



EMSC
Emergency Medical
Services for Children[®]

**EMS for Children Opportunities to
Enhance Pediatric Emergency Care through
Trauma Performance Improvement**
Moderator: Elizabeth Edgerton, MD, MPH

Jane Brice, MD, MPH
Jennifer Fritzeen, MSN, RN
Karen O'Connell, MD, MEd

September 27, 2013



EMSC Mission

To ensure that all children and adolescents regardless of where they live, attend school or travel receive appropriate emergency health care when it is needed. (Pediatric services, backed by optimal resources, are integrated into both EMS systems and hospital emergency departments.)

HRSA: EMSC Program

- ❖ **1997:** Every state, the District of Columbia, and six U.S. territories have received grant support at some time since the Program's establishment.
- ❖ **Current Grant Programs Focus On:**
 - ❖ improving, refining, and integrating pediatric care within the state EMS system
 - ❖ finding new approaches to providing the best possible emergency care for children across the nation
 - ❖ supporting a multi-institutional network for research in pediatric emergency medicine
 - ❖ improving access to specialized pediatric medical treatment in areas where such care is limited due to geographical distances or jurisdictional borders



Targeted Issues Grants

- A funding opportunity under the EMSC program that address specific needs or concerns of national significance in pediatric emergency care.
- Targeted Issue grant projects typically lead to a new product, resource, or illustrate best practices in pediatric emergency care.



Today's Webcast Speakers include:

- Jane Brice, MD, MPH
- Jennifer Fritzeen, MSN, RN
- Karen O'Connell, MD, MEd





Faculty Disclosure Statement

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CE Evaluation and Certificate

- Continuing Education guidelines require that the attendance of all who participate be properly documented.
- Those who participate and wish to receive continuing education need to be registered for the course, attend the activity **in its entirety**, and complete the online evaluation by October 4th, 2013. The online evaluation link will be provided at end of the educational activity by the facilitators. The online link will be available for one week to complete your evaluation. If you need assistance accessing the online evaluation link , or have questions regarding this internet education event please contact Diana Fendya at (dfendya@childrensnational.org).
- Continuing education certificates for doctors and nurses will be automatically generated and emailed to you upon completion of the online evaluation.





EMS and Pediatric Trauma: A North Carolina Population-Based Performance Improvement Intervention and Evaluation Using Multiple Linked Healthcare Databases

Jane Brice, MD, MPH

September 27, 2013

Grant Overview

- Three year study of pediatric trauma outcomes before and after implementation of a three-pronged EMS intervention designed to improve destination decision-making of EMS providers in North Carolina



Research Progress

- We have collected our “before” data and are in the process of linking it with our other health care databases.
- We will collect our “after” data in October



Interventions

- Targeted for EMS providers (prehospital personnel)
- Designed to improve destination decision-making
 - Trauma Center
 - Not trauma center
- NOT designed to impact clinical care

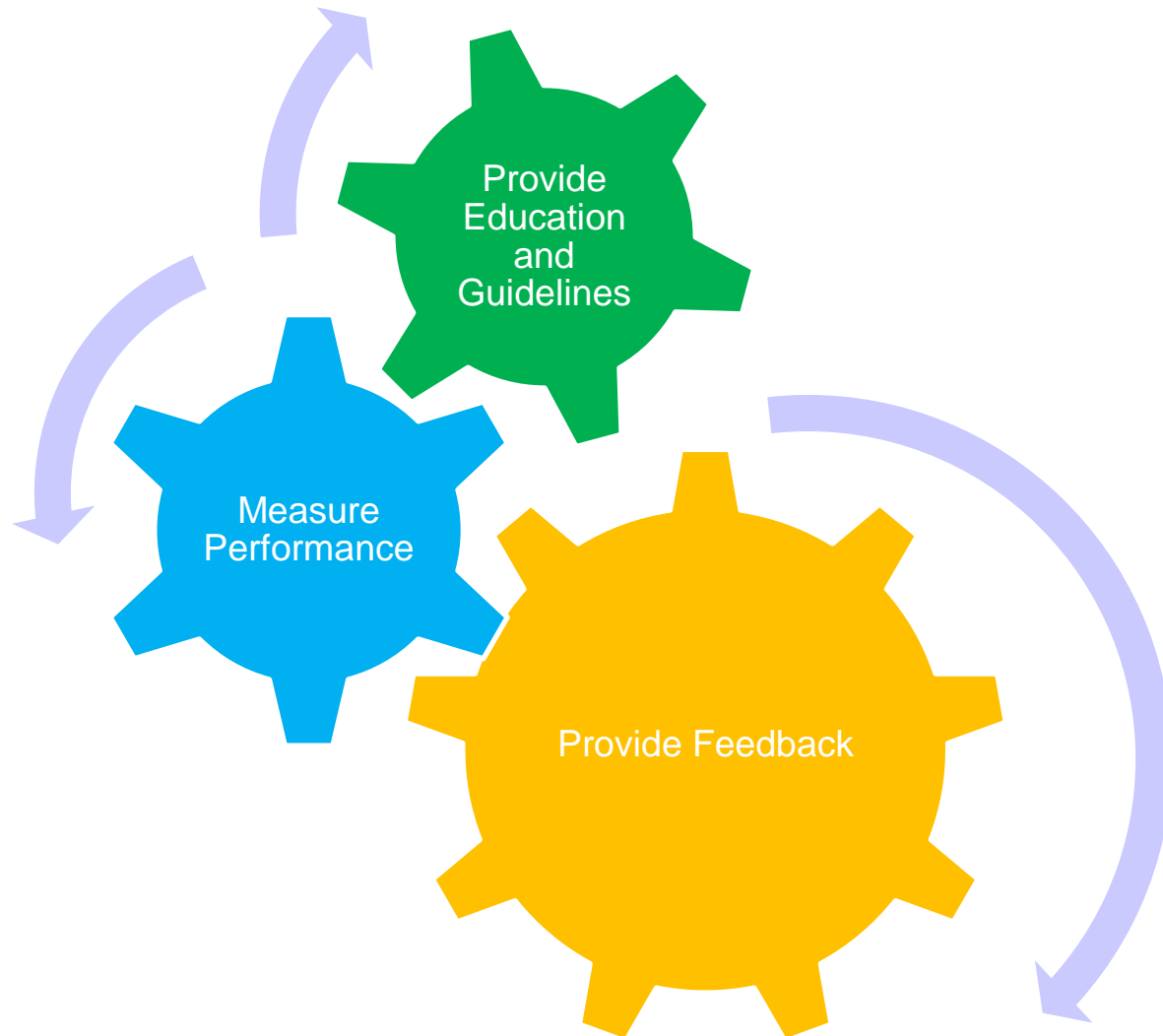


Interventions

- Three-pronged intervention strategy
 - Education courses
 - Pre-planning tool for destination decisions
 - Performance improvement tool



EMS Systems of Care



Educational Courses

Injured Children: Right Decision, Right Destination

- Broad Objective: to provide tools to recognize a child with injuries requiring advanced care and to make the right destination decision



Educational Courses

- Two Courses

- EMS providers
- 9-1-1 telecommunicators

- Web-based

- Flash presentation with slides and voice-over
- Content also available for reading and review
- Start-Stop-Resume feature



Course Structure

EMS Course

- Pre-test
- 4 modules
 - Each modules with review questions
- 2 case studies
- Post-test

9-1-1 Course

- Pre-test
- 2 modules
 - Each modules with review questions
- 1 case study
- Post-test



Course Content

- Epidemiology of pediatric injury
- Recognition of injured pediatric patients
- Discussion of destination types
- Destination decision-making



Course Development

■ Initial draft

□ Reviewed by

- Pediatric emergency physicians
- Pediatric trauma surgeons
- EMS physicians
- Injury epidemiologists

■ Second draft

□ Reviewed by

- EMS field providers
- EMSC advisory committee
- NC Office of EMS
- 9-1-1 telecommunicators



Course Design

- Contracted with AHEConnect
 - Educational Design
 - Graphic Artists
 - Voice-Over



Course Delivery

- Hosted on EMSPIC website
- Course credit once post-test is passed
- CEU credit from NC Office of EMS



Initial sign-up for the course

Injured Children: Right Decision, Right Destination

If you are in North Carolina, South Carolina or West Virginia, enter your State ID and answer the following questions to take this course for credit.

