

EMSC PROGRAM MANAGER SURVEY ON EDUCATION OF PREHOSPITAL PROVIDERS

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ABSTRACT

Background. Although pediatric-specific objectives for the initial education of prehospital providers have been established, uniform implementation of these objectives and guidelines for hours of required pediatric continuing education (CE) for prehospital providers have not been established. **Objectives.** To examine the content and number of hours of pediatric-specific education that prehospital providers receive during initial certification and recertification. Second, to identify barriers to implementing specific requirements for pediatric education of prehospital providers. **Methods.** Electronic surveys were sent to 55 EMS for Children (EMSC) State Partnership grantee program managers inquiring about the certification and recertification processes of prehospital providers and barriers to receiving pediatric training in each jurisdiction. **Results.** We had a 91% response rate for our survey. Specified pediatric education hours exist in more states and territories for recertification (63–67%) than initial certification (41%). Limitations in funding, time, instructors, and accessibility are barriers to enhancing pediatric education. **Conclusions.** Modifying statewide policies on prehospital education and increasing hands-on training may overcome identified barriers. **Key words:** emergency medical services; prehospital providers; pediatric education; medical education; certification

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INTRODUCTION

In 1984, the United States Congress created the Emergency Medical Services for Children (EMSC) program to integrate the needs of children into the existing EMS system. One way that EMSC strives to achieve its goal of reducing the morbidity and

mortality of children suffering from severe illness or injury is by emphasizing prehospital provider awareness of and training in pediatric emergency care.^{1–4} In 2006, EMSC implemented a set of 10 performance measures related to the Healthy People 2010 initiative, one of which calls for “the adoption of requirements by the State/Territory for pediatric emergency education for the license/certification renewal of basic life support (BLS) and advanced life support (ALS) providers.”^{5,6}

That same year, the Institute of Medicine (IOM) also released *Emergency Care for Children: Growing Pains*, a report that highlighted the disparity between pediatric and adult prehospital and hospital-based emergency care. This IOM report noted that although pediatric skills deteriorate quickly without practice, continuing education (CE) in pediatric care is not required or is extremely limited for many prehospital providers.⁷ Prior studies also note that frequent prehospital CE in pediatrics is integral for maintaining competencies, especially due to sporadic pediatric encounters by EMS providers.^{8–15} Finally, studies of EMS providers indicate that prehospital providers acquire most of their pediatric knowledge and skills through CE, but that these educational opportunities are limited.^{1,10,15,16}

In 2009, the National Highway Traffic Safety Administration (NHTSA) developed the National EMS Education Standards to provide guidelines for the initial training of prehospital providers. For EMT-basics (EMT-B), 8 of the 110 core curriculum hours are recommended for pediatric education, while 15 of the 1,000 hours for EMT-paramedics (EMT-Ps) focus on pediatrics. Though these standards define hours for initial certification, they are not mandatory and the certification process varies across states and territories that opt not to follow it.^{17,18} Further, the lack of consistent implementation of pediatric continuing education standards and training hours across states and territories contributes to significant variability in ongoing training for prehospital providers.^{19–21}

The purpose of this study was to examine the content and number of hours of pediatric-specific education that prehospital providers receive during initial certification and recertification in each state and territory of the United States. A secondary purpose was to identify barriers to implementing specific requirements for pediatric education of prehospital providers, in order to develop recommendations to overcome these barriers.

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METHODS

We created a 30-question survey using SurveyMonkey.TM The survey was reviewed by one EMSC program manager, staff of the Health Resources and Services Administration (HRSA), the EMSC National Resource Center (NRC), and the National EMSC Data Analysis Resource Center, which supported its distribution. Based on their feedback, we revised the survey prior to distribution. We received approval from the Baylor College of Medicine institutional review board (IRB) for distribution of the survey. After obtaining up-to-date contact information from the NRC for all 55 EMSC State Partnership grantee program managers, we electronically distributed the survey to the managers. At that time, the State of Maine did not have an EMSC State Partnership program, so data from Maine was not requested. We included an introductory letter outlining the goals of the survey, explaining what the survey would be used for, and attached a link to the survey on SurveyMonkey. We collected demographic data of the program managers as well as the initial certification and recertification processes of EMT-Bs and EMT-Ps in each state or territory. We also asked specific questions regarding the pediatric training prehospital providers receive in each jurisdiction and asked the program managers to provide feedback on their perceived barriers and proposed solutions to improve pediatric education for prehospital providers. We followed up with nonresponders at 2 weeks and again at 4 weeks, confirming with the NRC that we had the appropriate contact information for each individual before doing so.

The data analysis for quantitative data from the survey was described using frequencies of responses for each question. Free-text responses were clustered by similar themes for both the program managers' perceived barriers and proposed solutions.

