Physician Assistant Management of Pediatric Patients in a General Community Emergency Department
A Real World Analysis

Daniel Pavlik, PA-C,* † Alfred Sacchetti, MD, * ‡ Amanda Seymour, PA-C, † ‡ and Bonnie Blass, PA-C*

Purpose: Multiple studies have documented the nonclinical characteristics of physician assistant (PA) practices in the emergency department (ED). This study examines the clinical care PAs provide to younger pediatric patients in a general community ED.

Methods: The electronic medical record database of an urban community general ED was queried to identify pediatric patients aged 6 years or younger. This age group was selected because it was considered to be representative of physiologic and pathologic conditions unique to children. The 72-hour recidivism rates were used as an objective outcome measure to compare the care provided by PAs with the care of attending emergency physicians (EPs). Three different treatment groups were defined for the analysis: EPs alone, PAs alone, and PAs with consults from EPs (PA & EP).

Results: A total of 10,369 children aged 6 years or younger were seen during a 24-month study period. The mean (SD) age of the patients was 2.2 (0.2) years, with 2909 (28%) aged 1 year or younger. A total of 807 (7.8%) patients returned within 72 hours of their initial ED visit with 57 (0.55%) subsequently admitted. Recidivism rates for the 3 clinical groups were as follows: PA (6.8%), EP (8.0%), and PA & EP (9.3%) (P = 0.03). Patients admitted to the hospital on their return visits for the 3 clinical groups were as follows: PA (0.4%), EP (0.6%), and PA & EP (0.7%) (P = 0.2).

Conclusions: Based on the outcome measure of 72-hour recidivism, PA management of pediatric patients 6 years or younger is similar to that of attending EPs.

Key Words: physician assistant, emergency department recidivism, pediatric emergency medicine competence

(2016;00: 00–00)

Usage of physician assistants (PAs) in emergency medicine (EM) has been increasing steadily during the past decades. Studies suggest that up to 10% of the PA workforce is employed in EM and that PAs account for 1 of every 8 emergency department (ED) patients seen in the United States.

Physician assistant performance has been documented in nonclinical areas including productivity, patient satisfaction, resource usage, and patient length of stay. This study evaluates PAs’ management of pediatric patients in a general ED through examination of the 72-hour recidivism rates of their younger pediatric patients.

Study Site
The study was performed at Our Lady of Lourdes Medical Center in Camden, NJ, a general urban ED treating approximately 58,000 patients annually, 20% of which are younger than 18 years. The hospital houses a level II neonatal intensive care unit and newborn nursery but maintains no other inpatient pediatric facilities. All children requiring hospital admission must be transferred to a surrounding pediatric facility after ED stabilization.

The ED is staffed 40 hours a day with EM residency–trained board-certified or board-eligible emergency physicians (EPs). Physician assistants provide 17 hours of coverage daily in the ED. EM department policy permits PAs to evaluate, treat, and discharges patients of any age independent of the attending EPs. Attending EPs are continuously available for consultation and input on any patient under the care of a PA. Pediatric patients are treated by both EPs and PAs. Medical students and PA students variably rotate through the department and post graduate year 2 EM residents are present for 8 hours per day. All care by these practitioners is completely supervised by an attending EP or a PA.

The department is an open general ED with no dedicated pediatric ED or pediatric staff. Although EPs will generally treat higher acuity patients, no protocols exist assigning specific patients to specific providers.

METHODS
The ED electronic medical record database was analyzed to identify all patients aged 6 years or younger. This age group was selected because it was felt to be representative of the physiologic and pathologic conditions unique to children. Patient records for this study group were abstracted for treating clinicians, disposition, date of service, acuity score as measured by the Emergency Severity Index (ESI), and age. In the ESI scoring system, lower scores are associated with higher acuities.

Treated clinicians were categorized into 3 groups: attending EP only, PA only, and PA with consult from attending EP (PA & EP). Patients seen by EM residents or students were categorized according to their supervising clinician, either a PA or EP.

The 72-hour revisits to the ED were selected as an objective measure of patient outcomes. The choice of this indicator permitted the inclusion of all ED patients in the study age group without the need for individual chart reviews. In addition, the lack of any chart reviews avoided the potential for personal biases to be injected into subjective assessments of patient clinical conditions.

Emergency department visits were classified as either episodic, a new visit from a patient not seen in the previous 72 hours, or as a revisit, an ED visit within a 72-hour window of a prior visit regardless of the diagnosis. The visit preceding the revisit was secondarily classified as an initial visit.

