



Emergency department use for injuries by adolescents in foster care

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ABSTRACT

Youth in foster care are overrepresented with respect to their utilization of emergency department (ED) services. This study examines the ED utilization patterns of adolescents in foster care and evaluates the characteristics of injury related versus non-injury related visits. We found that adolescents in foster care have high rates of ED use (1.84 visits per year (95% CI 1.59, 2.12)), with 31.2% of ED visits being injury-related. Male gender was found to be the only independent predictor of having an injury related vs. non-injury related ED visit (odds ratio 2.22 (95% CI 1.27–3.87)). Regarding the mechanisms of injury, adolescent youth in group homes were significantly more likely to present with injuries inflicted by themselves or by others in their residence ($p < 0.05$ for both) but less likely to present with accidental injuries or injuries sustained during recreation ($p < 0.05$ for both). Resources and interventions targeted at both youth and group home staff related to behavioral health assessment, post-traumatic coping skills and conflict management may have beneficial effects.

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1. Introduction

As of 2012, nearly 400,000 children were in foster care in the United States, according to data from the federal Adoption and Foster Care Analysis and Reporting System (AFCARS) (U.S. Department of Health and Human Services, A.f.C.a.F., & Y.a.F. Administration on Children, Children's Bureau, 2013). As compared to the general population, children in foster care have significantly higher frequencies of medical conditions. This population, in fact, has been recognized by the American Academy of Pediatrics as a uniquely disadvantaged group with special health care needs (AAP District II, N.Y.S., 2005). Analyses of large cohorts of children entering the foster care system have identified that approximately half of children have at least one medical condition, including obesity, dental conditions, sexually transmitted infections, lead poisoning and anemia (Steele & Buchi, 2008; Simms, Dubowitz, & Szilagyi, 2000; Landers et al., 2013; Stein et al., 2013; Takayama et al., 1998).

It is not surprising then that children in foster care are overrepresented with respect to utilization of emergency department (ED) services. Chronic health conditions such as those seen in children in foster care account for a significant proportion of emergency department (ED) visits for children (Reynolds, Desguin, Uyeda, & Davis, 1996). Shatlin et al. demonstrated that low income children with

chronic conditions have higher ED utilization than children with private insurance (Shatlin, Levin, Ireys, & Haller, 1998). Furthermore, the transient nature of children in foster care with disruptions in primary care; lack of electronic records to convey existing medical conditions, current medications and plans of care; and issues related to Medicaid reimbursement are each counter to the need for continuous and comprehensive medical services. Almgren et al. found that a child's foster care history was an independent predictor of high ED utilization (Almgren & Marcenko, 2001). A cross-sectional analysis of the National Survey of Child and Adolescent Well-Being (Jee et al., 2005) found that nearly 1 out of 3 children in foster care had visited the ED or urgent care within the past 12 months with subgroups of children with chronic conditions, children of younger age and children with younger foster caregivers having particularly high rates of use. Rubin et al. (2004) analyzed Medicaid claims data linked to foster care administrative data and found that older foster children had increasingly greater ED use than did their Medicaid-eligible peers, with nearly double the rate of ED visits in the adolescent age group.

Although adolescents in foster care have increased rates of medical conditions and lack of prior medical history that may account for increased ED utilization, they may also be at risk of increased ED visits due to injury. Several factors might contribute to higher rates of injury visits including a lack of supervision in foster settings, behavioral disorders that predispose to injury, group home placements with other high risk adolescents, and increased rates of substance use.

We are not aware of any study that looks at the ED utilization patterns of adolescents in foster care with respect to the frequency of injury. We hypothesize that ED utilization for adolescents will include a high frequency of presentation for evaluation of injury in both family-based foster care and group homes. The objectives of this study are to

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describe the ED utilization patterns of adolescents in foster care and to compare the characteristics of adolescents who visit the ED for injury related versus medical events while in foster care.

2. Methods

Nationwide Children's Hospital Institutional Review Board (IRB) approval was received for this review. A chart review was performed of a random sample of all adolescents ages 12 to 18 years who were in the care of the county's Children Services and had received at least one comprehensive well care visit at one of the Hospital's primary care clinics between January 1, 2009 and October 31, 2013. During this time frame, approximately 45% of youth in foster care residing in the target county received primary care at one of the Hospital's primary care clinics. To qualify as a well care visit, the Children's Health Insurance Program Reauthorization Act of 2009 (CHIPRA) Pediatric Quality Measure definition was employed which required a health and developmental history, a physical exam, and health education/anticipatory guidance to be performed (Centers for Medicare and Medicaid Services, 2014). Only events that occurred during the inclusion period were recorded. Foster care was defined as full-time care provided by an approved foster care family or group home. Any adolescent in kinship care for the entirety of their out-of-home care during the study period, or the period of time that any adolescent was in kinship care, was excluded from the review. Medical record numbers (MRN) from 1256 potentially eligible adolescents were randomly ordered and these patients' charts were reviewed in order until 400 adolescents meeting study inclusion criteria had been examined. Information was manually collected from various user interface locations within the hospital's electronic health record containing both free text and discrete fields. Study data were collected using the REDCap® electronic data capture tool (Harris et al., 2009). Two examiners performed concomitant reviews on the first 40 charts and their inter-rater reliability (IRR) statistics were calculated. Kappa statistics and intra-class correlation coefficients (ICC) showed excellent reproducibility, by convention (Fleiss, 1999; Landis & Koch, 1977), between reviewers (average kappa = 0.83 for categorical variables and average ICC = 0.92 for continuous variables). These results were considered adequate to proceed to independent review.

