

Emergency Medical Services for Children

The New Jersey Model

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Abstract: Identification of specific facilities within a community for the emergency department (ED) treatment of children is a traditional component of Emergency Medical Services for Children systems. In such models, these Emergency Departments Approved for Pediatrics are the preferred EDs to receive patients from Emergency Medical Services providers. This article examines an alternative model developed in New Jersey in which every ED in the state is required by regulation to meet the standards of a traditional Emergency Departments Approved for Pediatrics. The New Jersey model leads to more accessible care and more rapid stabilization of children regardless of their mode of delivery to the ED.

Key Words: EMSC, prehospital care, Emergency Departments Approved for Pediatrics

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Emergency Medical Services for Children (EMSC) is the general description applied to any number of programs that address the emergent needs of pediatric patients. Encompassing every aspect of immediate care from individual ambulance practices to disaster management, EMSC has been applied to systems designed to address the emergency care of children, generally on a state or national level.^{1–5}

Most states have an EMSC program as part of their overall Emergency Medical Services (EMS) agenda. Most of these models are based on the design pioneered in California in the late 1980s. In this standard model, specific hospital emergency departments (EDs) request designation as Emergency Departments Approved for Pediatrics (EDAPs) and are the principle facilities to which ambulances deliver sick or injured children. Criteria for these facilities require specific pediatric focused resources including physician and nurse leaders along with designated age appropriate equipment and supplies.^{1,2,6,7}

This article describes an alternative EMSC model developed by the state of New Jersey for their EMSC program.

The New Jersey model (NJM): The state of New Jersey was the first state to enact legislation mandating an EMSC program. This law was signed into practice in 1992.

In addition, New Jersey was the first state and, to our knowledge, the only state in the nation which regulates the credentials of physicians practicing in hospital EDs.^{8,9} In addition to a valid

NJ medical license, any physician practicing in an ED must be either board certified or board eligible in emergency medicine or pediatric emergency medicine or meet the following additional educational criteria. Physicians trained in other specialties, including Internal Medicine, Pediatrics, Family Medicine, or Surgery who wish to practice emergency medicine must maintain a current course completion card in Advanced Cardiac Life Support, Advanced Trauma Life Support, and either Pediatric Advanced Life Support or Advanced Pediatric Life Support. These regulations are designed to assure a defined physician skill level for every ED in the state.

Because of these regulations, every ED in the state by regulation has the physician personnel necessary to treat any patient of any age presenting to their facility.

The nursing regulations do not require the full-time presence of a Certified Emergency Nurse but do mandate that, at all times within the hospital, there is a nurse present with pediatric capabilities as defined by certification in Pediatric Advanced Life Support, Advanced Pediatric Life Support, or the Emergency Nurse Pediatric Course. All EDs in the state are also required to maintain specialized equipment and supplies as defined by the document “Emergency Preparedness for the Care of Children.” This is a policy statement that defines the optimal parameters for an ED prepared to treat any potential pediatric emergency and is jointly sponsored by the American Academy of Pediatrics, the American College of Emergency Physicians, and the Emergency Nurses Association among other organizations. This document is updated periodically, the most recent update being in 2009.¹⁰

These requirements were formalized in 1999 through the New Jersey Hospital Regulations, which in effect mandated that every ED in the state meet the criteria of a traditional EDAP.⁹ Specialty hospitals or EDs in medical centers immediately adjacent to pediatric EDs are permitted to receive an exemption from regulations. An example of such a facility would be a University Hospital ED that is located across the street from a Children’s Hospital ED.

As opposed to the standard EMSC model in which dedicated EDAPs are identified within a given geographic area, in the NJM, every hospital ED in the state becomes a hospital capable of accepting pediatric patients. This concept of having every ED meet pediatric standards then leads to a number of implications for EMS and pediatric care.

