The Michigan Trauma Quality Improvement Program

Grand Rapids, MI
May 18, 2011

Information

- Current centers
  - 14
- New centers (July 1)
  - Botsford
  - Covenant
  - Spectrum
  - St. Johns
- Future centers (January 1)
  - 23 Total

Information

- ACS-TQIP Enrollment
  - Applications for 2012
- ACS-TQIP Meeting
  - Chicago
  - November 13-15, 2011

Agenda

- General Announcements (Hemmila)
- VTE Bariatrics (Birkmeyer)
- VTE NSQIP (Pannucci)
- Surveys (Jakubus)
- Projects (Mikhail)
- Reports (Hemmila)
- Process Measures (Hemmila)
- Report Tool (Hemmila)

Future Meetings

- October 11, 2011
  - Location: Ann Arbor
- February 14, 2012
  - Location: Ann Arbor
- May xx, 2012
  - Location: TBD

MTQIP Web-site

- Web-site (www.mtqip.org)
  - On-line report and query tool for trending
  - Meeting information

“Venous Thromboembolism – The Michigan Bariatric Surgery Collaborative Experience”

Nancy J.O. Birkmeyer, PhD

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“Risk Modeling Using Large Datasets: An examination of VTE after outpatient surgery”

Chris Pannucci, MD MS

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Questions

Audience Response Survey

Jill Jakubus, PA-C

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DATA UPDATE
VTE PRACTICES

North Campus Research Complex

June 7, 2011

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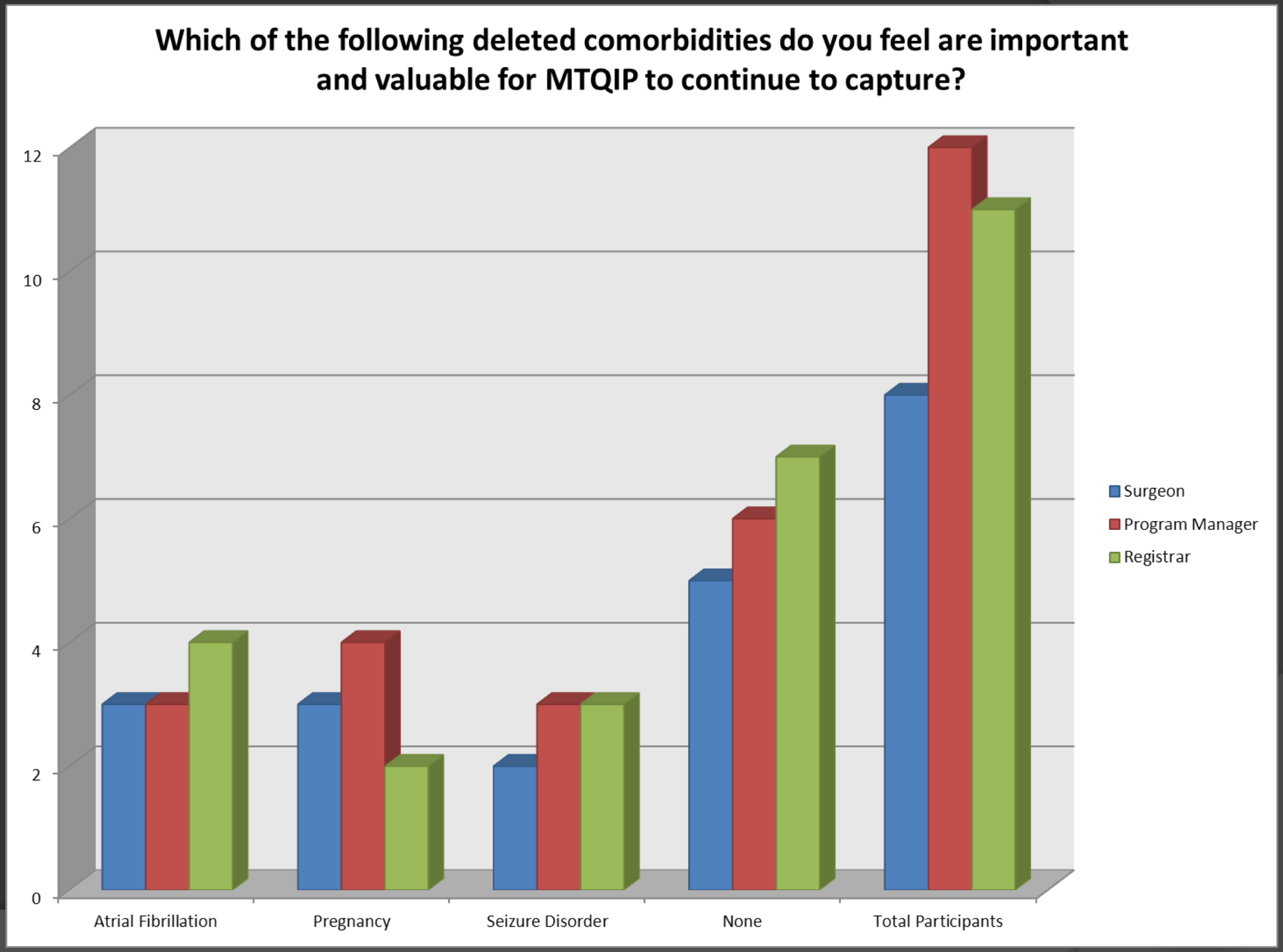
Which of the following deleted comorbidities do you feel are important and valuable for MTQIP to continue to capture?
12
10
8
6
4
2
0
Atrial Fibrillation
Pregnancy
Seizure Disorder
None
Total Participants
Surgeon
Program Manager
Registrar

Retained Comorbidities

- ✓ None

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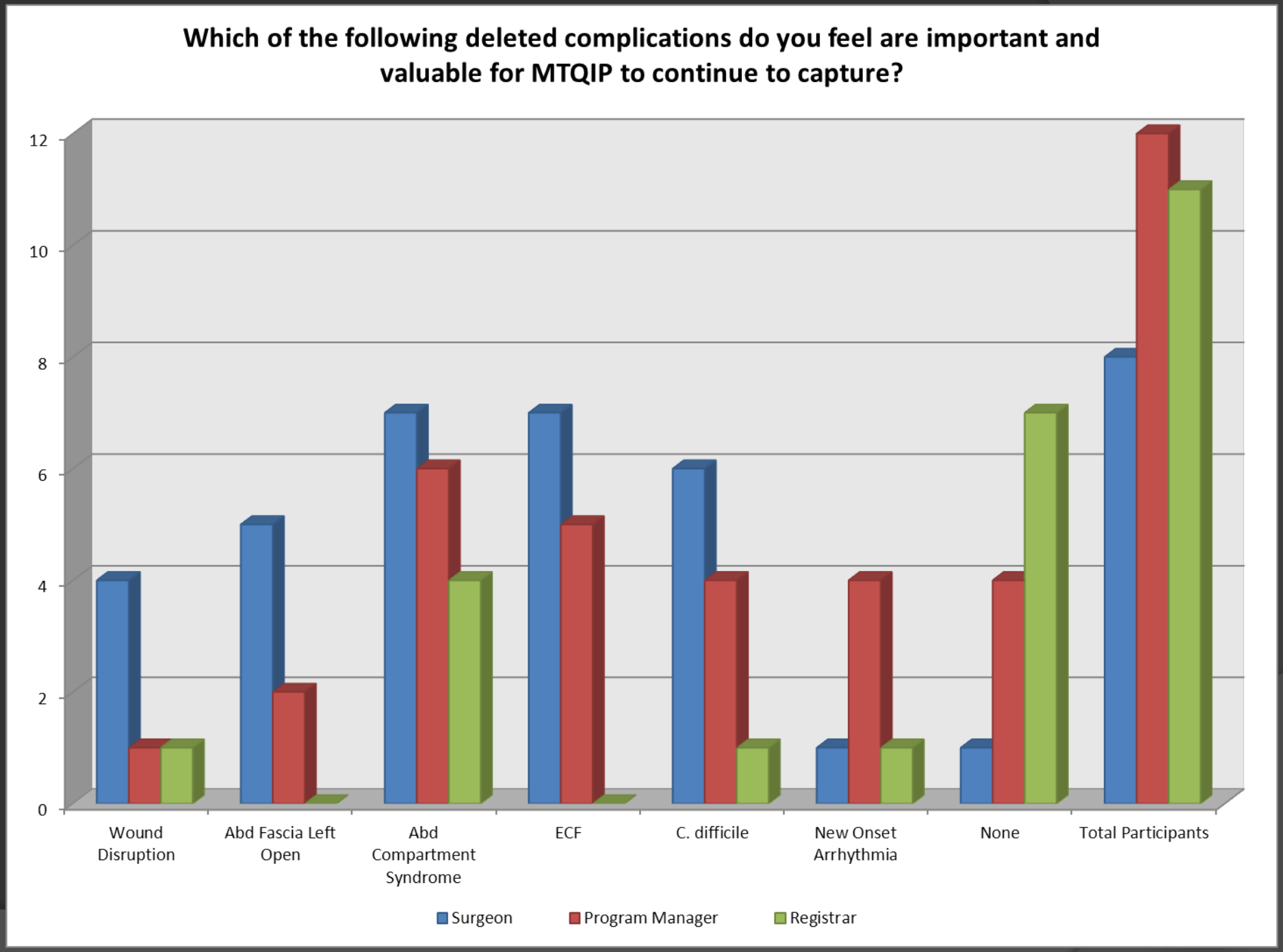
Which of the following deleted complications do you feel are important and valuable for MTQIP to continue to capture?
12
10
8
6
4
2
0
Wound Disruption
Abd Fascia Left Open
Abd Compartment Syndrome
ECF
C. difficile
New Onset Arrhythmia
None
Total Participants
Surgeon
Program Manager
Registrar

