The Michigan Trauma Quality Improvement Program

Kalamazoo, MI

May 15, 2013

M·TQIP

Agenda

- Sarah Taylor and Sharon Dickinson
  - ICU Mobility
- Judy Mikhail
  - Trauma Service FTE Survey
  - BCBS Physician Uplift
  - Cardiothoracic Surgery

Agenda

- Mark Hemmila
  - TQIP/NTDB Updates
  - Mattox Meeting Updates
  - Reports
  - ArborMetrix Report Site

Information: ACS-TQIP

- Benchmark Reports
  - October 2012, Aggregate 2011 data
  - January 2013, TBI and Shock
- ACS-TQIP Meeting
  - Phoenix AR, November 17-19, 2013
- Data
  - Quarterly data transfers
- Geriatric Trauma Guidelines

Call for Data, Feedback

- Data from 11/1/11 to 10/31/12
  - Due 6/7/13
- Motorcycle Helmet Use
  - Formatted report for DI/NTRACS
  - Working on CDM/Lancet

Program Manager

Judy Mikhail, RN

M·TQIP

Resource Benchmarking

- ***Goals:***
  - Provide independently collected aggregate resource benchmarking when negotiating resources
  - Identify productivity variability across staffing models
  - Identify staffing disparities among trauma centers

Clinical Resources

Letter	Critical Care Boards	# Trauma Surgeons Also Take EGS	What % EGS Call Covered by Trauma Surgeons	Simultaneous Trauma & EGS Call	What % of trauma/GS are managed by surgeons?	ICU open or closed?
R	3	8	100%	PM- Y		Open
W	0	2	100%	Y	100%	Open
U	2	9	100%	Y	100%	Open
O	0	6	60%	Y	100%	Open
I	5	2	25%	N	95%	Closed
G	0	7	100%	Y	100%	Open
T	3	8	73%	Y		Open
S	2	10	100%	Y	100%	Closed
A	9	9	100%	Y	100%	Open
M	5	0	0%	N	100%	Closed
E	1	5	100%	Y	100%	Open
B	4	9	100%	Y	100%	Closed
H	2	4	20%	N	95%	Open
J	2	5	35%	Y		Closed
Avg	36%	79%	72%	78%-Y		36%-Closed

Clinical Resources

Letter	Total Surgeons	Priv Prac	Hosp Emp	Locums	Vacancies Not Covered	Is in-house trauma call required
R	9	9	0	0	0	Y
W	5	2	0	0	3	N
U	9	9	0	0	0	N
O	6	6	0	0	0	N
I	9	9	0	0	0	Y
G	7	6	1	0	0	N
T	9	3	6	0	0	Y
S	10	10	0	0	0	Y
A	9	0	9	0	0	Y
M	8	3	5	0	0	Y
E	5	5	0	0	0	N
B	10	6	3	0	1	N
H	5	0	5	0	0	Y
J	5	0	5	1	1	Y
Avg	7.6	64%	32%	1 Total	5 Total	57% Y

Registry Resources

Hospital	Trauma Registry Information			
Letter	All ED Trauma Activations Included	All ED Trauma including those discharged from ED)	Hip Fx's Included	Most recent total admitted trauma volume (ICD9 800-959.9) (All Ages & MOI)
D	Y	Y	Y	1400
K	Y	N	Y	2700
V	Y	N	Y	769
R	Y	N	Y	1700
U	N	N	Y	630
O	Y	N	Y	859
I	Y	Y	Y	1984
G	Y	N	Y	700
T	N	N	Y	648
S	Y	N	Y	1101
A	N	N	N	1764
M	Y	N	Y	2650
E	Y	Y	Y	982
B	Y	N	Y	?
H	Y	N	Y	1350
J	Y	N	Y	595
Avg	81% Y	81% N	94% Y	

Registry Resources

	Trauma Program Manager or Trauma Coordinator			Registrar(s)		Injury Prevention	
Letter	Trauma Program Manager	Trauma Coordinator	Assistant or Associate Program Manager	Non RN	RN	Non RN	RN
D	1.00			1.00			0.80
K		1.00		2.00			1.00
V	1.00	1.00		1.80			
R	1.00			2.00			0.50
U	1.00			0.90			0.45
O	1.00			0.50	1.00		0.50
I		1.00		1.00			1.00
G	1.00			1.00			0.25
T	1.00			2.00			1.00
S	1.00			1.00			0.50
A	1.00	2.00		2.00			1.00
M	1.00	1.00		1.00		1.00	
E		1.00		1.00			1.00
B	1.00			1.00	1.00		1.00
H	1.00		0.40	1.80			0.50
J	1.00		1.00	1.00		1.00	

Registry Resources

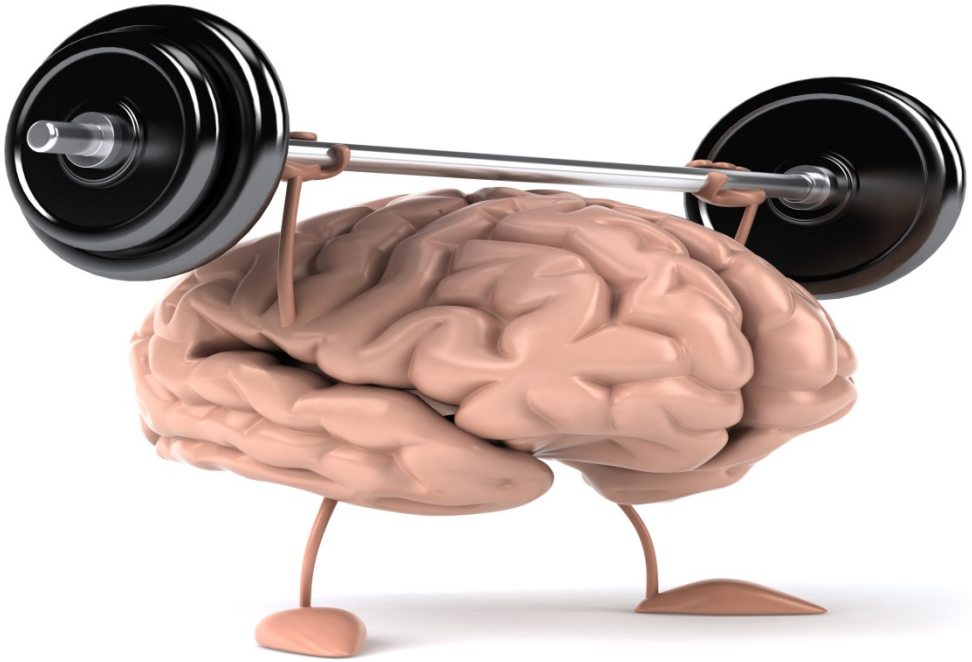
Letter	Research		Education		Outreach		Clerical	NP/PA	Other	Total
	Non RN	RN	EMS	RN	EMS	RN	Admin Assist	Adv Pract	Describe	Total # Positions
D							1.00			3.80
K							1.00		2.0 Case Managers	7.00
V							0.20			4.00
R						0.50	0.50		0.5 PI Coord	5.00
U										2.35
O						0.50	0.50			4.00
I	1.00						1.00			5.0
G										2.25
T							2.00			6.00
S									0.5 PI Coord	3.00
A							1.00			7.00
M							0.50			4.50
E										3.00
B							1.00			
H		1.00		0.50	0.50	1.00	1.00			7.70
J										4.00
16 Total										Avg 4.6

Registry Resources

Letter	Total # Positions (equals sum of columns F-U)	Registry Assistance (Abstracting Entering , etc.)	PI Assistance (Problem Identification, Complications Identification, Chart Review, etc.)
D	3.80	1.5 data clerk	.1.5 NP
K	7.00		0.125 FTE sec, 0.75 TrCoor, 0.75 TrSpec, 0.125 Case Managers
V	4.00		
R	5.00		
U	2.35		
O	4.00	0.15 Inj Prev , 0.25 TPM	
I	5.00	0.25 Adm Asst, 0.25 Tr Coord, 0.25 PA, 0.15 Inj Prev, 0.4 Research	0.4 Tr Coord, 0.4 PA
G	2.25	0.25 TPM	1.0 TPM
T	6.00	0.25 TPM	0.00
S	3.00	0.075 Volunteer 0.15 PI/IP Coor, 0.375 TPM	Hospital Case Manager notifies of complications at rounds M/W/F
A	7.00	0.250 TrCoord	0.250 TrCoord
M	4.50	0.25 TPM , 0.8 Tr Coord	
E	3.00	0.25 TrCoord	
B	5.00		
H	7.70		
J	4.00		

BCBSM

CQI Physician Recognition Uplift Incentives



BCBSM Physician Uplift Payments

- 2012 - Kickoff Year
  - Started with 4 Collaboratives:
    - General Surgery MSQC)
    - Bariatric Surgery (MBSC)
    - Percutaneous Coronary Interventions (BMC2-PCI)
    - Vascular/ Vascular Surgical Interventions (BMC2-VIC)
- 2013 MTQIP Inaugural Year

Purpose

- Recognize efforts of physician community, specifically for MTQIP:
  - Each participating hospital's physician champion or;
  - Highly engaged physicians taking on a lead role in MTQIP-associated quality improvement initiatives alongside the physician champion

- The physicians are recognized by the MTQIP Coordinating Center leadership

Recognition

- 5% recognition uplift for a set of Evaluation and Management (E&M) codes (specific codes are yet to be determined)
- Uplift occurs for 12 months
  - February 1, 2013 to January 31, 2014
- MTQIP Physician Recognition Index Scorecard

Proposed 2013 MTQIP Physician Champion Uplift Index

Measure	Weight/ Points	Description of Measure	Points Earned
#1	**30**	Meeting Participation- Physician	3 meetings **30** 2 meetings **20** 1 meeting **10** Did not participate **0**
#2	**40**	Present MTQIP reports at hospital meetings 3 times a year. Examples include: •Hospital Board Presentation •Trauma Peer Review Meeting •Trauma Operational Process Performance Committee •Administrative Dashboard •Other	Distributed at 3 meetings **40** Distributed at 2 meetings **30** Distributed at 1 meeting **20** Did not distribute **0** *signed attestation from physician champion for each available quarter 2013
#3	**30**	Surgeon/site review of performance data-logged into the new website	Yes **30** No **0**
Threshold for recognition is 80 points			**100 possible points**

M·TQIP MICHIGAN TRAUMA QUALITY IMPROVEMENT PROGRAM

Physician Attestation Form

Quality Improvement Report Distribution

Hospital Name: _____

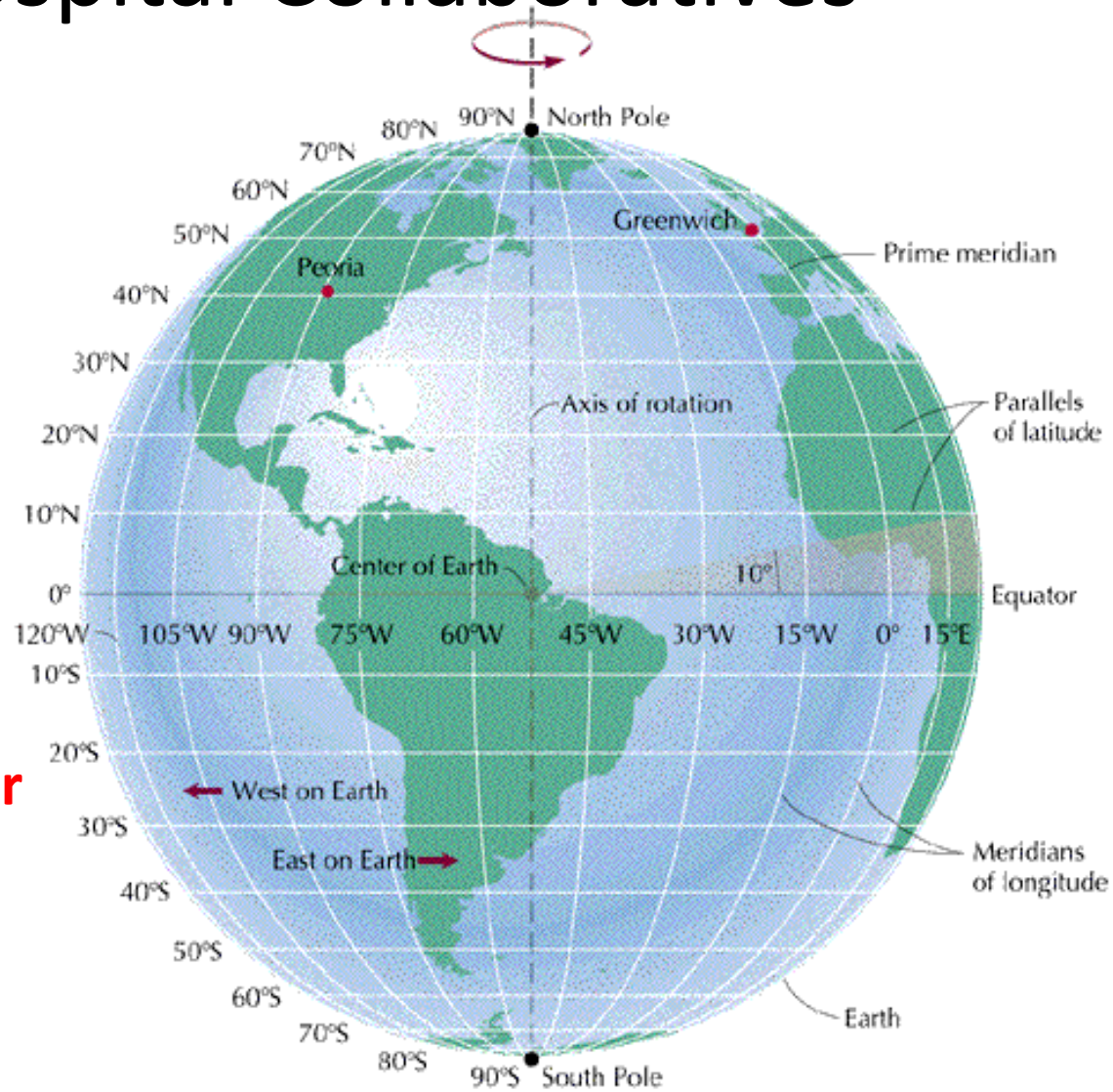
Physician Champion (print name): _____

Signature of Physician Champion: _____

Jan – Mar 2013	Meeting Presented At: Date:
Apr – Jun 2013	Meeting Presented At: Date:
Jul – Sept 2013	Meeting Presented At: Date:
Oct – Dec 2013	Meeting Presented At: Date:

Parallel Universe of BCBSM Hospital Collaboratives

- Anticoagulation
- Arthroplasty
- Bariatric Surgery
- Breast Oncology
- Cardiac Imaging
- General Surgery
- Hospital Medicine
- Peri-Operative
- Radiation Oncology
- **Thoracic Cardiovascular**
- Trauma
- Spine



Best Practices

Identifying Positive Deviants…

Michigan Society of
Thoracic and Cardiovascular
Surgeons

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MSTCVS Quality Collaborative

MSTCVS Quality Collaborative members click here.

Michigan Society of Thoracic & Cardiovascular Surgeons

2013 MSTCVS Quality Collaborative Meetings

May 11, 2013

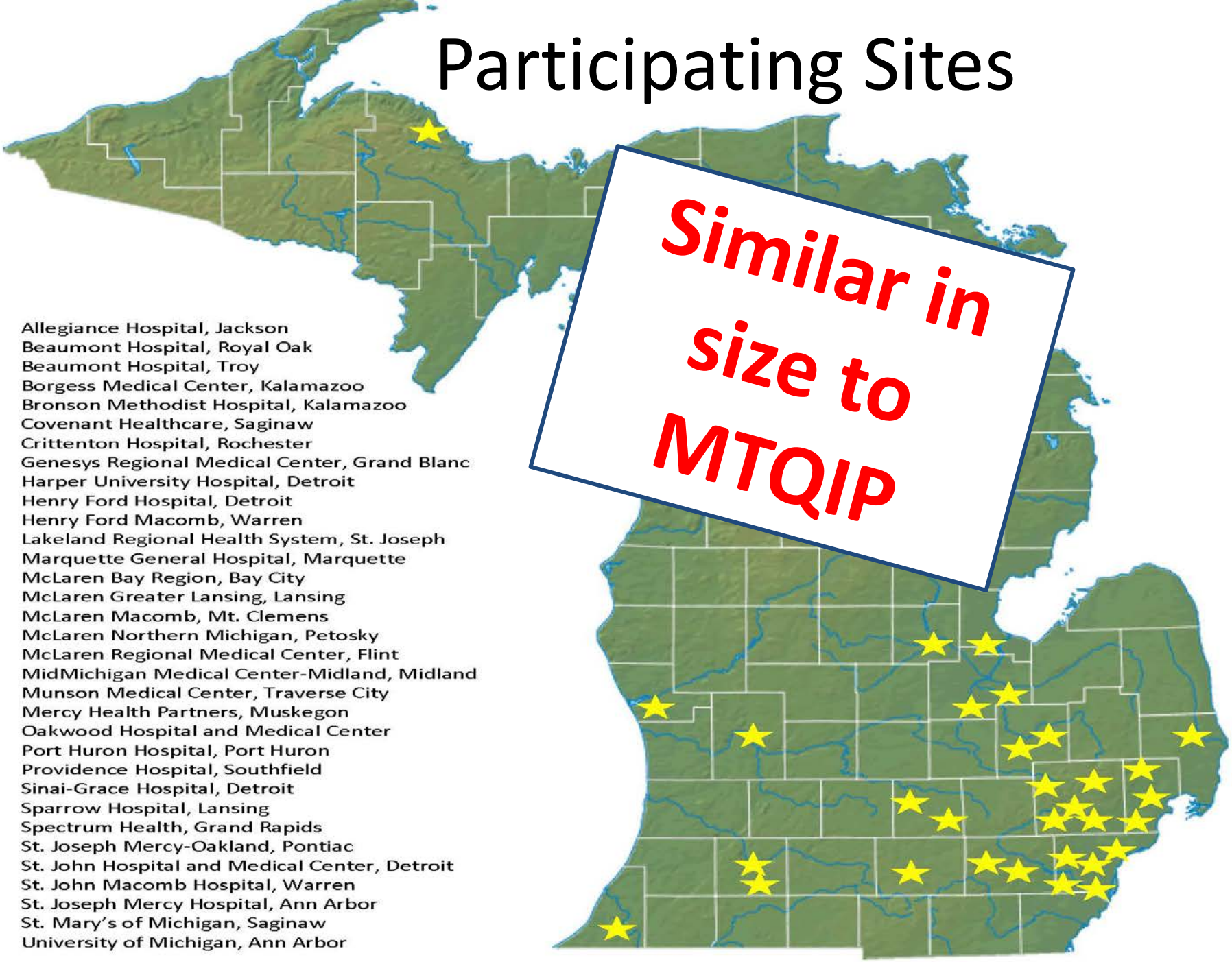
Ann Arbor Regent Hotel & Suites

10:00 am - 4:00 pm

Click here for more information

- *Started in 2001*
- *Associated with a Professional Society*
- *Registry Based*
- *Multidisciplinary*
  - *Nurses, NP/PA's, Perfusionists*
- *Collaborative Best Practice*

Participating Sites



Allegiance Hospital, Jackson
Beaumont Hospital, Royal Oak
Beaumont Hospital, Troy
Borgess Medical Center, Kalamazoo
Bronson Methodist Hospital, Kalamazoo
Covenant Healthcare, Saginaw
Crittenton Hospital, Rochester
Genesys Regional Medical Center, Grand Blanc
Harper University Hospital, Detroit
Henry Ford Hospital, Detroit
Henry Ford Macomb, Warren
Lakeland Regional Health System, St. Joseph
Marquette General Hospital, Marquette
McLaren Bay Region, Bay City
McLaren Greater Lansing, Lansing
McLaren Macomb, Mt. Clemens
McLaren Northern Michigan, Petosky
McLaren Regional Medical Center, Flint
MidMichigan Medical Center-Midland, Midland
Munson Medical Center, Traverse City
Mercy Health Partners, Muskegon
Oakwood Hospital and Medical Center
Port Huron Hospital, Port Huron
Providence Hospital, Southfield
Sinai-Grace Hospital, Detroit
Sparrow Hospital, Lansing
Spectrum Health, Grand Rapids
St. Joseph Mercy-Oakland, Pontiac
St. John Hospital and Medical Center, Detroit
St. John Macomb Hospital, Warren
St. Joseph Mercy Hospital, Ann Arbor
St. Mary's of Michigan, Saginaw
University of Michigan, Ann Arbor

- *Imbed data collection items into hospital records*
- *Regularly Compare MI data to National data*
- *Site visits*
- *Reverse site visits*

Contact Us

ne: 734.998.6445
x: 734.998.6420

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The Michigan Society of Thoracic & Cardiovascular Surgeons Quality Collaborative Welcomes You!

The Michigan Society of Thoracic and Cardiovascular Surgeons (MSTCVS) has created a voluntary data and quality collaborative. The MSTCVS Quality Collaborative is partially funded by Blue Cross Blue Shield of Michigan Blue Care Network. Click here for information on becoming a member or associate member of the MSTCVS.

Login

Username:

Password:

☑ Remember me

Login

Links

Hospital Quality Rating Information Websites

www.gdahc.org

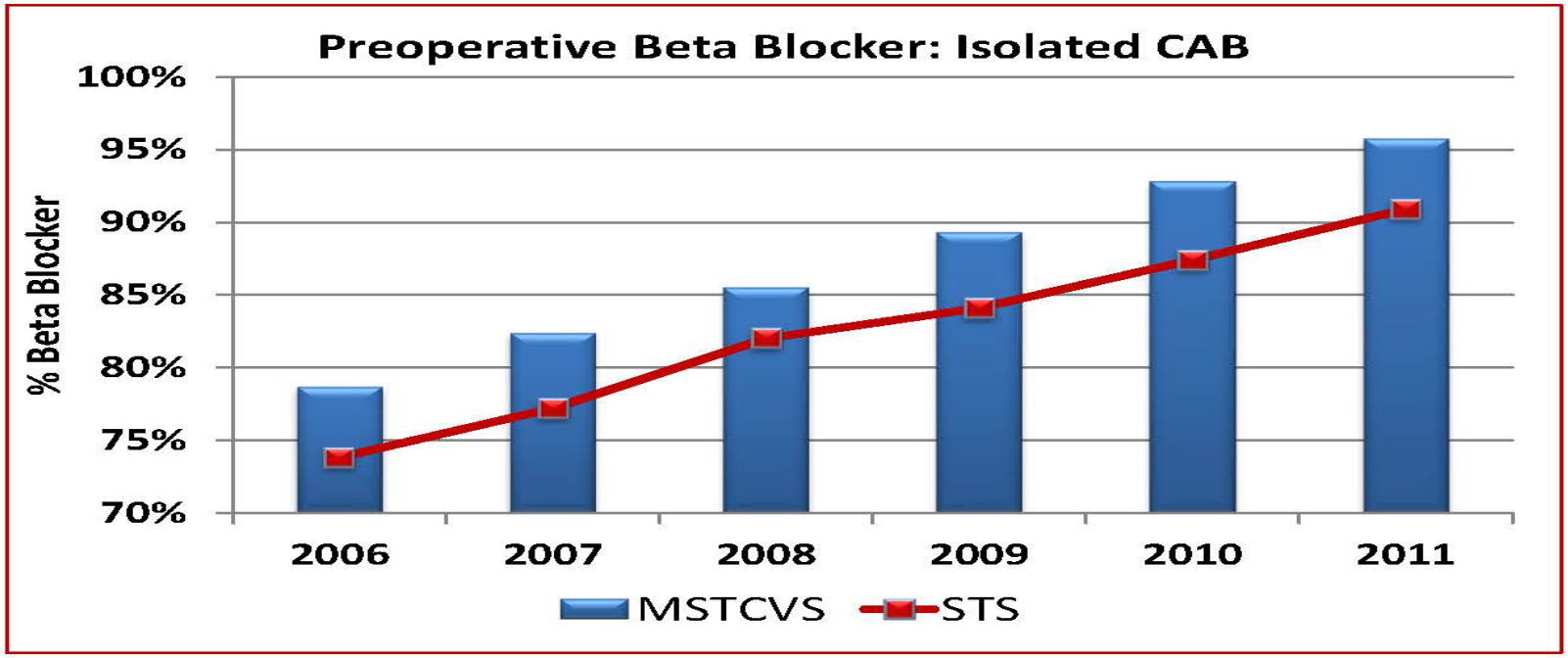
www.healthgrades.com

www.hospitalcompare.hhs.gov

www.leapfroggroup.com

Data is identified by hospital
&
Discussed openly at meetings

Resulting in Rich Clinical QI Discussions



	2008	2009	2010	2011
MSTCVS	85.5%	89.6%	92.8%	95.7%
A	93.3%	95.9%	99.0%	96.3%
B	81.5%	86.5%	97.4%	95.7%
C	96.2%	90.3%	98.1%	99.2%
D				
E				
F				
G				
H				
I				
J				
K				
L				
M	87.1%	92.4%	90.6%	99.2%
N	85.1%	83.7%	90.9%	94.0%
O	84.6%	89.0%	80.4%	100.0%
P	84.2%	88.4%	91.6%	95.4%

	2008	2009	2010	2011
Q	98.0%	95.0%	97.5%	97.9%
R	76.5%	84.6%	81.0%	95.6%
S	72.7%	90.4%	88.1%	92.7%
T	74.8%	87.6%	90.9%	88.6%
			6	87.7%
			6	100.0%
			6	93.3%
			6	97.4%
			6	93.5%
			6	99.4%
			6	100.0%
			6	99.0%
			6	95.7%
AF	78.2%	86.5%	83.2%	84.6%
AG	90.3%	95.9%	96.4%	98.6%
AH	95.1%	96.5%	97.6%	99.7%
AI	91.4%	100.0%	99.5%	100.0%

Building a culture of open sharing of results

☐ Sites below 2011 STS Mean of 90.9%

Michigan Society of Thoracic and Cardiovascular Surgeons Quality Collaborative

Confidentiality Agreement

This document is intended to validate the confidentiality of information discussed at Michigan Society of Thoracic and Cardiovascular Surgeons Quality Collaborative meetings under the guidelines set forth by the Michigan Society of Thoracic & Cardiovascular Surgeons.

