# Pediatric Readiness Program Education Session

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Pediatric Readiness in the Emergency Department: Does it Make a Difference in Outcomes?

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May 9, 2024



# Objectives

- Describe the rationale and evolution of pediatric readiness in the emergency department
- Summarize the major domains of pediatric readiness
- Discuss the accumulating evidence demonstrating the association of high readiness with increased survival

# CME Disclosure

None of the planners and faculty for this educational activity have relevant financial relationship(s) to disclose with ineligible companies whose primary business is producing, marketing, selling, reselling, or distributing healthcare products used by or on patients.









# Why This Matters

• Better preparing emergency departments for pediatric patients will save the lives of children presenting there for care.

# Outline

- Rationale for Emergency Preparedness
- History of Pediatric Emergency Readiness
- Outcomes around Preparedness
- What to Focus on in Your ED

# Rationale for Pediatric Preparedness

- 1 in 5 American children will have at least 1 ED visit each year
- 1 in 11 will have 2 or more visits
- > 30 million ED visits each year
- 25% of all ED visits
- 97% of EDs are nonchildren's hospitals
- 80% of visits in general emergency departments

# They're coming to us...but they're coming to you too!





## History of Pediatric Emergency Readiness:

Party like its 1995

# Guidelines for Pediatric Emergency Care Facilities

- Categorization
  - Standby
  - Basic
  - General
  - Comprehensive Regional

#### AMERICAN ACADEMY OF PEDIATRICS

#### **Guidelines for Pediatric Emergency Care Facilities**

#### Committee on Pediatric Emergency Medicine

Emergency care for life-threatening pediatric illness and injury requires specialized resources including equipment, drugs, trained personnel, and facilities. The American Medical Association Commission on Emergency Medical Services has provided guidelines for the categorization of hospital pediatric emergency facilities that have been endorsed by the American Academy of Pediatrics (AAP).<sup>1</sup> This document was used as the basis for these revised guidelines, which define:

- The desirable characteristics of a system of Emergency Medical Services for Children (EMSC) that may help achieve a reduction in mortality and morbidity, including long-term disability.
- The role of health care facilities in identifying and organizing the resources necessary to provide the best possible pediatric emergency care within a region.
- An integrated system of facilities that provides timely access and appropriate levels of care for all critically ill or injured children.
- The responsibility of the health care facility for support of medical control of pre-hospital activities and the pediatric emergency care and education of pre-hospital providers, nurses, and physicians.
- The role of pediatric centers in providing outreach education and consultation to community facilities.
- The role of health care facilities for maintaining communication with the medical home of the patient.

Children have their emergency care needs met in a variety of settings, from small community hospitals to large medical centers. Resources available to these health care sites vary, and they may not always have the necessary equipment, supplies, and trained personnel required to meet the special needs of pediatric patients during emergency situations.

Timely, effective pediatric emergency care depends on a network of pre-hospital and hospital medical and administrative resources. For a system of pediatric emergency care to be developed, the capabilities of the emergency care facility for pediatric treatment must be categorized. Once health care

The recommendations in this statement do not indicate an exclusive course of treatment or procedure to be followed. Variations, taking into account individual circumstances, may be appropriate. PEDIATRICS (ISSN 0031 4005). Copyright © 1995 by the American Academy of Pediatrics.

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facilities are categorized according to their emergency capabilities, a network must be developed within a region that assures access to specialized care, avoids duplication of services, and assures that services are available to all infants and children. This process of categorization and regionalization of pediatric emergency facilities requires the cooperation of hospitals and emergency medical services (EMS) systems within a region.

These guidelines are designed to assist health care facilities within a region to meet the emergency care needs of children. A framework is offered that integrates the resources of facilities to assure access to appropriate levels of care, including specialized services for children wherever the entry point into the system.

Many children access emergency care at community hospitals that must take responsibility for the triage and stabilization of critically ill or injured pediatric patients. Most hospitals provide basic pediatric emergency services. However, a system that assures comprehensive care is often not available. The development of a regionalized cooperative network of EMS-EMSC allows rural and community hospitals access to a system that assures integration with more specialized facilities.

Each state, region, or local area has different administrative structures and organizations responsible for the administration of an EMS-EMSC system. Each hospital within the system is a component of EMSC. Pre-hospital care is often not the direct responsibility of a health care facility, but each facility must support and cooperate with their pre-hospital system to assure a functioning pediatric emergency care network. This cooperation may include assisting pre-hospital care providers and services with education, training, and consultation. Every health care facility that is a component of EMSC has a responsibility to accept appropriate patients, provide prehospital guidance when necessary, stabilize pediatric emergencies, and, when appropriate, transport patients to a definitive care facility

Small community facilities (such as standby or basic) within an EMS-EMSC system are responsible for accepting critically ill and/or injured children who do not have immediate access to definitive care resources because of geographical restrictions, and they must have the equipment and skilled personnel necessary to recognize, stabilize, and support the timely transport of pediatric patients to a prearranged definitive care resource.