Retained Complications

- ✓ Wound disruption
- ✓ Abdominal fascia left open
- ✓ Abdominal compartment syndrome
- ✓ C. difficile colitis
- ✓ ECF

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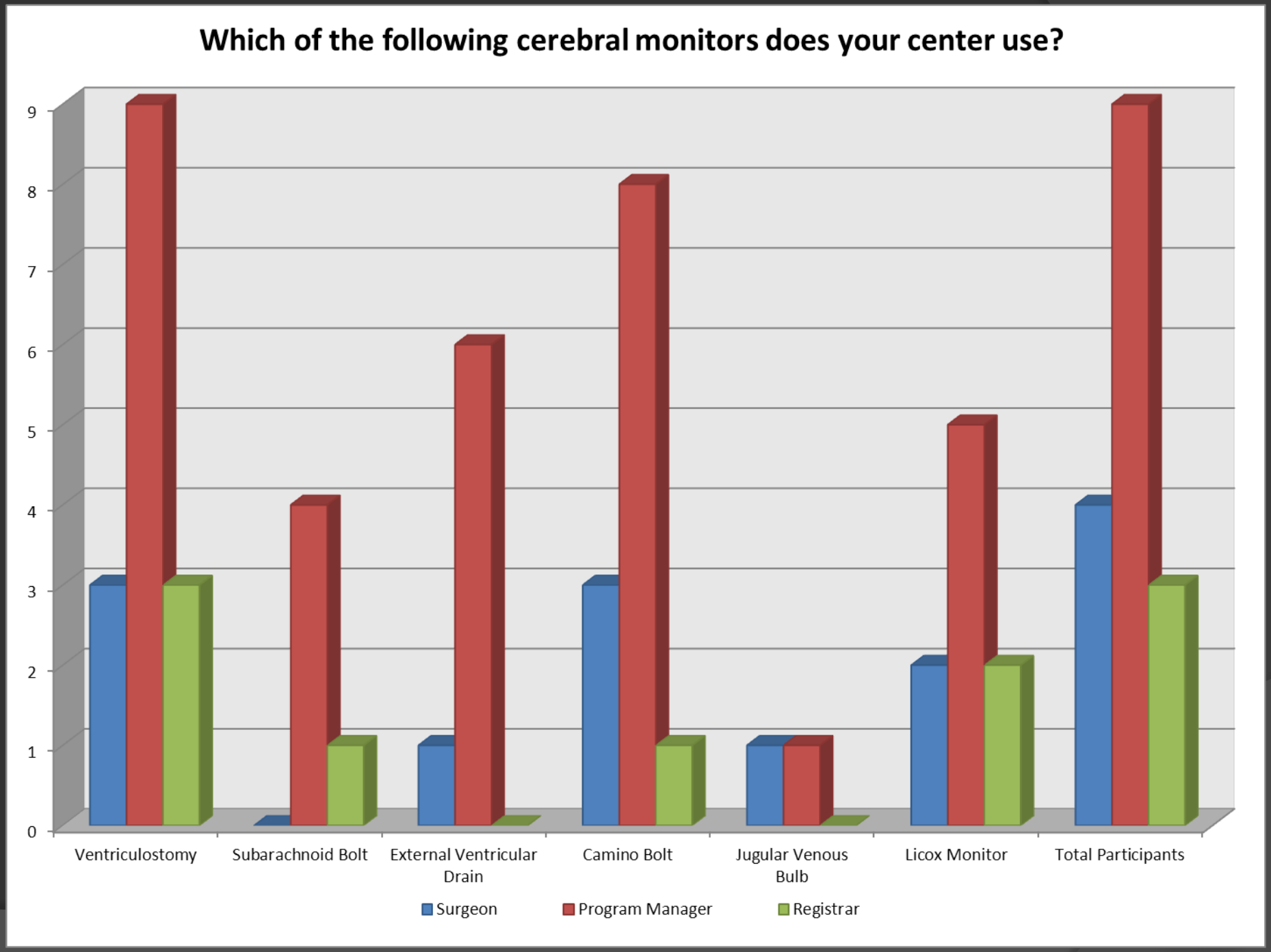
Which of the following cerebral monitors does your center use?
9
8
7
6
5
4
3
2
1
0
Ventriculostomy
Subarachnoid Bolt
External Ventricular Drain
Camino Bolt
Jugular Venous Bulb
Licox Monitor
Total Participants
Surgeon
Program Manager
Registrar

Cerebral Monitor

1. Intraventricular monitor/catheter

   (e.g. ventriculostomy, external ventricular drain)

2. Intraparenchymal pressure monitor

   (e.g. Camino bolt, subarachnoid bolt, intraparenchymal catheter)

3. Parenchymal oxygen monitor

   (e.g. Licox monitor)

4. Jugular venous bulb

3 cerebral monitors with time & date may be entered

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VTE PRACTICES REGISTRAR WOUND REVIEW

Audience Response Discussion

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For your trauma patients who are admitted to the hospital, how do you assess VTE risk?

A. Caprini Score
B. Type of Injury
C. Other Scoring System
D. “Eyeball Test”
E. None

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30-year-old female admitted status post fall from Segway. Catalog of injuries includes: stable pelvic fracture managed nonoperatively w/o WB restriction and small bowel perforation status post resection. Patient has stable hematocrit and normal CrCl. Weight is 75kg.

What is your preferred agent for VTE prophylaxis?

A. Lovenox 30mg SQ BID
B. Lovenox 40mg SQ QD
C. Heparin 5000units SQ TID
D. Heparin 5000units SQ BID
E. None

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40-year-old male admitted status post playground trauma. Catalog of injuries: subdural hematoma status post craniotomy and nonoperative splenic contusion. Head CT is stable 48 hours post craniotomy.

What is your (trauma surgeon) preferred VTE prophylaxis therapy 36 hours post craniotomy?

A. None
B. SCD
C. IVC Filter
D. Heparin
E. LMWH

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In a trauma patient who cannot receive chemical prophylaxis do you perform DVT surveillance?

A. No
B. Yes. Every 48 hours.
C. Yes. Every 3-5 days.
D. Yes. Once a week.
E. No. They all receive IVC filters.

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20-year-old female admitted status post MVC. Catalog of injuries includes: stable pelvic fracture managed operatively (NWB BLE) and small bowel perforation status post resection. Patient has stable hematocrit and normal CrCl. Weight is 60kg.

What is your preferred agent for VTE prophylaxis for discharge to home at the WC level?

A. LMWH
B. Coumadin
C. ASA
D. None

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18-year-old male status post exploratory laparotomy and splenectomy for grade V splenic laceration following MCC.

On POD #5, house staff note purulent drainage from intact midline incision with surrounding erythema. Wound is opened at the bedside and fascia is intact on palpation. Culture of fluid not performed. What type of wound occurrence is this?

A. Superficial incisional surgical site infection
B. Deep incisional surgical site infection
C. Organ/space surgical site infection
D. None

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Answer

A. Superficial incisional surgical site infection
B. Deep incisional surgical site infection
C. Organ/space surgical site infection
D. None

Definition: Occurs within 30 days after the operation and infection involves only skin or subcutaneous tissue of the incision and at least 1 of the following:

-Purulent drainage, with or without laboratory confirmation, from the superficial incision.
-Organisms isolated from an aseptically obtained culture of fluid or tissue from the superficial incision.
-At least one of the following signs or symptoms of infection: pain or tenderness, localized swelling, redness, or heat AND superficial incision is deliberately opened by the surgeon, unless incision is culture-negative.
-Diagnosis of superficial incisional SSI by the surgeon or attending physician.

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18-year-old male status post exploratory laparotomy and splenectomy for grade V splenic laceration following MCC.

On POD #6, patient develops leukocytosis of unclear etiology. CT scan reveals abdominal fluid collection. Interventional radiology aspirates purulent fluid and places drain. What type of wound occurrence is this?