Maximizing the number of access points for emergent pediatric care in the state, minimizes the ED entry time for any child in need of immediate care. Children with ambulatory problems can be treated and discharged without the need for excessive travel to a geographically remote EDAP. Children with more serious problems can more quickly access emergency care for immediate stabilization. Children requiring inpatient care that is not provided at the initial hospital ED can undergo a secondary transfer once stabilized. A transfer agreement with higher level pediatric centers is required in the regulations for hospitals that are not full service pediatric facilities. Because

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most of pediatric critical care involves predominately ED procedures, this model works well, even for severely ill children. In computer simulations, the time to stabilization of a critically ill child was 30% lower in a decentralized EMSC model such as the NJM, in which children were delivered to a local ED, compared to ones in which children were transported directly to a single pediatric center.^{11,12} It should be emphasized that the premise in these models is that the local EDs are all pediatric competent.

The NJM also eliminates the possibility of caretakers transporting a child to an unprepared ED. Not all seriously ill or injured children are delivered to the hospital by ambulance. Because of their portability, small children and infants are easily carried to the ED or transported in a private vehicle. In the context of an acute event, it is much more likely for a caregiver to stop at the first facility they encounter with a large ED sign than to continue on to a designated EDAP. In addition, it is unrealistic to expect the lay public to remember an updated list of the EDAPs in their community, especially in the context of a frightening event involving their child.

With the advances in pediatric immunizations and neonatal care, the number of pediatric inpatients has dropped dramatically over the past decades. Many community medical facilities, which at one time housed full pediatric units, have now closed those units because of low patient censuses. In a survey of office-based pediatricians, 47% admitted a smaller percent of their patients locally and 7% had seen a closure of their hospital's pediatric unit. During the period from 1992 to 2004, approximately 17% of nonteaching hospitals and 14% of teaching hospitals closed their inpatient pediatric units.^{13,14} However, the populations of children surrounding these facilities have remained constant or grown. The children have not gone away, just the diseases that lead to their admissions. If the EDs in these facilities were permitted to mirror their inpatient counterparts and withdraw their pediatric services, the community would be left with no immediate access to emergency care. Long travel times would be needed for even minor episodic problems and delays in care would result for seriously ill or injured children transported by private vehicles. In a presentation on this subject, Sigrest¹³ noted: "Well known problems related to the transfer of a child far from home such as lack of transportation, disruption of family support systems, and parental employment issues are already commonly encountered, and will increase in volume and intensity."

More importantly, this lack of in-hospital pediatric support mandates an even higher level of pediatric capabilities in the ED. The ED alone now must provide all pediatric care, including emergent stabilization and transfer.^{15,16}

The NJ-EMSC model assures that pediatric ED resources remain in a community regardless of the pediatric capabilities of the facility housing the ED.

The NJM also optimizes the physician resources available to provide pediatric emergency care. By taking advantage of the pediatric skills of all emergency physicians in the state, the NJ-EMSC model distributes pediatric patients across a greater supply of physician providers than those isolated at EDAPs in the standard model.¹⁷

In the NJ-EMSC model, Pediatric Emergency Physicians (PEPs) provide both direct patient care and serve as educational and training resources for other emergency care providers within the EMSC system. As with other EM subspecialists, PEPs along with general emergency physicians, monitor and incorporate advances in their area of expertise into emergency practices in the state. Pediatric Emergency Physicians also engage in emergency medicine research, assist with policy development and support childhood advocacy issues.

This overlap of general and PEPs in New Jersey has permitted a cross-pollination of ideas between these 2 disciplines that is not seen in areas in which the 2 groups practice in isolation or in which pediatric emergency care is limited to just PEPs. General emergency medicine and pediatric emergency medicine collaborations have produced innovations in the care of both children and adults.¹⁸⁻²⁰

Within the state, hospitals vary in their approach to the pediatric ED hospital regulations. Most hospitals maintain a general ED, which treats the entire spectrum of patient ages. Some community hospitals deliver pediatric care in either full or part time nested pediatric EDs, frequently marketing these as a unique service to patients in their surrounding community. In university settings, dedicated separate full-time pediatric EDs may be found. Regardless of the format, all of the EDs are expected to provide the same level of emergency care at all hours of the day.

