The Trauma Quality Improvement Program (TQIP)
Pennsylvania Collaborative

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Objectives

• TQIP overview and updates
• Getting the most out of a collaborative
• Pennsylvania Collaborative
  • Updates
  • Benchmark Report Review
• Collaborative Drilldown
ACS TQIP

Valid, Reliable, Standardized Data

Monitor Performance

Risk-Adjusted Performance Measurement

Promote Structures and Processes of High Performers

Confidential Feedback to Trauma Centers

Explore variability to identify best practices
## TQIP Components

| Risk adjusted inter hospital comparisons: | • Semi-annual TQIP risk adjusted benchmark reports  
• Online data analysis tool to drill down into your own TQIP data, obtain patient lists |
| --- | --- |
| Education and training: | • Annual meeting  
• Online training  
• Monthly educational experiences for abstractors  
• Regular Q & A webinars |
| Enhanced data quality: | • Contemporary data collection processes  
• Data quality reporting and quarterly submissions  
• TQIP Validator |
| Sharing best practices: | • Annual meeting, abstracts  
• Collaboratives  
• Best Practice Guidelines |
## Hospital Participation

<table>
<thead>
<tr>
<th>Type of Center</th>
<th>Number of Enrolled Centers*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult Only (LI &amp; LII) Centers</td>
<td>364</td>
</tr>
<tr>
<td>Peds Only Centers</td>
<td>37</td>
</tr>
<tr>
<td>Combined Centers</td>
<td>76</td>
</tr>
<tr>
<td>Level III Centers</td>
<td>73</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>550</strong></td>
</tr>
</tbody>
</table>

*As of 10/10/2016
ACS Registries Project
Press release: March 4, 2016

Quintiles and the American College of Surgeons Announce Agreement to Develop Clinical Registry of the Future

ACS selects Quintiles to combine multiple patient outcomes registries to provide surgeons with robust clinical and quality measures across practice areas to improve the quality of surgical care.

NEWS FROM THE AMERICAN COLLEGE OF SURGEONS AND QUINTILES | FOR IMMEDIATE RELEASE

• New dashboard
• Data integration across ACS programs
• Data extraction from EMR
Aptify-Quintiles Data Integration

Verification
TQIP
NTDB
Collaboratives
(NSQIP, etc.)

Permissions
-who has access to what data?

- Report posting
- Business intelligence tools
- Data export to PRQ
- Data export to Surgeon-specific Registry

Aptify

Quintiles
Level III Program

• Pilot completed
• Several processes and outcomes of care as in Level 1 and 2 report
• Selected modifications to address unique challenges
  • Early resuscitation
  • Transfer process – timely decision making
  • Admitted vs transferred
  • Delayed transfers (e.g. >24 hrs)
Pediatrics

• Remove complications and co-morbid conditions which are not relevant to pediatrics, add those that are relevant
• Add process measure tables
• Increase focus on the identification and treatment of abuse
• Explore long-term outcomes
• Explore length of stay modeling
Preventable Death Reporting System

Classifying errors in preventable and potentially preventable trauma deaths: a 9-year review using the Joint Commission’s standardized methodology

Sandra M. Vioque, M.D.\textsuperscript{a}, Patrick K. Kim, M.D., F.A.C.S.\textsuperscript{b}, Janet McMaster, M.H.S.A., R.N.\textsuperscript{b}, John Gallagher, M.S.N., C.C.N.S., C.C.R.N.\textsuperscript{b}, Steven R. Allen, M.D., F.A.C.S.\textsuperscript{b}, Daniel N. Holena, M.D., F.A.C.S.\textsuperscript{b}, Patrick M. Reilly, M.D., F.A.C.S.\textsuperscript{b}, Jose L. Pascual, M.D., Ph.D., F.R.C.S(C)., F.A.C.S.\textsuperscript{b,}*
Preventable Death Reporting System

• We all see a small number of deaths that we deem preventable
• Patterns and opportunities for improvement difficult to identify at the center level
• Can we use the combined experience of TQIP centers to identify patterns and design interventions to reduce preventable deaths?
Preventable Death Reporting System

