.0)	
Southeast	15 (78.9)	4 (21.1)	
Southwest	6 (66.7)	3 (33.3)	
Western	16 (88.9)	2 (11.1)	
Career plan			.01†
Subspecialty fellowship	33 (67.3)	16 (32.7)	
Hospital medicine	20 (83.3)	4 (16.7)	
Primary care	16 (45.7)	19 (54.3)	

*Geographic regions defined by Association of Pediatric Program Directors (APPD).
†Indicates statistical significance at alpha < 0.05.

attending physician, billing/coding, documentation, and conducting difficult conversations.

DISCUSSION

In this study, we found that the majority of pediatric chief residents serve as inpatient attending physicians during chief residency and value their time in this clinical role. Program size, geographic region, and career choice affect a chief's likelihood of performing this clinical activity, and most chief residents wanted to spend more time in this role, particularly if they performed less than 6 weeks of service or were entering careers in either hospital medicine or subspecialty fellowship. Chief residents provide inpatient attending coverage for approximately 10% of the year per clinical service (5.5 of 52 weeks), and represent 20% of a clinical full-time-equivalent when using a 1800 clinical-hour hospitalist benchmark established in a recent report of university-based programs.[12] Our findings suggest an optimal commitment of 6 weeks and 7 weekends of inpatient clinical service, although this may be individualized based on program resources, balance with administrative duties, and a chief resident's career choice and interest in this opportunity.

Respondents reported similar career choices to chief residents surveyed in a previous study[9] and were slightly more likely to enter subspecialties and hospital medicine than primary care when compared with all pediatric residency graduates from the same year.[13] More pediatric chief residents now plan to pursue academic medicine than in 2008 (80% vs 17%),[9] which may point toward a trend in chief residency serving as a stepping stone to academic medicine—a phenomenon that has been suggested in internal medicine.[14] Chief residents entering outpatient careers were less likely to perform inpatient attending duties, although it is not known if this was by personal choice, or if these chiefs represent training programs with a reduced emphasis on inpatient medicine.

Chief residency traditionally has been touted as an opportunity to grow as a clinician and educator, while

Table 4. Predictive Factors in Chief Residents' Desire for Change in Inpatient Service Time

Variable	Desired Change in Inpatient Service Time			*P*
	More Time	No Change	Less Time	
Number of service weeks, mean (SD)	4.2 (2.3)	6.1 (3.0)	8.1 (3.9)	.001*
Number of service weekends, mean (SD)	5.0 (2.9)	6.9 (3.6)	8.7 (3.5)	.006*
General pediatrics† patient mix, mean % (SD)	63.4 (18.3)	60.4 (22.4)	43.4 (21.5)	.040*
Rating of inpatient experience,‡ mean (SD)	8.3 (1.0)	8.4 (1.1)	7.1 (1.1)	.005*
Career plans, n (%)				.049*
Subspecialty fellowship	31 (63.3)	14 (28.6)	4 (8.2)	
Hospital medicine	13 (54.2)	8 (33.3)	3 (12.5)	
Primary care	12 (34.3)	21 (60.0)	2 (8.0)	
Type of residency completed, n (%)				.042*
Categorical pediatrics	51 (48.6)	45 (42.9)	9 (8.6)	
Combined medicine–pediatrics	9 (90.0)	1 (10.0)	0	

*Indicates statistical significance at alpha < 0.05.
†Patients with general conditions (ie, asthma, bronchiolitis, cellulitis, dehydration, fever).
‡Rated on a 10-point favorability scale, where 0 is very poor and 10 is excellent.

Table 5. Qualitative Themes, Key Concepts, and Quotations

Theme	Key Concept	Representative Quotations
Prompt 1: What could have been different for you to give a higher rating?		
Service time	■ More time (7)	"More inpatient clinical experience as the primary attending would have been nice."
	■ Less time (3)	"Less time on service."
	■ Continuity of experience	"Weeks that I was on service were spread apart. Grouping them maybe closer together . . . would have helped with that continuity of growth."
Mentorship	■ Feedback	"I would have liked more feedback about my performance in general."
	■ Clinical support	"Slightly more mentorship in faculty oversight while attending."
Training	■ Inexperience	"More confidence in my own clinical judgement and ability to lead a team."
	■ Specific training	"More orientation to role of hospitalist, especially things we don't learn in residency like billing."
Prompt 2: Please describe challenges you faced as an inpatient attending during your chief residency.		
Balance	■ Clinical vs administrative duties	"Juggling both chief and clinical duties, especially when various meetings and conferences conflict with family meetings, bedside teaching."
		"Also felt emotionally drained at times while leading a team but also acting as a chief and listening to resident complaints, etc."
Self-identity	■ Respect from nurses, residents, and other attendings	"Difficult for nursing staff to view us as a 'regular attending' vs just 'another resident'"
		"Residents don't view the chiefs as attendings"
	■ Authority	"Being an attending is incredibly difficult when the rest of the hospital, especially consulting physicians, intensivists, etc, do not recognize you as an attending. I feel less effective than my non-chief hospitalist counterparts."
Prompt 3: Please describe successes you experienced as an inpatient attending during your chief residency.		
Clinical experience	■ Personal growth	"I definitely gained clinical experience and expertise thanks to the amazing support of our hospital medicine staff."
		"I became much more confident managing a team, making independent assessments and decisions, and taking triage phone calls."
		"I became a better educator."
	■ Patient care and connection	"Opportunity to reconnect with patients."
		"I really enjoyed working with patients again in an inpatient setting and felt the residents were excited to be on my team."
Contact with trainees	■ Opportunities to teach	"So much fun teaching, working with the residents and doing what you were actually trained to do rather than scheduling and attending meetings."
		"Greater ability to teach and interact with interns."
	■ Comradery	"Able to connect with residents on a deeper level and gain insight into their development as clinicians."
		"It was wonderful to interact with the residents in a capacity other than administrative. It was quite fun to see how the interns have progressed from the time we oriented them in June to the spring."