	Facility Levels			
	CRPC	General	Basic	Standby
Personnel	FFD	FFD	FFD	ED
Physician with pediatric emergency care experience	EED	EED	EED	EP
RN with pediatric training*	EED	EED	EED	EED
Respiratory therapist	EH	EH	EH	
Trauma coordinator	E	E		
Nurse educator	E	E		
Trauma team*	E	E	SE	
Specialist consultants*				
Pediatrics	EH	EP	EP	SE
Radiology	EP	EP	EP	SE
Anesthesiology*	EH	EH	EP	SE
Cardiology	EP			
Critical Care	EH	EP		
Nephrology	EP			
Hematology/oncology	EP			
Endocrinology	EP			
Gastroenterology	EP			
Allergy	EP			
Neurology	EP			
Pulmonology	EP			
Psychiatry	EP			
Infectious Disease	EP			
Intectious Disease				
Council and a significant				
Surgical specialists		ET I	ED	CE
General surgeon		EH	EP	SE
Pediatric surgeon	EH	SE		
Neurosurgery	EP	EP	rn.	
Orthopedics	EP	EP	EP	
Otolaryngology	EP			
Urology	EP			
Plastic surgery	EP			
Oral/maxillofacial	EP			
Gynecology	EP			
Microvascular surgery	EP			
Hand surgery	EP			
Ophthalmology	EP			
Cardiac surgery	EP			
Equipment and Supplies				
EMS communication equipment*	Е	Е	Е	E
Organized emergency cart*	EED	EED	EED	EED
Printed drug doses/tape	EED	EED	EED	EED
Monitoring devices				
FCC manitar (defibrillator with redictric reddles 0, 400 isules and hard	FED	FED	ELI	ELI
ECG monitor/denominator with pediatric paddies 0-400 joules and hard	EED	EED	ЕП	ЕП
copy capabilities	FFD	FFD	P11	EU.
Pulse oximeter (adult/pediatric probes)	EED	EED	EH	EH
Blood pressure curis (infant, child, adult, thigh)	EED	EED	EED	EED
Rectal thermometer probe (28°–42°C)	EED	EED	EH	EH
Otoscope, ophthalmoscope, stethoscope	EED	EED	EED	EED
Cardiopulmonary monitor with pediatric capability	EED	EED	EED	EH
Doppler and noninvasive blood pressure monitoring (infant, child, adult	EED	EED	EH	
cuffs)				
Apnea/respiratory monitor	EED	EED	SE	
End tidal $CO_2$ , monitor	EED	EH	SE	
Monitor for central venous pressure, arterial lines	EED	EH	SE	
Airway control/ventilation equipment				
Bag-valve-mask device: pediatric (450 mL), and adult (1000 mL) with oxygen	EED	EED	EED	EED
reservoir and without pop-off valve. Infant, child, and adult masks				
Oxygen delivery device with flow meter	EED	EED	EED	EED
Clear oxygen masks, standard and non-rebreathing (neonatal, infant, child,	EED	EED	EED	EED
adult)				
Nasal cannula (infant, child, adult)	EED	EED	EED	EED
Suction devices-catheters 6-14 fr. vankauer-tip	EED	EED	EED	EED
Oral airways (sizes (1-5)	EED	EED	EED	EED
	220			

Abbreviations: E, essential; EED, essential in emergency department (ED); EH, essential in hospital; EP, promptly available (within 20–30 min when possible); SE, strongly encouraged if such services are not available within a reasonable distance. \*, See text for further definition.

# Guidelines for Pediatric Emergency Care Facilities

- Personnel
- Equipment, supplies, facilities
- Access, triage, transfer and transport
- Education, training
- Research
- Quality assessment and improvement
- Administrative support

### AMERICAN ACADEMY OF PEDIATRICS

American Academy of Pediatrics, Committee on Pediatric Emergency Medicine and American College of Emergency Physicians, Pediatric Committee

### Care of Children in the Emergency Department: Guidelines for Preparedness

ABSTRACT. Children requiring emergency care have unique and special needs. This is especially so for those with serious and life-threatening emergencies. There are a variety of components of the emergency care system that provide emergency care to children that are not limited to children. With regard to hospitals, most children are brought to community hospital emergency departments (EDs) by virtue of their availability rather than to facilities designed and operated solely for children. Emergency medical services (EMS) agencies, similarly, provide the bulk of out-of-hospital emergency care to children. It is imperative that all hospital EDs and EMS agencies have the appropriate equipment, staff, and policies to provide high quality care for children. This statement provides guidelines for necessary resources to ensure that children receive quality emergency care and to facilitate, after stabilization, timely transfer to a facility with specialized pediatric services when appropriate. It is important to realize that some hospitals and local EMS systems will have difficulty in meeting these guidelines, and others will develop more comprehensive guidelines based on local resources. It is hoped, however, that hospital ED staff and administrators and local EMS systems administrators will seek to meet these guidelines to best ensure that their facilities or systems provide the resources necessary for the care of children. This statement has been reviewed by and is supported in concept by the Ambulatory Pediatric Association, American Association of Poison Control Centers, American College of Surgeons, American Hospital Association, American Medical Association, American Pediatric Surgical Association, American Trauma Society, Brain Injury Association Inc, Emergency Nurses Association, Joint Commission on Accreditation of Healthcare Organizations, National Association of Children's Hospitals and Related Institutions, National Association of EMS Physicians, National Association of EMTs, National Association of School Nurses, National Association of State EMS Directors, National Committee for Quality Assurance, and Society for Academic Emergency Medicine.

ABBREVIATIONS. ED, emergency department; EMS-C, Emergency Medical Services for Children (program); EMS, emergency medical services; QI, quality improvement; PI, performance improvement.

#### ACKNOWLEDGMENTS

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The recommendations in this statement do not indicate an exclusive course of treatment or serve as a standard of medical care. Variations, taking into account individual circumstances, may be appropriate. PEDIATRICS (ISSN 0031 4005). Copyright © 2001 by the American Academy of Pediatrics.

Department of Health and Human Services, Health Resources and Services Administration and Maternal and Child Health Bureau. This statement has been reviewed by and is supported in concept by the Ambulatory Pediatric Association, American Association of Poison Control Centers, American College of Surgeons, American Hospital Association, American Medical Association, American Pediatric Surgical Association, American Trauma Society, Brain Injury Association Inc, Emergency Nurses Association, Joint Commission on Accreditation of Healthcare Organizations, National Association of Children's Hospitals and Related Institutions, National Association of EMS Physicians, National Association of EMTs, National Association of School Nurses, National Association of State EMS Directors, National Committee for Quality Assurance, and Society for Academic Emergency Medicine.

#### BACKGROUND

A ccording to the *Child and Adolescent Emergency Department Visit Data Book*,<sup>1</sup> there are 31 447 000 child and adolescent visits to emergency departments (EDs) every year, corresponding to an annual rate of 41.2 visits/100 persons. Of these, 13 562 000 child and adolescent visits per year (17.8 visits/100 persons) were injury related. Children younger than 3 years represent the largest proportion of medically and injury related visits in this sample.

The Consumer Product Safety Commission surveyed a sample of 101 hospitals with EDs that were enrolled in the National Electronic Injury Surveillance System to identify the state of preparation of hospital EDs for managing pediatric emergencies.<sup>2</sup> The survey results were extrapolated to the estimated 5312 hospitals in the United States that have EDs. Although less than 10% have pediatric EDs or intensive care services, 76% admit children to their own facilities, and 25% of hospitals without trauma services admit critically injured children to their own facilities.