The purpose of the MSTCVS Quality Collaborati[illegible] of care for cardiac surgery patients in th[illegible] and will involve the revie[illegible] c surgery data [illegible] o i[illegible]

[illegible] confidential information and s[illegible] MSTCVS Quality Collaborative m[illegible]

[illegible] all patient information.

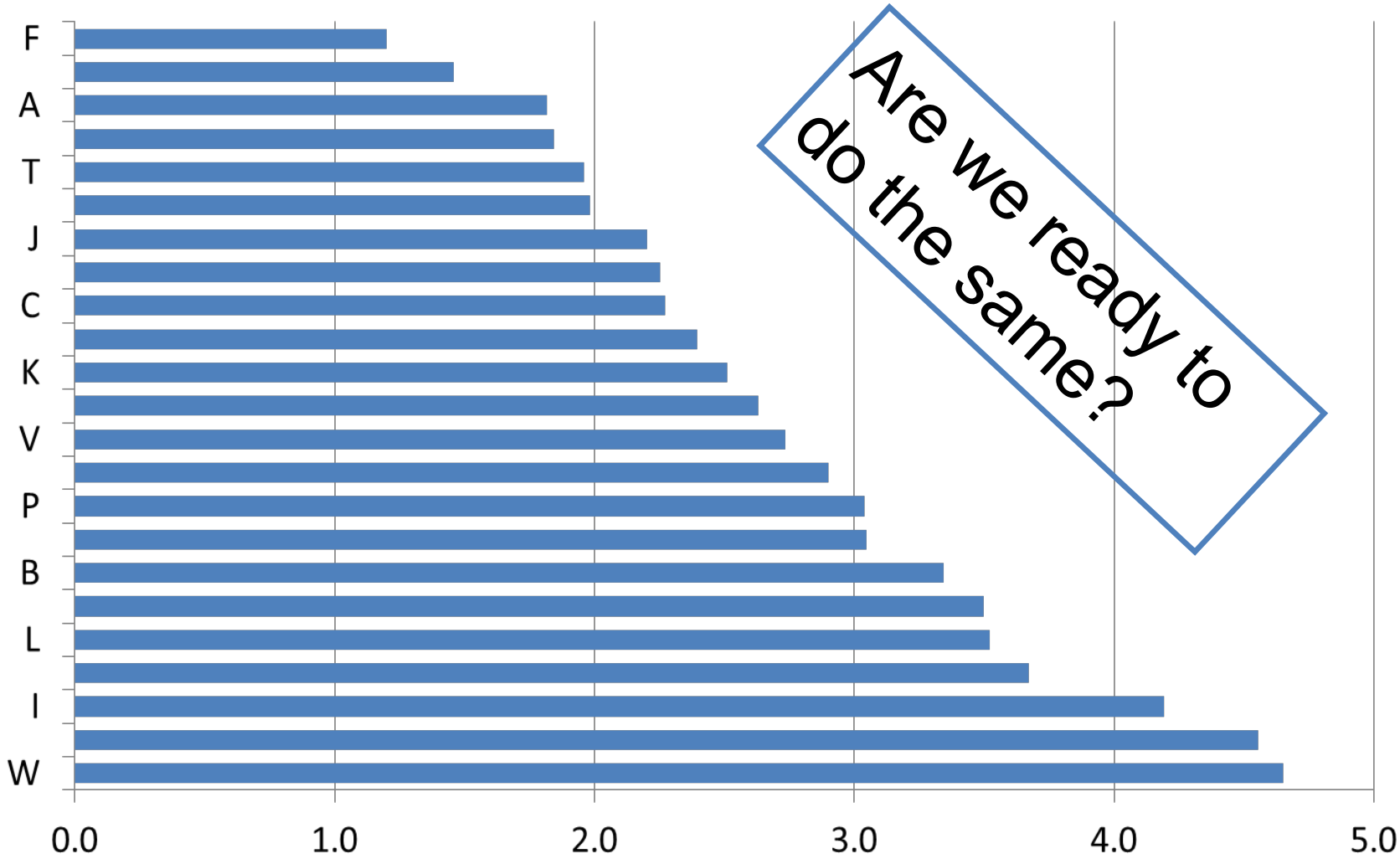
- Any and all patient identifiers which are considered privileged and protected health information as defined by current HIPPA laws.
- Any specific Michigan STS site cardiac surgery case information.
- Any information discussed regarding a specific Michigan STS site outcome.
- Any reference to a specific Michigan STS site result or analysis.
- All cardiac surgery data presented including but not limited to Composite Metrics.

By signing this document, I agree to protect the confidentiality of all information discussed at this meeting and take steps to safeguard against any disclosure of privileged information that may have been discussed. I understand that any violation of confidentiality may result in my personal removal from participation in the project as well as the removal of the hospital site I represent.

Meeting Participant Signature: _____ Date: _____

Everyone Signs Confidentiality Agreement at Every Meeting

MTQIP
PRBC:FFP Ratio



MTQIP Reports, etc.

Mark Hemmila, MD

Revisions for NTDS 2013

- Height and weight
- Withdrawal of care
- Hemorrhage control for TQIP
- ICD10 fields for
  - diagnosis
  - procedures
  - Ecodes
  - inclusion criteria

Revisions for NTDS 2014

- Abuse fields
- Revisions to Hospital Discharge Disposition
- Trauma Triage Criteria (CDC)

Proposed for 2015

- Review and revision of complications and comorbidities
- Update of source hierarchy
- ICD10 – Required for 2015 admissions
- AIS05 -- Required for 2015 for TQIP

Mattox Meeting – Trauma Critical Care 2013

- Chest Tubes
  - Peter Rhee
  - Smaller
  - Percutaneous/Seldinger
- Irrigation of Open Wounds
  - Low Pressure (Bulb Syringe)
  - Less tissue destruction and infection

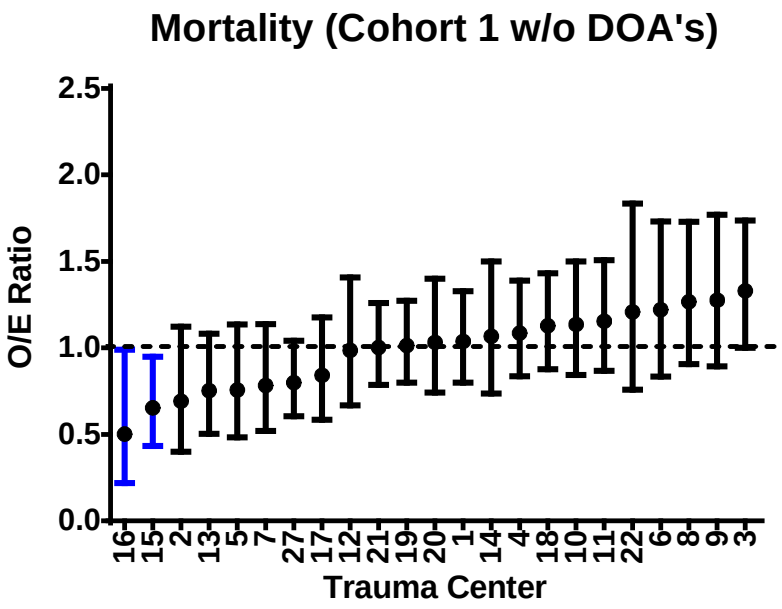
Reports

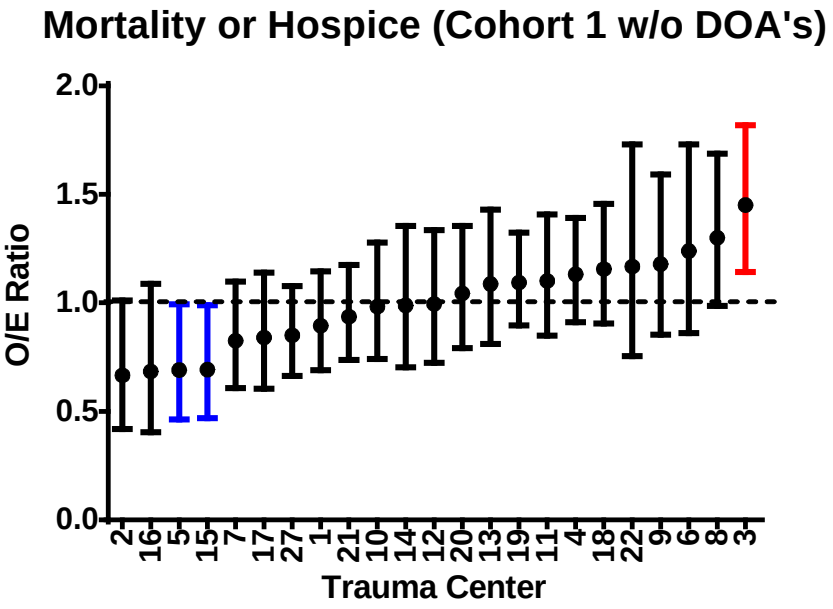
- 7/1/11 to 6/30/12
- Penetrating
- > 65 and < 65 yo
- IVC Filter Use
- Brain Injury Monitors
- Blood

Signs of Life

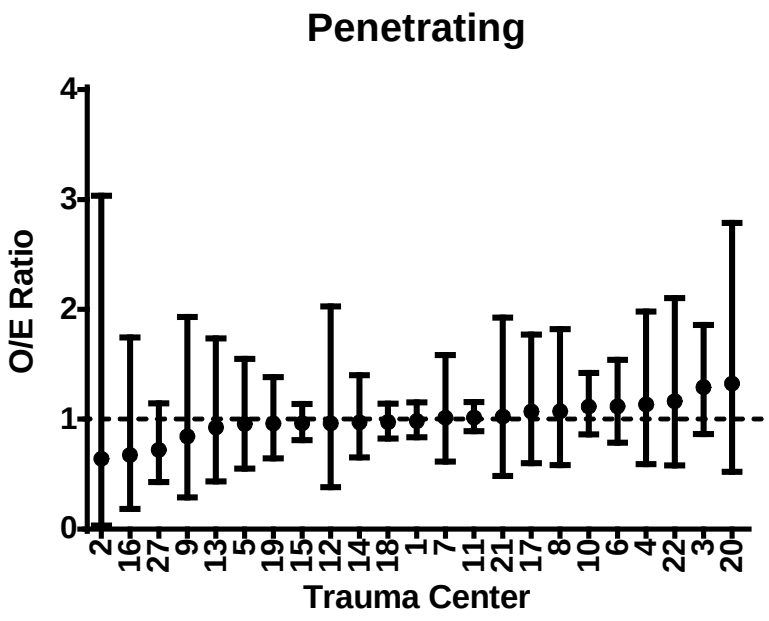
- Dead on Arrival
  - Definition not followed
  - Significant time and procedures
- Signs of Life
  - No, BP=0, HR=0, GCS=3
  - Replaced DOA with “No Signs of Life” in Analysis
  - DOA = No Signs of Life