A. Superficial incisional surgical site infection
B. Deep incisional surgical site infection
C. Organ/space surgical site infection
D. None

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Answer

A. Superficial incisional surgical site infection
B. Deep incisional surgical site infection
C. Organ/space surgical site infection
D. None

Definition: Occurs within 30 days after the operation and infection involves only skin or subcutaneous tissue of the incision and at least 1 of the following:

- Purulent drainage from a drain that is placed through a stab wound into the organ/space.
- Organisms isolated from an aseptically obtained culture of fluid or tissue in the organ/space.
- An abscess or other evidence of infection involving the organ/space that is found on direct examination, during reoperation, or by histopathologic or radiologic examination.
-Diagnosis of an organ/space SSI by a surgeon or attending physician.

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18-year-old male status post exploratory laparotomy and splenectomy for grade V splenic laceration following MCC.

On POD #10, medical student is removing staples from abdomen and notes localized erythema and expression of a drop of purulence on inferior most staple. Supervising house officer initiates the patient on oral antibiotic. What type of wound occurrence is this?

A. Superficial incisional surgical site infection
B. Deep incisional surgical site infection
C. Organ/space surgical site infection
D. None

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Answer

A. Superficial incisional surgical site infection
B. Deep incisional surgical site infection
C. Organ/space surgical site infection
D. None

Definition: Do not report the following conditions as SSI:

-Stitch abscess (minimal inflammation and discharge confined to the points of suture penetration).
-Infected bum wound.
-Incisional SSI that extends into the fascial and muscle layers (see deep incisional SSI).

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18-year-old male status post exploratory laparotomy and splenectomy for grade V splenic laceration following MCC.

On POD #5, house staff note purulent drainage from a midline incision that has spontaneously opened. Fascia intact on palpation. Culture of fluid not performed. CT scan negative for intra abdominal fluid collection. What type of wound occurrence is this?

A. Superficial incisional surgical site infection
B. Deep incisional surgical site infection
C. Organ/space surgical site infection
D. None

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A. Superficial incisional surgical site infection
B. Deep incisional surgical site infection
C. Organ/space surgical site infection
D. None

Definition: Occurs within 30 days after the operation and infection involves only skin or subcutaneous tissue of the incision and at least 1 of the following:

-Purulent drainage from the deep incision but not from the organ/space component of the surgical site.
- A deep incision spontaneously dehisces or is deliberately opened by a surgeon when the patient has at least one of the following signs or symptoms: fever (> 38C), localized pain, or tenderness, unless site is culture-negative.
-An abscess or other evidence of infection involving the deep incision is found on direct
examination, during reoperation, or by histopathologic or radiologic examination.
-Diagnosis of a deep incision SSI by a surgeon or attending physician.
Note:
-If an incision spontaneously opens as a result of infection, code for deep incisional SSI.
-Report infection that involves both superficial and deep incision sites as deep incisional SSI.
-Report an organ/space SSI that drains through the incision as a deep incisional SSI.

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MTQIP Site Specific Projects

Judy Mikhail, BSN, MSN, MBA

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PROJECT UPDATES

Judy Mikhail, MSN, MBA
MTQIP Program Manager

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Mortality Review Forms

- Collect & aggregate current forms
  - 19/23 (83%)
- Standardize elements across forms
- Incorporate new ACS nomenclature

Goal:

"Collect standardized data on mortalities across the state"

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Program Manager Site Visits

- Beginning June
- Goals:
  - Detailed review of individual MTQIP report
  - Confirm registry custom fields
  - Discuss site specific PI progress
  - Identify TC commonalities and disparities
  - “Kick the tires”
- Start with newer trauma centers
- Expand to all eventually

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Hospital Specific PI Project

- By July 1, 2011
- Each center must select a PI project
- With availability of baseline data
- Ongoing interventions
- Continued data collection
- Report periodically to the group

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Publications Policy

- Development of a publications policy
- Welcome input from membership
- Present at next meeting

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MTQIP Reports

Mark Hemmila, MD

Reports

- 7/1/09 to 6/30/10
- Cohort selection
- Summaries
- Stratified mortality
- Risk adjusted mortality
- Risk adjusted complications
- Risk adjusted LOS

Cohort Formation

- Cohort 1
  - Blunt or penetrating
  - Age ≥ 18
  - ISS ≥ 5
  - Hospital LOS ≥ 1 or dead
- Cohort 2 (admit trauma service)
- Cohort 3 (blunt multi-system)
- Cohort 4 (blunt single-system)

Cohort Formation

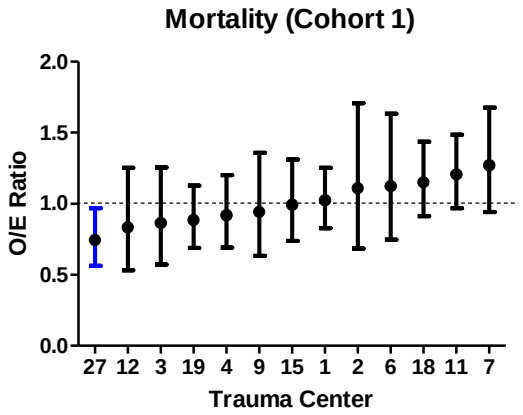
- Complications
  - Cohort 2 w/o DOA's
  - Group 1 (All)
  - Group 2 (Subset)
  - Specific
- Length of Stay
  - Hospital, ICU, Mechanical Ventilator Days
  - Cohort 2
  - Exclude deaths for Hospital LOS

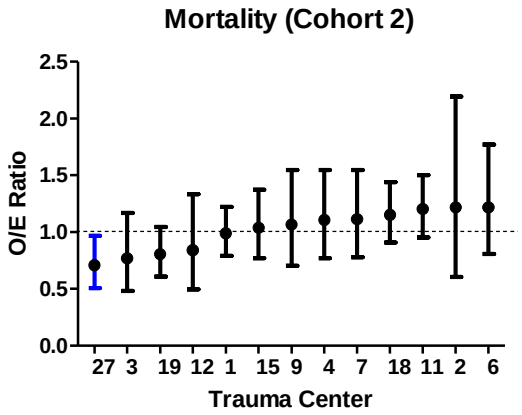
Risk Adjustment

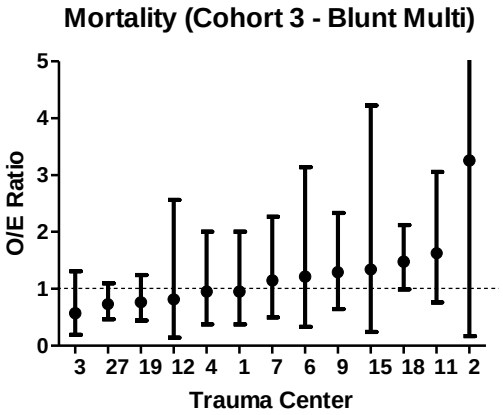
- Univariate
- Imputed BP, Pulse, mGCS if missing
- Step-wise Multivariate Logistic Regression
  - Identify predictor variables, $p \leq 0.2$
- Logit Equation
- Expected Mortality
- O/E Ratios
  - 90% Confidence Interval, Mortality
  - 95% Confidence Interval, Complications
  - 95% Confidence Interval, LOS

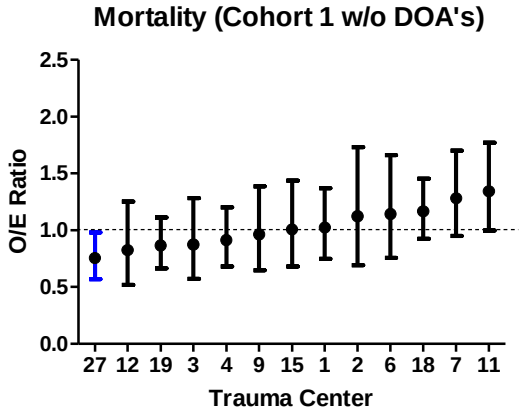
Mortality

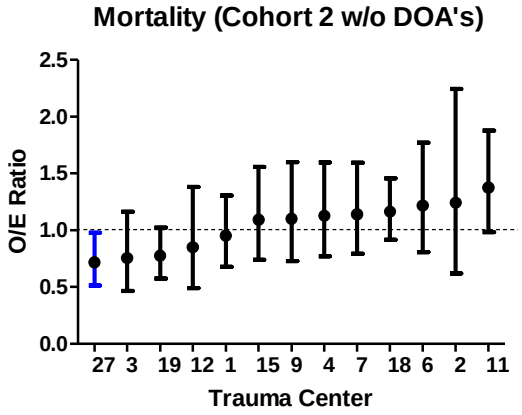
- Cohort 1 (Overall Mortality - All Admissions)
- Cohort 1 (w/o DOA's)
- Cohort 2 (Admit to Trauma Service)
- Cohort 2 (w/o DOA's)
- Cohort 3 (Blunt Multi-System Mortality)
  - Trauma type classified as blunt with injuries of AIS ≥ 3 in at least two of the following AIS body regions: head/neck, face, chest, abdomen, extremities or external.
- Cohort 4 (Blunt Single-System Mortality)
  - Trauma type classified as blunt with injuries of AIS ≥ 3 limited to only one AIS body region with all other body regions having a maximum AIS ≤ 2.
- Cohort 2 (w/o DOA's) Dead or Hospice

