Where Pediatric Trauma Fits into a Trauma System

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Something more to it

- ACS verification improves outcomes
- Level matters
- Pediatric centers improve outcomes

AAST 2011 Plenary Paper

Pediatric trauma centers: Correlation of ACS-verified trauma centers with CDC statewide pediatric mortality rates

David M. Notrica, MD, Jeffrey Weiss, MD, Pamela Garcia-Filion, PhD, MPH, Erin Kuroiwa, MHI, Daxa Clarke, MD, Melissa Harte, MS, RN, Jenessa Hill, and Sally Moffat, MSN, Phoenix, Arizona
American Medical Association

- Arkansas ranked 50th in the United States for timely trauma center accessibility for its citizens.
- Pre-hospital times are long leading to preventable mortality

AMA 293:2633-2633, 2005
Arkansas’ emergency care system is the worst in the nation.

Receiving a “D-”

Only state without a designated/verified trauma center.
American College of Surgeons Committee on Trauma

- Overall injury fatality is 50% higher than the national average

- CDC Data puts mortality for children involved in motor vehicle crashes at almost three times the national average.
What happened in Arkansas

- 2008 – ACS, ACEP and CDC all publicized the highest mortality rates in the Country.

- The Med was going broke

- Momentum for a trauma bill
2009 Legislature

- Established a **funded** mandate for the creation of a trauma system

  - Infra-structure within the ADH
  - Call center for rapid transportation
  - Designation of Trauma Centers
  - Establishment State-wide education
  - Establish triage and care guidelines
  - State-wide trauma registry
  - Develop quality indicators
AR deaths, age 1-14, 1999-2007

- 1.28% mortality rate at Arkansas Children’s Hospital
AR deaths, age 1-14, 1999-2007

- 1.28% mortality rate
- 791 injury deaths in the state; only 97 (12%) at Arkansas Children’s Hospital
- % ISS > 16 below the national average
AR deaths, age 1-14, 1999-2007

- 1.28% mortality rate
- 791 injury deaths in the state; only 97 (12%) at Arkansas Children’s Hospital
- Vast majority of Arkansas pediatric trauma deaths occur outside ACH
Contribution of Mortality

9/3/13
Are we really doing the best we can to care injured children?
What’s Different about Pediatric Trauma Patients?

Well... Nothing and Plenty!
## Haddon Matrix

<table>
<thead>
<tr>
<th>Phase</th>
<th>Human</th>
<th>Vehicles and equipment</th>
<th>Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Event</td>
<td>Behavioral</td>
<td>Avoidance Design</td>
<td>Avoidance Design</td>
</tr>
<tr>
<td>Event</td>
<td>Behavioral</td>
<td>Response Systems</td>
<td>Response Systems</td>
</tr>
<tr>
<td>Post-Event</td>
<td>Treatment</td>
<td>Tools</td>
<td>System</td>
</tr>
</tbody>
</table>
Pre-Hospital Skills

- Paramedics in busy urban areas intubate children 1.5 times per year and children < 5 yrs once every three years.
  - CJEM Jan 2006

- Multiple ETI attempts are associated with significant morbidity.

- Pre-hospital care of children is suboptimal because of lack of ETI, PIV and fluid resuscitation skills
Pre-hospital

- Triage Criteria
- Education – Mandated
  - Foundation
- Equipment – Mandated
  - ACEP / AAP
  - Braslow
First Receiving Hospitals

- Few critically injured children seen
- Few practitioners with significant pediatric resuscitation skills

- Causes of preventable death
  - Airway management
  - IV access and fluid resuscitation
  - Ability to transfer to definitive care
Community Hospital

- Education – Mandated
- Equipment - Mandated
- Clinical Practice Guidelines
  - Imaging, Fluid resuscitation
- Communications Center
- Trauma Image Repository
- Performance Improvement
  - Regional
  - State-wide
Remote Site

Hub Site

T-1
Transfer

- Specialized transport services
- All others

First responder performance in pediatric trauma: A comparison with an adult cohort

Sunday Bankole, MD; Arsenia Asuncion, MD; Steven Ross, MD; Zubair Aghai, MD; Laura Nollah, MS; Heather Echols, MS, MPH; Shonola Da-Silva, MD, MBA
Tertiary Hospital

- ACS *may* not be the best way to provide care in a pediatric hospital
  - Collaborative
  - Outcome based
  - Continuously ready
  - Benchmarked

- Psycho-social
Defining Quality Care

- Collaborative Research
  - PECARN
  - ATOMAC

- Benchmark
  - TQIP
  - NTDB – State-wide comparisons
  - ACS verification
Rehabilitation

- Must have a place to go
- Care should be specific
- Must have funding for patients to get care
- Demonstrate value
Drinking and Driving
Caregiver behavior that contributes to pediatric injury

Behaviors are socially normative

Social psychology and marketing

Pursuit all available avenues
No Helmet
No Booster Seat
Gunshot wound
Disaster preparedness

- Rare
- No “pop off”
- Drill deep into the facility
  - Identify weaknesses and solutions
- Medical Society, Legal,
  - Credentialing, liability, financial
Influencing Policy

- There should **NOT** be a Pediatric Committee
- Pediatric issues should be considered in *Every* discussion
- Sit at the table with the policy makers
- Inform the electorate
Back at Arkansas Children’s

- Volume has gone up
- Transfers have gone down
- Scene runs have gone up
- Mortality at ACH
  - 2007 - 1.28%
  - 2012 – 1.6%
- Mortality in the State is down
There is something more to it

Pediatric centers improve outcomes

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Role of the Pediatric Trauma Center in a Region

- Educate
- Protocols
- 24/7 support – Telemedicine
  - Where are the mistakes made?
- Regional Peer Review
Role of the Pediatric Trauma Center in a Region

- Define and provide care
- Rehabilitate – family
- Injury Control
- Advocacy
Thank you