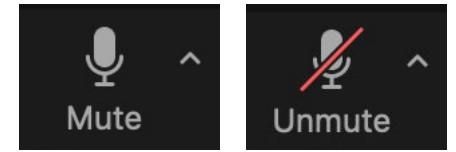


The Michigan Trauma Quality Improvement Program

Virtual, MI
February 7, 2023





Meeting Logistics

- **Join via computer and enter full name**
- **Mute all microphones**
- **Discussion opportunities at section ends**
- **Use chat to signal contribution**
- **You'll unmute your own microphone**

Disclosures

- ◆ Salary Support for MTQIP from BCBSM/BCN and MDHHS
 - Mark Hemmila
 - Judy Mikhail
 - Jill Jakubus
 - Shauna Di Pasquo
 - Bryant Oliphant

Disclosures

- ◆ Mark Hemmila Grants
 - Blue Cross Blue Shield of Michigan
 - Michigan Department of Health and Human Services

No Photos Please



Evaluations

- ◆ Link will be emailed to you following meeting
- ◆ You have up to 7 days to submit
- ◆ Please answer the evaluation questions
- ◆ Physicians/Nurses/Advanced Practitioners:
 - E-mail certificate for 3.75 Category 1 CME

Data Submission

- ◆ Data submitted December 2, 2022
 - This report
 - Available in ArborMetrix January 2023
- ◆ Data submitted February 3, 2023
 - Pending
- ◆ Next data submission
 - April 7, 2023

Future Meetings

- ◆ Spring (MCOT)
 - Wednesday May 17, 2023
 - Boyne Mountain, Boyne Falls
- ◆ Spring (Registrars and MCR's)
 - Tuesday June 6, 2023
 - Ypsilanti, EMU Marriott
 - Level 3's

MTQIP Hospital CQI Scoring Index Results

Mark Hemmila, MD



Metrics for MTQIP

- ◆ Hospital = CQI Scoring Index
 - 10 Measures
 - End result: Hospital P4P
- ◆ Surgeon = VBR
 - 3 Measures (VTE LMWH Timing (G), IHF OR in <48hrs (G), Open femur/tibia fracture abx in 90 minutes (C))
 - Scoring as a group practice
 - End result: Surgeon VBR in 2023 (March)
 - BCBSM will notify

- Hospital Result
- Points
- Possible Points
 - New Center
 - No patients in metric

Score =
Points/Possible Points x 100

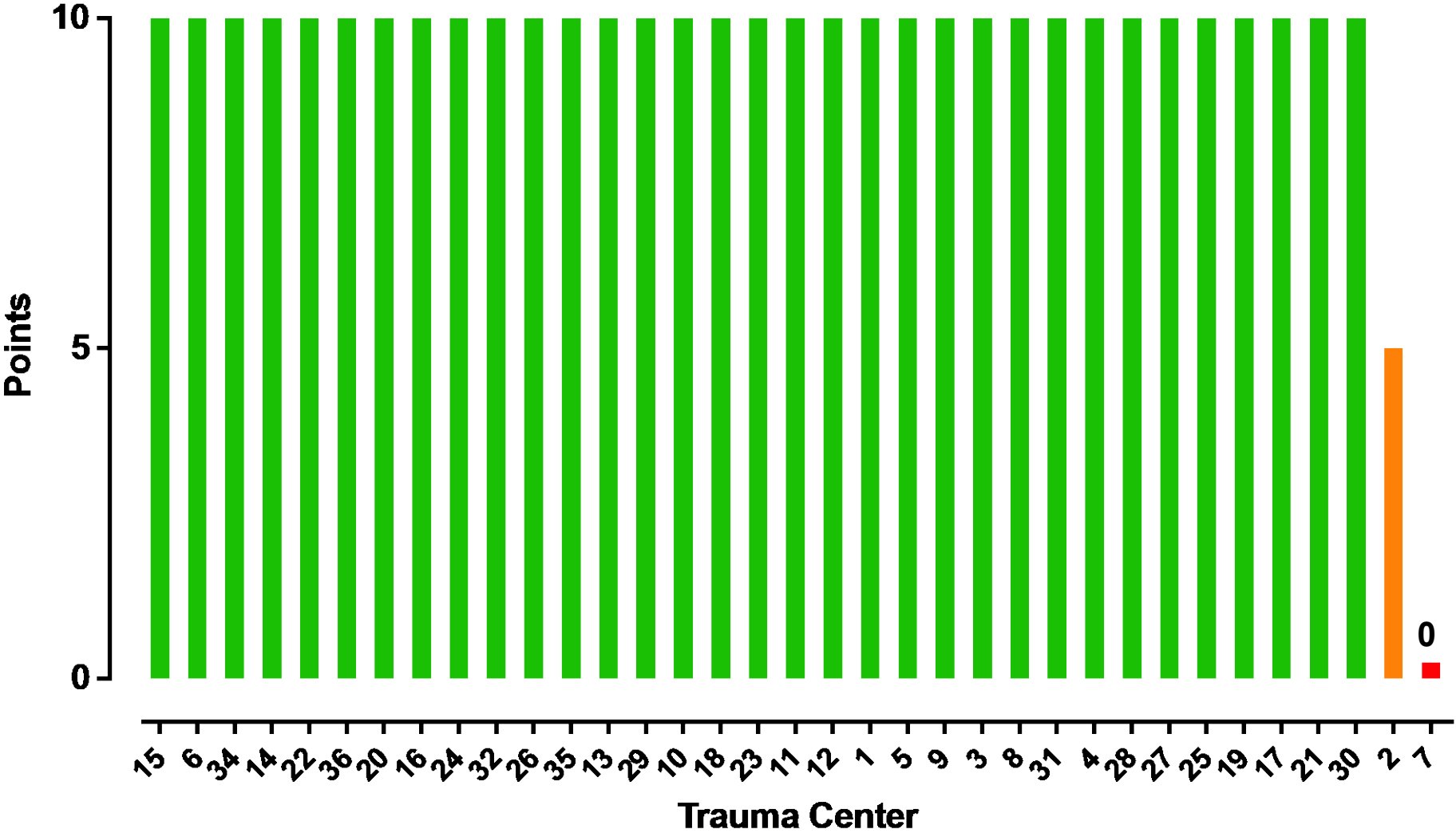
Michigan Trauma Quality Improvement Program (MTQIP)						
2021 Performance Index						
January 1, 2021 to December 31, 2021						
Measure	Weight	Measure Description	Result	Points	Possible	
#1	10	Data Submission On time and complete 3 of 3 times On time and complete 2 of 3 times On time and complete 1 of 3 times	3	10	10 5 0	PARTICIPATION (30%)
#2	10	Meeting Participation Surgeon and (TPM or MCR) participate in 3 of 3 collaborative meetings (9 pts) Surgeon and (TPM or MCR) participate in 2 of 3 collaborative meetings (6 pts) Surgeon and (TPM or MCR) participate in 1 of 3 collaborative meetings (0 pts) Surgeon and (TPM or MCR) participate in 0 of 3 collaborative meetings (0 pts) Registrar or MCR participate in the annual June data abstractor meeting (1 pt)	3	10	9 6 0 0 1	
#3	10	Data Validation Error Rate 0.0-3.0% 3.1-4.0% 4.1-5.0% > 5.0%	1.6	10	10 8 5 0	
#4	10	Timely LMWH VTE Prophylaxis in Trauma Admits (18 mo: 1/1/20-6/30/21) ≥ 52.5% of patients (≤ 48 hr) ≥ 50.0% of patients (≤ 48 hr) ≥ 45.0% of patients (≤ 48 hr) < 45% of patients (≤ 48 hr)	63.0	10	10 8 5 0	PERFORMANCE (70%)
#5	10	Timely Surgical Repair in Geriatric (Age ≥ 65) Isolated Hip Fxs (12 mo: 7/1/20-6/30/21) ≥ 92.0% of patients (≤ 48 hr) ≥ 87.0% of patients (≤ 48 hr) ≥ 85.0% of patients (≤ 48 hr) < 85.0% of patients (≤ 48 hr)	91.0	8	10 8 5 0	
#6	10	RBC to Plasma Ratio in Massive Transfusion (18 mo: 1/1/20-6/30/21) Weighted mean points in patients transfused with > 5 units 1st 4 hr	1.7	8.0	0-10	
#7	10	Serious Complication Z-Score Trend in Trauma Service Admits (3 years: 7/1/18-6/30/21) < -1 (major improvement) -1 to 1 or serious complications low-outlier (average or better rate) > 1 (rates of serious complications increased)	-0.72	7	10 7 5	
#8	10	Mortality Z-Score Trend in Trauma Service Admits (3 years: 7/1/18-6/30/21) < -1 (major improvement) -1 to 1 or mortality low-outlier (average or better rate) > 1 (rates of mortality increased)	0.40	7	10 7 5	
#9	10	Timely Head CT in TBI Patients on Anticoagulation Pre-Injury (12 mo: 7/1/20-6/30/21) ≥ 90% patients (≤ 120 min) ≥ 80% patients (< 120 min) ≥ 70% patients (< 120 min) < 70% patients (< 120 min)	83	7	10 7 5 0	
#10	10	Timely Antibiotic in Femur/Tibia Open Fractures - Collaborative Wide Measure (12 mo: 7/1/20-6/30/21) ≥ 85% patients (< 120 min) < 85% patients (< 120 min)	Center 78 MTQIP 89	10	10 10 0	
MACS Enrollment Bonus			No	0	5	
Total Points				87.0	100	
BCBSM Reported Score				87.0		

CQI Index Changes for 2022

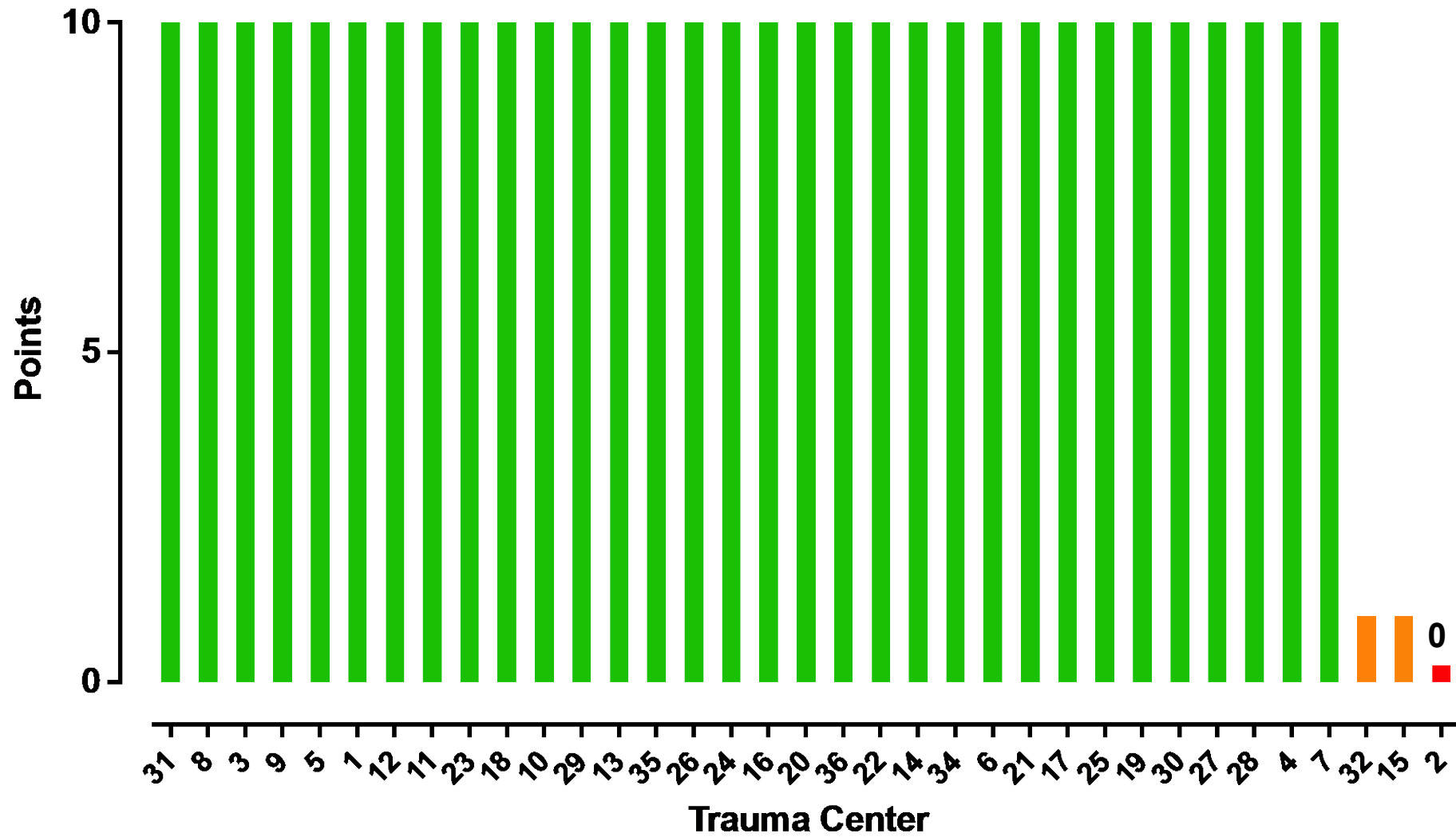
#10	10	Timely Antibiotic in Femur/Tibia Open Fractures - COLLABORATIVE WIDE MEASURE (12 mo: 7/1/21-6/30/22) ≥ 85% patients (≤ 90 min) < 85% patients (≤ 90 min)	10 0
-----	----	--	---------

