The Michigan Trauma Quality Improvement Program

Ypsilanti, MI October 10, 2017



Disclosures

Salary Support for MTQIP from BCBSM/BCN

- Mark Hemmila
- Judy Mikhail
- Jill Jakubus
- Anne Cain-Nielsen

Evaluations

- Link will be emailed to you following meeting
- You have up to 7 days to submit
- Please answer the BCBSM questions
- Physicians/Nurses/Advanced Practitioners:
 - E-mail certificate for 3.75 Category 1 CME
- Registrars (Non-RN):
 - Certificates will be at registration table

Introductions

- Rachel N. Saunders, MD
 - Spectrum Health/Michigan State University General Surgery Residency
- Nick S. Adams, MD
 - Spectrum Health/Michigan State University Plastic Surgery Residency
 - Do Motorcycle Helmet Laws Affect Craniomaxillofacial injuries?

Data Submission

- Data submitted August 4, 2017
 - Every 2 months
 - 3 week turnaround
- Next data submission

October 6, 2017

Future Meetings

- Winter
 - Tuesday February 13, 2018
 - Ypsilanti, EMU Marriott
- Spring (MCOT)
 - Wednesday May 16, 2018
 - Traverse City, Grand Traverse Resort
- Spring (Registrars and MCR's)
 - Tuesday June 5, 2017
 - Ann Arbor, TBD

MTQIP/MANS Neurosurgery Meeting

Spring 2018

- Friday June 8, 2018
- Crystal Mountain, MI
- 12n to 4p
- Suggestions
 - Topics
 - Planning

MTQIP/Orthopedic Surgery Meeting

Fall 2018

- Thursday October 11, 2018
- Ypsilanti, EMU Marriott
- Suggestions
 - Topics
 - Planning

MTQIP Data in Presentations

Judy Mikhail, PhD



Do Motorcycle Helmet Laws Affect Craniomaxillofacial injuries?

Nick S. Adams, MD



Do Motorcycle Helmet Laws Affect the Incidence of Craniomaxillofacial Injuries?

Nicholas S. Adams, MD¹

Patrick Newbury, BS²; Mitchell G. Eichhorn, MD¹; Alan T. Davis, PhD³; John W. Polley, MD^{1,4}; Robert J. Mann, MD^{1,4};

John A. Girotto, MD, MMA^{1,4}

1) Spectrum Health/MSU Plastic Surgery Residency, 2) Michigan State University, 3)GRMEP Research Department, 4)Helen DeVos Children's Hospital Pediatric Plastic and Craniofacial Surgery, Grand Rapids, Michigan

Institution







MICHIGAN STATE UNIVERSITY

College of Human Medicine

Disclosures

• The authors have no disclosures

Publication



PEDIATRIC/CRANIOFACIAL

The Effects of Motorcycle Helmet Legislation on Craniomaxillofacial Injuries

Nicholas S. Adams, M.D. Partick A. Newbury, B.S. Mitchell G. Eichhorn, M.D. Alan T. Davis, Ph.D. Robert J. Mann, M.D. John W. Polley, M.D. John A. Girotto, M.D., M.M.A.

Grand Rapids, Mich.

Background: Motorcycle helmet legislation has been a contentious topic for over a half-century. Benefits of helmet use in motorcycle trauma patients are well documented. In 2012, Michigan repealed its universal motorcycle helmet law in favor of a partial helmet law. The authors describe the early clinical effects on facial injuries throughout Michigan Methods: Retrospective data from the Michigan Trauma Quality Improvement Program trauma database were evaluated. Included were 4643 mo-

ment Program trauma database were evaluated, Included were 4043 motorcycle trauma patients presenting to 29 Level 1 and II trauma centers throughout Michigan 3 years before and after the law repeal (2009 to 2014). Demographics, external cause of injury codes, International Classification of Disease, Ninth Revision diagnosis codes, and injury details were gathered.

Results: The proportion of unhelmeted trauma patients increased from 20 percent to 44 percent. Compared with helmeted trauma patients, unhelmeted patients were nearly twice as likely to sustain craniomaxillofacial injuries (relative risk, 1.90), including fractures (relative risk, 2.02) and soft-issue injuries (relative risk, 1.94). Unhelmeted patients had a lower Glasgow Coma Scale score and higher Injury Severity Scores, Patients presenting after helmet law repeal were more likely to sustain craniomaxillofacial injuries (relative risk, 1.46), including fractures (relative risk, 1.283) and soft-tissue injuries (relative risk, 1.56). No significant differences were observed for age, sex, Injury Severity Score, or Glasgow Coma Scale score ($\rho > 0.05$).

Conclusions: This study highlights the significant negative impact of relaxed motorcycle helmet laws leading to an increase in craniomaxillofacial injuries. The authors urge state and national legislators to reestablish universal motorcycle helmet laws. (*Plast. Reconst. Surg.* 139: 1455, 2017.)

dorcyclists are 30 times more likely to die and five times more likely to be injured when compared mile for mile to passenshown to prevent nearly 40 percent of fatal injuries and 13 percent of nonfatal serious injuries.¹⁻³ However, as many as one-third of motorcycle riders still do not wear helmets, with a larger percentage riding unhelmeted in states without universal helmet laws.³ The effects of motorcycle helmet legislation on helmet use, patient injuries, and outcomes have been demonstrated.³⁶ However, few to no data are available evaluating the effects of motocycle helmet laws on craniomaxillofacial trauma. Complex facial injuries are common among

Complex facial injuries are common among motorcycle trauma patients and are over twice as

Disclosure: The authors have no financial interest to declare in relation to the content of this article.

From Grand Rapids Medical Education Partners, Michigan State University College of Human Medicine; and Spectrum Health Helen DeVos Children's Hospital. Received for publication August 24, 2016; accepted October 6, 2016.

(a) 2010, presented at the 55th annual Miduest Association of Plastic Surgeons meeting, in Chicago, Illinois, April 30, 2016; and at the 29th biennial Michigan Academy of Plastic Surgeons meeting, on Mackinac Island, Michigan, July 24 through 27, 2016.