Pediatric trauma patients in the state are cared for within the parameters of the New Jersey Trauma system, which includes designated level 1 and 2 trauma centers in accordance with the American College of Surgeons Committee on Trauma designations. Children meeting criteria for direct transport to a trauma center are taken to the appropriate trauma center and are not taken to the closest ED as they might with other emergency pediatric conditions. However, as with every trauma system, severely injured patients may present to nontrauma centers through either self-transport or misriage. The NJM assures that these children will receive appropriate initial care regardless of their point of entry into the trauma system.

This EMSC model also eliminates the need for prehospital providers to weigh the transport time to a pediatric center against the need for immediate interventions in a critical child. The closest hospital is expected to be able to provide any immediate stabilization.

The use of general emergency physicians or undifferentiated community EDs to deliver pediatric care may seem counterintuitive to those familiar only with pediatric-trained providers or dedicated pediatric centers. However, comparative studies of children treated by general and pediatric emergency-trained physicians show some differences in approaches to specific patient managements but no significant differences in outcomes based on residency training.^{21,22} Most states include general emergency physicians in their EDAP criteria, but none to the extent used in the NJ-EMSC model.^{4,17}

The NJM also may seem to contradict the Institute of Medicine Report "Emergency Care for Children: Growing Pains," which recommends the regionalization of pediatric care.²³ For definitive care procedures, the concept of concentrating care in specific institutions is certainly appropriate to assure sufficient numbers of cases to maintain essential skill sets. This is not necessarily the case for emergency medicine. Most of pediatric ED visits are ambulatory outpatient encounters that do not require the specialized resources of a tertiary care facility. More importantly, those true pediatric emergencies that do occur are episodic, geographically random, and time sensitive.²⁴ As already noted, by distributing care over the greatest number of EDs, the NJM assures the shortest time to treatment of conditions that do need immediate interventions. More importantly, this model permits a baseline pediatric exposure for all EDs that maintain the skills necessary to care for a critically ill or injured child. Because true emergencies can never be assured of occurring in proximity to a pediatric center, the NJM in effect complies with the recommendation of the Institute of Medicine report.

Comparison of the NJM with the standard EDAP model is difficult. At present, there exists no dedicated source of ED

patient outcomes that can be used to compare different state EMSC models. The Centers for Disease Control and Prevention's Multiple Cause of Death database might be considered a surrogate for overall pediatric care in a state, including EMS. For the latest year reported, 2007, New Jersey was within the top 10 states for fewest childhood deaths, with 15 per 100,000.²⁵ The most recent information for infant deaths in 2006 also places New Jersey in the top 10 states for fewest deaths with 5.4 deaths per 1000 livebirths.²⁶ This reflects mostly neonatal mortality but does still include the care of all children up to 1 year of age. Again, EMS is only one component of these statistics, but an inferior EMSC system would be expected to demonstrate some negative impact on a state's mortality statistics.

LIMITATIONS

Because in the NJM, every hospital ED in the state must meet specified pediatric standards, compliance with regulations is much more difficult to assure than in states with select numbers of EDAPs. Enforcement of all hospital regulations is accomplished by periodic on-site inspections of licensed medical facilities. However, on any given round of inspections, specific regulations are emphasized, and there is no visitation team dedicated to just the pediatric ED regulations as there are in states with the traditional EDAP model.

At present, there are no objective outcome criteria for EDs to evaluate their individual performances or for the state to recognize facilities having difficulties with their pediatric care. To rectify this problem, a registry is under development of all critically ill or injured children accessing their medical care through the ED.

CONCLUSIONS

There exists no ideal EMSC model that fits every state. The standard model of isolated EDAP has certainly raised the emergency medicine community's awareness of pediatric patients and is a proven model for delivery of emergency care for children. The NJM provides an alternative to the standard EMSC model which functions well within the parameters of its state.

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