

ORIGINAL ARTICLE

Inpatient Pediatric Training of Family Medicine Residents: A Pediatric Perspective

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HOW TO CITE: Halley TV, Bhansali P, Clouser KN, et al. Inpatient Pediatric Training of Family Medicine Residents: A Pediatric Perspective. *Fam Med*. 2025;57(X):1–6. doi: [10.22454/FamMed.2025.431942](https://doi.org/10.22454/FamMed.2025.431942)

PUBLISHED: 4 June 2025

KEYWORDS: family medicine pediatric training, inpatient pediatrics, interprofessional education, pediatric hospital medicine

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ABSTRACT

Background and Objectives: Family physicians contribute significantly to the pediatric workforce, but little is known about their pediatric training during residency, specifically in the inpatient setting. Our objective was to gather data on the inpatient pediatric training of family medicine residents from the perspective of pediatric faculty.

Methods: We created a survey about inpatient pediatric training of family medicine residents, including pediatric rotation characteristics, ward team structure, educational resources, and faculty involvement. The Association of Pediatric Program Directors (APPD) accepted the survey for distribution to pediatric residency associate program directors. Demographic data about respondents were provided by APPD. Data were collected between January and February 2024. We performed descriptive analysis of survey responses.

Results: We received 74 responses from 190 institutions, for a response rate of 39%. Of the respondents, 81% provided training to family medicine residents. We found wide variability in the structure of this training. Only 7% of sites reported having curricula specific to training family medicine residents in inpatient pediatric care. Inpatient pediatricians (76%) are often tasked with creating rotation structure and curricula for training family medicine residents.

Conclusions: In the view provided by our limited survey population, we found variability in the training structure and content of pediatric inpatient experiences; few family medicine-specific curricular tools are being used for this training, with little to no family medicine faculty involvement in this training. An opportunity may be available for collaboration between pediatric and family medicine faculty to establish a foundation for future curricula.

INTRODUCTION

Family physicians contribute substantially to the pediatric workforce nationally. This contribution is evidenced by the fact that family physicians increase the number of primary care service areas (PCSAs) considered to have an adequate physician supply from 2,000 PCSAs when counting only pediatricians to more than 4,000 PCSAs when including both pediatricians and family physicians.¹ Thus, training of family physicians in pediatrics is a priority to ensure the overall health of children nationally. However, the number of family physicians caring for children, especially young children, is decreasing, according to data from the American Board of Family Medicine and claims data.^{2,3} While this decline in practice may be due

to several factors, examining the pediatric training of family medicine residents may provide a clue.¹

Family medicine residents rotate through multiple services during their residency training. The current Accreditation Council for Graduate Medical Education (ACGME) program requirements state that family medicine residents should spend 100 hours, or 1 month, caring for ill children in the inpatient or emergency setting. Specifically, this experience should include at least 50 inpatient pediatric encounters and at least 50 pediatric emergency department encounters. However, the ACGME does not mandate specific content or structure for this part of the training.⁴ Additionally, inpatient pediatric experiences may vary based on the time of year, given the

seasonality of some pediatric diagnoses. Time spent in a specialty alone, without attention paid to the experiences and skills gained during that time, may not ensure competency.⁵ Because clinical teaching is often prompted by diagnostic and management considerations associated with direct patient care provided daily, assumptions cannot be made that family medicine residents will become competent in inpatient pediatric care by the end of their residency when their inpatient pediatric training may be influenced by these factors.

A review of the relevant literature demonstrated that the lack of standard curricula is a recognized problem within family medicine training. Curricula and tools exist for pediatric curricular content, including (a) a Pediatric Core Curriculum List created in 1982 based on recommendations of an advisory panel and billing data review; (b) 1998 American Academy of Family Physicians curriculum guidelines for family medicine residents in the care of infants and children, which have been revised regularly since; and (c) 2019 Academic Pediatric Association guidelines for the care of children for family medicine residents.^{5–7} However, these overarching curricular guidelines, meant to define goals and objectives over an entire residency, become less applicable in the context of a time-limited inpatient pediatric rotation. Recognizing this challenge, a recent contribution to family medicine inpatient pediatric curricula uses clinical reasoning as a framework to teach the most common pediatric chief complaints.⁸ This framework begins to address the existing gap of relevant and realistic curricula for the care of hospitalized children by family medicine residents but is not comprehensive. Thus, a balance of comprehensive and broad curricula must be integrated with focused and applicable curricula.

