EMS for Children Program: History, Lifespan and Successes – Celebrating the 30th Year

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Faculty Disclosure Information

• In the past 12 months, we have not had a significant financial interest or other relationship with the manufacturer(s) of the products or provider(s) of the services that will be discussed in my presentation.

• This presentation will not include discussion of pharmaceuticals or devices that have not been approved by the FDA.
The Emergency Medical Services for Children program and Pediatric Emergency Medicine have been inextricably linked for 30 years. Clinicians should be cognizant of the broad influence that EMS for Children has had on best practice and policy related to the emergency care of children in the United States:

- Identify the major programmatic accomplishments of the federal EMSC program.

- Discuss the critical research and evidence-based developments that currently frame the future of EMS for Children in this country.

- Describe the integration of EMS and the National Pediatric Readiness Project.
EMS for Children: Where We Are, Where We’re Going

• Historical and Programmatic Overview
• Research and Scholarship
• Hot Topics and Future Directions
EMS for Children in a Nutshell

• Bill introduced 1983 with bipartisan Senate sponsorship [Inouye (D-HI), Hatch (R-UT), Weicker (R-CT)]

• Authorizing legislation enacted 1984 (Public Law 98-555)

• First federal appropriation 1985 ($2 million)

Calvin C.J. Sia, MD, FAAP
EMS for Children in a Nutshell: Champions

Senator Daniel Inouye (D-HI)
1924-2012

Dr. Cal Sia
James S. Seidel, MD, PhD
1943 – 2003
“Transformative Visionary”

- EDAPs
  - Categorization
  - Pediatric Readiness Project
- Ambulance Equipment
- Family Presence
- Evidence Based Guidelines
EMS for Children in a Nutshell: Programmatic Mission

• To ensure state-of-the-art emergency medical care for the ill or injured child and adolescent

• To ensure that pediatric services are well integrated into an emergency medical services (EMS) system and backed by optimal resources

• To ensure that the entire spectrum of emergency services - including primary prevention of illness and injury, acute care, and rehabilitation - is provided to infants, children, adolescents and young adults.
EMS for Children in a Nutshell: Continuum of Care

- Prevention
- Bystander
- Prehospital
- Transport
- Definitive Care
- Rehabilitation
- Postvention
Federal Funding Stream

US Department of Health and Human Services (DHHS)

Centers for Disease Control and Prevention (CDC)

Health Resources and Services Administration (HRSA)

Maternal and Child Health Bureau (MCHB)

National Institutes of Health (NIH)

Department of Transportation, National Highway Traffic Safety Administration (NHTSA)

Emergency Medical Services for Children (EMSC)

Elizabeth Edgerton, MD, MPH
History of EMS for Children Federal Appropriations

Fiscal Year

Million $
EMS for Children: Where We Are, Where We’re Going

• Historical and Programmatic Overview

• Research and Scholarship
  - 2006 Institute of Medicine Report
  - Pediatric Emergency Care Applied Research Network
  - Targeted Issues grants
Coordinated, Accountable, Regionalized System of Care: global recommendation

• “The federal government should support the development of national standards for emergency care performance measurement, the categorization of all emergency care facilities, and protocols for the treatment, triage and transport of prehospital patients”.
State of Pediatric Emergency Care

• “If there is one word to describe pediatric emergency care in 2006 it is uneven.”

- Growing Pains, pg. 33
“Only six percent of the nation’s emergency departments are fully supplied to care for children”.

The average emergency department has about 80 percent of the recommended pediatric supplies, [i.e. 130 pieces of equipment]

Middleton KR, Burt CW. Advance Data 2006; no. 367

National Health Statistics Reports
Number 47 ■ March 1, 2012

Availability of Pediatric Services and Equipment in Emergency Departments: United States, 2006
by Susan M. Schappert, M.A., and Farida Bhuiya, M.P.H.
Division of Health Care Statistics
Access to Acute Care

- 89% of children in the emergency care system are seen in non-children’s hospitals.
- Only 2-3% of seriously injured children are initially treated at a pediatric trauma center.
- 75% of emergency departments see < 20 kids/day.
- 50% of emergency departments see < 10 kids/day.

Gausche-Hill M. Pediatrics 2007; 120:1229-37
Emergency Care for Children – Growing Pains: Key Recommendations

- Arm the Emergency Care Workforce with Pediatric Knowledge and Skills
- Improve Emergency Preparedness for Children Involved in Disasters
- Build the Evidence Base for Pediatric Emergency Care
Joint Policy Statement—Guidelines for Care of Children in the Emergency Department

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
Improve Emergency Preparedness for Children in Disasters


Pediatric-specific Recommendation: Disaster Preparedness

“Pediatric concerns should be explicit in disaster planning”

– Minimize parent-child separation:
  • Family-centered decontamination

– Address pediatric surge capacity:
  • All hazard readiness
“If We Can’t Be Ready Everyday, We Can’t Be Ready on Game Day”

