Eastern Association for the Surgery of Trauma

Sunrise Session 03
Oh No an Injured Child!
How Can We Be More Prepared & Who Needs to Be Transferred?

January 15, 2014
Waldorf Astoria Naples
Naples, Florida
Limitations to providing Pediatric Trauma Care

- Pediatric Surgeon Availability
  - Indianapolis
  - Ft. Wayne
  - Only 1125 in the US

- Geography
  - Serve IN, KY, IL
  - Rural access to pediatric care

St. Mary’s Level II Trauma Center

- 391 bed hospital
- 65,000 ED visits
  - 12,000 pediatric visits
- 23 bed Pediatric unit
- 7 bed PICU
  - 2 Intensivists
  - 2 Hospitalists
  - 0 Pediatric general or subspecialty surgeons

Challenges to Providing Pediatric Trauma Care

- ACS-COT change in requirements to be a Level II Pediatric Trauma Center
  - Must have full time pediatric surgeon

- How can Trauma Centers achieve Pediatric Trauma Center verification with adult trauma surgeons?

- Aligning with a Pediatric Trauma Center renowned for clinical expertise and outcomes
Limitations to a collaborative approach

- Geography
- Community barriers: educating staff and families on why we chose CCHMC
- Cost

Pediatric Trauma Care in the Rural Community

- Organizing pediatric trauma care within a region
- Know capabilities and resources available in your institution
- Participate in your regional trauma system with leadership from Level I and Level II trauma centers

Rural Trauma Care in Indiana

- Indiana has more miles of interstate highway per square mile than any other state.
- Indiana’s 92 counties ranging from 2,171 per square mile to fewer than 25 per square mile.
- Rural trauma and the required transportation of trauma patients is a **significant challenge** in portions of Indiana and across the Tri-State region
Limitations: Adult Surgeons Caring for Kids

How to get buy in from physicians?
– CME requirements
– Pediatric sub-speciality needs
– Comfort level with the pediatric patient
– Knowledge of protocols
– Family/Caregiver dynamics

Pediatric trauma care in the rural community

• How to organize pediatric trauma care within a region using a collaborative approach
• Regional – Indiana Region 10
  • All hospitals and pre-hospital services within a geographical region develop transfer agreements and protocols to guarantee rapid flow of injured children
  • Pediatric trauma care can be facilitated from outside the region

Building a regional trauma system plan

• Goal: improve quality of pediatric care in the rural community by developing a timely, organized, rational response to the care of the pediatric trauma patient
• Performance Improvement
  • Formal feedback process with your referring center
  • Collaborative approach
    • Open communication
• Education
• Web conferencing
  • Benefit of visual/virtual interaction
Building a regional trauma system plan
- Real time clinical questions

Improving Pediatric Trauma Care
- Increasing quality and improved outcomes with this model
  - Solid organ injury
  - Radiographic imaging
  - Activation Response Team/Communication model
  - Child Protection Team

Improving pediatric trauma care
- Future of trauma care requires the development of regional, state and national trauma system plans specific to the pediatric population
Conclusion

- Why does it work?
- Pediatric trauma care can be facilitated from outside the region
- Collaboration results in increased quality and improved care with this model

Pediatric RTTDC
Collaborative approaches to improving pediatric injury care: Telemedicine and Beyond

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Associate Professor of Surgery
Director, Trauma Services

Objectives

- Access to Pediatric Trauma Centers
- Telemedicine roles and benefits
- Collaborative partnerships

Do children have access to trauma care?
Where are injured children in the U.S. going for their care?

It is estimated 13% of the injured children are treated at a hospital with trauma credentialing.

Approximately 11% of the injured children are treated at a free-standing verified pediatric trauma center.
The Use of Telemedicine for Children Presenting to Remote Emergency Departments

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What is Telemedicine?
• Interactive health care over distance using telecommunications technology
  • Live-interactive (synchronous)
  • Store-and-forward (asynchronous)
  • Remote patient monitoring (RPM)

Telemedicine in the ED
Initial experiences and outcomes of telepresence in the management of trauma and emergency surgical patients
Rifat Latifi, M.D., M.H.S., George J. Hadeed, M.P.H., Peter Rhee, M.D., Terrence O’Keeffe, M.D., Randall S. Frese, M.D., Julie L. Wynne, M.D., Michelle L. Ziemba, R.N., Dan Judkins, R.N.