Until recently, more than 30 years had passed since family medicine residency program directors were surveyed on the structure, setting, and typical educational content of the pediatric training provided for their residents. At that time, results demonstrated that training was inconsistently delivered, and researchers called for additional research to be dedicated to identifying standards.⁹ A likely contributing factor to variability is the lack of consensus on the optimal approach to pediatric training for family medicine residents.¹⁰ Recently published research reinforced these earlier findings, with a 2023 study showing that despite a relatively stable time requirement and setting for inpatient pediatric training, meeting the ACGME encounter requirements in the care of ill children is a major challenge for family medicine program directors.¹¹ We suggest that focusing on time spent on a rotation may not be the best approach to address this challenge and instead offer that addressing details of rotational experiences may be a step in the right direction.

The objective of our study was to describe how family medicine residents are being trained in inpatient pediatrics from the perspective of inpatient pediatricians. Describing these current practices is a first step in identifying how family medicine residents learn to care for the acutely ill child. This background information will help to paint the current

landscape of family medicine training in inpatient pediatrics and help to serve as a foundation for future standardized curricula for this group of learners.

METHODS

The Interprofessional Education Taskforce is a subgroup of the American Academy of Pediatrics Society of Hospital Medicine Subcommittee on Pediatric Hospital Medicine (PHM) Educators. The taskforce was established in 2015 and has approximately 35 members, representing approximately 25 institutions across the nation, and includes physicians and advanced practice providers working in PHM. The objective of the taskforce is to advance interprofessional education in the PHM setting through research and educational scholarship to ultimately improve patient care.

Survey Development and Content

The Interprofessional Education Taskforce coauthors developed a survey for pediatric program leadership on the inpatient pediatric training of family medicine residents during pediatric hospital medicine rotations. Survey questions were created *de novo*, based on coauthor experience and expertise, with the intent to describe both the structure and content of inpatient pediatric training for family medicine residents. The survey was revised by taskforce members in an iterative fashion. Survey domains included institutional characteristics, family medicine rotation characteristics, overall trainee presence, educational resources, and faculty involvement. The survey format included multiple-choice questions, free-text options, and branching logic to customize responses.

Expert feedback was solicited from a convenience sample of pediatric residency program directors, associate pediatric program directors, and family medicine residency program directors on both the content and structure of the survey. We received input from four members of family medicine residency leadership and four members of pediatric residency leadership. Their feedback was incorporated, and the survey was revised. The survey then was submitted to the Association of Pediatric Program Directors (APPD) for approval. Feedback from the APPD Research and Scholarship Taskforce was received and used to create the final version of the survey. This study was deemed exempt by the Institutional Review Board.

Survey Distribution

The survey was distributed electronically by APPD using LimeSurvey¹² from January 10, 2024, to February 23, 2024, across 190 institutions, and targeted pediatric residency associate program directors. Survey instructions allowed respondents to consult with knowledgeable parties at their institutions, including program directors, prior to responding. The survey closed on February 28, 2024.

Data on the pediatric residency programs' demographic variables, such as geographic location, program type, and program size, were provided by APPD. Geographic locations were defined by APPD as Mid-America, Mid-Atlantic, Midwest, New York, Northeast, Southeast, Southwest, and Western. Pro-

gram types were categorized as university-based, community-based, or community-based with a university affiliation. Program size was defined as small (fewer than 30 residents), medium (30–60 residents) or large (more than 60 residents).

Data Analysis

We conducted a descriptive analysis of survey data to characterize inpatient pediatric training of family medicine residents.

RESULTS

Site Characteristics

We received 74 responses from 190 institutions, for a response rate of 39%. Table 1 shows a demographic comparison of responding and nonresponding sites. Of the 74 responding sites, 60 sites (81%) provided inpatient pediatric training to family medicine residents. Of these sites, 26 (43%) identified as community-based programs; 16 (26%) as university-based programs, and 5 (8%) as community-based pediatric residency programs with a university affiliation. Table 2 details the respondent types.

