Using Benchmarked Data to Improve Care and Outcomes in the Severely Brain Injured

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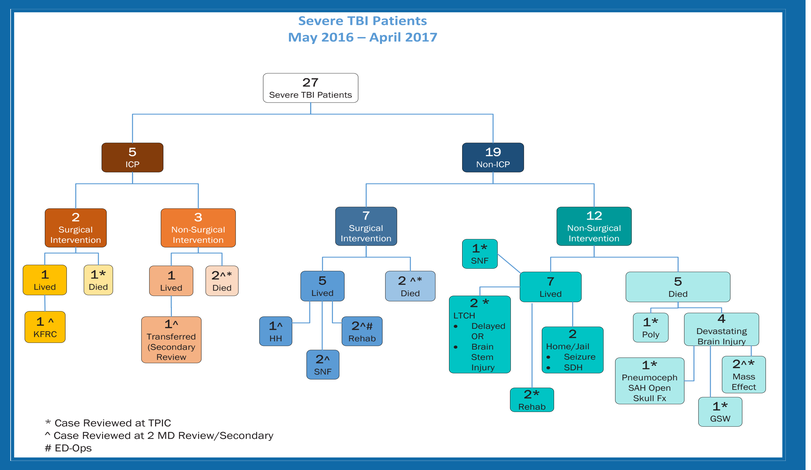
VACAVILLE MEDICAL CENTER
Level II Trauma Center

Patient - End of November 2017

Patient - End of March 2018
with Trauma Medical Director and PM&R Physician

According to the American College of Surgeons Committee on Trauma (ASCOT) "trauma programs should seek to reduce unnecessary variation in the care they provide" (American College of Surgeons, 2014, p.114). One method to monitor the care is through clinical practice guidelines (CPG). Programs must monitor CPGs for compliance and patient outcomes. We identified an opportunity via the Trauma Quality Improvement Program (TQIP) report 2016 (Spring and Fall) and 2017 (Spring) within the Severe Traumatic Brain Injured (TBI) cohort. We had higher than expected complications, mortality, vent days, and length of stay. In addition, while preparing for our 2017 Re-verification visit we were concerned at the low percentage of severe TBI patients that received intra-cranial pressure (ICP) monitoring. In the reporting period we had 24 patients with only a 21% rate of ICP monitoring. Our Neurosurgical Liaison assisted us in developing a concept map showing the rationale behind those receiving vs not receiving ICP monitoring. We identified and developed a process to evaluate severe TBI care and outcomes.

For our 2017 survey preparation we used a concept map to illustrate: the surgical interventions, invasive monitoring, outcomes and level of case review for all severe TBI patients in the reporting period. We suggest using this system to organize special populations in the pre-review questionnaire (PRQ) especially for TBI.



We found it helpful to include all key players in development of the severe TBI CPG. We used our CPG to determine key items to review on our user-friendly review tool (as part of the primary case review), providing a means to electronically review and upload into the registry. It is important to remember that you cannot review everything and every aspect of the patient's care and outcomes. Identify a few focus areas at first. We focused on ICP monitoring, VTE prophylaxis, Trach and PEG timing. Next steps will be to see how we can decrease our ventilator days, our ICU length of stay, and our overall length of stay. While not outliers there are opportunities to improve and get the severe TBI patients to the next phase of their recovery through providing optimal care.

Accurate data entry, concurrent review of severe TBI patients, and a collaborative approach led to improvement across the board in our TQIP report Fall 2017.

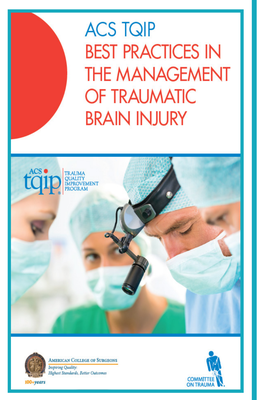
A standardized approach to case review decreases variability, optimizing care and ultimately the outcomes of the severely brain injured patient. All trauma centers should be evaluating the quality and outcomes for severe TBI patients. Easy to use severe TBI review tools that can be completed electronically and uploaded to the registry for easy retrieval allow for simplified processes for PIPS review and survey readiness. The Society of Trauma Nurses' (STN) Trauma Outcomes and Performance Improvement Course (TOPIC) state the goals of the PIPS process are to
1) Reduce variability in trauma care thus improving outcomes and decreasing costs.
2) Develop data elements to measure processes of care
3) Standardize care management via trauma centers nationally and
4) Implement uniform defined audit filters and universally accepted data definitions (2015, p. 73).