Copyright © 2017 by the American Society of Plastic Surgeons DOI: 10.1097/PRS.000000000003370 A "Hot Topic Video" by Editor-in-Chief Rod J. Rohrich, M.D., accompanies this article. Go to PRSJournal.com and click on "Plastic Surgery

PRSJournal.com and click on "Plastic Surgery Hot Topics" in the "Digital Media" tab to watch. On the iPad, tap on the Hot Topics icon.

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Geographical breakdown

Country	Count	As %
United States	23	41%
Canada	3	5%
United Kingdom	2	4%
India	1	2%
Bolivia, Plurinational State of	1	2%
Spain	1	2%
Ireland	1	2%
Netherlands	1	2%
Australia	1	2%
Other	2	4%
Unknown	20	36%

Demographic breakdown

	Туре	Count	As %	
Members of the public		35	63%	
Practitioners (doctors, other health	ncare professionals)	16	29%	
Scientists		4	7%	
Science communicators (journalist	s, bloggers, editors)	1	2%	

Do Motorcycle Helmet Laws Affect the Incidence of Craniomaxillofacial Injuries?

Nicholas S. Adams, MD¹

Patrick Newbury, BS²; Mitchell G. Eichhorn, MD¹; Alan T. Davis, PhD³; John W. Polley, MD^{1,4}; Robert J. Mann, MD^{1,4};

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Motorcycle Helmet Law

- National Highway Safety Act – 1966
- Act rescinded
 1976
- Motorcycle fatalities
 25-46%



Michigan Motorcycle Helmet Law

- April 13, 2012
- ≥21yo + 2y experience
 − OR
- Safety course
 Plus
- \$20,000 insurance



Impact of Helmet Use

- Mortality, head trauma
- Hospital admission and cost
- Craniomaxillofacial trauma

HELMETS ARE MANDATORY

Do helmet laws make a difference?

Objective

- Asses the impact of helmet laws on motorcycle trauma patients
 - Helmet use
 - Craniomaxillofacial (CMF) injuries
- Assess the impact of helmet use on motorcycle trauma patients
 – CMF Injuries



ICD-9 E = International Statistical Classification of Disease, Ninth Revision, External Cause of Injury ICD-9-CM = International Statistical Classification of Disease, Ninth Revision, Clinical Modification

ICD-9-CM Diagnosis Codes

Facial Fracture Codes

- Nasal Bone Fractures 802.0-1
- Orbital Fractures 802.6-8
- Malar Fractures 802.4-5
- Mandibular Fractures 802.20-39
- Soft Tissue Trauma Codes
 - Facial Laceration 873.2-7
 - Facial Abrasion 910
 - Facial Contusion 920



Methods

- Statistical Analysis
 - STATA v14.1
 - Descriptive statistics
 - Chi-square test
 - Two sample t-test



Results

Rate of Unhelmeted Trauma Patients



Helmet vs. No Helmet

	Helmet	No Helmet	p Value
Age (y)	43.9	43.6	NS
Any EtOH - BAC (>0)	111.5	148.8	<0.0001
Intoxicated - BAC (>79)	178.4	198.6	0.0022
GCS (ED)	13.9	13.1	<0.0001
ISS	14.3	15.2	0.0100
NISS od alcohol content (mg/dL), GCS = Glasgow Com	17.7 a Scale, ISS = Injury Severity S	19.5 core, NISS = New Injury Se <u>verity Sc</u>	0.0001 ore, ICU = Intensiv <u>e Care</u>
ICU Days	7.0	6.9	NS

BAC =

Facial Injuries: Helmet vs. No Helmet



Helmet vs. No Helmet

	Helmeted Patients	Unhelmeted Patients	p Value	Relative Risk
Nasal Bone Fractures	5.14%	8.96%	<0.0001	1.74
Orbital Fractures	4.96%	11.31%	<0.0001	2.28
Malar Factures	5.38%	12.53%	<0.0001	2.33
Mandibular Fractures	1.82%	3.34%	0.005	1.83
Facial Lacerations	12.77%	23.01%	<0.0001	1.89
Facial Abrasions	7.39%	11.77%	<0.0001	1.59
Facial Contusions	6.36%	16.25%	<0.0001	2.55

Effects of Helmet Law Repeal

	Universal Law	Partial Law	p Value
Age (y)	43.6	43.7	NS
Any EtOH - BAC (>0)	135.5	130.7	NS
Intoxicated - BAC (>79)	182.3	191.7	NS
GCS (ED)	13.7	13.6	NS
ISS	15.3	14.7	NS
lood NacSontent (mg/dL), GCS = Glasgow Coma	Scale, ISS = 1,9,7,2 everity Scor	e, NISS = New 18 sofewarity Score	e, ICU = IntensSe Care Uni
ICU Days	6.4	6.9	NS

BAC =

Facial Injuries: Effects of Helmet Law Repeal



Effects of Helmet Law Repeal

	Universal Helmet Law	Partial Helmet Law	p Value	Relative Risk
Nasal Bone Fractures	5.84%	6.81%	0.181	1.17
Orbital Fractures	6.40%	7.59%	0.116	1.19
Malar Factures	5.99%	8.45%	0.002	1.41
Mandibular Fractures	2.34%	2.32%	0.972	0.99
Facial Lacerations	10.86%	17.73%	<0.0001	1.62
Facial Abrasions	7.01%	9.24%	0.006	1.32
Facial Contusions	5.18%	11.11%	<0.0001	2.26

Discussion

- Craniomaxillofacial Injuries are common
- Helmet law affect behaviors and injuries
 - Unhelmeted patients
 - More CMF trauma
- Poor health outcomes

Long-Term Physical Impairment and Functional Outcomes after Complex Facial Fractures

John A. Girotto, M.D., Ellen MacKenzie, Ph.D., Carolyn Fowler, Ph.D., M.P.H., Rick Redett, M.D., Bradley Robertson, M.D., D.D.S., and Paul N. Manson, M.D.

Baltimore, Md.