TABLE 1. Demographic Comparison of Respondents Versus Nonrespondents*

Program characteristic	Responding sites (N=74) n (%)	Nonresponding sites (N=116) n (%)
Geographic location		
Mid-America	11(15)	13 (11)
Mid-Atlantic	6 (8)	9 (8)
Midwest	12 (16)	14 (12)
New England	0	2 (2)
New York	9 (12)	21 (18)
Northeast	4 (5)	5 (4)
Southeast	14 (19)	28 (24)
Southwest	2 (3)	9 (8)
Western	14 (19)	13 (11)
Unknown	2 (3)	2 (2)
Program type		
Community-based	33 (45)	50 (43)
Community-based, university-affiliated	6 (8)	9 (8)
University-based	21 (28)	47 (40)
Military	2 (3)	0
Unknown	12 (16)	10 (9)
Program size		
Small	27 (36)	41 (35)
Medium	19 (26)	45 (39)
Large	22 (30)	25 (22)
Unknown	6 (8)	5 (4)
Provision of training to family medicine residents		
Yes	60 (81)	–

*Program characteristics listed refer to the pediatric residency programs surveyed.

TABLE 2. Pediatric Residency Program Respondent Type*

Role of respondent (N=74)	n (%)
Pediatric residency program director	14 (19)
Pediatric residency associate program director	59 (80)
Pediatric residency program coordinator	0
PHM division leadership	6 (8)
PHM faculty member	19 (26)
Other	2 (3)

*Multiple responses permitted
Abbreviation: PHM, pediatric hospital medicine

Inpatient Pediatric Training Characteristics

We found wide variability in the structure of inpatient pediatric training for family medicine residents in the areas of rotation site, rotation length, and number of family medicine residents supported. Additionally, we identified variability in resident-specific characteristics, such as training level during the pediatric rotation and average daily pediatric census. Table 3 describes the features of the inpatient pediatric training structure.

Learning Environment and Faculty Involvement

All family medicine residents worked alongside pediatric residents. Many also rotated with other learners or trainees, including but not limited to medical students, physician assistants or nurse practitioners/students, and psychiatry residents. Most respondents (n=52, 86%) reported that they did not use a curriculum specifically for family medicine residents on inpatient pediatrics, instead relying on curricula for pediatric residents via a variety of teaching resources including morning reports, noon conferences, simulation, and assigned readings.

Pediatric faculty and members of pediatric residency leadership were largely responsible for the oversight of inpatient pediatric rotations for family medicine residents, and all (n=60, 100%) reported that PHM faculty were the primary teachers of family medicine residents as leaders of inpatient teams. Few (n=3, 5%) programs reported consistent family medicine faculty involvement or oversight in the inpatient pediatric teaching of family medicine residents. See Table 4 for characteristics of the learning environment and faculty involvement.

Sites reported a wide range of perceived benefits of training family medicine residents at their institutions. These benefits included the opportunity to improve the skill set of family physicians (n=59, 98%), to access additional workforce for patient care (n=46, 77%), to improve rapport with other providers and institutions in the community (n=44, 73%), to access trainees that allow pediatric residents to practice supervisory skills (n=32, 53%), and to support trainees in ways that may enhance the referral base for the institution (n=17, 28%).

TABLE 3. Features of Inpatient Pediatric Family Medicine Training Structure (N=60)

	n (%)
Training site	
Main hospital	48 (80)
Affiliated hospital	4 (7)
Main and affiliated hospitals	8 (13)
Length of family medicine rotation	
2 weeks	3 (5)
4 weeks	52 (87)
Other	5 (8)
Frequency of family medicine rotation	
Once	40 (67)
Twice	15 (25)
More than twice	5 (8)
Number of family medicine residents per year	
≤10	22 (37)
11–20	18 (30)
>20	20 (33)
Family medicine residency program affiliation	
Affiliated with responding site	23 (38)
External to responding site	13 (22)
Both affiliated and external	24 (40)
Training level of family medicine residents*	
PGY-1	48 (80)
PGY-2	31 (52)
PGY-3	11 (18)
Daily patient load per family medicine resident	
≤4	18 (30)
5–8	38 (63)
>8	2 (3)
Unsure	2 (3)

