

## BRIEF REPORT

# Pediatric Care in the Nonpediatric Emergency Department: Provider Perspectives

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**OBJECTIVES:** Most pediatric emergency visits are to nonpediatric emergency departments (EDs), and little is known about provider comfort level with pediatric patients. We aimed to assess providers' comfort level caring for pediatric patients of different age groups and perceived resources and barriers to delivering evidence-based pediatric care.

**METHODS:** We conducted an anonymous electronic survey of providers (physicians, nurse practitioners, and physician assistants) in nonpediatric EDs in an urban area who admit to a single quaternary-care children's hospital. Questions addressed provider comfort in examining, diagnosing, and treating patients across 4 age groups; access to management guidelines; resources for education; and benefits of feedback from inpatient providers. Comfort was assessed with a 5-point Likert scale, with "comfortable" being defined as a 4 or 5. The association between patient age and provider comfort was analyzed by using logistic regression with generalized estimating equations.

**RESULTS:** We surveyed 375 providers. Our response rate was 26% (14% nurse practitioners, 34% physician assistants, and 51% physicians). Of respondents, <50% report being comfortable caring for patients <3 months of age (46% examining, 38% diagnosing, 46% treating). Thirteen percent found it mostly or very easy to keep up with pediatric management guidelines ( $n = 12$ ); cited barriers were time constraints, a lack of access to journals or pediatric experts, and low institutional priority due to low pediatric volume.

**CONCLUSIONS:** This study suggests that nonpediatric ED providers' comfort in caring for pediatric patients decreases with decreasing patient age. Less than half of providers report that they are comfortable managing patients <3 months old.

## ABSTRACT

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Dr Jain conceptualized and designed the study, collected data, conducted the initial analyses, drafted the initial manuscript, and reviewed and revised the manuscript; Dr Choi designed the study, conducted the initial analyses, and reviewed and revised the manuscript; Dr Katyal conceptualized and designed the study and reviewed and revised the manuscript; and all authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work.



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Pediatric emergencies are common, with 29.4 million emergency department (ED) visits being reported in the United States in 2011.<sup>1</sup> Recent data show that roughly 25% of ED visits in the United States are by infants, children, and adolescents.<sup>1-3</sup> Most of these visits are to nonpediatric EDs,<sup>4-6</sup> where they are managed by providers without specialty training in pediatrics. Approximately 12% of ED patients are seen by a physician assistant (PA), and 6% are seen by a nurse practitioner (NP).<sup>1</sup> PAs see a wide variety of patients independently, but the literature lacks studies specifically defining the role of PAs or type of patients seen by PAs even in a pediatric ED.<sup>1,7,8</sup> Children suffer from a different spectrum of disease and injury than adults. Therefore, to reduce the consequences of illness and injury, providers must have the knowledge and skills to provide appropriate emergency care to pediatric patients.

Although there have been surveys that have addressed EDs' capabilities to care for pediatric patients,<sup>2,4,9,10</sup> few have addressed provider comfort level with pediatric patients,<sup>11</sup> and no surveys to date have addressed all ED providers' (physicians, NPs, and PAs) comfort level in caring for pediatric patients. Little research currently exists to evaluate how often and to what degree ED providers receive feedback on patients they admit and if feedback would inform future practice in the emergency care of children.

Our purpose in this study is to assess emergency medicine (EM) providers' comfort level caring for pediatric patients of different age groups as well as to describe perceived resources and barriers to delivering evidence-based pediatric care in urban nonpediatric EDs. Our urban, diverse population makes ED use and provider perspectives in this location a distinct area for study.

## METHODS

We conducted an electronic survey of physicians, NPs, and PAs at 8 nonpediatric EDs who admit patients to a quaternary-care children's hospital in an urban setting to determine their perspectives and practices.

### Survey Instrument

As mentioned, no previous researchers have surveyed providers' comfort with pediatric

patients across various age groups. The current survey instrument was developed via an iterative process by a committee of pediatric emergency and inpatient providers. The survey was piloted by 10 pediatric and adult ED providers who did not participate in the study. On the basis of the results of the pilot survey, the instrument was revised for clarity before use in the current study.