State ID:

Years in current position:

Years as a 911 Communicator:

Primary 911 work level:

Primary 911 work environment:

Education:

What is your confidence level in receiving and dispatching pediatric trauma calls?

How knowledgeable are you about pediatric trauma?

Prior pediatric trauma training:

Participants not signing up for credit were asked to provide additional demographic information.

User Environment

Injured Children: Right Decision, Right Destination



Injured Children: Right Decision, Right Destination

[Attachments](#) | [Help](#)

Outline | [Text](#)

Injured Children

Tutorial

▶ [Pediatric Injury](#)

▶ [Assessing the Injured Child](#)

▶ [The Trauma Center](#)

▶ [The Pediatric Trauma Destination ...](#)

▶ [Case Study 1](#)

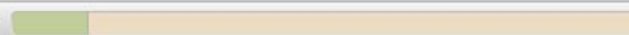
▶ [Case Study 2](#)

[Congratulations](#)

[Credits](#)



Search...



[← PREV](#)

[NEXT >](#)



Case Studies as a component of learning

Injured Children: Right Decision, Right Destination

UNC SCHOOL OF MEDICINE

Injured Children: Right Decision, Right Destination Attachments | Help


Outline | Text

- Injured Children
- Tutorial
- ▶ Pediatric Injury
- ▶ Assessing the Injured Child
- ▶ The Trauma Center
- ▶ The Pediatric Trauma Destination ...
- ▼ Case Study 1
 - Introduction
 - After ensuring the safety of the...
 - Patient Assessment
 - Based on you the information y...
 - What is the next step of your p...
 - A & B - Assess Airway & Breathi...
 - C - Assess Circulation
 - D - Assess Disability
 - E- Assess Exposure
 - Based on the information you g...
 - If you believe a transport decisi...
 - Patient Transport & Hospitaliza...
- ▶ Case Study 2
- Congratulations
- Credits

Search... 🔍

▶ [Progress Bar] 🔁

Attachments | **Help**



After ensuring the safety of the scene you approach the motor vehicle occupants for evaluation. While another member of the team triages Anne, you focus on David and his son Thomas. David appears to be fine so you turn your attention to Thomas first.

What is the first step of your patient evaluation?

- Head-to-toe examination
- Patient Assessment Triangle
- Detailed patient history
- ABCDEs hands-on initial assessment

SUBMIT

▶

Optional pretest assessed knowledge before taking the course

Injured Children: Right Decision, Right Destination

Pretest

1. The single leading cause of death in children one year of age and older is:

- Intentional self-harm (suicide)
- Malignant neoplasms
- Unintentional injuries
- Assault (homicide)

2. What is the most common form of traumatic injury in children?

- Both blunt and penetrating trauma equally
- Penetrating trauma
- Blunt trauma
- A form of trauma other than blunt or penetrating

3. Which is not a significant risk factor for pediatric trauma?

- Socioeconomic status
- Gender
- Location of residence
- Primary language spoken at home

Mandatory post-tests assessed knowledge gained from the course

Injured Children: Right Decision, Right Destination

Post Test

Which is not a special consideration or unique condition that requires EMS transport to a trauma center?

- Pregnancy
- Respiratory conditions
- Being a child
- Blood disorders

Which level of adult trauma center is focused on stabilization and transport?

- Level I
- Level II
- Community hospital
- Level III

In which age range is a child's risk of injury the highest?

- 1 to 6 years
- 6 to 12 years
- 0 to 1 years
- 12 to 18 years

Course Reach

	NC Registered	911 Dispatcher Course	EMS Responder Course	Total
	N	n	n	%
Medical Responders	1819	1	4	0.27
EMT-Basic	24280	8	230	0.98
EMT-I	2478	3	148	6.09
Paramedics	8035	21	772	9.87
EMD	2254	390	14	17.92

Participant Demographics				
	911 Dispatcher Course		EMS Responder Course	
	n	%	n	%
Credit				
For Credit	386	83.2	1249	92.6
Not for Credit	78	16.8	100	7.4
Age (mean, SD)	39.1	9.9	38.5	11.4
Age Group				
18-24	27	5.8	157	11.7
25-34	145	31.3	391	29.2
35-44	147	31.7	367	27.5
45-54	115	24.8	299	22.4
55+	30	6.5	123	9.2
Gender				
Female	287	62.3	472	35.3
Male	174	37.7	865	64.6
Certification				
EMD	390	92.2	14	1.2
Medical Resp.	1	0.2	4	0.3
EMT-Basic	8	1.9	230	19.7
EMT-I	3	0.7	148	12.7
Paramedic	21	5.0	772	66.1

Participant Demographics				
	911 Dispatcher Course		EMS Responder Course	
	n	%	n	%
Organization Status				
Volunteer	4	1.1	68	6.2
Non-Volunteer	307	85.5	676	61.3
Mixed	6	1.7	67	6.1
Multiple	41	11.5	291	26.4
Organization Type				
Community, Non-Profit	8	2.2	81	7.35
Fire Department	1	0.3	53	4.8
Governmental, Non-Fire	290	81.0	465	42.4
Hospital	6	1.7	120	10.9
Private, Non-Hospital	3	0.8	29	2.6
Multiple	50	13.9	354	32.1

Participant Demographics

	911 Dispatcher Course		EMS Provider Course	
	n	%	n	%
Education				
High School	91	19.6	216	16.0
Some college	188	40.5	552	40.9
College graduate	156	33.6	444	32.9
Graduate degree	11	2.4	88	6.5
Primary Work Level				
Part-time	31	6.7	887	65.8
Full-time	390	84.1	201	14.9
Volunteer	7	1.5	152	11.3
None	17	3.7	57	4.2
Primary Work Environment				
Urban	170	36.6	316	23.4
Suburban	90	19.4	307	22.8
Rural	175	37.7	637	47.2
Wilderness	1	0.2	13	1.0

Course Completion				
	911 Dispatcher Course		EMS Responder Course	
	n	%	n	%
Yes	351	75.7	855	63.4
No	113	24.4	494	36.6

Change in Score				
	t	P	Mean	Std Dev
911 Dispatcher Course	16.45	<.0001	2.03	1.8
EMS Responder Course	26.54	<.0001	3.60	3.9

No significant differences in post test scores by personal and work demographics.

Intervention #2

Pre-Planning Tool for Destination Decisions



- Right Patient
- Right Care
- Right Destination
- Right Time



Triage Destination Plans

- January 2010
- NC Office of EMS mandated use of Triage Destination Plans (TDPs)
- Utilized the National Expert Panel's Field Triage Guidelines
- Merged specific destination decisions into scheme