RESULTS

We had a response rate of 50/55 (91%) for the survey. Of those program managers who responded, 24/50 (48%) have held their position for five or more years, 30/50 (60%) have been involved in EMSC for 5 or more years, 32/50 (64%) are or have been prehospital providers, and 25/50 (50%) are or have been EMS educators. With regards to the states and territories, 42/49 (86%) follow the national education standards, and 17/49 (35%) certify graduates from nationally accredited programs only.

Twenty of 49 (41%) EMSC program managers noted that within their state or territory, both EMT-B and EMT-P level providers are required to have a specific number of hours of pediatric education during initial training (Table 1). This requirement was higher for recertification, with 30/48 (63%) and 32/48 (67%) for

EMT-B and EMT-P level providers, respectively. The median number of pediatric training hours for initial certification and recertification was highly variable between states and territories (Table 1).

Recertification occurred in 2-year cycles for 33/48 (69%) states and territories for both EMT-Bs and EMT-Ps (Table 1). Of note, 9/16 (56%) states and territories that have recertification cycles every 3–5 years felt that recertification should occur more frequently, with 2-year cycles being cited most often as the optimal time period.

Thirty of 48 (63%) states and territories allow for pediatric training to be combined with other topics as part of required prehospital provider training. Those topics included neonatology and several special populations, including obstetrics/gynecology and geriatrics (Table 2). The extent to which these combined topics are dedicated to pediatrics alone is not defined.

EMSC program managers noted several barriers to pediatric education for prehospital providers, including limited funding, time, access to trained educators, and access to education (Table 3). Respondents to the survey noted that funding barriers included the cost to pay both instructors and students to attend CE programs, in addition to the actual cost of course materials. Program managers commented that requiring more pediatric hours may compromise time allotted to other nonpediatric topics, and that increasing the overall training hours is a challenge, especially for volunteer EMS agencies. Common themes that emerged regarding access to trained educators were the limited number of instructors with significant pediatric patient care experience or training in established pediatric-focused courses. Limited accessibility to educational courses was also cited several times for volunteer agencies and those in rural areas.

DISCUSSION

To our knowledge, this is the first national assessment of pediatric prehospital educational requirements for initial certification and recertification of prehospital providers with a qualitative assessment of potential barriers to pediatric education from the perspective of EMSC program managers. Interestingly, the percentage of states and territories with a requirement for specified pediatric hours for initial certification was lower than that for recertification. In addition, many program managers noted that pediatric hours are combined with other topics, which further diminishes the time devoted to pediatric education. A solution that several program managers suggested would be for an explicit number of hours dedicated to pediatric education to be defined in every state and territory.

Though most states have recertification cycles that occur every 2 years, most EMSC program managers in states and territories with 3- to 5-year recertification

TABLE 1. Required pediatric training hours and recertification frequency among U.S. States and Territories

		EMT-B	EMT-P
Presence of required number of pediatric training hours	Initial	20/49 (41%)	20/49 (41%)
	Recertification	30/48 (63%)	32/48 (67%)
Required number of pediatric training hours (median hours [interquartile range])	Initial	7.5 hours [4–9]	24 hours [7–33.5]
	Recertification	4 hours [2–6]	8 hours [6–9]
Frequency of recertification (median years [interquartile range])		2 years [2–3]	2 years [2–2.5]

cycles believed that recertification every 2 years would be optimal. Wolfram et al. tested paramedics at 6-month intervals after the American Heart Association’s (AHA) Pediatric Advanced Life Support (PALS) course and found that 75% of them failed to achieve a passing score at an average of 21 months after their last PALS course. Retest scores were unaffected by years of ALS experience, number of pediatric patients per month, or PALS instructor status.¹⁴ Since knowledge seems to decline for PALS approximately 2 years after training, reducing recertification cycles to every 2 years in all states and territories may enhance the ability to refresh and assess prehospital providers’ knowledge and skills in all topics, not just pediatrics.¹⁴

Common themes for the barriers to enhancing pediatric education that the EMSC program managers identified were time, funding, instructor limitations, and accessibility. One proposed solution that EMSC program managers offered would be for instructors to achieve and maintain certification in pediatric-specific courses applicable to prehospital providers. Prior studies have shown that prehospital providers with PALS training had significantly more successful intubations and peripheral and intraosseous line placements, and were more successful in recognizing and treating shock or arrest situations.⁸ Courses with a pediatric focus for prehospital providers include the American Academy of Pediatrics’ (AAP) Pediatric Education for Prehospital Providers (PEPP) course and the National Association of Emergency Medical Technicians’ (NAEMT) Emergency Pediatric Care (EPC) course.