Previously 120 minutes

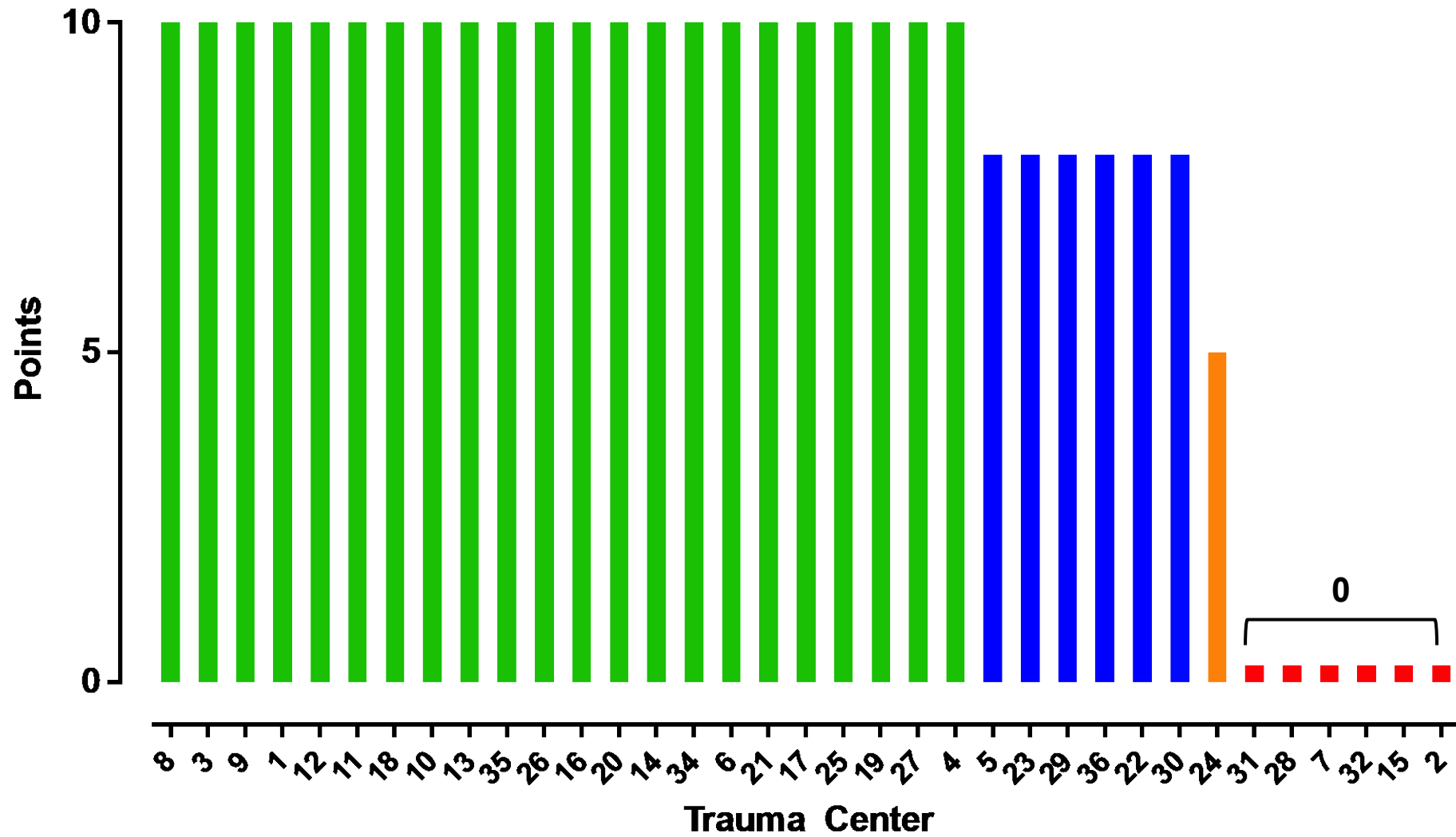
Data Submission

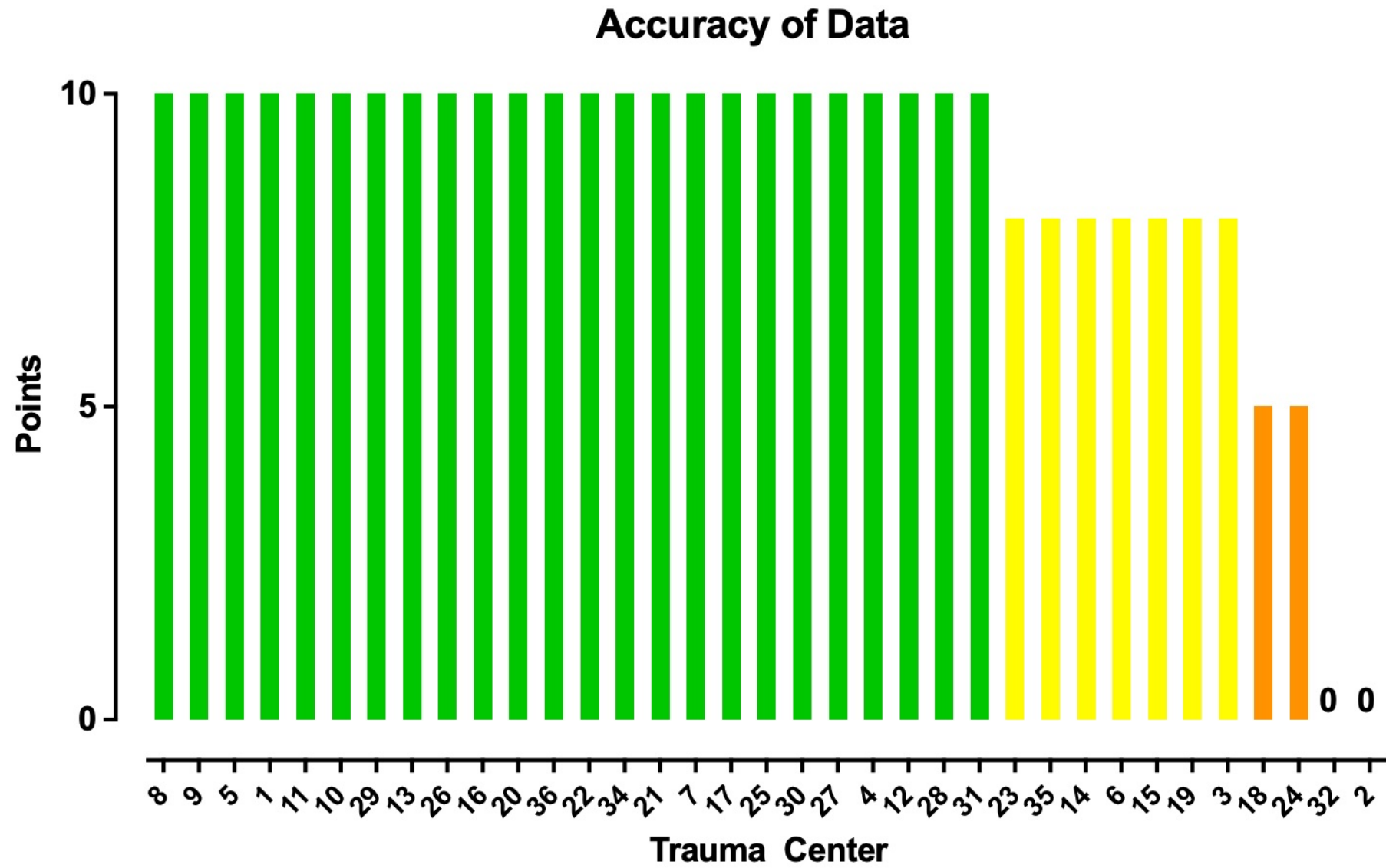


Meeting Participation



Accuracy of Data





Backsliding in data validation and submission?

What is driving this development?

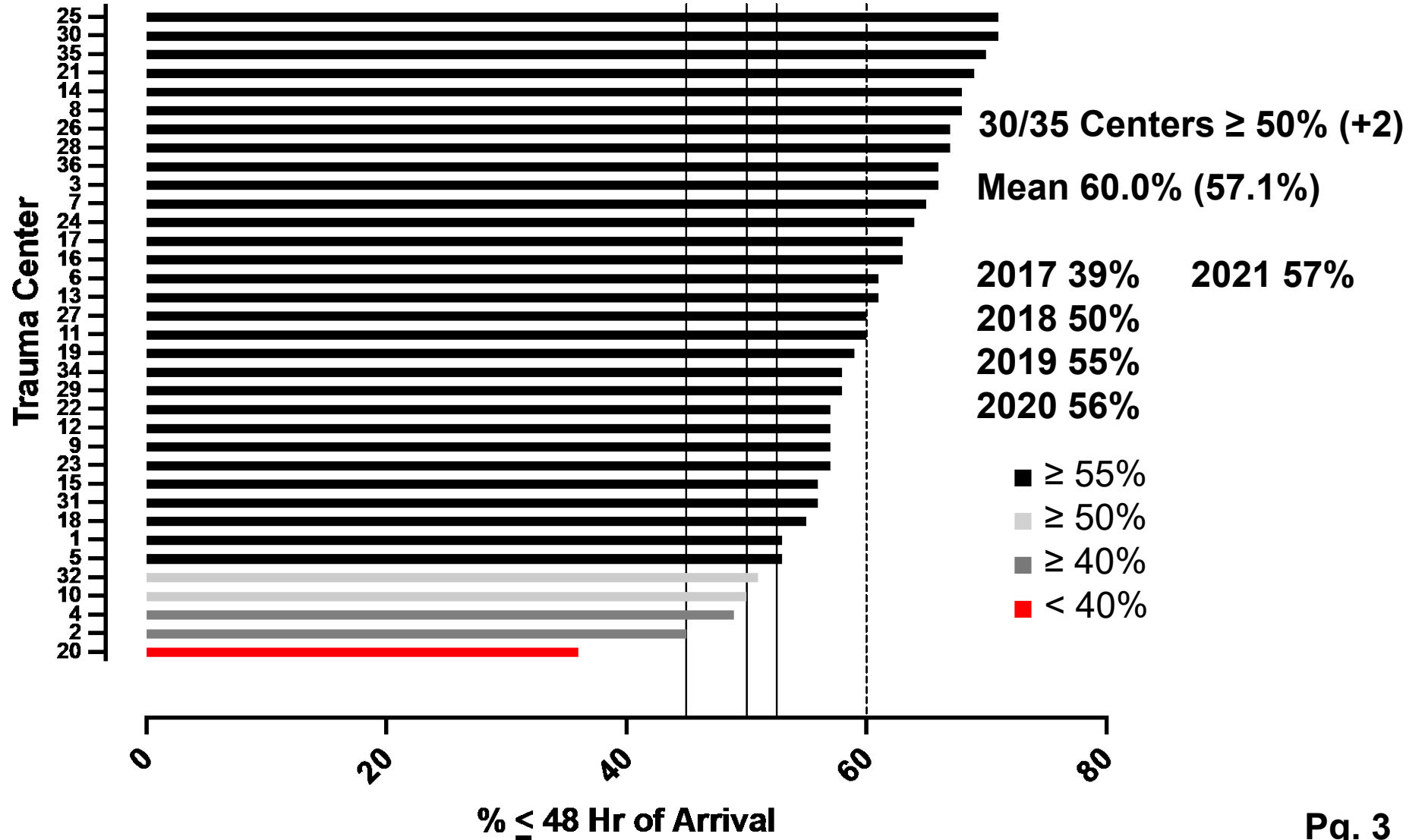
Exhaustion

Turnover, new staff

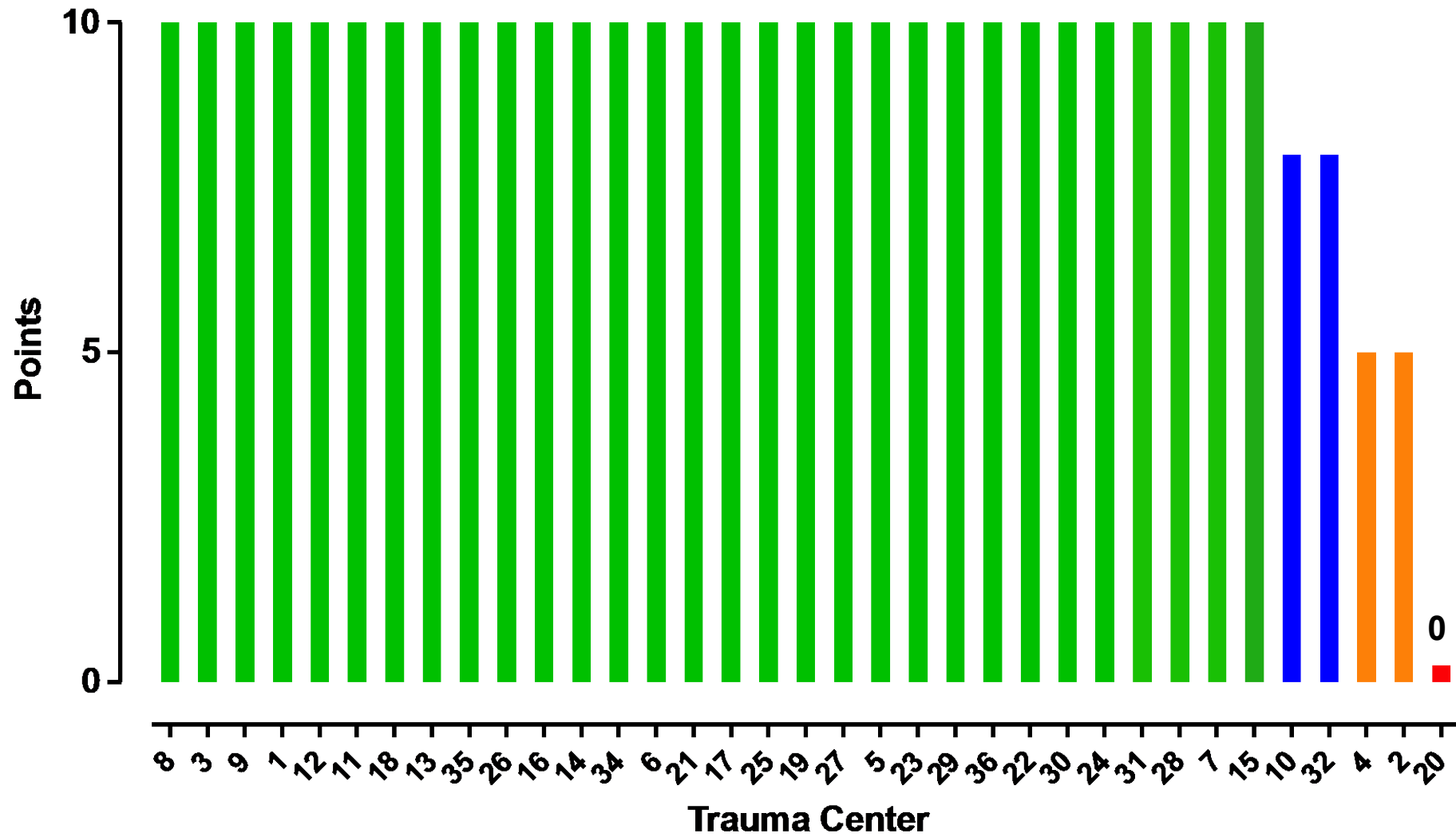
#4 Timely LMWH VTE Prophylaxis in Trauma Service Admits

- ◆ Venous Thromboembolism (VTE) Prophylaxis with LMWH Initiated Within 48 Hours of Arrival in Trauma Service Admits with > 2 Day Length of Stay (18 mo: 1/1/21-6/30/22)
 - $\geq 52.5\%$ of patients (≤ 48 hr)
 - $\geq 50\%$ of patients (≤ 48 hr)
 - $\geq 45\%$ of patients (≤ 48 hr)
 - $< 45\%$ of patients (≤ 48 hr)

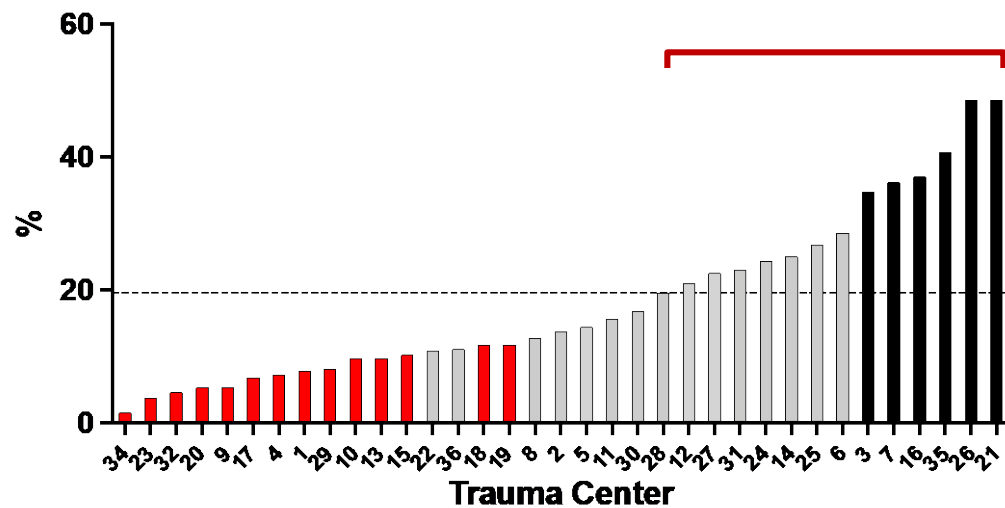
Metric 4 - VTE Prophylaxis LMWH Timeliness **Cohort 2 - Admit to Trauma** **1/1/21 - 6/30/22**



