The Michigan Trauma Quality Improvement Program

Ann Arbor, MI
February 14, 2012

Agenda

- General Announcements (Hemmila)
- Future Performance Reporting - ArborMetrix (Birkmeyer)
- Group Sessions
- Lunch
- Panel and Collaborative Discussion
- CQI Scoring, DI Training, Data/Publications Policy, CME (Mikhail)
- DI, Pradaxa, Reports, VTE prophylaxis (Hemmila)

Information – MTQIP Centers

- One year
- New centers (January 1)
  - McLaren Macomb (Mt. Clemons)
  - Oakwood Dearborn
  - Oakwood Southshore
  - Saint Mary's Health Care - Grand Rapids
  - St. Mary's of Michigan - Saginaw
- Total centers
  - 23
  - 16 with data in current report

Information - TQIP

- Benchmark Reports
  - November 2011
  - 2010 admissions
- ACS-TQIP Enrollment
  - Applications for 2012
  - www.facs.org/trauma/ntdb/tqip
- ACS-TQIP Meeting
  - Philadelphia
  - October 28-30, 2012

ACS COT - QDRC/NTDB/NTDS/TQIP

- Quality and Data Resources Committee
- Process Measures
  - Fracture fixation
  - Hemorrhage control/Angiography
- ICD-10
  - October 2013
- AIS 2005
  - Injury coding system
  - AIS 2005 hand coding is standard for MTQIP
  - Michigan Trauma Coalition

Group Sessions

- Order of rooms based on color of name badge
- Red - Room 1, 2, 3, 4
- Blue - Room 2, 3, 4, 1
- Yellow - Room 3, 4, 1, 2
- Green - Room 4, 1, 2, 3
- 20-25 minutes per session
- Return to main room for lunch

“Future Options for Performance Reporting”

John Birkmeyer, MD
President - ArborMetrix

Conflict Disclosure

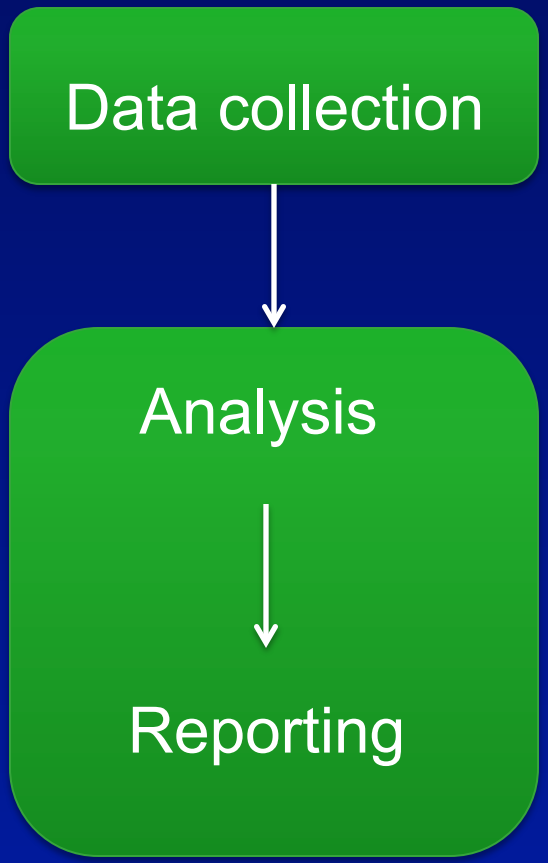
- Presenter has a financial interest in ArborMetrix, Inc.
  - Ann Arbor-based health care analytics and software company
- Relevance to today's presentation
  - Database vendor for several Michigan CQI programs

My involvement with clinical registries

- Northern New England Cardiovascular Disease Study Group (cardiac surgery
- American College of Surgeons-National Surgical Quality Improvement Program
  - Chair, Measurement & Evaluation committee
- Michigan Bariatric Surgery Collaborative
- Michigan Surgical Quality Collaborative

Status Quo

Vendor



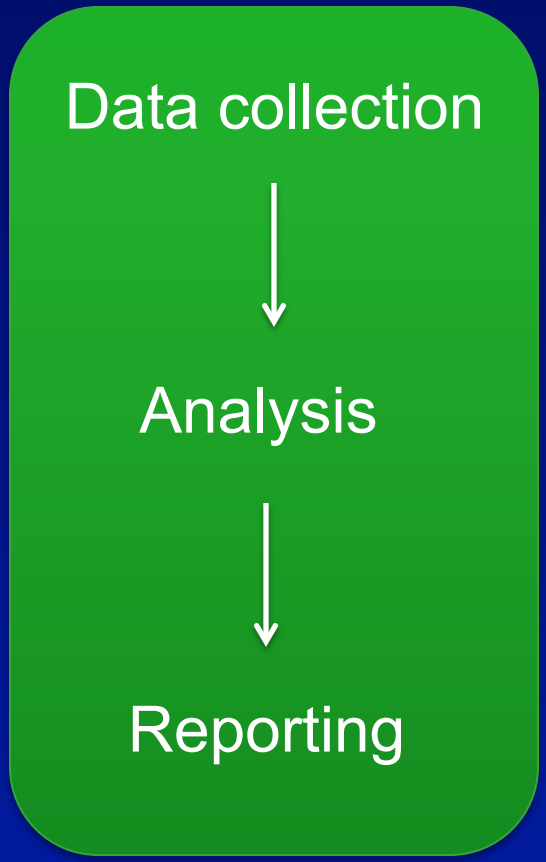
Society / coordinating center

Problems

- Inefficient, $$$
- Uneven science
- Batched analysis, “stale” data
- Static reports, little drill-down capability

Our goal

Fully integrated software platform



Practice management tool

- Real time reporting (risk and reliability adjustment)
- Clinical decision support
- Patient-level drill down capabilities
- Easy, cool & fun

Panelists

- Room 1 – Sepsis
  - Mary-Anne Purtill, Tom Rohs
- Room 2 – Use of MTQIP
  - Judy Mikhail, Joann Burrington
- Room 3 – Data Collection
  - Jill Jakubus, Cece Roiter
- Room 4 – Trauma Resuscitation
  - Wendy Wahl, Jim Wagner

Group Sessions

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- Return to main room for lunch

Lunch


Presented to
Madonna R. Walters,
BSN, MS, RN
Outstanding Trauma Nurse
Specialist and Friend, for her
Fourteen years of Leadership,
Dedication, and Professionalism.
Trauma Program 1997 – 2012
St. Joseph Mercy Hospital, Ann Arbor
Selfless Acts of Time
Compassion For All Creatures
Exceptional Work Ethic
Resident Reseach Forum Winner
ACS Verified 1998
"Wicked" 2006 – 2011
TNCC / ATLS
Safe Wheels
Educator / Instructor
Six Sigma Black Belt
Artist
Facilitator / Mentor

Group Sessions – Panel

Program Updates

Judy Mikhail, BSN, MSN, MBA

M·TQIP

BCBSM
Hospital Payments

1. Cost to join ACS-TQIP = $9,000
2. Registry software license = $2,500
3. Data abstraction support based on volume
   - 30% of 1 FTE Registrar salary = $25,500

Example: TC Volume 650
Total payment ≈ $37,000

2 Questions

Do you know where your money went?

If you do, have you used it?