Each adolescent's total time spent in foster care during the study period was calculated based on exact entry and exit dates whenever available in the medical record. In the overall cohort of 399 patients, only 87 (21.8%) patients had exact dates of entry and exit documented in their medical records. Among patients with an ED visit, this percentage was similar (49/239, 20.5%). Most of the missing dates were exit dates, with the majority of patients (74.9% in the overall cohort, 73.1% in the cohort with an ED visit) having exact dates of entry into foster care. Among those adolescents with an available date range for entry, the midpoint of the date range was assumed to be their entry date; the same strategy was used for exit dates. Among those for whom no exact date or date range was available for entry or exit from foster care, the first documented healthcare encounter after entry into foster care was considered to be the adolescent's entry date, and the date of last contact with the child (the last healthcare encounter of any type documented in the medical record while the adolescent was in foster care) was considered to be the exit date.

For the purposes of this study, we identified from the larger cohort those adolescents who were seen in the ED for at least one visit. Demographic data collected include gender, race and ethnicity. Foster care information gathered included dates in care and type of placement (standard vs. group home). The type of placement at the time of an ED visit was determined either by patient/caregiver report or identification of the group home facility in the signed consent for treatment. The primary diagnosis provided by the ED physician of record was utilized as the reason for the ED visit. Cause of an injury was retrieved from the free text account given by the adolescent at the time of the ED visit.

These causes of injury were divided into the following categories: Unintentional, self-inflicted, residential staff inflicted, or fellow home member inflicted. Descriptive statistics were presented in the form of frequencies and percentages for categorical variables and medians and interquartile ranges for continuous variables. Univariable and multivariable logistic regression models for injury related vs. non-injury related ED visits were fit using generalized estimating equations, in order to account for the clustering of ED visits within children. Similar models were used to compare causes of injury between the standard and group home settings. Analyses were performed using SAS v9.3 (SAS Institute, Cary, NC). P values <0.05 were considered statistically significant.

3. Results

A total of 399 charts were reviewed of patients who met all inclusion criteria and had sufficient information to analyze. Table 1 depicts the demographic and foster care related characteristics of the study cohort. Just over half the adolescents were male (51.4%) and the majority were African-American (60.2%). The median length of stay in foster care was 10.1 months.

Of the 399 subjects, a cohort of 239 subjects (59.9%) with 706 ED encounters was identified for further analysis. Among this cohort of 239 adolescents, nearly half (43.5%) had only one ED encounter; however, 38.5% had three or more ED encounters while they were in foster care during the study period. There were no differences in demographic characteristics between adolescents who did and did not have an ED visit during the study period, but those who did have an ED visit were in foster care for a larger portion of the study period, on average, than those who did not have an ED visit (median (IQR) 14.7 months (6.3–

Table 1
Demographic, entry, and exit related characteristics of study cohort.

	Total cohort N = 399	Adolescents with an ED visit N = 239
Gender		
Male	205 (51.4)	124 (51.9)
Female	194 (48.6)	115 (48.1)
Race		
White	119 (29.8)	75 (31.4)
Black or African-American	240 (60.2)	141 (59.0)
Asian	2 (0.5)	2 (0.8)
Native Hawaiian or Other Pacific Islander	3 (0.8)	0 (0)
Other	12 (3.0)	8 (3.4)
Multiple Races	18 (4.5)	10 (4.2)
Not documented	5 (1.3)	3 (1.3)
Ethnicity		
Hispanic or Latino	20 (5.0)	12 (5.0)
Not Hispanic or Latino	361 (90.5)	218 (91.2)
Not documented	18 (4.5)	9 (3.8)
Type of foster care at entry into first period spent in foster care during study period		
Standard	231 (57.9)	129 (54.0)
Group home	146 (36.6)	97 (40.6)
Not documented	22 (5.5)	13 (5.4)
Number of months in foster care while aged 12–18 years during the study period ^a	10.1 (2.5–21.0)	14.7 (6.3–26.9)
Number of emergency department encounters while in foster care		
1		104 (43.5)
2		43 (18.0)
3		35 (14.6)
4		19 (8.0)
5		11 (4.6)
≥6 (max = 26)		27 (11.3)

^a Unknown dates of entry into and exit from foster care were estimated as described in the methods. For the calculation of months spent in foster care, a 30 day period was treated as a month.

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