- EMS agencies and hospitals to appoint pediatric coordinators to provide pediatric leadership.
Pediatric-specific Recommendation: Building the Evidence Base

• The Secretary of DHSS should conduct a study to examine the gaps and opportunities in emergency care research, including pediatric emergency care, and recommend a strategy for the optimal organization and funding of the research effort. This study should include consideration of training of new investigators, development of multicenter research networks, involvement of emergency and trauma care researchers in the grant review and research advisory processes, and improved research coordination through a dedicated center or institute.
The Case for an EMS for Children Multicenter Research Network

- Low incidence of critical pediatric emergencies
- Large numbers and diversity of study sample
- Infrastructure is needed to:
  - Test the efficacy of treatments
  - Establish evidence base for pre-hospital care
  - Promote collaboration and scholarship
- Mechanism is needed to study the process of transferring research results to treatment settings
The Pediatric Emergency Care Applied Research Network (PECARN) = 6 nodes/18 sites
# The Pediatric Emergency Care Applied Research Network (PECARN) = 6 nodes/18 sites

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<tr>
<th>University of Michigan, Ann Arbor</th>
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A single dose of 1 mg/kg of oral dexamethasone did not significantly alter the rate of hospital admission.
Clinical Decision Rules for TBI (n=42,000)

Identification of children at very low risk of clinically-important brain injuries after head trauma: a prospective cohort study


Summary
Background CT imaging of head-injured children has risks of radiation-induced malignancy. Our aim was to identify children at very low risk of clinically-important traumatic brain injuries (ciTBI) for whom CT might be unnecessary.

< 2 years w/ normal ms, no scalp hematoma except frontal, LOC < 5 sec, non-severe MOI, no palpable skull fx and acting normally;

> 2 years w/ normal mental status, no LOC, no vomiting, non-severe MOI, no signs of basilar fx and no severe headache
Recent PECARN Publications (2013)

Identifying Children at Very Low Risk of Clinically Important Blunt Abdominal Injuries

James F. Holmes, MD, MPH; Kathleen Lillis, MD; David Monroe, MD; Dominic Borgialli, DO, MPH; Benjamin T. Kerrey, MD; Prashant Mahajan, MD, MPH; Kathleen Adelgais, MD, MPH; Angela M. Ellison, MD, MSc; Kenneth Yen, MD, MS; Shireen Atabaki, MD, MPH; Jay Menaker, MD; Bema Bonsu, MD; Kimberly S. Quayle, MD; Madelyn Garcia, MD; Alexander Rogers, MD; Stephen Blumberg, MD; Lois Lee, MD, MPH; Michael Tunik, MD; Joshua Kooistra, DO; Maria Kwok, MD; Lawrence J. Cook, PhD; J. Michael Dean, MD, MBA; Peter E. Scololove, MD; David H. Wisner, MD; Peter Ehrlich, MD; Arthur Cooper, MD, MS; Peter S. Dayan, MD, MSc; Sandra Wootton-Gorges, MD; Nathan Kuppermann, MD, MPH; for the Pediatric Emergency Care Applied Research Network (PECARN)*

Variability of Prehospital Spinal Immobilization in Children at Risk for Cervical Spine Injury

Emily G. Kim, MPH,* Kathleen M. Brown, MD,† Julie C. Leonard, MD, MPH,‡ David M. Jaffe, MD,‡ Cody S. Olsen, MS,§ and Nathan Kuppermann, MD, MPH,|| for the C-Spine Study Group of the Pediatric Emergency Care Applied Research Network (PECARN)

- 6 projects exclusively focused on prehospital research
- Total of $5.4M over 3 years:
  - Rural pediatric prehospital care (NH)
  - Pediatric prehospital asthma interventions (IN)
  - Prehospital oral steroids in asthma (NY)
  - Compassionate options for prehospital EMS (KY)
  - Prehospital evidence-based guideline utilization (TX)
  - Charlotte, Houston, Milwaukee prehospital research node
EMS for Children: Where We Are, Where We’re Going

- Historical and Programmatic Overview
- Research and Performance Measures
- Hot Topics and Future Directions:
  - National Pediatric Readiness Project
  - Prehospital Evidence Based Guidelines
A 5-year-old child chokes on a small rubber ball, and is rushed to your emergency department in respiratory arrest...

Is your facility ready to provide appropriate pediatric care?

