

Prior Treatment of Fracture Patients in a Tertiary Pediatric Emergency Department

Informal Referrals From Other Emergency Departments

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Background: The purposes of this study were to determine the following: (1) the percentage of fracture patients at a tertiary pediatric emergency department (ED) who previously sought treatment for the injury elsewhere and (2) how often such patients were sent from another ED.

Methods: A prospective survey was conducted in the ED of a tertiary pediatric medical center in a large metropolitan area. Patients who presented with suspected extremity fractures and previously sought treatment elsewhere were asked where they had sought treatment and whether staff at another ED had told them to come to the tertiary ED. Demographic, clinical, insurance, and transfer information were also collected.

Results: Ninety-two patients who had sought previous care for the injury elsewhere participated in the survey, with 82 (89%) ultimately being diagnosed with fractures. This represents 33% (82/246) of the patients with extremity fractures treated by the participating ED physicians during the study. Seventy-nine percent (73/92) of the subjects had previously sought treatment at another ED. For those who did not also visit a regular physician, 69% (37/54) were told to come to the tertiary ED by staff at the initial ED. No differences were observed based on race or insurance status because the study subjects were predominantly minority (91%, including 80% Hispanic) and lacking private insurance (84%).

Conclusions: Seeking follow-up care in a tertiary ED, often on the advice of staff from another ED, is a common practice for this largely minority and poorly insured population. Because patients did not present to our ED until an average of 3 days after injury and many had been discharged to a primary care physician, it is likely that many of the patients did not require emergency care. This practice inefficiently uses limited emergency care resources.

Level of Evidence: Level II prospective survey.

Key Words: fractures, emergency department use, insurance, Medicaid

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Overcrowding in emergency departments (EDs) has become increasingly common. This is due, in part, to

patients seeking care for problems that may be better managed in an outpatient, nonemergent setting.^{4,5,18} Although Emergency Medical Treatment and Active Labor Act regulations have eliminated much of patient “dumping,” EDs are still burdened by physicians or hospitals sending the patient to another emergency facility, rather than appropriate follow-up care.¹¹ Although the reasons for this practice vary, insurance status is known to be one of the most common reasons. In particular, transfers to level I trauma centers have been shown to be more common in patients with government or no insurance compared with those in health maintenance organization (HMO) or preferred provider organization plans.^{2,7,11,13} Transfer rates have also been reported to be higher in minorities and patients seen during the evening and night.¹¹ Level I centers may therefore be bearing a disproportionate burden of underinsured minority patients who do not require and are not appropriate for tertiary care and related resources.

A recent study at a tertiary state-funded hospital in New Jersey found that 10% of pediatric orthopaedic trauma patients presenting to the ED had previously been seen for the same complaint at another ED with an on-call orthopaedic surgeon.¹⁵ Most of the patients had closed single-bone fractures that were treated by closed reduction and casting. The authors therefore concluded that these patients did not require a higher level of medical care than was available at the initial ED. Most patients were minorities, and 82% had public insurance (Medicaid, HMO-Medicaid, no insurance, or charity care). Those with public insurance experienced a delay in treatment because they visited an additional facility between the initial ED and the tertiary ED. These delays may lead to detrimental outcomes.

This study examines the care sought by patients presenting to a tertiary pediatric ED with suspected extremity trauma. A particular focus was to quantify the practice of informal referrals from one ED to another. Therefore, the aims of this study were the following: (1) to determine the percentage of fracture patients who had previously sought treatment for the injury elsewhere and (2) to determine how often such patients were sent from another ED.

METHODS

A prospective survey of patients and families was performed at a tertiary pediatric medical center for a 59-week period from August 2006 to September 2007. This center is a 22-bed dedicated pediatric tertiary care ED and a level I trauma center with an annual census of 62,000 patients. The

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TABLE 1. Subject Demographics

Variable	Result
Sex (n = 88), n (%)	
Male	65 (73.9)
Female	23 (26.1)
Race (n = 90), n (%)	
Hispanic	72 (80.0)
White (not Hispanic)	7 (7.8)
Black (not Hispanic)	3 (3.3)
Asian	7 (7.7)
Other	1 (1.1)
Language (n = 92), n (%)	
English	64 (69.6)
Spanish	26 (28.3)
Korean	2 (2.2)
Age, y (n = 90)	
Mean \pm SD	8.3 \pm 4.5
Range	0.4–17
Insurance (n = 88), n (%)	
Private	14 (15.7)
Government	57 (64.8)
None	17 (19.3)

study procedures were approved by our hospital's institutional review board. A convenience sample of patients was asked to participate in the study if they presented to the ED with suspected upper or lower extremity fractures during the hours that one of the investigators was present. This covers approximately 17% of the shifts during the course of the study. We initially attempted to include patients who came directly to our ED as well as patients seen elsewhere, but this proved too burdensome in the busy ED. Therefore, only patients who had previously sought treatment for the injury elsewhere were included in the final data.