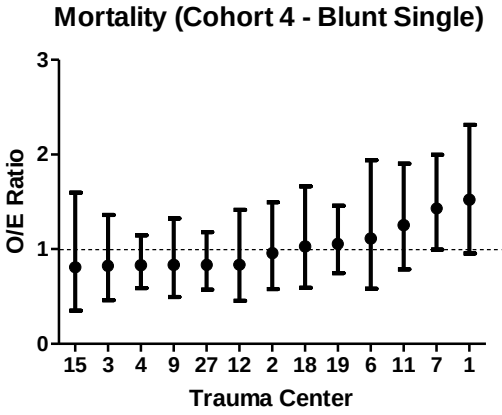

Mortality (Cohort 1)
O/E Ratio
2.0
1.5
1.0
0.5
0.0
27 12 3 19 4 9 15 1 2 6 18 11 7
Trauma Center

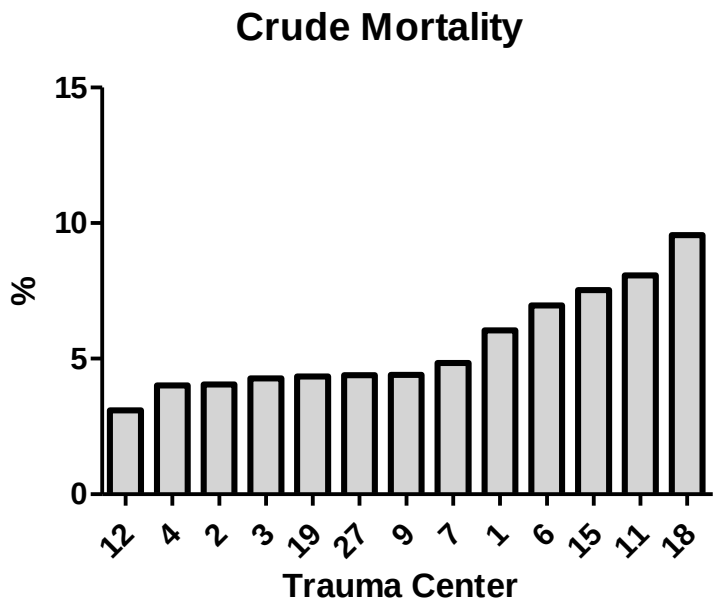

Mortality (Cohort 2)
O/E Ratio
2.5
2.0
1.5
1.0
0.5
0.0
27 3 19 12 1 15 9 4 7 18 11 2 6
Trauma Center

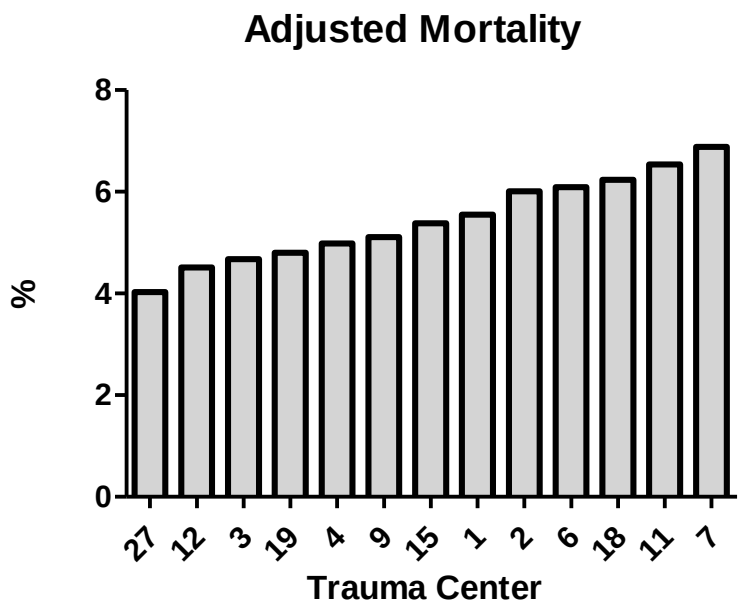

Mortality (Cohort 3 - Blunt Multi)
O/E Ratio
5
4
3
2
1
0
3 27 19 12 4 1 7 6 9 15 18 11 2
Trauma Center

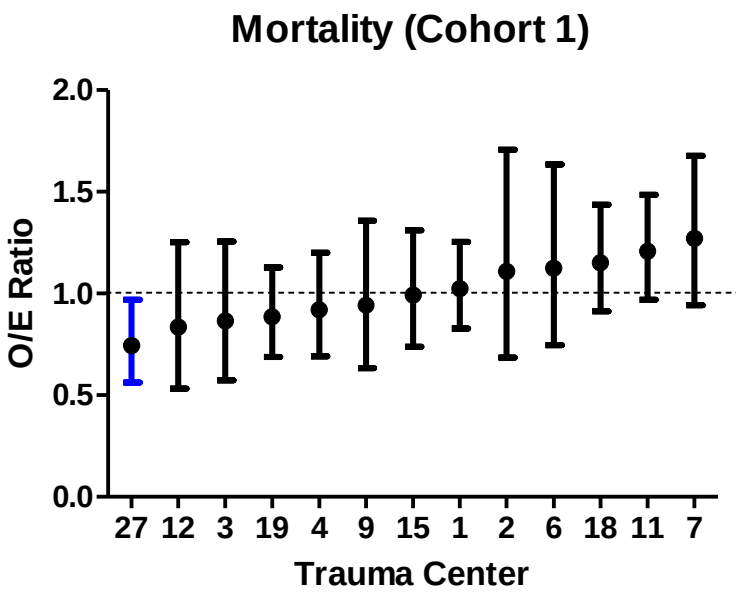

Mortality (Cohort 1 w/o DOA's)
O/E Ratio
2.5
2.0
1.5
1.0
0.5
0.0
27 12 19 3 4 9 15 1 2 6 18 7 11
Trauma Center

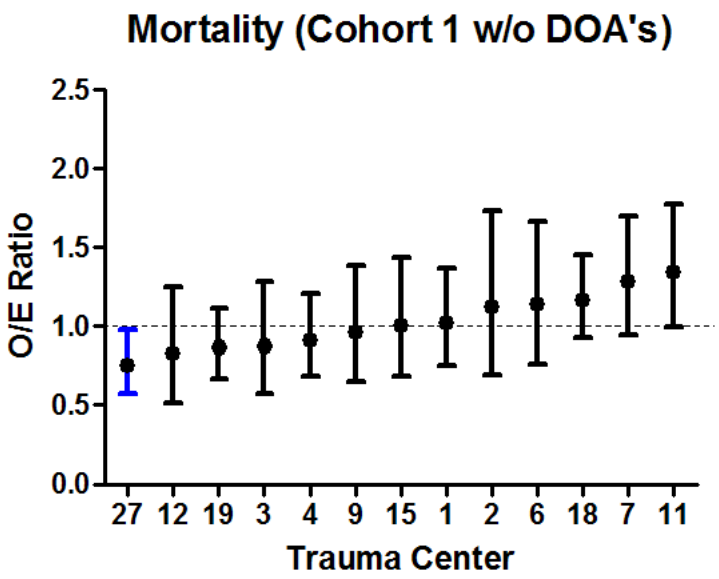

Mortality (Cohort 2 w/o DOA's)
O/E Ratio
2.5
2.0
1.5
1.0
0.5
0.0
27 3 19 12 1 15 9 4 7 18 6 2 11
Trauma Center

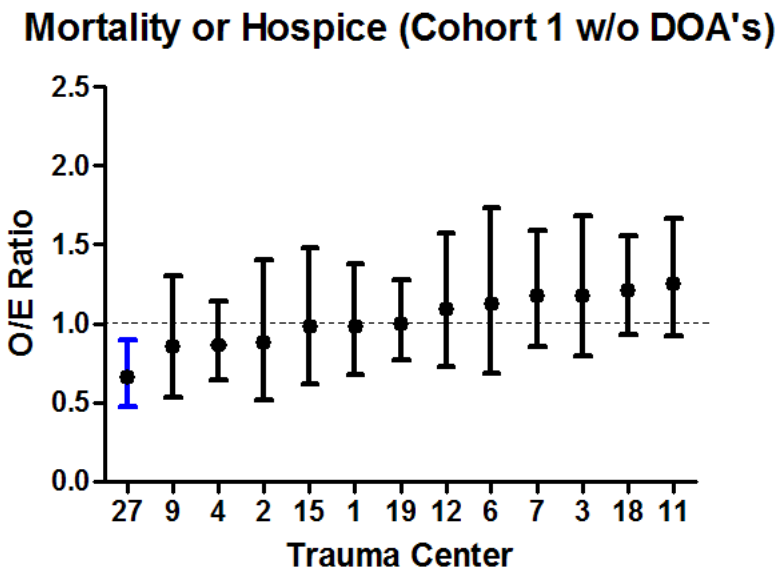

Mortality (Cohort 4 - Blunt Single)
O/E Ratio
3
2
1
0
15 3 4 9 27 12 2 18 19 6 11 7 1
Trauma Center