2012 CQI Index Measures

Measure	Weight	Measure Description	Points Earned
#1	20	Timeliness of data • 3 of 3 times • 2 of 3 times • 1 of 3 times	20 10 0
#2	15	Site Visit/Audit • Completed • Not completed	15 0

2012 CQI Measures

Measure	Weight	Measure Description	Points Earned
#3	25	Meeting Participation - Surgeon • All Meetings • 2 of 3 Meetings • 1 of 3 Meetings • Did not participate	 25 10 5 0
#4	25	Meeting Participation - TPM & Registrar • All Meetings • 2 of 3 Meetings • 1 of 3 Meetings • Did not participate	 25 10 5 0

2012 CQI Measures

Measure	Weight	Measure Description	Points Earned
#5	15	Timely PI Project Data Submission: Within Two Weeks of Request • 3 of 3 times • 2 of 3 times • 1 of 3 times • No Participation	 15 10 5 0

DI Report Writer Training

- 16 of 23 MTQIP Centers use NTRACs
- NTRACs plans to stop support of Foxfire
- Will switch to Report Writer
- Need for training
- Part A: 4 hour web based session “Basic”
- Part B: 8 hour in person session “Advanced”


Research
Opportunities

Publications

Publication Policy

- Authorship
- Conflict of Interest
- Processes for proposing & approving research questions

Publications Committee

- Dr. Bowling (Hurley)
- Dr. Kepros (Sparrow)
- Dr. Share (BCBSM)
- J. Mikhail (MTQIP)

Data Use and Publications

Data Use Agreement

Mailed disc with data

MTQIP Coordinating Center

Analysis Performed

(allow 6 months)

Coming Soon….

- **Web Site Overhaul**
  - Calendar of meetings
  - Due Dates, Schedules
  - Past meeting presentations
  - Publications Forms
    - Policy - Proposal - DUA
  - Registry
    - Data definitions - Forms
  - Resources
- **Meeting CME**
- **Forms QI Reporting**
  - **Hospital Specific Projects**

DI, MTQIP Reports, etc.

Mark Hemmila, MD

DI

- 3 year contract (2012, 2013, 2014)
- 35-40 MTQIP custom data elements
- Mapping and transmittal of TQIP process measures
- Technical support for MTQIP tab
- DI Report Writer
- Will add future TQIP process measures

Costs

- Coordinating Center
  - $5000 Create MTQIP tab
  - $1500/yr Technical support
  - $1000/yr/center Mapping and transmittal
  - $65/hr Programming costs for additional process measures
- MTQIP Centers
  - $2000 DI Report Writer new purchase
  - $700/yr DI Report Writer license fee

CDM/Lancet

- CDM
  - TraumaBase
  - 4 MTQIP centers
  - Standardize MTQIP tab and reports
- Lancet
  - Trauma One
  - 2 MTQIP centers
  - Custom data element insertion synchronized between BM and POH

It's a brave new world…

PRADAXA® Official Site | Pradaxa.com
Pradaxa® Capsules (dabigatran etexilate). Learn More Here.
*www.**pradaxa**.com*
Internal Bleeding Lawsuit | thesteinberglawfirm.com
Steinberg Law Firm PC is accepting internal bleeding cases Nationwide.
*www.thesteinberglawfirm.com/**pradaxa***
Pradaxa Blood Thinner- - Bleeding or Hemorrhaging?
Lawsuits Being Investigated, Call Today!
Attorney Profile - Pradaxa Lawsuit - Dangerous Medical Products
www.migliorelaw.com

Acutely Injured Patients on Dabigatran

TO THE EDITOR: Trauma remains the fourth leading cause of death in the United States, with 40,000 deaths annually in persons over the age of 65. U.S. trauma centers are seeing an increasing number of severely injured elderly patients,[1] and hemorrhagic complications and head injuries account for a substantial proportion of these fatalities.[1] Although the preinjury use of warfarin is increasing and is associated with a considerable increase in morbidity and mortality, these complications can be dramatically reduced with methods that rapidly reverse the anticoagulant effect.[1] Moreover, numerous options are available to achieve warfarin reversal (e.g., vitamin K, plasma, factor VIIa, and factor concentrates).[1] Warfarin reversal can also be easily monitored with readily available laboratory and point-of-care tests.

Warfarin has long been the mainstay of anticoagulation therapy in atrial fibrillation. However, dabigatran etexilate (a new oral direct thrombin inhibitor) has recently been reported to have a similar or lower bleeding risk as compared with warfarin.[2,3] Unlike warfarin, dietary restrictions and frequent blood sampling to monitor the degree of anticoagulation are unnecessary with dabigatran. Enthusiasm for this agent, however, must be tempered by three notable concerns: there is no readily available means for assessing the degree of anticoagulation with dabigatran,

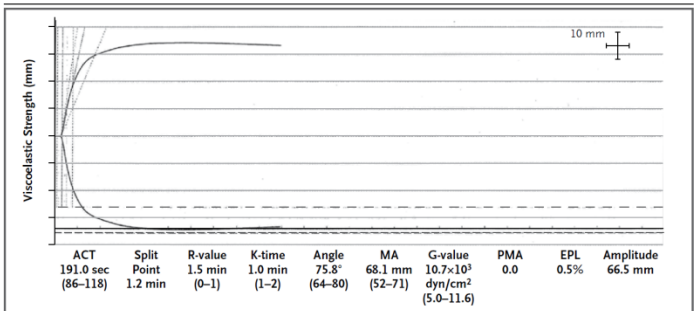


Figure 1. **Rapid Thromboelastographic Tracing in Patient with Dabigatran Coagulopathy.**
This tracing shows the prolonged activated clotting time (ACT) in a patient with a head injury who was receiving dabigatran. The sequence of the variables measured is chronological, and all the values are normal except ACT. The graph lines and interval plots are reference lines imposed by the machine to generate degrees of acceleration and kinetics. Normal ranges are shown in parentheses. EPL denotes estimated percent clot lysis, G-value the generated value of clot strength, K-time clot kinetics, MA maximal amplitude, PMA projected maximal amplitude, and R-value reaction time.

Anticoagulants

- Pradaxa (Dabigatran)
  - Direct thrombin inhibitor
  - Renal elimination, half-life 13 hours
  - No reversal agents
- Xarelto (Rivaroxaban)
  - Direct Xa inhibitor
  - 2/3 Hepatic elimination, half-life 11 hours
  - Possible agents for use in severe bleeding prothrombin complex concentrate, rFactor VIIa

Anticoagulants

- Plan
  - Comorbids (now)
    - Z.04 - Direct Thrombin Inhibitor
    - Z.05 – Direct Xa Inhibitor
  - Blood Products (now)
  - Time to procedure (now)
  - Process measures
    - 2013
    - Dialysis
    - Other reversal agents

Reports

- 3/1/10 to 2/28/11
- 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

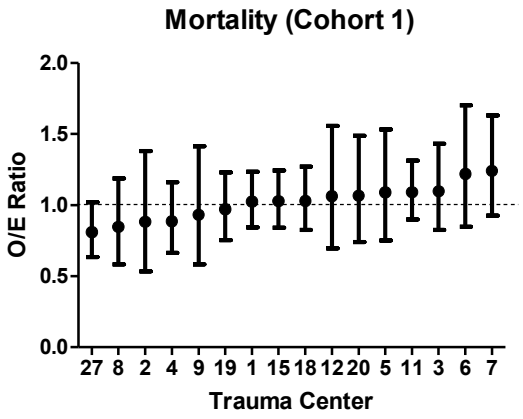
- Complications
  - Cohort 2 w/o DOA's
  - Group 1 (All)
  - Group 2 (Subset)
  - Specific
- Length of Stay
  - Hospital, ICU, Mechanical Ventilator Days
  - Cohort 2
  - Exclude deaths for Hospital LOS