Eligible patients and their parents were asked to complete the questionnaire shown in Appendix 1. The questionnaire was available in English, Spanish, and Korean. Information was collected on where the patient had previously sought treatment and whether a staff member (doctor, nurse, or other employee) at another ED told the patient to come to our ED for treatment. Demographic information and other information about the injury and treatment history were also collected (see Appendix). The physician recorded the patient's insurance status, transfer status, and final diagnosis.

TABLE 2. Results of Where Patients Sought Treatment Before Coming to the Tertiary ED (n = 92)

Location	n (%)
Another emergency department	52 (56.5)
Another emergency department and orthopaedic physician/clinic	3 (3.3)
Another emergency department and child's regular physician/clinic	14 (15.2)
Another emergency department and child's regular physician/clinic and orthopaedic physician/clinic	4 (4.3)
Child's regular physician or clinic	14 (15.2)
Orthopaedic physician or clinic	5 (5.4)

The survey results were compiled, and descriptive statistics were examined. The total number of patients with extremity fractures treated by the participating physicians during the study period was determined by an electronic medical records query. The number completing the survey was used to calculate a lower bound on the percentage that had sought previous care for the injury elsewhere. For patients who had previously visited another ED, the nonparametric Fisher's exact test was used to compare the percentage of minorities, patients without private insurance, and patients who sought treatment on nights and weekends between patients who were told to come to our ED and those who were not.

RESULTS

During the study period, the 2 ED physicians involved with data collection treated 246 patients with upper or lower extremity fractures. Surveys were collected for 92 patients who had previously sought care elsewhere; 82 (89%) of these were ultimately diagnosed with fractures. The remaining patients had contusions (n = 3), dislocations (n = 2), slipped capital femoral epiphysis (n = 1), possible occult fracture (n = 1), or no diagnosed problem (n = 3). The survey results indicate that at least 33% (82/246) of the patients with extremity fractures treated by the participating physicians during the study period had previously sought care for the injury elsewhere.

Demographics of the study subjects are shown in Table 1. Seventy-four percent of the patients were male subjects, 91% were ethnic minorities (including 80% Hispanic), and 28% selected the Spanish language version of the questionnaire. Only 16% of the patients had private insurance. The mean age was 8 years, with a range of 5 months to 17 years.

On average, injury occurred 3.2 ± 6.6 days (median, 2 days; range, 0–60 days) before the visit to our ED, and treatment had been sought at another location 2.0 ± 2.3 days (median, 1 day; range, 0–14 days) before presentation at our ED. The most common causes of injury were falls (71%) and sports injuries (15%). The most common sites of injury were the elbow (31%), forearm (29%), hand (15%), leg (13%), and wrist (7%).

Of the 92 patients surveyed, 73 (79%) had previously sought treatment at another ED. Of these, 25% (18/73) had also gone to their regular doctor (Table 2). Five of the patients came to our ED with a formal transfer from another ED. In 7 cases, patients reported that they were sent from another ED to a primary care physician (PCP) who then referred them to our ED.

For patients who had sought previous treatment at another ED without visiting a regular physician, 69% (37/54) reported that they had been told to come to our ED by a doctor (34/37), nurse (1/37), or other employee (2/37) at the other ED (Table 3). In contrast, for patients who had also sought treatment from a regular physician, only 6% (1/17) reported that they had been told to come to our ED by personnel at another ED. The most common reasons given for not providing treatment were not having an orthopaedic specialist on call (16/38,

TABLE 3. Results of How Often Patients Were Told to Come to the Tertiary ED by Personnel at Another ED (n = 71; 2 Subjects Declined to Answer the Question)

Where Patient Sought Previous Treatment	Told to Come to Authors' Emergency Department?	
	Yes, n (%)	No, n (%)
Another emergency department only	34 (67)	17 (33)
Another emergency department and orthopaedic physician	3 (100)	0 (0)
Another emergency department and child's regular physician	1 (7)	13 (93)
Another emergency department and child's regular physician and orthopaedic physician	0 (0)	3 (100)

42%) and having an orthopaedic specialist who does not treat children (8/38, 21%).