When the US Congress approved and funded the Emergency Medical Services for Children (EMS-C) program in 1984 to stimulate the organization of emergency medical services (EMS) systems to respond to the needs of children, a number of demonstration programs began to address issues related to emergency care for children. In 1993, after nearly a decade of efforts to integrate the needs of children into EMS systems, the Institute of Medicine was asked to provide an independent review of EMS-C and report to the nation on the state of the continuum of care for children within the EMS system.<sup>3</sup>



### Let's talk about it

### • 2001

 AAP and ACEP publish guideline on care of children in the emergency department

# What was included

Administration and Coordination of Care

Guidelines for Physicians and Others Staffing the ED

**Quality Improvement Guidelines** 

Policies, procedures, and protocols

Support services

Equipment, supplies, and medication



# Pediatric Emergency Care Coordinators (RN and MD)



- Ensure skill and knowledge of personnel
- Oversee QI, PI, care protocols
- Assist with review of meds, equipment, policies
- Liaise with in- and out-of-hospital committees
- Liaise with definitive care hospital
- Facilitate education for ED providers



# Guidelines for Physicians and Other Practitioners Staffing the ED

- Physicians and nurses...have the necessary skill, knowledge, and training to provide emergency evaluation and treatment of children of all ages who may be brought to the ED...
- Competency evaluations completed by the staff are age specific and include neonates, infants, children, and adolescents.



# Quality Improvement

- 1) Have a program
- 2) Interface with prehospital, ED, trauma, inpatient, PICU
- 3) Identify indicators of good outcome, collect and analyze data, define improvement plans and what success looks like
- 4) Monitor education and staffing

# Standard Policies

- Child maltreatment
- Consent of minors
- Death of a child
- Pediatric Triage
- Mental Health Emergencies
- Family-Centered Care
- Discharge Planning
- Transfers







# Support Services

- Radiology
- Lab
- Plan for trauma, burns, abuse, critical care

## Medications and Equipment



scitation Medications

agents hloride

(D10W, D50W)

ne

ainamide

sium sulfate

one hydrochloride

ium bicarbonate (4.2%, 8.4%)



or a more complete list of medications used in a pediatric ED, see ref.<sup>44</sup> D10W indicates dextr. dextrose 50% in water.

Vasopressor agents

<sup>a</sup> For less frequently used antidotes, a procedure for obtaining them should be in place.

# How'd we do?

- 2003
  - 'most hospitals were unaware of the national guidelines and few had all the essential equipment and care policies listed in the recommended guidelines'
- 2006
  - IOM, Committee on the Future of Emergency Care described pediatric emergency care specifically as 'uneven'.
  - Recommended hospitals appoint 2 pediatric emergency coordinators – one a physician – to provide pediatric leadership



## Evolution of Pediatric Readiness

### • 2009

- Updated Guideline by AAP, ACEP, and ENA
- Added 'Improving Pediatric Safety in the ED'

### $\checkmark$ Weight in kg

- ✓ Full set of vital signs
- Way to identify abnormal signs
- Process for safe medication delivery (dosage)
- ✓ Report safety events and encourage disclosure

### American Academy of Pediatrics

### FROM THE AMERICAN ACADEMY OF PEDIATRICS

Organizational Principles to Guide and Define the Child Health Care System and/or Improve the Health of all Children

### Joint Policy Statement—Guidelines for Care of Children in the Emergency Department

AMERICAN ACADEMY OF PEDIATRICS COMMITTE ON PEDIATRIC EMERGENCY MEDICINE AMERICAN COLLEG OF EMERGENCY PHYSICIANS PEDIATRIC COMMITTEE EMERGENCY NURSES ASSOCIATION PEDIATRIC COMMITTEF

#### KEY WORD

pediatric emergency proparations ABBERYLINDS ED—emergency department EMS—emergency medical services EMSO—emergency medical services for children 0(—quality improvement PI—performance improvement This document is copyrighted and is property of the American Academy of Pediatrics and its Board of Directors. All authors have filed conflict-of-interest statements with the American Academy of Pediatrics has nother abate bean resolved through a process approved by the Board of Directors. The American Academy of Pediatrics has nother abate bean resolved through a process approved by the Board of Directors. The American Academy of Pediatrics has nother abate bean resolved through a process approved by the Board of Directors. The American commercial involvement in the development of the content of this publication.

www.pediatrics.org/cgi/doi/10.1542/peds.2009-1807 doi:10.1542/peds.2009-1807 All policy statements from the American Academy of Pediatrics automaticality eavies a verse after publication unless reaffirmed

revised, or retired at or before that time. PEDIATRICS (ISSN Numbers: Print, 0031-4005; Online, 1098-4275). Copyright © 2009 by the American Academy of Pediatrics abstract Children who require emergency care have unique needs, especially when emergencies are serious or life-threatening. The majority of ill and injured children are brought to community hospital emergency departments (EDs) by virtue of their geography within communities. Similarly, emergency medical services (EMS) agencies provide the bulk of out-of-hospital emergency care to children. It is imperative, therefore, that all hospital EDs have the appropriate resources (medications, equipment, policies, and education) and staff to provide effective emergency care for children. This statement outlines resources necessary to ensure that hospital EDs stand ready to care for children of all ages, from neonates to adolescents. These guidelines are consistent with the recommendations of the Institute of Medicine's report on the future of emergency care in the United States health system. Although resources within emergency and trauma care systems vary locally, regionally, and nationally, it is essential that hospital ED staff and administrators and EMS systems' administrators and medical directors seek to meet or exceed these guidelines in efforts to optimize the emergency care of children they serve. This statement has been endorsed by the Academic Pediatric Association, American Academy of Family Physicians, American Academy of Physician Assistants, American College of Osteopathic Emergency Physicians, American College of Surgeons, American Heart Association, American Medical Association, American Pediatric Surgical Association, Brain Injury Association of America, Child Health Corporation of America. Children's National Medical Center, Family Voices National Association of Children's Hospitals and Related Institutions, National Association of EMS Physicians, National Association of Emergency Medical Technicians, National Association of State EMS Officials, National Committee for Quality Assurance, National PTA, Safe Kids USA, Society of Trauma Nurses, Society for Academic Emergency Medicine, and The Joint Commission. Pediatrics 2009;124:1233-1243