Using robotic telecommunications to triage pediatric disaster victims
Rita V. Burke, Bridget M. Berg, Paul Vee, Inge Morton, Alan Nager, Robert Neeches, Randall Wetzen, Jeffrey S. Upperman
Cost Savings & Effectiveness

- The mean cost for a telemedicine consultation:
  - $2,096/child/ED/year
- 31% lower transfer rate among similarly ill children receiving telemedicine compared to telephone consults
- Telemedicine consultations cost-saving
- Assuming 10 seriously ill children/year receiving telemedicine results in cost-savings of $38,366/year
- For every dollar invested in the telemedicine program, society saved twelve dollars
Large free-standing pediatric hospital - urban area
- > 500 beds
- > 13,800 employees
- Many medical specialists available in region
- Began Trauma Center in 1989
- Verified since 1993
- 1800 injury admissions a year
- 22 staff and 3 core surgeons

American College of Surgeon Committee on Trauma Changes
- 2006 New edition released
- No longer allowed “added qualifications in pediatrics”
- Required participation of a pediatric surgeon to qualify

Goals of Collaborative Partnership
- Support hospitals committed to improving the care of injured children in their regions
- Help provide high quality of care in regions of need to reduce the need to transfer patients away from their families and support systems
Customizable Components

Participation in monthly performance improvement meetings

- Review of cases identified by participating hospitals
- Video conference participation in monthly multidisciplinary team meetings
- Identification of improvement opportunities and sharing of resources

Guideline development and support

All current trauma guidelines are made available to collaborative partners
Specific needs of individual partners are reviewed and support provided in developing and reviewing new guidelines
Pediatric trauma focused CME/CEU

Quarterly trauma lecture series available online for pediatric trauma CME/CEU

Comprehensive Children’s Injury Center monthly lecture series available online

CME/CEU provided for performance improvement meetings

Pediatric trauma simulation training

- Multidisciplinary trauma team training
- Scenarios based on real cases
- Video based debriefing

24/7 availability for phone consultation

Pediatric Trauma Surgeons are available for immediate phone consultation regarding the care of an injured child
Support for trauma center verification process

• Collaboration with individuals who have extensive experience with the ACS review process during preparation
• Mock reviews
• Participation on site on day of review

Peer to Peer Support

• Physician and nurse shadowing opportunities
• Registrar expertise support
• Program Manager collaboration
• Pediatric Trauma Nurse Practitioner

Outcomes
**ACS Verification**

- St. Mary’s Hospital in Evansville, IN successfully verified twice as Level II Pediatric Trauma Center
  - First under new rules without an on-site pediatric surgeon
- Parkview Hospital in Fort Wayne, IN verified as Level II Pediatric Trauma Center
- Sanford Hospital in Fargo, ND beginning verification process since starting collaboration

Both verified sites had the PTTC listed as one of the key strengths of their program

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**Improvement Initiatives**

- Image/radiation reduction
- Cervical Spine clearance
- Non-accidental trauma evaluation process
- Safe transport checklists for children
- Trauma team notification system to include pediatric critical care physician
- Pediatric trauma outreach/follow-up

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**Solid Organ Management**

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Future Steps

• Expand the number of partners
• Increase collaborative learning opportunities across centers
• Increase the quality and benchmark metrics across sites to improve care and patient safety
• Grow emergency pediatric care component of the collaborative program

Thank You!
PEDIATRIC TRAUMA TRANSFER

Resources, Guidelines, Pathways and Surge

I. Goal:
Guide the expedient and appropriate inter-facility transfer of pediatric patients from the first facility providing care to definitive care at a hospital with pediatric trauma care resources.

II. Definition:
A pediatric patient is anyone who has not reached their 15th birthday or anyone with an injury requiring specific pediatric expertise.

III. Criteria for Appropriate/Recommended Transfer:
Physiologic Criteria (as referenced in the ATLS manual and curricula)
1. Decreased or deteriorating neurologic status
   - GCS < 14
2. Respiratory distress or failure
3. Endotracheal intubation and/or ventilatory support and children requiring anesthesia
4. Shock of any type, compensated or uncompensated
5. Injuries requiring blood transfusion
6. Care requiring any one of the following:
   a. Invasive monitoring (arterial and/or central venous pressure)
   b. Intracranial pressure monitoring
   c. Vasoactive medications

Anatomic Criteria
1. Fractures and penetrating injuries to an extremity which may be complicated by neurovascular and/or compartment injury
2. Fracture of two or more long bones (femur, humerus, tibia/fibula)
3. Suspected injury to the axial skeleton or spinal cord
4. Traumatic amputation and crush injuries
5. Significant head injury with any of the following after assessment and documentation: (Choose one problem, plus imaging studies, per protocol)
   a. Skull fracture with associated intracranial injury
   b. Subarachnoid hemorrhage
   c. Sagittal sinus injury
   d. Any level of intracranial abnormality e.g. SAH, ICH
   e. Increased ICP on monitoring
   f. Intracranial blood on imaging
Opportunities

• Children are not little adults
• Good – many pediatric trauma patients are not even cared for at trauma centers
• Better – adult trauma centers are required to care for a minimum number of pediatric patients in order to be designated for pediatric care
• Best – a pediatric trauma center
• Establish transfer agreements in advance
Disaster Surge

- Same basic principles apply
- You may need to treat patients longer
- Send most in need of pediatric expertise first
- Review resources in advance
- One size does not fit all in pediatrics

Summary

- Know your resources
- Know what you and your staff are comfortable with
- Please do not perform diagnostic studies unless you are treating at your facility
  - Less radiation at pediatric centers
- Remember collaboration
  - Telemedicine
  - Critical care team assessment
  - Collaborative arrangements