Limitations

- Retrospective
- Evolving database
- Multiple sources
- Incomplete data
- No frontal bone/frontal sinus codes



Conclusion

- Following Repeal

 - 个CMF trauma by 45%
 - Fractures (28%↑) and Soft tissue injuries (56%↑)



Thank you!





State of Michigan

Mark Hemmila, MD



State of Michigan

- Proposal accepted
- Scope
 - Level 1 and 2
 - Data submission
 - Reporting: Center, State, Region
 - Education
 - Level 3
 - Data submission
 - Report development, provision 2x/year
 - Education
 - EMS Data
- Objective 1: Create and manage a trauma data system
 - Level 1 and 2
 - Add new centers (3)
 - Level 3
 - Add centers (9), NTDS data only
 - DI or CDM infrastructure
 - On boarding
 - New DUA
 - Add additional NTDS data elements
 - Transfer data to SOM
 - Schedule
 - 1/1/2016 onward

- Objective 2: Reporting
 - Descriptive statistics (volume, means, types)
 - Bi-annual
 - Risk-adjusted benchmarking Level 1 and 2 centers
 - Hospital/Trauma center
 - Region
 - Web-based
 - Non risk-adjusted benchmarking Level 3 centers
 - Hardcopy
 - Develop

- Objective 3: Education
 - Annual meeting
 - Coordinate MTQIP and SOM
 - June

Objective 4: Data validation

- Level 1 and 2 centers
- Annually or per BCBSM SOW
- Objective 5: Technical support

EMS ?

What do I have to do?

Get new DUA signed and return to MTQIP

- Updates language, people, etc.
- Share data with State of Michigan
- Share data with other BCBSM CQI's on collaborative projects
- As is, no changes

Regions Reporting



Publication Pilot Anticoagulation Reversal

Jill Jakubus, PA-C



Publication Pilot

Introduce concept Gauge interest Discuss approach



Data use interest

Data presentation concerns

Meetings



Resources

Time



Red Tape

What if we made it easier for the collaborative to collaborate

Evidence-driven quality improvement

Publication Pilot

12-month period 3-4 surgeons and staff total MTQIP-facilitated red tape cutting Surgeon-directed collaboration 30 min WebEx meetings 1-2x/month Findings shared at collaborative meetings

Publication Pilot

Interest? Approach?

Anticoagulation Reversal Variables 2018

First ED/Hospital INR First ED/Hospital PTT First ED/Hospital Anti-Xa Activity

Type of First Therapy Date of First Therapy Time of First Therapy

Collection Criterion: Collect on all patients on anticoagulant therapy (NTDS 31) or aspirin with at least one injury in the AIS head region, excluding patients with isolated scalp abrasion(s), scalp contusion(s), scalp laceration(s) and/or scalp avulsion(s).

Anticoagulation Reversal Variables 2018

- (1) FFP
- (2) PRBC
- (3) PLT
- (4) Vitamin K
- (5) 4 Factor PCC (e.g. Kcentra)
- (6) 3 Factor PCC
- (7) Antifibrinolytic (e.g. TXA, aminocaproic acid)
- (8) Desmopressin
- (9) Protamine
- (10) Dialysis / Continuous Renal Replacement
- (11) Charcoal
- (12) Monoclonal antibody fragment (e.g. Praxbind)
- (13) Modified recombinant factor Xa (e.g. andexanet)
- (14) Other

Collection Criterion: Collect on all patients on anticoagulant therapy (NTDS 31) or aspirin with at least one injury in the AIS head region, excluding patients with isolated scalp abrasion(s), scalp contusion(s), scalp laceration(s) and/or scalp avulsion(s).

MTQIP Program Manager Update

Judy Mikhail, PhD



Value Based Reimbursement (VBR) MTQIP Opportunity for 2019

Aligning Incentives





Surgeon

2019 MTQIP-VBR Opportunity



VBR Eligibility

- General Surgeons enrolled in PGIP and nominated by PO
- Using MTQIP Trauma Surgeon NPI numbers
- We estimated ~ 80% MTQIP surgeons currently eligible
- Remaining surgeons need to join by Dec 31, 2017
- Caveat:
 - Surgeon restricted to 1 Trauma Center only
 - Surgeon reimbursed for 1 CQI only: MTQIP, MBSC, MSQC



Hospital Performance Index

2017 Performance Index Timeline

- October 2017 Final Data Submission for the Year
- December 2017 Final Site Specific Project Submission for the Year
- January 2018 Preliminary Results To Each Center
- February 2018 Results to BCBSM

Michigan Trauma Quality Improvement Program (MTQIP)

2018 Performance Index January 1, 2018 to December 31, 2018

Measure	Weight	Measure Descri	ption	Points	
#1	10	Data Submission (Partial/Incomplete Submissions No Points)			
		On time and complete 3 of 3 times		10	
		On time and complete 2 of 3 times		5	
		On time and complete 1 of 3 times		0	
#2	10	Meeting Participation All Disciplines *Surgeon represents 1 hospital only			
		Surgeon, and (TPM or MCR) Participate in 3 of 3 Collaborative meetings (9 pts)			30
		Surgeon, and (TPM or MCR) Participate in 2 of 3 Collaborative meetings (6 pts)			z
		Surgeon, and (TPM or MCR) Participate in 1 of 3 Collaborative meetings (3 pts)			10
		Surgeon, and (TPM or MCR) Participate in 0 of 3 Collaborative meetings (0 pts)			ΡA
		Registrar, and/or MCR Participate in the Data Abstractor Meeting (1 pt)			D
#3	10	Data Accuracy	Error Rate		ART
		5 Star Validation	0-4.0%	10	Ы
		4 Star Validation	4.1-5.0%	8	
		3 Star Validation	5.1-6.0%	5	
		2 Star Validation	6.1-7.0%	3	
		1 Star Validation	>7.0%	0	