Timely VTE Prophylaxis



**VTE LMWH \leq 48 hours
Cohort 9 - TBI**



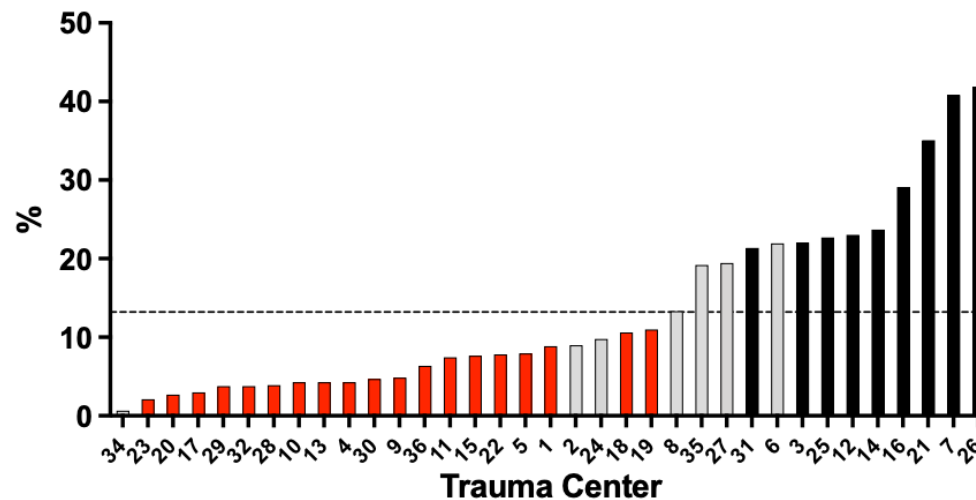
Current

Improvement to 20%

**VTE rate in Cohort 9
= 1.8 – 1.9%**

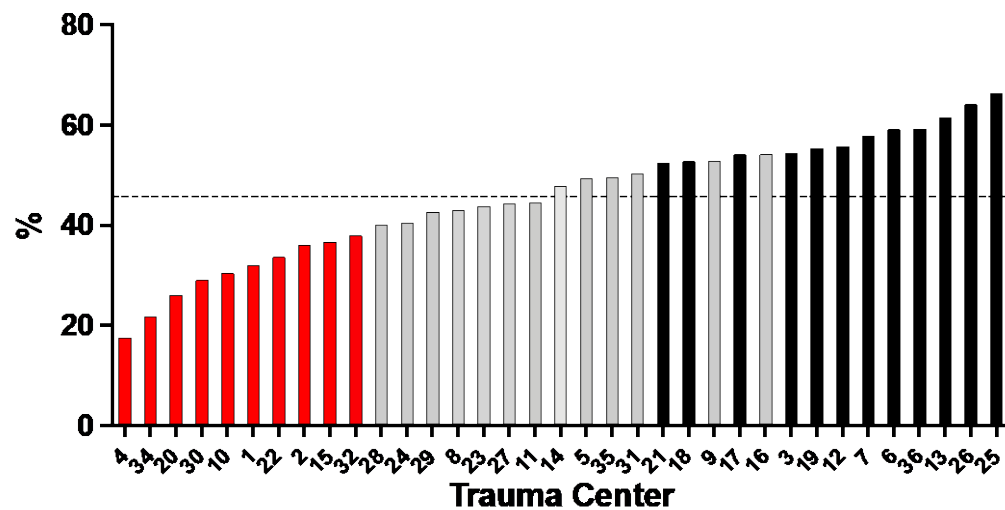
5,500 patients/yr

**VTE LMWH \leq 48 hours
Cohort - TBI**



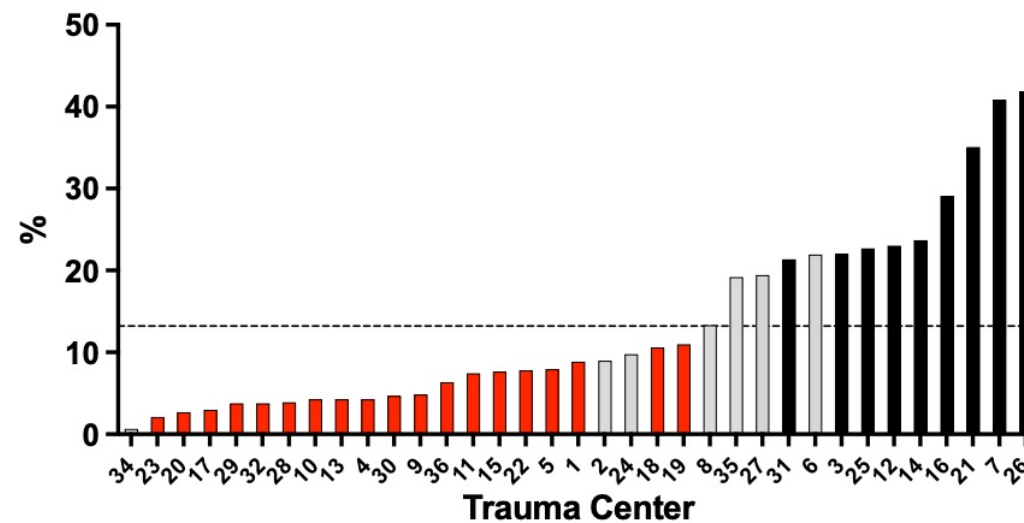
Last Year

**VTE LMWH \leq 48 hours
Cohort - Spine Injury**



Current

**VTE LMWH \leq 48 hours
Cohort - TBI**

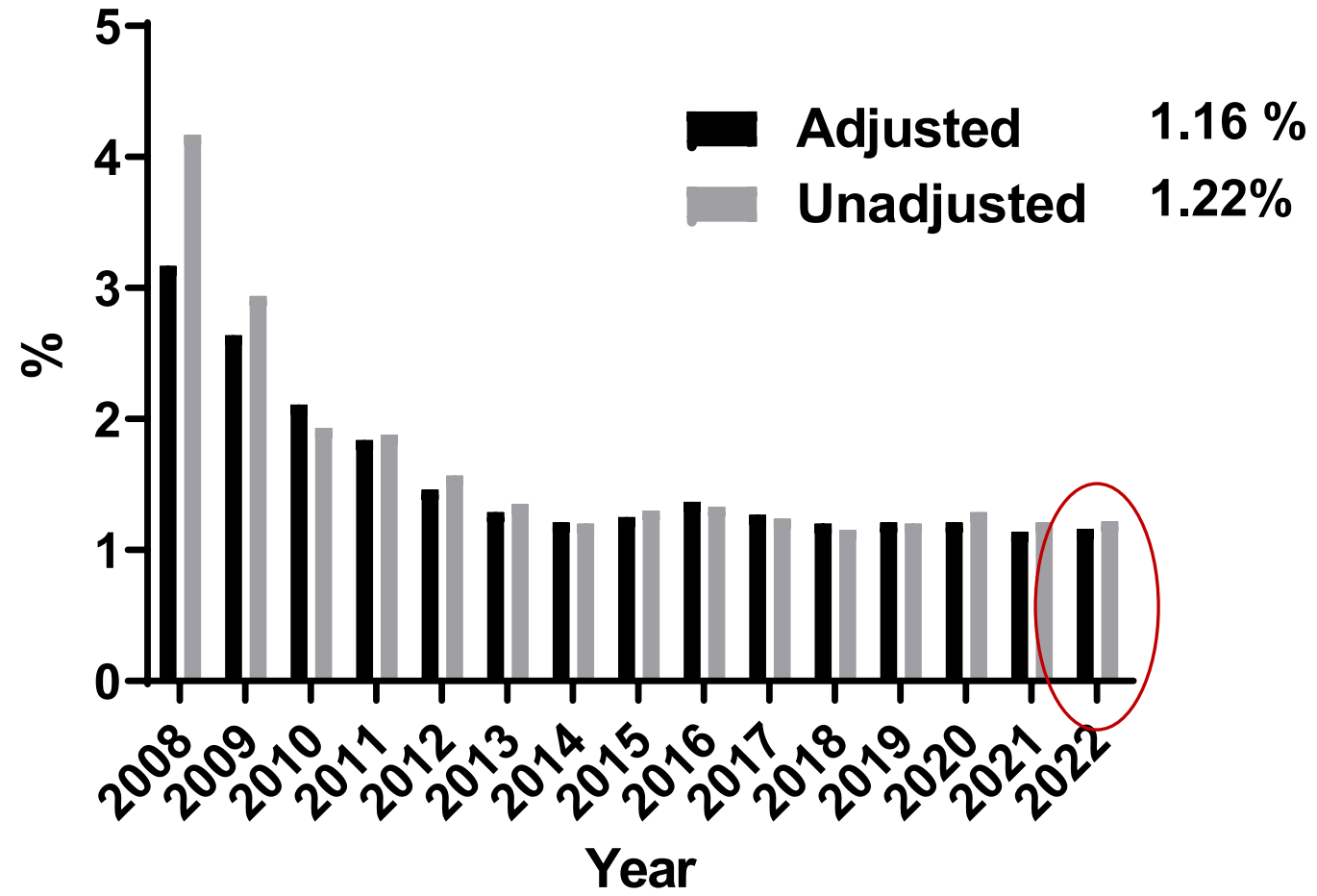


Last Year

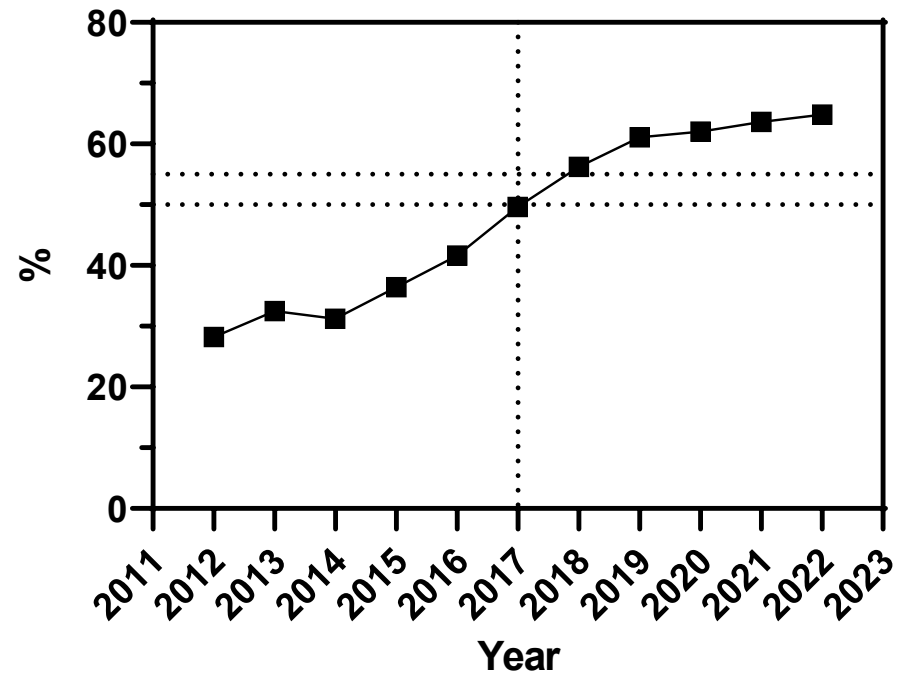
What drives this large spread in practice?

Fear

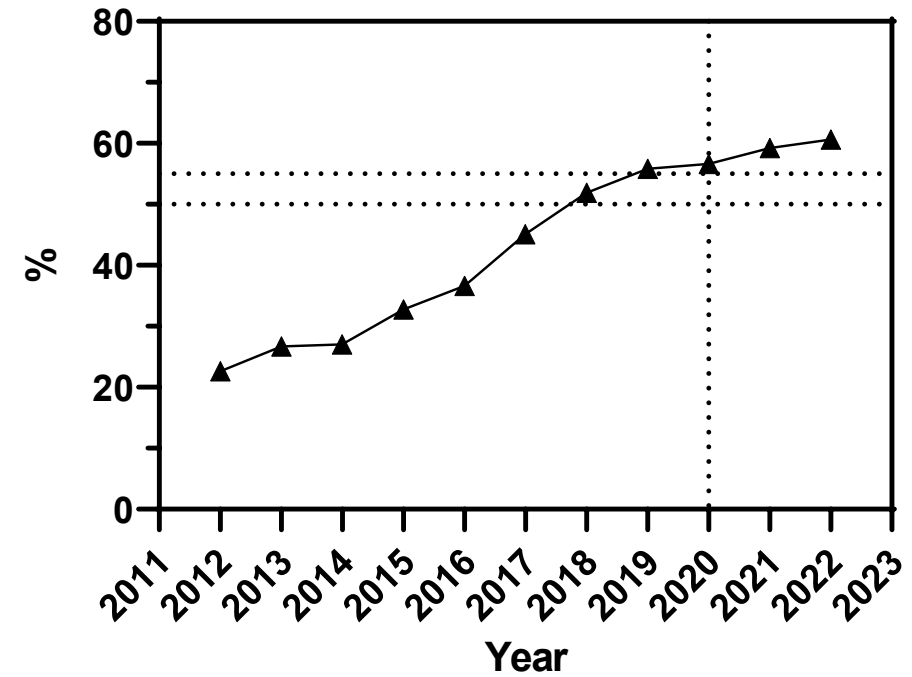
VTE Event



LMWH Type VTE Prophylaxis



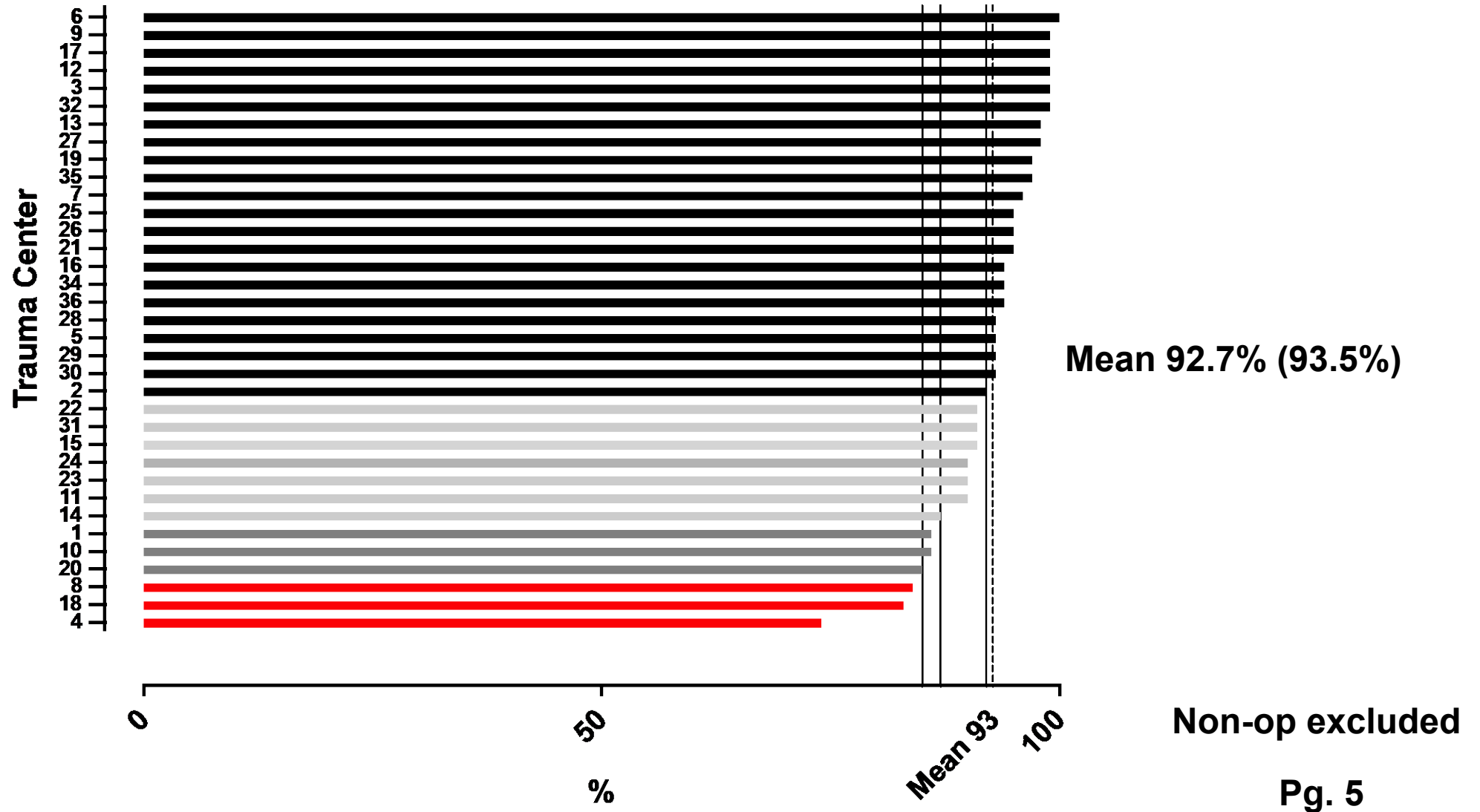
VTE Prophylaxis (LMWH, \leq 48 hrs)



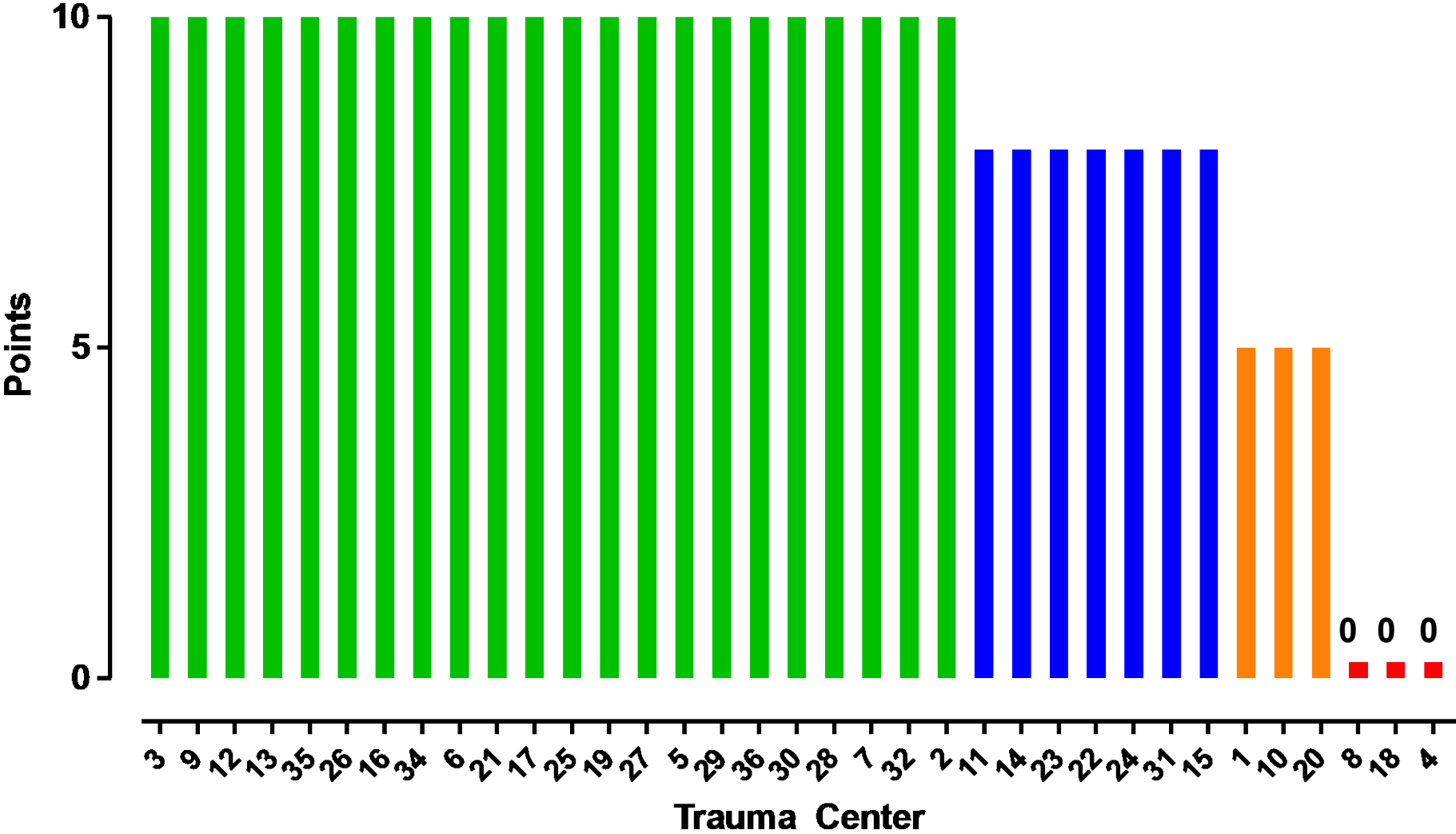
#5 Timely Surgical Repair in Geriatric (Age \geq 65) Isolated Hip Fracture

- ◆ Time to surgical repair of isolated hip fracture in patients age 65 or older (12 mo: 7/1/21-6/30/22)
 - \geq 92% of patients (\leq 48 hr)
 - \geq 87% of patients (\leq 48 hr)
 - \geq 85% of patients (\leq 48 hr)
 - $<$ 85% of patients (\leq 48 hr)

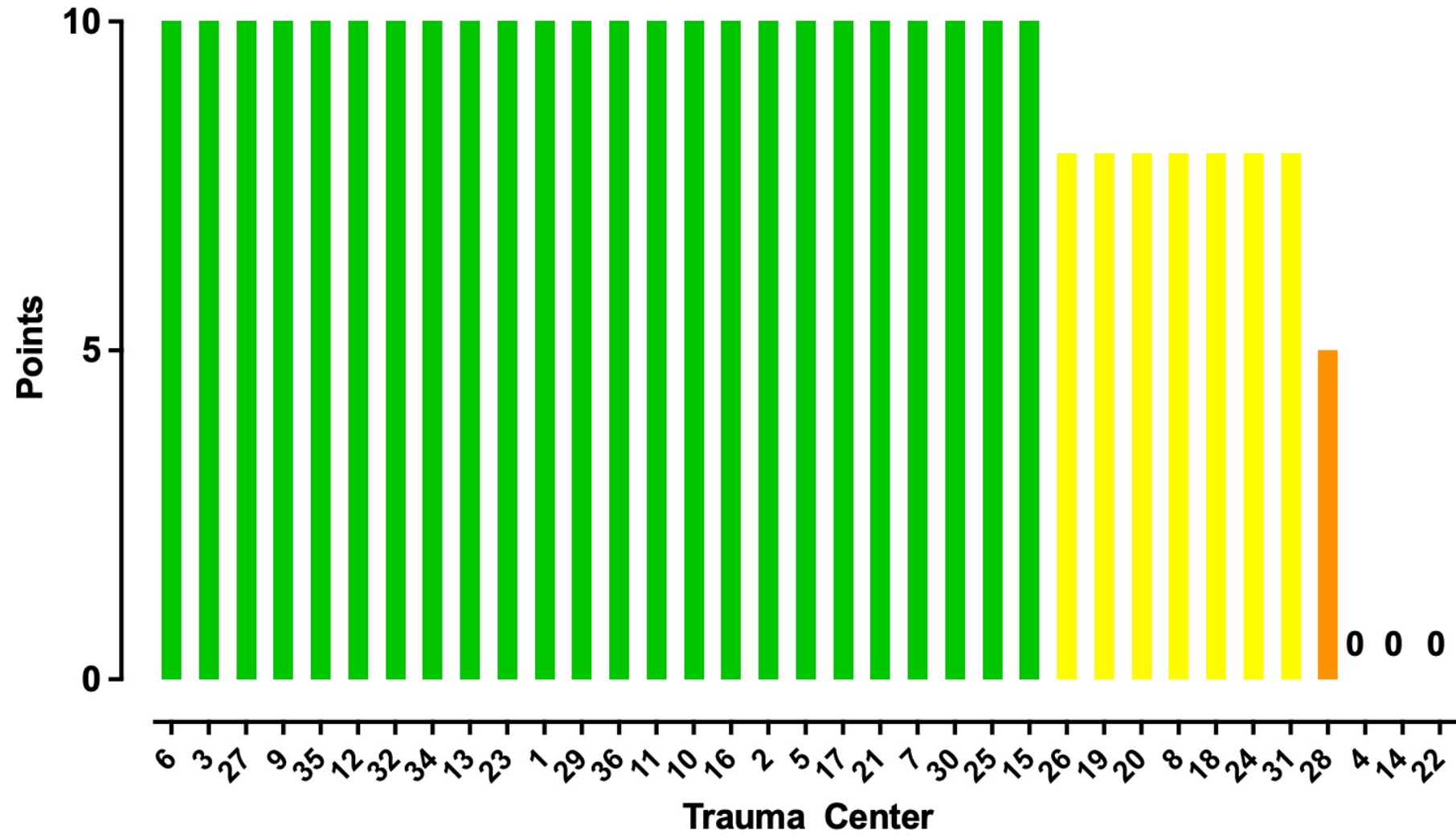
Metric 5 - Timely Surgical Hip Repair \geq 65 years
Cohort 8 - Isolated Hip Fracture
7/1/21 - 6/30/22



Timely IHF Repair



Timely IHF Repair



Does your hospital care?