#### INTRODUCTION

This policy statement delineates guidelines and the resources necessary to prepare hospital emergency departments (EDs) to serve pediatric patients. Adoption of these guidelines should facilitate the delivery of emergency care for children of all ages and, when appropriate, timely transfer to a facility with specialized pediatric services. This policy is an update of previously published guidelines.<sup>12</sup>

This statement has been endorsed by the Academic Pediatric Association, American Academy of Family Physicians, American Academy of Physician Assistants, American College of Osteopathic Emergency Phy-

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# Readiness Writ Large

- 2013
  - The NPRP launches its first national assessment based on the 2009 guidelines.
  - More than 4,000 EDs participate, yielding a response rate of more than 82%



Pediatric Readiness Project Ensuring Emergency Care for All Children

# Weighted Pediatric Readiness Score (0-100)

- 19 points for coordination of care
- 10 points for physician/nurse staffing
- 7 points for quality improvement
- 14 points for patient safety
- 17 points for policies/procedures
- 33 points for equipment/supplies



# Takeaways

Table	Fable 2. National Assessment Response Summary <sup>a</sup>								
		All	EDs by Pediatric ED Volume Category						
		Responding EDs (N = 4137)	Low (n = 1626)	Medium (n = 1244)	Medium to High (n = 706)	High (n = 561)			
PECC									
Phy	vsician	1966 (47.5)	627 (38.6)	549 (44.1)	368 (52.1)	422 (75.2)			
Nu	se	2455 (59.3)	899 (55.3)	714 (57.4)	415 (58.8)	427 (76.1)			
Physic	cian certifications/training (board)								
Em	ergency medicine	3418 (82.6)	1127 (69.3)	1117 (89.8)	677 (95.9)	497 (88.6)			
Fan	nily medicine	2555 (61.8)	1283 (78.9)	769 (61.8)	323 (45.8)	180 (32.1)			
Pec	liatrics	791 (19.1)	147 (9.0)	173 (13.9)	144 (20.4)	327 (58.3)			
Pec	liatric emergency medicine	604 (14.6)	96 (5.9)	113 (9.1)	84 (11.9)	311 (55.4)			
Oth	ier	1116 (27.0)	505 (31.1)	357 (28.7)	156 (22.1)	98 (17.5)			
ED co	mpetency evaluations								
Phy	vsician	1599 (38.7)	386 (23.7)	489 (39.3)	341 (48.3)	383 (68.3)			
Nu	se	2757 (66.6)	800 (49.2)	903 (72.6)	563 (79.7)	491 (87.5)			
Mic	llevel practitioner	749 (18.1)	155 (9.5)	245 (19.7)	169 (23.9)	180 (32.1)			
Key p	rocesses, policies, or procedures								
Pec	liatric QI process	1867 (45.1)	528 (32.5)	531 (42.7)	375 (53.1)	433 (77.2)			
We	igh children only in kilograms	2802 (67.7)	853 (52.5)	893 (71.8)	564 (79.9)	492 (87.7)			
Fan	nily-centered care plan	2468 (59.7)	821 (50.5)	784 (63.0)	447 (63.3)	416 (74.2)			
Pec	liatric disaster plan	1938 (46.8)	613 (37.7)	577 (46.2)	370 (52.4)	378 (67.4)			
Pec	liatric mental health care	1825 (44.1)	528 (32.5)	575 (46.2)	367 (52.0)	355 (63.3)			
Requi media	red equipment, nn (IQR), % carried	91 (81-98)	87 (78-96)	91 (83-98)	94 (85-100)	98 (91-100			

Abbreviations: ED, emergency department; IQR, interquartile range; PECC, pediatric emergency care coordinator; QI, quality improvement. <sup>a</sup> Unless otherwise indicated, data are expressed as number (percentage) of responding EDs.

- Overall readiness score nationally was 69.8
- 48% had a physician PECC and 59% had an RN PECC
- Only 45% of hospital EDs reported having a pediatric care QI plan, 58% had defined pediatric quality indicators
- EDs had 91% of required equipment
- Presence of a physician and nurse PECC associated with higher median pediatric readiness score compared with no PECC



Pediatric Readiness Quality Collaborative **Ensuring Emergency Care for All Children** 



1) WEIGHT IN KG 2) ABNORMAL VS 3) TRANSFERS 4) DISASTER PREPAREDNESS



Central hubbleste: maintains sentral data and persentes Apports- mains staff at each node, coloras improvement

Regional Conter/Notes. danavarobark toubress (bending data to hull) and angage sommunity 6D in transocoupsidate house

**Community EDs** porticipant in an assessment and report out, addres to improve/want resources incen built

## 2018 Readiness Guideline Revision

- More explicitly describes staff 'competency' (e.g., neonatal resuscitation, pediatric airway management) and how to assess it
- Examples of PI/QI provided (e.g., pain assessment and reassessment in kids with fractures, number of 48-hour returns, head CT use for minor head trauma, etc.)
- Explicitly recommend evidence based clinical pathways, order sets, or decision support

### Pediatric Readiness in the Emergency Department

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This is a revision of the previous joint Policy Statement titled "Guidelines for Care of Children in the Emergency Department." Children have unique physical and psychosocial needs that are heightened in the setting of serious or life-threatening emergencies. The majority of children who are ill and injured are brought to community hospital emergency departments (EDs) by virtue of proximity. It is therefore imperative that all EDs have the appropriate resources (medications, equipment, policies, and education) and capable staff to provide effective emergency care for children. In this Policy Statement, we outline the resources necessary for EDs to stand ready to care for children of all ages. These recommendations are consistent with the recommendations of the Institute of Medicine (now called the National Academy of Medicine) in its report "The Future of Emergency Care in the US Health System." Although resources within emergency and trauma care systems vary locally, regionally, and nationally, it is essential that ED staff, administrators, and medical directors seek to meet or exceed these recommendations to ensure that high-quality emergency care is available for all children. These updated recommendations are intended to serve as a resource for clinical and administrative leadership in EDs as they strive to improve their readiness for children of all ages.