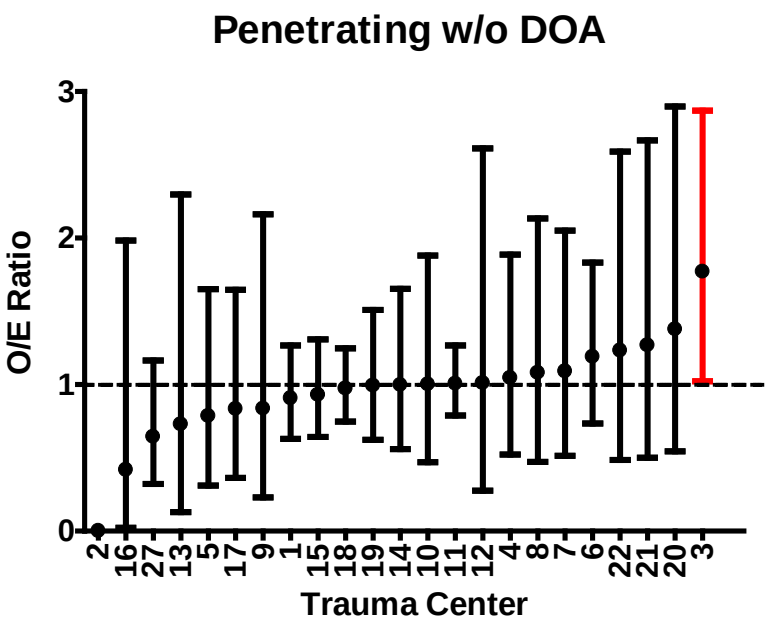
7/1/2011 to 6/30/2012





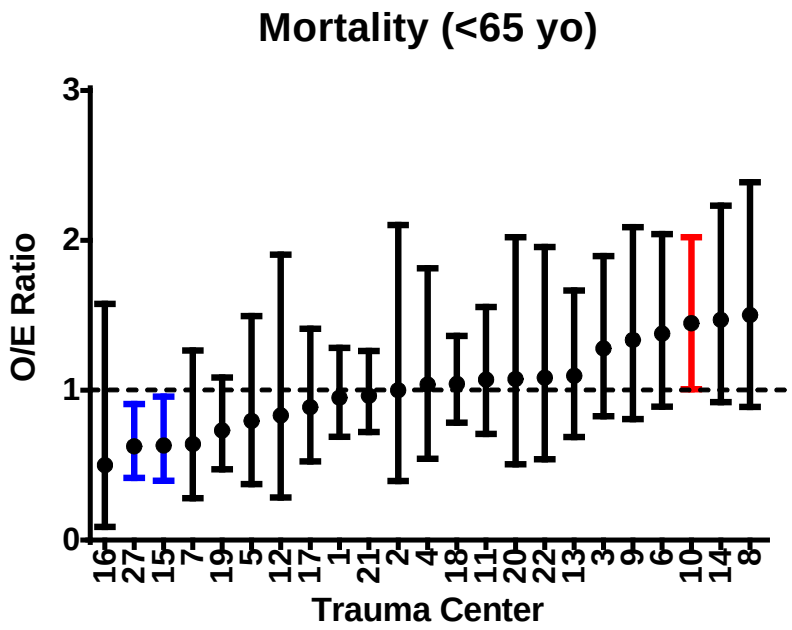
7/1/2008 to 6/30/2012

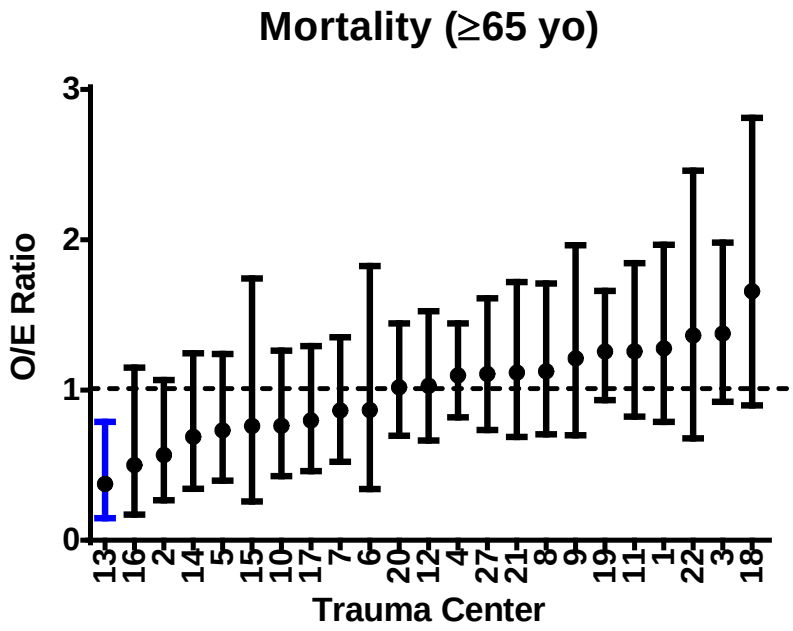




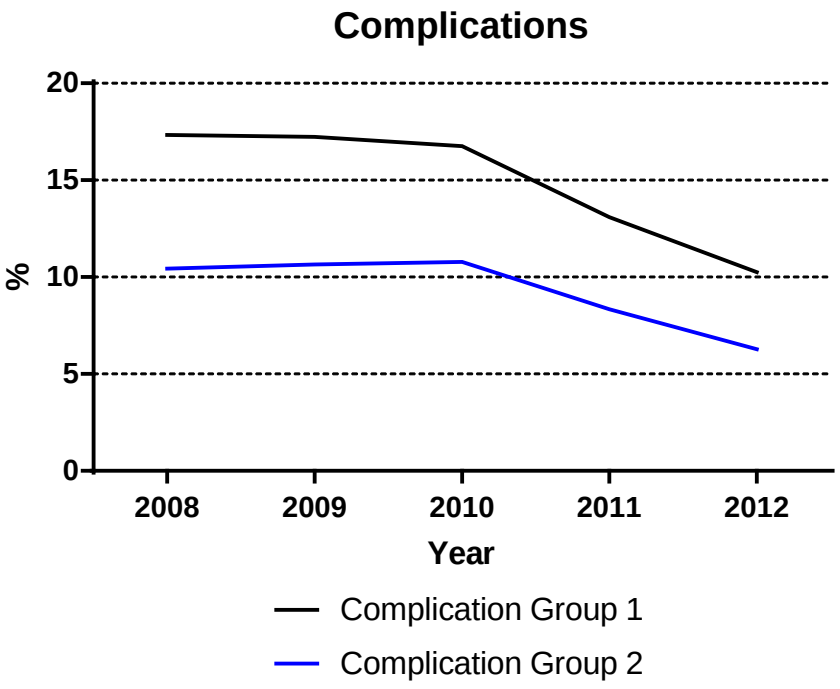
7/1/2011 to 6/30/2012

Cohort 1

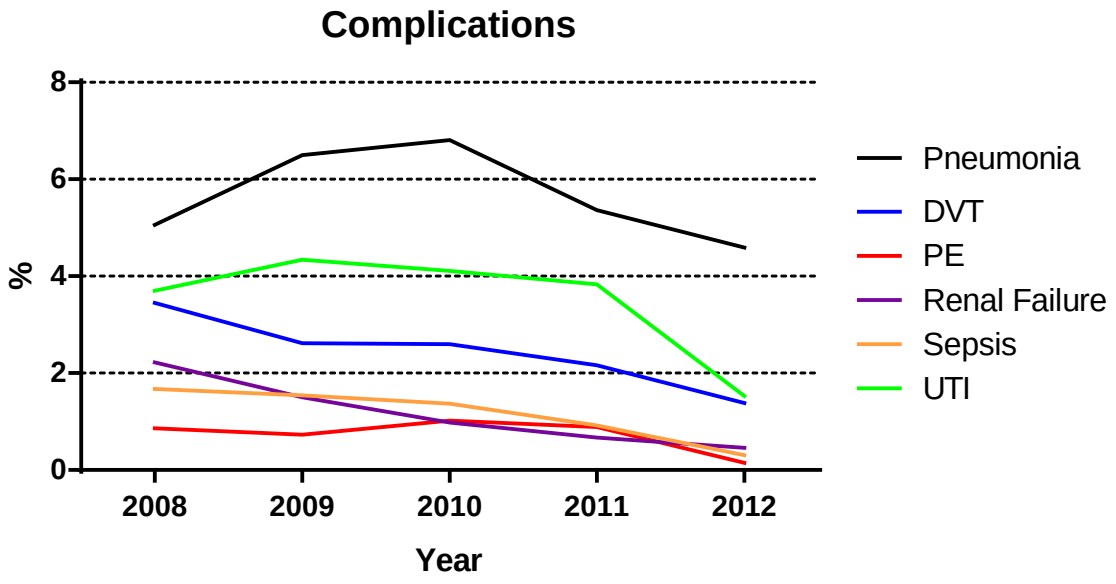




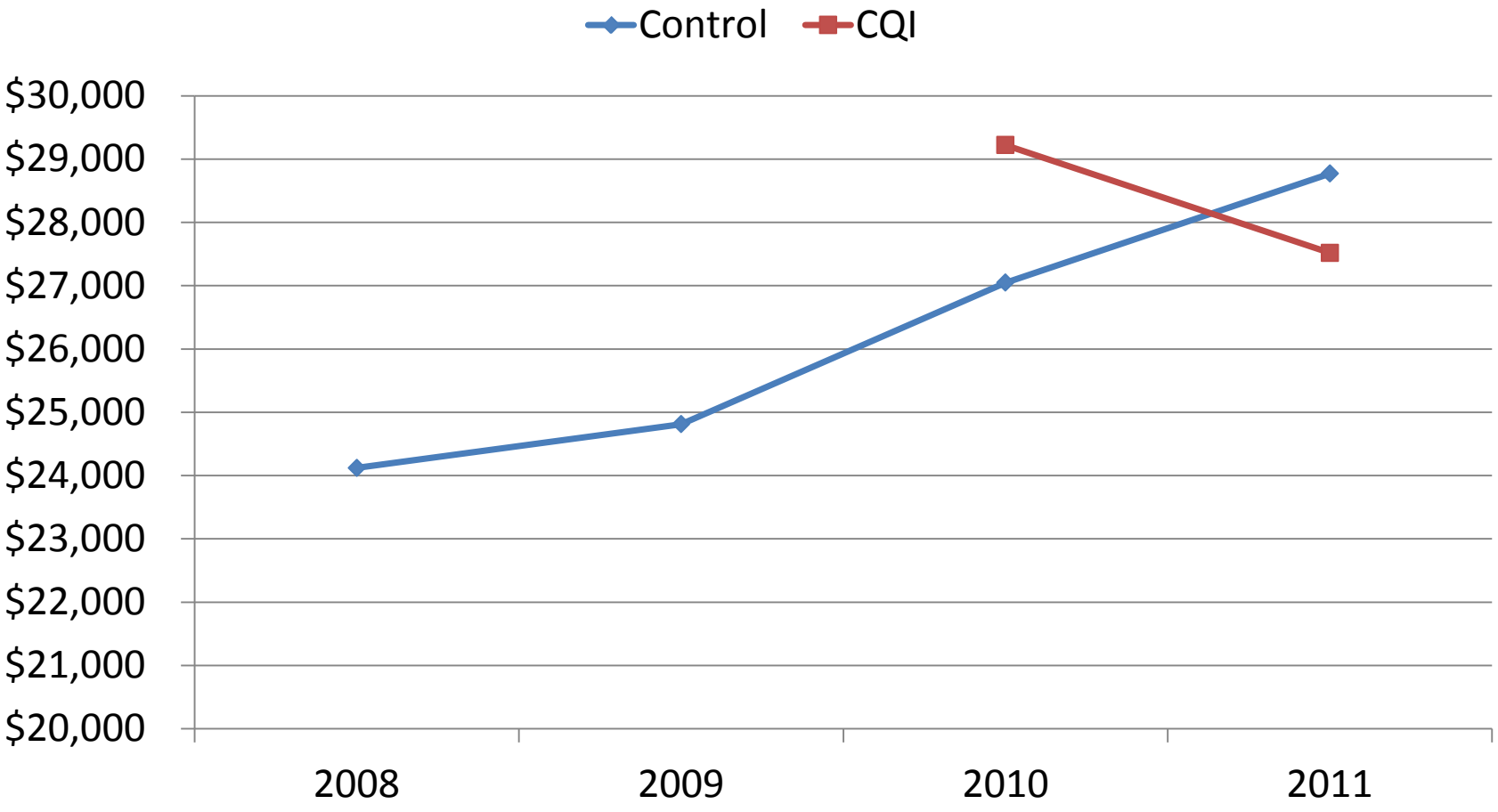
HF, SJ, UM, WB, HU, GH



HF, SJ, UM, WB, HU, GH



Total Episode Payment (BCBSM, Trauma ICD-9)



