Specialty Pediatric Transport in Primary Care or Urgent Care Settings

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Abstract

Objective: We sought to describe a single center's experience with specialized critical care transport from non-hospital settings, including primary care offices and urgent care centers. We hypothesized that the majority of patients will require procedures outside the scope of practice of most EMS providers and will be better served by specialized pediatric critical care transport (SPCCT) teams.

Methods: This study sought to retrospectively evaluate instances where children (0–18 years old) were transported by our SPCCT team from nonhospital settings, including primary care offices and urgent care centers, in 2009 and 2010. Data were extracted from a customized database and appropriate statistical tests were applied, including Fisher's exact test for categorical comparisons and Mann-Whitney U test for non-parametric data comparisons.

Results: Fifty-two patients were included. Most of the children were transported for respiratory distress (78%), and many were treated with albuterol (42%) and steroids (42%) prior to the SPCCT team arrival. The most common interventions performed by the SPCCT team were obtaining IV access and administering IV fluid boluses; 4 (7.7%) patients required advanced critical care treatments unique to SPCCT. Most patients (n = 34; 65%) were directly admitted to the general care floor, but a high number of patients (n = 12; 23%; PICU = 11, NICU = 1) required pediatric or neonatal intensive care unit admission. Only 3 patients (5.7%) were discharged home without hospital admission. For the 11 patients admitted to the PICU, the median length of stay (LOS) was 2.5 days (IQR 0.14–13.2). All patients survived to hospital discharge with an additional hospital LOS of 1.3 days (IQR 0.2–6.7). Patients were billed for these critical care transports an average of $2,660.14 ± $940.

Conclusion: Our small cohort demonstrates infrequent application of advanced critical care interventions beyond those provided by the referring primary care office or urgent care centers. This supports the practice of SPCCT teams providing transport services for select critically ill children at primary care offices and urgent care centers, but not as a standard practice for most pediatric patients in these settings.

Introduction

Approximately 200,000 infants and children in the United States are transported each year for specialty neonatal or pediatric care unavailable at the referral hospital.[1] Interfacility transports are commonly performed by specialty pediatric critical care transport (SPCCT) teams, although sick and injured children also present to a variety of nonhospital settings including school, primary care offices, or urgent care centers and may require emergency care and/or transport to a pediatric hospital for further management. Typically, for pediatric emergencies in the community, local emergency medical services (EMS) are activated via the public safety access point (911) where processes are in place for rapid response and transport to the nearest emergency department (ED). A community ED is often supported by a regional pediatric hospital with its regional SPCCT team available for transport when a higher level of care is required. However, for providers in primary care offices and urgent care centers, there is often no standardized process for mobilizing emergency transport resources to transfer children directly to a tertiary care children's hospital.[2]

A medical emergency is defined by Heath et al[3] as an event that requires equipment and intervention beyond the usual and customary scope of pediatric office practice. Medical emergencies in pediatric offices and urgent care centers are not rare. In Connecticut, pediatric offices report a median of 24 emergencies each year.[4] Other studies indicate weekly emergencies in 62% of pediatric offices and monthly emergencies in 82% of pediatric offices.[4-6] Moreover, 46% to 66% of primary care offices have called local EMS providers in the previous 12 months.[3,7] However, the use of local EMS by primary care providers is sporadic. Some providers are unsure if

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Presented as an oral abstract at the American Academy of Pediatrics National Conference and Exhibition, Section on Transport Medicine, October 2011, Boston, MA.

1067-991X/$36.00

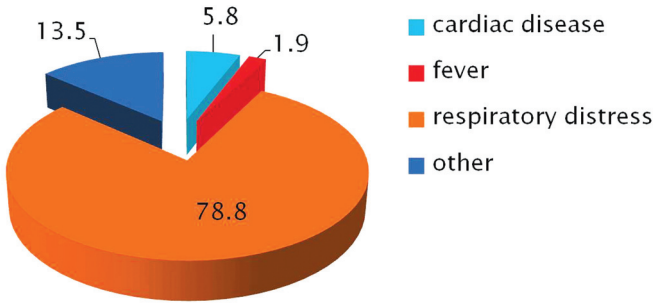
http://dx.doi.org/10.1016/j.amj.2013.12.003

