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# Need for Intervention in Families Presenting to the Emergency Department with Multiple Children as Patients

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**Introduction:** To assess if families presenting to a pediatric emergency department (PED) with multiple children as patients require interventions at the same rate as families presenting with a single child.

**Methods:** This is a retrospective chart review looking at PED encounters for families presenting with single children versus multiple children as patients. Patients presenting with siblings were retrospectively selected from the electronic tracking board, and we randomly selected age/gender matched single-patient controls from a comparable time period. The primary outcome was a comparison of visit acuity between families presenting with single versus multiple children, with the hypothesis that families presenting with multiple children as patients would require less utilization of services (as a surrogate for acuity). Admission, intravenous fluid administration (IVF), planned observation, subspecialty consultation, performance of procedures, laboratories and radiographs, administration of prescription medications, and prescription medications for home were all recorded and compared via chi-squared comparison. We considered 5 interventions (admission, subspecialty consultation, performance of procedures, IVF administration, and observation > 6 hours) “critical interventions” and compared them separately.

**Results:** In our sample of 83 patients from 41 families registering multiple children and 248 singleton controls, we found a significant difference in the percentage of patients requiring critical interventions (4.8% versus 32.5%,  $P < 0.0001$ ).

**Conclusion:** Families presenting with multiple children concurrently to an ED require critical interventions at a much lower rate than children presenting as single patients. Many of these families could be well-served at an urgent care or primary care provider. [West J Emerg Med. 2013;14(5):525–528.]

## INTRODUCTION

It is not uncommon for families to bring multiple children for evaluation in the pediatric emergency department (PED) at a single visit. From our personal experience in an urban PED, these children often require less emergency department (ED) resources than patients presenting individually. Such non-acute visits can pose an obstacle to throughput and optimal use of the ED. A recent study by Kannikeswaran, et al<sup>1</sup>

investigated the epidemiology of such visits to an inner city ED and concluded that these patients have lower triage acuity and low hospital admission rates when compared with the general patient population of individual pediatric ED patients. To our knowledge, no other studies have been published on families presenting to the ED with multiple children as patients.

Defining which patients require ED care is a challenge. Studies looking at the use of EDs by “non-urgent” patients

typically define these patients by triage acuity, need for procedural intervention, physician time, or by physician judgment of the need for evaluation or care within 24 hours.<sup>2-5</sup> The American College of Emergency Physicians (ACEP) defines an emergency as “any medical condition of recent onset and severity, including but not limited to severe pain, that would lead a prudent layperson, possessing an average knowledge of medicine and health, to believe that his or her condition, sickness, or injury is of a nature that failure to obtain immediate medical care could result in placing the patient’s health in serious jeopardy, serious impairment of bodily function, or serious dysfunction of bodily organ or part.”<sup>6</sup> When the “prudent layperson” is asked to rate symptoms as emergent, only 29% of symptoms are consistently rated emergent, and common symptoms, such as nausea, vomiting, coughing, fever, and abdominal pain, are not rated emergent.<sup>7</sup> When this is extrapolated to pediatrics, parents tend to slightly overestimate the acuity of non-urgent scenarios. When confronted with non-urgent scenarios and asked to rank them on a Likert scale where 5 represents least urgent, the “prudent layperson” mean score was 3.7 out of 5.<sup>8</sup> Clearly, patients attend EDs because of overestimation of illness severity, convenience, lack of insurance or primary care, transportation issues, and need for reassurance. These factors are important, but do not modify the actual acuity of a patient’s illness.

In this study, we sought to look at the actual need for urgent intervention in children of families registering multiple patients at once versus those registered alone. We hypothesized that a low proportion of such multiple patient visits would warrant a critical ED intervention when compared with singleton patient encounters.

## METHODS

### Study Setting and Population

This study was performed at an urban ED with a dedicated PED from April to July 2011. Consecutive families registering more than 1 child simultaneously for ED care were selected from the electronic patient tracking system retrospectively within 4 days of their registration (the duration for which the tracking board is stored). Once these patients were identified, controls were chosen by retrospectively selecting day(s) during the study period and consecutively enrolling age- and gender-matched patients from the electronic tracking board.