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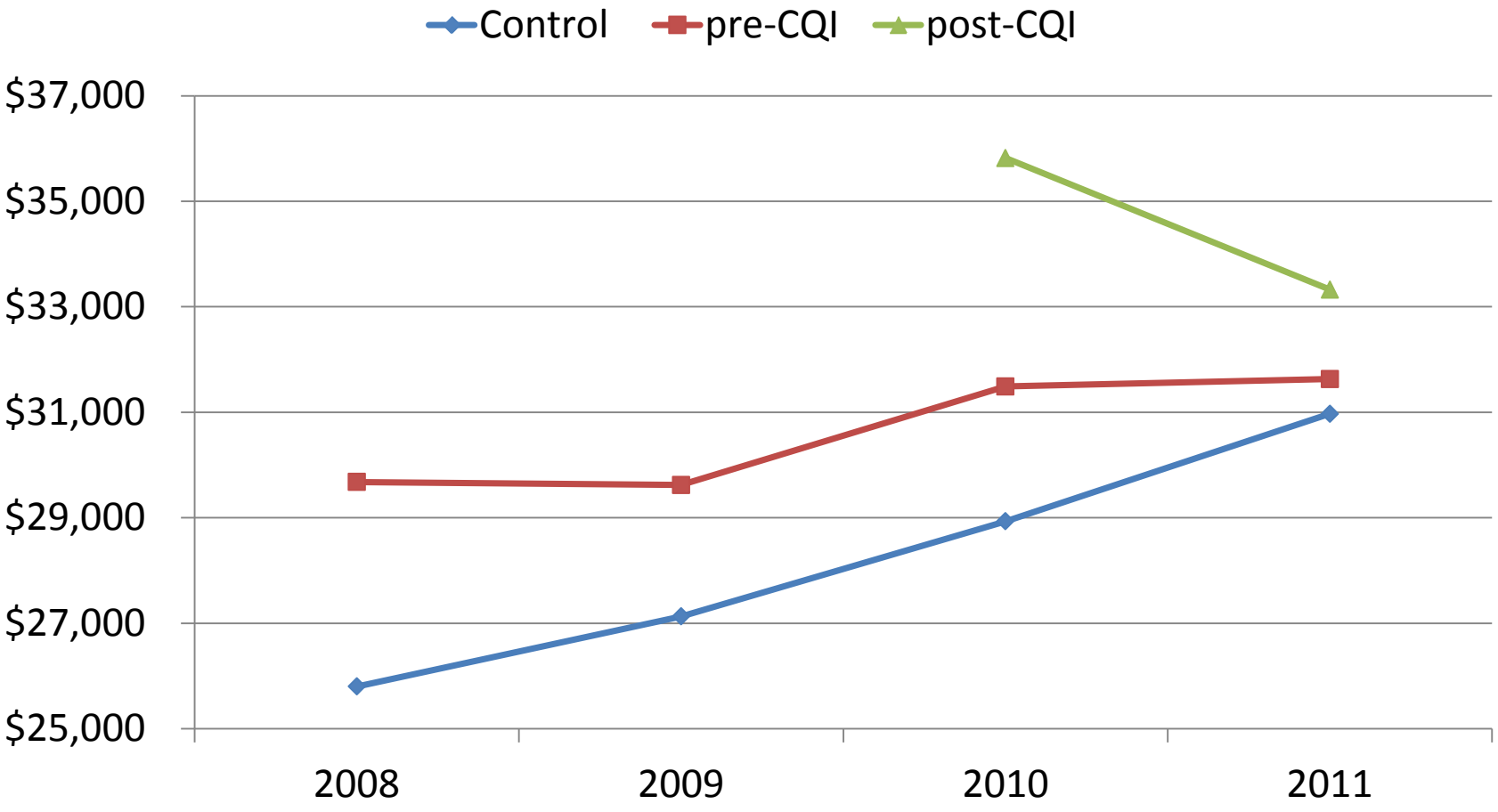
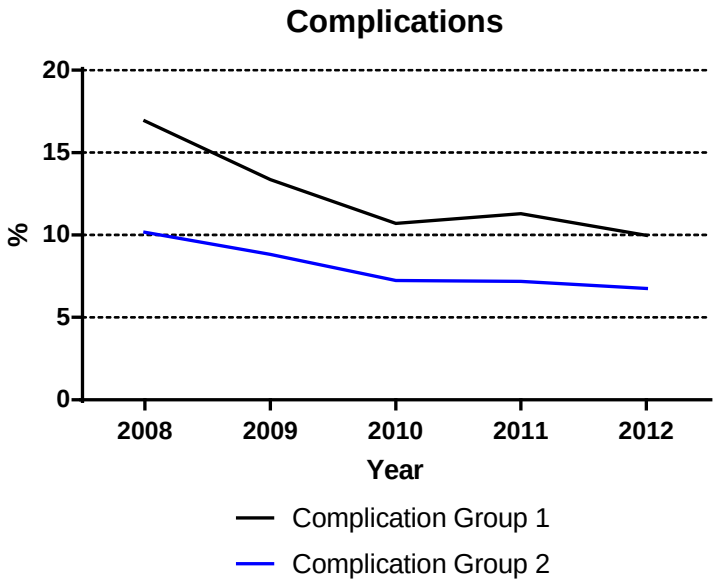
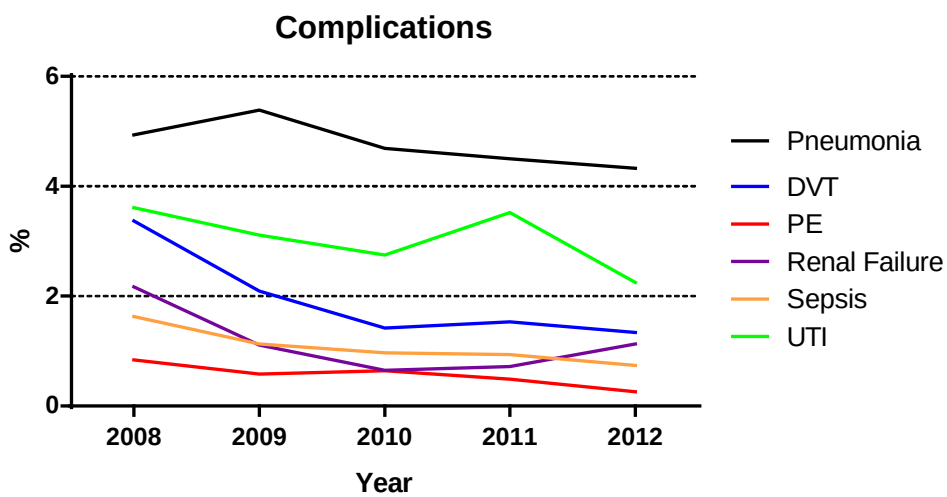


MTQIP – All Centers





Brain Injury Monitors

- 7/1/11 to 6/30/12
- Procedure Data – (ICD-9)
  - Ventriculostomy (2.20, 1.26, 1.28)
  - Intraparenchymal pressure monitor (1.10)
  - Brain tissue oxygen monitor (1.16)
- MTQIP Process Measures Data (7/1/11 to 6/30/12)
- Combined data for monitor type, date, time
  - Any Monitor, Vent, IPPM, O2Mon, JVB
  - Vent, IPPM, O2Mon, JVB
  - No assessment of injury (AIS Head or GCS)

Brain Monitors (7/1/11 to 6/30/12)

Trauma Center	Any Monitor	Ventriculostomy	IPPM	02 Monitor	Jugular Venous Bulb
21	50	20	50	2	0
27	32	21	18	0	0
1	25	3	22	1	0
18	24	6	16	8	0
15	17	8	9	2	1
11	13	5	7	2	0
20	13	0	13	0	0
3	12	3	9	0	0
6	11	2	11	0	0
17	11	11	0	0	0
14	10	3	7	0	0
19	10	9	4	0	0
4	10	6	6	1	1
8	9	7	8	0	0
2	8	6	7	0	0
9	7	0	7	3	0
5	7	7	1	1	0
16	6	3	5	0	0
7	6	1	4	1	0
10	5	0	5	0	0
13	5	5	0	0	0
12	3	3	0	0	0
22	3	1	3	0	0
Total	297	130	212	21	2

Monitor for Head Injury

- 7/1/11 to 6/30/12
- Include if AIS Head > 0
- Exclude if
  - No signs of life
  - ED GCS > 8 and TBI GCS > 8
- Eligible patients
  - Dead
  - Dead with and without any monitor
  - Alive with and without any monitor
  - Dead and monitor withheld
  - Any Monitor, Vent, IPPM, O2Mon, JVB
- Summary
- Reason monitor withheld

Monitor for Head Injury (7/1/2011 to 6/30/12)

Inclusion:	Exclusion:
AIS Head > 0	No signs of life
	ED GCS > 8 & TBI GCS > 8

Trauma Center	N	Dead	Alive w/o Monitor	Alive with Monitor	Dead w/o Monitor	Dead with Monitor	Dead and Monitor Withheld	Any Monitor	Ventric	IPPM	02 Mon	JVB
27	87	23	44	20	15	8	10	28	19	15	0	0
21	84	39	17	28	24	15	12	43	17	43	2	0
19	63	27	29	7	25	2	2	9	8	3	0	0
1	61	25	22	14	20	5	7	19	1	18	1	0
18	53	25	18	10	17	8	6	18	3	14	6	0
3	49	21	23	5	15	6	0	11	3	8	0	0
17	42	9	30	3	8	1	3	4	4	0	0	0
11	37	13	20	4	10	3	3	7	1	6	1	0
14	37	15	18	4	12	3	0	7	1	6	0	0
10	35	15	18	2	14	1	0	3	0	3	0	0
13	34	15	18	1	14	1	0	2	2	0	0	0
4	34	14	15	5	11	3	1	8	5	6	1	0
15	33	8	15	10	7	1	2	11	5	6	1	1
20	27	10	8	9	6	4	1	13	0	13	0	0
2	25	8	12	5	5	3	4	8	6	7	0	0
9	23	11	9	3	9	2	8	5	0	5	2	0
6	23	11	7	5	7	4	0	9	2	9	0	0
7	22	9	9	4	8	1	2	5	1	3	1	0
8	18	11	6	1	10	1	6	2	2	2	0	0
5	18	4	10	4	4	0	1	4	4	1	1	0
16	13	3	7	3	3	0	2	3	1	3	0	0
22	12	7	3	2	6	1	1	3	1	3	0	0
12	8	6	1	1	6	0	1	1	1	0	0	0
Total	838	329	359	150	256	73	72	223	87	174	16	1

Monitor for Head Injury (7/1/2011 to 6/30/12)

Inclusion:	Exclusion:
AIS Head > 0	No signs of life
	ED GCS > 8 & TBI GCS > 8

Summary

	N	%
Alive w/o Monitor	359	43%
Alive with Monitor	150	18%
Dead	329	39%
Total	838	

	N	%
Dead w/o Monitor	256	78%
Dead with Monitor	73	22%
Total	329	

	N	%
Dead and Monitor Withheld for reason	72	28%
Dead, no Monitor, not Withheld for reason	184	72%
Total	256	

	Alive	Dead	Total
Not known/Not recorded/Missing	328	184	512
Decision to withhold life sustaining measures	2	40	42
Death prior to correction of coagulopathy	0	25	25
Expected to improve within 8 hours due to effects of alcohol and/or drugs	10	0	10
Operative evacuation with improvement post-op	16	2	18
No ICP because of coagulopathy	3	5	8
Total	359	256	615

Calculation of % Eligible w/o Monitor

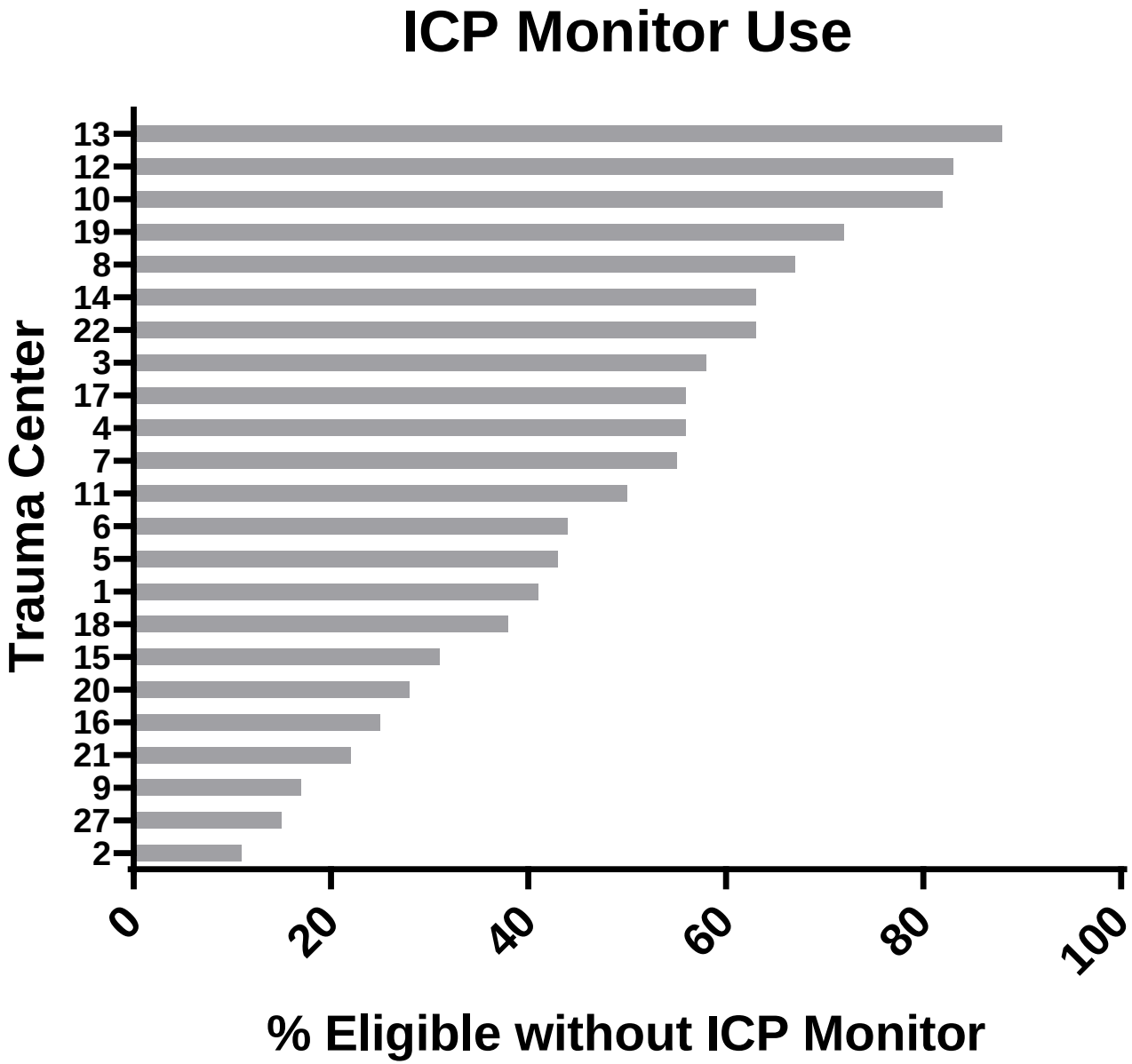
- Eligible and no monitor = N - Alive w/o monitor - Alive with monitor - Dead with monitor - Dead and monitor withheld for reason