Table 1. Patient Demographics

Category/Subcategory	Total Patients (N = 52)
Sex	n (%)
Male	32 (61.5)
Female	20 (38.5)
Race	n (%)
White	44 (84.6)
Black	3 (5.8)
Other/nonwhite	5 (9.6)
Age	
Age (y), median (IQR)	2.01 (0.6-7.0)
Weight	
Weight (kg), median (IQR)	13.5 (8-21)
	n (%)
Chronic medical conditions	23 (44.2)
Asthma	8 (34.7)
Congenital heart disease	5 (21.7)
Down syndrome	2 (8.7)
Seizure	3 (13.0)
Other diabetes, failure to thrive, genetic abnormalities, lupus	10 (43.4)

IQR = interquartile range.
"Other" chronic medical conditions included patients with choanal atresia (n = 1), biliary atresia (n = 1), systemic lupus erythematosus (n = 1), Cornelia de Lange Syndrome (n = 1), cerebral palsy (n = 2), diabetes mellitus (n = 2), and feeding intolerance with gastrostomy tube dependence (n = 2). Some patients had more than one chronic medical conditions.

Figure 1. Transport request chief complaint. The category "other" included seizure, ruptured appendix, temporal bone fracture, motor vehicle accident, hyperglycemia, failure to thrive, and renal failure.



EMS providers are skilled with pediatric emergencies, whereas other providers choose not to call EMS because of improved efficiency with the family car (61.8%), cost savings to the family (9.3%), and failure to consider EMS (6.5%).[8]

Many pediatric offices are ill equipped for pediatric emergencies.[2,4-6] A study in Wisconsin showed that baseline preparedness for medical and surgical emergencies in physician offices ranges from 37% with intraosseous needles to 96% with albuterol solution.[5] Additionally, only 26% of offices require physician certification in pediatric advanced life support.[5] Little data exist on pediatric emergency preparedness in the urgent care center setting related to staff, equipment, and the frequency of critical illness requiring transfer of care to a pediatric specialty hospital.

There is variability in the willingness and readiness of SPCCT teams to respond to primary care offices and urgent care centers across the country. Furthermore, there are no studies describing the impact of SPCCT teams on transports from these nonhospital clinical settings. Herein, we sought to generate pilot data to describe a single center's experience with specialized critical care transport response to nonhospital primary care and urgent care settings. We hypothesized that the majority of patients will require procedures outside the scope of practice of most EMS providers and will be better served by SPCCT teams.

Methods

This study was an institutional review board–approved retrospective chart review of a 2-year period from January 2009 through December 2010. Our SPCCT fleet comprises 4 mobile intensive care units and 1 dedicated helicopter. The SPCCT team composition is a 3-person crew including a transport nurse, transport respiratory therapist, and transport paramedic. The SPCCT fleet serves over 20 counties encompassing 12,000 square miles and performs 2,500 neonatal and pediatric transports annually. Decisions regarding transport by SPCCT are made after telephone triage, which includes a telephone conversation between the referral physician or practitioner and the SPCCT team medical control physician. The triage includes a discussion about the appropriate mode of transportation, which is influenced by the medical control physician's opinion that the patient does or might need critical care therapies, although, ultimately, we oblige with sending SPCCT if that is the decision of the referring physician. The triage telephone call does include an assigned disposition for patients transported by local EMS (ED or direct admission), whereas disposition for SPCCT patients is deferred until the assessment of the patient's status. Only those patients transported by SPCCT were included, and patients referred and triaged but not receiving SPCCT were not included in the analysis.

This study included an analysis of all SPCCT team transports that originated from nonhospital settings (primary care office or urgent care center setting). Primary care offices included general pediatrician offices located throughout the region or pediatric subspecialty clinics not located within the hospital campus. Urgent care settings describe community-based urgent care outpatient settings located outside of the hospital setting. Community-based freestanding EDs are located in the region but were not included in this cohort. The patients were identified through a local transport database that specifies the origin of each transport. Once transports were identified, patient data were extracted from the referral medical record, the transport record, and the inpatient medical record. Data periods were assigned as follows: 1) pretransport care: all care for the patient before the arrival