There was no difference in the frequency of night or weekend visits to the other facility between the patients who were told to come to our ED and those who were not ($P > 0.70$). There was also no difference in race or insurance status because our patient population was predominantly Hispanic and either uninsured or covered by state-sponsored insurance ($P = 1.0$).

DISCUSSION

Approximately a third of patients with extremity fractures had previously sought care for the injury elsewhere, and more than a quarter had visited another ED. Of those who were seen at another ED, 25% had also visited a PCP and are presumed to have been sent from the initial ED to the PCP and then to the tertiary ED. Because these patients were discharged from an ED to a PCP, they likely did not require additional ED care. This is consistent with the findings of Chin et al³ who found that PCP referrals account for a substantial number of nonacute ED visits, particularly in low-income areas where the ED is a choice of convenience. Other studies have similarly found that nonacute ED visits are primarily related to issues of access and convenience.^{1,8,10,12,14} Because the children in this study presented to our ED, a mean of 3.2 days after injury, it is likely that many of these conditions did not require emergency care and could have been evaluated in an outpatient orthopaedic setting. Unnecessary use of the ED in this manner wastes limited emergency care resources, particularly when 2 ED visits are made for the same injury.

Of the remaining patients who were seen at another ED, more than two thirds reported that they were told to come to our ED by staff at the initial ED. This advice was almost always given by a physician, and in most cases, there was no formal transfer. Lack of orthopaedic or pediatric orthopaedic specialists was often given as the reason for the referral. However, anecdotal evidence and previous studies suggest that the referring EDs are capable of handling many of the cases.^{6,15} Although it could not be demonstrated in the current study because of the high proportion of patients without private insurance, these referrals may be related to insurance status. There has been a disproportionate increase in trauma

patient transfers, especially for orthopaedic injuries,⁶ and insurance status has been found to be an independent predictor of the frequency of transfers.^{2,7,11,13} There may also be other reasons for the informal referrals such as real or perceived lack of access to general orthopaedic or pediatric orthopaedic care.

These patterns of visiting the ED for nonurgent care and informal referrals from other EDs contribute to overcrowding in the level I trauma center. Emergency department overcrowding is a widespread problem with significant consequences including delays in receiving care, compromised quality of care, poorer outcomes, and high levels of frustration for both patients and ED staff.^{3-5,18} The causes of ED overcrowding are complex and include a shortage of inpatient beds, high patient acuity, limited access to ancillary services, staffing shortages, and high patient volume.^{3-5,18} Patient volume is elevated, in part, by use of EDs for nonurgent problems because of lack of insurance, limited access to primary care, and the perceived convenience and quality of ED care. This behavior is particularly common among underinsured, minority, urban families with low education levels.⁹ Transfers from other EDs for financial reasons further exacerbates overcrowding in level I trauma centers.^{2,7,11,13}

It would be interesting to determine whether informal transfers are more common for minorities, patients lacking private insurance, or when the visit to the referring ED is at night or on weekends. We were not able to answer these questions in the current study because of the skewed composition of our patient population. As previously noted, insurance status has been found to be an independent predictor of the frequency of formal transfers to level I trauma centers.^{2,7,11,13} There may be a similar effect for informal transfers, but sufficient evidence is not yet available to prove or disprove this hypothesis.

We also do not know why patients who were seen by a PCP were sent to the ED because our questionnaire did not ask this question. Anecdotally, patients told us that their PCP was concerned that it would take too long to get an orthopaedic appointment or that it did actually take too long to get an orthopaedic appointment. Insurance status could contribute to this problem. In a previous study, we found that a child with a fracture could obtain an orthopaedic appointment in only 1 of 50 randomly selected orthopaedic offices in California within 1 week if he had Medicaid insurance but could obtain an appointment at all 50 offices if he had private insurance.¹⁶ In a nationwide survey of 230 orthopaedic offices in all 50 states, 18% of offices stated that they would not accept a child insured by Medicaid under any circumstances, and an additional 38% had limitations on appointments for Medicaid patients.¹⁷