- Eligible = N - Alive w/o monitor - Dead and monitor withheld for reason

Monitor for Head Injury (7/1/2011 to 6/30/12)

Inclusion:	Exclusion:
AIS Head > 0	No signs of life
	ED GCS > 8 & TBI GCS > 8

Trauma Center	N	Dead	Alive w/o Monitor	Alive with Monitor	Dead w/o Monitor	Dead with Monitor	Dead and Monitor Withheld	Eligible & no Monitor	Eligible	% Eligible w/no Monitor
27	87	23	44	20	15	8	10	5	33	15%
21	84	39	17	28	24	15	12	12	55	22%
19	63	27	29	7	25	2	2	23	32	72%
1	61	25	22	14	20	5	7	13	32	41%
18	53	25	18	10	17	8	6	11	29	38%
3	49	21	23	5	15	6	0	15	26	58%
17	42	9	30	3	8	1	3	5	9	56%
11	37	13	20	4	10	3	3	7	14	50%
14	37	15	18	4	12	3	0	12	19	63%
10	35	15	18	2	14	1	0	14	17	82%
13	34	15	18	1	14	1	0	14	16	88%
4	34	14	15	5	11	3	1	10	18	56%
15	33	8	15	10	7	1	2	5	16	31%
20	27	10	8	9	6	4	1	5	18	28%
2	25	8	12	5	5	3	4	1	9	11%
9	23	11	9	3	9	2	8	1	6	17%
6	23	11	7	5	7	4	0	7	16	44%
7	22	9	9	4	8	1	2	6	11	55%
8	18	11	6	1	10	1	6	4	6	67%
5	18	4	10	4	4	0	1	3	7	43%
16	13	3	7	3	3	0	2	1	4	25%
22	12	7	3	2	6	1	1	5	8	63%
12	8	6	1	1	6	0	1	5	6	83%
Total	838	329	359	150	256	73	72	184	407	45%


ICP Monitor Use
Trauma Center
13
12
10
19
8
14
22
3
17
4
7
11
6
5
1
18
15
20
16
21
9
27
2
0
20
40
60
80
100
% Eligible without ICP Monitor

ICP monitoring practices & mortality

- Centers divided into 4 groups
  - Quartile 1-4, from lowest rate to highest rate of ICP monitoring
- Evaluated center TBI mortality rate as a function of their use of ICP monitors
  - Adjusted for differences in case mix

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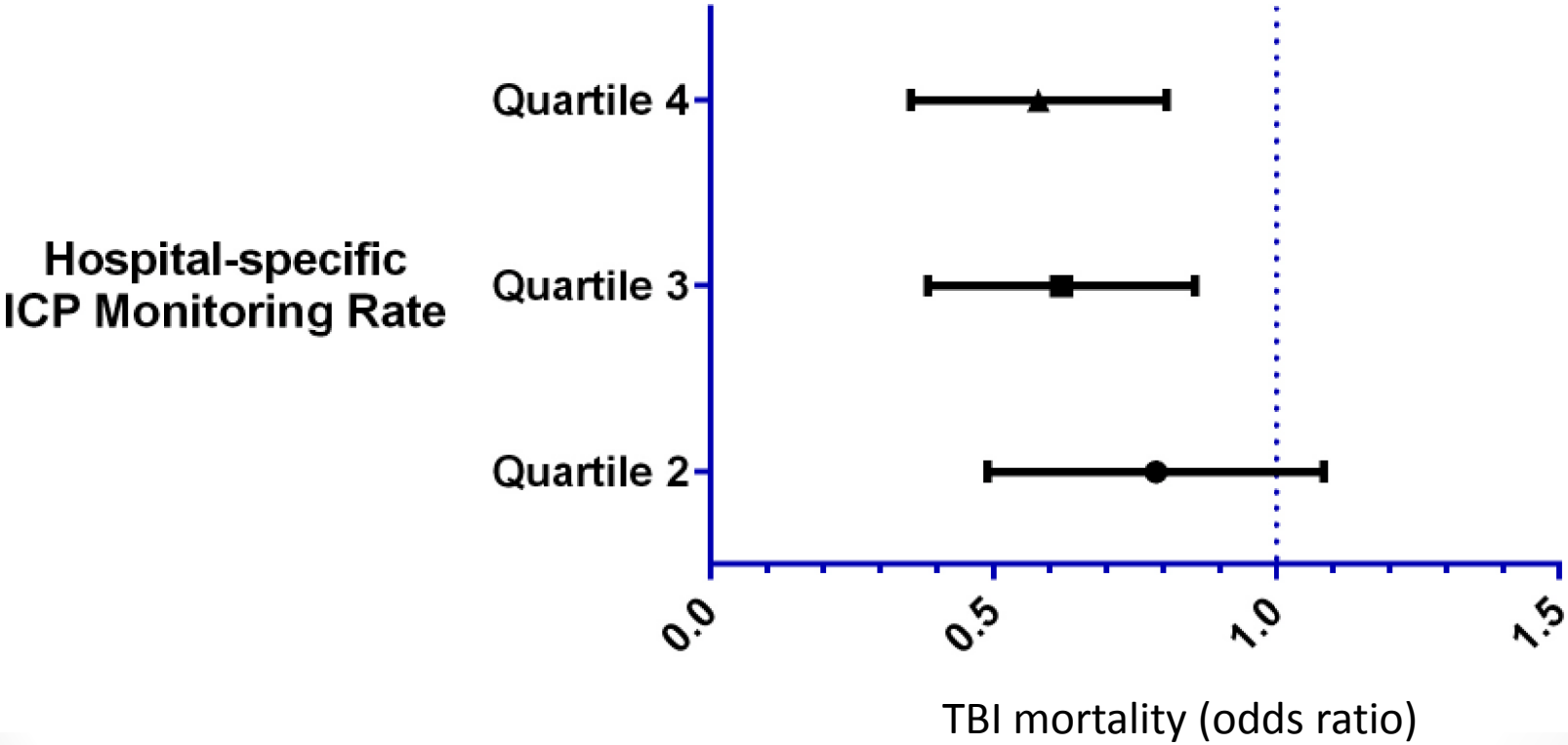
ICP monitoring and mortality



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ICP monitoring and mortality

- Centers with higher rates of ICP monitoring have lower TBI mortality
- Should we implement strategies to increase the rate of ICP monitoring?
  - The adjusted odds of dying in one hospital compared to another is ~46% greater
  - …but variability in ICP monitoring rate explained less than 10% of the differences in TBI mortality across centers!!

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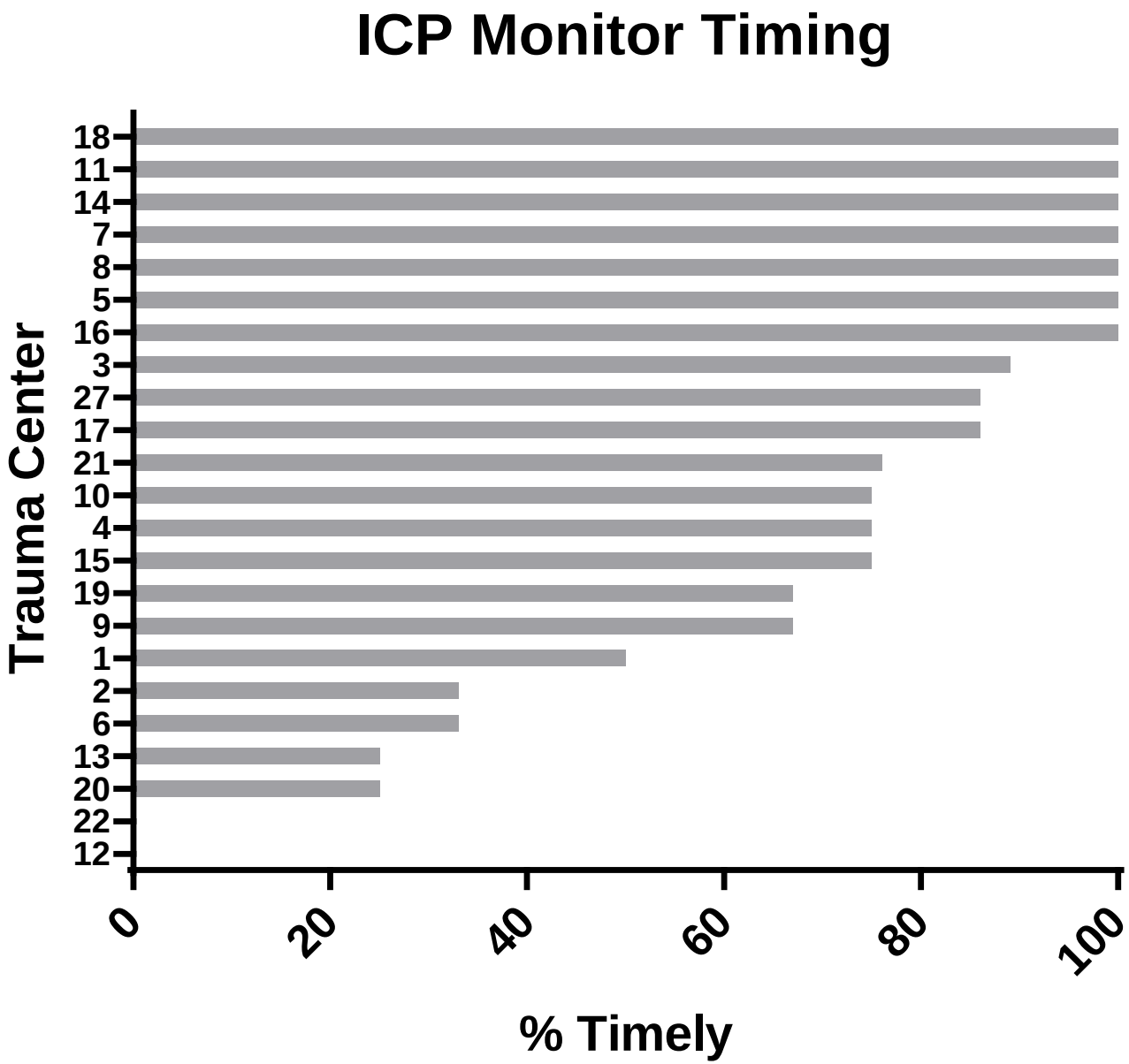
Timing of Monitor for Head Injury

- 7/1/11 to 6/30/12
- Include if AIS Head > 0
- Exclude if
  - No signs of life
  - ED GCS > 8
  - Placement time > 5 days or negative
- Eligible patients
  - Any Monitor, Vent, IPPM, O2Mon, JVB
  - Mean time from ED admit to placement of first monitor
  - N, patients where time to placement of first monitor < 8 hrs

Timing of Monitor for Head Injury (7/1/2011 to 6/30/12)

Inclusion:		Exclusion:			Timely = Placement ≤ 8hrs after ED arrival			
AIS Head > 0		No signs of life						
		ED GCS > 8						
		Placement time > 5 days						
Trauma Center	N Any Monitor	Ventric	IPPM	02 Mon	JVB	Mean Time to Placement (hrs)	N Timely	% Timely
21	35	15	35	2	0	6.0	30	86%
27	21	15	11	0	0	6.2	16	76%
1	15	0	15	0	0	9.2	10	67%
18	14	2	11	5	0	21.7	7	50%
3	9	2	7	0	0	2.2	9	100%
15	9	5	5	0	1	7.9	8	89%
2	7	5	6	0	0	6.0	6	86%
6	7	1	7	0	0	2.4	7	100%
19	7	6	3	0	0	3.2	7	100%
5	4	4	1	1	0	9.0	3	75%
11	4	1	3	1	0	19.2	1	25%
14	4	0	4	0	0	5.5	3	75%
17	4	4	0	0	0	16.6	3	75%
4	4	2	4	0	0	13.7	1	25%
8	3	3	3	0	0	21.9	1	33%
9	3	0	3	1	0	6.5	2	67%
13	3	3	0	0	0	9.3	1	33%
16	2	1	2	0	0	3.2	2	100%
20	2	0	2	0	0	2.7	2	100%
22	2	1	2	0	0	4.1	2	100%
7	2	1	0	1	0	4.9	2	100%
12	1	1	0	0	0	10.8	0	0%
10	1	0	1	0	0	14.0	0	0%
Total	163	72	125	11	1	8.3	123	75%