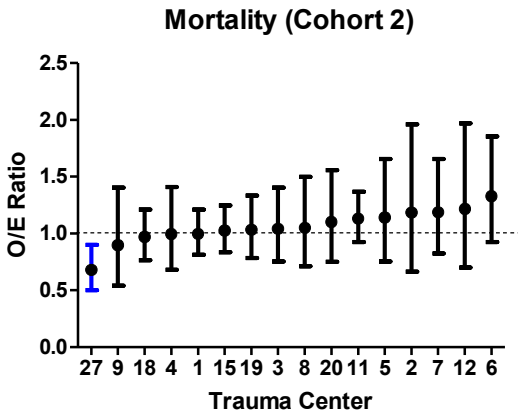
Risk Adjustment

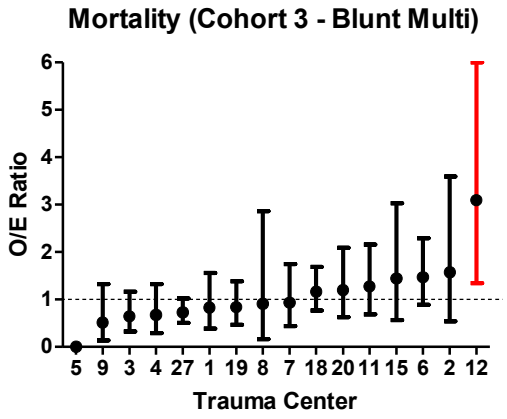
- Univariate
- Imputed BP, Pulse, mGCS if missing
- Step-wise Multivariate Logistic Regression
  - Identify predictor variables, $p \leq 0.2$
- Logit Equation
- Expected Mortality
- O/E Ratios
  - 90% Confidence Interval, Mortality
  - 95% Confidence Interval, Complications
  - 95% Confidence Interval,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

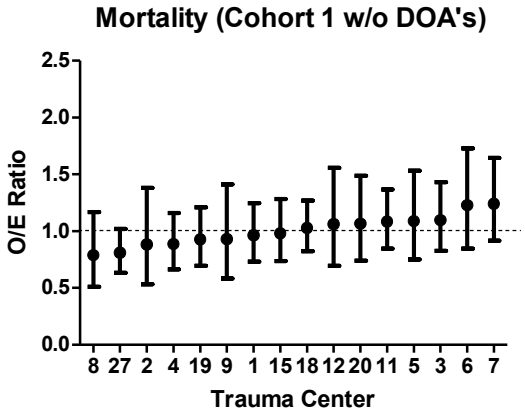
Mortality

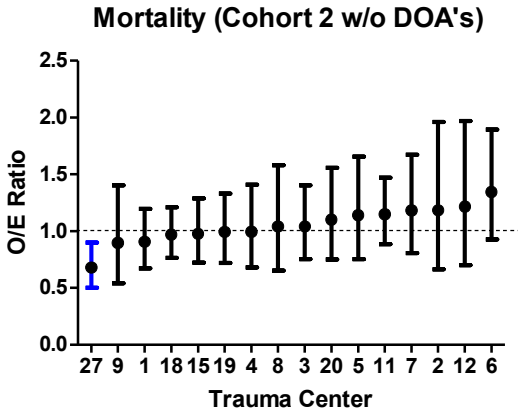
- Cohort 1 (Overall Mortality - All Admissions)
- Cohort 1 (w/o DOA's)
- Cohort 2 (Admit to Trauma Service)
- Cohort 2 (w/o DOA's)
- Cohort 3 (Blunt Multi-System Mortality)
  - Trauma type classified as blunt with injuries of AIS ≥ 3 in at least two of the following AIS body regions: head/neck, face, 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

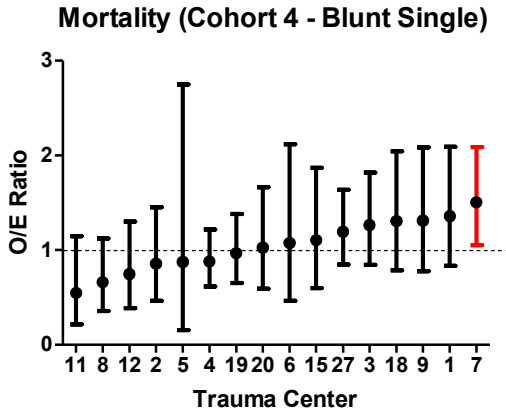

Mortality (Cohort 1)
O/E Ratio
2.0
1.5
1.0
0.5
0.0
27 8 2 4 9 19 1 15 18 12 20 5 11 3 6 7
Trauma Center


Mortality (Cohort 2)
O/E Ratio
2.5
2.0
1.5
1.0
0.5
0.0
27 9 18 4 1 15 19 3 8 20 11 5 2 7 12 6
Trauma Center

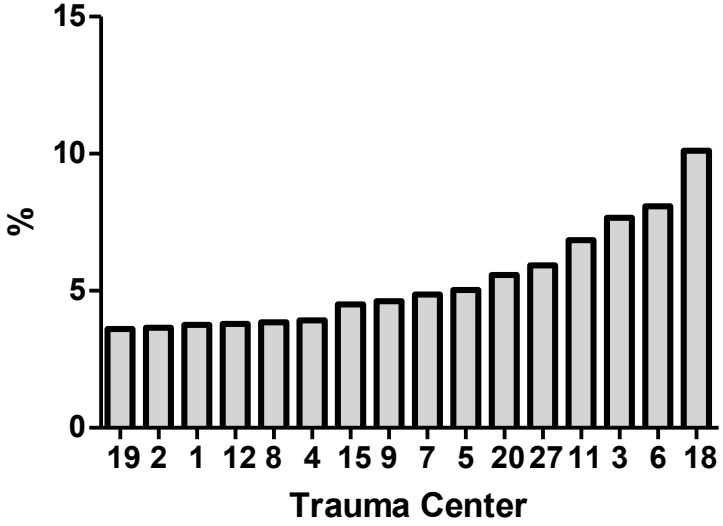

Mortality (Cohort 3 - Blunt Multi)
O/E Ratio
6
5
4
3
2
1
0
5 9 3 4 27 1 19 8 7 18 20 11 15 6 2 12
Trauma Center


Mortality (Cohort 1 w/o DOA's)
O/E Ratio
2.5
2.0
1.5
1.0
0.5
0.0
8 27 2 4 19 9 1 15 18 12 20 11 5 3 6 7
Trauma Center

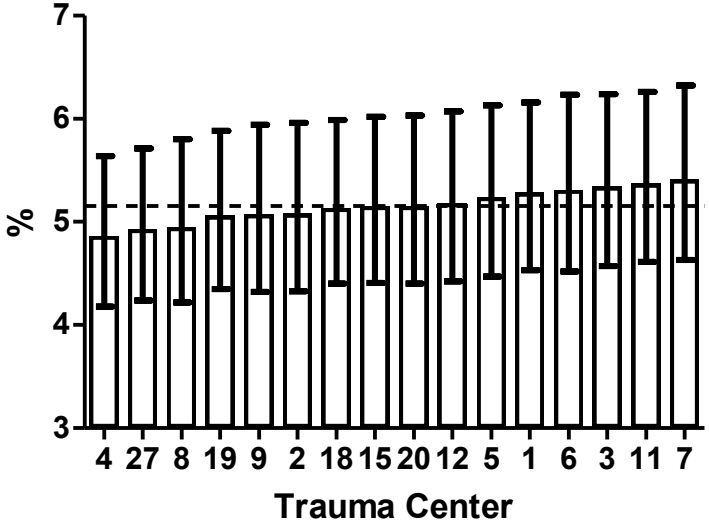

Mortality (Cohort 2 w/o DOA's)
O/E Ratio
2.5
2.0
1.5
1.0
0.5
0.0
27 9 1 18 15 19 4 8 3 20 5 11 7 2 12 6
Trauma Center


Mortality (Cohort 4 - Blunt Single)
O/E Ratio
3
2
1
0
11 8 12 2 5 4 19 20 6 15 27 3 18 9 1 7
Trauma Center