### INTRODUCTION

In this Policy Statement, we delineate the recommended resources necessary to prepare emergency departments (EDs) to care for pediatric patients. Adoption of the recommendations in this Policy Statement will facilitate the delivery of emergency care for children of all ages and, when appropriate, timely transfer to a facility with specialized pediatric services. This joint Policy Statement is an update of previously published muidelines 1-4

### abstract



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Drs Gausche-Hill, Remick, Joseph, Brown, and Wright and Ms Snow were each responsible for all aspects of writing and editing the document and reviewing and responding to questions and comments from reviewers and the Board of Directors; and all authors approved the final manuscript as submitted.

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# Did Readiness Improve?

- 2021
  - NPRP launched 2nd national assessment with 3,647 EDs responding (71%). Results published in JAMA Pediatrics in 2023
  - WPRS 69.5
  - 37% had MD/APP PECCs, 37% had RN/APP PECCs
  - Competency evaluation for MDs and RNs increased (39->62, 67->86, respectively)
  - 50% had Peds QI (up from 45)
  - 78% now weight children in kgs (from 68%)
  - 60% had *all* recommended equipment (from 6% in 2003)

WPRS, median (IQR) <sup>b</sup>	64.0 (55.6-76.0)	71.4 (61.0-85.4)	77.5 (66.1-91.0)	94.4 (83.3-97.5)	69.5 (59.0- 84.0)
PECC					
Physician PECC					
MD or DO	432 (24.1)	425 (38.6)	197 (52.4)	225 (78.7)	1279 (36.0)
Advanced practice practitioner	32 (1.8)	10 (0.9)	1 (0.3)	3 (1.0)	46 (1.3)
Nurse PECC					
RN	502 (28.0)	426 (38.7)	182 (48.4)	210 (73.4)	1320 (37.1)
Advanced practice practitioner	2 (0.1)	5 (0.5)	0	5 (1.7)	12 (0.3)
Physician certifications and training (board) <sup>c</sup>					
Emergency medicine board eligible or certified	1141 (77.8)	990 (90.6)	347 (93.3)	226 (79.6)	2704 (84.1)
Pediatric emergency medicine board eligible or certified	78 (5.3)	100 (9.1)	62 (16.7)	214 (75.4)	454 (14.1)
Pediatrics board eligible or certified	77 (5.3)	83 (7.6)	64 (17.2)	182 (64.1)	406 (12.6)
Family medicine board eligible or certified	536 (36.6)	308 (28.2)	73 (19.6)	31 (10.9)	948 (29.5)
Other eligible or certified	551 (37.6)	354 (32.4)	99 (26.6)	60 (21.1)	1064 (33.1)
Non-board eligible or certified physician with other training	207 (14.1)	103 (9.4)	22 (5.9)	19 (6.7)	351 (10.9)
ED competency evaluations					
Physician	1111 (62.0)	750 (68.1)	277 (73.7)	257 (89.9)	2395 (67.3)
Nurse	1536 (85.7)	997 (90.5)	360 (95.7)	272 (95.1)	3165 (89.0)
Advanced practice practitioner <sup>d</sup>	681 (67.4)	595 (66.0)	212 (66.3)	192 (85.3)	1680 (68.4)
Pediatric-specific policies or procedures					
QI process	738 (41.2)	564 (51.2)	222 (59.0)	253 (88.5)	1777 (50.0)
Weight in kilograms	1177 (65.6)	873 (79.2)	333 (88.6)	268 (93.7)	2651 (74.5)
Triage	934 (52.1)	731 (66.3)	290 (77.1)	263 (92.0)	2218 (62.4)
Patient assessment and reassessment	1303 (72.7)	905 (82.1)	321 (85.4)	271 (94.8)	2800 (78.7)
Immunization assessment and management	702 (39.2)	532 (48.3)	188 (50.0)	204 (71.3)	1626 (45.7)
Child maltreatment	1573 (87.7)	1021 (92.6)	359 (95.5)	277 (96.9)	3230 (90.8)
Death in ED	1137 (63.4)	835 (75.8)	283 (75.3)	269 (94.1)	2524 (71.0)
Reduced-dose radiation for CT and radiograph imaging	1261 (70.3)	864 (78.4)	305 (81.1)	271 (94.8)	2701 (75.9)
Mental health care	1155 (64.4)	877 (79.6)	297 (79.0)	270 (94.4)	2599 (73.1)
Behavioral health transfer	1051 (58.6)	790 (71.7)	268 (71.3)	255 (89.2)	2364 (66.5)
Social service plans	1003 (55.9)	811 (73.6)	310 (82.4)	265 (92.7)	2389 (67.2)
Interfacility guidelines for transfer of pediatric patients	1187 (66.2)	818 (74.2)	300 (79.8)	245 (85.7)	2550 (71.7)
Family-centered care plan	1002 (55.9)	716 (65.0)	262 (69.7)	244 (85.3)	2224 (62.5)
Disaster planning	676 (37.7)	546 (49.5)	231 (61.4)	238 (83.2)	1691 (47.5)
Percentage of recommended equipment carried <sup>e</sup>					
Median (IQR)	100.0 (95.3-100.0)	100.0 (97.7-100	0) 100.0 (97.7-100.0)	100.0 (100.0-100.0)	100.0 (95.3-100.0)
100% of recommended equipment carried	904 (50.4)	707 (64.2)	249 (66.2)	245 (85.7)	2105 (59.2)

# Outcomes of Preparedness:

Do kids in EDs with higher readiness do better??

### **MEDPAGE**TODAY

More Investment in Pediatric Readiness Will Save Lives in the ED

- The situation has improved but more can be done

by Sandy Chung, MD, Terry Foster, MSN, RN, and Aisha Terry, MD, MPH November 14, 2023



Chung is a pediatrician. Foster is an emergency nurse. Terry is an emergency physician.

Children experiencing a medical emergency should have access to high-quality care that meets their distinct needs, no matter where they live. Every clinician shares this goal -- emergency physicians, nurses, pediatricians, and surgeons alike.