#4	10 Venous Thromboembolism (VTE) Prophylaxis Initiated Within 48 Hours of Arrival			
		in Trauma Service Admits with \geq 2 Day Length of Stay (18 Mo's: 1/1/17-6/30/18)		
		≥ 55%	10	
		≥ 50%	8	
		≥ 40%	5	
		< 40%	0	
#5	10	Low Molecular Weight Heparin (LMWH) Venous Thromboembolism (VTE)		
		Prophylaxis Use in Trauma Service Admits (18 Mo's: 1/1/17-6/30/18)		
		≥ 50%	10	
		37-49%	7	
		25-36%	5	
		20-24%	3	
		< 20%	0	
#6	10	Red Blood Cell to Plasma Ratio (Weighted Mean Points) of Patients Transfused ≥5	0-10	
		Units in 1st 4 Hours (18 Mo's: 1/1/17-6/30/18)		
		10 pts: Tier 1: ≤ 1.5		()
		10 pts: Tier 2: 1.6-2.0		0
		5 pts: Tier 3: 2.1-2.5		
		0 pts: Tier 4: >2.5		N
#7	10	Serious Complication Rate-Trauma Service Admits (3 years: 7/1/15-6/30/18)		MA
		Z-score: < -1 (major improvement)	10	SR
		Z-score: -1 to 1 or serious complications low-outlier (average or better rate)	7	RF
		Z-score: > 1 (rates of serious complications increased)	5	L L
#8	10	Mortality Rate-Trauma Service Admits (3 years: 7/1/15-6/30/18)		1
		Z-score: < -1 (major improvement)	10	
		Z-score: -1 to 1 or mortality low-outlier (average or better rate)	7	
		Z-score: > 1 (rates of mortality increased)	5	
#9	10	Open Fracture Antibiotic Usage (12 Mo's: 7/1/17-6/30/18)		
		\geq 90% patients (Antibiotic type, date, time recorded)	10	
		\geq 80% patients (Antibiotic type, date, time recorded)	7	
		≥ 70% patients (Antibiotic type, date, time recorded)	5	
		< 70% patients (Antibiotic type, date, time recorded)	0	
#10	10	Head CT Scan performed in ED on patient taking anticoagulation medication with		
		head injury (12 Mo's: 7/1/17-6/30/18)		
		\geq 90% patients (Head CT scan in ED with date and time recorded)	10	
		≥ 80% patients (Head CT scan in ED with date and time recorded)	7	
		\geq 70% patients (Head CT scan in ED with date and time recorded)	5	
		< 70% patients (Head CT scan in ED with date and time recorded)	0	
		Total (Max Points) =	100	

2018 MTQIP Joint Meetings

Neurosurgery Meeting

- Friday June 8th
- Crystal Mountain, MI
- 12N to 4pm (No Hotels)
- Ideas & Planning

Orthopedic Meeting

- <u>Thursday</u> October 11th
- Eagle Crest Ypsilanti, MI
- 10am to 3pm
- Ideas & Planning

2 MTQIP Evaluations

Annual: 4 extra questions added to todays meeting evaluation

Q2 years: Electronic Survey to membership later this week!





WHAT OUR CUSTOMERS ARE SAYING



Lunch



MTQIP Data

Mark Hemmila, MD



#4 VTE Prophylaxis Initiated ≤ 48 hrs

Website

- Practices > VTE Prophylaxis Metric
- Cohort = Cohort 2 (admit to Trauma)
- No Signs of Life = Exclude DOAs
- Transfers Out = Exclude Transfers Out
- Default Period = Set for CQI Index time period
- Heparin, LMWH <= 48 Hours</p>
 - Hospital Unadj %



1/1/16-5/31/17

Percent



1/1/16-5/31/17

Percent



1/1/16-5/31/17

Percent



Timely VTE Prophylaxis

%
#5 VTE Prophylaxis with LMWH

Website

- Practices > VTE Prophylaxis Type
- Cohort = Cohort 2 (admit to Trauma)
- No Signs of Life = Exclude DOAs
- Transfers Out = Exclude Transfers Out
- Default Period = Set for CQI Index time period
- LMWH (Type)
 - Hospital Unadj %



1/1/16-5/31/17

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Type VTE Prophylaxis

Year

MTQIP VTE Prophylaxis

- VTE
 - VTE Rate
 - Begin = 2.5 %
 - Previous = 1.3 %
 - Current = 1.1 %
 - Target = 1.5 %
 - 48 hr VTE Prophylaxis Rate
 - Begin = 38 %
 - Previous = 61 %
 - Current = 63 %
 - Target = 50 %



MTQIP VTE Prophylaxis

- VTE
 - VTE Rate
 - Begin = 2.5 %
 - Previous = 1.3 %
 - Current = 1.1 %
 - Target = 1.5 %
 - VTE Prophylaxis with LMWH
 - Begin = 27 %
 - Previous = 43 %
 - Current = 47 %
 - Target = 50 %



Year

How can we get there?

LMWH

- Mortality
- All (MTQIP)
- TBI (USC, Toronto)
- Pelvic fracture (USC)
- Barriers?
- Timing
 - Barriers?
 - EMR

#6 PRBC to Plasma ratio in Resuscitation

Website

- Practices > Hemorrhage
- Cohort = Cohort 1
- No Signs of Life = Include DOAs
- Transfers Out = Include Transfers Out
- Default Period = Set for CQI Index time period
- N, Eligible patients
 - List
 - PRBC/FFP Ratio

MTQIP 2017 Collaborative-Wide PI Projects

- Hemorrhage (\geq 5 u PRBC's first 4 hrs)
 - 1/1/2016 to 5/31/2017
 - % of patients with 4hr PRBC/FFP ratio ≤ 2.5
 - 2013 = 65 %
 - Current = 83 % (278/336)
 - % of patients with 4hr PRBC/FFP ratio ≤ 2.0
 - 2013 = 55 %
 - Current = 77 % (258/336)
 - Target = 80 %

Z-score

- Measure of trend in outcome over time
- Hospital specific
 - Compared to yourself
- Standard deviation
- > 1 getting worse
- 1 to -1 flat
- < -1 getting better

Z-score

- Time: 7/1/2014 to 5/31/17
- Cohort 2
- Exclude if no signs of life
- Exclude transfers out

#7 Serious Complication Rate (Z-score)