The survey consisted of 34 items (plus consent questions) and was administered anonymously through the Web site SurveyMonkey (surveymonkey.com). Each respondent was asked his or her role (ie, physician, PA, and NP), board certifications and/or eligibility, and years in practice. Survey questions addressed general facility information and setting, which were adapted from previously published data.<sup>2,4,10</sup> Respondents were asked to use a 5-point Likert scale to rate their comfort level (similar to in previous literature)<sup>11,12</sup> in examining, diagnosing, and treating pediatric patients across 4 age groups (<3 months, 3 months to 2 years, 2-6 years, and >6 years). Responses were dichotomized into comfortable (levels 4 and 5) and uncomfortable (levels 1-3). Additionally, access to pediatric management guidelines, resources for education, and benefits of feedback from

inpatient providers were also surveyed. No identifying information was recorded. This study was deemed exempt by the institutional review board.

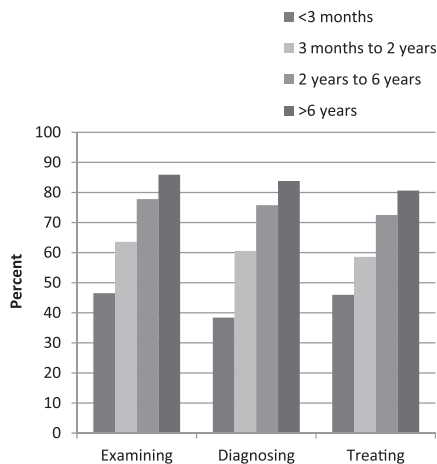
### Statistical Analysis

Descriptive analysis was performed on demographic characteristics of survey participants as well as the variables related to survey questions. All variables were considered categorical. Their bivariate associations with the primary outcome and provider comfort at each domain for each age group of pediatric patients were evaluated by using a  $\chi^2$  or Fisher's exact test. The association between patient age and provider comfort was analyzed with and without adjusting for confounders by using logistic regression, with generalized estimating equations taking into account that providers responded to the questions about all age groups. Cronbach's  $\alpha$  was used to assess the internal consistency of providers in their survey answers for similar age groups. An additional exploratory descriptive analysis was conducted on provider responses to determine perceived barriers to following pediatric management guidelines.  $P < .05$  was considered statistically significant. Data were analyzed by using SAS software (version 9.4; SAS Institute, Inc, Cary, NC).

**TABLE 1** Summary of Responses

Demographics of Respondents	n (%)
Total	99
Physicians	51 (52)
EM	46
Pediatrics	2
Pediatrics and EM	1
Internal medicine and EM	2
Family NPs	14 (14)
PAAs	34 (34)
Availability of pediatric-specific area	
Pediatric area in ED 24 h	29 (29)
Pediatric area open few hours of day	10 (10)
No pediatric area	60 (61)
Availability of pediatric-trained physicians in ED	
Availability of PEM attending	18 (18)
Availability of general pediatrics attending	8 (8)
No pediatric attending	73 (74)

PEM, pediatric emergency medicine.



**FIGURE 1** Percentage of providers reporting comfort by age.

## RESULTS

Of the 375 contacted providers, 99 (26%) completed all of the questions. Of these respondents, 14% were family NPs, 34% were PAs, and 51% were physicians (Table 1). Forty (40%) have been in practice >10 years (64% of NP respondents, 21% of PA respondents, 47% of physician respondents). Twenty-seven percent of all respondents have been in practice 5 to 10 years, 27% have been in practice 1 to 4 years, and 6% have been in practice <1 year. Among PA and NP respondents ( $n = 48$ ), 75% report no formal training in pediatrics, and an additional 10% report pediatric advanced life support (PALS) only.

### Comfort With Caring for Children

Forty-three percent of respondents indicate that they are comfortable in examining, diagnosing, and treating patients <3 months of age. Comfort in all categories increases with patient

age: For children aged 3 months to 2 years, 60% were comfortable. For children aged 2 to 6 years, 74% were comfortable. And for children aged >6 years, 82% were comfortable (Fig 1). For critically ill children of any age, 33% report being mostly or very comfortable assessing these patients, whereas 32% are mostly or very comfortable stabilizing these patients.

In Table 2, the odds ratios (ORs) of being comfortable caring for children are shown, from results of pairwise comparisons of all age groups in the 3 domains (examining, diagnosing, and treating patients). Multivariable analysis was used, adjusting for provider role and years in practice. There is a clear increasing trend of providers reporting comfort over patients' age in all domains. Providers are more likely to report feeling comfortable when a patient is older and the analysis is controlled for role and years in practice. For example, the odds of providers being comfortable with examining patients aged 3 months to 2 years, 2 to 6 years, and >6 years (compared with the youngest age group of <3 months) are 2.2, 4.98, and 9.57, respectively, when role and years in practice are the same. Cronbach's  $\alpha$  was 0.8 to 0.9 for all pairs of neighboring age groups in each of 3 domains, indicating good consistency of provider responses to survey questions between similar age groups.