### Study Design

This is a retrospective analysis. A notation is made on the tracking board if a family registers multiple children, and this information is stored for 96 hours. Once patients were selected from the tracking board by the primary investigator, ED records were obtained for each patient and evaluated by the 2 co-authors. Blinding was inconsistent, as most charts for the families registering multiple children indicated the presence

of a sibling. Each patient was treated as an independent data point. In families presenting with multiple children, no “index patient” was selected because the retrospective nature of the study did not allow the investigators to determine which child the parent had indicated a greater level of concern for. Investigators completed a data sheet to record demographic information, disposition, and interventions. We eliminated patients with incomplete data (charts not scanned into the computer for analysis). Laboratory and radiology records were reviewed as well to insure thoroughness of data collection. The local Internal Review Board approved this study.

### Outcome Measures/ Definition

Our primary outcome measure was the need for any “critical intervention” in the ED, which was defined as a hospital admission, planned observation of 6 hours or greater (documented by the provider), any subspecialty consultation, administration of intravenous fluids, performance of a procedure (e.g. suturing, urinary catheterization, splinting). The literature is silent on which interventions are commonly performed in the offices of primary care providers who care for children. Thus, this list was developed based on calls to and website assessment of local providers. Since most providers do provide medication, laboratory services, and radiographs, need for these interventions was collected, but analyzed separately. We chose to assess interventions rendered as the outcome measure for several reasons. As a retrospective study, these parameters are collectable with relative objectivity. Assigned triage acuity is similarly objective, but with 41% underestimation of acuity and variable inter-provider correlation.<sup>9-10</sup> As our triage system, the Emergency Severity Index is based on need for intervention; we elected to make the eventual need for a critical intervention our outcome measure.

### Data Analysis

We performed a sample size calculation to identify a 20% difference between groups, assuming that 40% of patients presenting to the PED would require an intervention. This indicated that 82 patients would be required per group. For the final analysis of interventions, we elected to collect 3 control patients per study patient, or 246 single patients, to minimize the chance of an alpha error. We used chi-squared testing to compare the proportion of patients ultimately requiring intervention in Group Multiple or GM (families with multiple children registering simultaneously) with that of Group Single or GS (single patients).

## RESULTS

We identified 83 patients for GM, all of whom had adequate data sets. This represented 41 families, 3 of which presented with 3 children as patients and the rest presenting with 2 children as patients. Initially 248 were identified for GS, of whom 18 were eliminated for missing data, leaving 230

**Table 1.** Demographic information of sibling pediatric patients presenting to the emergency department.

	Group Multiple	Group Single
Female/ male (%)	48/52	49/51
Age in years (mean)	5.5	5.4
Latino/other (%)	94	93
Presentation from 7AM-3PM/ 3PM-11PM/11PM-7AM (%)	47/42/11*	29/44/27*
Insurance (% state sponsored/ no insurance/ private)	84.3/15.7/0	83.4/13/3.6
ESI triage category (%1/2/3/4/5)	0/3.6*/28.9*/63.9*/3.6	0/19.2*/51.8*/27.7*/1.2

\* significance of < 0.05

patients in that group. Patient demographics are detailed in Table 1. Breakdown of category of chief complaints is detailed in Table 2.

Four of the GM patients (4.8%) required any of the “critical” variables (admission, IVF, performance of a procedure, urgent subspecialty consult, and planned observation period > 6 hours), with 1 requiring an admission, 1 requiring a splint, 1 requiring a 6-hour period of observation, and 1 requiring a burn service consultation. Two of the children requiring a critical intervention were from the same family. Therefore, only 3 of the 41 families (7.3%) had any child requiring a critical intervention. In the GS group, 32.5% patients required a critical intervention ( $P < 0.0001$ ), with 19% requiring an admission. The difference between the groups was significant for each of the critical variables except > 6 hours observation ( $P = 0.464$ ). Percentages of each group requiring each intervention are shown in Figure 1.

