

# **The Future of Emergency Care Workshop**

## **Advancing Pediatric Emergency Care: Report of the IOM Committee on the Future of Emergency Care in the United States Health System**

### ***Research in Emergency Medical Services for Children (EMSC)***

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# Objectives

- u IOM EMSC research recommendations from 1993
- u IOM EMSC research recommendations from 2006
- u Suggest implementation of select topics

## 993 IOM Recommended EMSC Research Priorities

- u Clinical aspects of emergencies and emergency care
- u Indices of injury / illness severity
- u Patient outcomes / outcome measures
- u Costs of illness/injury and care
- u System organization, configuration, and operation
- u Education and training, retraining, and skill retention
- u Prevention of illness and injury

# Information Gaps Remain

- u Many gaps in knowledge about pediatric emerg. care remain
- u Compared to adults, much less is known in children about treatment of **life threatening injuries and illnesses**:
  - cardiac arrest, shock, respiratory failure, multisystem trauma...
- u Globally, what we need to know is (following the IOM quality domains) how...
  - **Safe, effective, patient-centered, timely, efficient, and equitable** is pediatric emergency care?

# Barriers to EMSC Research

- u Inadequate funding
- u Limited data: especially pre-hospital and trauma registries
- u Few trained investigators
- u Epidemiology of pediatric emergency events
- u Sufficient number and diversity of study patients
- u Pressure for clinical productivity and chaotic environment
- u Complexity of obtaining informed consent
- u Lack of infrastructure/data linkages for collaboration between pre-hospital, ED, and PICU settings

# 006 IOM EMSC Research Recommendations

- u DHHS should define a strategy for research organization and funding
- u Considerations include:
  - Training investigators
  - Standard pediatric-specific data elements in registries
  - Development of multi-center research networks
  - Involvement in the grant review and research advisory process
  - Improved research coordination through a dedicated institute

# Potential EMSC Research Domains

## u Basic Science

- EM requires basic discovery, then translation to the clinical setting
  - ✓ e.g. molecular events surrounding ischemia, pathophysiology of acute lung injury, hypothermia and gene expression after arrest

## u Translational research

- Translation of basic science to application in the clinical setting
  - ✓ e.g. resuscitation, ventilator settings for resp. failure, artificial blood substitutes

## u Health Services Research

- Impact of organization and mode of delivery on quality/outcomes
  - ✓ e.g. translation of research into practice, ED overcrowding, cost effectiveness of trauma systems, preventing missed diagnoses of child abuse

# Implementation:

## A Case for EMSC Multicenter Research Networks

- u Low incidence rates of pediatric emergency events
- u Large numbers and diversity of needed study samples
- u An infrastructure is needed to test the efficacy of treatments
- u An infrastructure is needed to test the efficacy of transport and pre-hospital care
- u An infrastructure is needed to promote collaboration
- u A mechanism is needed to study the process of transferring research results to treatment settings

***Capabilities of multicenter research in EMSC should be expanded***

# Implementation:

## Challenges Facing Multicenter Research Networks

### Funding

- **Potential solutions:** advocate Congress, dedicated institute for EM research

### Sharing of information and IRB coordination

- **Potential solutions:** collaboration between IRBs regarding interpretation of federal regulations, consideration for centralized IRB

### Generalizability

- **Potential solutions:** research training for community practitioners, funding and incentives for hospitals

### Need to enhance pre-hospital collaborative research

- **Potential solutions:** Training investigators, better funding for pre-hospital research, better data linkages



# **Pediatric Emergency Care Applied Research Network (PECARN)**

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# PECARN Research and Development

Real-time biosurveillance

Evaluation of head trauma

C-Spine immobilization

Steroids in acute bronchiolitis

The burden of mental illness and psychiatric emergencies in PED

§ Therapeutic hypothermia in pediatric cardiopulmonary arrest

§ Diagnostic categorization of illnesses and injuries in the PED

§ Management of status epilepticus

§ Medical error reduction

§ Creation and sharing of pre-hospital data sets

# Implementation:

## Mitigating inequities in access to pediatric emergency care

27% of all ED visits are by children

> 90% of children seen in general/community EDs

Substantial variation in care

Only 6% of hospitals have all the supplies needed; ½ have > 85%

Regionalization of pediatric services improves outcomes

# Implementation:

Mitigating inequities in access to pediatric emergency care

## Research goals:

*Identify factors associated with, and potential solutions to, inequities*

For centers lacking access to expert PEM care, consider research in:

- Telemedicine to provide PEM expertise/consultation
- Dissemination of evidence-based guidelines, decision support tools
- Protocols / guidelines for patient transfer
- Skill development/maintenance of practitioners with little PEM expertise

# Implementation:

Improve safety, decrease errors in pediatric emerg. care

Emergency care is delivered in an environment prone to errors

Children at greatest risk because of physical/developmental vulnerabilities, inexperienced providers

Many medications need study of efficacy and safety

Skill maintenance of pre-hospital and ED providers is critical

# Implementation:

Improve safety, decrease errors in pediatric emerg. care

## Research goals:

*Identify and quantify the most important and most common types of medical errors in EDs caring for children; identify factors that contribute to a “safe climate” in the ED*

Consider research in:

- Medical error reporting systems
- Interventions to improve reporting
- Interventions to mitigate errors

# Final Thoughts

- u EMSC research has progressed substantially since 1993
- u 2006 IOM report lays important roadmap for the work ahead
- u Many other topics need further study
- u **Much work yet to be done!**