Crude Mortality
15
10
5
0
%
12
4
2
3
19
27
9
7
1
6
15
11
18
Trauma Center


Adjusted Mortality
8
6
4
2
0
%
27
12
3
19
4
9
15
1
2
6
18
11
7
Trauma Center

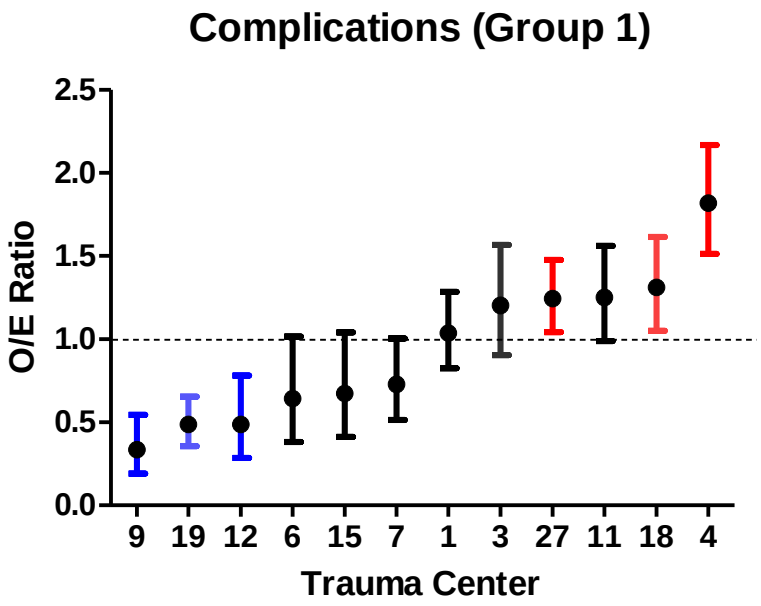

Mortality (Cohort 1)
2.0
1.5
1.0
0.5
0.0
O/E Ratio
27
12
3
19
4
9
15
1
2
6
18
11
7
Trauma Center

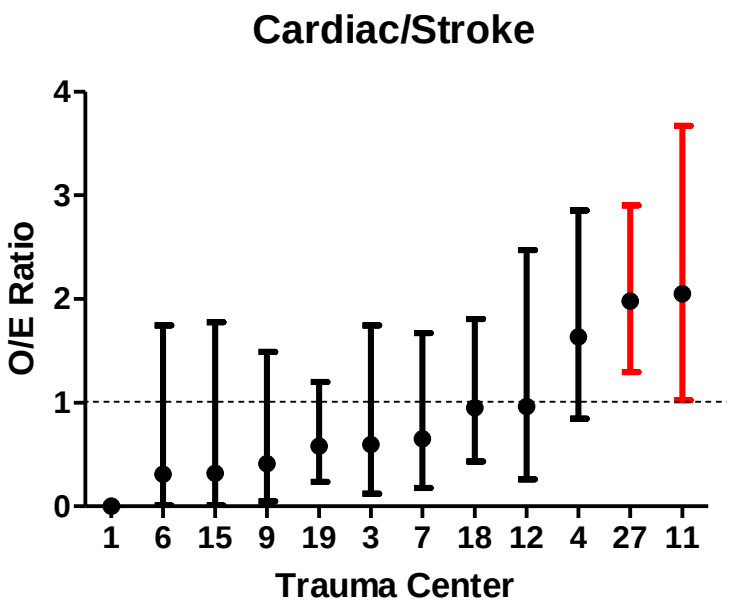

Mortality (Cohort 1 w/o DOA's)
O/E Ratio
2.5
2.0
1.5
1.0
0.5
0.0
27 12 19 3 4 9 15 1 2 6 18 7 11
Trauma Center

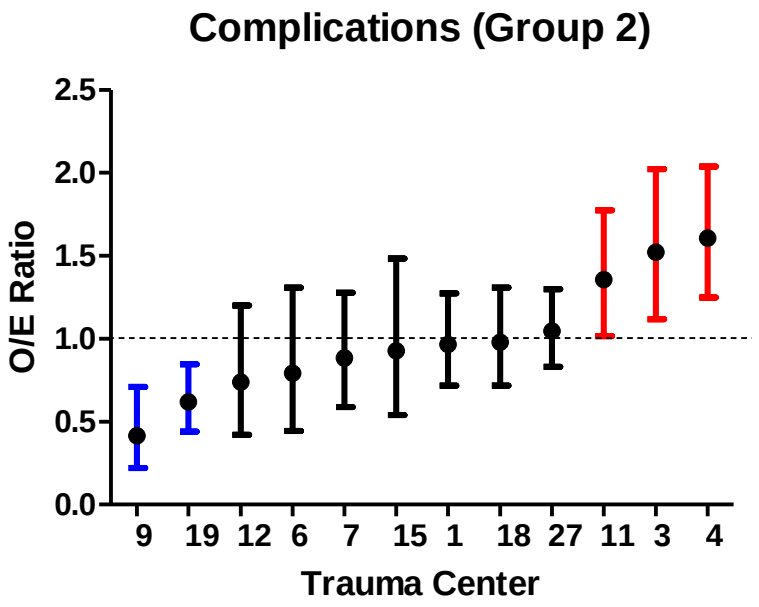

Mortality or Hospice (Cohort 1 w/o DOA's)
O/E Ratio
2.5
2.0
1.5
1.0
0.5
0.0
27 9 4 2 15 1 19 12 6 7 3 18 11
Trauma Center

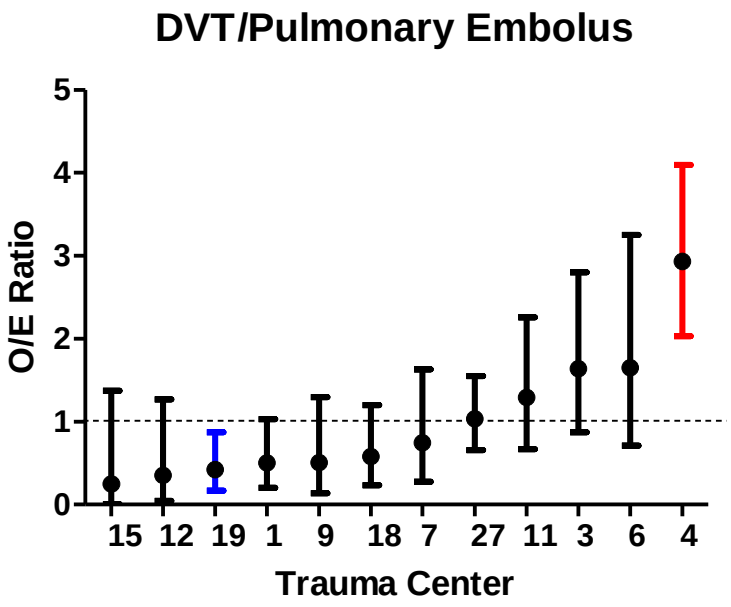
Complications

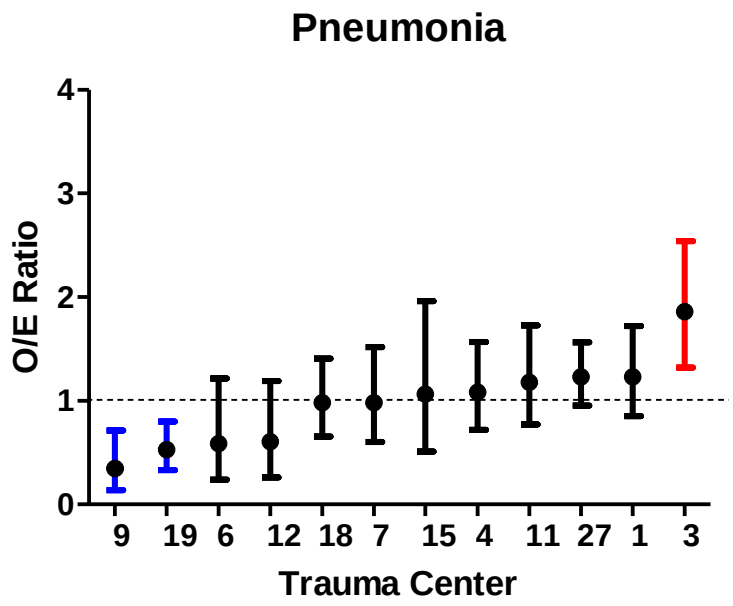
- Cohort 2 w/o DOA's
- Group 1
  - Superficial SSI, Deep SSI, Organ space SSI, Wound disruption, ARDS, Pneumonia, Unplanned intubation, PE, Acute renal failure, UTI, Stroke/cva, Cardiac arrest requiring cpr, MI, New onset arrhythmia, DVT LE , DVT UE, Systemic sepsis, Decubitus ulcer,C. difficle colitis.
- Group 1
  - Organ space SSI, Wound disruption, ARDS, Pneumonia, PE, Acute renal failure, MI, DVT LE , DVT UE, Systemic sepsis.
- Specific
  - Cardiac/Stroke, Pneumonia, DVT/PE, UTI, Renal Failure, Sepisis