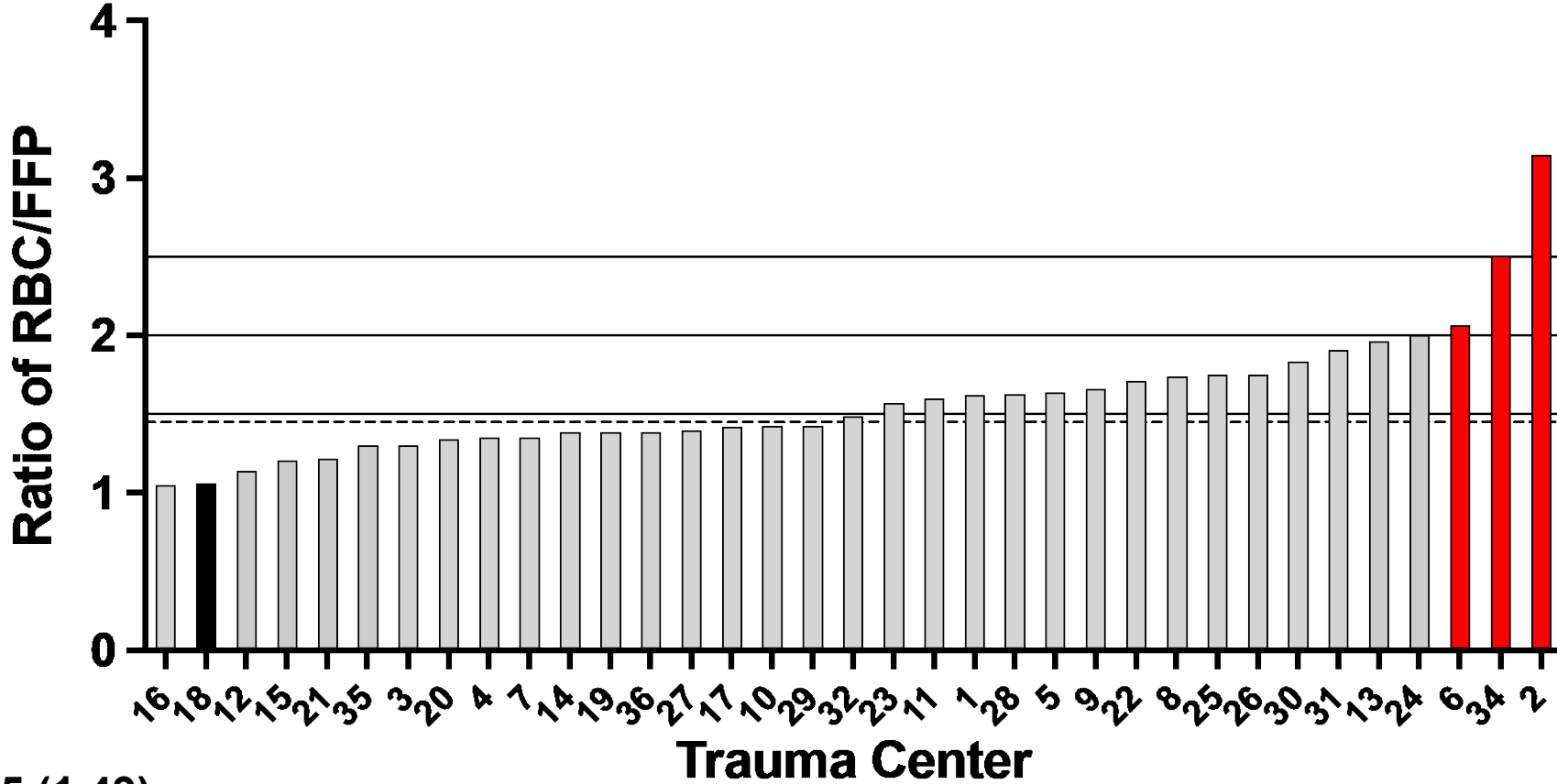
Moving from 48 to 42 hrs is on the way

5,000-6,000 patients a year

#6 Red Blood Cell to Plasma Ratio

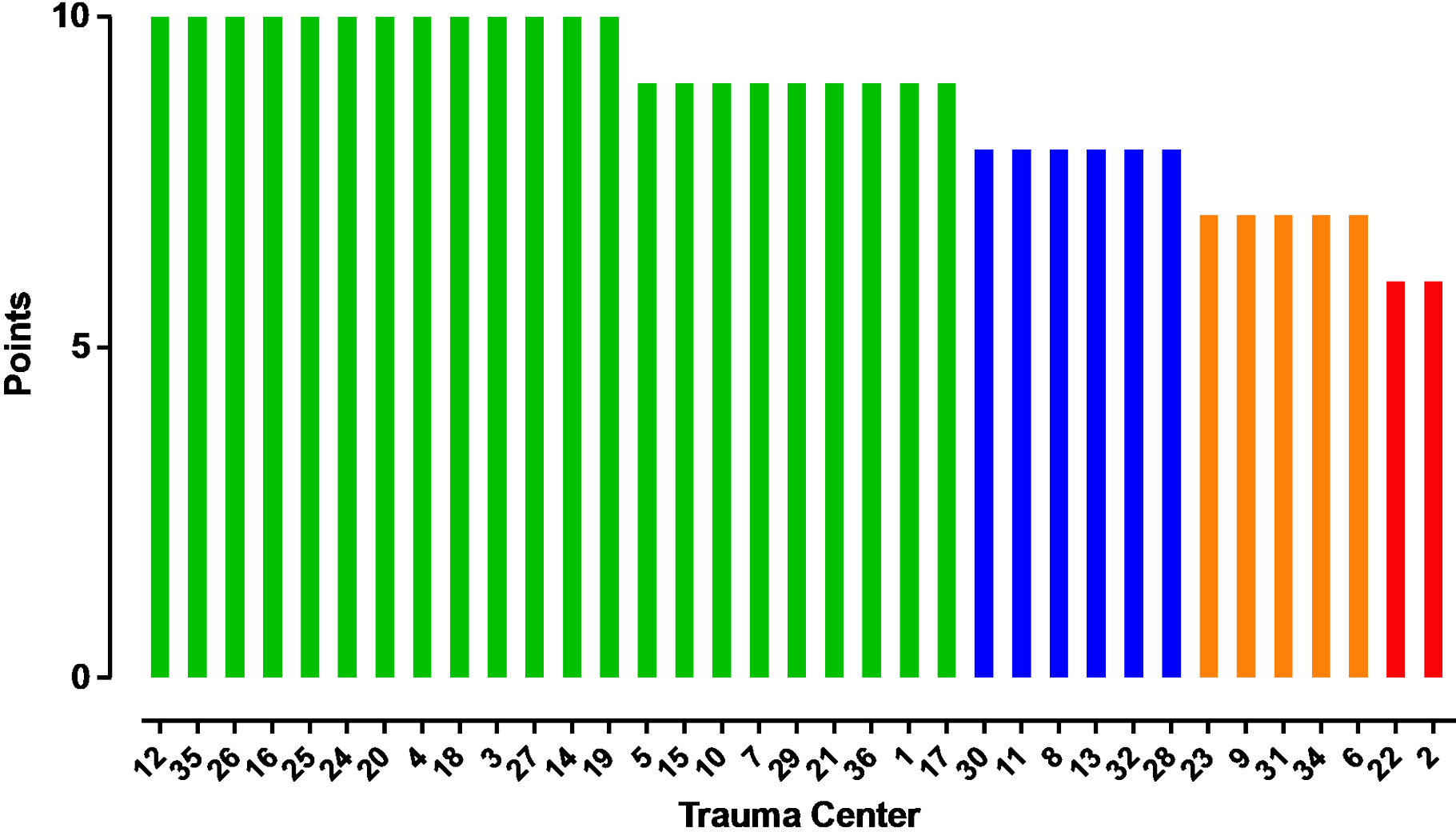
- ◆ Red blood cell to plasma ratio (weighted mean points) of patients transfused ≥ 5 units in first 4 hours (18 Mo's: 1/1/21-6/30/22)

Metric 6 - RBC to FFP Ratio - Mean
Cohort 1 - MTQIP All
1/1/21 - 6/30/22



Mean 1.45 (1.49)

PRBC to Plasma Ratio



#7 Serious Complications

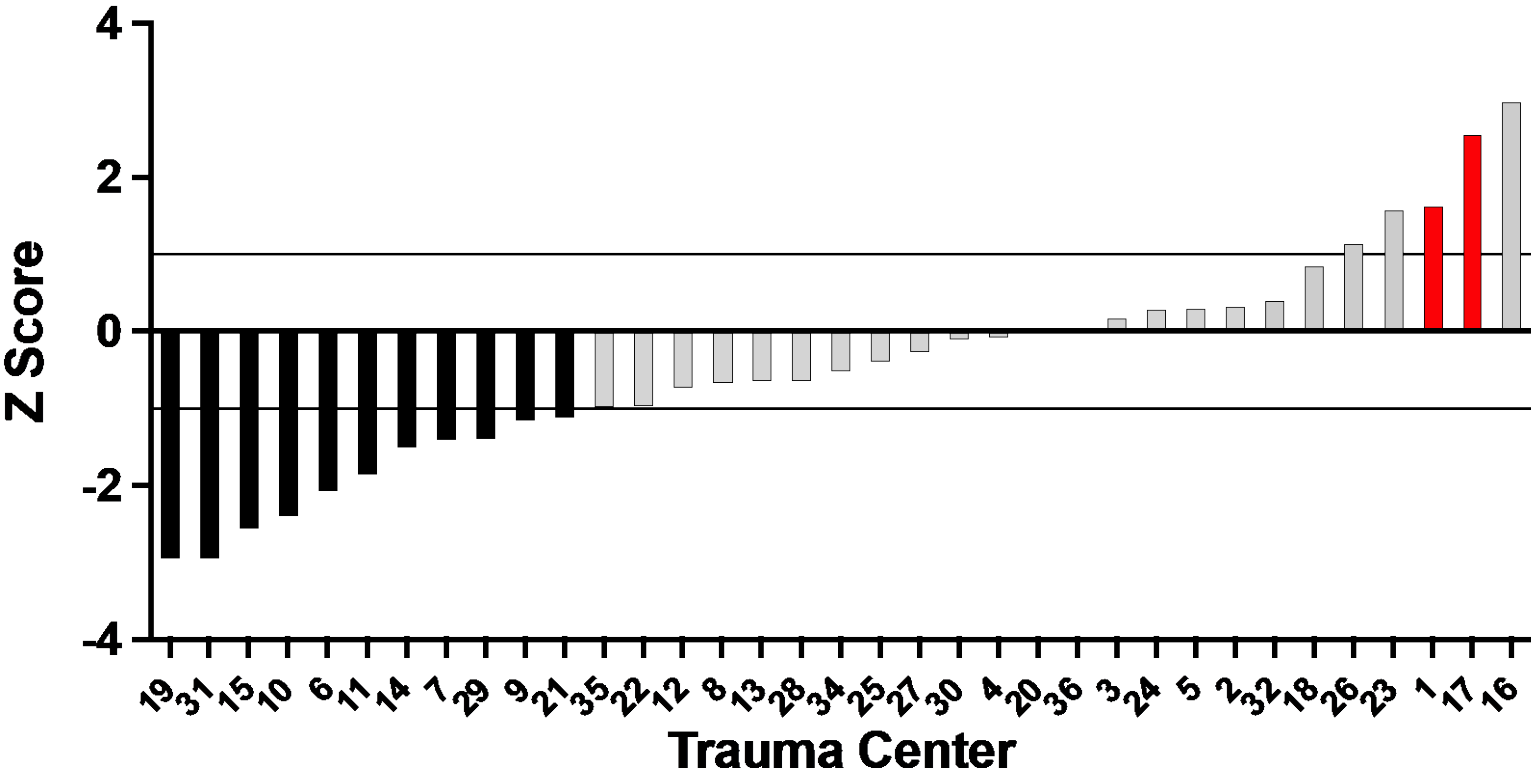
- ◆ Serious Complication Rate-Trauma Service Admits (3 years: 7/1/19-6/30/22)

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

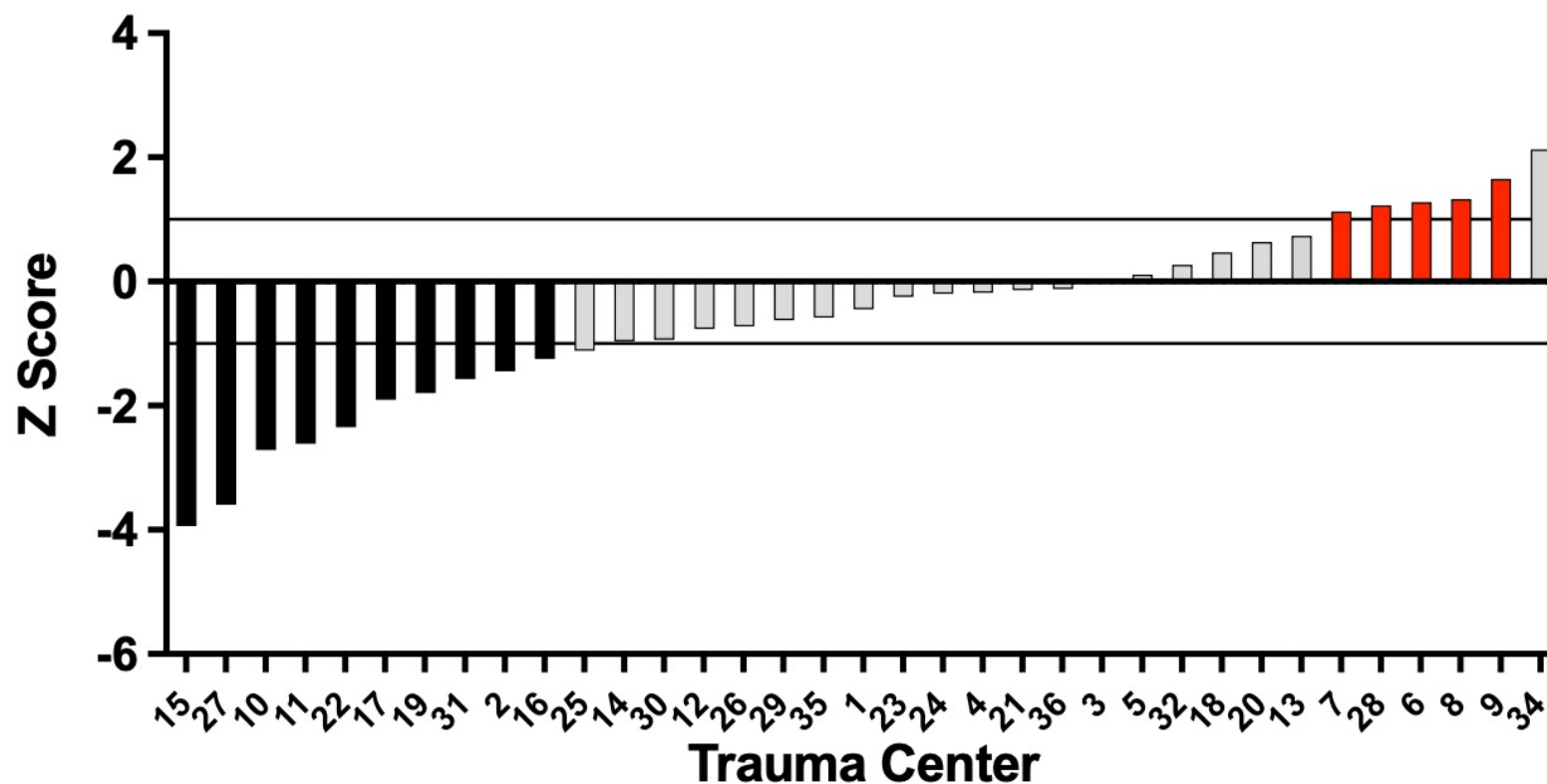
#7 Serious Complication Rate (Z-score)

Metric 7 - Z Score - Serious Complication Rate
Cohort 2 - Admit to Trauma
7/1/19 - 6/30/22