Trauma and Burn

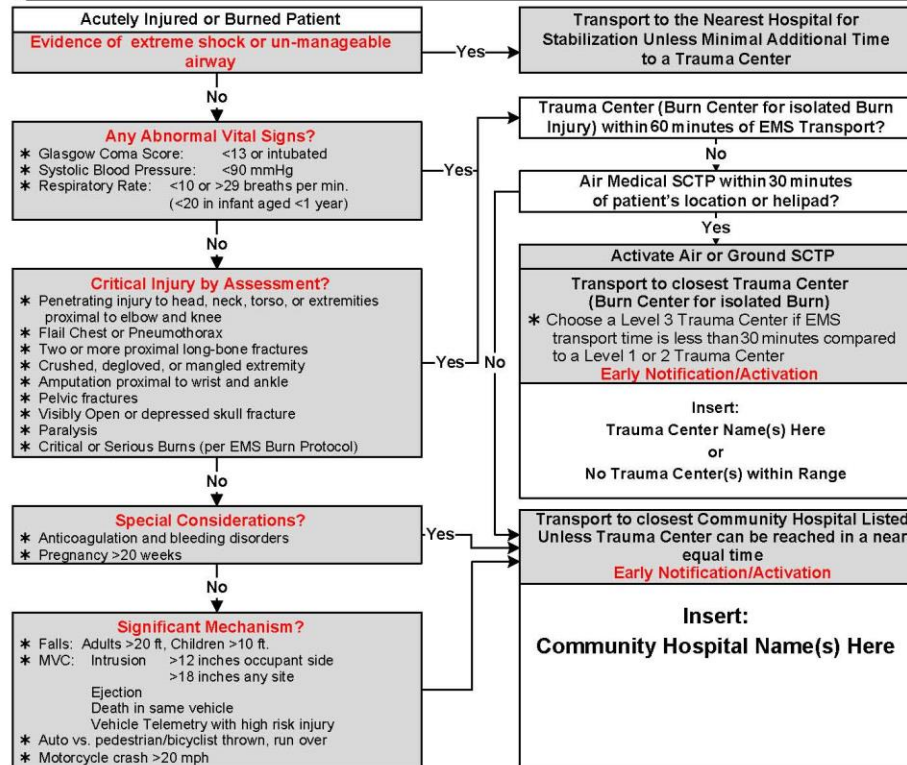
EMS Triage and Destination Plan



Trauma or Burn Patient = Any patient less (regardless of age) with a significant injury or burn

The Purpose of this plan is to:

- * Rapidly identify injured or burned patients who call 911 or present to EMS
- * Minimize the time from injury to definitive care for critical injuries or burns
- * Quickly identify life or limb threatening injuries for EMS treatment and stabilization
- * Rapidly identify the best hospital destination based on time of injury, severity of injury, and predicted transport time
- * Early activation/notification to the hospital of a critically injured or burned patient prior to patient arrival
- * Minimize scene time to 10 minutes or less from patient extrication with a "load and go" approach
- * Provide quality EMS service and patient care to the EMS Systems citizens
- * Continuously evaluate the EMS System based on North Carolina's EMS performance measures



Trauma and Burn EMS Triage and Destination Plan

Pearls and Definitions

- * **All Injury and Burn Patients must be triaged and transported using this plan. This plan is in effect 24/7/365**
- * **All Patient Care is based on the EMS Trauma Protocols**
- * **Designated Trauma Center** = a hospital that is currently designated as a Trauma Center by the North Carolina Office of Emergency Medical Services. Trauma Centers are designated as Level 1, 2, or 3 with Level 1 being the highest possible designation. Free standing emergency departments and satellite facilities are not considered part of the Trauma Center.
- * **Burn Center** = a ABA verified Burn Center co-located with a designated Trauma Center
- * **Community Hospital** = a local hospital within the EMS System's service area which provides emergency care but has not been designated as a Trauma Center
- * **Specialty Care Transport Program** = an air or ground based specialty care transport program which can assume care of an acutely injured patient from EMS or a Community Hospital and transport the patient to a designated Trauma Center.

Pediatric Trauma TDP

- Utilized pediatric specific components of the National Expert Panel's Field Triage Guidelines
- Created a Pediatric Trauma Triage and Destination Plan
- Provided this to the NC Office of EMS



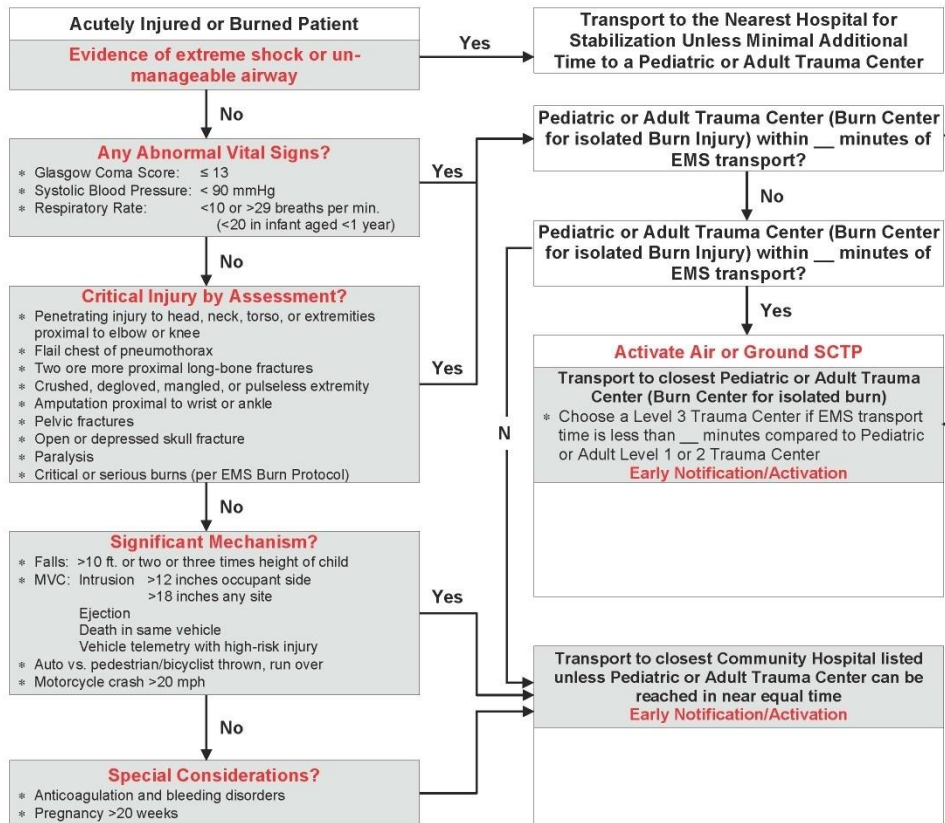
Pediatric Trauma and Burn

EMS Triage and Destination Plan

Pediatric Trauma or Burn Patient: Any patient 15 years of age or younger with a significant injury or burn

The Purpose of this plan is to:

- * Rapidly identify injured or burned pediatric patients who call 911 or present to EMS
- * Minimize the time from injury to definitive care for critical injuries or burns
- * Quickly identify life or limb threatening injuries for EMS treatment and stabilization
- * Rapidly identify the best hospital destination based on time of injury, severity of injury, and predicted transport time
- * Early activation/notification to the hospital of a critically injured or burned pediatric patient prior to patient arrival
- * Minimize scene time to 10 minutes or less from patient extrication with a "load and go" approach
- * Provide quality EMS service and patient care to EMS Systems citizens
- * Continuously evaluate the EMS System base on North Carolina's EMS performance measures



Pediatric EMS Triage and Destination Plan

Pearls and Definitions

- * All pediatric patients with a life-threatening illness must be triaged and transported using this plan. This plan is in effect 24/7/365.
- * The Pediatric Trauma and Burn Triage and Destination Plan should be used for all injured patients less than 16 years of age.
- * Pediatric patients transport priority, when possible: pediatric trauma center, pediatric capable trauma center, adult trauma center.
- * Pediatric Capable Hospital = A hospital with an emergency and pediatric intensive care capability including but not limited to:
 - * Emergency Department staffed 24 hours per day with board certified Emergency Physicians
 - * An inpatient Pediatric Intensive Care Unit (with a physician pediatric intensivist available in-house or on call 24/7/365)
 - * Board-certified surgeon willing and capable of caring for injured children
 - * Accepts all EMS patients regardless of bed availability
 - * Provides outcome and performance measures feedback to EMS including case review
- * Community Hospital = A local hospital within the EMS System's service area which provides emergency care but does not meet the criteria of a Pediatric Trauma Center, Pediatric Capable Trauma Center, or Pediatric Capable Hospital

Who Creates the TDP?

Personnel	N
County Medical Director	98
EMS Director	94
County Training Officer	82
County Hospital Representative	55
Other Personnel	37

How Are They Distributed?

Method	N
Face to Face Training	98
Paper Copies	83
Online Education	19
Other methods of distribution (CD, e-mail, and web portal distribution)	11
Part of protocol, no training	2
No method	1

How Are They Maintained?