ICP Monitor Timing
Trauma Center
18
11
14
7
8
5
16
3
27
17
21
10
4
15
19
9
1
2
6
13
20
22
12
0
20
40
60
80
100
% Timely

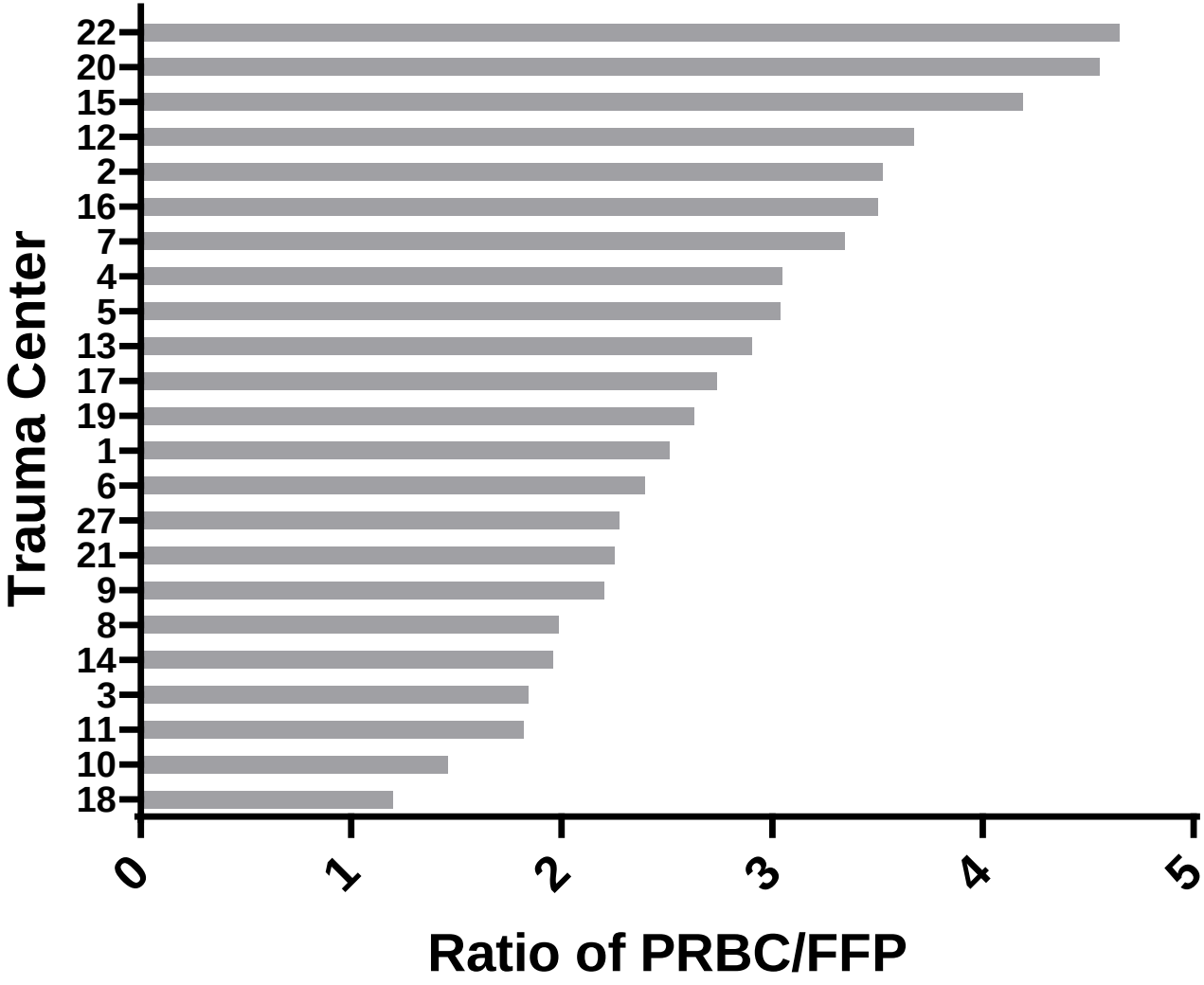
Blood Use in first 24hr if MTP

- 7/1/08 to 6/30/12
- Cohort 1
- Include if units PRBC ≥ 5 in first 24 hrs
- Calculations
  - Mean ratio of PRBC/FFP in first 24 hrs
  - N patients with ratio ≤ 2
  - N patients with ratio ≤ 1.5
  - N patients Dead and ratio > 1.5
  - N patients Dead and ratio ≤ 1.5
  - % Dead with ratio ≤ 1.5 / All patients with ratio ≤ 1.5
  - % Dead with ratio > 1.5 / All patients with ratio > 1.5

Blood Use in MTP (PRBC ≥ 5 units in 24 hrs)

Trauma Center	N	Mean Ratio PRBC/ FFP 24hrs	N 24 hr Ratio ≤ 2	N 24 hr Ratio ≤ 1.5	N Dead	N Dead & 24 hr Ratio > 1.5	N Dead & 24 hr Ratio ≤ 1.5	% Dead ≤ 1.5 / N ≤ 1.5	% Dead > 1.5 / N > 1.5
15	114	4.2	48	30	26	22	4	13	26
11	107	1.8	62	42	34	20	14	33	31
18	74	1.2	66	59	25	5	20	34	33
27	52	2.3	25	16	17	11	6	38	31
3	38	1.8	23	17	15	9	6	35	43
1	34	2.5	17	10	14	11	3	30	46
4	28	3.0	7	4	13	11	2	50	46
19	25	2.6	8	5	13	9	4	80	45
7	22	3.3	1	1	5	4	1	100	19
21	20	2.3	8	5	10	8	2	40	53
8	16	2.0	9	8	9	5	4	50	63
6	14	2.4	7	4	6	5	1	25	50
9	10	2.2	3	3	2	2	0	0	29
12	10	3.7	1	1	7	7	0	0	78
20	9	4.6	1	0	5	5	0	--	56
14	9	2.0	5	5	4	2	2	40	50
5	8	3.0	3	1	3	2	1	100	29
2	6	3.5	1	1	0	0	0	0	0
17	6	2.7	1	1	4	4	0	0	80
10	4	1.5	4	2	1	0	1	50	0
13	2	2.9	0	0	0	0	0	--	0
16	2	3.5	0	0	0	0	0	--	0
22	2	4.7	0	0	1	1	0	--	50

Blood Product Usage in first 24 hrs if ≥ 5 uPRBCs



VTE

- Type Prophylaxis
  - None
  - Heparin SQ
  - LMWH SQ
- Timing
  - Timely (< 48 hrs after admission)

New Report Site

M·TQIP

Future Meetings

- Tuesday June 4, 2013
  - Location: Ann Arbor
  - Registrars
- Tuesday October 15, 2013
  - Location: Ann Arbor/Ypsilanti
- Tuesday February 11, 2014
  - Location: Ann Arbor/Ypsilanti

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Early Mobility: The Experiences of Two ICUs

Sharon Dickinson MSN, RN, ANP, ACNS-BC, CCRN
Clinical Nurse Specialist SICU/Rapid Response

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Clinical Nurse Specialist TBICU

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Disclosures

- **Nothing to disclose**

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Objectives

- **At the end of the presentation the learner will be able to:**
  - Describe the process of developing an early mobility protocol for ICU patients and how to modify to adapt to specific patient populations
  - Define the impact a mobility protocol can have on:
    - ICU LOS
    - Hospital LOS
    - Deposition

Historical Background…

- **Early ambulation first introduced in WW II**
  - Expedited recovery for soldiers to return to war
    - Rheums Dis Clinic NA 1990;16:791-801
- **"Early Rising After Operation"**
  - NEJM 1942; 14:576-577
  - Benefits of early mobility were clear
    - "First, morale is greatly improved…General health and strength are better maintained & convalescence is more rapid"

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Risks associated with immobility….

- Complications can be significant for bedridden, critically ill patients
- Multiple random trials have associated bed rest with HARM
  - Neuromuscular dysfunction – Stevens RD, et. Al., Intensive Care Medicine, 2007, Angela KM, et. Al., ICU Director, 2012
  - Delayed weaning from mechanical ventilation - Morris PE., Crit Care Clin, 2007
  - Neuropsychiatric, cognitive dysfunction - Pisani MA *et al., AJRCCM, 2010*

Is mobility important for ICU patients?

- **Evidence suggests yes!**
  - Decreased LOS in ICU
  - Decreased days on ventilator
  - Decreased pressure ulcer rates
  - Improved mortality

Protocols/Guidelines can help improve getting patients moving

- **"The greatest impact of early mobilization is through standardized mobility protocols or programs".**

Pashikanti, L and Von Ah, Diane, 2012

Do we actively mobilize our patients?

- **MTQIP survey results**
  - 80% admit their patients to the ICU with a bedrest order
  - 70% mobilize (bedside PT, OOB to chair, standing and/or walking) patients only after they are hemodynamically stable
  - Reasons to withhold mobility included: FIO2 >60%, ***Ventrics***, Epidurals, sedation, ***unclear spines***.
- **So the answer is mostly no. But would a mobility protocol really make a difference?**

How Did we build the Protocol?

Dickinson S, Tschannan D and Shever L, Can the Use of an Early Mobility Program Reduce the Incidence of Pressure Ulcers in a Surgical Critical Care Unit? Critical Care Nurse Quarterly Jan-Mar 2013.

How Did <u>We</u> Do This??

- No definitive literature to guide our protocol
- Utilized Evidence from:
  - Rehabilitation Medicine
  - Immunology
  - Gerontology
  - Biological Sciences/Medical Sciences
  - Physiotherapy Research

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Literature Review

- **Title: Early Intensive Care Unit Mobility Therapy in the Treatment of Acute Respiratory Failure**
- **Purpose:** To assess the frequency of physical therapy, site of initiation of physical therapy, and patient outcomes comparing respiratory failure patients who received usual care compared with patients who received physical therapy from a Mobility Team using the mobility protocol.
- **Method:** Prospective cohort study of MICU patients with acute respiratory failure requiring mechanical ventilation on admission. An ICU Mobility Team (ICU RN, Nursing Assistant, PT) initiated the protocol within 48 hours of mechanical ventilation.
- **Results: A Mobility Team using a mobility protocol initiated earlier physical therapy was feasible, safe, did not increase costs, and was associated with decreased ICU and hospital LOS in survivors who received physical therapy during ICU treatment versus patients who received usual care.**

Morris, Goad, Thompson, Taylor, et al., 2008

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Literature review…

- **Title: Early Physical and Occupational Therapy in Mechanically Ventilated, Critically Ill Patients: A Randomized Controlled Trial**
- **Purpose:** To assess the efficacy of combining daily interruption of sedation with physical and occupational therapy on functional outcomes in patients receiving mechanical ventilation in intensive care.
- **Method:** Prospective, randomized controlled trial of sedated adults. Patients were randomized to early exercise an mobilization (PT and OT) during periods of sedation interruption or to therapy as ordered per primary team during sedation holiday.
- **Results:** Return to independent functional status at hospital discharge occurred in significantly more patients from the intervention group versus control. Intervention group also had significantly shorter duration of delirium and more ventilator-free days during 28-day follow-up than controls. **Interruption of sedation combined with PT and OT in the earliest days of critical illness was safe and well tolerated.**

Schweickert, Pohlman, Pohlman, Nigos, et al., 2009

Barriers to Overcome

- "Bed rest" as an admission order selection
- Concern for the safety of tubes and lines
- Patient size
- Hemodynamic/respiratory instability
- Sedation protocols
- Limited resources (people and equipment)
- Fear by all

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Early Mobility Program
"Moving and Grooving"

Phase 0	Phase 1	Phase 2
Range of Motion Passive (3x/day, 10 repetitions) Active (3x/day, 10 repetitions)	Range of Motion Passive (3x/day, 10 repetitions) Active (3x/day, 10 repetitions)	Range of Motion Resistance (3x/day, 10 repetitions)
HOB Elevated 30-45 degrees Or Reverse Trendelenberg	HOB Elevated 30-45 degrees Or Reverse Trendelenberg	HOB Elevated 30-45 degrees Reposition (every 2 hours)
Reposition (every 2 hours)	Reposition (every 2 hours)	Standing (3x/day)
Continuous Lateral Rotation (18-24 hours per day)	Chair position or OOB with sling (3x/day)	OOB (bear own weight) (3x/day)
If patient tolerates these activities, advance to next phase	Dangling (3x/day)	Walking (3x/day)

Early Mobility Program Initiated in the Surgical ICU 2010
Adopted and started in the Trauma Burn ICU April 2012

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Inclusion Criteria:

- **Early activity is initiated when the patient achieves physiological stabilization**
- **Low dose catecholamine drips should not preclude the patient from early mobility (i.e. low dose norepi, phenylephrine, vasopressin)**
- **FiO2 < or equal to 80% (Used to be 60%)**
- **Peep less than or equal to 10 cm H2O**

Goals:

1. **Every patient should be evaluated for early mobility.**
2. **Small efforts can yield large results.**
3. **Never give up! Poor tolerance during one episode does not predict future tolerance.**
4. **Evaluate patient readiness and response to current therapy and ability to progress.**

*Possible criteria to withhold early mobility: hypoxia, hemodynamic instability (escalation of vasopressors in the last 12 hours), ICP monitoring or unstable cardiac rhythm (life threatening rhythm that compromises blood pressure in past 24 hours) or new cardiac arrhythmia & epidural.