The National Pediatric Readiness Project
http://www.PediatricReadiness.org
The National Pediatric Readiness Project

- Six domains for establishing an optimal care environment:
  - Administration and Coordination;
  - Physicians, Nurses, and Other ED Staff;
  - QI/PI in the ED;
  - Pediatric Patient Safety;
  - Policies, Procedures, and Protocols; and
  - Equipment, Supplies, and Medications
Pediatric Readiness Project Elements

- 2009 National Guidelines released supported by 22 national organizations including NAEMSP
- Online national assessment/Audit/Assessment feedback
- Quality improvement resources, i.e. toolkit
## Staggered Roll Out

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<th>Field Test/Pilot</th>
<th>Group 1</th>
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<td>Fed States of Micronesia</td>
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Readiness Score and Gap Analysis

Hospital Name: Some Sample Hospital
Hospital Volume: 3,041 Pediatric Patients Last Year
Date of Report: 6/1/2012

This score represents the essential components needed to establish a foundation for pediatric readiness. Not all of the questions on the assessment are scored. The score is in no way inclusive of all the components recommended for pediatric readiness. It represents a suggested starting point for hospitals. The scoring criteria was developed by a group of clinical experts thru a modified delphi process.

Your state participated in a pediatric recognition program for hospitals. We encourage you to contact your State EMSC Program Manager. NAME, at CONTACT INFO to learn more about this program.

YOUR HOSPITAL SCORE

67
n = 50
Average Score of Similar Pediatric ED Volume

55
n = 200
Average Score of All Participating hospitals

62

ANALYSIS OF YOUR SCORE:

Guidelines for Administration and Coordination of the ED for the Care of Children

YOUR SCORE: 9.5 out of 19

You indicated that your hospital DOES NOT have a nurse coordinator who has been assigned the responsibility of coordinating the administrative aspects of pediatric emergency care in the emergency department. (This person may have additional administrative roles in the ED.)

IMPORTANT: This individual is important to........

IMPROVEMENT: For information on how to setup a nurse coordinator for your hospital please refer to the "Nurse Administration/Coordination" section on pediatricreadiness.org

Guidelines for Physician and Other Practitioners Staffing the ED

YOUR SCORE: 5 out of 10

You indicated that your hospital DOES NOT require specific competency evaluations of physicians staffing the ED (e.g., sedation and anesthesia).

IMPORTANT: Competency evaluations ensure.....

IMPROVEMENT: For information on how other hospitals have setup competency evaluations for....

Source: U.S. Department of Health and Human Services, Healthcare Commission on Emergency Department Readiness.
Overall Response Rate: 4,149/5,017 = 82.7%
Pediatric Patient Volume

- Low (<5 children/day) 39%
- Medium (5-14 children/day) 30%
- Med-High (15-27 children/day) 17%
- High (>27 children/day) 14%
Median Pediatric Readiness Scores

- All Hospitals: 69
- Low Volume (< 5 children/day): 61
- Medium Volume (5-14 children/day): 69
- Medium-High Volume (15-27 children/day): 75
- High Volume (>27 children/day): 90
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<th>Patient Volume</th>
<th>Median Score</th>
<th>Median 2003 Score</th>
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<td>Low Volume (&lt;1800 patients)</td>
<td>61.0</td>
<td>47.8</td>
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<tr>
<td>Medium Volume (1800-4999 patients)</td>
<td>69.0</td>
<td>54.2</td>
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<tr>
<td>Medium to High Volume (5000-9999 patients)</td>
<td>75.0</td>
<td>58.3</td>
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<tr>
<td>High Volume (&gt;=10000 patients)</td>
<td>90.0</td>
<td>68.9</td>
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Implications for EMS

EMS systems which verify hospitals for pediatric readiness see higher compliance with national guidelines

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<th>Hospital Type</th>
<th>Weighted Readiness Score (0-100)</th>
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<td>Non-EDAP</td>
<td>66</td>
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<tr>
<td>EDAP</td>
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IOM Recommendation

• “…convene a panel of individuals with multi-disciplinary expertise to develop evidence-based model prehospital care protocols for the treatment, triage, and transport of patients, including children.”
G.O.B.S.A.T. Method

“Good Ol’ Boys (and Gals) Sitting Around the Table”
Why Evidence Based Guidelines?

• To apply the best available information derived from scientific investigation to inform medical decision making.

• To improve patient outcomes and advance the field of prehospital medicine.
The GRADE Process

- Grading of Recommendations Assessment, Development and Evaluation

- A standardized method for evaluating and summarizing the quality of evidence and the strength of a given recommendation.
• Evidence Based Guidelines for Prehospital Practice: A Process Whose Time Has Come

• The Development of Evidence-based Prehospital Protocols Using a GRADE-based Methodology

• An Evidence-Based Guideline for Pediatric Prehospital Seizure Management Using GRADE Methodology

• An Evidence-Based Guideline for Prehospital Analgesia in Trauma

• An Evidence-Based Guideline For the Air Medical Transportation of Prehospital Trauma Patients

• The Implementation and Evaluation of an Evidence-based Statewide Prehospital Pain Management Protocol
References

References

• Pellegrini C, Krug SE and Wright JL. Saving Emergency Medical Services for Children. Clinical Pediatric Emergency Medicine 2014;13 in press
• Wright JL. Evidence-based Guidelines for Prehospital Practice: A Process Whose Time Has Come. Prehosp Emerg Care 2014; in press

Children's National Medical Center