The 72-hour recidivism rates were determined for each of the 3 different clinician classifications for all the study patients. Because of lack of access to primary care, the ED will arrange follow-up visits in the ED for patients requiring closer supervision. These scheduled revisits were not differentiated from
unscheduled revisits in the data analysis if they occurred within 72 hours of a prior visit.

Statistical analysis was performed using \( \chi^2 \) and analysis of variance.

The study was approved by the hospital institutional review board.

## RESULTS

During the 24-month study period, a total of 10,369 pediatric patients aged between 0 and 6 years were treated in the ED. The mean (SD) age of the children seen was 2.2 (0.2) years, and 2909 (28.0%) of these patients were younger than 1 year. The

<table>
<thead>
<tr>
<th>Characteristics of Study Population</th>
<th>PA Only</th>
<th>PA &amp; EP</th>
<th>EP Only</th>
<th>All Clinicians</th>
<th>( P )</th>
</tr>
</thead>
<tbody>
<tr>
<td>All patients ≤ 6 y</td>
<td>2798 (27.0%)</td>
<td>984 (9.5%)</td>
<td>6587 (63.5%)</td>
<td>10,369</td>
<td></td>
</tr>
<tr>
<td>Mean (SD) age, y</td>
<td>2.5 (0.05)</td>
<td>2.4 (0.06)</td>
<td>1.7 (0.02)</td>
<td>2.0 (0.2)</td>
<td>0.001</td>
</tr>
<tr>
<td>Patients admitted</td>
<td>26 (0.9%)</td>
<td>33 (3.4%)</td>
<td>269 (4.1%)</td>
<td>328 (3.2%)</td>
<td>0.001</td>
</tr>
<tr>
<td>Return visits</td>
<td>191 (6.8%)</td>
<td>91 (9.3%)</td>
<td>525 (8.0%)</td>
<td>807 (7.7%)</td>
<td>0.03</td>
</tr>
<tr>
<td>Patients admitted on return visit</td>
<td>10 (0.4%)</td>
<td>7 (0.7%)</td>
<td>40 (0.6%)</td>
<td>57 (0.5%)</td>
<td>0.22</td>
</tr>
</tbody>
</table>

![FIGURE 1. Age distribution of study patients.](image1)

![FIGURE 2. Percentage of patients treated by clinician groups in each age range (\( P < 0.001 \)).](image2)
distribution of these patients is presented in Figure 1. Of all the study patients, 807 (7.8%) returned to the ED for reevaluation within 72 hours of the initial ED visit. Of the patients who returned within 72 hours, 57 (0.55%) were subsequently admitted to an inpatient pediatric unit.

The characteristics of the study population and clinician groups are contained in Table 1. Figures 2 and 3 present the age distributions and the ESI scores for the treating clinician groups. Figure 4 presents the ESI score distributions for the different age groups. Figures 5 and 6 present the age distributions and the ESI score for the different dispositions.

The recidivism rates for the clinician groups are presented in Table 1. Those patients treated only by the PAs demonstrated significantly lower return rates than for the other 2 clinician groups: 6.8% compared with 8.0% for the EP-only group and 9.3% for the combined PA & EP group. Table 2 presents dispositions and recidivism rates by ESI score. Again, the patients treated by the PAs alone demonstrated the lowest recidivism rate; however, this did not achieve statistical significance.

FIGURE 3. Percentage of patients treated by clinicians for each ESI score ($P < 0.001$).

FIGURE 4. Distribution of ESI scores for each age group ($P < 0.001$).

**DISCUSSION**

The quality of care provided by any clinician, regardless of title, is an underlying objective of all performance improvement initiatives. Any treatment delivered by a PA or other midlevel provider must lead to patient outcomes that are equivalent to the existing outcomes from others in that clinical arena. To date, much of the PA quality of care analyses have focused on productivity and resource usage. Individual institutions may perform clinical evaluations of any clinician's performance, although these studies are frequently based on random chart reviews. Such programs are limited by the documentation in the medical record, are subject to the biases of the individuals reviewing the charts, and restricted to a fraction of the patients treated.

The current study examined specifically the ability of PAs to treat young children in the ED using recidivism rates as a measure of clinical performance. This is the first outcome study of this nature. The analysis examined 100% of the patients treated and provided an internal standard to evaluate care with the potential for comparison with published national standards.

This analysis measured 2 decisions made by each PA on every patient: (1) is input from the attending EP required and (2) can this patient be safely discharged from the ED? For those patients managed solely by the PAs, the recidivism rates were significantly lower than those of the EPs. These findings would indicate that the PAs in this study were able to effectively identify those patients whom they could manage alone and, in those patients, determined an appropriate disposition.