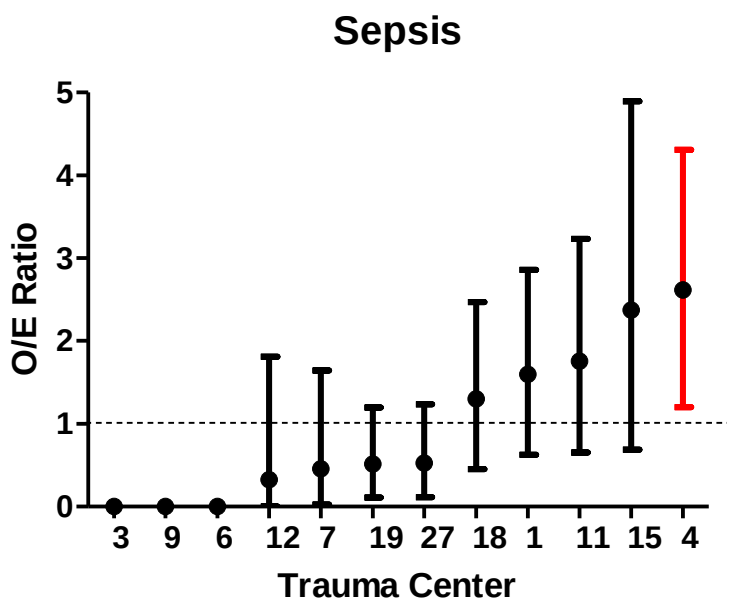

Complications (Group 1)
O/E Ratio
2.5
2.0
1.5
1.0
0.5
0.0
9 19 12 6 15 7 1 3 27 11 18 4
Trauma Center

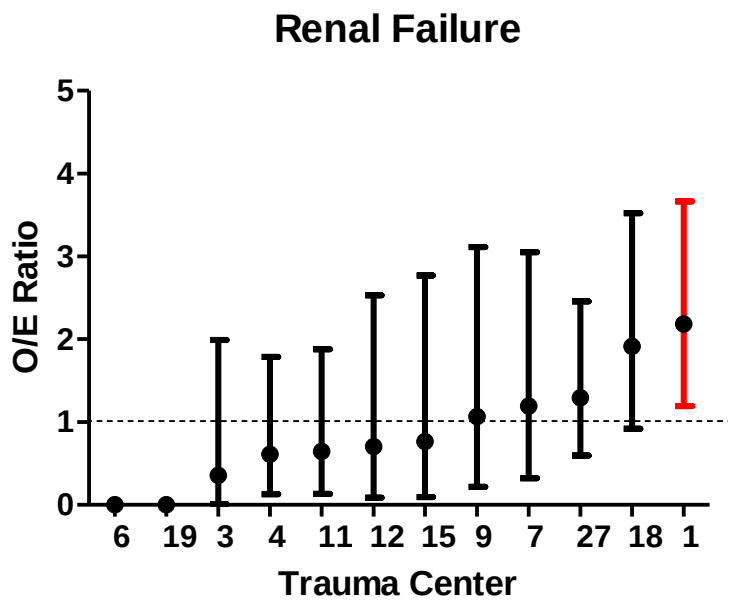

Cardiac/Stroke
O/E Ratio
4
3
2
1
0
1 6 15 9 19 3 7 18 12 4 27 11
Trauma Center

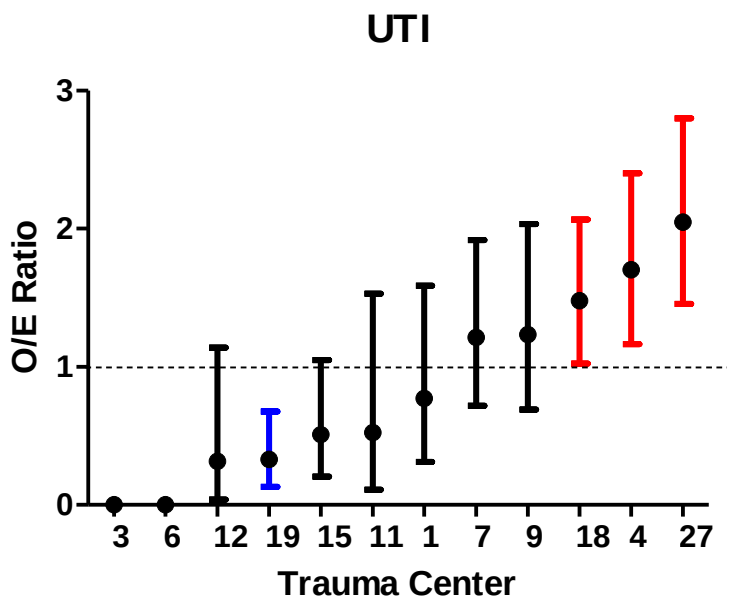

Complications (Group 2)
O/E Ratio
2.5
2.0
1.5
1.0
0.5
0.0
9 19 12 6 7 15 1 18 27 11 3 4
Trauma Center


DVT/Pulmonary Embolus
O/E Ratio
5
4
3
2
1
0
15 12 19 1 9 18 7 27 11 3 6 4
Trauma Center