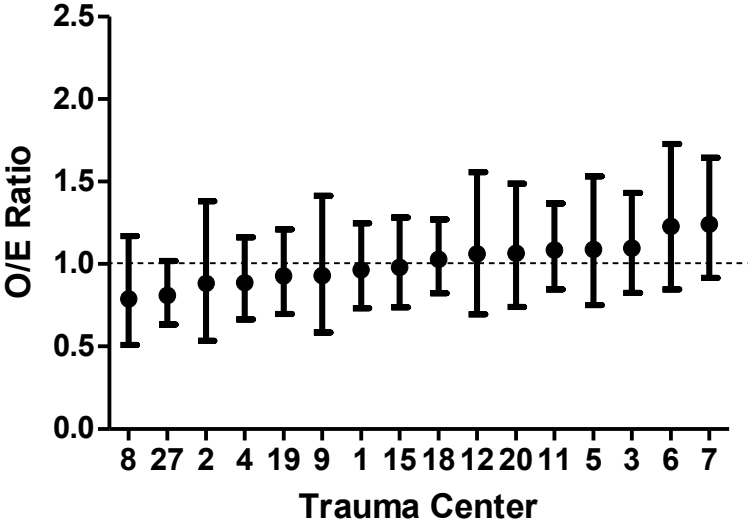
Crude Mortality



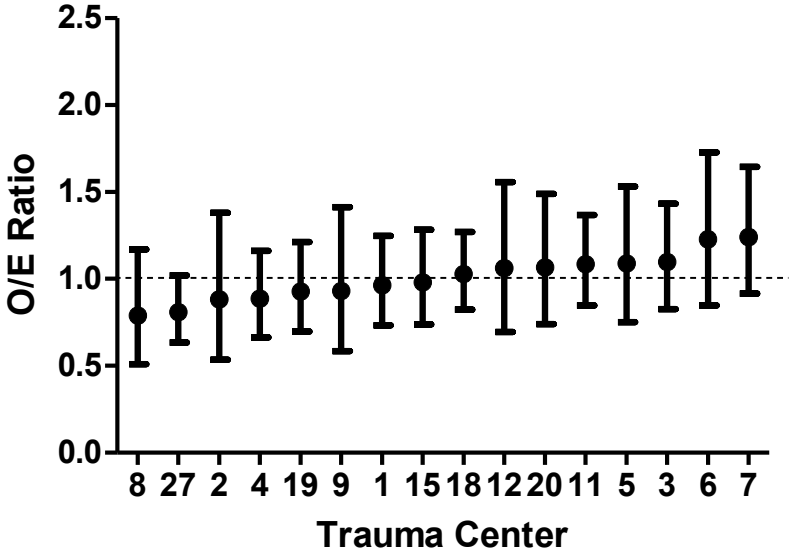
Risk and Reliability Adjusted Mortality



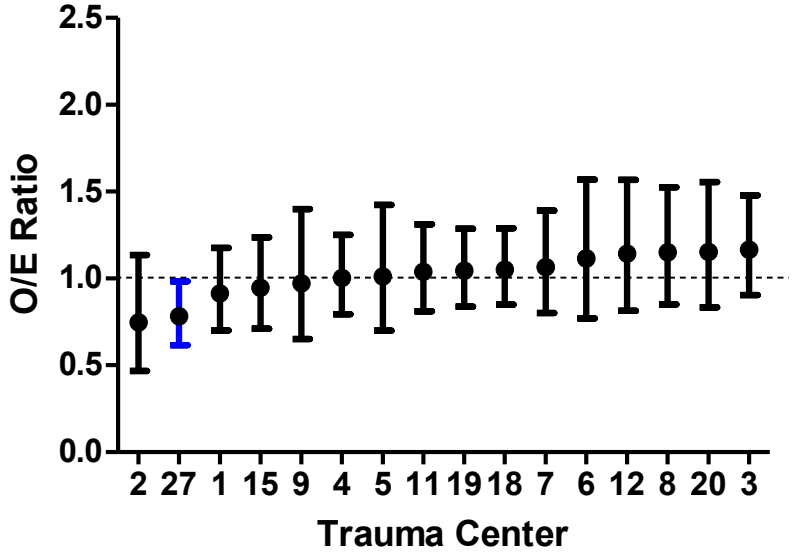
Mortality (Cohort 1 w/o DOA's)



Mortality (Cohort 1 w/o DOA's)

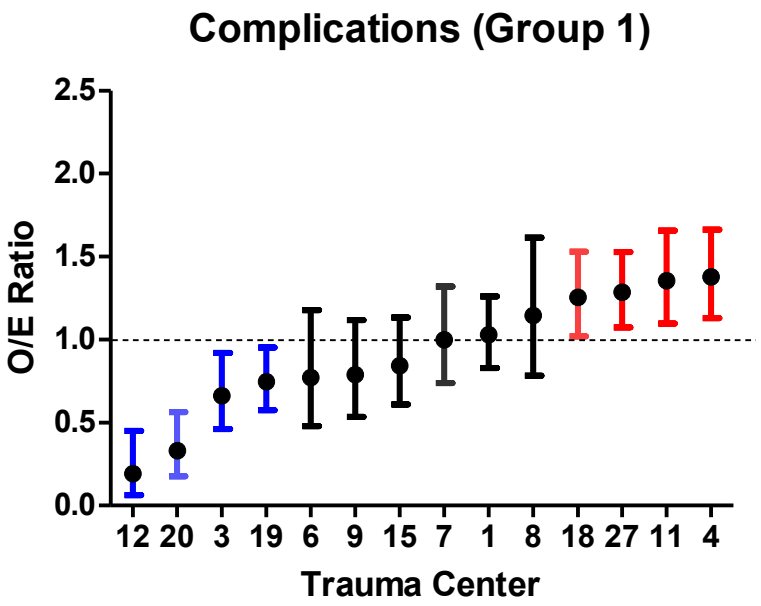


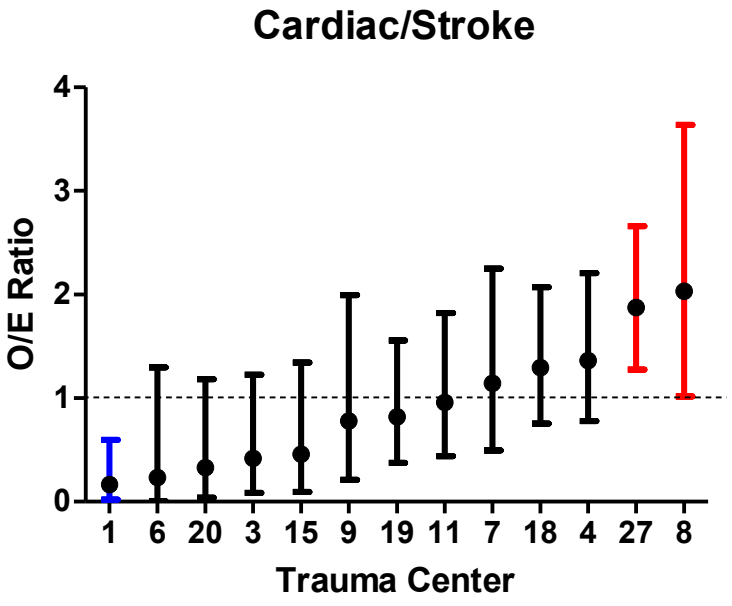
Mortality or Hospice (Cohort 1 w/o DOA's)