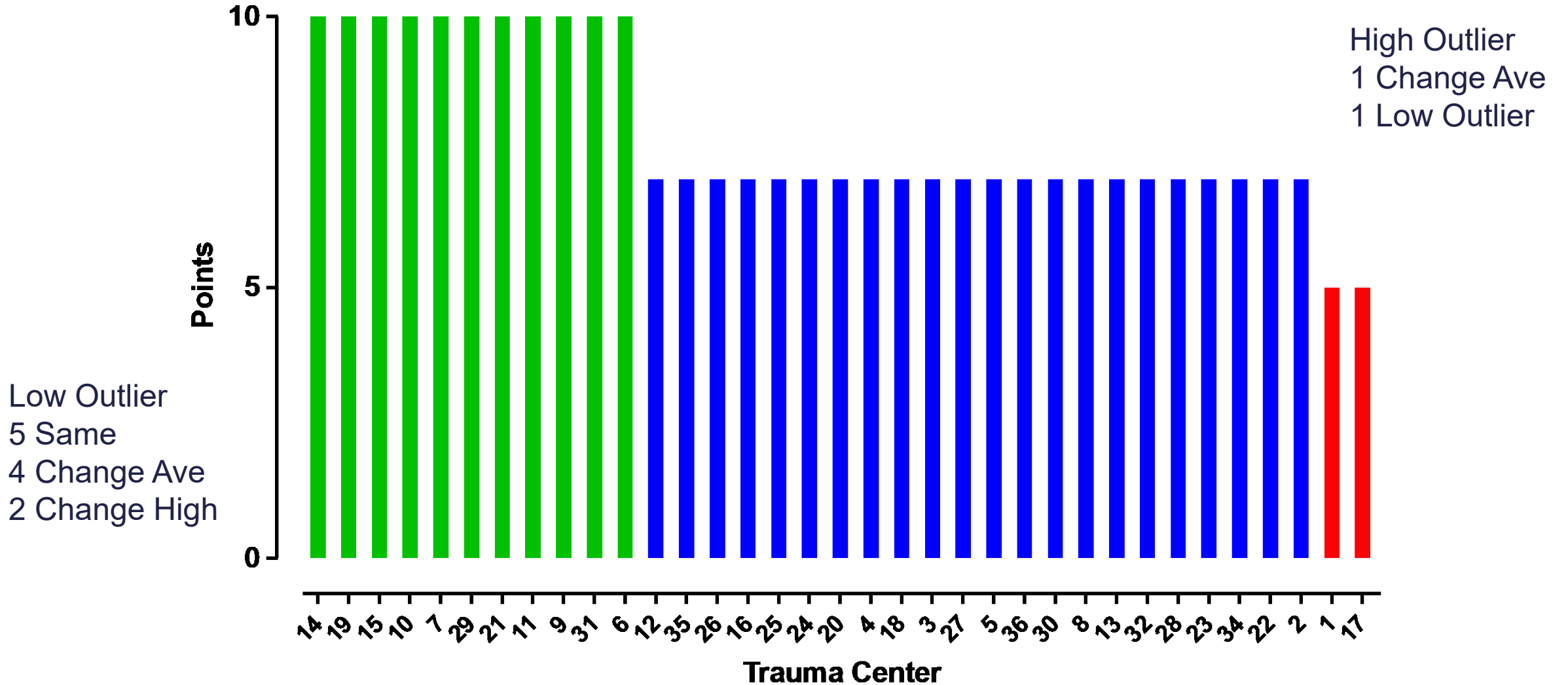


#7 Serious Complication Rate (Z-score)

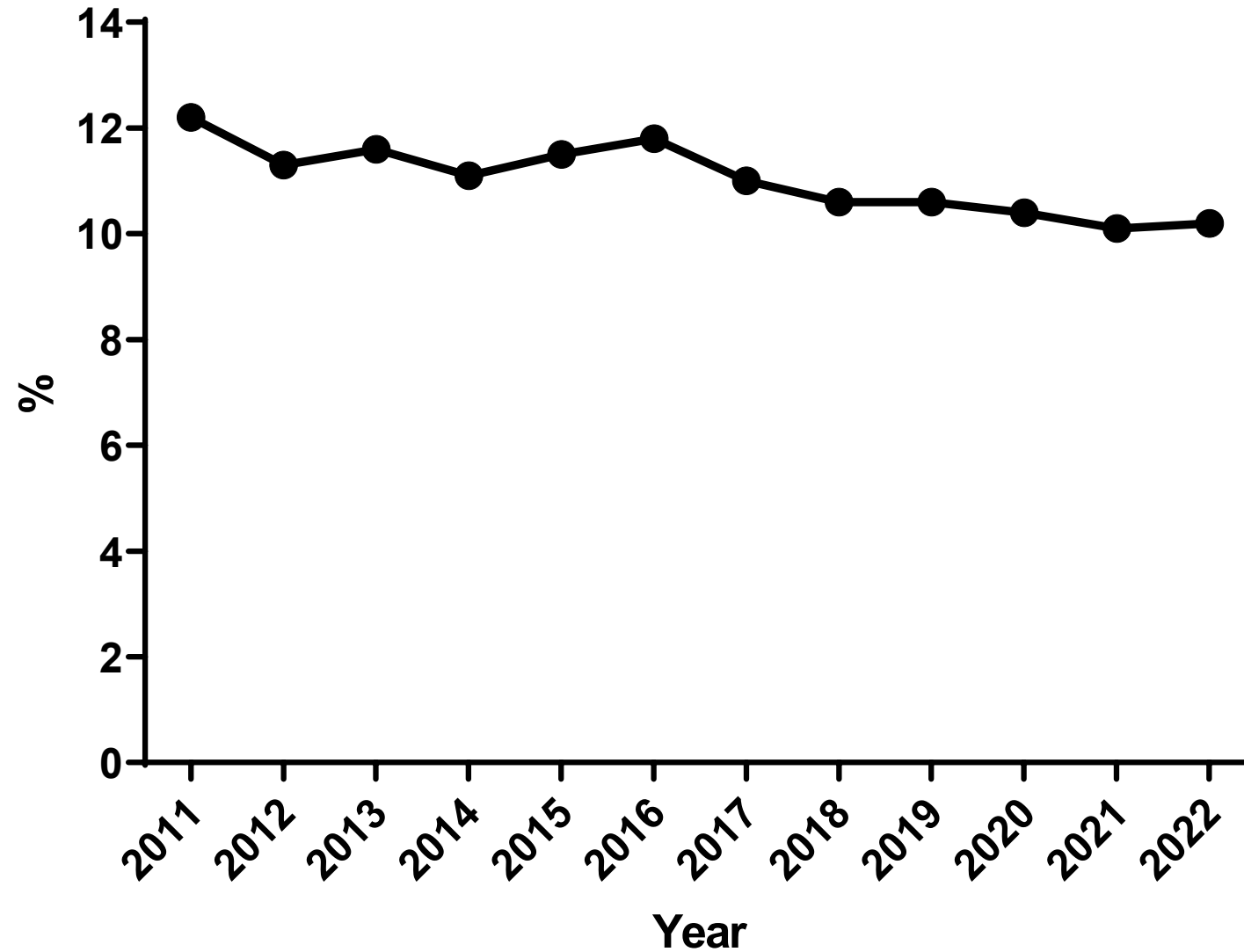
Metric #7 - Z Score - Serious Complication Rate
Cohort 2 - Admit to Trauma
7/1/18 - 6/30/21



Complication Rate: Z-score



Collaborative Outcome Overview - Serious Cx Cohort 2 - Admit to Trauma

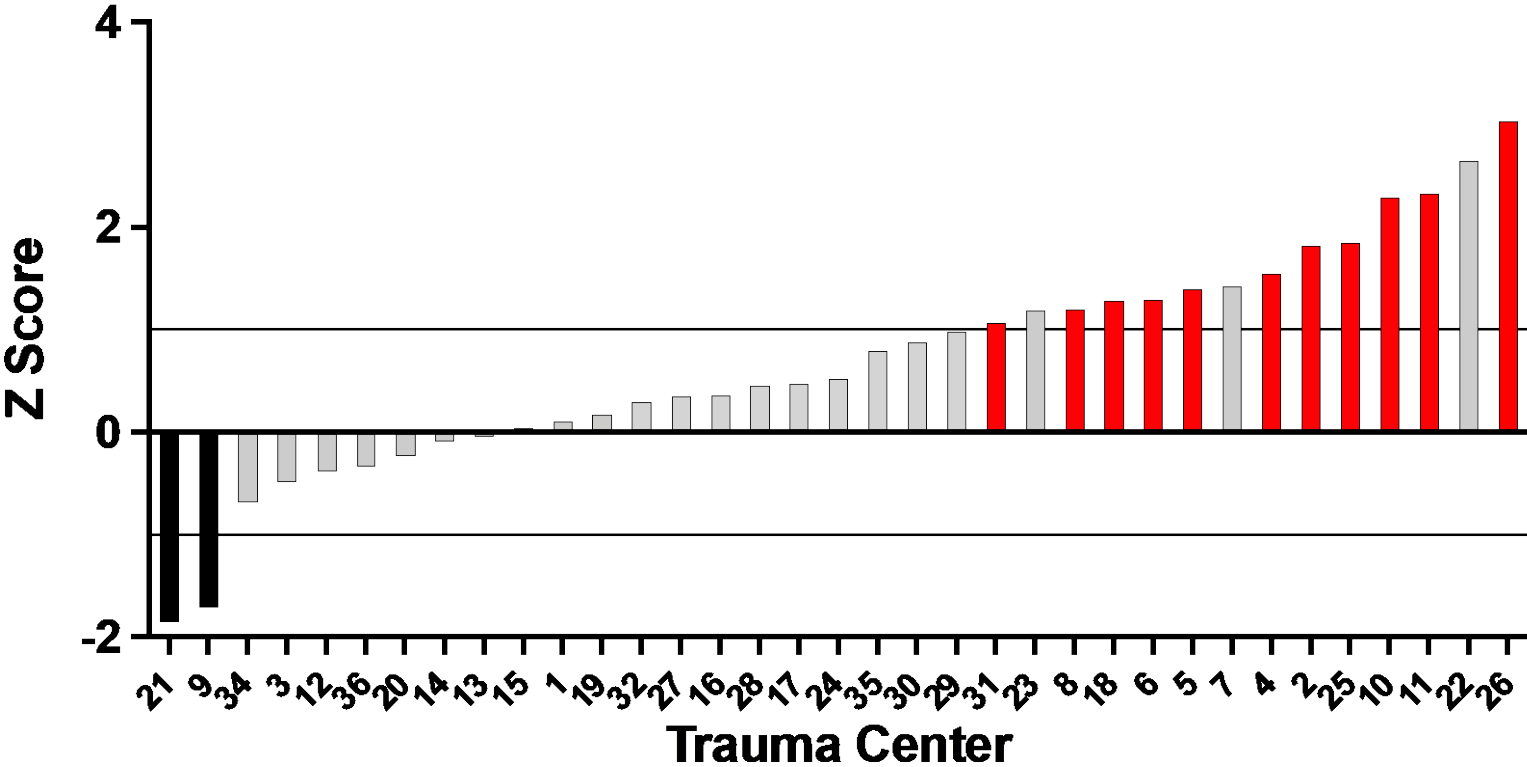


#8 Mortality

- ◆ Mortality Rate-Trauma Service Admits (3 years: 7/1/19-6/30/22)

#8 Mortality Rate (Z-score)

Metric 8 - Z Score - Mortality Rate
Cohort 2 - Admit to Trauma
7/1/19 - 6/30/22

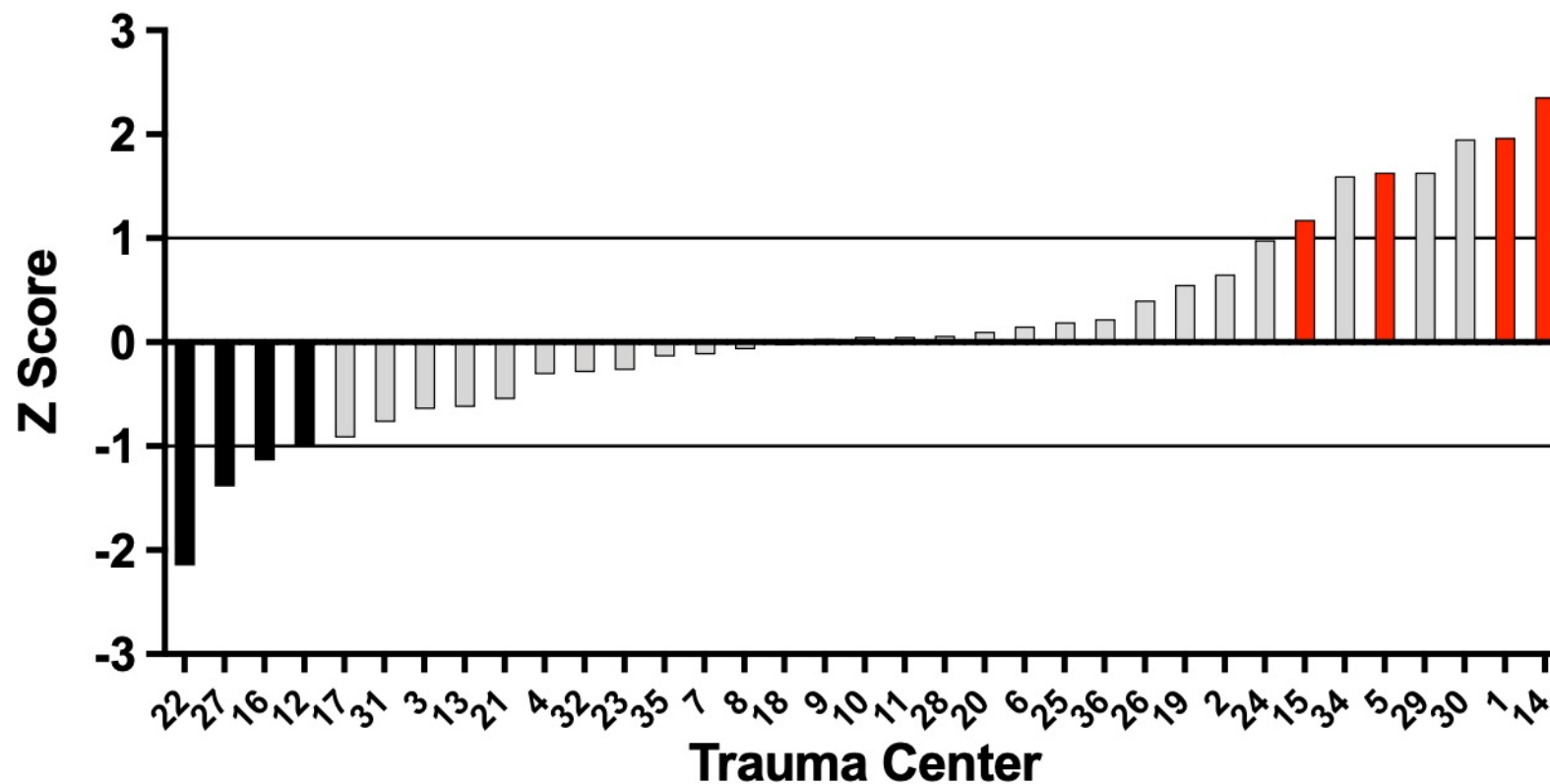


#8 Mortality Rate (Z-score)