Despite notable improvements over the last decade, systemic gaps remain in

### Medical News From Around the

Ask the Expert: Exploring Emerging

Therapies and Advancing Patient-

Centered Care in IgAN

Contract and a

Web

# Emergency Department Pediatric Readiness and Mortality in Critically Ill Children

Stefanie G. Ames, MD, MS,<sup>a</sup> Billie S. Davis, PhD,<sup>e</sup> Jennifer R. Marin, MD, MSc,<sup>c,d</sup> Ericka L. Fink, MD, MS,<sup>c,e</sup> Lenora M. Olson, PhD, MA,<sup>g</sup> Marianne Gausche-Hill, MD,<sup>e,h,i</sup> Jeremy M. Kahn, MD, MS<sup>e,f</sup>

- 2019
- N = 20,483 children with critical illness
- 426 EDs



### JAMA Pediatrics | Original Investigation

## Evaluation of Emergency Department Pediatric Readiness and Outcomes Among US Trauma Centers

Craig D. Newgard, MD, MPH; Amber Lin, MS; Lenora M. Olson, PhD; Jennifer N. B. Cook, GCPH; Marianne Gausche-Hill, MD; Nathan Kuppermann, MD, MPH; Jeremy D. Goldhaber-Fiebert, PhD; Susan Malveau, MS; McKenna Smith, BS; Mengtao Dai, MS; Avery B. Nathens, MD, PhD; Nina E. Glass, MD; Peter C. Jenkins, MD, MSc; K. John McConnell, PhD; Katherine E. Remick, MD; Hilary Hewes, MD; N. Clay Mann, PhD, MS; for the Pediatric Readiness Study Group

- Published 2021
- 832 trauma centers across U.S. (2012 2017)
- n = 372,004 injured children 0-17 years
  - 5,700 (1.5%) in-hospital mortality
  - 5,018 (1.3%) complications
  - 10,375 (2.8%) death or complications

# Quartiles of ED pediatric readiness in 832 TCs

Figure 1. Emergency Department (ED) Pediatric Readiness and Annual ED Pediatric Volume in 832 Trauma Center EDs



Gray bars indicate the number of EDs at each weighted pediatric readiness score (wPRS) and the blue line indicates the median annual ED volume of children at each wPRS.

# Adjusted OR of outcomes (compared to least ready quartile)

Figure 2. Adjusted In-Hospital Mortality and Composite Outcome (In-Hospital Mortality or Complication) Across Quartiles of Emergency Department (ED) Pediatric Readiness for Injured Children

Variable	OR (95% CI)	In-hospital mortali	tv P value	OR (95% CI)	Combined outcome	<i>P</i> valu
All patients (n = 372004)	(		,	(		
4th Quartile	0.58 (0.45-0.75) -	— <b>—</b>	<.001	0.88 (0.74-1.04)		.14
3rd Quartile	0.90 (0.70-1.17)		.44	1.05 (0.88-1.24)		.60
2nd Quartile	1.16 (0.87-1.54)	<b></b>	32	1.05 (0.87-1.26)	<b></b>	.61
ISS ≥16 (n=50440)						
4th Quartile	0.61 (0.49-0.76)	<b>—</b>	<.001	0.86 (0.73-1.01)		.07
3rd Quartile	0.90 (0.72-1.12)		.34	1.01 (0.86-1.20)	<u>+</u>	.87
2nd Quartile	1.11 (0.87-1.43)		.39	1.03 (0.86-1.23)	<b></b>	.76
Head AIS ≥3 (n = 57 368)						
4th Quartile	0.56 (0.44-0.71) -	<b></b>	<.001	0.80 (0.67-0.96)		.01
3rd Quartile	0.86 (0.68-1.10)		.24	1.01 (0.84-1.21)	<b>#</b>	.92
2nd Quartile	1.03 (0.78-1.36)		.82	0.99 (0.82-1.21)	<u>+</u>	.94
Any AIS ≥3 (n = 124507)						
4th Quartile	0.57 (0.45-0.71) -	<b>B</b>	<.001	0.83 (0.71-0.97)		.04
3rd Quartile	0.88 (0.70-1.11)		.30	1.01 (0.86-1.19)	<u>i</u>	.82
2nd Quartile	1.05 (0.80-1.37)		.44	0.97 (0.82-1.16)	<b></b>	.98
High resource needs (n = 32	2671)					
4th Quartile	0.60 (0.46-0.77)	<b>_</b>	<.001	0.86 (0.72-1.02)		.09
3rd Quartile	0.93 (0.72-1.20)	<b>B</b>	.56	1.08 (0.90-1.30)		.37
2nd Quartile	1.05 (0.79-1.39)		.73	0.98 (0.79-1.20)		.81
	0.4	0.8	1.6	0.4	0.8 1	.6
	Od	lds of outcome vs least read (95% CI)	У	Odds o	of outcome vs least ready (95% CI)	
	÷	Better outcomes Wo	orse outcomes →	← Bet	ter outcomes Wors	e outcome

# Additional lives that *could have been* saved by increasing ED pediatric readiness at U.S. TCs

% of patients shifted to highest quartile	<u>lowest</u> quartile ED readiness to highest quartile n lives saved per year (95% CI)	<u>second</u> quartile ED readiness to highest quartile n lives saved per year (95% CI)	<u>third</u> quartile ED readiness to highest quartile n lives saved per year (95% CI)	Across all <u>quartiles</u> n lives saved per year (95% Cl)
0% (no change)	(no change) 0		0	0
25%	7 (5-8)	11 (9-13)	13 (9-18)	31 (23-38)
50%	13 (10-17)	23 (19-27)	27 (18-35)	63 (49-77)
75%	20 (15-25)	34 (28-40)	40 (27-53)	94 (72-116)
100%	27 (20-34)	46 (37-54)	53 (36-70)	<b>126</b> (97-154)

## 756 children's lives over 6 years

### JAMA Surgery | Original Investigation

## Association of Emergency Department Pediatric Readiness With Mortality to 1 Year Among Injured Children Treated at Trauma Centers

Craig D. Newgard, MD, MPH; Amber Lin, MS; Jeremy D. Goldhaber-Fiebert, PhD; Jennifer R. Marin, MD, MSc; McKenna Smith, MPH; Jennifer N. B. Cook, GCPH; Nicholas M. Mohr, MD, MS; Mark R. Zonfrillo, MD, MSCE; Devin Puapong, MD; Linda Papa, MD, MSc; Robert L. Cloutier, MD, MCR; Randall S. Burd, MD, PhD; for the Pediatric Readiness Study Group