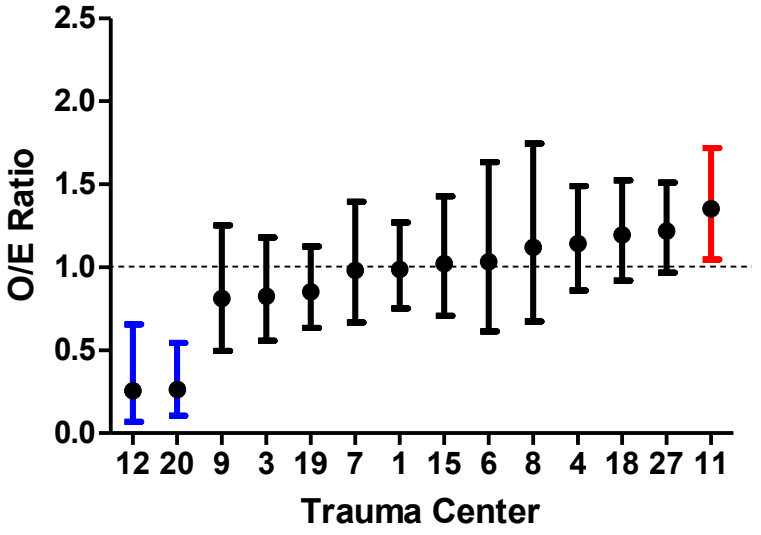


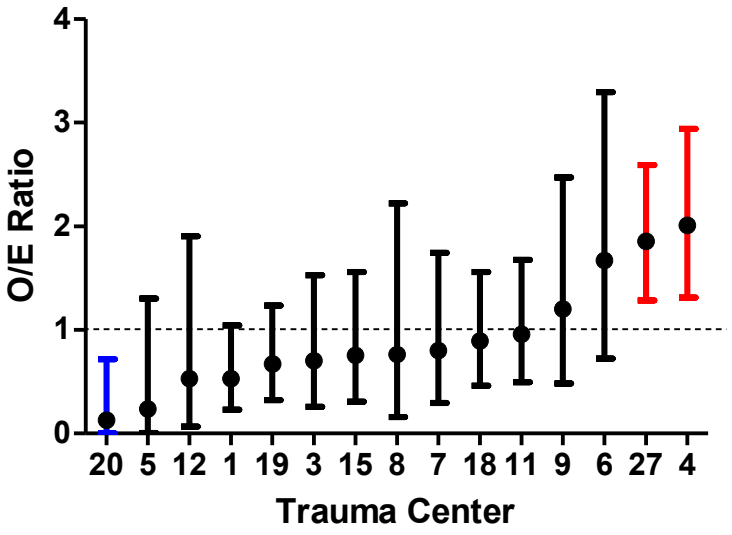
Complications

- 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 2
  - 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, Sepsis

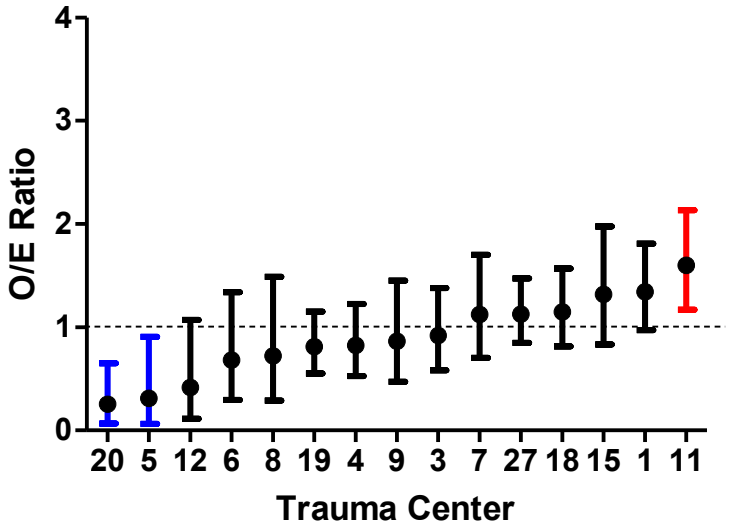

Complications (Group 1)
O/E Ratio
2.5
2.0
1.5
1.0
0.5
0.0
12 20 3 19 6 9 15 7 1 8 18 27 11 4
Trauma Center


Cardiac/Stroke
O/E Ratio
4
3
2
1
0
1 6 20 3 15 9 19 11 7 18 4 27 8
Trauma Center

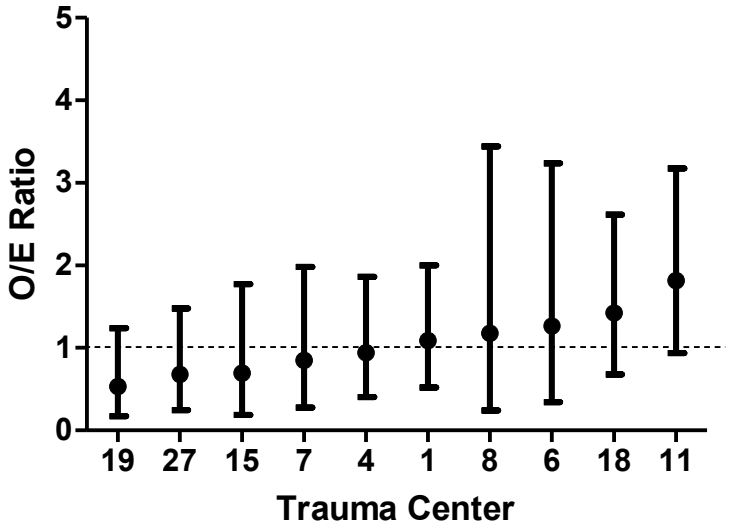

Complications (Group 2)
O/E Ratio
2.5
2.0
1.5
1.0
0.5
0.0
12 20 9 3 19 7 1 15 6 8 4 18 27 11
Trauma Center


DVT/Pulmonary Embolus
O/E Ratio
4
3
2
1
0
20 5 12 1 19 3 15 8 7 18 11 9 6 27 4
Trauma Center