Metric #8 - Z Score - Mortality Rate

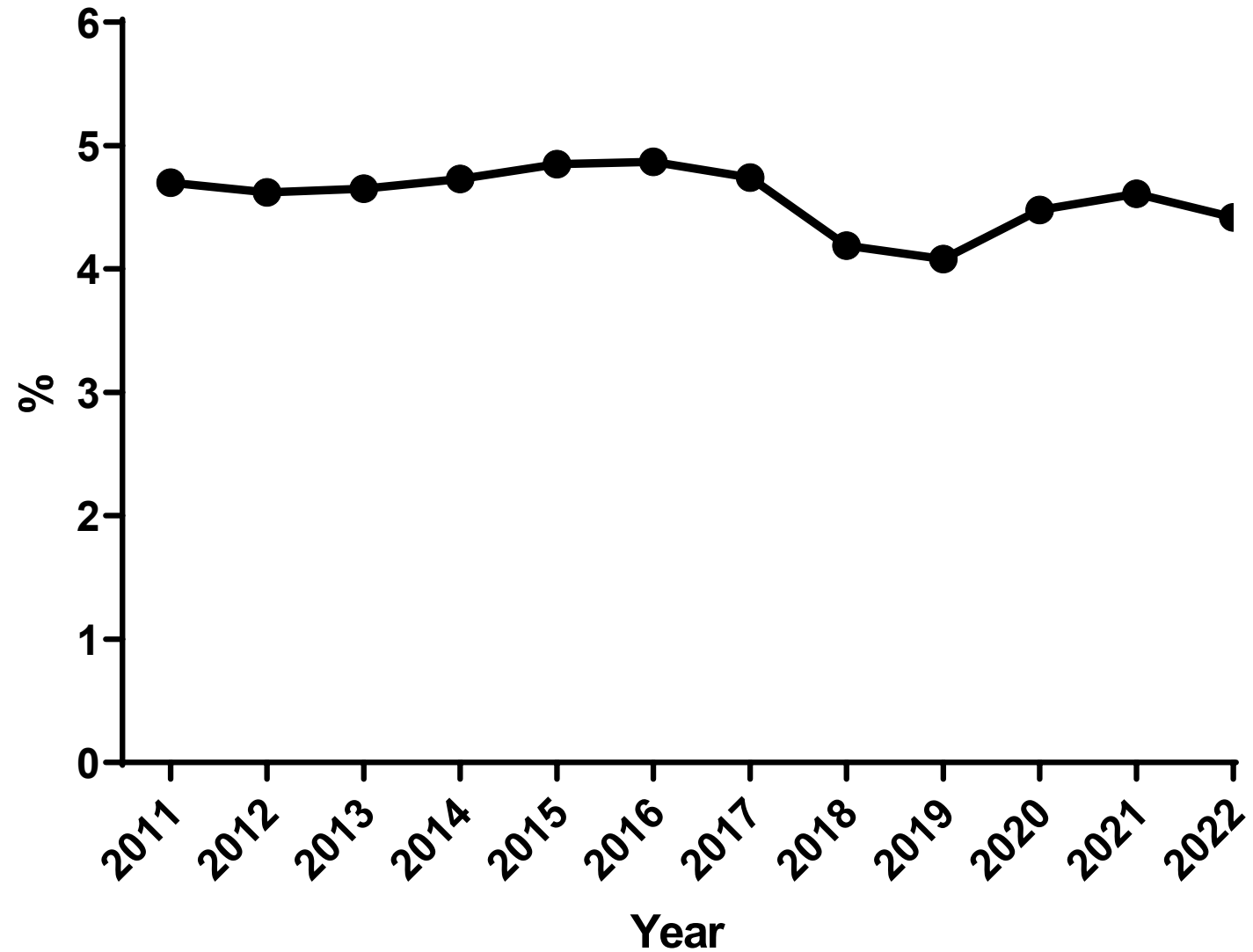
Cohort 2 - Admit to Trauma

7/1/18 - 6/30/21

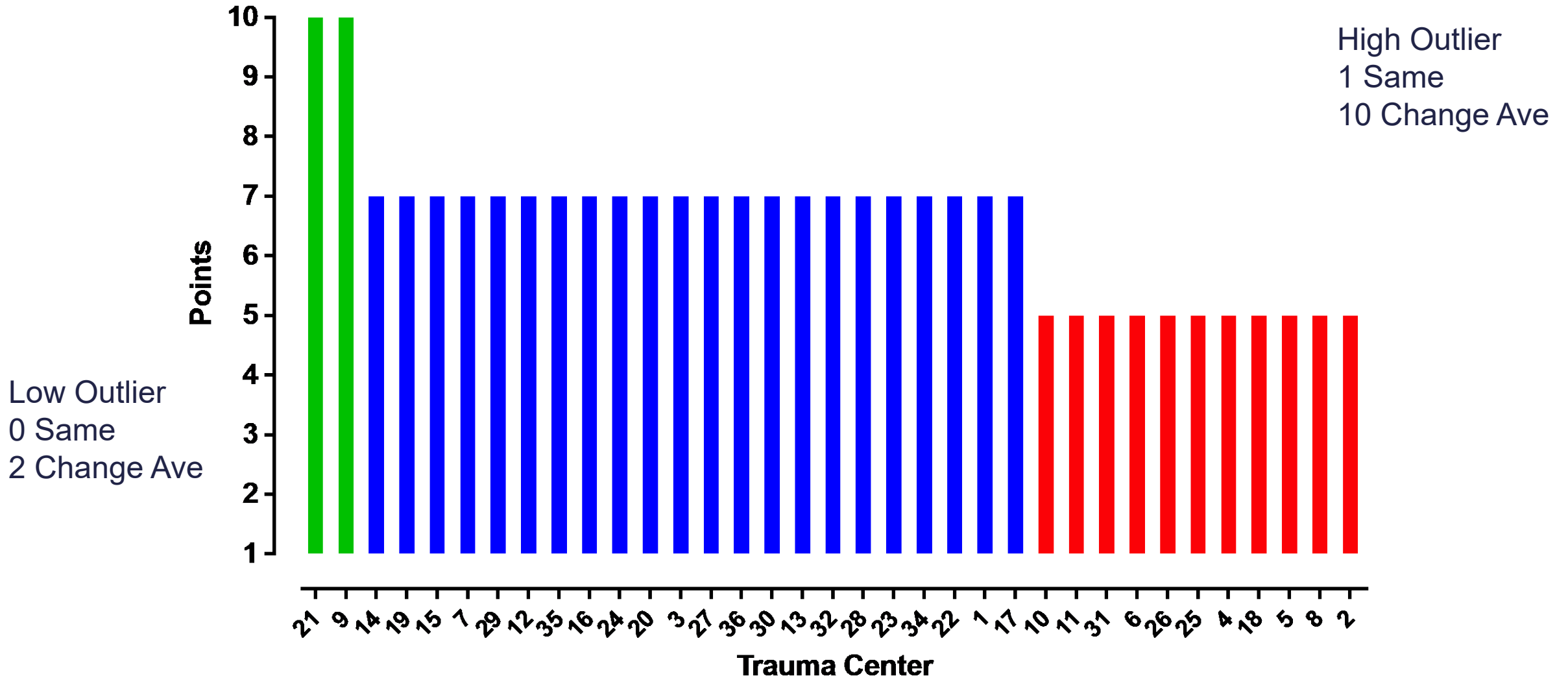


Collaborative Outcome Overview - Mortality

Cohort 2 - Admit to Trauma



Mortality Rate: Z-Score



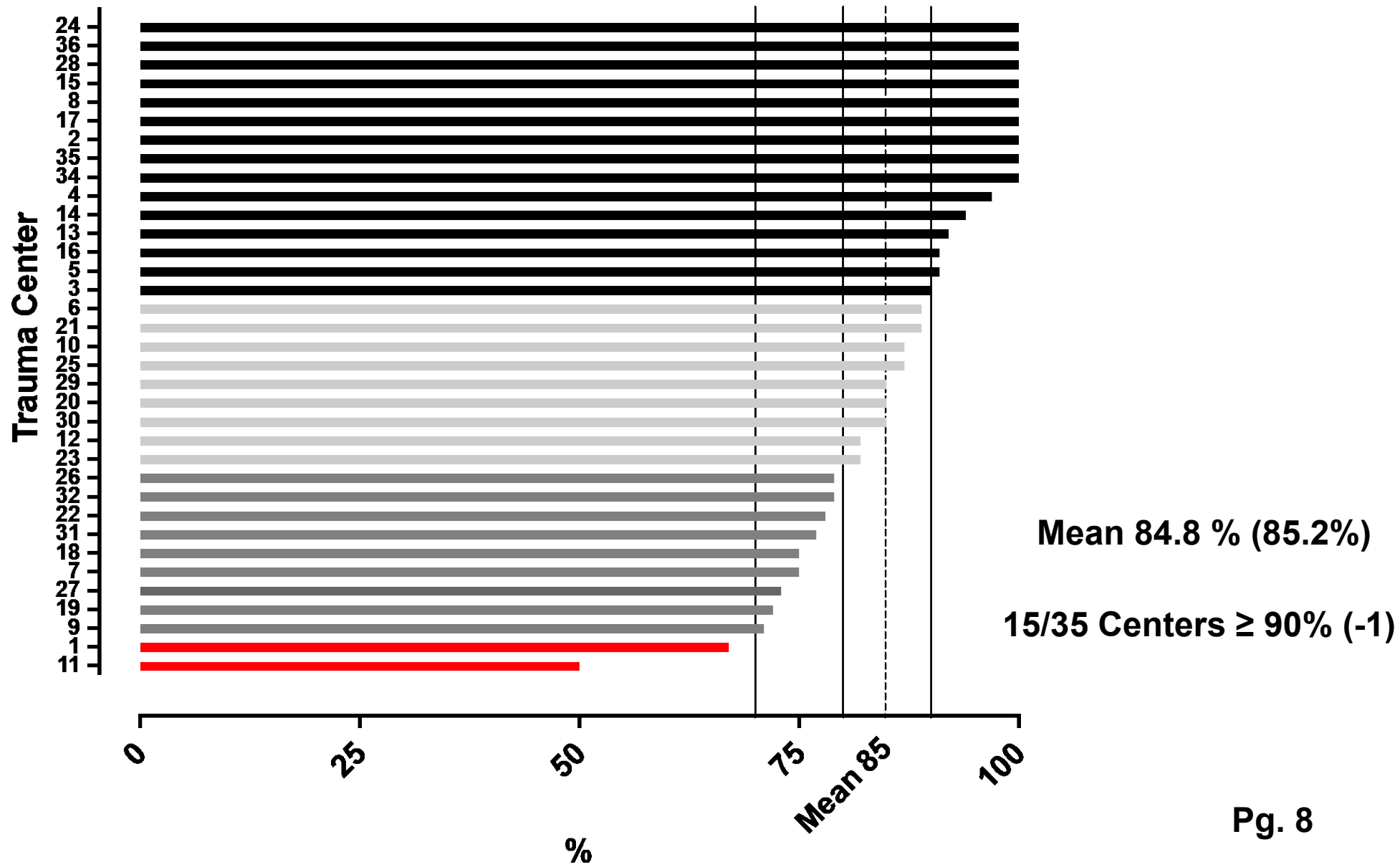
#9 Timely Head CT in TBI Patients on Anticoagulation Pre-Injury

- ◆ Head CT date and time from procedures
- ◆ Presence of prehospital anticoagulation
- ◆ TBI (AIS Head, excluding NFS, scalp, neck, hypoxia)
- ◆ Cohort1, Blunt mechanism
- ◆ Exclude direct admissions and transfer in
- ◆ No Signs of Life = Exclude DOAs
- ◆ Transfers Out = Include Transfers Out
- ◆ Time Period = 7/1/21 to 6/30/22

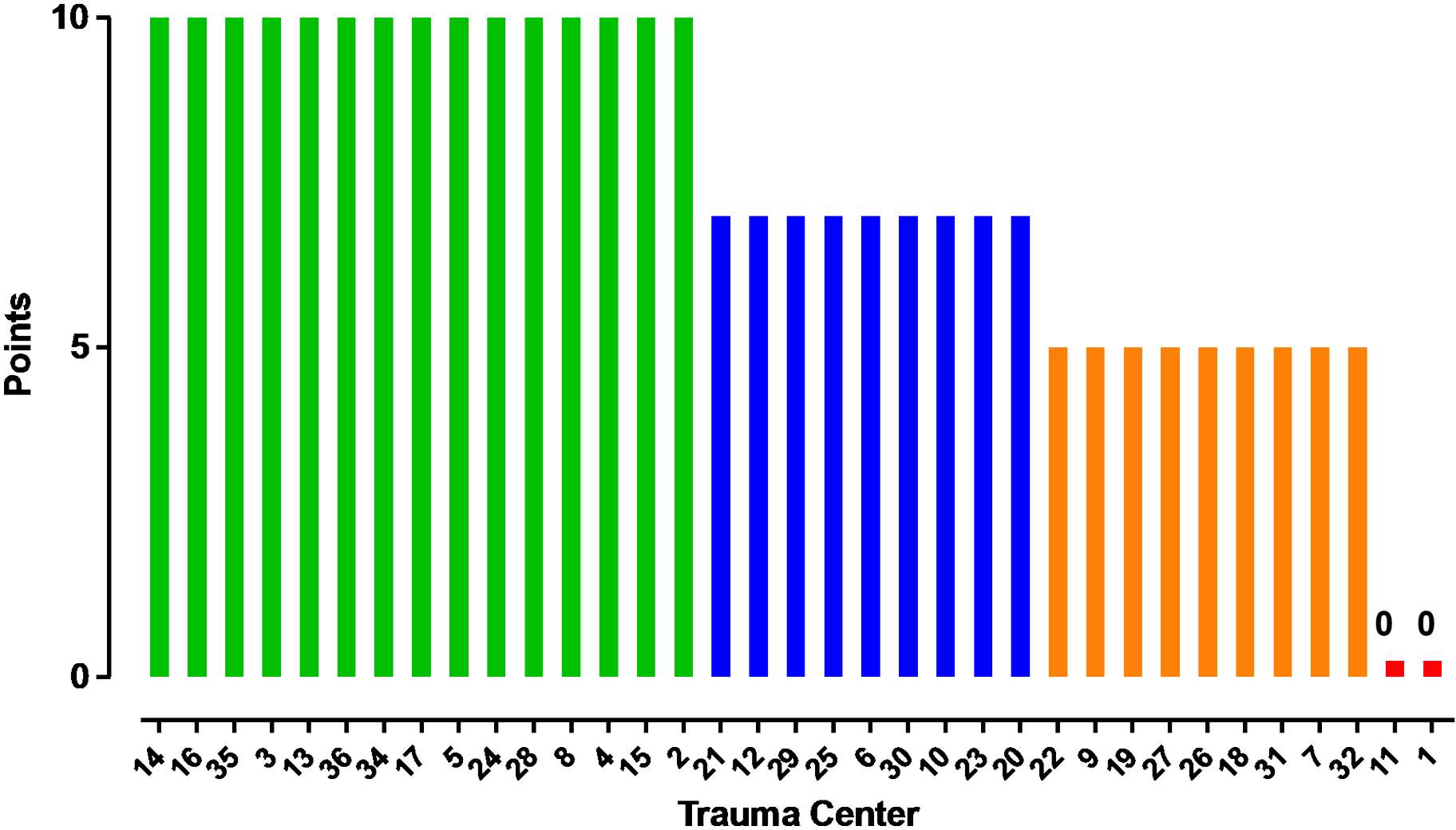
#9 Head CT

- ◆ Measure = % of patients with Head CT, date, and time
- ◆ Timing
 - $\geq 90\%$ patients (≤ 120 min)
 - $\geq 80\%$ patients (≤ 120 min)
 - $\geq 70\%$ patients (≤ 120 min)
 - $< 70\%$ patients (≤ 120 min)

Metric 9 - ED Head CT \leq 120 min
Cohort 1 - MTQIP All on Anticoagulant (Excluding ASA)
7/1/21 - 6/30/22



Head CT Time with Anticoagulant



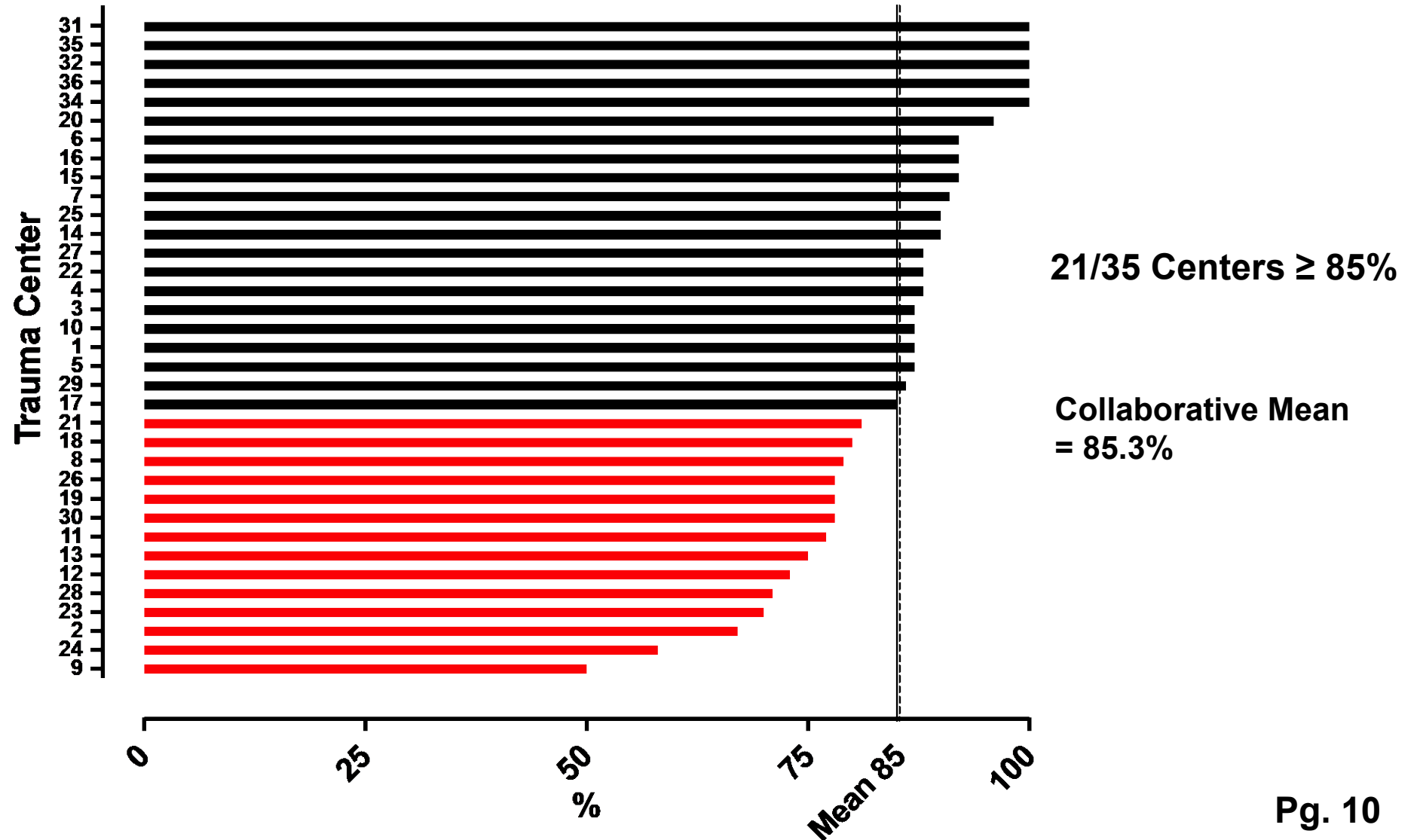
#10 Timely Antibiotic in Femur/Tibia Open Fractures - Collaborative Wide Measure

- ◆ Type of antibiotic administered along with date and time for open fracture of femur or tibia
- ◆ Presence of acute open femur or tibia fracture based on AIS or ICD10 codes (See list)
- ◆ Cohort = Cohort 1 (All)
- ◆ Exclude direct admissions and transfer in
- ◆ No Signs of Life = Exclude DOAs
- ◆ Transfers Out = Include Transfers Out
- ◆ Time Period = 7/1/21 to 6/30/22