*Multiple responses permitted per site.
Abbreviation: PGY, postgraduate year

TABLE 4. Characteristics of the Learning Environment and Faculty Involvement (N=60)

	n (%)
Inpatient team members/colearners *	
Pediatric residents	60 (100)
Medical students	60 (100)
PA or NP students	14 (23)
Psychiatry residents	9 (15)
Other residents/learners	10 (17)
Inpatient team leaders	
PHM faculty	60 (100)
Family medicine faculty	0
Other	0
Rotation/curriculum lead for family medicine rotations	
Pediatric faculty	26 (43)
Family medicine faculty	0
Pediatric residency leadership	20 (33)
Family medicine residency leadership	3 (5)
Administrative staff	1 (2)
None	2 (3)
Unsure	3 (5)
Other	5 (8)
Use of family medicine-specific curricula	
Yes	4 (7)
No	52 (86)
Unsure	3 (5)
Other	1 (2)

*Multiple responses permitted per site
Abbreviation: PHM, pediatric hospital medicine

DISCUSSION

Our study, from the perspective of pediatric associate program directors, is the first study to describe pediatric training of family medicine residents specifically in the inpatient setting, whereas prior studies have examined pediatric training across inpatient, outpatient, and emergency settings during family medicine residency. Our data demonstrated three main findings: Significant variability exists in inpatient pediatric training structure and content; few family medicine-specific curricular tools are being used for this training; and family medicine faculty have little involvement in this training.

Training Variability

Our findings are similar to those of prior studies that have reported wide variation in pediatric training practices in family medicine residencies across the United States. One study from 1992 demonstrated similar variation in the length of pediatric

training and in the allocation of time between outpatient and inpatient pediatrics.⁹ More recent research continues to show variation in the time spent on pediatric blocks, as well as differing levels of family medicine and pediatric faculty involvement.¹¹ The continued variability highlighted by both older and more recent research underscores the need for studies such as ours to examine this topic in more detail. Because children account for nearly a quarter of all visits in a typical family medicine practice, the implications of this variability are important and may raise questions of competency in pediatrics after residency completion.⁹

While the ACGME has recommended goals for time spent in inpatient pediatrics, our results show that the time spent in inpatient experience is considerably varied. Furthermore, how or whether achieving these goals correlates with competency development in the ACGME family medicine milestones is not clear. Additionally, the ACGME program requirements may be problematic for family medicine residency programs themselves; a recent study found that more than one-third of residency program directors reported that meeting the prior requirement of 250 encounters with sick children in the inpatient pediatric or pediatric emergency setting was a challenge

for their residents.¹¹ Note that since the publication of the study by Krugman et al¹¹, the ACGME program requirements have been revised and currently recommend a minimum of 100 inpatient pediatric and emergency encounters.⁴ Our study begins to describe how these program requirements are met, but more work is needed to understand whether inpatient pediatric training variability has practice implications for family physicians caring for children.

A large gap exists between self-reported preparation for practice and the actual provision of pediatric hospital care among family physicians. Data from the 2016 National Graduate Survey, sent to those American Board of Family Medicine diplomates that completed residency in 2013, showed that despite feeling prepared to provide pediatric hospital care upon graduation from family medicine residency, providing these services was a small part of actual practice.¹³ Additionally, research has shown that despite performing at the national average on in-training exams, family medicine graduates reported that they needed more training in pediatrics, and 70% of current residents surveyed felt less than confident in their pediatric skills.¹⁴ This finding highlights an important discrepancy among perceived fund of knowledge, clinical skill development, and provision of professional services. This discrepancy warrants further examination. While the factors that contribute to this discrepancy are not clear, clarifying how pediatric training occurs is a first step in understanding how trainees achieve self-reported readiness to practice.

Use of Curricular Resources

We found little use of family medicine-specific curricular resources in the inpatient pediatric training of family medicine residents. Our survey asked whether respondents had a specific curriculum for family medicine residents on inpatient pediatrics but did not ask survey respondents why or why not. Possibly a simple lack of awareness of published resources exists, which could be related to our finding that family medicine physicians themselves, who might be more aware of both the ACGME guidelines for family medicine and resources, are rarely involved in inpatient pediatric training of family medicine residents. Further studies are needed to explore whether pediatric faculty believe that a family medicine-specific curriculum on inpatient pediatrics would be beneficial in prioritizing learning content and/or skills for this subgroup of learners. Without such prioritization, programs either will continue to rely on the fallacy that limited time spent on inpatient pediatrics ensures a basic competency in the care of acutely ill children or will create a heterogenous set of diagnoses to emphasize from the broad curriculum guidelines outlined by other resources. Both strategies would be a disservice for family medicine residents and for the pediatric patients they will eventually serve if the guidelines are not grounded in overarching residency curriculum and linked with family medicine-specific milestones and competencies.