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HOW DID WE MODIFY FOR BURN PATIENTS?

Inclusion Criteria:

- Early activity is initiated when the patient achieves physiological stabilization
- Low dose catecholamine drips should not preclude the patient from early mobility (i.e. low dose norepi, phenylephrine, vasopressin)
- FiO2 < or equal to 60%
- Peep less than or equal to 10 cm H_2O

Trauma Burn Special Considerations:

- ROM should only be performed on non-impaired joints or those with stable orthopedic injuries
- See post-op wound sheet for activity restrictions s/p grafting
- Spinal cord injury pts. need abd. binder, Juzos or ACE, and proper chair for mobility
- ACE wraps to lower extremities if burn present

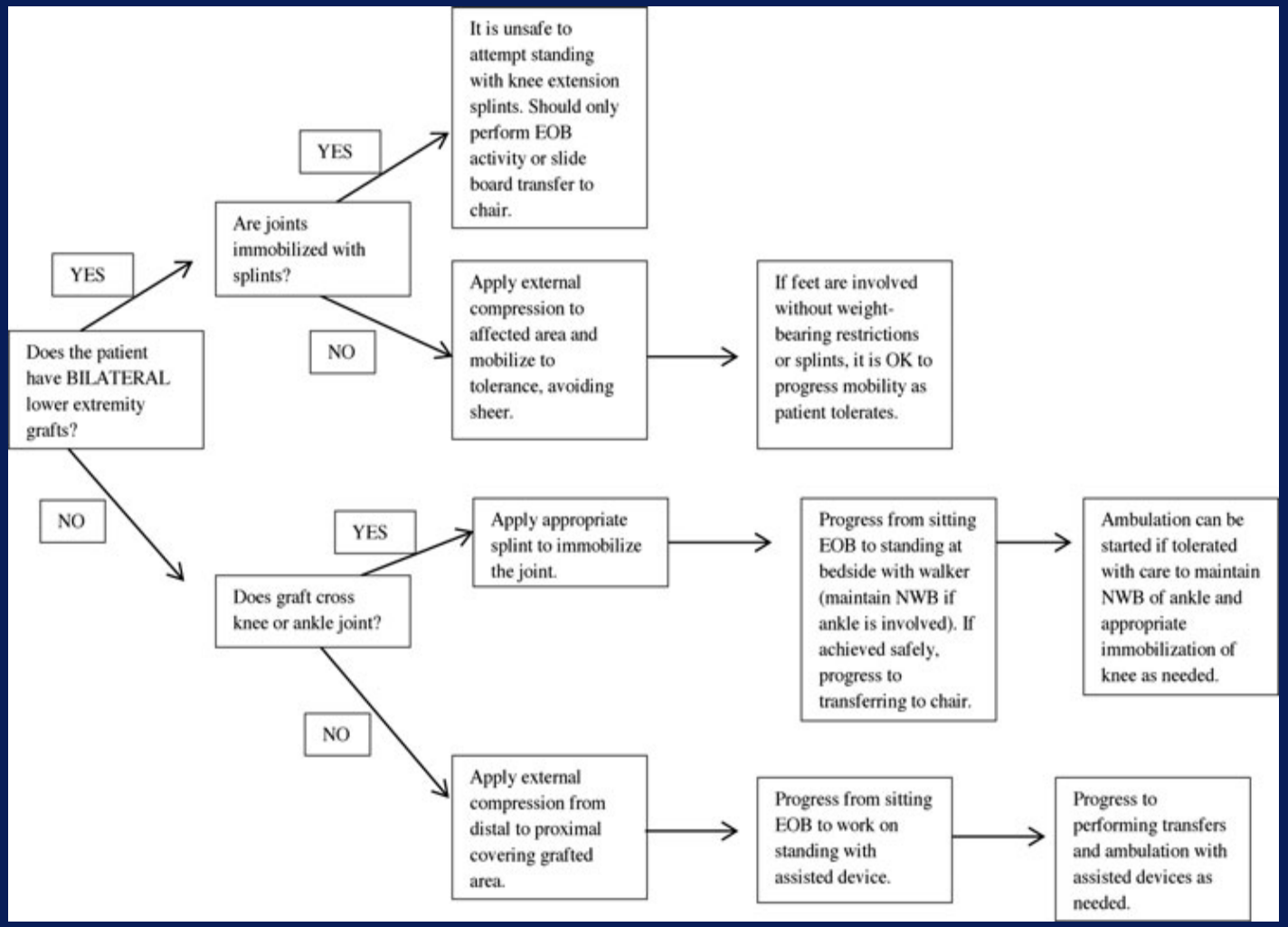
Goals:

1. Every patient should be evaluated for early mobility.
2. Small efforts can yield large results.
3. Never give up! Poor tolerance during one episode does not predict future tolerance.
4. Evaluate patient readiness and response to current therapy and ability to progress.

*Possible criteria to withhold early mobility: hypoxia, hemodynamic instability (escalation of vasopressors in the last 12 hours), ICP monitoring or unstable cardiac rhythm (life threatening rhythm that compromises blood pressure in past 24 hours) or new cardiac arrhythmia, epidural, & critical/difficult airways.

*Special considerations need to be addressed for: spinal clearance, orthopedic injuries and newly placed skin grafts prior to starting ROM.

Burn Algorithm s/p Grafting



Taylor, Manning, & Quarles
2013

Tracking the data…

						Reg Num
5806	5810	5814	5818	5820	5824	Room
11/25/2010 1:42	11/11/2010 21:35	11/2/2010 23:19	11/12/2010 19:44	10/28/2010 0:28	11/19/2010 20:15	Admit Date
5	19	28	18	33	11	LOS
86%	71%	67%	86%	97%	97%	Overall Doc Grade
Phase 0	Phase 1*	Phase 1	Phase 0	Phase 0	Phase 0	Initial Phase
Phase 0	Phase 2*	Phase 1	Phase 0	Phase 0	Phase 0	Phase Today
1	2	3	1	5	1	Phase 0 Count
0	2	3	0	7	0	Phase 1 Count
0	0	0	0	3	0	Phase 2 Count
0	2	3	0	7	0	Phase Up Count
0	1	2	0	7	0	Phase Down Count
2	3	2	3	3	3	ROM
3	5	4	2	5	3	HOB
11	12	12	11	11	11	Reposition
0	0	0	0	0	0	Phase 0 Cont LR
0	0	1	0	0	0	Phase 1 Chair pos
0	0	1	1	0	0	Phase 1 Dangling
0	3	0	0	0	0	Phase 2 Standing
0	3	0	0	0	0	Phase 2 OOB
0	2	0	0	0	0	Phase 2 Walking

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OUTCOMES

TBICU: Patients

Pre-Initiation Data Period : December 11, 2011 - April 29, 2012			
Post-Initiation Data Period: April 30, 2012 - August 31, 2012			
	Pre	**Post**	**% Change**
Admissions:	**180**	**225**	**25.0**
Case Mix:			
Burn	**29**	**57**	**96.6**
Trauma Post-Op	**16**	**22**	**37.5**
Trauma Non-Op	**83**	**95**	**14.5**
All Other	**52**	**51**	**-1.9**

TBICU: LOS

	Pre	Post	% Change
ICU Length of Stay			
Average	5.76	4.23	-26.6
Median	2.28	1.80	-21.0
Minimum	0.09	0.03	-63.6
Maximum	84.03	32.61	-61.2
Hosp Length of Stay			
Average	13.40	10.47	-21.9
Median	6.82	6.87	0.7
Minimum	0.23	0.17	-22.8
Maximum	196.62	60.00	-69.5

Acuity down 11.1% in Post-Implementation period. This led to an expected decrease in ICU and hospital length of stay (LOS) as well as decreased ICU and hospital mortality rates. Case mix shows a significant increase in Burn and Post-Op trauma admissions in the Post-Implementation period.

Mortality

	Pre	Post	% Change
ICU Disposition Status			
Live	170	216	27.1
Dead	10	9	-10.0
Mortality Rate	5.56	4.00	-28.1
Hosp Disposition Status			
Live	160	192	20.0
Dead	12	11	-8.3
Mortality Rate	6.98	5.42	-22.3

More patients were leaving the unit and hospital alive!

SICU outcomes -When combined with our CCI Bundle….

Datapoint	Pre-Implementation Avg (Total)	Post-Implementation Avg (Total)	% Change
Patient CCI Encounters	32	42	31.3%
SICU-Only Readmissions	10	6	-40.0%
Age	53.5	53.7	0.4%
Day 1 APACHE	74.5	68.8	-7.7%
ICU LOS	35.1	24.4	-30.3%
Hosp LOS	**55.9**	**40.9**	**-26.8%**
Vent LOS	**27.8**	**15.5**	**-44.2%**
Total Group Vent Days	**(835)**	**(622)**	**-25.5%**
CRRT Days	**21.9**	**14.9**	**-32.0%**
Total Group CRRT Days	(351)	(224)	-36.2%

ICU Disposition	Pre-Implementation	Post-Implementation	% Change
Alive	22	35	59.1%
Dead	10	7	-30.0%
Rate	31.3%	16.7%	-46.6%

Hosp Disposition	Pre-Implementation	Post-Implementation	% Change
Alive	17	32	88.2%
Dead	11	9	-18.2%
Rate	39.3%	22.0%	-44.0%

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THE CHALLENGE OF THE "DIFFICULT" ICU PATIENT

CRRT/ECMO Patient Being Mobilized…..

70% TBSA Burn Patient

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Conclusions…..

- **It is easy and safe to mobilize patients**
- **Standardized protocols help to define expectations and will enhance mobility**
- **Even the most complicated ICU patients can get up and moving with standardized protocols (burns, trauma, ventilated, CRRT, ECMO, other)**
- **Standardized mobility protocols can improve outcomes: ICU, LOS, Vent days, CRRT days, Disposition, and other areas not discussed (i.e. pressure ulcer free days and patient well being)**

Questions?

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References….

- Allen C. Glasziou P, Del Mar C. Bed rest: a potential harmful treatment needing more careful evaluation. Lancet. 1999; 354:1229-1233.
- American Nurses Association. Nursing report card for acute care. Washington, DC: American Nurses Association. 2005.
- Bower RG. Consequences of bed rest. Critical Care Medicine. 2009; 37. (10): 422-428.
- Bruunsgaard, H. Physical activity and modulation of systemic low-level inflammation. J Leukoc Biol. 2005 Oct;78(4):819-35.
- Dammeyer J, Dickinson S, Packard D, Baldwin N, Ricklemann C. Building a protocol to guide mobility in the ICU. Crit Care Nurs Q. 2013 Jan-Mar;36(1):37-49. doi: 10.1097/CNQ.0b013e3182750acd.
- Morris PE. Moving our critically ill patients: mobility barriers and benefits. Critical Care Clinics. 2007; 23(1);1-20.
- Morris, P., Goad, A., Thompson, C., Taylor, K., et al. (2008). Early intensive care unit mobility therapy in the treatment of acute respiratory failure. Critical Care Medicine, 36(8), 2238-2243. doi: 10.1097/CCM.0b013e318180b90e

References

- Needham DM, Korupolu R, Zanni JM, Pradhan P, Colantuoni E, Palmer JB, Brower RG, & Fan E. Early physical medicine and rehabilitation for patients with acute respiratory failure: a quality improvement project. Arch Phys Med Rehabil. **2010 Apr;91(4):536-42. doi: 10.1016/j.apmr.2010.01.002.**
- Perme, C. & **Chandrashekar, R. Early mobility and walking program for patients in intensive care units: creating a standard of care. Am J Crit Care. 2009 May;18(3):212-21. doi: 10.4037/ajcc2009598.**
- Schweickert, W., Pohlman, M., Pohlman, A., Nigos, C., et al. (2009). Early physical and occupational therapy in mechanically ventilated, critically ill patients: A randomised controlled trial. *Lancet 373*, 1874-1882. doi: 10.1016/S0140-6736(09)60658-9
- Winkelman, C. (2007). Inactivity and inflammation in the critically ill patient. Critical Care Clinics 23, 21-34. doi: 10.1016/j.ccc.2006.11.002