Z-score - Serious Complication Rate 7/1/14 - 5/31/17



8 Mortality Rate (Z-score)

Z-score - Mortality Rate 7/1/14 - 5/31/17



Outcomes Overview - Dead Cohort 2 (Admit to Trauma Service), Exclude DOAs, Exclude Transfers Out



Outcomes Overview - Dead Cohort 2 (Admit to Trauma Service), Exclude DOAs, Exclude Transfers Out



MTQIP - All

#9 IVC Filter Use

Website

- Practices > IVC Summary
- Cohort = Cohort 1
- No Signs of Life = Exclude DOAs
- Transfers Out = Exclude Transfers Out
- Default Period = Set for CQI Index time period
- IVC Filter Use
 - Group Unadj %

Unadjusted IVC Filter Use 7/1/16 - 5/31/17



7/1/16 - 5/31/17

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Unadjusted IVC Filter Use 3/1/15 - 5/31/17



3/1/15 - 5/31/17

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MTQIP Outcomes

Web-Site Report

- 11/1/2014 to 1/31/2017
- Rates
 - Risk and Reliability-adjusted
 - Red dash line is collaborative mean
- Legend
 - Low-outlier status (better performance)
 - Non-outlier status (average performance)
 - High-outlier status (worse performance)

Unplanned Intubation



%

Adjusted Ventilator Days



Trauma Center

Updated 6/7/2017



- Step 4 Post-Extubation Plan (1st 12 hrs)
- D/C IV sedation (except Dexmedetomidine)
- Order Aggressive Pulmonary Hygiene
- Reintubate EARLY if failing ⁴

- RT Assessment Q4 hs x 24hs (High Risk pts)
- Blood Gas Q4hs or Continuous EtCO2 monitoring X 12hs (High Risk Pts)
- Extend monitoring as needed

POP QUIZ

18 year-old man involved in MVC on 1/1/17. Patient sustained a grade III splenic laceration, right pulmonary contusion and right femur fracture. On 1/16/17, patient has findings concerning for ARDS with no other clinical changes.

Does this patient meet the timing criteria for ARDS?



18 year-old man involved in MVC on 1/1/17. Patient sustained a grade III splenic laceration, right pulmonary contusion and right femur fracture. On 1/16/17, patient has findings concerning for ARDS with no other clinical changes.

Does this patient meet the timing criteria for ARDS?

ACUTE RESPIRATORY DISTRESS SYNDROME (ARDS)

Timing	Within 1 week of known clinical insult or new or worsening respiratory symptoms.
Chest imaging	Bilateral opacities – not fully explained by effusions, lobar/lung collage, or
	nodules
	Respiratory failure not fully explained by cardiac failure of fluid overload. Need
Origin of edema	objective assessment (e.g., echocardiography) to exclude hydrostatic edema if
	no risk factor present.
	Common risk factors: major trauma (ISS ≥ 20), pneumonia, pulmonary
	contusion, aspiration of gastric contents, non-cardiogenic shock, drug overdose,
	multiple transfusions, transfusion-associated acute lung injury (TRALI)
	pancreatitis, inhalation injury, pulmonary vasculitis, drowning, severe burns,
Oxygenation	Pa02/Fi02 ≤ 300
	With PEEP or CPAP ≥ 5 cmH20c

Def. Source: NTDS, New Berlin

Acute Respiratory Distress Syndrome (NTDS 5)

18 year-old man involved in MVC on 1/1/17. Patient sustained a grade III splenic laceration, right pulmonary contusion and right femur fracture. On 1/5/17, patient has findings concerning for ARDS with right pulmonary opacity.

Does this patient meet the timing and chest imaging criteria for ARDS?



18 year-old man involved in MVC on 1/1/17. Patient sustained a grade III splenic laceration, right pulmonary contusion and right femur fracture. On 1/5/17, patient has findings concerning for ARDS with right pulmonary opacity.

Does this patient meet the timing and chest imaging criteria for ARDS?

ACUTE RESPIRATORY DISTRESS SYNDROME (ARDS)

Timing	Within 1 week of known clinical insult or new or worsening respiratory symptoms.
Chest imaging	Bilateral opacities – not fully explained by effusions, lobar/lung collage, or nodules
Origin of edema	Respiratory failure not fully explained by cardiac failure of fluid overload. Need objective assessment (e.g., echocardiography) to exclude hydrostatic edema if no risk factor present.
	contusion, aspiration of gastric contents, non-cardiogenic shock, drug overdose, multiple transfusions, transfusion-associated acute lung injury (TRALI) pancreatitis, inhalation injury, pulmonary vasculitis, drowning, severe burns,
Oxygenation	Pa02/Fi02 ≤ 300
	With PEEP or CPAP ≥ 5 cmH20c

Def. Source: NTDS, New Berlin

Acute Respiratory Distress Syndrome (NTDS 5)

18 year-old man involved in MVC on 1/1/17. Patient sustained a grade III splenic laceration, right pulmonary contusion and right femur fracture. On 1/5/17, patient has findings concerning for ARDS with bilateral pulmonary opacities.

Does this patient need an echo for assessing origin of edema for ARDS?



18 year-old man involved in MVC on 1/1/17. Patient sustained a grade III splenic laceration, right pulmonary contusion and right femur fracture. On 1/5/17, patient has findings concerning for ARDS with bilateral pulmonary opacities.

Does this patient need an echo for assessing origin of edema for ARDS?