Reasons for Plan Review	N
Yearly	60
With Hospital Changes	92
With Complaints	71
With Protocol Revision	52
No plan revision	2
With a sentinel event	2

Intervention #3

Performance Improvement Toolkit

- North Carolina's state-wide EMS database allows the creation of several types of performance improvement tools
- Toolkits are large comprehensive performance improvement reports on specific types of critical events



Toolkits

- These large reports allow EMS systems to:
 - Identify the period of review
 - Identify the type of patients (or events) they want to review
 - Trauma
 - Stroke
 - STEMI
 - Pediatrics (in general)
 - Cardiac Arrest
 - Response Times



Toolkits

- EMS systems then receive a complete synopsis of system performance
- Specific system parameters
 - Patient Care
 - Service Delivery
 - Personnel Performance
- Benchmarking against regional and state performance
- Recommendations for improvement



Trauma Toolkit

- Adult toolkit developed by national panel of experts (40 members)
- Agreed on definition of a trauma patient and content of toolkit
- Pediatric toolkit mirrors the adult toolkit by limiting age to less than 16 years



Sample Toolkit - Summary

EMS Trauma Care Toolkit

Trauma Care Toolkit Summary

SAMPLE

6/1/2010 - 11/30/2010

	System	State
Total Records Found for Date Range	5,007	708,923
Total Patient Records Usable for Toolkit	4,778 (95%)	638,481 (90%)
- Injured Patients	352(7%)	67,044(11%)
- Other Patients	2(<1%)	585(<1%)
- Not Recorded	1(<1%)	705(<1%)
Total Patients	355	68,334
Disposition of Injured Patients		
- No Treatment Required	2(<1%)	1,259(2%)
- Patient Refused Care	22(6%)	6,092(9%)
- Treated and Released	3(<1%)	4,406(6%)
- Treated, Transferred Care	2(<1%)	1,592(2%)
- Treated, Transported by EMS	325(92%)	54,762(80%)
- Treated, Transported by Law Enfo	0(0%)	69(<1%)
- Treated, Transported by Private	1(<1%)	154(<1%)

Sample Toolkit – Data Elements

Trauma Care Data Element Completion Rates

SAMPLE

6/1/2010 - 11/30/2010

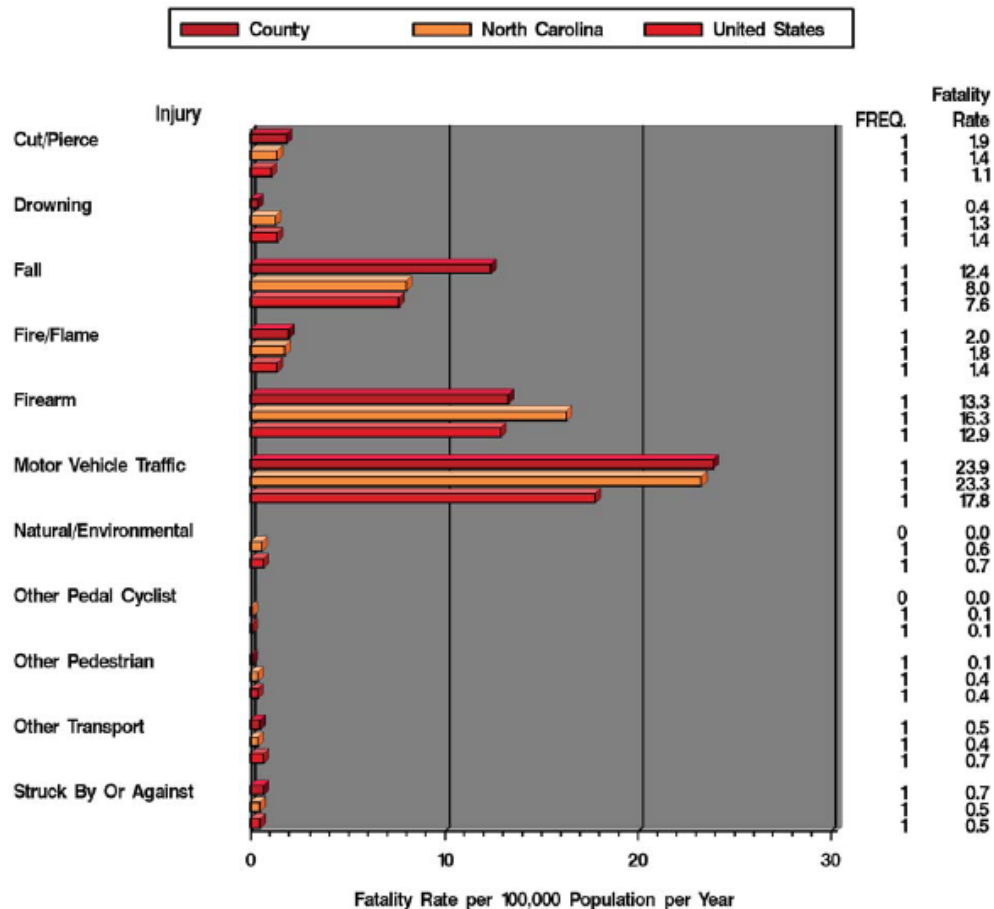
Data Element	EMS System Completion Rate	State Completion Rate
PSAP Call Date	34%	62%
Unit Notified by Dispatch Date	100%	100%
Unit En Route Date/Time	100%	94%
Unit Arrived on Scene Date/Time	100%	96%
Arrived at Patient Date/Time	100%	69%
Unit Left Scene Date/Time	100%	79%
Patient Arrived at Destination Date/Time	88%	73%
Type of Response Delay	66%	46%
Type of Scene Delay	76%	49%
Type of Transport Delay	54%	37%
Response Mode to Scene	100%	100%
Incident ZIP Code	100%	91%
Possible Injury	54%	61%
Chief Complaint Organ System	54%	37%
Other Associated Symptoms	62%	52%
Chief Complaint Anatomic Location	55%	37%
Primary Role of the Unit	100%	100%
Incident Location Type	67%	89%
Complaint Reported by Dispatch	84%	76%
EMD Card Number	0%	28%

Sample Toolkit – Fatality Rates

EMS Trauma Care Toolkit

CDC Injury Fatality Rates

(1999-2006)



Contact Information

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EMSC Webcast:

Impact of a Checklist on ATLS Task Performance During Pediatric Resuscitation

Presenter: Jennifer Fritzeen

Date: September 27, 2013

Disclosure

Funding provided by HRSA grant
H34MC19351
Approved by Children's National IRB



Background

Advanced Trauma Life Support (ATLS)

- Accepted standard for “first hour” of trauma care
- Shown to improve outcomes
- Errors in ATLS application persist



Background

Checklists

- Used in protocol-driven domains
- Introduced in medical domains
 - WHO Surgical Safety Checklist
 - Infection control procedures
- Increase protocol adherence
- Improve team communication
- Improve outcomes
 - Decreased mortality
 - Decreased infection rates



Checklist Development & Testing

Checklist Development

- Focus groups – items and format
- Included all trauma disciplines

Simulation Testing

- Twelve simulation sessions
- Four scenarios: two with checklist, two without
 - 1 with “to do” list
 - 1 with “verification”
- Outcomes measured:
 - ATLS task completion (ATLS Performance Score)
 - Compliance with checklist use
 - Workload (NASA TLX) surveys



Checklist Development & Testing

Results of Simulation Testing

- Improved ATLS performance score with checklist use
- Improved ATLS performance score with improved checklist compliance
- No change in overall workload of team members

Conclusions

- Checklist improves ATLS performance in simulation
- Safe to implement and evaluate in actual resuscitations



Methods

Checklist Implementation:

- Three month introduction period
- Presented at Trauma M&M
- Training video for trauma team
- Team leaders oriented to checklist at beginning of rotation