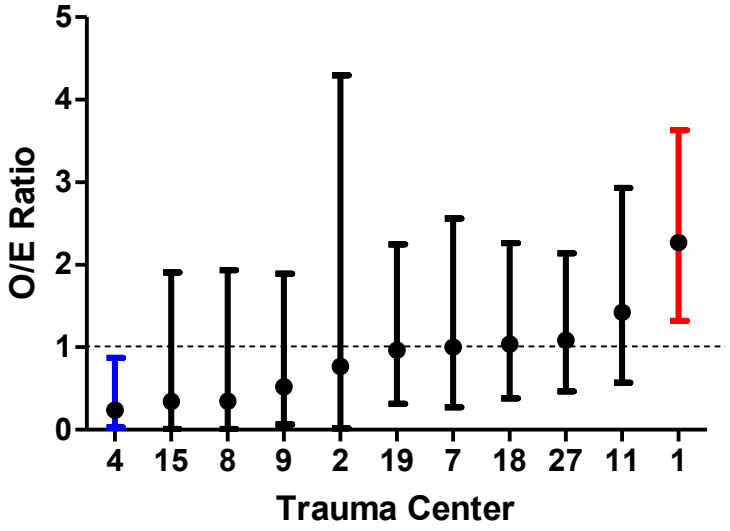
Pneumonia



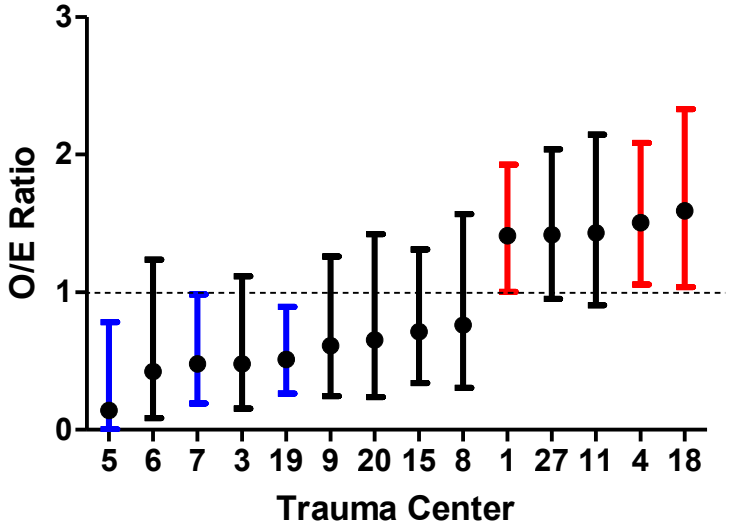
Sepsis



Renal Failure



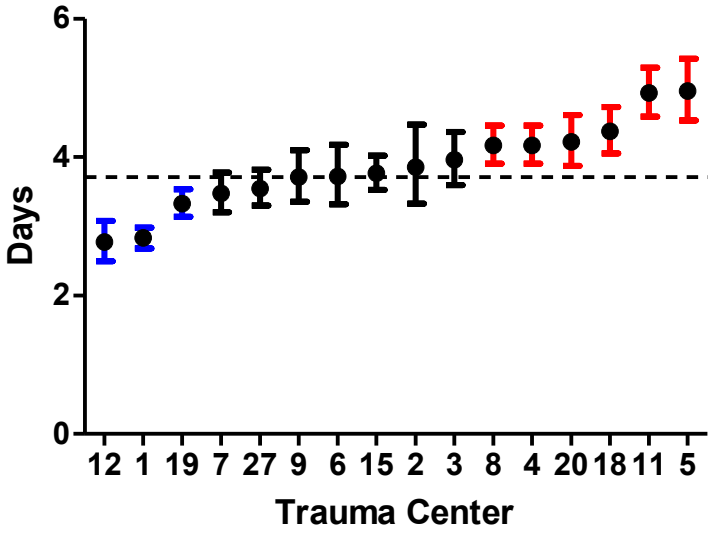
UTI



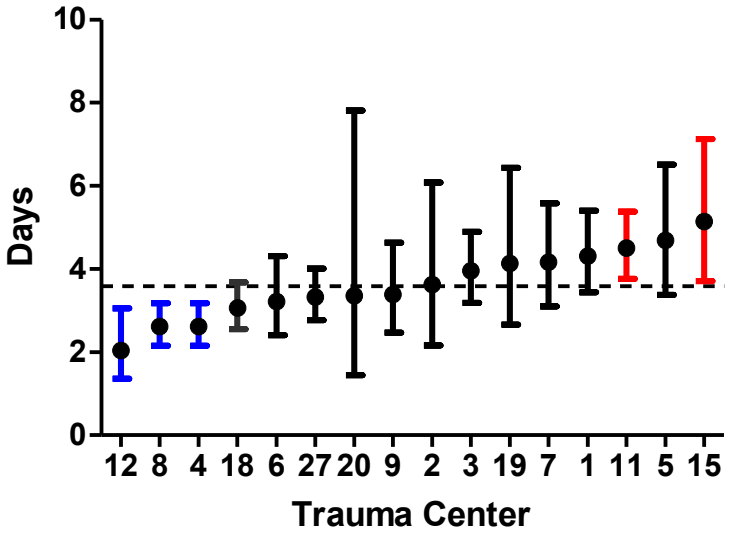
Length of Stay

- Cohort 2
- 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

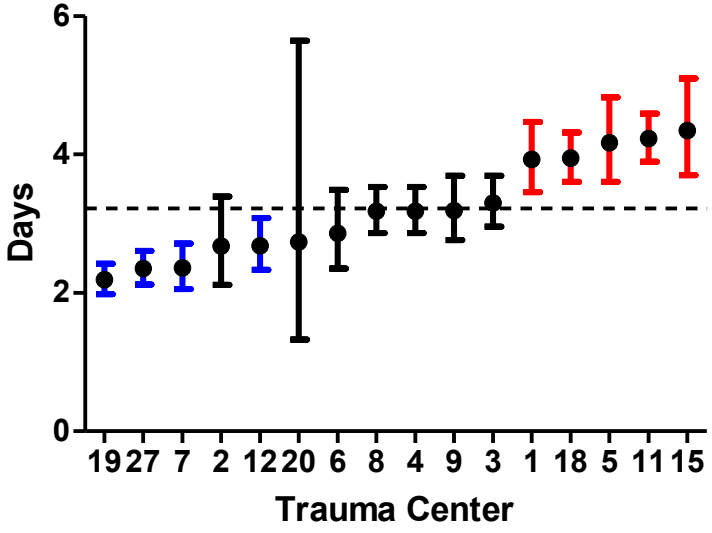
Adjusted Hospital LOS

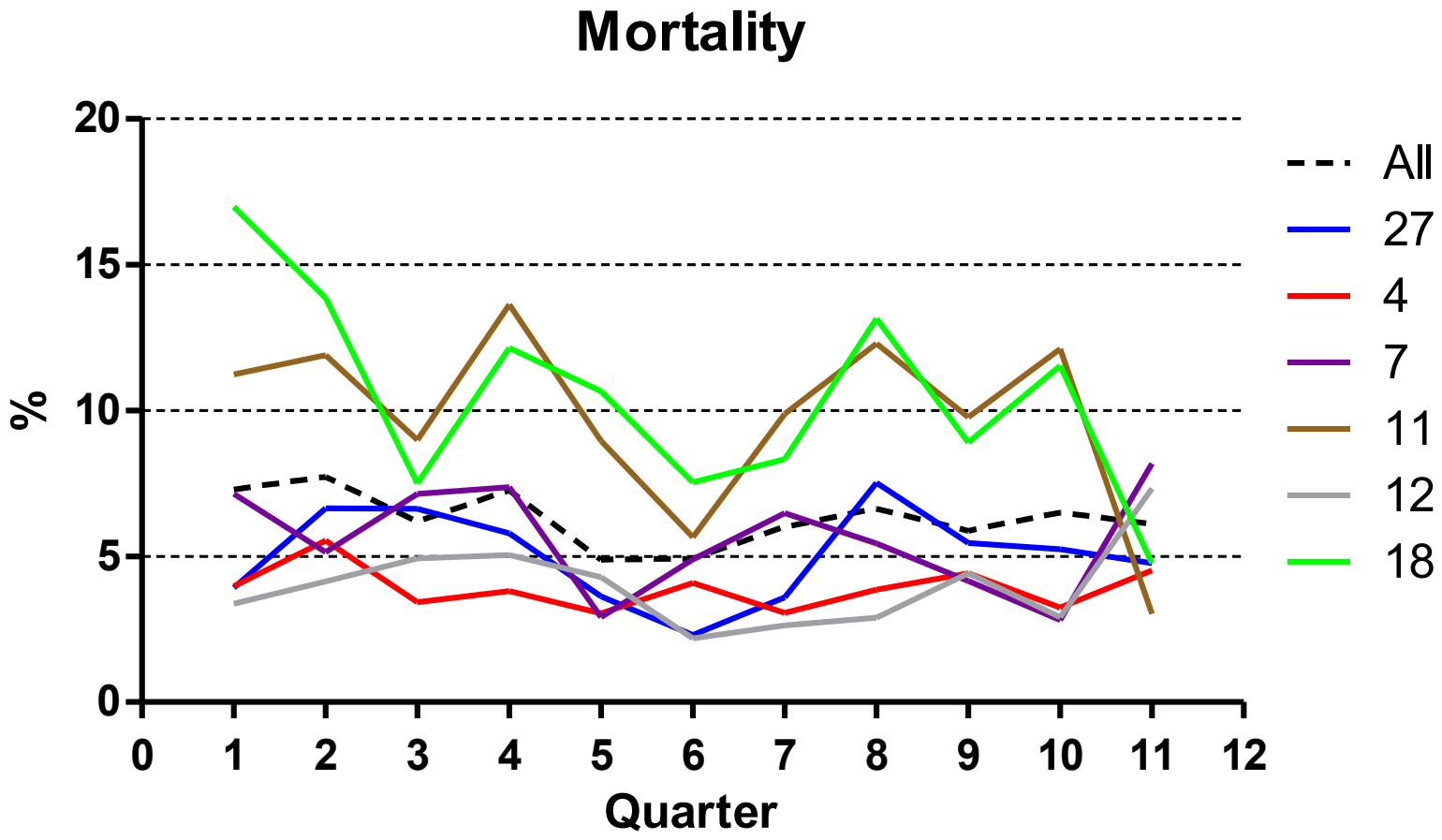


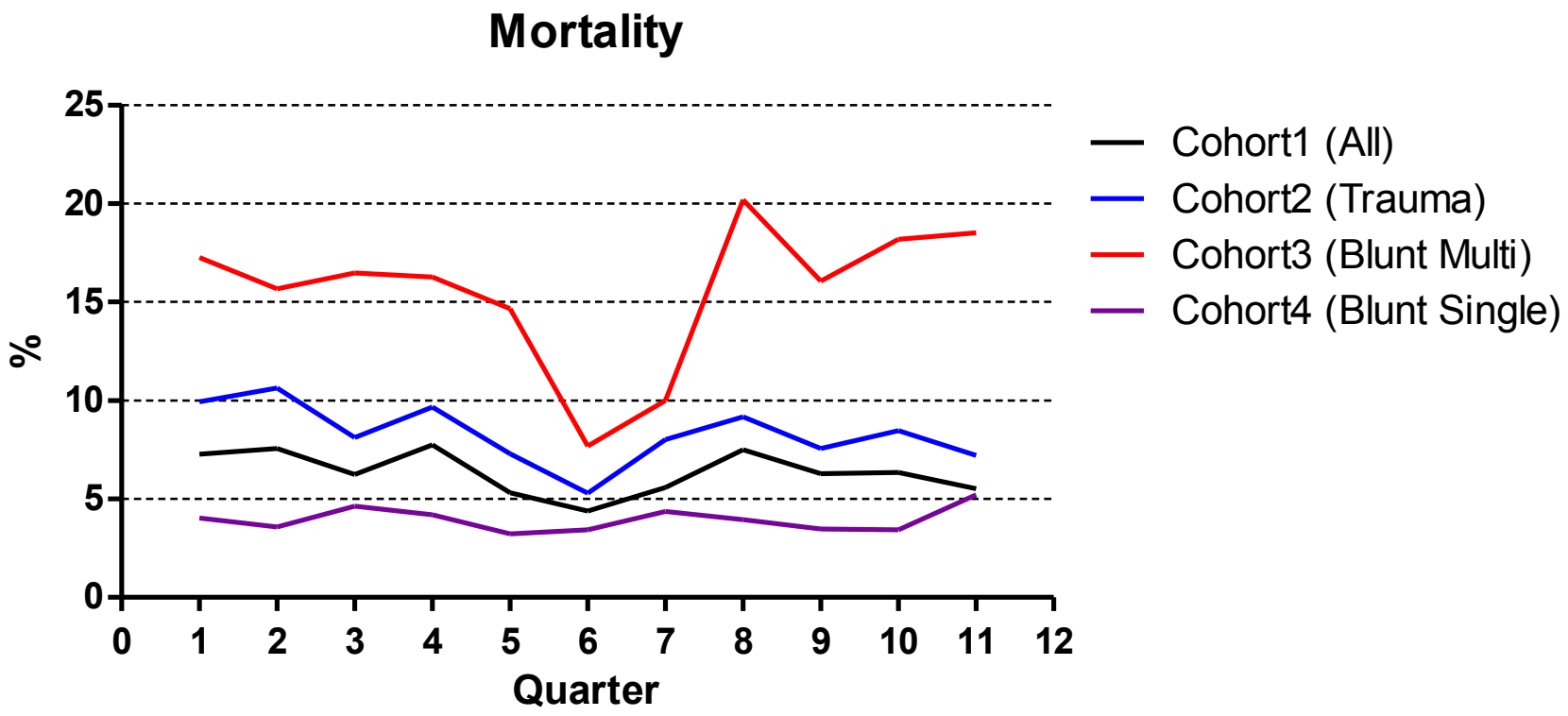
Adjusted Ventilator Days

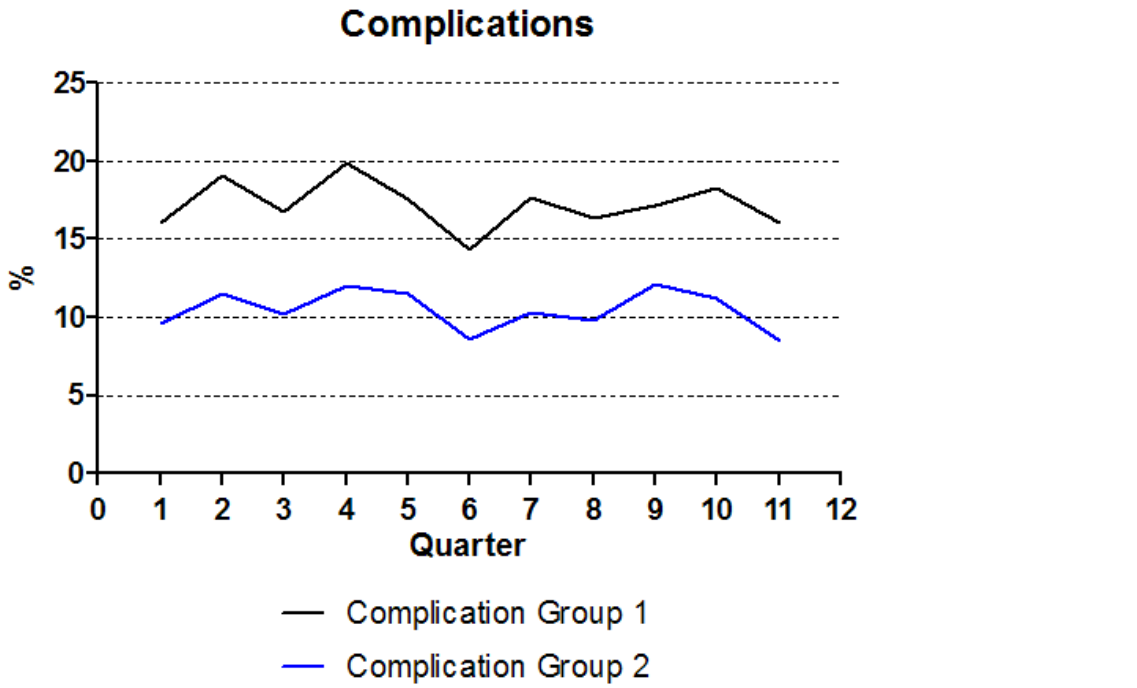


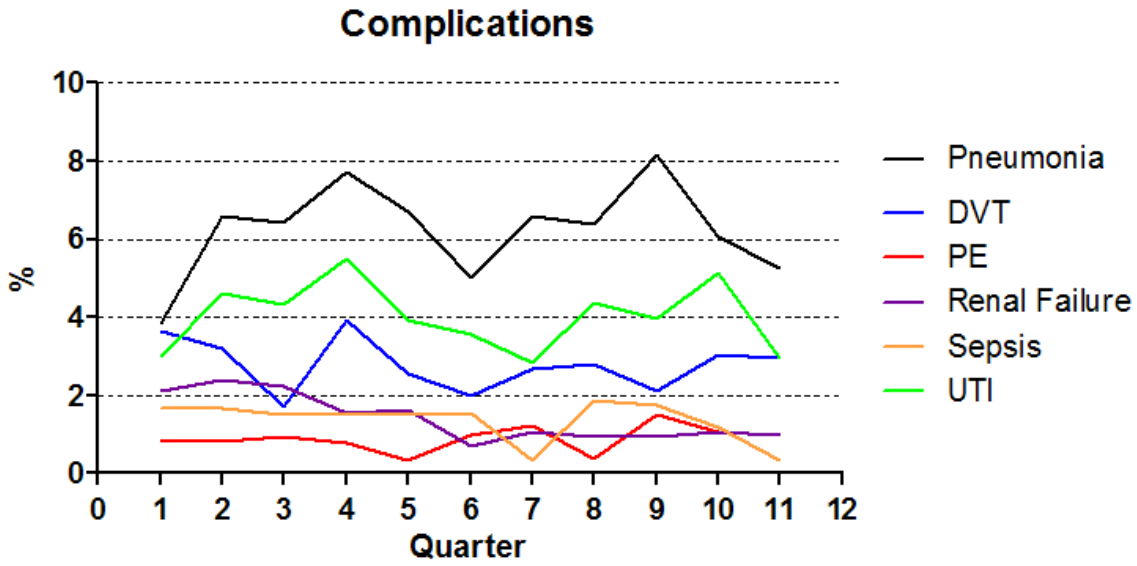
Adjusted ICU LOS




Mortality
20
15
10
5
0
%
0
1
2
3
4
5
6
7
8
9
10
11
12
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
10
11
12
Quarter
Cohort1 (All)
Cohort2 (Trauma)
Cohort3 (Blunt Multi)
Cohort4 (Blunt Single)


Complications
25
20
15
10
5
0
%
0 1 2 3 4 5 6 7 8 9 10 11 12
Quarter
Complication Group 1
Complication Group 2


Complications
10
8
6
4