PROPOSED MTQIP 2018

ACUTE RESPIRATORY DISTRESS SYNDROME (ARDS)

Timing	Within 1 week of known clinical insult or new or worsening respiratory symptoms.
Chest imaging	Bilateral opacities – not fully explained by effusions, lobar/lung collage, or nodules
Origin of edema	Respiratory failure not fully explained by cardiac failure of fluid overload. Need objective assessment (e.g., echocardiography) to exclude hydrostatic edema if no risk factor present. Common risk factors: major trauma (ISS ≥ 20), pneumonia, pulmonary contusion, aspiration of gastric contents, non-cardiogenic shock, drug overdose, multiple transfusions, transfusion-associated acute lung injury (TRALI) pancreatitis, inhalation injury, pulmonary vasculitis, drowning, severe burns
Oxygenation	Pa02/Fi02 ≤ 300 With PEEP or CPAP ≥ 5 cmH20c

Def. Source: NTDS, New Berlin

Acute Respiratory Distress Syndrome (NTDS 5)

Unplanned Admit to ICU



Adjusted ICU LOS






Mean ED LOS - Consult



ACS-TQIP Michigan Report

Mark Hemmila



ACS-TQIP Reports

Thank you for sending in lists and reports

Risk-Adjusted Mortality by Cohort TQIP Report ID: Michigan



Patient Cohort



Risk-Adjusted Mortality by Cohort - Spring 2017 TQIP Report ID: Michigan

Patient Cohort



Odds Ratios by TQIP Hospital; Mortality



Report

<u>Measure</u>	<u>2014</u>	<u>2015 S</u>	<u>2015 F</u>	<u>2016 S</u>	<u>2016 F</u>	<u>2017 S</u>
Odds Ratio	0.97	1.15	1.02	0.96	1.09	1.22
Outlier	Average	Average	Average	Average	Average	High
Decile	5	7	6	5	7	7
Patients (n)	9355	10784	11208	11227	11056	12080
Dead (n)	564	730	698	638	645	776
Delta		-3	-64	-125	-107	-45



Report

<u>Measure</u>	<u>2014</u>	<u>2015 S</u>	<u>2015 F</u>	<u>2016 S</u>	<u>2016 F</u>	<u>2017 S</u>
Odds Ratio	0.92	1.48	1.29	1.46	1.95	1.60
Outlier	Average	Average	Average	Average	High	High
Decile	3	10	10	10	10	10
Patients (n)	571	533	545	511	498	480
Dead (n)	44	63	56	49	51	54
Delta		15	7	3	6	11

What we know?

- Michigan, less sick
- AIS 2005/08 is crosswalked to AIS98
- Lagging patients are included
- Lot's of hospice
- DNR/Advance directive
 - Dropped
 - 85% live in MTQIP data
- Analyst (Anne)
 - Problems CI, size of centers

Analysis

Mark Hemmila



ACS-TQIP Lists

Collated all 29 lists into one dataset

ACS-TQIP data

- Duplicate patients
 - 2 centers with 100's of pairs
 - 4 centers with 1-3 pairs
- Patients in ACS-TQIP but not MTQIP
 - 10 centers
 - 7 centers with 5 or less
 - 2 center with 20-50
 - 1 center with > 100

ACS-TQIP Reports

- Looked at deciles
 - All
 - Penetrating
 - Elderly

Pen	Eld		
4	2		
8	2		
4	3		
5	2		
1	4		
5	4		
NA	5		
6	4		
6	5		
7	4		
9	6		
8	4		
6	6		
6	6		
6	6		
9	6		
4	8		
3	9		
7	9		
6	6		
5	7		
4	6		
10	8		
8	9		
9	9		
9	7		
10	10		
9	10		
3	10		
	Pen 4 8 4 5 1 5 NA 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 9 4 3 7 6 6 5 4 3 7 6 5 4 10 8 9 9 9 4 3 7 6 5 4 10 8 9 9 9 10 9 9 3		

ACS-TQIP Reports

- Stick with our data validation program
- Odds Ratios vary and is does not take much to get to higher deciles

AAST Summary

Mark Hemmila, MD



TBI and Beta Blockade

Session: I: Plenary Papers 1-8 Paper 1: 1:00-1:20 pm

BETA BLOCKERS IN CRITICALLY ILL PATIENTS WITH TRAUMATIC BRAIN INJURY: RESULTS FROM A MULTI-CENTER, PROSPECTIVE, OBSERVATIONAL AAST STUDY

Eric J. Ley* MD, Samuel D. Leonard BS, Kenji Inaba* MD, Ali Salim* MD, Karen R. O'Bosky MD, Danielle Tatum Ph.D., Hooman Azmi MD, Chad G. Ball* MD, Paul T. Engels* MD, Julie A. Dunn* MD, Matthew M. Carrick* MD, Jonathan P. Meizoso MD, Sarah Lombardo MD, Thomas J. Schroeppel* MD, Sandro Rizoli* MD,Ph.D., Cedars-Sinai Medical Center

Invited Discussant: Saman Arbabi, MD, MPH

TBI and Beta Blockade

- AAST Clinical Trial (Observational)
- 15 Trauma Centers
- After risk adjustment beta blocker use associated with decreased mortality
- Thoughts?

Session: V: Plenary Session Papers 9-13: Canizaro Session Paper 13: 8:50-9:10 am

EARLY PHARMOLOGICAL THROMBOPROPHYLAXIS IN ISOLATED SEVERE PELVIC FRACTURE IS SAFE AND IMPROVES OUTCOMES

Elizabeth Benjamin* MD,Ph.D., Alberto Aiolfi MD, Gustavo Recinos MD, Kenji Inaba* MD, Demetrios Demetriades* MD,Ph.D., LAC+USC Medical Center

Invited Discussant: Michael Cripps, MD

- ACS-TQIP Data
- Blunt AIS 3 or > pelvic fracture
- Patients with head, chest, spine, and abdominal injuries AIS > 3, or those with angio or operative intervention prior to VTEp were excluded.
- Early or Late (48 hrs)
- No none group

- 2,007 patients
- 73% received early pharmacological prophylaxis.
- LMWH was administered in 85% and UH in 15% of patients.
- LATE VTEp higher incidence of VTE (4.3% vs. 2.2%, p=0.004).

- LATE VTEp independent risk factor for VTE (OR 1.93, p=0.009) and mortality (OR 4.03, p=0.006).
- LMWH was an independent factor protective for both VTE and mortality (OR 0.373, p<0.001, OR 0.266, p=0.009).

Thoughts?