Trauma Resuscitation Checklist

Items in the shaded boxes pertain to high-acuity patients — may be marked as N/A

Pre-arrival Plan
<input type="checkbox"/> Introductions & confirm team roles
<input type="checkbox"/> Brief team on incoming patient
<input type="checkbox"/> Estimate weight: _____ kg
<input type="checkbox"/> Oxygen connected to NRB <input type="checkbox"/> Suction hooked up <input type="checkbox"/> Trauma shears available <input type="checkbox"/> Bair hugger on bed <input type="checkbox"/> RSI meds removed from Pyxis
For Attending activations: <input type="checkbox"/> N/A <input type="checkbox"/> Prepare intubation equipment <input type="checkbox"/> Order Code Orange blood <input type="checkbox"/> CPR board in room or on bed

PUT PATIENT LABEL HERE

Primary Survey	
A	<input type="checkbox"/> Confirm airway is protected <input type="checkbox"/> Confirm C-spine is immobilized properly (manually or with collar)
	If intubating: <input type="checkbox"/> N/A <input type="checkbox"/> GCS assessed before giving RSI medications <input type="checkbox"/> Report ET tube size, depth, and color change <input type="checkbox"/> Confirm ETCO ₂ reading on monitor <input type="checkbox"/> Order chest x-ray for placement confirmation
B	<input type="checkbox"/> Confirm O ₂ placement
C	<input type="checkbox"/> Check distal pulses (then central, if needed) <input type="checkbox"/> Confirm IV/IO access has been established
	<input type="checkbox"/> Give fluid bolus (NS/LR) or blood <input type="checkbox"/> N/A
D	<input type="checkbox"/> State GCS (eyes, verbal, motor) <input type="checkbox"/> State pupil size and response
E	<input type="checkbox"/> Completely remove patient's clothing <input type="checkbox"/> Cover patient with warm blanket <input type="checkbox"/> Take temperature
VITALS	State and evaluate whether logical and WNL for age: <input type="checkbox"/> Heart rate (with good waveform) <input type="checkbox"/> Respiratory rate <input type="checkbox"/> Oxygen saturation <input type="checkbox"/> Blood pressure

Secondary Survey
Evaluate and state findings:
<input type="checkbox"/> Head
<input type="checkbox"/> Ears
<input type="checkbox"/> Ocular/periorbital integrity
<input type="checkbox"/> Facial bones
<input type="checkbox"/> Nose
<input type="checkbox"/> Mouth
<input type="checkbox"/> Neck
<input type="checkbox"/> Chest
<input type="checkbox"/> Abdomen
<input type="checkbox"/> Pelvis
<input type="checkbox"/> Lower extremities
<input type="checkbox"/> Upper extremities
<input type="checkbox"/> Log roll and back exam
<input type="checkbox"/> C-spine exam

Departure Plan
<input type="checkbox"/> Summarize 1° and 2° survey findings
<input type="checkbox"/> Brief team on plan of care and patient destination
Prepare patient for travel: <input type="checkbox"/> N/A
<input type="checkbox"/> Equipment
<input type="checkbox"/> Medications
<input type="checkbox"/> Identify who will travel with patient
<input type="checkbox"/> Notify destination (OR, PICU, etc.)

Place completed list in the drop-box in the hallway.

DO NOT ADD TO MEDICAL RECORD

Last Updated APR242012



Methods: Pre-Post Study

Two 15-week periods

- Pre-implementation: May-August 2011
- Post-implementation: May-August 2012

Video review of all trauma resuscitations

- 14 ATLS primary survey tasks
- 15 ATLS secondary survey tasks

Differences between cohorts calculated

- Cohort characteristics
- Frequency of and mean time to task completion
- Pearson's chi-square and Student's t-test



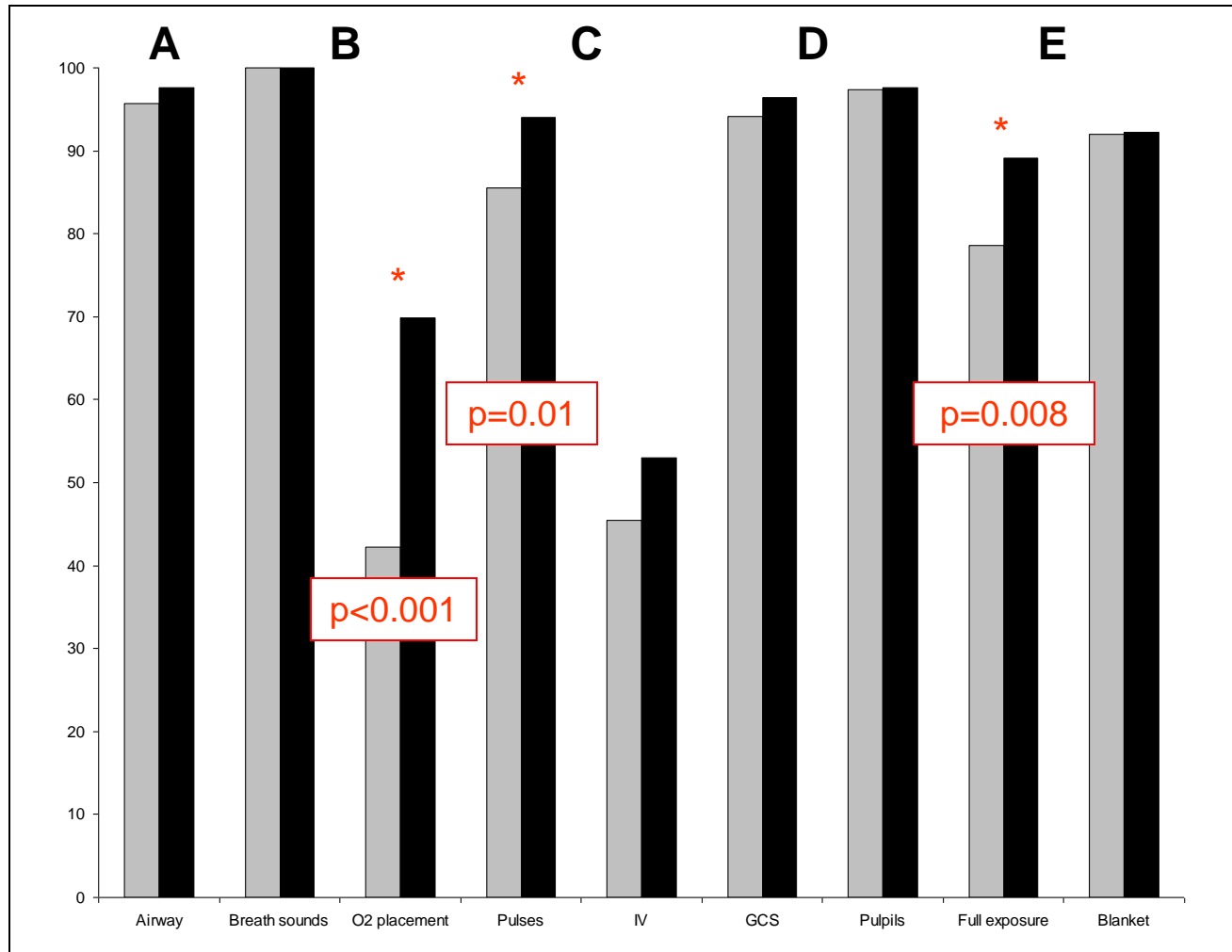
Results: Cohort Characteristics

Table 1. Resuscitation characteristics pre and post checklist implementation, %.