In addition, incorporating more hands-on training and simulation may maximize the quality of time devoted to pediatric education and address the decline in skills and knowledge over time. Lammers et al. used simulation to evaluate the resuscitation skills of paramedics in pediatric patients and found

it to be an effective tool to identify the most common performance deficiencies in paramedics’ management of 3 simulated pediatric emergencies.¹¹ Simulation can also be used for training and retraining prehospital providers in pediatric airway skills, specifically bag–mask ventilation and endotracheal intubation, and has been shown to improve retention of airway skills.²² High-fidelity manikins can also be transported, which may enhance accessibility to hands-on training. Hands-on simulation with debriefing also allows learners to reflect on the experience and understand the cognitive approaches that led to specific

TABLE 3. Sample responses from EMSC program managers on barriers to improving pediatric education of prehospital providers

Limited funds	
1)	“Funding the salary of the instructors, most of whom work on their off hours (and are) paid by the hour.”
2)	“Cost and time since we are mainly a volunteer state when it comes to prehospitala [sic] providers”
3)	“Government entities do not set as a priority pediatric care thus funding, regulatory opportunity, training opportunities and appropriate pediatric equipment in an out of hospital setting remain a uphill battle.”
4)	“Funding remains the primary barrier to education . . . the cost of the actual training course and back filling the positions while the provider is in class remains the barrier when the opportunity arises for pediatric education.”
Limited time	
1)	“It is a challenge to add (pediatric training) hours, so what other training would be given up to add more peds.”
2)	“In a voluntary agency it becomes difficult to add more training or mandates to a group that is already working many other hours and stretched to the limit.”
Limited access to trained educators	
1)	“One critical barrier is the limited number of PEPP instructors to teach the course.”
2)	“Instructor certification is limited to building classroom skills, no effort is made to improve instructor’s pediatric knowledge. Providers become instructors regardless of competency.”
3)	“Lack of clinical experience”
4)	“The lack of instructors with a solid base of knowledge in this area.”
5)	“The availability of pediatric experts with real life pediatric emergency medicine experience to train prehospital providers”
Limited access to education	
1)	“Rural areas within our state have less access to educational resources.”
2)	“It is difficult to reach volunteer providers in rural areas with accessible continuing education.”

TABLE 2. Topics allowed to be combined with pediatric training in states and territories

	N (%)
Obstetrics/Gynecology	14 (46.7%)
Mixture of special populations	10 (33.3%)
Geriatrics	3 (10%)
Neonatology	3 (10%)

behaviors and enhance future patient care.²³ Though this may enhance quality and accessibility, the costs involved in operating a simulation education program for prehospital providers may still be a barrier.

Enhancing real-life exposure to pediatric cases through rotations in local emergency departments may also be a way to maximize the quality of the time spent on pediatric training. David et al. found that an individual paramedic's patient care volume is highly proportional to improved performance, standardization of care with trauma patients, and reduced mortality.⁹ Increased real-life exposure to pediatric patients can also decrease barriers in administration of analgesia and decrease medication dosing errors in children.^{24–28}

LIMITATIONS

Though our survey had a high response rate and was developed by three pediatric emergency medicine physicians, one EMSC program manager, and one program lead from the National Resource Center, this study has several limitations. First, our survey has not been validated and thus the interpretation of questions may not have been similar between respondents. By having multiple reviewers, however, we hoped this would be minimized. Although surveying EMSC program managers made it possible to obtain data with regards to certification at the state level, this method may not have captured requirements or opinions of local EMS systems within each state that do not fall under state-level requirements.

CONCLUSIONS

Specified hours for pediatric education are not present in all states and territories for the initial certification and recertification of prehospital providers. EMSC program managers note that policies that allow combining pediatric hours with other topics and recertification cycles longer than every 2 years may decrease exposure to pediatric education. Time, cost, instructor, and accessibility barriers limit prehospital provider exposure to pediatric content, and modifying statewide policies and increasing hands-on training may be solutions to overcome some of these barriers.