### Adherence to Practice Guidelines

Twelve respondents (13%) find it mostly or very easy to keep up with pediatric management guidelines. Cited barriers were time constraints (41%), lack of access to journals or pediatric experts (32%), low

institutional priority (13.6%), and low pediatric volume (9%).

Whereas 21 respondents (23%) report that they always or often follow-up on patients they admit, 69 respondents (74%) report that a summary of hospitalization and medical decision-making for the admitted patients would be helpful for future decision-making.

## DISCUSSION

We undertook a survey (Supplemental Fig 2) to determine provider comfort in caring for pediatric patients across age groups in a nonpediatric ED setting. We found a statistically significant increase in provider comfort level in examining, diagnosing, and treating as the age of the patients increases. Our study suggests a general lack of comfort with examining, diagnosing, and managing the youngest pediatric patients.

Most hospitals are likely to have a board-certified EM physician attending but are unlikely to have a pediatric EM physician attending.<sup>2,10</sup> Many emergency providers do not have formal training in pediatric EM. According to the Accreditation Council for Graduate Medical Education, EM resident physicians are required to complete 5 months, or 20% of all ED encounters, dedicated to the care of pediatric patients. Current literature shows that there is a lack of appropriate pediatric equipment, knowledge and implementation of practice guidelines, and appropriate resources for hospitalization.<sup>2,4,9,10</sup> A post-EM residency study revealed that many graduates felt less prepared to handle pediatric patients than to handle adults.<sup>11</sup> Also, there is no formal pediatric EM training for PAs or NPs. Emergency-care providers who lack pediatric training, experience, and treatment protocols may find it more difficult to discern a critically ill or injured child from other children with less serious conditions.<sup>13,14</sup> They may also have difficulty in determining the correct course of treatment and appropriate level of care. Because most pediatric patients initially present to a nonpediatric ED, and these providers self-report as not being comfortable, this may impact medical decision-making and disposition decisions.

**TABLE 2** ORs When Comparing Age Groups

Age	Comfort Level in Examining the Patient		Comfort Level in Diagnosing the Patient		Comfort Level in Treating the Patient	
	OR (95% CI)	P	OR (95% CI)	P	OR (95% CI)	P
>6 y vs <3 mo	9.57 (4.8–19.05)	<.0001	11.51 (6.4–20.71)	<.0001	6.48 (3.78–11.11)	<.0001
2–6 y vs <3 mo	4.98 (2.97–8.35)	<.0001	6.35 (3.81–10.59)	<.0001	3.58 (2.27–5.67)	<.0001
3 mo–2 y vs <3 mo	2.2 (1.5–3.24)	<.0001	2.77 (1.86–4.13)	<.0001	1.83 (1.29–2.6)	.0007
>6 y vs 3 mo–2 y	4.34 (2.45–7.7)	<.0001	4.15 (2.48–6.96)	<.0001	3.54 (2.2–5.69)	<.0001
2–6 y vs 3 mo–2 y	2.26 (1.51–3.4)	<.0001	2.29 (1.58–3.31)	<.0001	1.96 (1.39–2.75)	.0001
>6 y vs 2–6 y	1.92 (1.22–3.03)	.0049	1.81 (1.21–2.72)	.0042	1.81 (1.26–2.6)	.0013

All analyses were adjusted for provider role and years in practice. CI, confidence interval.

Potential implications of these findings include unnecessary hospital admissions or transfers due to a lack of provider comfort with pediatric patients, which can drive up health care costs.<sup>15,16</sup> One approach to mitigating this may be instituting an educational curriculum. Another approach is to provide easily accessible clinical guidelines for common pediatric conditions. In addition, regular feedback on admitted patients may be helpful in improving comfort.

Our findings are limited by a low response rate and potentially biased sample. Although providers responded about their comfort level in caring for pediatric patients, we do not have a correlation to the quality of care provided. Because this may not be a representative sample, more research is needed to determine if decreased comfort level correlates with diagnostic or management discrepancies.

## CONCLUSIONS

There may be a lack of comfort with the assessment, diagnosis, and treatment of pediatric patients among providers at nonpediatric EDs. Comfort decreases with decreasing patient age. In addition, there are perceived barriers to keeping up with pediatric management guidelines and new evidence, which may affect the quality of care.

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