The Role of the Family Medicine Physician

In our cohort, no respondents reported family medicine faculty as the primary type of inpatient educator. Similarly, only 5% of respondents reported that family medicine residency leadership was responsible for family medicine resident rotation structure and/or curricula in the inpatient setting. PHM faculty were noted to lead inpatient teams, with pediatric faculty and/or pediatric residency leadership responsible for family medicine resident curricula 76% of the time. To our knowledge, no published faculty development program exists that provides specific training to nonfamily medicine-trained attendings who supervise family medicine residents on inpatient general pediatric teams. Possibly nonfamily medicine-trained attendings apply typical categorical pediatric residency expectations to family medicine residents because that is what they are most familiar with. More research is needed to determine whether this is occurring. Perhaps missed opportunities exist for partnership between inpatient pediatric physicians and family medicine residency program faculty.

A key strength of our study is that it is among the first to examine inpatient pediatric training of family medicine residents specifically, rather than all pediatric education throughout residency. Our findings can serve as a basis for more focused development of family medicine competencies in the care of acutely ill, hospitalized children, recognizing that family medicine programs may send their residents to sites outside their institutions for inpatient pediatric experience and the range of settings may also vary from a community hospital to a quaternary care center.

A limitation of our study was our limited survey population. In 2024, 796 family medicine residency programs existed; our survey population represented less than 10% of those programs. Additionally, by querying pediatric residency leadership, our survey population did not include institutions with pediatric services where training may have been occurring but where no pediatric residency program existed. While these limitations prevented us from extrapolating our findings broadly, our study examined the educational structure in which family medicine residents receive training in inpatient pediatrics from the perspective of pediatric residency leadership. Thus, our study contributes a small, but meaningful, glimpse into the inpatient pediatric training landscape for family medicine residents.

Our study was also limited by a response rate of 39%. However, in 2024, completed APPD surveys had response rates ranging from 26% to 56%. In the 2 years prior, the average response rate was 40%. Thus, our survey response rate was within the range of what could be expected for an APPD-distributed survey.¹⁵

Further research is needed to determine whether a more intentional partnership between pediatric and family medicine residency leadership would lead to an inpatient general pediatric rotation that provides the educational experience desired by family medicine residents to fulfill the ACGME requirements and their own career goals. Such a partnership should include

a discussion regarding the content and structure of the rotation. We recommend including the specific types of patients family medicine residents should care for, as well as specific strategies to best engage family medicine residents during the inpatient general pediatric rotation. Additionally, examining inpatient pediatric training that occurs in the absence of pediatric residents also may provide a useful perspective in fully understanding how this training is taking place. Through both qualitative and quantitative methods, opportunities exist to engage family medicine and pediatric faculty, along with family medicine residents themselves, in future work. Doing so would provide valuable insight into all training dimensions.

CONCLUSIONS

In our survey study of pediatric associate program directors, we found variability of inpatient pediatric training for family medicine residents, with few sites using available family medicine-specific curricular guidelines in pediatrics. While we cannot assume that these findings are applicable to all family medicine training programs, our study provides a starting point for further examination of this topic. Given that family physicians provide a sizable proportion of pediatric care delivery in the country, we suggest the collaboration of pediatric and family medicine faculty in the development of inpatient curricula and the close collaboration of faculty to ensure that inpatient learning experiences provided by pediatric faculty meet the goals of family medicine programs.

ACKNOWLEDGMENTS

The authors thank the members of the Interprofessional Education Taskforce for their support of this work. Additionally, they acknowledge the American Academy of Pediatrics Society of Hospital Medicine Subcommittee on Pediatric Hospital Medicine Educators for their guidance and support of the Interprofessional Education Taskforce efforts.

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