This table displays the most popular concepts that are representative of widely shared views; it is not comprehensive of all concepts derived from qualitative analysis.

making important academic connections and serving a training program. However, the administrative burden on chief residents is growing with increasingly complex ACGME work-hour regulations.[10] To that effect, a common challenge noted by our respondents was the conflict between administrative duties and their responsibilities as an attending physician. Despite this tension, pediatric chief residents generally rated their inpatient time highly and indicated they would prefer to spend the same or greater amount of time in this role. Although rating was not associated with clinical workload or career choice, qualitative analysis suggests that more robust training and mentorship may have led to higher ratings. Chief residents serving as inpatient attending physicians likely require additional training compared to other residency graduates, given their deep involvement and leadership role within the residency training program, which inherently creates a power hierarchy with residents and other faculty. Program directors and hospital medicine faculty should set clear goals and expectations with chief residents regarding the balance between administrative tasks, clinical work, and teaching.

The subspecialty certification of pediatric hospital medicine raises important considerations, both positive and negative, for chief residents as inpatient attending physicians. Potential positive outcomes include chief residents' access to structured mentorship and training designed for hospital medicine fellows within an accredited fellowship infrastructure. Lack of formal training was a common negative theme cited by chief residents in our study and others.[8] In addition to local institution-specific training, regional leadership training programs present an opportunity for specific preparation for clinical roles, given that most chief residents have exposure to these events. In contrast, a potential negative consequence is the elimination of this clinical opportunity for future chief residents due to either their lack of subspecialty certification, or a preference for fellows. Given the high satisfaction with this experience and its role in preventing administrative burnout,[8-10,15] it will be important to preserve this experience or add similar opportunities to retain teaching and clinical leadership roles within chief residency.

Our study had limitations. There is no official database to determine the total number of pediatric chief residents across the country in ACGME-accredited programs, nor did we have access to up-to-date contact information for each chief. This limited our response rate and thus the generalizability of the results. In addition, given our goal of achieving representation of different viewpoints, we invited participation from all chief residents and therefore more than 1 chief resident per institution may have participated in our study. Our respondents were skewed toward larger programs since they are more likely to have multiple chief residents and more likely to have served as inpatient attending physician. As such, our findings likely reflect the varied experiences of chief residents at medium and large residency programs. Second, our study may have unintentionally selected for individuals with greater interest in inpatient medicine or those with a better experience on the inpatient service. However, recruitment materials asked subjects to participate in a study about general "clinical responsibilities" rather than specific "inpatient responsibilities." In addition, ratings were as low as 5 of 10, indicating heterogeneity of experiences. Furthermore, respondents planned to enter hospital medicine careers at a similar rate to all pediatric residents from the same academic year.[13] Third, we did not ask respondents to rate other aspects of their chief residency such as administrative activities, which would have allowed direct comparison of ratings of their clinical experience to other tasks. Fourth, our qualitative analysis had some concerns for transferability given the timing of the survey at the end of the academic year, when fatigue with many aspects of the chief resident experience may have been high. It is possible that the chief residents would have reported different experiences with inpatient service at different points throughout the year, or in years following their experience. Our confirmability was also somewhat limited by the fact that all researchers had completed chief residency themselves and thus personal experience may have played a role in analysis. We attempted to address this by performing an inquiry audit by an experienced qualitative researcher not involved in the design of this study. Finally, when assessing chief residents' rating of their clinical time we did not collect information on environmental factors that influence physician satisfaction such as culture of respect toward hospitalists, resource availability, organizational climate, personal time, and relationships with patients, staff, and colleagues.[16,17] Thus, there may be institution-specific factors that may have affected chief residents' experience on their inpatient unit.

CONCLUSIONS

Most pediatric chief residents perform supervisory patient care activities on the inpatient unit and contribute to the hospitalist workforce. Although the amount and structure of inpatient service vary, nearly all chief residents find this to be a positive experience. Future research should further elucidate how inpatient service experiences during chief residency influence career choice, perspective on hospital medicine, and general approach to patient care. In addition, it will be important to track administrative burnout among chief residents should this clinical opportunity decline with the introduction of a requisite hospital medicine fellowship.

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SUPPLEMENTARY DATA

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