Pneumonia
O/E Ratio
0
1
2
3
4
9 19 6 12 18 7 15 4 11 27 1 3
Trauma Center

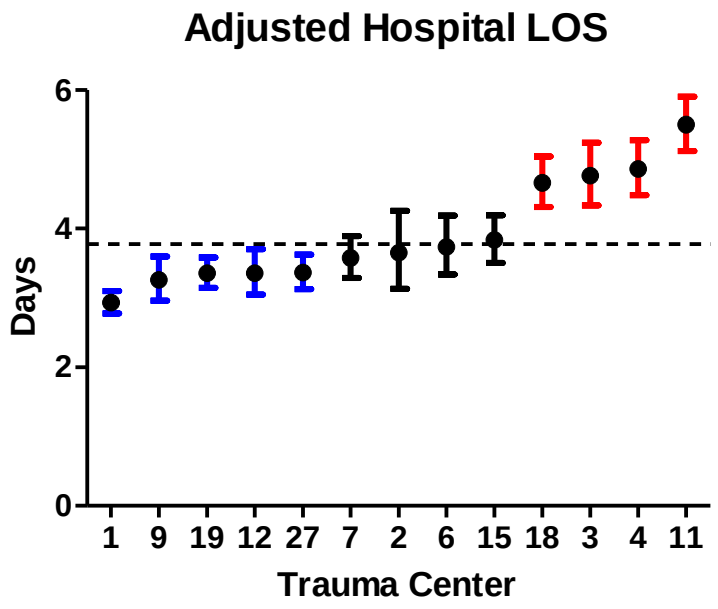

Sepsis
O/E Ratio
0
1
2
3
4
5
3 9 6 12 7 19 27 18 1 11 15 4
Trauma Center

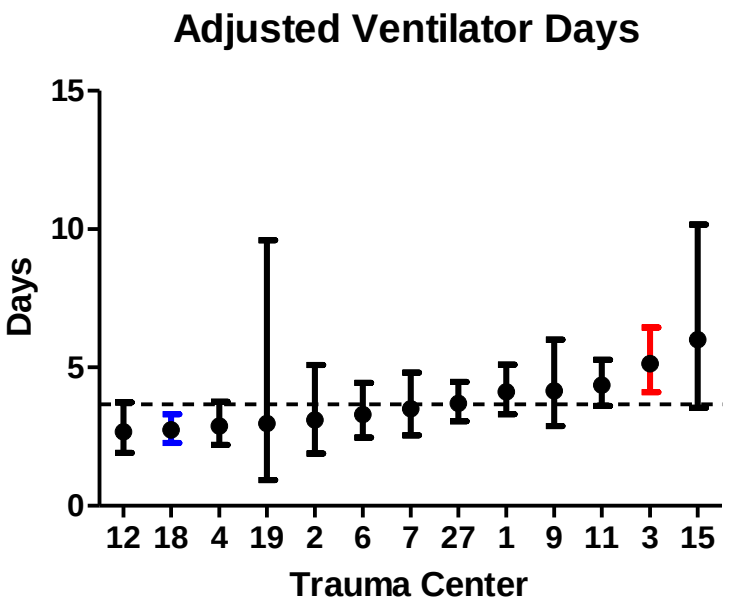

Renal Failure
O/E Ratio
0
1
2
3
4
5
6 19 3 4 11 12 15 9 7 27 18 1
Trauma Center

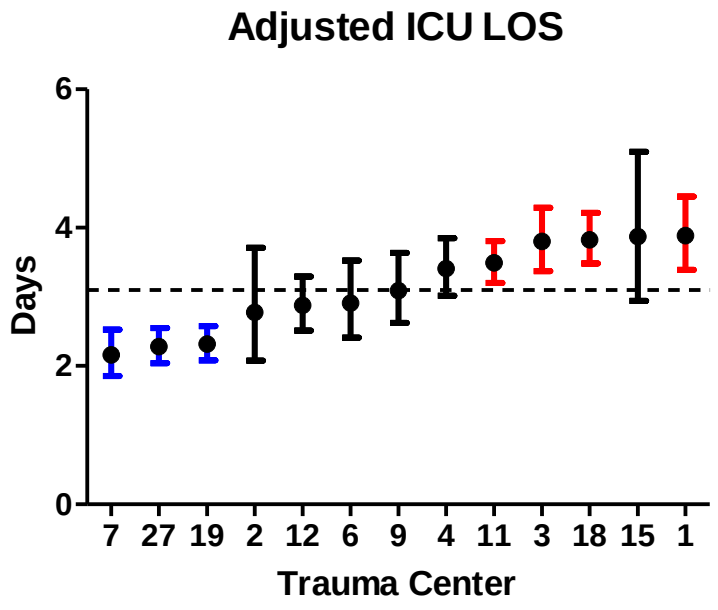

UTI
O/E Ratio
0
1
2
3
3 6 12 19 15 11 1 7 9 18 4 27
Trauma Center

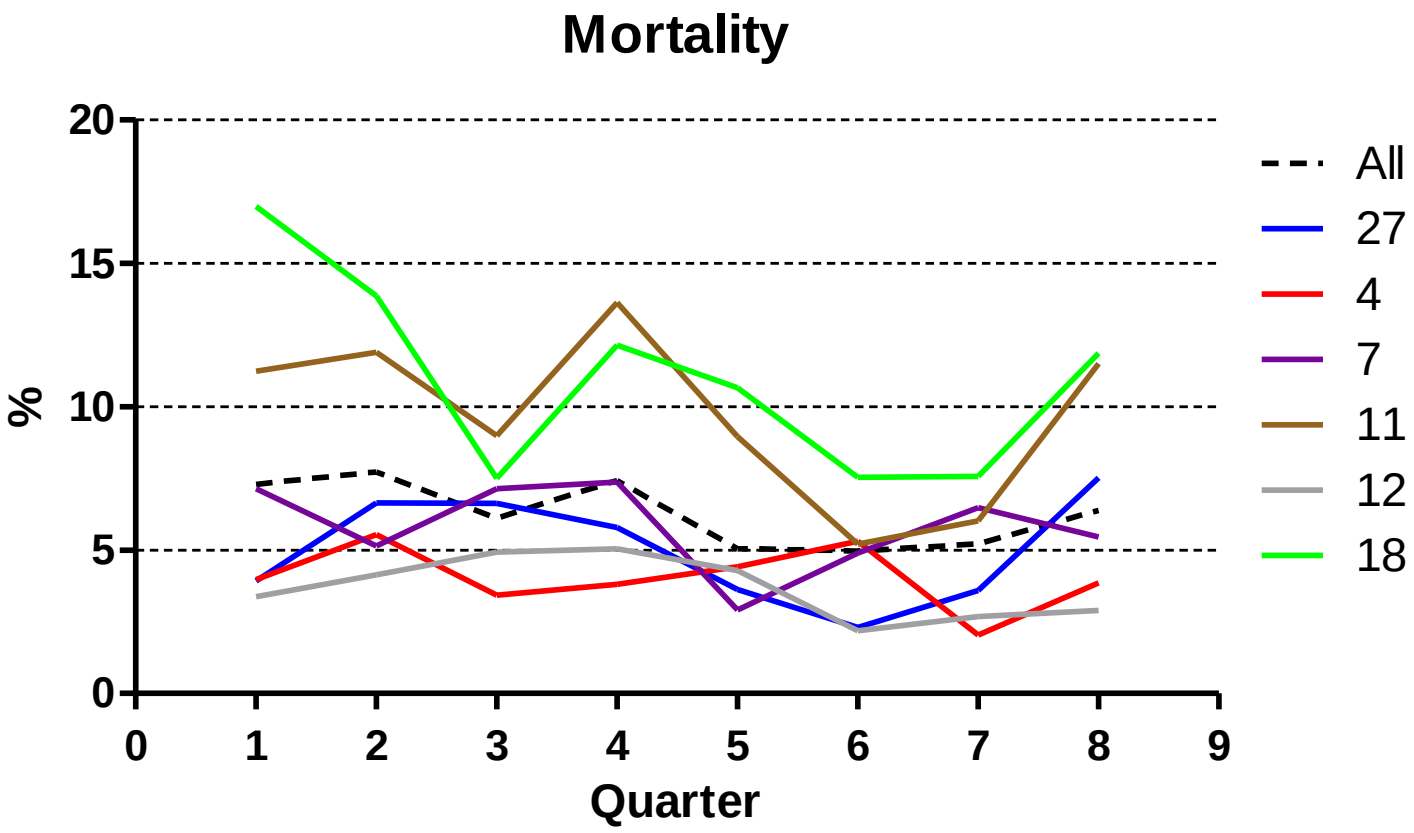
Length of Stay

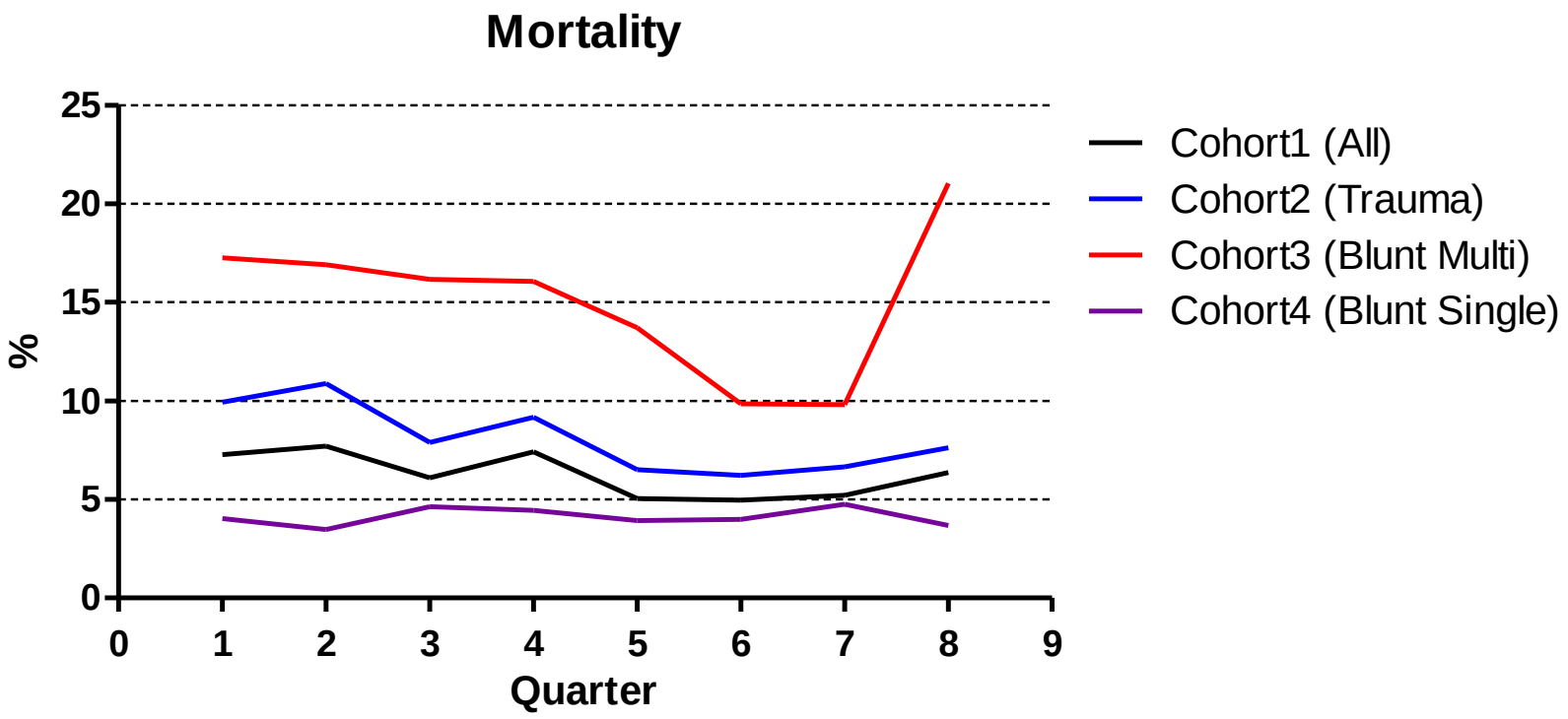
- Cohort 2
- Changed to Risk Adjusted Rate
- Natural log transformed, linear regression
- Adjusted for age, ISS, mGCS, comorbids, etc.
- Hospital LOS, ICU LOS, MV Days
- Exclude deaths for Hospital LOS
- 95% CI