Angio availability and timeliness

VARIABILITY IN MANAGEMENT OF BLUNT LIVER TRAUMA AND CONTRIBUTION OF LEVEL OF ACS-COT VERIFICATION STATUS ON MORTALITY Presenter: Christopher Tignanelli, MD Discussant: Rajesh Gandhi, MD, PhD

TIME TO ANGIOEMBOLIZATION FOR PELVIC HEMORRHAGE: REAL WORLD EXPERIENCE AND THE IMPACT ON OUTCOMES Presenter: James Byrne, MD Discussant: Brian Williams, MD

DECREASED MORTALITY, LAPAROTOMY, AND EMBOLIZATION RATES FOR LIVER INJURIES WITH 70 PERCENT NOM OF GRADE 4 & 5 INJURIES Presenter: Iver Gaski, MD Discussant: Mayur Narayan, MD, MPH, MBA

BALLOONS UP: SHORTER TIME TO ANGIOEMBOLIZATION AND REDUCED MORTALITY IN PATIENTS WITH SHOCK AND PELVIC FRACTURES Presenter: Kathleen O'Connell, MD Discussant: Thomas Scalea, MD

ROUTINE POSTOPERATIVE HEPATIC ANGIOGRAPHY IS ASSOCIATED WITH DECREASED MORTALITY IN SEVERE LIVER INJURY Presenter: Shokei Matsumoto, MD Discussant: Daniel Holena, MD

Others

Emergent General Surgery

- Session
- 7 operations
- How to move forward?
- Palliative Care
 - Ron Maier Fitt's Lecture
 - ACS-TQIP
- Unplanned Intubation (Reintubation)

Hospital Systems Trauma Registry Development

Judy Mikhail, PhD Tom Wood, Mid-Michigan Amy Koestner, Spectrum Health



Multifacility Registry

Tom Wood and Shari Meredith MidMichigan Health



Background



Design Concepts

- Same platform
 - Two programs already on DI
- Centralized resources
 - Leverage expertise at larger volume programs
 - Draw from bigger candidate pool
- Eliminate data variation between programs
- Create processes for cross-coverage



Organizational Restructure

MidMichigan Health System Trauma Services



UNIVERSITY OF MICHIGAN HEALTH SYSTEM

Registry Options

ImageTrend

- Eliminated: Did not meet needs for Midland
 - TQIP, MTQIP, complex reporting, etc
- Single Instance DI-V5 at all centers
- Transition to DI-V5 Multifacility
- Explore other registry vendors



S.I. vs Multifacility

Single Instance

- Pros:
 - Same platform
 - No disruption to legacy software
 - Support processes already built
- Cons:
 - Cost
 - 2x Implementation
 - 1.6x Annual
 - Multiple logins
 - No shared reporting
 - Data element variation

Multifacility

- Pros:
 - Same platform
 - Cost
 - Shared report writing
 - System data reports
 - No element variation
 - Aligns OPOR model
- Cons:
 - Data migration required
 - MTQIP/TQIP concerns
 - Complete rebuild
 - Process changes for legacy programs



Before







Implementation Challenges

- Step 1: Put Shari in charge!
 - Step 1b: Hide
- Implementation challenges
 - Alpena, Gladwin and Clare need to submit data to State
 - Midland upcoming reverification visit
 - Need to eliminate all element variation
 - NTDB/TQIP/MTQIP etc



Implementation Experience

- 11/2016- Multifacility software was installed
 - Initial delays for several weeks due to IT issues and server requirements
- Clare, Gladwin, and Alpena-immediate data entry
 - Retrospective and concurrent data collection
- Strategic delays for transitioning Midland and Gratiot registries until Midland's ACS re-verification visit completed



Implementation Experience

Tiered approach to implementation for existing single instance registry.

#1: Wait until ACS visit completed

#2: Determine cutover date for entry in "new"multifacility registry while closing out charts in "existing" registry (Goal 2/1/17)

#3: Data Migration- work with DI support to migrate all closed legacy data to the "new" multifacility registry


Implementation Experience

Challenges:

- Additional IT requirements not initially communicated- Have IT involved early in process.
- Delays with implementation of MTQIP/TQIP data module. 1st multifacility registry to utilize MTQIP module.
 - Delayed implementation for 1 month for existing centers.
- Confusion with security access/ roles
 - Log in under correct facility ID
- Favorites/Staff menus were not exported, requiring manual re-entry by registrars
- Success!
- 3/1/17: All 5 centers transitioned to data entry in multifacility registry



Data Migration

- Data migration scheduled 60 days after data entry began for all centers (May 2017)
- DI copied/tested legacy registry data to ensure data elements mapped correctly prior to cutover

Challenges:

- Registrars required to work out of 2 registries.
- Confusion regarding software updates to legacy registries.
 - Gratiot registry had not received several updates thus incompatible with multifacility registry. Updates required prior to data migration.



Results

- Combined volumes give small facilities access to resources including PI Outcomes modules
- High quality data system wide
 - System wide validation process
- Ability to workload balance
 - Ability to cover vacations/turnover/leaves
- One registry helped with EPIC implementation
- Standardized reports



Results

Continued Challenges:

- Optimizing PI Outcomes modules
- Scheduling Data submission time among registrars
- Re-creation of reports
 - Reporting errors from data from legacy time frames.



SPECTRUM HEALTH



Developing & Implementing a Hospital System Registry



Amy Koestner, RN, MSN Trauma Program Manager Spectrum Health Butterworth

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Intro to the Spectrum Health System





Assessing registry needs across facilities

Worked with all SH regionals to gather base line data on # of patients with ICD-9/ICD-10 injury codes that were:

- Admitted to facility
- Discharged to home from ED
- Transferred to a higher level of trauma care





By the numbers.....

Butterworth 2.5 registrars

Blodgett .5 registrar

SH regionals 2 FTE



The million dollar question

Do the SH regionals go with the "free" state Image Trend data base?

Do we invest in adding 8 institutions to our Trauma Base system?