References

- Ball JW, Liao E, Kavanaugh D, Turgel C. The emergency medical services for children program: accomplishments and contributions. *Clin Pediatr Emerg Med.* 2006;7:6–14.
- Cichon ME, Fuchs S, Lyons E, Leonard D. A statewide model program to improve emergency department readiness for pediatric care. *Ann Emerg Med.* 2009;54(2):198–204.
- Durch JS, Lohr KN. *Emergency Medical Services for Children.* Washington DC: National Academy Press; 1993.
- Fotlin G, Fuchs S. Advances in pediatric emergency medicine service systems. *Emerg Med Clin N Am.* 1991;9(3):459–74.
- Government Performance and Results Act of 1993, Pub. L. No. 103-62, 107 Stat. 285.
- EMSC National Resource Center. Healthy People 2010: Mapping to the EMSC Performance Measures. Available at: www.childrensnational.org/files/PDF/EMSC/ForGrantees/Healthy_People_2010-Mapping_to_the_Performance_Measures.pdf, Accessed January 14, 2011.
- Institute of Medicine. *Emergency Care for Children: Growing Pains.* Washington, DC: The National Academies Press; 2006.
- Baker TW, King W, Soto W, Asher C, Stolfi A, Rowin ME. The efficacy of Pediatric Advanced Life Support training in emergency medical services providers. *Pediatr Emerg Care.* 2009;25(8):508–12.
- David G, Brachet T. Retention, learning by doing, and performance in emergency medicine services. *Health Serv Res.* 2009;44(3):902–25.
- Gausche M, Henderson DP, Brownstein D. Education of out-of-hospital emergency medicine personnel in pediatrics: report of a national task force. *Ann Emerg Med.* 1998;31:58–64.
- Lammers RL, Byrwa MJ, Fales WD, Hale RA. Simulation-based assessment of paramedic pediatric resuscitation skills. *Prehosp Emerg Care.* 2009;13:345–56.
- Latman NS, Wooley K. Knowledge and skill retention of emergency care attendants, EMT-As, and EMT-Ps. *Ann Emerg Med.* 1980;9(4):183–9.
- Su E, Schmidt TA, Mann NC, Zechinich AD. A randomized controlled trial to assess decay in acquired knowledge among paramedics completing a pediatric resuscitation course. *Acad Emerg Med.* 2009;7(7):779–86.
- Wolfram RW, Warren CM, Doyle CR, Kerns R, Frye S. Retention of Pediatric Advanced Life Support (PALS) course concepts. *J Emerg Med.* 2003;25(4):475–9.
- Wood D, Kalinowski EJ, Miller DR, Newton TJ. Pediatric continuing education for emergency medical technicians. *Pediatr Emerg Care.* 2004;20(4):261–8.
- Sanddal ND, Sanddal TL, Pullum JD, Altenhofen KB, Werner SM, Mayberry J, Rushton B, Dawson DE. A randomized, prospective, multisite comparison of pediatric prehospital training methods. *Pediatr Emerg Care.* 2004;20(2):94–100.
- National Highway Traffic Safety Administration. *Education Agenda for the Future: A Systems Approach.* Available at: www.nhtsa.gov/people/injury/ems/FinalEducationAgenda.pdf. Accessed March 20, 2011.
- Sirbaugh PE, Leswing V. Prehospital pediatrics. Available at: www.uptodate.com/online/content/topic.do?topicKey=peds_ems/2940&selectedTitle=1%7E6&source=search_result. Accessed October 20, 2009.
- Wright JL. Emergency medical services for children. *Clin Pediatr Emerg Med.* 2006;1(5):1–20.
- Wright JL. Emergency medical services for children and the institute of medicine revisited, 1993–2006. *Clin Pediatr Emerg Med.* 2006; 4(3):69–70.
- Zaveri PP, Agrawal D. Pediatric education and training of prehospital providers: a critical analysis. *Clin Pediatr Emerg Med.* 2006; 7:114–20.
- Youngquist S, Henderson DP, Gausche-Hill M, Goodrich SM, Poore PD. Paramedic self-efficacy and skill retention in pediatric airway management. *Acad Emerg Med.* 2008;15:1295–303.
- Zimont JJ, Kappus LJ, Sudikoff SN. The 3D model of debriefing: defusing, discovering, and deepening. *Semin Perinatol.* 2011;35(2):52–8.
- De Maio VJ, Osmond MH, Stiell IG, Nadkarni V, Berg R, Cabanas JG. Epidemiology of out-of-hospital pediatric cardiac arrest due to trauma. *Prehosp Emerg Care.* 2102;16:230–6.
- Barata IA, Benjamin LS, Mace SE. Pediatric patient safety in the prehospital/emergency department setting. *Pediatr Emerg Care.* 2007;23(6):412–8.

26. Heyming T, Bosson N, Kurobe A, Kaji AH, Gausche-Hill M. Accuracy of paramedic Broselow tape use in the prehospital setting. *Prehosp Emerg Care.* 2012;16:374–80.
27. Hoyle JD, Davis AT, Putman KK, Trytko JA, Fales WD. Medication dosing errors in pediatric patients treated by emergency medical services. *Prehosp Emerg Care.* 2012;16:59–66.
28. Williams DM, Rindal KE, Cushman JT, Shah MN. Barriers to and enablers for prehospital analgesia for pediatric patients. *Prehosp Emerg Care.* 2012;16:519–26.