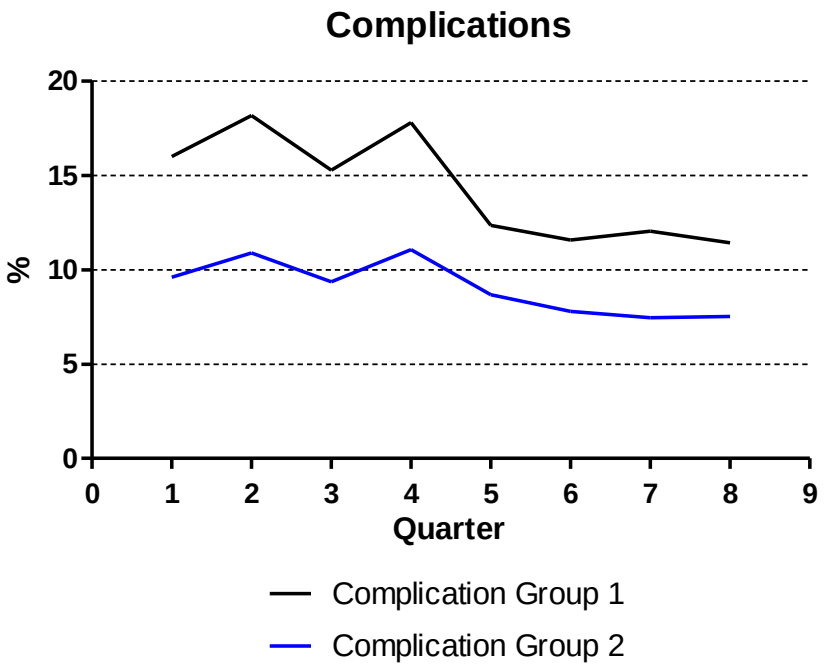

Adjusted Hospital LOS
Days
0
2
4
6
1 9 19 12 27 7 2 6 15 18 3 4 11
Trauma Center

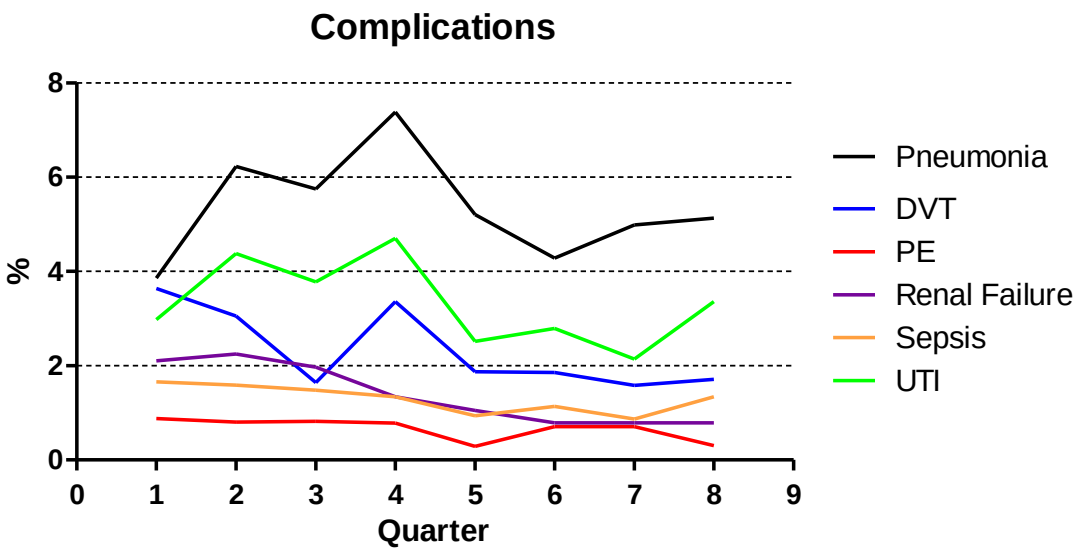

Adjusted Ventilator Days
Days
0
5
10
15
12 18 4 19 2 6 7 27 1 9 11 3 15
Trauma Center


Adjusted ICU LOS
Days
0
2
4
6
7 27 19 2 12 6 9 4 11 3 18 15 1
Trauma Center


Mortality
20
15
10
5
0
%
0
1
2
3
4
5
6
7
8
9
Quarter
All
27
4
7
11
12
18


Mortality
25
20
15
10
5
0
%
0
1
2
3
4
5
6
7
8
9
Quarter
Cohort1 (All)
Cohort2 (Trauma)
Cohort3 (Blunt Multi)
Cohort4 (Blunt Single)


Complications
20
15
10
5
0
%
0
1
2
3
4
5
6
7
8
9
Quarter
Complication Group 1
Complication Group 2


Complications
8
6
4
2
0
%
0
1
2
3
4
5
6
7
8
9
Quarter
Pneumonia
DVT
PE
Renal Failure
Sepsis
UTI

Questions

Process Measures

Mark Hemmila, MD

M·TQIP

Traumatic Brain Injury

- TBI Data Collection Criteria
  - Best GCS within first 24 hrs after ED arrival ≤ 8 or best GCS motor within the first 24hrs after ED arrival ≤ 3
  - **AND**
  - At least one injury in the AIS head region

Traumatic Brain Injury

- Highest (Best) GCS Total in first 24 hrs
- Highest (Best) GCS Motor in first 24 hrs
- GCS Assessment Qualifier
- ICP or Cerebral Perfusion Monitor
  - Type
  - Date, Time
- Reason ICP Monitor Withheld *
- Beta Blockade *
- Discharge Location

VTE Prophylaxis

- VTE Prophylaxis Data Collection Criteria
  - All admitted patients

VTE Prophylaxis

- Date of first dose of pharmacologic VTE prophylaxis administered
- Time of first dose of pharmacologic VTE prophylaxis administered
- Type of pharmacologic VTE prophylaxis
  - Heparin
  - Lovenox
  - Fragmin
  - Coumadin
- IVC Filter *

Putting it together

- Date and type of pharmacologic VTE prophylaxis
- Date IVC filter (Procedure)
- Date PE or DVT (Complications)
- Risk factors (Injury, comorbids, etc.)

Plan

- Implementation
  - ICP Monitoring (TQIP 2012)
  - VTE Prophylaxis (TQIP 2012)
- Target start date for MTQIP 7/1/2011
  - Definitions
  - Instructions
- Custom Data Points
  - Cerebral Monitor – 14
  - VTE – 3

Plan

- Pure Custom
  - No cost
  - ? TQIP mapping
- Vendor
  - DI
  - CDM
- Custom » with transition
  - MTQIP module
  - Set number of fields we choose
  - Validator

MSQC

- Changing
- Partitions (Oncologic, Vascular, etc.)
- Acute Care Surgery
  - Trauma
  - Emergent General Surgery
  - ICU
- Feedback

Call for Data, Next Meeting

- Submit data from 11/1/09 to 10/31/10
  - Due June 3, 2011
  - 14 centers
- Next call
  - Data from 3/1/10 to 2/28/11
  - Due September 30, 2011
  - 18 centers
- Meeting October 11, 2011
  - Sepsis
  - Hospital LOS

Feedback

- Meeting Ideas
- Reports
  - 2 years
  - Trends
  - Adjusted rates vs. O/E
  - Selected Patient Groups
- Emergent General Surgery and ICU

MTQIP Location

- U of M North Campus Research Complex
- MSCORE-MTQIP
  Building 520 NCRC, 3rd Floor, Rm 3180C
  2800 Plymouth Road
  Ann Arbor, MI 48109-2800
- Phone 734 763-2854
- Fax 734 998-7473
- MSQC, MBSC