	Pre (n=187)	Post (n=166)	P-value
Activation level			0.20
Attending	4.8	7.2	
Stat	63.1	68.7	
Transfer	32.1	24.1	
Weekend	30.5	31.3	0.86
No pre-notification	9.6	14.5	0.16
Team leader (% fellow)	44.4	38.2	0.49
Intubated patient	5.3	7.2	0.47
Major clinical event	4.3	4.2	0.98



Results: Primary Survey



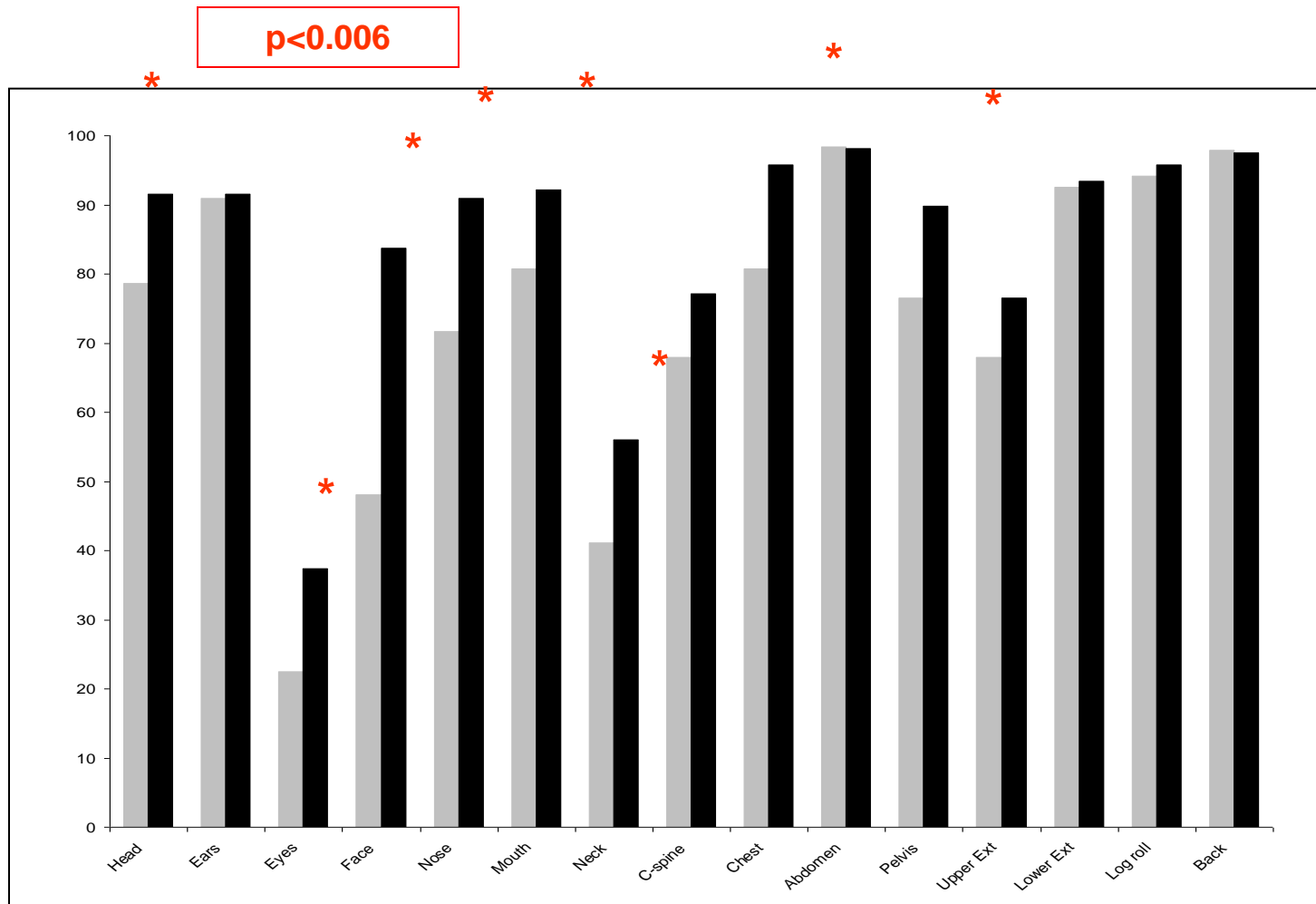
Results – Primary Survey

Table 2. Vital sign task completion pre and post checklist implementation

	Frequency (%)			Mean time (min)		
	Pre	Post	p-value	Pre	Post	p-value
Temperature	94.7	97.0	0.28	5.6	4.4	<0.001
Heart rate	100	100	NS	3.0	2.4	<0.001
Respiratory rate	98.9	99.4	0.63	2.6	2.0	<0.001
Oxygen saturation	100	100	NS	2.5	2.2	0.005
Blood pressure	100	99.4	0.29	3.8	3.7	0.82



Results – Secondary Survey



Results – Overall

Table 3. Mean ATLS task completion pre and post checklist implementation

	Mean time (min)		
	Pre	Post	p-value
Primary survey (max=14)	12.3	12.9	<0.001
Secondary survey (max=15)	11.1	12.6	<0.001
Total (max=29)	23.3	25.5	<0.001



Results – Summary

High compliance with checklist use

Used by team leader in 97% of resuscitations

Improved ATLS task completion

- Primary: +0.6 tasks, three significantly improved
- Secondary: +1.5 tasks, eight significantly improved
- Overall: +2.5 tasks completed
- 15 vs. 20 tasks completed over 90% of the time
- No tasks completed less frequently



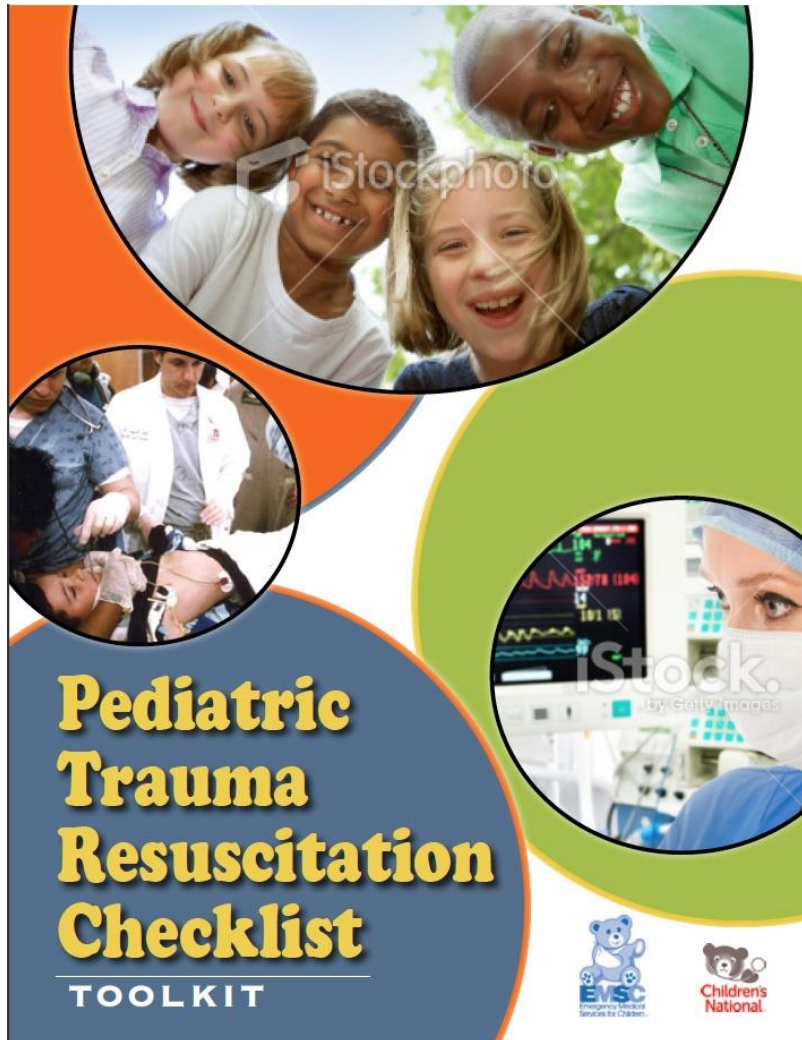
Results – Summary

No delay in evaluation

- Faster vital sign measurement
- Only one task significantly slower: GCS
2.4 vs. 2.8 minutes, $p=0.03$
- No change in total resuscitation time
25.8 minutes for both, $p=0.97$



Implementing a Checklist



COMING SOON!