Data collection instrument developed to provide the foundation for the PDRS

Next steps include:

- Instrument review by TQIP participants
- Formal pilot including data collection
- Eventual inclusion OR linkage to registry data
ACS TQIP

Valid, Reliable, Standardized Data

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Confidential Feedback to Trauma Centers

Explore variability to identify best practices
Midshaft femur # - Timing of fixation
Orthopaedic Trauma Association, Oct 2016

• 19,732 patients over >250 centers; median time to fixation 14 hrs;
• Matched cohort design: fixation <=24 hrs vs >24 hrs
Midshaft femur # - Timing of fixation
Orthopaedic Trauma Association, Oct 2016

• Patients who underwent early fixation had:
  • 42% lower risk of PE & 32% lower risk of DVT
  • 36% lower risk of pneumonia
  • 29% lower risk of ALI
  • 42% lower risk of Decubitus ulcer
  • Fewer ventilator days, days in ICU and LOS
  • No change in mortality
Exploring variability has taught us that:

• Early tracheostomy in patients with severe TBI is associated with fewer ventilator days, shorter ICU and hospital LOS
• Centers with higher use of ICP monitors have better outcomes in severe TBI – it’s not the monitor but the protocols and order sets
• Safe to begin VTE prophylaxis in “most” patients with TBI within 48 hrs
• LMWH is associated with lower risk of PE compared to UH
• Withdrawal of life sustaining care consistent with patients’ goals and preferences does not increase mortality
Making the best of the TQIP database

• Defining a research agenda for TQIP
• Survey (Delphi-like) methodology to get input from the broader trauma community
• Where are the gaps in our knowledge that can be addressed using TQIP data?
• What data needs to be captured?
TQIP Best Practice Guidelines

- End of life care (2016)
- Imaging with large focus on pediatrics (2017)
Collaboratives

Current: Georgia, Michigan, Florida, Pennsylvania, Texas
In-process: California, LA County, HCA, North Carolina
Expressed interest: Arkansas, several CA counties, Canada, COT Region III, DoD, D.C., Kansas, New York, Ohio, Wisconsin, Nebraska, Maine, Utah
Collaborative Reporting

- Provided in the Spring and Fall every year
- Focusing on Adult I/II hospitals
- Structure of the Collaborative Report mirrors the hospital reports
- Access to the TQIP Driller for your Collaborative
  - Collaborative as a comparison group
Collaborative reports allow you to answer important questions

- What can we as a collaborative work on together?
  - Collaborative hospitals aggregated together and compared to the rest of TQIP
- What can I as a hospital learn from others in my collaborative? What successes should I share?
  - Hospitals compared to each other in the collaborative
ACS Communities for Collaboratives

- An online communications and document sharing platform
- Collaboratives can share:
  - Documents and resources (e.g. membership expectations, best practices, meeting minutes)
  - Announcements on meetings, events, deadlines
  - Opportunity for ongoing discussion and networking
  - Pilot test with Pennsylvania Collaborative then open to other Collaboratives
Before diving in....
We Learn from You

• Focus groups at ACS clinical congress (Chicago, 2015), TQIP annual meeting (Nashville, 2015) and STN (Anaheim, 2016)

• Goals
  • To understand how TQIP centers use performance data and benchmarking reports for improvement
  • To identify opportunities to improve the delivery of performance data to TQIP centers
Hospitals use TQIP for

- Tighter integration with hospital wide PI processes
- Promotion of data-driven PI initiatives
- Positive reinforcement
- Refine data collection
- Access institutional resources
- Influence practice change
- Implementation of Best Practices
  - Geriatric, MTP, TBI, Orthopaedic (co-branding)
Box plots or caterpillar plots?

• Just when I got comfy with the caterpillar graph you all changed it and now --- I kind of liked it, but I had a heck of a time explaining it to people not in this group. And somebody always asked the question about those darn caterpillar graphs that I couldn’t answer... So for our use of the graphs, the current charts that you guys have are much better
Box plots or caterpillar plots?