The patients in whom the PAs sought input from the attending EPs had the highest return-within-72-hour rate. The fact that the recidivism rates were higher in this group would imply that these were more complex patients and a group in whom the management and disposition decisions were not entirely straightforward. More importantly, these results demonstrate that the PAs were able to successfully identify those patients in whom solo care may not have been appropriate.

In the study ED, no protocols exist for assignment of patients to specific classes of providers. Despite this, the mean ages and ESI scores for the EP's patients were statistically lower than those
of the PAs. This age difference and acuity difference also corre-
lated with a higher admission rate for episodic visits for the EPs.
In examining Figure 2, it seems that the majority of the age
differences for the treatment groups result from the care of chil-
dren younger than 8 weeks. This is also the age when mandatory
sepsis work-ups, including lumbar punctures, are performed for
children with fevers. Physician assistants do not perform lumbar
punctures in the study ED. More importantly, when febrile infants
younger than 8 weeks are encountered by the triage nurse, they are
brought to the immediate attention of the EP.
This practice also applies to any child who is assessed by a
nurse as acutely ill and is reflected in Figure 3. Because the ESI
is a triage designation, this would support the premise that obvi-
ously sicker patients were brought directly to the attention of a
physician by the triaging nurse. Such a practice would explain
the lower mean age and ESI scores and higher initial admission
rates for the attending EPs.
However, not all younger infants or higher acuity patients are
triaged directly to the EPs, and PAs will manage pediatric patients
from birth to 8 weeks as well as higher acuity children.
Table 2 demonstrates that when the sicker children managed
by the PAs are compared with those seen by the EPs, no differ-
ences in recidivism rates are identified. This would indicate that,
regardless of age or acuity, the PAs provide appropriate care in
the patients they treat.
The use of return visits is a required performance activity for
all US hospitals surveyed by The Joint Commission.17,18 Returns
to the ED requiring admission have been used as a quality out-
come measurement for emergency care in multiple pediatric
EDs and studies.14–17 According to the Pediatric Hospital Infor-
mation System database statistics, the national average of returns
that were subsequently admitted for a national consortium of chil-
dren's hospitals was 0.83% in 2010.17 Although the return-to-
admission rate differences between the clinician groups in this
study were not statistically significant, all 3 rates do compare fa-
vorably with published reports on this subject. In particular, the
group of pediatric recidivists who were seen by the PA alone
had the lowest rates of return-to-admission at 0.4%.
This study was conducted in a general community. It would
be interesting to examine how the recidivism rates for midlevel
providers in a dedicated pediatric ED compare with those of pedi-
atric EM attendings.

### Table 2. Recidivism Rates for Clinician Groups for Different Triage Acuities

<table>
<thead>
<tr>
<th></th>
<th>ESI 2</th>
<th>ESI 3</th>
<th>ESI 4</th>
<th>ESI 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>All clinicians</td>
<td>19 (14.0%)</td>
<td>327 (10.0%)</td>
<td>402 (7.0%)</td>
<td>46 (5.9%)</td>
</tr>
<tr>
<td>PA only</td>
<td>1 (7.7%)</td>
<td>65 (9.4%)</td>
<td>110 (6.5%)</td>
<td>11 (4.2%)</td>
</tr>
<tr>
<td>PA &amp; EP</td>
<td>1 (25%)</td>
<td>39 (13.4%)</td>
<td>47 (8.4%)</td>
<td>3 (3.1%)</td>
</tr>
<tr>
<td>EP only</td>
<td>17 (12.3%)</td>
<td>223 (9.75%)</td>
<td>245 (7.06%)</td>
<td>32 (5.5%)</td>
</tr>
<tr>
<td>P</td>
<td>0.65</td>
<td>0.12</td>
<td>0.30</td>
<td>0.45</td>
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</tbody>
</table>
LIMITATIONS
The major limitation of this study lies in the fact that it is a retrospective review. Because there was no randomization of the study patients, the analysis demonstrated a trend toward the EPs treating a greater number of neonates and higher acuity patients, and as a result a greater number of their patients were admitted on their initial episodic visit to the ED. With the data available, it is not possible to determine if the PAs would have made the same decisions in those patients. However, as a real-world model of which patients the PAs actually do treat, this study does demonstrate that these providers can deliver care comparable to that of physician providers in a general community ED.

CONCLUSIONS
Based on the outcome measure of 72-hour recidivism and return-to-admission rates, PA management of pediatric patients 6 years or younger is equivalent to that of attending EPs in a general community ED. In addition, this study suggests that the PAs have the ability to recognize more severely ill children and elicit the input of a supervising physician in those individuals.

REFERENCES