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Quick tips to implementing

- Determine elements of your checklist
 - Multidisciplinary team
 - Forgotten items
- Checklist acceptance
 - “I don’t need this”
 - “takes to long”
 - “will never work”



Quick tips to implementing

■ Logistics

- Administrator
- Paper or Electronic
- Responsibility to stock or monitor

■ Leadership

- Communication
- Ability to control a room



Conclusions

Checklist use during pediatric trauma resuscitation:

- Significantly improves ATLS task completion
 - Improved task completion frequency
 - Decreased time to first vital sign measurements
- Does not increase resuscitation duration



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Thank You





Family Presence during Pediatric Trauma Team Activation: Measuring the Effects of a Multidisciplinary Approach to Patient-Family-Centered Care

Karen J. O'Connell, MD, MEd
September 27, 2013

Children's National Medical Center, Washington, DC

Children's Hospital of Philadelphia, PA

Children's Medical Center of Dallas, TX

Background

- ❑ Trauma is the leading cause of child morbidity and mortality
- ❑ Families play integral role in the ongoing care of the pediatric trauma patient
- ❑ Traditional practice → family exclusion



Patient-Family-Centered Care

- Families are caregivers for pediatric patient
- Focus on mutually beneficial partnerships & collaboration among patients, families, and health care providers
 - Shared decision makers
 - Part of healthcare team
- Core principles include:
 - Dignity and respect
 - Information sharing
 - Participation
 - Collaboration



Family Presence

The attendance of family in a location that allows visual or physical contact with their child during resuscitations or invasive procedures

Emergency Nurses Association 2001



National Platform

- National call for Patient-Family-Centered Care
 - Institute of Medicine, Report on Emergency Care in the US, 2006
 - AAP/ACEP Policy Statement, *Pediatrics* 2006
 - Report on the National Consensus Conference on FP during Pediatric CPR and Procedures, 2006
- Limited research on the effects of family presence on pediatric trauma care
- Few hospitals have formal written family presence policies



Joint Recommendations

- Patient-centeredness one of six proposed aims for health care quality improvement *Institute of Medicine, 2006*
- Encourage option of family presence for all emergency care, including prehospital
- Institutional development of PFCC policies
 - Assessing family members
 - Clear procedures with family support outlined
 - Documentation guidelines
 - Legal consensus
 - Education
- Call to promote PFCC research





Do families want to
be present?

Parental Experiences

- 18 family members of deceased children
 - 72% wanted to be present
 - 96% “should have the option”

Doyle CJ et al. Ann Emerg Med 1987

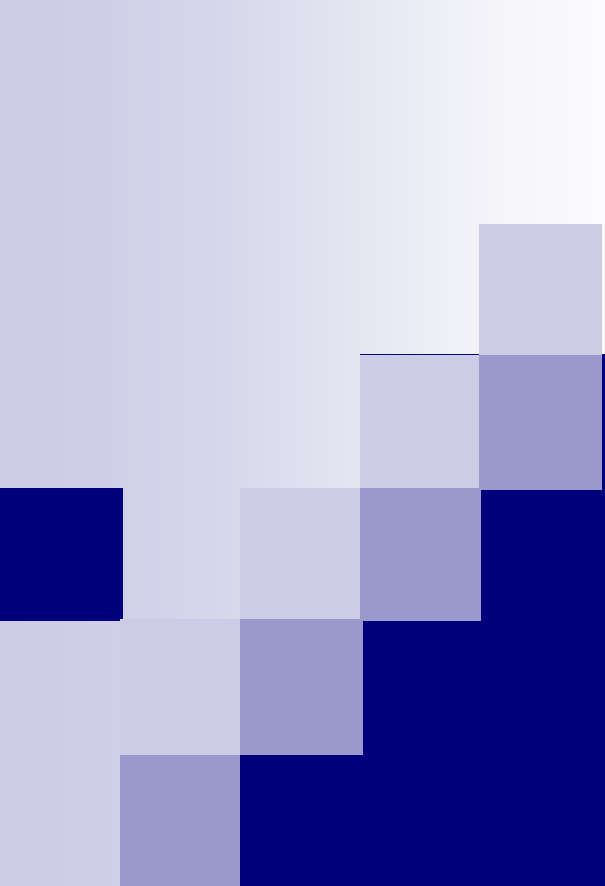
- 25 family members of deceased (8-90 yrs)
 - 80% wanted to be present

Meyers TA et al. J Emerg Nurs 1998

- 66 parents interviewed after 3 months
 - 86% believed they had a right to be there
 - 100% felt they would do again

Mangurten J et al. J Emerg Nurs 2006





Does family presence
benefit patients &
families?

Patient and Family Benefits

- Provided patient comfort; increased coping and pain control

Eichorn,2001; Robinson,1998; Wolfram,1997

- Removes doubt, know everything done

Mangurten,2006; Meyers,2000; Robinson,1998; Timmermans,1997; Turner,1997; Shapira,1996; Wolfram,1996; Bauchner,1991; Hanson,1992; Doyle,1987

- Reduces anxiety & fear

Mangurten,2006; Doran,2004; Powers,1999; Robinson,1998; Turner,1997; Shapira,1996; Wolfram,1996

- Supported & helped patient

Mangurten,2006; Meyers,2000; Powers,1999; Berns,1998; Turner,1997; Sacchetti,1996; Shapira,1996; Wolfram,1996; Hanson,1992; Bauchner,1991



Effect on Family

- No reports of traumatic memories

Mangurten,2006, Robinson,1998


- Helped with continued patient-family connectedness

Meyers,2000; Bauchner,1991; Hanson,1992

- Facilitates grieving process

Powers,1999; Meyers,1998; Robinson,1998; Belanger,1997; Timmermans,1997; Sacchetti,1996; Hanson,1992; Doyle,1987; Anderson,1985





Do healthcare
providers want families
to be present?

Barriers to Family Presence

- Experience may be too traumatic
- Family may get too emotional
- Family may interfere with clinical care
- Family presence will increase staff stress
- Family presence will decrease performance

*Mangurten,2006; Helmer,2000; Redley, 1996;
Meyers,2000; Sacchetti,2000*



Healthcare provider FP trends

- Nurses more supportive than physicians
McClenathan,2002; Helmer,2000; Meyers,2000; O'Connell,2007
- Experienced physicians more supportive than trainees
Fein,2004; O'Connell,2007; Meyers,2000
- Female providers more supportive than male
Meyers,2000, Kirchoff,2007
- Pediatric providers more supportive than adults
Gola,2006
- Trauma surgeons least supportive of physicians
Helmer,2000; Kirchoff,2007; Gola,2006





Is patient care affected?

Disruption of Care?

- Pediatric trauma patients (N=196)

- No cases of direct interference with care
- 2 parents asked to leave for emotional responses

O'Connell, 2007

- Pediatric trauma patients (N=220)

- 4 cases with reported family “in the way”
- 16 with verbal interruptions
- No family members asked to leave the room

Dudley, 2009

- 3 Level I adult trauma centers (N=193)

- No family members lost control or interfered with care

Morse, 2002



Effects on performance?

