Pediatric TQiP: Development and Roll out

Trauma Quality Improvement Program (TQiP) Annual Scientific Meeting and Training 2012/3
Michael L. Nance, MD, FACS
Why do we need a pediatric version of TQIP?

Are kids really that different?
It is why kids die
Case Fatality Rate Differs
Mechanisms Differ

NTDB Annual Report 2012
>100,000 pediatric patients—nearly 15% of NTDB
Why do we need a pediatric version of TQIP?

• Kids die too
• Circumstances differ
• Morbidity different
• Mortality different
• Current TQIP specifically excludes children
And, studies have demonstrated that...

- Care differs
- Outcomes differ
- Most treatment not at (pediatric) Trauma Centers

None of the studies risk-adjusted!
Initial Steps

• Develop a coalition of the willing
• 12 centers caring for children
• 6 combined adult/peds centers and 6 stand-alone peds centers
• Queried centers for recommendations for outcome measures appropriate for the pediatric trauma population
• Meeting of pilot centers and interested parties at ACS-COT 9/2011
• Follow-up meeting ACS-COT 3/2012
• Methodologic meetings at ACS 6/2012 and 8/2012
Outcome Indicator Recommendations for Pilot Pediatric TQIP Indicators:

**Injury**
- Severe TBI
- Orthopedic injuries
- Blunt/penetrating
- SOI (isolated/multiple)
- MTBI
- Abuse

**Intervention**
- ICP monitor
- Fx management
- Angiogram
- Radiation exposure
- Vascular access
- Failed non-op management
Outcome Indicator Recommendations for Pilot Pediatric TQIP Indicators:

**Physiology**
- Shock
- High ISS/AIS
- Low GCS

**Systems**
- Surgeon presence in resuscitation
- Time for transfer patients
- Time in ED
- Time to OR/procedures

**Complications**
- DVT/PE
- Compartment syndrome
- Airway issues
- Medication errors
- Surgical site infection
Variables of interest for pilot

- TBI
- Management of SOI (spleen)
Potential Variables of interest

- Imaging
- Delayed OR need
- Time to OR for definitive fx care or other orthopedic variable
- Height and weight (BMI), coming in 2013
- Control for/ study child abuse
- Other?
Inclusion/exclusion criteria

Center level criteria:
• Level I or II ACS verified or state designated trauma centers in NTDB. The trauma level of center is first determined according to ACS verification then by state designation.
• For trauma centers outside US, its level will be determined using the information from the corresponding government/health authority.
• Must be on list of selected pediatric pilot centers

Patient level criteria:
• Age ≤18 years
• At least one valid trauma ICD-9 code in the range of 800–959.9, excluding late effects (905-909.9), superficial injuries (910-924.9), and foreign bodies (930-939.9).
• Trauma type of blunt or penetrating.
• Injured patients with at least one AIS ≥ 2 in body regions 1 – 8*
• ED discharge disposition AND hospital discharge disposition cannot both be unknown.
• Exclude patients with ED discharge disposition of home, home with services, transfer to another hospital.
• Exclude patients with pre-existing advanced directive to withhold life sustaining interventions

• *AIS crosswalk version 98 was used when available otherwise the ICD9 map was used to calculate the AIS score.

More inclusive rather than less
Methodology issues

• Need to modify risk-adjustment model
  • Age (group by developmental status?)
  • Mechanism
  • BP (create z score and report deviation from z)
  • HR (create z score and report deviation from z)
  • RR (create z score and report deviation from z)
  • Impact of comorbid disease
• Limited “N”
  • Added additional centers (total 38)
  • Analyzed 2-year window (2010 and 2011) of data
Challenges

• How to deal with age cut off at different centers
• How to define shock
• How to deal with DOA
• Child abuse
• Low rate of comorbidities and complications
• Smaller “N” for pediatric cohort
Complications

- Intracranial pressure
- Extremity compartment syndrome
- Coagulopathy
- Unplanned intubation
- Decubitus ulcer
- Bleeding
- Systemic sepsis
- Cardiac arrest with CPR
- DVT/thrombophlebitis
- Drug/alcohol withdrawal
- Acute renal failure
- Base deficit
- ARDS
- Pneumonia

Frequency (%)

Complication

2010 Dataset

Pediatric
Adult

Frequency (%)
Next steps… data quality check

• Review complications coding and mapping
  • Possibly under reporting of complications
  • Are definitions followed?

• Are procedures captured in the registry per NTDS instructions?
  • Are procedures reported with ICD9 codes?
  • Check on coding/mapping for tracheostomy and ICP monitoring
Program roll out

• Reviewing NTDS for Pediatric needs
  • Complications and comorbs
  • Additional pediatric fields?
  • Child abuse
• Planning for program implementation of full program in 2014
• Fee structure likely similar to adult TQIP ($9,000) with potential discount ($4,500) to institutions with both peds and adult
Program Roll Out

- Pediatric TQIP Work Group ongoing
- Released first pilot report October 2012
  - Combined 2010 and 2011 admission year data
- Web conference about report to come in early 2013
  - Questions
  - Feedback
- Assess need for and content of 2nd pilot report
Participating Centers

Akron Children's Hospital
Alfred I. DuPont Hospital for Children
Arkansas Children's Hospital
C. S. Mott Children's Hospital
Cardinal Glennon Children's Medical Center
Children's Hospital Boston
Children's Hospital Los Angeles
Children's Hospital of Atlanta at Egleston
Children's Hospital of Atlanta at Scottish Rite
Children's Hospital of Michigan
Children's Hospital of Pittsburgh of UPMC
Children's Hospital Of Wisconsin
Children's Mercy Hospital
Children's National Medical Center
Cincinnati Children's Hospital Medical Center
Cook Children's Medical Center
Dayton Children's Medical Center
Dell Children's Medical Center of Central Texas
Floating Hospital at Tufts Medical Center
Harborview Medical Center
Helen DeVos Children's Hospital
J.H. Stroger, Jr. Hospital of Cook County
Johns Hopkins Pediatric Trauma Center
LeBonheur Children's Hospital
Memorial Hermann Hospital
Nationwide Children's Hospital
NSLIJHS-Cohen Children's Medical Center of NY
Phoenix Children's Hospital
Rady Children's Hospital
St. Christopher's Hospital for Children
St. Mary's Hospital - Mayo
The Children's Hospital
The Children's Hospital of Philadelphia
University Of California Davis Medical Center
University of Chicago Comer Children's Hospital
University of Mississippi Medical Center
University of North Carolina
Wake Forest University Baptist Medical Center
If interested in participating…

If you have suggestions for variables of interest…

• Contact TQIP staff at TQIP@facs.org
• Contact Michael Nance at nance@email.chop.edu