Our severe TBI project has met the STN's goal statement related to performance improvement efforts. All our cases that are reviewed in our Trauma Performance Improvement Committee are classified using the Joint Commission's (TJC) Event Safety Taxonomy and included in the trauma registry to assist in identifying trends and or variances in the care provided.

Other Level One and Level Two Trauma centers can optimize use of the trauma registry and TQIP benchmark data to drive performance improvement efforts. Adopt the use of a severe TBI tool using CPGs to drive their content and focus areas. Develop or personalize a severe TBI tool for your center. "A trauma center should provide, safe, efficient, and effective care to the injured patient" (American College of Surgeons, 2014, Chpt 16, p. 114). Limit the scope of what facility does in depth reviews on and narrow the focus to 1-5 CPG specific compliance metrics (Society of Trauma Nurses, 2015, p. 43).

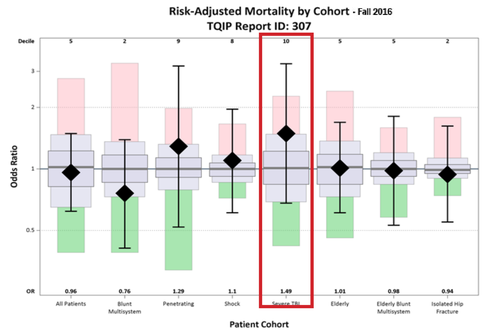
Resources

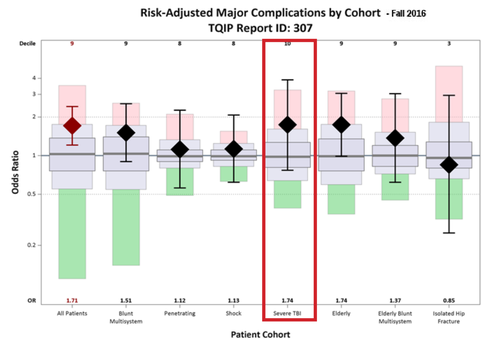
We needed:
1) Guidelines for management of severe TBI patients, we used the ACS TQIP Best Practices in Management of Traumatic Brain Injury and the Brain Trauma Foundation's Guidelines for Management of Severe TBI 4th Edition as our content references. (American College of Surgeons, TQIP, n.d., The Brain Trauma Foundation, 2016).
2) Primary reviews and focused reviews on severe TBI patients. We defined severe TBI as any patient arriving with Glasgow Coma Scale (GCS)<9 admitted to the ICU or OR. The primary review of cases that met inclusion as severe TBI patient was done by the Performance Improvement(PI) Coordinator.
3) Secondary review on all severe TBI patients. We use our performance improvement and patient safety (PIPS) plan that dictates the Trauma Medical Director or designee attends secondary review with the Trauma Program Director and PI Coordinator to determine next steps; **a)** case is closed, **b)** 2 MD review, c) Peer Review, and/or d) Systems Review. Under rare circumstances our PIPS plan indicates a quaternary review by the physician Quality committee.
4) High quality, accurate data. Our registrars abstract the medical records, clean and submit data to the National Trauma Data Bank and TQIP. Both the PI Coordinator and the Trauma Program Director assist in data validation. If re-education is needed it can be performed one on one or obtained from the TQIP Portal and via ACS or TQIP webinars.



Actions

First, we identified our opportunities by evaluating TQIP data using drill down capabilities on the TQIP website. Once we narrowed the scope to severe TBI patients we:
1) Collaboratively developed CPG with neuro and trauma surgeons vetting through appropriate committees.
2) Created a tool for review of severe TBI patients.
3) Performed concurrent review of severe TBI patients while in house for compliance with guidelines providing early opportunities to adjust or alter care if indicated. This was accomplished with trauma surgeon daily hand-off rounds, patient rounding by PI Coordinator and Trauma Program Director, daily multidisciplinary ICU rounds that include an ICU Clinical Nurse Specialist, and the use of our trauma registry.