- 196 pediatric traumas, FP vs. no FP
- No significant time differences for:
 - Time to end of primary & secondary surveys
 - Time to IV access
 - Invasive procedures too for analysis
 - 19 ETI; 8 chest tube; 8 central line

O'Connell et al. Pediatrics 2007

- 283 pediatric traumas, FP vs. no FP
- No significant time differences for:
 - CT scan time and resuscitation time
 - Invasive procedures too few for analysis
 - 30 ETI; Chest tube 7

Dudley N et al. Pediatrics 2009



Summary of FP Discussion

Pros

- Numerous family and patient benefits
- Affords transparency
- Helps families advocate for their child
- Incorporates families in the medical team
- Little evidence of interruptions in care

Cons

- Alters team dynamics and housestaff training
- Perceived increase in staff stress
- Limited data on the impact of trauma performance and care delivery
- No comparative data for severely injured children





Family Presence during Pediatric Trauma Team Activation: Measuring the Effects of a Multidisciplinary Approach to Patient-Family-Centered Care

HRSA, Grant #H34MC10578, Emergency Medical Services For Children, FY08 Targeted Issue Grant

Study Aims

- 1.1A To evaluate the effects of family presence on the ***timeliness*** and ***effectiveness*** of care during pediatric trauma resuscitation
- 1.1B Measure the frequency of family member ***interference*** with patient care
- 1.2 Explore the attitudes and experiences of family members who were present and not present
- 1.3 Explore the attitudes and experiences of trauma team providers



Methods

- Multi-center, 3 Level I pediatric trauma centers
 - Children's National Medical Center, Washington, DC
 - Children's Hospital of Philadelphia, Pennsylvania
 - Children's Medical Center of Dallas, Texas
- Inclusion Criteria
 - ≤ 18 years of age
 - Site specific "Trauma team activation" criteria met
- Exclusion Criteria
 - Multiple patients in trauma area simultaneously
- All sites have FP policies
 - Family accompanied by FP facilitator



1.1A: Compare specific measures of ***timeliness*** and ***effectiveness*** with and without FP

■ ***Timeliness***

- Times to completion of invasive procedures
 - IV and central line placement, intubation, chest tube, needle thoracostomy
- Times to first radiograph and CT scan
- Time to completion of trauma survey

■ ***Effectiveness***

- Success rates of procedure completion

Preliminary data, N = 1415

Data analysis in progress

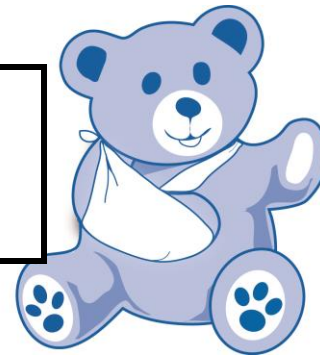
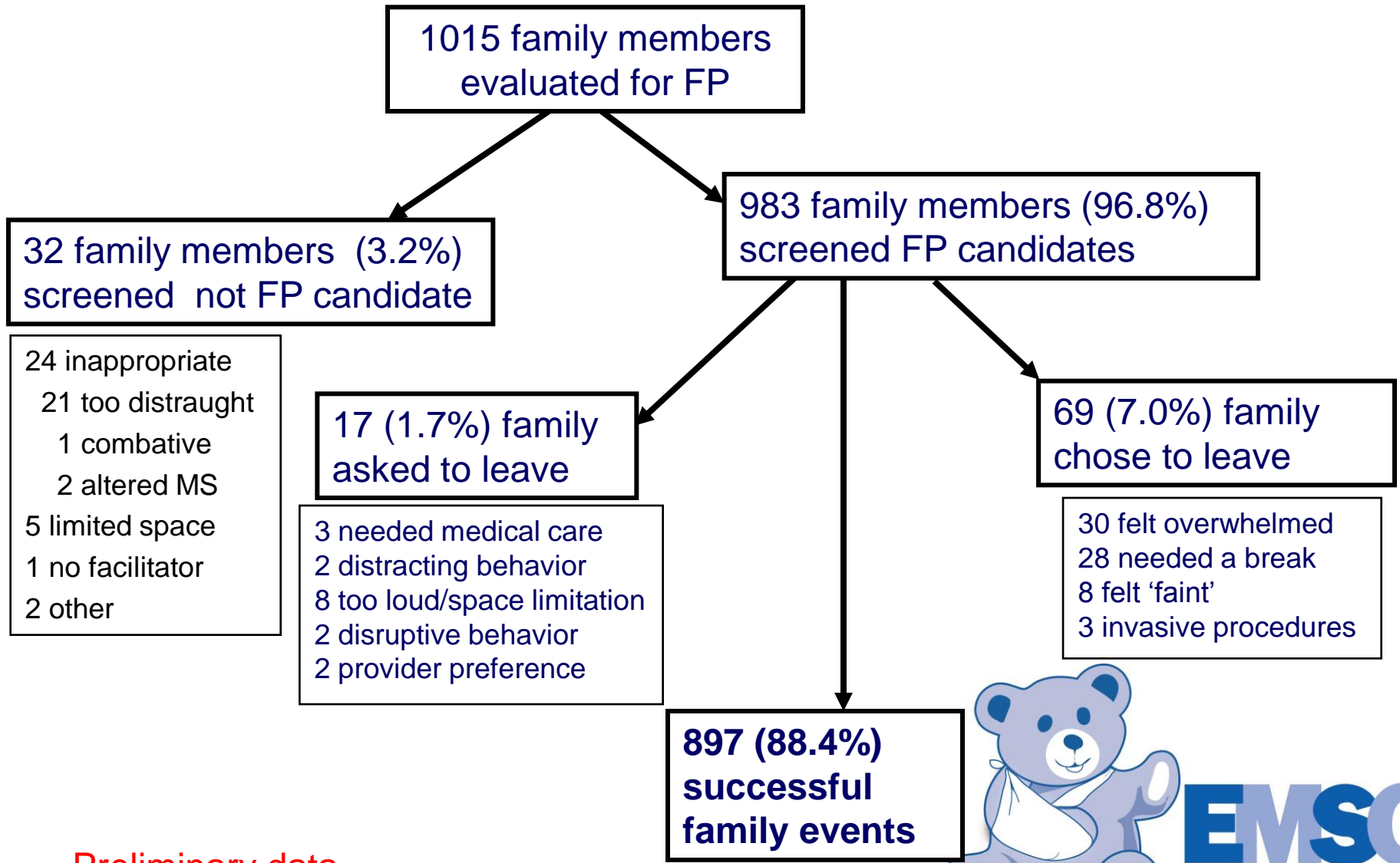


1.1B: Measure the frequency of family member *interference* with patient care

- Interference defined as physical or verbal disruption in patient care resulting in the termination of family presence for that event



Family Member Events



1.2: Measure the ***experiences*** and ***attitudes*** of family members of enrolled children

■ Methodology:

- Telephone interviews 3-6 months after event
 - Validated interview tool
 - Post Traumatic Stress Disorder (PTSD) self-assessment specific for the trauma event
- Focus groups – 2 per site
 - 3 family present
 - 3 family not present



Family Experiences & Attitudes, n=126

Families present (N=99)

Being there...

- Is my right
- Gives me comfort and peace of mind
- Lets me see my child's care
- Allows me to contribute to decision making
- Helps me advocate on behalf of my child
- Involves recognizing my own limitations

Families not present (N=27)

Despite the missed opportunity...

- The choice is my right
- I feel being there would have comforted my child
- I feel being present would have decreased my anxiety
- I desire real-time information
- I recognize the need for self-regulation
- I trust the staff to give my child the best care possible



1.3: Describe the *experiences* and *attitudes* of trauma team providers

■ Methodology

- Validated paper survey completed within 24 hours of the event
- Focus groups
 - Trauma surgeons
 - Emergency medicine attendings
 - Emergency medicine and trauma nurses
 - Family presence facilitators



Providers Experiences & Attitudes

- “Right” vs. “A privilege that can be taken away”
- The procedure needs to be clearly delineated
 - Facilitator role is key to success
- Parents see everything that is being done
- Can be distracting, hinder training, and prolong futile care
- Overall positive experience - beneficial for comforting child and providing information



Dissemination of Best Practices

Aim 2

To develop and disseminate a toolkit to assist emergency departments with the implementation of family presence



Implementing Best Practice

- ❑ Ask – assess culture, barriers, and feasibility
- ❑ Acquire – collect evidence, national guidelines
- ❑ Appraise – evaluate existing research, conduct site surveys
- ❑ Apply – develop policies & procedures, educate
- ❑ Analyze – study process and outcomes
- ❑ Adopt/Adapt – sustained practice, sharing of best practices

Flemming, 1998



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**EMS for Children Opportunities to
Enhance Pediatric Emergency Care through
Trauma Performance Improvement**
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September 27, 2013