- Published 2022
- ED peds ready and long-term outcomes (1-year)
- 146 trauma centers in 15 states
- n = 88,071
  - In-hospital mortality: 2.0% (n = 1,768 deaths)
  - 1-year mortality: 2.2% (n = 206 deaths after discharge)



# Adjusted time-to-death (1-year)

Figure 3. Adjusted Time-to-Death Analysis Among 88 071 Injured Children Presenting to 146 Trauma Centers by Emergency Department (ED) Pediatric Readiness





- Published 2023
- 983 EDs in 11 states
- n = 796,937 children receiving emergency services
  - 90,963 (11.4%) injured
  - 705,974 (88.6%) medically ill

# ED/in-hospital risk-adjusted mortality

B Medically ill

### A Injured

Subgroup and ED readiness	aOR (95% CI)						Subgroup and ED readiness	a
Injured patients (n = 90 963)							Medically ill patients (n = 70	5974)
Fourth quartile	0.40 (0.26-0.60)			_	-		Fourth quartile	0
Third quartile	0.92 (0.60-1.43)						Third quartile	0
Second quartile	0.97 (0.62-1.51)						Second quartile	
ISS >16 (n=6E77)	0.07 (0.02 1.01)						Severity score ≥4 (n=3775)	74)
135 210 (11-0577)							Fourth quartile	0
Fourth quartile	0.58 (0.38-0.91)				<b></b>		Third quartile	(
Third quartile	0.99 (0.60-1.61)						Second quartile	0
Second quartile	0.78 (0.45-1.33)						Respiratory diagnosis (n = 29	92 508
Head AIS ≥3 (n = 12 959)							Fourth quartile	0
Fourth quartile	0.43 (0.25-0.72)						Third quartile	0
Third quartile	0.85 (0.49-1.48)						Second quartile	(
Second guartile	0.72 (0.40-1.29)						Neurologic diagnosis (n = 89	058)
Severity score $>4$ (n = 46262)					_		Fourth quartile	0
5				_			Third quartile	0
Fourth quartile	0.38 (0.26-0.58)						Second guartile	(
Third quartile	0.94 (0.61-1.45)						Cardiovascular diagnosis (n:	= 64 21
Second quartile	0.92 (0.59-1.43)						Fourth quartile	(
	1	1	1 1	1 1	i 1	7	Third quartile	(
	0.			aOR (95% CI	)	2	Second quartile	(

1820 deaths

### 7688 deaths



2

Additional lives that could have been saved if all EDs in the 11 states were high-ready = **1,442** children over 6 years (288 injured + 1,154 medical)

# Adjusted mortality to 1-year (n = 545,921)



Death to 1-year (children in 6 states)

- 1,136 deaths in the *injury cohort*; 2.1% 1-year mortality
  - 693 (52.7%) in ED
  - 477 (36.2%) inpatient
  - 146 (11.1%) after discharge
  - Median time-to-death = 0 days (IQR 0-2 days)
- 6,635 deaths in the medical cohort, 1.4% 1-year mortality
  - 4,150 (62.5%) in ED
  - 759 (11.4%) inpatient
  - 1,726 (26.0%) after discharge
  - Median time-to-death = 0 days (IQR 0-7 days)

# What does all this mean?

- Children hospitalized with injury or illness are less likely to die when cared for in EDs with higher degrees of pediatric readiness.
- Because most children who die from acute injuries and illnesses do so early in their clinical course, EDs have the potential to change this trajectory
- The mortality benefit was most consistent for EDs in the highest quartile of pediatric readiness (wPRS ≥88)
- So do we advertise wPRS and bring kids to ED with the highest levels?

### JAMA Surgery | Original Investigation

## Association of Transport Time, Proximity, and Emergency Department Pediatric Readiness With Pediatric Survival at US Trauma Centers

Nina E. Glass, MD; Apoorva Salvi, MS; Ran Wei, PhD, MS; Amber Lin, MS; Susan Malveau, MS; Jennifer N. B. Cook, GCPH; N. Clay Mann, PhD, MS; Randall S. Burd, MD, PhD; Peter C. Jenkins, MD, MSc; Matthew Hansen, MD, MCR; Nicholas M. Mohr, MD, MS; Caroline Stephens, MD; Mary E. Fallat, MD; E. Brooke Lerner, PhD; Brendan G. Carr, MD, MS; Stephen P. Wall, MD, MSc, MAEd; Craig D. Newgard, MD, MPH

- 765 trauma centers; n = 212,689
- 105,871 (49.8%) of children in TCs with high readiness EDs
- Additional 36,330 (17.1%) had high-readiness ED within 30 minutes

# How could we save the most pediatric lives?

- Scenario 1: Transport all injured children to TCs with highreadiness EDs within 30 minutes (optimized transport plan) = would have saved 468 lives
- Scenario 2: Raise ED readiness to high among all TCs = would have saved 1,655 lives



# What to Focus on in Your ED: How do we know what to target?



### Oregon

**Emergency Medical Services for Children Program** 



OR Response Rate: 85% (50 out of 59)



Urbanicity is calculated using the 2013 Urban Influence Codes; population data is from the 2020 ACS 5 Yr Estimates.

### **How Do We Compare with the Nation?** Oregon's Median Score (in light blue) in Comparison to the National Distribution of All Median Scores



### To learn more about pediatric readiness and PECCs, visit PediatricReadiness.org.

Questions about your state? Contact your State EMSC Program Manager.

LEmergency Department Pediatric Readiness and Short-term and Long-term Mortality Among Children Receiving Emergency Care.



The NPRP Assessment and Emergency Medical Services for Children (EMSC) Data Center are funded in part by the U.S. Department of Health and Human Services (HHS), Health Resources and Services Administration (HRSA), Maternal & Child Health Bureau, EMSC Program, as part of the EMSC Data Center award totaling \$3,200,000 with 0% financed with non-governmental sources. The contents are those of the author(s) and do not necessarily represent the official views of, nor an endorsement, by HRSA, HHS, or the U.S. Government For more information please visit HRSA dov

### **Pediatric Readiness:**

The data shown here are individual state results from the 2021 National Pediatric Readiness Project (NPRP) Assessment of hospitals with a 24/7 emergency department (ED). EDs that are well-prepared for the unique health needs of pediatric patients score 88 or higher on the NPRP Assessment and are associated with lower mortality for ill and injured children.<sup>1</sup>

### The Power of PECCs:



Designating an individual to serve as a pediatric emergency care coordinator (PECC) is one of the best ways to increase readiness and provide quality care to children in the ED.