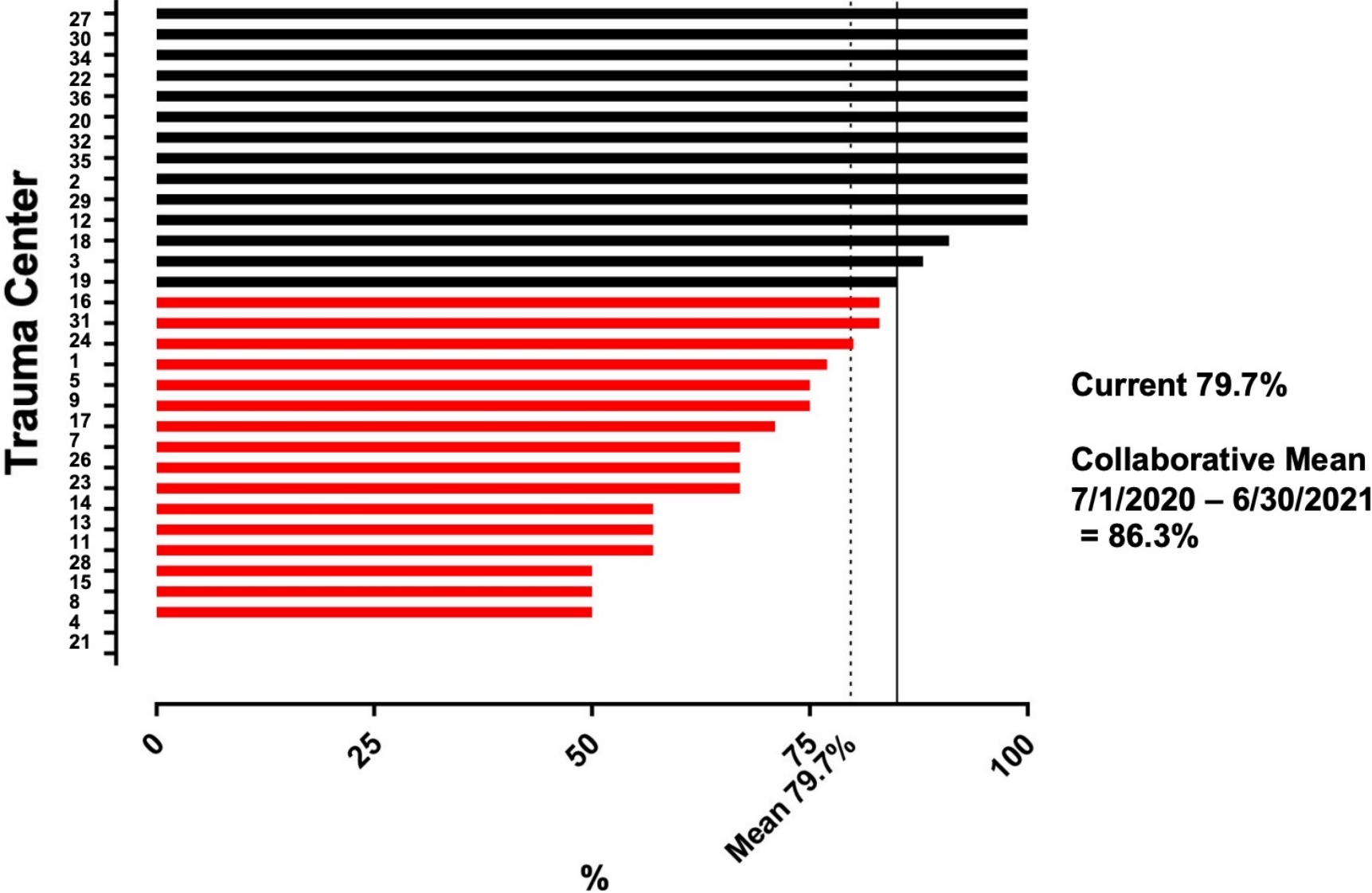
#10 Open Fracture Antibiotic Usage

- ◆ Measure = % of patients with antibiotic type, date, time recorded ≤ 120 minutes
 - $\geq 85\%$ patients (≤ 90 min) > 10 points
 - All or nothing
- ◆ ACS-COT Orange Book – VRC resources
 - Administration within 60 minutes
 - ◆ ACS OTA Ortho Update
 - ◆ ACS TQIP Best Practices Orthopedics

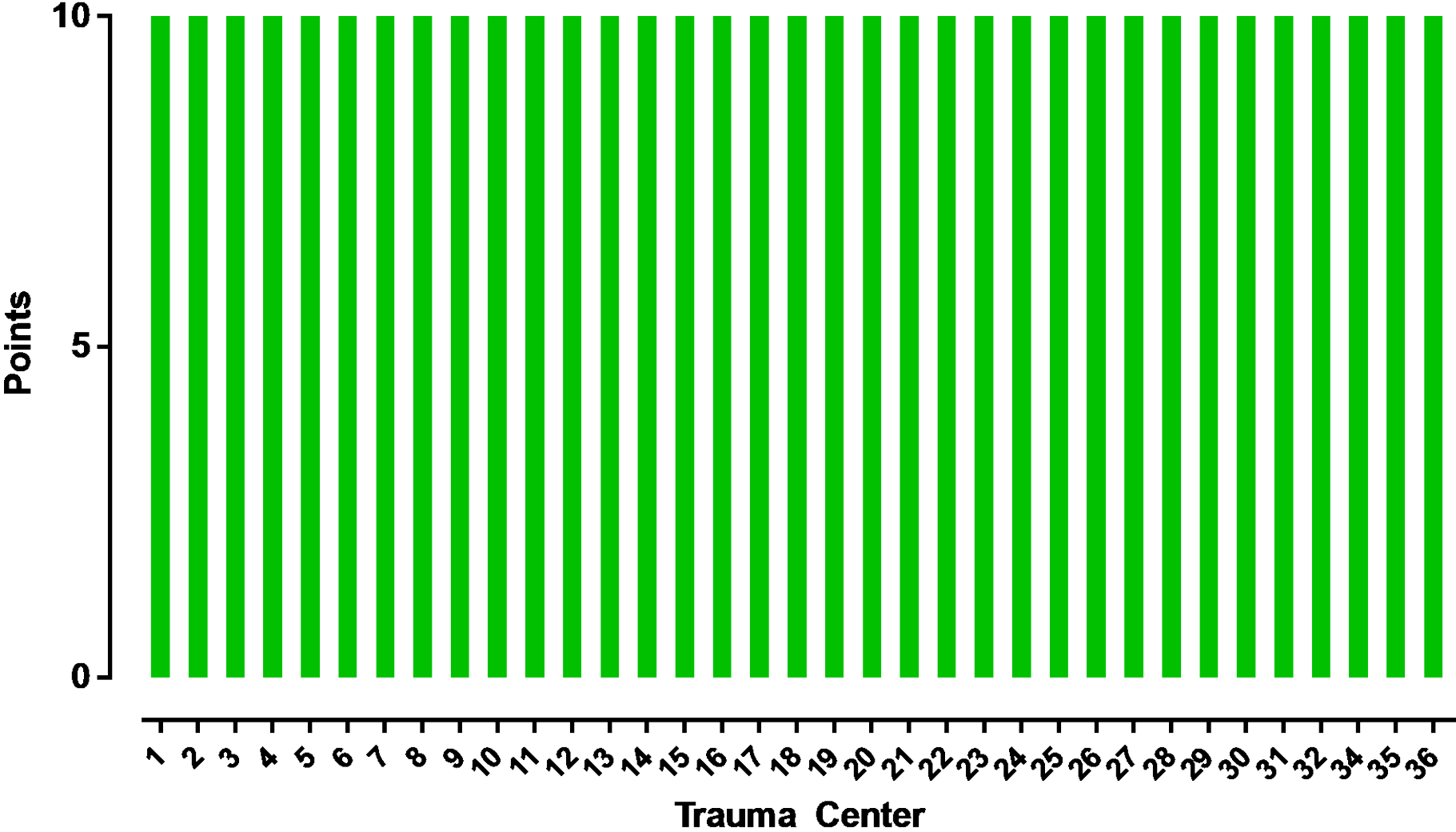
Metric 10 - Open Fracture - Time to Abx \leq 90 min
Cohort 1 - MTQIP All
7/1/21 - 6/30/22



Open Fracture - Time to Abx ≤ 90 min
Cohort 1 - MTQIP All
7/1/21 - 12/31/21



Open Fracture Antibiotic



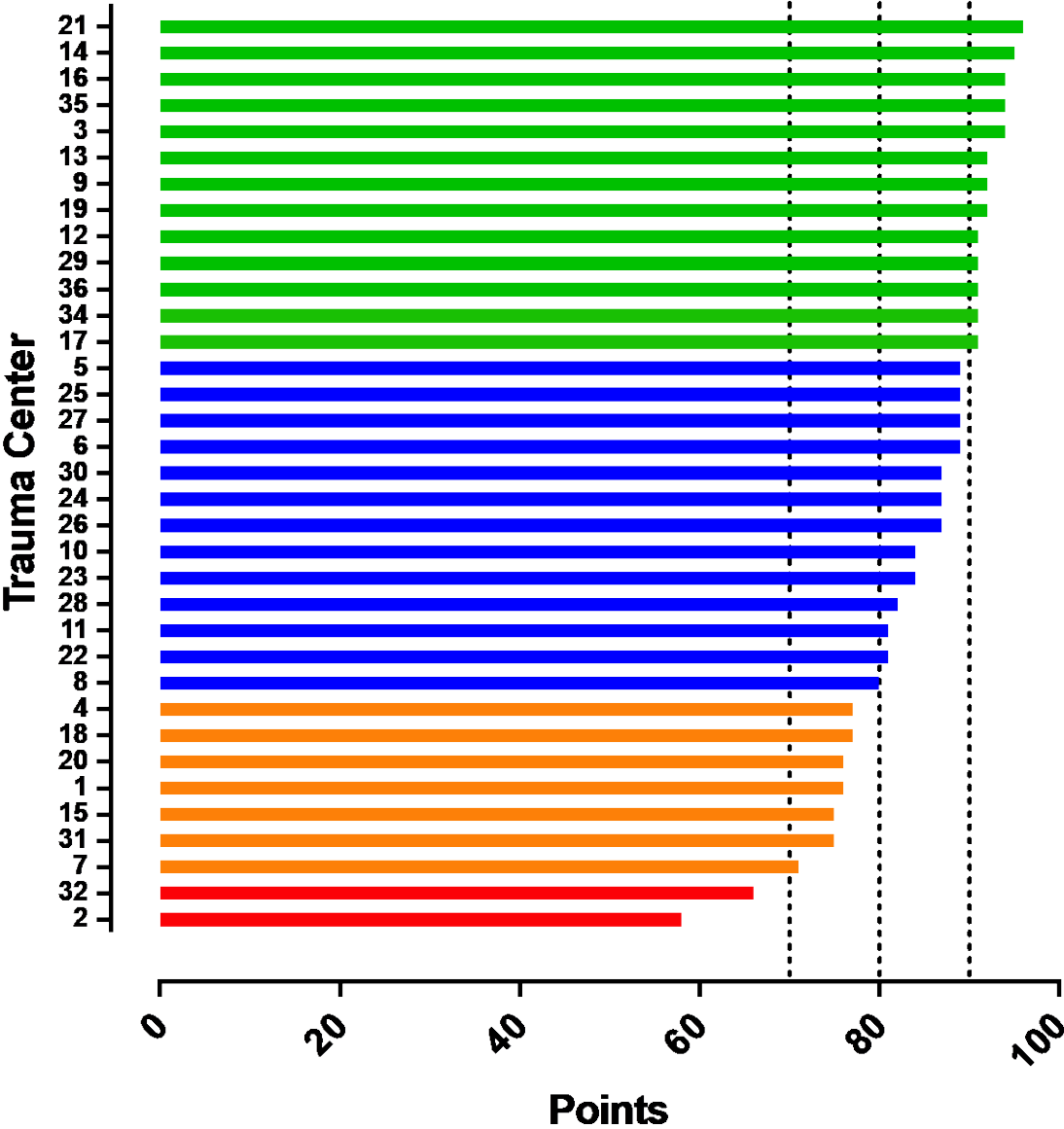
We did it.

Great Job

#10 Open Fracture Antibiotic Usage 2023

- ◆ Check your list of patients
 - February Submission
 - Jill will send out separately
- ◆ Every patient counts

2022 CQI Total Score



2022

84.6%

96 – 57.6%

2021

86.0%

100 – 69%

2014	86%
2015	86%
2016	92%
2017	85%
2018	86%
2019	89%
2020	88%
2021	86%
2022	85%

MTQIP Hospital CQI Index Changes for 2023

#4	5	PI Death Determination Documentation (12 mo: 7/1/22-6/30/23)	
		0-2 Deceased patients missing documentation	5
		3-4 Deceased patients Missing documentation	3
		> 4 Deceased patients Missing documentation	0
#10	5	Timely Head CT in TBI Patients on Anticoagulation Pre-Injury (12 mo: 7/1/22-6/30/23)	
		≥ 90% patients (≤ 120 min)	5
		≥ 80% patients (≤ 120 min)	4
		≥ 70% patients (≤ 120 min)	3
		< 70% patients (≤ 120 min)	0

MTQIP Hospital CQI Index Changes for 2024

Pending > Judy to discuss

Questions



VBR (2022 scoring for 2023 payout)

- ◆ Timely LMWH VTE Prophylaxis ($\geq 50\%$ of patients within 48 hours)
- ◆ Timely operative repair in geriatric hip fractures ($\geq 90\%$ of patients within 48 hours)
- ◆ Timely antibiotic in femur/tibia open fractures ($\geq 85\%$ of patients within 90 min)
 - Collaborative
- ◆ Scoring
 - 2 of 3 Measures = 103%
 - 3 of 3 Measures = 105%

VBR 105% (All 3)

- Center ID
- 3
 - 5
 - 6
 - 7
 - 9
 - 12
 - 13
 - 15
 - 16
 - 17
 - 19
 - 21
 - 22
 - 25
 - 26
 - 27
 - 28
 - 29
 - 30
 - 31
 - 32
 - 34
 - 36

VBR 103% (2 of 3)

Center ID

1

2

8

10

11

14

18

23

24

VBR (2023 scoring for 2024 payout)

- ◆ Timely LMWH VTE Prophylaxis ($\geq 52.5\%$ of patients within 48 hours)
- ◆ Timely operative repair in geriatric hip fractures ($\geq 92\%$ of patients within 48 hours)
- ◆ Timely antibiotic in femur/tibia open fractures ($\geq 85\%$ of patients within 90 min)
 - Collaborative
- ◆ Scoring
 - 2 of 3 Measures = 103%
 - 3 of 3 Measures = 105%

**PI Death Determination
Opioid
PROM**



PI Death Determination

- ◆ Started 7/1/2022
- ◆ Scoring
 - 0-2 Missing= 5 points
 - 3-4 Missing= 3 points
 - >4 Missing= 0 points

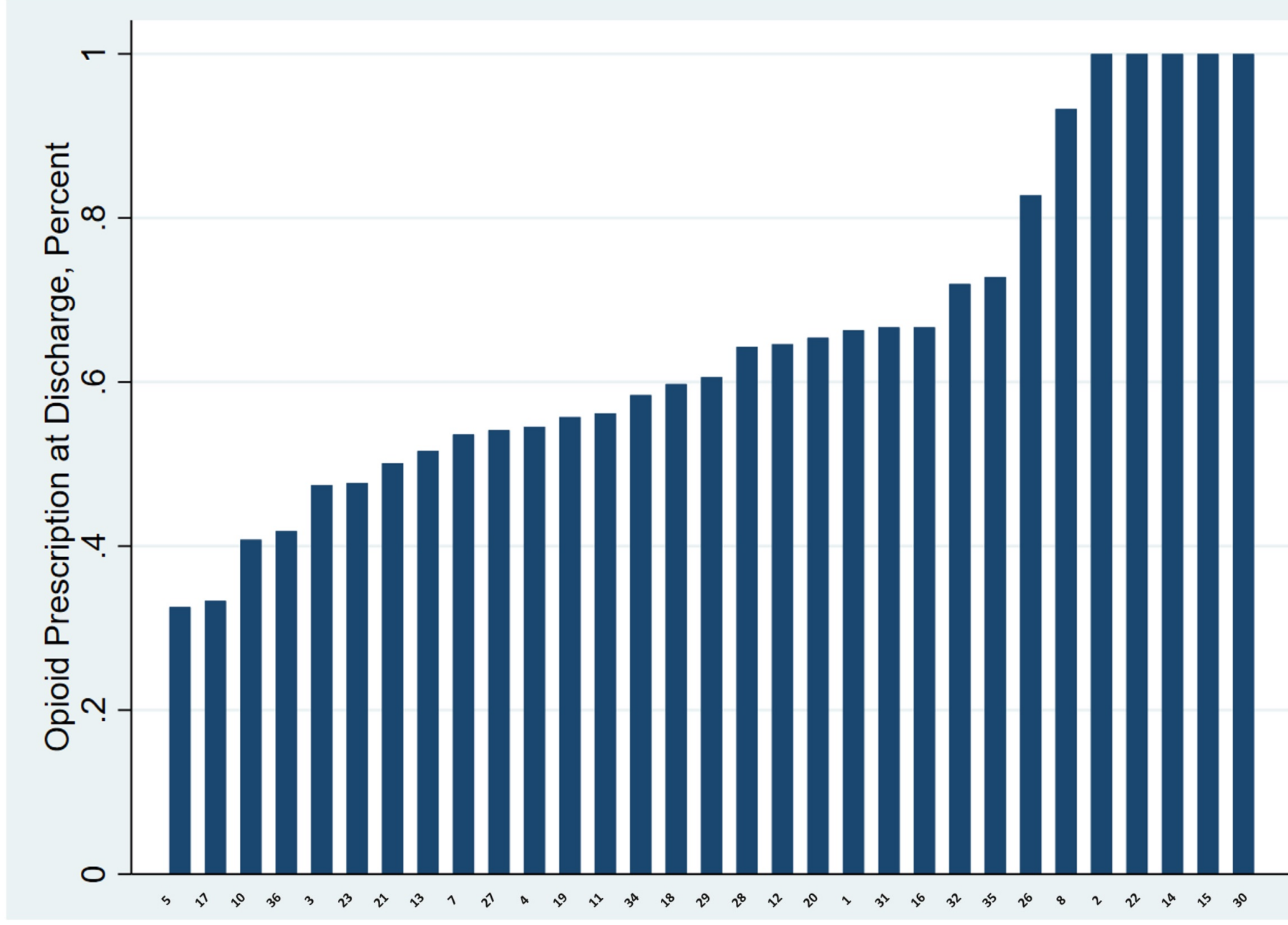
```
. tab preventable dead, mi
```

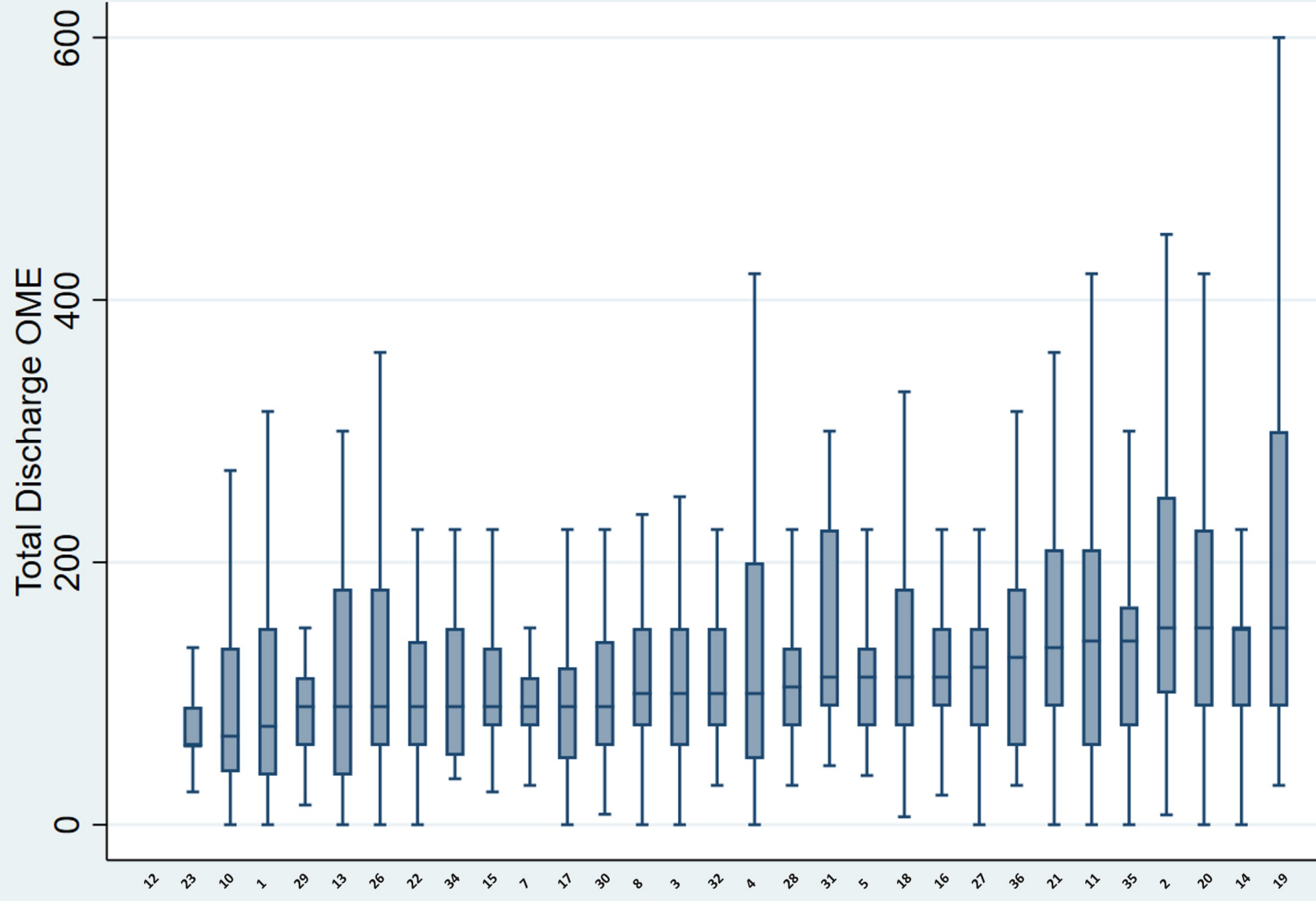
preventable	dead	Total
	1	
Unanticipated mortality	4	4
Mortality with opportunity	17	17
Mortality without opportunity	42	42
Not done	5	5
.	136	136
Total	204	204