Centralized versus individual facility : 2 FTE

Centralized

- All registrars on same data base
- Orientation: start regional charts and move to abstracting BW
- All would attend AIS / State registry course
- Job satisfaction
- Resources at same location
- Bi-monthly registry mtg / edu
- Shift work among facilities
- Access to Trauma Data Coord

Individual facility

- Registrar at regional location (.1-.3 FTE one person / site)
- Wears multiple hats / competing priorities
- Limit of on-going training, access data / validate / reports
- Potential high turn over rate
- No software cost to facilities
- No in-system resources for Image Trend



Challenges

- Eight facilities that were all new to trauma / trauma registry work
- Three different EMR systems in use, + Epic "go live" 11/17 & 5/18
- Eight new regional Trauma Nurse Coordinators with no knowledge of registry work & limited PI experience
- Orientation process for 2 new registrars while maintaining abstracting metrics for Level I and Provisional Level III

Anticipating designation visits for all SH facilities in 2017 - 2018



Plan

All registry staff report to / part of BW trauma service

Each regional registry assigned specific facilities

Create system at regional level for capturing patients (TNC)

Develop plan that included all regional TNC in registry education sessions

Establish / expand Standard Work to include regional facility process

Generate weekly reports on open cases / facility



Standard Work / Patient log

Sta Step:	ndard Work Activity Shee	et	Auth	or: Ch e Strea	eryl Klin m: Trau	n <mark>kner</mark> ma Ser	Rev Date 05/7 vices for regi	//2014 strars	;													
	Consistently Standardize identifying a patiel trauma base	nt for										Sta	andar	d Wo	ork A	ctivity .	Sheet	Autho	or: Kelly	y Burns I	Rev Date 09/21/201	17
Seq. No	q. Task Description:		Key Point / Image / Measure (what good looks like)			sure :)	Who	Cy Tii mn	cle me u:ss	Step:			Purpose: Consistent process for chart abstraction to assess compliance with chart completion rate 80% wit					Value Stream: All required data elements are complete trauma registry.				vithin the
1	Check trauma list for new patients	Lo	ocation: H	I-drive						•	+	Seq.		60 da	lys. Task Des	cription:		Key Point	t / Image	/ Measure	Who	Cycle
2	Check 3M list (Pat's List)	Di	agnosis									No	Concurrent is defined as 3 days after the patient has been shelled and assigned to a registrar.			r the ed to a	(what good looks like)				Time mm:ss	
3	Check Cerner for trauma criteria	Case Inclusion Criteria Contained in the data dictionary								1	Registrars will adhere to standard work process for case identification and inclusion based on the NTDB data elements and other additional fields as required by the MTQIP, TQIP, or other state initiatives					Maintain national and state standards		Registrars, data base coordinator				
4	Assign trauma base number for all trauma patients	Included in this is all trauma patients including observation, admit or those with an activation with a d/c home.				on, ition						2	At the beginning of each month a trauma base report will be run to calculate the chart completion rate.					Meet ACS and MDHHS standard of 80% chart closure rate within 60 days of discharge.		Data base coordinator or registrar		
5	All patients will be assigned a trauma base number daily. Before any other work is done to	This process will help delete the excel tracking method and also				the. Iso						3	TPM / T assist w	NC will r ith adjus	eview the tment of r	view the completion report to ment of registry resources			Alignment of resources to meet standard		TPM/ TNC	
	complete the registry process						CY 2016	5 TRAU	ΜΑ ΡΑΤ	IENT I	LO	G - SP	ECTRUM H	IEALTH	HOSPITAI	Ĺ						
	-		Registry Status NI IN IC	VISIT #	MED RECORDS #	DATE	NAME LAST, FIRST	Age	ARRIVE VIA:	DEPA STATU A D T	ART US: TM	ADMI	T PHYSICIAN	TRANSFER TO:	TRANSFER AGENCY	PI NOTES		NOTES		dard for data	Data base coordinator	
																				-		
																				ique losure	Registrar	
																				osure	PI Nurses	
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Tools

REGIONAL TRAUMA CALENDAR	CATEGORIES	
< October 2017 >	ACS- American College of Surgeons	
None	Guidelines, Policies, Procedures	
	Misc information	
GROUP OVERVIEW	Pediatric Trauma	
	Performance Improvement Documents	
Sharten	Region 6 documents	
	Regional Trauma Team Meeting (schedule, agenda & minutes)	
	Registry	
6	Resuscitation Documents	
	RTAC and RTN Meeting Schedule	
	State Trauma Documents	
This group is composed of nurses, registrars, & physician leaders involved the development and implementation of the state trauma designation for the	e STN Trauma Powerpoint Presentations	
individual Spectrum Health hospitals.	Tourniquet use with trauma patients	
Owned by: Jill Cline, Amy Koestner		
Tags:		
trauma desig		
Private ③	655 6751U	
Created:	SPECTRUI	MHEALIH
MTQIP	·Case·ReviewAppeal·Chart·Review·Documentation¶	
	Case·Validation·Visit·September·2017¶	
Case: Number:00000¶		
Case Number 60000 1		
1. → ·Documented·by·Regis concussion·in·EMR.¶	strar·patient·sustained·a·concussion.··MTQIP·did·not·find·e	vidence∙of∙



Semi Annual Audit Filters												
Audit Filters	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ОСТ		
Patient seen in ED and discharged home and who re-presents to ED within 72 hours of initial ED visit AND is admitted to trauma service	R						R					
Unplanned operation following non-operative management		R			R			R				
Trauma patient admitted to non-surgical service without an appropriate surgical service consultation.	R	R	R	R	R	R	R	R	R	R		
Trauma surgeon present in trauma Bay greater												





Pearls

All registrars part of Level I education / "teaching moments"

- Trauma data coordinator on site to assist with uploading data, PRQ tables & reports, developed a registry packet for state, & on-site support during designation visit
- Monthly meetings with TNC group and registrars (webex option)
- Regional TNC training for entering PI in Trauma base

Regional TNC have access to Butterworth PI RNs (MCR)



Summary

A number of lessons were learned as we went, with more to come.....

Need to move forward with a system leadership model to provide assistance to all facilities beyond the registry

Constantly looking at our metrics and process

Looking at Epic to assist with further efficiencies in data entry and patient identification processes





Thank you

Conclusion

Evaluations

- Fill out and turn in
- Questions?
- See you in February