40% of OR Hospitals Have One or More PECC(s)

Average Scores By Section			
Section	Missing Records	Avg Section Score	Possible Score
Guidelines for Administration and Coordination of the ED for the Care of Children (19 pts)	0	6.1	19
Physicians, Nurses, and Other Health Care Providers Who Staff the ED (10 pts)	o	5.7	10
Guidelines QI/PI in the ED (7 pts)	0	3.0	7
Guidelines for Improving Pediatric Patient Safety in the ED (14 pts)	0	12.9	14
Guidelines for Policies, Procedures, and Protocols for the ED (17 pts)	0	10.8	17
Guidelines for Equipment, Supplies, and Medications for the Care of Pediatric Patients in the ED (33 pts)	0	32.1	33

NOTE: If there are missing values from any of the assessments (specifically from PDF assessments), they are shown in the "Missing Records" column. This indicates records that were missing scored questions and could not be included in the calculation of the average section score.

### Guidelines for Administration and Coordination of the ED for the Care of Children (19 points)

	KPI	2021 Number of EDs that Have Item	2021 Percent that Have Item	2013-14 Percent that Had Item	Difference Between Assessments
Physcian Coordinator	•	18/50 (Missing = 0)	36.0%	34.0%	2.0% 🛦
Nurse Coordinator	HELP	14/50 (Missing = 0)	28.0%	62.0%	-34.0% 🔻

Physicians, Nurses, and Other Health Care Providers Who Staff the ED (10 points)

Physician Competency Evaluations		34/50 (Missing = 0)	68.0%	34.0%	34.0% 🛦
Physician Maintenance of Board Certification	٠	<b>24/50</b> (Missing = 0)	48.0%		
Nurse Competency Evaluations		<b>48/50</b> (Missing = 0)	96.0%	72.0%	24.0% 🛦
Nurse Maintenance of Specialty Certification	HELP	<mark>8/50</mark> (Missing = 0)	16.0%		

# Who can help me?

### Pediatric Readiness Program

#### Mission

How We Serve

pathways for common conditions

Quality Improvement (QI):

Education:

The Pediatric Readiness Program (PRP) is a not-for-profit. collaborative effort to promote enhanced pediatric emergency care through quality improvement work, education and knowledge sharing among emergency departments who care for kids across the state of Oregon and Southwest Washington. The interdisciplinary program team is motivated by a passion for providing high-quality care to sick children where they are cared for and by the spirit of continuous improvement wherever we practice.

The PRP offers opportunities for participating hospitals to collaborate through:

Collaborative Problem Solving and Resource Sharing:

### Who We Are

webinars (live and on demand), in situ simulations, tabletop exercises, hospital visits, in-person education sessions, phone-based

peer-to-peer joint problem-solving, mentorship, open-format materials, specific pediatric policies/protocols/procedures, standardized

conference calls, in-person conferences in partnership with public health and healthcare professional organizations

quality improvement and data entry templates, collaborative-driven quality improvement projects

We are physicians, nurses, educators and public health professionals interested in facilitating meaningful collaboration with participating hospitals to improve everyday pediatric readiness. From 2018-20 we worked with one Southwest Washington and sixteen Oregon hospitals on a national Pediatric Readiness Quality Collaborative. With the conclusion of the national project we created the PRP and invited all Oregon and Southwest Washington hospitals to participate at the level that best meets their individual needs

### PEDIATRIC READINESS PROGRAM ERVING OREGON & SW WASHINGTON

### Contact Us

Rachel Ford, MPH EMSC Program Manager 971-673-0564

Healthcare Provider Mental Health and Crisis Support Resources

### Education Session

February 15, 2024 1200-1300 Pediatric Fentanvl Exposures

#### Presenter: Robert G. Hendrickson, MD FACMT FAACT

Description: Participants will be able to identify the clinical features of fentanyl overdose in pediatric patients, describe the treatment of fentanyl overdose in pediatric patients, and describe mitigation strategies to decrease the risk of pediatric exposures to illicit fentanyl.

### Pediatric Readiness Saves Lives

FAQs





#### View the infographic

The National Pediatric Readiness Project (NPRP) empowers

The project is led by the EMSC Program in partnership with the American Academy of Pediatrics, the American College of

emergency departments (EDs) to improve their capability to provide high-quality care for children, also known as being "pediatric ready."

Emergency Physicians, and the Emergency Nurses Association. The

NPRP offers free and open-access assessment opportunities as







Take the Assessment

**Use the Checklist &** Toolkit



Ensuring Emergency Care for All Children

### Why improve pediatric emergency care?

Children have unique characteristics that require specific care, especially in emergencies. But not all children have access to specialized pediatric care. In fact, 80% of children receive emergency care in general EDs, General EDs primarily treat adults and may not be well-prepared for children because of low pediatric patient volume. In the 2013 NPRP assessment, the median score for EDs was 69 out of 100, and scores increased with increased pediatric patient volume.

### Pediatric readiness saves lives.

Research shows that high pediatric readiness (>87 points) is associated with:

- 60% lower mortality rate in injured children II
- at least 1,400 children's lives saved ☑\* across the United States each year

well as resources to address gaps.

### Get started





# What Do I Do When T Leave Here Today?

- Find (or be!) someone passionate about improving care for kids
- Take the assessment to target efforts

o <u>www.pedsready.org</u>

• Find and repurpose policies, pathways, and other resources

## Appropriate freely!

- <u>https://www.ohsu.edu/clinical-resources-for-womens-and-childrens-services</u>
- <u>www.pedsreadyprogram.org</u>





# Take Home

- Pediatric Emergency Readiness Saves Kids Lives
- There is a Roadmap for Doing This
- There are Folks who Want to Partner with You to Reach High Levels of Readiness

# Thank you!

# Questions?

# burnsb@ohsu.edu





# Scan this QR code with your phone



# Thank you!

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