KAISER PERMANENTE® Trauma Services Severe TBI Review

Name Click or tap here to enter text. **MRN:** Click or tap here to enter text. **TR#** Click or tap here to enter text. **Date of Arrival** Click or tap to enter a date. **Time of Arrival** Click or tap here to enter text. **Trauma Activation** ☐Yes ☐NO **Level of Activation** Choose an item. **GCS on Arrival** Choose an item. **Airway Secure if GCS<9** ☐Yes ☐NO
Pre-existing condition requiring anticoagulation ☐Yes ☐NO Click or tap here to enter text.
Transfusion ☐Yes ☐NO **TYPE** Choose an item. **#**Choose an item.
TYPE Choose an item. **#** Choose an item. **NO TYPE** Choose an item. **#** Choose an item.
KCENTRA ☐Yes ☐NO **Mannitol** ☐Yes ☐NO
Hypertonic Saline ☐Yes ☐NO
Evidence of *midline shift* ☐Yes ☐NO **Shift > 5mm with mass lesion** ☐Yes ☐NO
Trauma Surgeon Admit ☐Yes ☐NO **Surgeon:**
Neurosurgeon Consulted ☐Yes ☐NO Click or tap here to enter text.
Timely response ☐Yes ☐NO **Time called** Click or tap here to enter text. **Time arrived** Click or tap here to enter text.

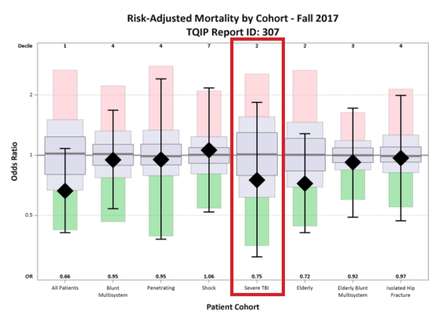
Ventriculostomy ☐Yes ☐ No Click or tap to enter a date. **If no** Click or tap here to enter text.
Camino Bolt ☐Yes ☐ No Click or tap to enter a date. **If no** Click or tap here to enter text.
CPP maintained >60 ☐Yes ☐ No Click or tap here to enter text.
ICP <22 ☐Yes ☐ No Click or tap to enter a date. **If no** Click or tap here to enter text.
HOB elevated ☐ Yes ☐ No **N+ 135-150** ☐ Yes ☐ No **Glucose 80-180** ☐ Yes ☐ No
Craniotomy ☐ Yes ☐ No Click or tap to enter a date.
Craniectomy ☐ Yes ☐ No Click or tap to enter a date.
Anti-seizure prophylaxis ☐ Yes ☐ No **DVT prophylaxis** ☐Yes ☐NO **IVC filter?** ☐Yes ☐NO
GI prophylaxis? ☐Yes ☐NO **Enteral nutrition 24-48 hrs?** ☐Yes ☐NO
PEG? ☐Yes ☐NO **Hospital day #** Click or tap here to enter text. **Trach?** ☐Yes ☐NO **Hospital day #** Click or tap here to enter text.
Complications Neuro ☐Yes ☐NO ☐ DI ☐ SIADH ☐ Storming ☐ Seizure Click or tap here to enter text.
Complications NTDB ☐Yes ☐NO ☐ARDS ☐ PE ☐ DVT ☐ VAP ☐ Other Click or tap here to enter

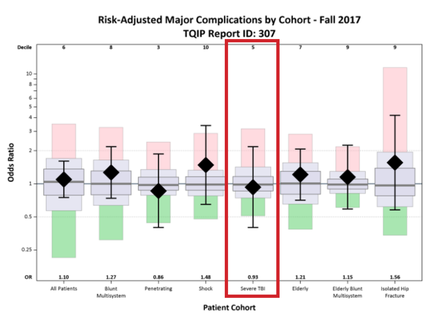
Outcome: ☐ Live **Glascow Outcome Scale:** Choose an item.
☐ Die ☐ Brain death declaration ☐ Palliation Click or tap to enter a date.
Donor? ☐Yes ☐NO
Notes: Click or tap here to enter text.

Initial Review By: Click or tap here to enter text. Click or tap to enter a date. **Secondary Review:** Click or tap to enter a date. TMD sign off? ☐Yes ☐NO **Date:** Click or tap to enter a date. 2MD Review ☐Yes ☐NO Click or tap to enter a date. TSR? ☐Yes ☐NO Click or tap to enter a date. TPIC? ☐Yes ☐NO Click or tap to enter a date.

Results

The improvements noted in our Spring versus Fall TQIP Benchmark demonstrated the arduous work by our team. In the risk adjusted mortality by cohort severe TBI we improved from the 10th decile to the second. We also lowered our risk adjusted major complications by cohort severe TBI improving from the 10th decile to the 5th.





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