2
0
%
0 1 2 3 4 5 6 7 8 9 10 11 12
Quarter
Pneumonia
DVT
PE
Renal Failure
Sepsis
UTI

Questions

Process Measures

DVT Prophylaxis

- MTQIP pilot data from U of M
- 8/04 to 7/05 and 8/6 to 7/08
- Adult patients, admitted to trauma service, ISS≥5, LOS > 24 hrs or death.
- 1531 patients
- Date of DVT or PE
- Date and type of 1st dose of VTE prophylaxis
- Heparin SQ 5000 units BID
- Enoxaparin SQ 40 mg QD

Exclusions/Groups/Analysis

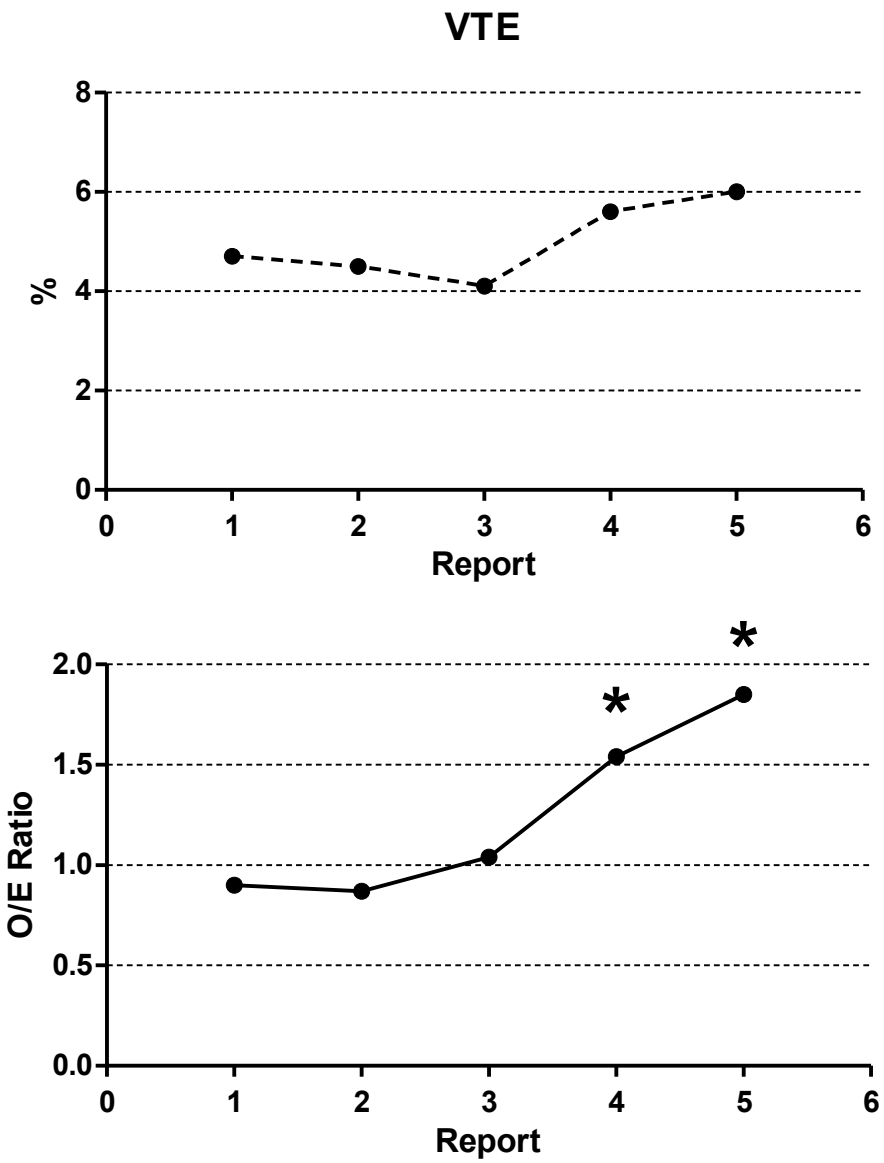
- No VTE prophylaxis
- VTE prophylaxis/treatment started after diagnosis of VTE event
- Heparin gtt
- 1531 → 933 patients
- Multivariate
- Propensity Score Matching

Results

Analysis	VTE Prophylaxis	N	DVT, N (%)	PE, N (%)	VTE, N (%)
Multivariate	SQ Heparin	552	41 (7.4)	14 (2.5)	49 (8.9)
	SQ Enoxaparin	381	13 (3.4)	5 (1.3)	15 (3.9)
Propensity	SQ Heparin	345	22 (6.4)	10 (2.9)	28 (8.1)
	SQ Enoxaparin	345	12 (3.5)	5 (1.5)	14 (4.1)

Results

- Multivariate adjustment
  - Patients receiving enoxaparin experienced fewer VTE events
  - Odds ratio 0.46 (95% CI 0.25-0.85)
- Propensity matched cohort
  - Similar result
  - Odds ratio 0.5 (95% CI 0.26-0.95)
- Limitations


VTE
8
6
4
2
0
%
0
1
2
3
4
5
6
Report
2.0
1.5
1.0
0.5
0.0
O/E Ratio
*
*
0
1
2
3
4
5
6
Report

Putting it together

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

Future Meetings

- Wednesday May 16, 2012
  - Location: Traverse City
- Tuesday June 5, 2012
  - Location: Ann Arbor
  - Registrars
- Tuesday October 16, 2011
  - Location: Ann Arbor

Call for Data, Feedback

- Submit data from 7/1/10 to 6/30/11
  - Due February 10, 2012
  - 23 centers
- Next call
  - Data from 11/1/10 to 10/31/11
  - Due June 1, 2012
- Evaluations
  - Meeting ideas, Reports, Web-site
  - Emergent general surgery and critical care survey

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