When any intervention (including laboratories, radiographs, medication administration, or medication prescription for home as well as the critical interventions) was considered, 62% of patients in GM and 71% of the patients in GS required an intervention. This result was not significant with a  $P$ -value of 0.103. The most commonly required interventions in both groups were use of imaging, laboratories, and prescription medications.

## LIMITATIONS

Being a retrospective study, our sample is limited by provider documentation. We attempted to use objective measures and access multiple data sources (patient records, lab data, etc.) to minimize this concern. This study was inspired by a sense that families presenting with multiple children as patients represent a less-ill sample than children registering independently, and this perception may have altered physician behavior. While all physician behavior is subjective to some degree, it seems unlikely that patient admission or performance of a procedure would have been altered due to such bias. Additionally, there are inherent limitations to any surrogate marker of the acuity of a patient’s presentation. The need for critical procedures was our marker, as it seemed the most objective; however, this system will clearly miss certain patients whom any “prudent layperson” would consider emergent. For example, the febrile seizure patient may receive

none of these interventions, though most laypeople, and perhaps many medical professionals, would appropriately seek emergency care for such a complaint. It is also notable that the groups differed in terms of their time of presentation. This could be due to a myriad of different factors from parental perception of degree of illness to availability of transportation and is an observation that merits further investigation, but is beyond the scope of this study. Finally, there are several threats to generalizability. We included an overwhelmingly underinsured Latino population during a 4-month period in the late spring and summer. It is possible, with the seasonal nature of illness, that the make-up of patients would be different at another point in the year or in a different practice setting.

## CONCLUSION

In families presenting to the ED with multiple children as patients, only 4.8% of patients required a critical ED intervention, a significantly lower proportion than found in patients registering without siblings. When all interventions were considered, there was no significant difference between the groups. Therefore, while it is likely that the majority of children required medical care, over 95% of the GM could have been seen in a primary care setting.

The concept of the ED as primary care has been well substantiated in the literature, particularly in an underinsured population. Just over half of parents presenting to a PED assess their child’s complaints as “minor” or “somewhat urgent.” Over half of parents who have a primary care provider (PCP) for their child do not attempt to contact them prior to presentation to an ED.<sup>11</sup> In those patients who visit the ED after attempting to call the PCP, only 6% were able to make contact, and the majority were directed to the PED.<sup>12</sup> Patients in the PED with non-urgent complaints tend to have high expectations and can potentially require provider time disproportionate to their level of acuity.<sup>13</sup>

The ED is used for non-emergent illnesses for a number of reasons, including lack of cost awareness, organizational problems in primary care, better convenience and availability, illness perception, and confidence in ED services.<sup>14</sup> In a systematic review, the preponderance of data indicated a decrease in ED usage with increase in primary care centers and broadening of hours. Telephone triage and education interventions targeting patients had no lasting impact.

**Table 2.** Information regarding nature of chief complaints.

Chief complaint category	Group multiple	Group single
Trauma	10%	19.6%
Upper respiratory tract infection	20.5%	8.4%
Other ENT complaints	10.8%	8.4%
Abdominal pain	1.2%	10%
Other GI tract complaints	8.4%	7.3%
Exacerbation of chronic disease	0%	2.4%
Other respiratory/cardiac symptoms	1.2%	2.4%
Fever	21.6%	20.5%
Other	25.4%	20.5%

ENT, otolaryngology; GI, gastrointestinal

Insurance with cost-sharing of the ED visit by the patient is associated with less ED use than coverage with no patient cost-sharing.<sup>15</sup> Oregon's experience with tightening of Medicaid restrictions, including institution of a \$50 co-pay for ED visits (versus \$5 for primary care), showed a 6% decrease in ED use by Medicaid recipients, but did not report on potential adverse consequences of those abandoned ED visits.<sup>16</sup>

In our study sample, families presenting with multiple children as patients mainly fell into this non-urgent category in terms of need for ED resource use. The majority of these patients' complaints could likely be addressed by a PCP visit. Every effort should be made to improve systems that allow families to use primary care in this setting.

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*Conflicts of Interest:* By the WestJEM article submission agreement, all authors are required to disclose all affiliations, funding sources and financial or management relationships that could be perceived as potential sources of bias. The authors disclosed none.

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