The main limitation of this study is possible selection bias in the patients surveyed. The shifts surveyed, which comprised approximately 17% of the total shifts, should be fairly representative because they include all the shifts of 2 ED physicians and were therefore distributed equitably across days of the week and times of day and night throughout the study period, which covered more than 1 full year. However, there may have been selection bias with regard to the patients who participated in the survey. This study captured

92 of 246 fracture patients. Many of the remaining patients were intentionally not included because they had not sought previous care elsewhere; others who did may have been missed during busy periods in the ED or because they declined to answer the survey. Nevertheless, it is clear that a considerable number of patients had the experiences documented. It can be estimated that, on an annualized basis, fracture patients in the ED studied include at least 378 patients who previously sought treatment at another ED and 197 who were sent to our ED by personnel at the outside ED. These are likely conservative estimates of the number of patients who were seen for the injury before presenting to the tertiary ED. Additional research is needed to determine whether similar patterns of informal referrals are observed at other tertiary pediatric EDs, which are likely to serve patient populations with different ethnic, socioeconomic, and geographic distributions.

In summary, one third of patients presenting to the ED with fractures had previously sought treatment for the injury elsewhere. Most often, this was at another ED, and in many cases, the patient was told to come to our ED by staff at the other ED without a formal transfer. Because patients did not present to our ED until an average of 3 days after injury and many had been discharged to a PCP, it is likely that many of the patients did not require emergency care. Thus, seeking follow-up care in the ED, often on the advice of staff from another ED, is a common practice for this largely minority poorly insured population.

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APPENDIX 1: Questionnaire Used in the Study.

Today’s Date: ____ / ____ / ____

PART 1: ABOUT YOUR CHILD

Child’s age: ____ years Sex: Boy Race: Hispanic Asian
 Girl White (not Hispanic) Other (specify) _____
 Black (not Hispanic) _____

PART 2: TREATMENT HISTORY

Where did you seek treatment for this injury before coming to Childrens Hospital?

- My child’s regular doctor or clinic
- Orthopaedic doctor or clinic
- Another emergency room
- Did not go anywhere else (skip to Part 3)

How many days ago did you first go somewhere else for treatment? _____ days

Did a worker at another Emergency Room tell you to come to the CHLA Emergency Room for treatment?

- Yes, an Emergency Room **doctor** told me to come to CHLA
- Yes, an Emergency Room **nurse** told me to come to CHLA
- Yes, an Emergency Room **employee** told me to come to CHLA
- No, I was not told to come to CHLA by an Emergency Room worker (skip to Part 3)

Name of hospital and doctor/nurse _____

Why did they tell you they could not treat your child?

- No insurance
- Other insurance/payment problems
- Other (specify reason) _____
- No orthopaedic specialist on call
- Their orthopaedic specialist doesn't treat children

What day of the week did you first go to another Emergency Room?

- Friday, Saturday, or Sunday
- Monday, Tuesday, Wednesday, or Thursday

Was it day or night?

- Day (7 A.M. to 5 P.M.)
- Night (after 5 P.M.)

What were you told to give your child for pain?

- Tylenol
- Motrin
- Tylenol with codine
- Other (specify) _____

PART 3: ABOUT YOUR CHILD'S INJURY

What part of your child's body is hurt?

- Hand
- Forearm
- Elbow
- Leg
- Other (specify) _____

How did your child get this problem/injury? (examples—car accident, fell, sports injury, etc.)

How many days ago did your child become injured? _____ days

PART 4: WHERE YOU LIVE

Zip code where you live _____

DOCTOR TO COMPLETE THIS PAGE

Type of insurance (check all that apply):

- | | | |
|--|---|---|
| <p>Government</p> <ul style="list-style-type: none"> <input type="checkbox"/> Medicaid/Medi-Cal <input type="checkbox"/> CCS <input type="checkbox"/> Healthy Families <input type="checkbox"/> Medicaid HMO | <p>Private</p> <ul style="list-style-type: none"> <input type="checkbox"/> HMO <input type="checkbox"/> PPO | <ul style="list-style-type: none"> <input type="checkbox"/> Self Pay <input type="checkbox"/> Other (specify) _____ |
|--|---|---|

If sent from another ER:

- Formal transfer
- No formal transfer

Diagnosis: Fracture

- Sprain
- Presumed SH1
- Contusion
- Other (specify) _____

Bone(s) _____
 Angulated _____ deg
 Displaced _____

Referred to orthopaedics? Yes

No