• I’m going to tell you, as a new center we’ve only had three reports. And the first time, I thought I was reading a foreign language. I was, like, “What? Okay, green, that’s good, black ...” And then, you know, I got with our NSQIP person and she’s like, “Well, if the lines are shorter, it means this. If they’re longer, it means ...” and I’m like, “What?” I don’t even..”
Drill-Down Tools

• Yeah, it’s really awesome. You get your patient population, you download it into an Excel and away you go.

• I’m working in it and I think I understand it, until I’m about thirty to forty five minutes into looking at it and then – in all honesty, and then at that point I’m like oh my god, I’m confused, I thought I understood this. Well, I guess I don’t
PA TQIP

- Pennsylvania trauma centers:
  - Adult (L I/II): 28 (23, 20 w signed addendum; 4 in process)
  - Pediatrics (L I/II): 6 (3 combined with adult) – all in
  - Level III: 2 (1 in process)
  - Level IV: 5
- Fall 2016 TQIP Benchmark Report
  - 11 hospitals eligible as a part of the PA Collaborative; more in future reports as hospitals enroll
Risk-Adjusted Mortality by Cohort
TQIP Report ID: Pennsylvania

Decile

2  2  6  2  3  1  5  1

All  Blunt multisystem  Penetrating  Shock  Severe TBI  Elderly  Elderly blunt multisystem  Hip fracture

Odds Ratio (OR)

0.73  0.82  1.02  0.89  0.81  0.67  1.0  0.87
Risk-Adjusted Specific Complications
TQIP Report ID: Pennsylvania

Decile

<table>
<thead>
<tr>
<th>Decile</th>
<th>Odds Ratio</th>
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</thead>
<tbody>
<tr>
<td>2</td>
<td>0.56</td>
</tr>
<tr>
<td>6</td>
<td>0.99</td>
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<tr>
<td>4</td>
<td>0.87</td>
</tr>
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<td>1</td>
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</tr>
<tr>
<td>5</td>
<td>0.9</td>
</tr>
<tr>
<td>5</td>
<td>1.04</td>
</tr>
</tbody>
</table>

Conditions: AKI, AKI shock, Pneumonia, Pneumonia-severe TBI, PE, SSI, Unplanned ICU admit, Unplanned return to OR, UTI.
Pennsylvania Hospital Odds Ratios by Cohort and Outcome

- Acute Kidney Injury in All Patients
- Acute Kidney Injury in Shock
- Pneumonia/VAP in All Patients
- Pneumonia/VAP in Severe TBI
Using the Collaborative Report

- If the system is performing well, are there individual centers with opportunities for improvement
  - Ask your colleagues for help
- Examine variance in hospital performance to guide focus
  - If all hospitals share similar outcomes, then collaborative-wide deviations from overall TQIP performance should receive most of the attention
Patient Drill Down

- TQIP provides the Patient Listing Application, currently accessible from the NTDB Data Center
  - This application contains all of the patient-level information which was used to generate your report
  - Data can be exported and explored in Excel or within the application itself
  - Data is contained in reporting cycles
  - This tool can be used to identify patients which had an unexpected outcome therefore contributing to hospital benchmarking status (e.g. outlier status)
Patient Listing Application (PLA)

The three Outcome filters represent raw outcomes and not model inclusion.
Who had Unexpected Outcomes?

• The TQIP Patient Listing Application provides the probability of an outcome occurring within a cohort for each patient

• Patients which have a low probability of outcome (e.g. mortality) but had the outcome occur (i.e. died) would have unexpected negative outcomes

• Patient who had a high probability of outcome (e.g. mortality) but did not have the outcome occur (i.e. did not die) would have unexpected positive outcomes
Who had Unexpected Outcomes?

• The appropriate threshold for an expected probability of an outcome is subjective and depends on cohort
  • Broadly and conservatively, a death with a probability of less than 30% would be unexpected
• These are the individual patients which are most useful to explore
What Next?

• Is the data that TQIP uses for risk-adjustment accurate?
  • If TQIP does not have appropriate data, then we cannot appropriately assess risk
    • E.g. a 72 year old patient entered as a 27 year old patient will likely show up as having a lower risk of mortality

• Do you think there is something that TQIP does not account for in their models?
  • If so, please let us know and we can consider improvements
What Next?

• Was there a clinical issue with the treatment of this patient?
  • If the data looks good, it is possible that TQIP flagged this patient as unexpected because of an issue or strength with or about care?

• Model applicability
  • Few patients are marked as unexpected as a product of the model, but not directly related to data quality or clinical care
Collaborative Drill-Down Exercise

• Activity for Collaboratives to manage self-directed drill-down of systems level outcomes at the constituent hospital level
Collaborative Drill-Down Exercise

Your Collaborative has been identified as a [low; high] outlier for the following outcome in the following cohort, as presented in the [Spring 2016 TQIP Benchmark Report; Fall 2016 TQIP Benchmark Report]:

[Outcome] in the [Cohort] cohort (e.g. Mortality in the sTBI cohort)

As a result, we are asking that all of our participating centers complete the following worksheet to help identify potential causes for this status. When complete, or if you have any questions regarding this process, please email TQIP at TQIP@facs.org as they will be responsible for analyzing the data and aggregating the information into a summary report.

<table>
<thead>
<tr>
<th></th>
<th>TQIP Report ID:</th>
<th>[1-4 digit #]</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>What is your hospital’s outlier status for the model as indicated above? This can be found in the 9th column of Table 2 on page 5.</td>
<td>[Non-outlier, High, Low]</td>
</tr>
<tr>
<td>C</td>
<td>How many patients met cohort criteria for the model as indicated above? This can be found in the 2nd column of Table 2 on page 5.</td>
<td>[N]</td>
</tr>
<tr>
<td>D</td>
<td>How many of your patients in row C had an adverse outcome occur? [E.g. number of patients in the sTBI cohort who died]. This can be found in the 3rd column of Table 2 page 5.</td>
<td>[N]</td>
</tr>
<tr>
<td>E</td>
<td>How many of your patients in row C had a favorable outcome? [E.g. number of patients in the sTBI cohort who lived]. This can</td>
<td>[N]</td>
</tr>
</tbody>
</table>
Lived vs. Died
- Lived: 1070 (82%)
- Died: 235 (18%)

Expected vs. Unexpected Deaths
- Expected: 187 (80%)
- Unexpected: 48 (20%)

Unexpected Death Categorization
- Unexpected: 19 (40%)
- Expected: 24 (50%)
- Uncategorized: 5 (10%)

Data
- Data: Blue
- Clinical: Orange
- Uncategorized: Red
TQIP Driller

• Available from the NTDB Data Center
• PTSF Collaborative account shows Collaborative vs. the nation
  • PTSF hospital accounts are able to change compare group between PTSF Collaborative and the nation
• Will be updated and improved with Quintiles – share your suggestions!
Share Your Findings!

• If you’re great – celebrate it locally
  • Being a low (good) outlier is also worth exploration
    • What are you doing that makes a difference?
  • Share good performance with your team!
• Share performance within Collaborative
• Share it nationally
  • TQIP Annual Meeting – contribute to the library of PI activities
• Many high outliers have enacted change
  • We can connect you
  • ...or turn to your neighbors
  • Progress is about process and time
Demonstrations

• Ryan and I will be available during lunch to provide individual demonstrations of using the PLA for drill-down
• Snack donations accepted
Thank you!

For more information:
Contact TQIP at tqip@facs.org
Questions and Discussion
TQIP Annual Meeting
November 5-7, 2016 in Orlando, FL

• Preconference workshops in coding and reimbursement (November 3rd-4th)
• Parallels sessions for experts/beginners
• Sessions for Level III TQIP and TQIP Collaboratives
• Best practices on palliative/end of life care
• New Brain Trauma Foundation guidelines (V4)
• Keynote speaker: Wayne Meredith, MD, FACS