traumactr	patients	missing
14	10	10
8	2	2
4	2	2
22	2	2
30	8	5
3	12	12
5	1	0
1	3	3
11	5	3
18	17	6
2	3	1
13	16	16
36	3	3
32	4	0
35	1	0
26	3	3
20	13	4
28	2	2
34	2	2
16	1	0
15	26	26
19	15	15
21	15	1
10	18	18
7	3	3
29	7	0
17	4	0
27	6	2
		141

Opioid Prescribing

- ◆ Started 7/1/2022
- ◆ Some data capture issues
 - None
 - Recording of Tylenol rather than opioid mg amount
 - Extreme values





MOpen Ex. Lap

Max 10 pills of
Oxycodone 5 mg

75 OME

traumactr	N	mean	min	max	p50	p25	p75
31	25	174.1	45	900	112.5	90	225
8	85	127.3412	0	750	100	75	150
3	85	110.4412	0	337.5	100	60	150
9	50	113.9367	37.5	495	112.5	75	135
5	126	149.7738	0	3360	75	37.5	150
1	0
12	97	143.9175	0	630	140	60	210
11	62	83.99194	25	480	60	60	90
23	191	157.7408	6	1020	112.5	75	180
18	40	121.75	0	900	67.5	40	135
10	91	87.66484	15	300	90	60	112.5
29	125	100.924	0	600	90	37.5	180
13	27	221.7593	7.5	675	150	100	250
2	84	124.881	0	315	140	75	166.25
35	119	136.5105	0	600	90	60	180
26	113	113.6962	30	225	100	75	150
32	73	123.5616	22.5	300	112.5	90	150
24	306	177.9984	0	2250	150	90	225
16	22	223.4659	30	2400	127.5	60	180
20	96	104.8177	0	400	90	60	140
36	148	148.3784	0	1980	150	90	150
22	57	110.3947	35	300	90	52.5	150
14	78	109.9359	25	630	90	75	135
34	263	145.884	0	450	135	90	210
6	138	107.6087	0	600	90	75	112.5
15	41	116.2805	0	1260	90	50	120
21	229	228.8581	30	990	150	90	300
7	235	120.1745	8	1800	90	60	140
17	157	146.9554	0	1050	120	75	150
25	33	139.0909	30	450	105	75	135
19	237	217.4499	0	9225	100	50	200
30							
27							
28							
4							
Total	3433	146.3988	0	9225	105	75	157.5

Opioid Prescribing

- ◆ N and % of patients > 75%
 - ◆ Hospital LOS
 - ◆ Operation
 - ◆ Discharge disposition
 - ◆ Injuries
-
- ◆ Questions ? Suggestions

Patient Reported Outcome Measures

- ♦ 256 unique patients
- ♦ 319 surveys (>75% complete)

Number of Surveys	Freq.	Percent	Cum.
first	256	80.25	80.25
second	49	15.36	95.61
third	9	2.82	98.43
fourth	4	1.25	99.69
fifth	1	0.31	100.00
Total	319	100.00	

elapse_cat	Freq.	Percent	Cum.
<2 mon	57	17.87	17.87
2-4 mo	92	28.84	46.71
5-7 mo	104	32.60	79.31
8-12 mo	51	15.99	95.30
13-24 mo	15	4.70	100.00
Total	319	100.00	

Trauma Center	Freq.	Percent
29	29	9.09
32	18	5.64
16	14	4.39
7	44	13.79
25	16	5.02
19	7	2.19
27	191	59.87
Total	319	100.00

11 Hospitals signed up

Patient Reported Outcome Measures

Age

traumactr	N	mean	min	max	p25	p50	p75
29	22	64.47768	24.4	98.215	56.827	64.9295	72.575
32	16	58.09181	20.512	92.843	43.4835	55.469	79.136
16	9	65.98833	39.871	74.7	66.472	71.357	73.432
7	36	64.90372	21.021	96.025	56.3285	68.475	74.6555
25	15	62.78553	30.218	98.973	51.608	65.886	75.379
19	7	62.71429	19	78	55	69	76
27	151	56.91391	18	93	39	61	73
Total	256	59.58277	18	98.973	45.6925	63.4415	74

race	Freq.	Percent	Cum.
A	4	1.56	1.56
B	10	3.91	5.47
I	1	0.39	5.86
O	4	1.56	7.42
W	237	92.58	100.00
Total	256	100.00	

Trauma Center	Sex		Total
	F	M	
29	15	7	22
	68.18	31.82	100.00
32	6	10	16
	37.50	62.50	100.00
16	8	1	9
	88.89	11.11	100.00
7	16	20	36
	44.44	55.56	100.00
25	9	6	15
	60.00	40.00	100.00
19	1	6	7
	14.29	85.71	100.00
27	68	83	151
	45.03	54.97	100.00
Total	123	133	256
	48.05	51.95	100.00

Patient Reported Outcome Measures

ISS							
traumactr	N	mean	min	max	p25	p50	p75
29	22	10.18182	5	21	9	9	10
32	16	12.375	9	25	9	11	14
16	9	13.11111	9	29	9	9	13
7	36	13.30556	5	43	9	10	14
25	15	9.666667	5	16	9	10	10
19	7	11.42857	5	20	5	10	17
27	151	11.97351	5	50	5	10	14
Total	256	11.92188	5	50	9	10	14

activation_ n	Freq.	Percent	Cum.
1	20	7.81	7.81
2	63	24.61	32.42
3	77	30.08	62.50
4	96	37.50	100.00
Total	256	100.00	

Patient Reported Outcome Measures

EQ1 response (mobility)	Freq.	Percent	Cum.
no problems walking	124	38.87	38.87
slight problems walking	80	25.08	63.95
moderate problems walking	76	23.82	87.77
severe problems walking	26	8.15	95.92
unable to walk	13	4.08	100.00
Total	319	100.00	

EQ2 response (self-care)	Freq.	Percent	Cum.
no problems washing or dressing myself	190	59.56	59.56
slight problems washing or dressing mys	63	19.75	79.31
moderate problems washing or dressing m	47	14.73	94.04
severe problems washing or dressing mys	14	4.39	98.43
unable to wash or dress myself	5	1.57	100.00
Total	319	100.00	

EQ3 response (usual activities)	Freq.	Percent	Cum.
no problems doing my usual activities	85	26.65	26.65
slight problems doing my usual activiti	92	28.84	55.49
moderate problems doing my usual activi	89	27.90	83.39
severe problems doing my usual activiti	39	12.23	95.61
unable to do my usual activities	14	4.39	100.00
Total	319	100.00	

Patient Reported Outcome Measures

EQ4 response (pain/discomfort)	Freq.	Percent	Cum.
no pain or discomfort	82	25.71	25.71
slight pain or discomfort	117	36.68	62.38
moderate pain or discomfort	99	31.03	93.42
severe pain or discomfort	17	5.33	98.75
extreme pain or discomfort	4	1.25	100.00
Total	319	100.00	

EQ5 response (anxiety/depression)	Freq.	Percent	Cum.
not anxious or depressed	180	56.43	56.43
slightly anxious or depressed	68	21.32	77.74
moderately anxious or depressed	48	15.05	92.79
severely anxious or depressed	15	4.70	97.49
extremely anxious or depressed	8	2.51	100.00
Total	319	100.00	

Patient Reported Outcome Measures

EQ3 response (usual activities)	elapse_cat					Total
	<2 mon	2-4 mo	5-7 mo	8-12 mo	13-24 mo	
no problems doing my	7 12.28	31 33.70	27 25.96	17 33.33	3 20.00	85 26.65
slight problems doing	8 14.04	21 22.83	40 38.46	15 29.41	8 53.33	92 28.84
moderate problems doi	17 29.82	30 32.61	27 25.96	13 25.49	2 13.33	89 27.90
severe problems doing	17 29.82	10 10.87	5 4.81	6 11.76	1 6.67	39 12.23
unable to do my usual	8 14.04	0 0.00	5 4.81	0 0.00	1 6.67	14 4.39
Total	57 100.00	92 100.00	104 100.00	51 100.00	15 100.00	319 100.00

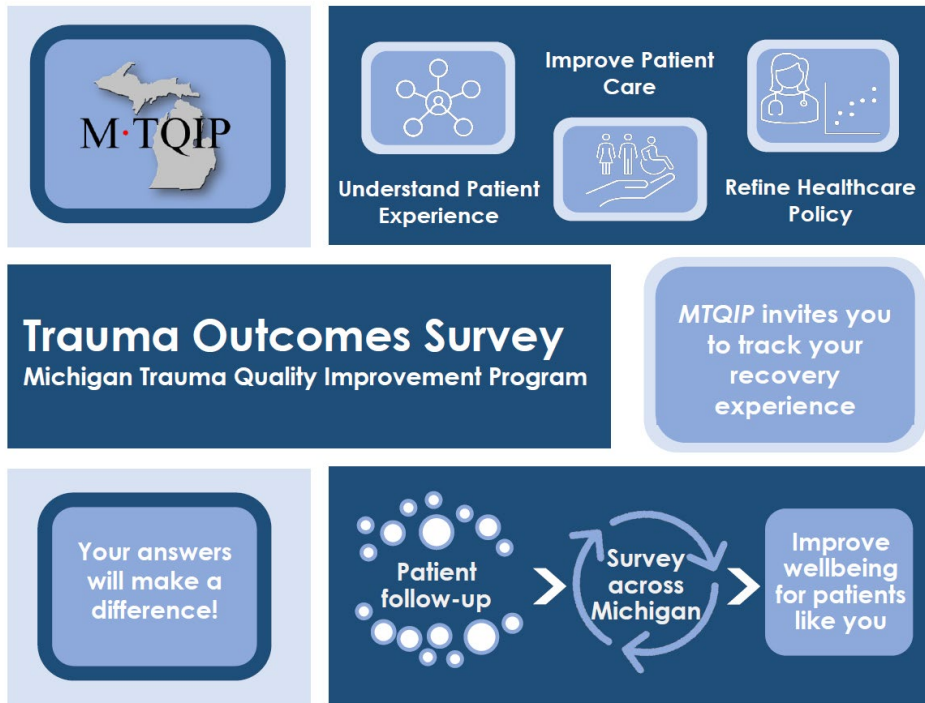
Patient Reported Outcome Measures

How were you invited to survey?	Freq.	Percent	Cum.
text message	49	15.41	15.41
email	137	43.08	58.49
qr code	1	0.31	58.81
phone call	131	41.19	100.00
Total	318	100.00	

Did a caregiver complete the survey?	Freq.	Percent	Cum.
no	203	91.44	91.44
yes	19	8.56	100.00
Total	222	100.00	

Patient Reported Outcome Measures

- ◆ On boarding kits for Trauma Center
- ◆ Primer cards
- ◆ Website mtqipoutcome.org



Scan the QR code below to register for your first survey



Participants will be entered into a raffle

Tell Us About Your Recovery Experience!

Next Steps:

- Select how you wish to be contacted by scanning the QR code or visiting bit.ly/mtqiprecovery
- A member of the MTQIP team will reach out to you over the next year to learn about your recovery
- The survey will take no more than 10 minutes to complete

M·TQIP

Questions?
Contact us at
(734) 763-1928

Visit us at
mtqipoutcome.org
to learn more

M·TQIP Patient-Reported Outcomes

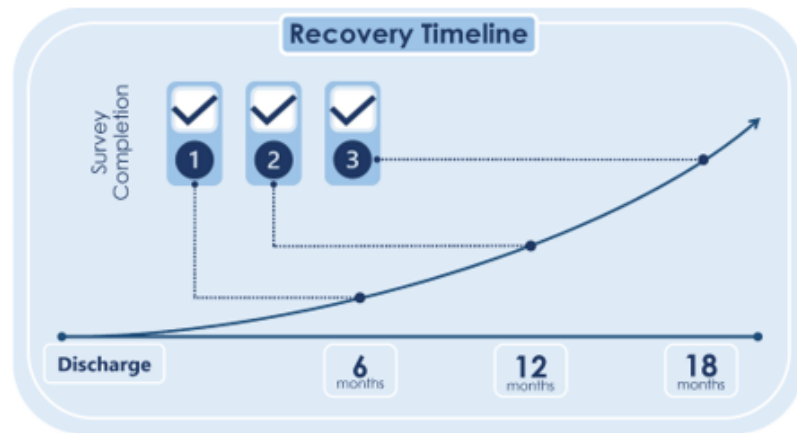
Healing isn't complete when the patient leaves the hospital, which is why MTQIP offers patient-reported outcomes (PROs). PROs measure a patient's recovery experience after leaving the hospital to help healthcare providers improve the quality of care.

About the Project: A team member will reach out to patients at 6, 12, and 18 months after discharge and conduct a short survey. The survey takes approximately 10 minutes to complete and addresses the following topics:

- Hospital experience
- Quality of life measures
- Pain management and medication usage
- Economic burden of traumatic injuries
- Impact on caregivers (family and friends)

Eligible patients will be contacted by the MTQIP Coordinating Center and can provide feedback on their healing process via phone, text, or email at regular intervals. Patients can self-enroll for the survey and select their preferred contact method at bit.ly/mtqiprecovery.

We have included a copy of the survey with these welcome materials.



Role of Participating Centers: We have found that informing trauma patients about this survey at discharge or clinic increases participation. Therefore, we encourage care teams to discuss this survey with patients. This package includes flyers to include in a patient's discharge packet. The flyers have a QR code that links to a survey registration page; patients can fill this out and select their preferred method of contact. If they do not fill this form out, members from the MTQIP coordinating center will reach out based on the information provided from your center's MTQIP data submission.

FAQ:

- How are patients selected to participate?
 - We utilize existing MTQIP data submissions from the trauma registry to select patients to contact.
- How is the data used?
 - Patient-provided data will be shared with the patient's hospital and surgeon; aggregate data will be shared with MTQIP participating hospitals to understand and improve care delivery across the state. Any data that could reveal private patient information will not be given to third parties and kept secure.
- How is patient information kept secure?
 - Just like healthcare records, patient information will be kept private and secure in compliance with HIPPA regulations. Access will be limited and password protected. Personal information will only be accessed by members of the MTQIP team at UM Health.
- Do participating hospitals get information back from the survey?
 - Yes; data is returned to respective trauma centers at specific intervals over the year.
- Do participating hospitals need to let patients know about the survey at discharge?
 - We have found that priming the patients to the idea of this survey encourages participation. If interested, we can provide physical handouts to include in discharge packets and/or signs to post in the clinic.

For more information, visit our website at mtqipoutcome.org

Contact PROs Team:

- For any concerns, please schedule a meeting with Janessa Monahan - monahaj@med.umich.edu
- Project email: surgery-quality-mtqip@med.umich.edu
- Project phone: (734) 763-1928

Future Scorecard Metrics Planning

Judy Mikhail, PhD MBA RN



MTQIP *Perpetua*/Metrics Planning

- **Continuously** plan ahead for new metrics

Annually:

- **By May**: Propose new metrics - May meeting
- **By June**: Submit metrics to BCBSM for approval
- **By July**: Data collection begins

MTQIP Metrics History

[illegible]

Performance Index Changes

2023	2024	2025
Death Determination Documentation		

Michigan Trauma Quality Improvement Program (MTQIP) 2023 Performance Index January 1 to December 31, 2023				
Measure	Weight	Measure Description	Points	
#1	10	Data Submission On-time and complete 3 of 3 times On-time and complete 2 of 3 times On-time and complete 1 of 3 times	10 5 0	PARTICIPATION (30%)
#2	10	Meeting Participation Surgeon and TPM or MCR participate in 3 of 3 Collaborative meetings Surgeon and TPM or MCR participate in 2 of 3 Collaborative meetings Surgeon and TPM or MCR participate in 0-1 of 3 Collaborative meetings Registrar or MCR participate in the annual June Data Abstractor meeting	0-10 9 6 0 1	
#3	10	Data Validation Error Rate 0.0-3.0% 3.1-4.0% 4.1-5.0% > 5.0%	10 8 5 0	
#4	5	PI Death Determination Documentation (12 mo: 7/1/22-6/30/23) 0-2 <u>Deceased</u> patients missing documentation 3-4 <u>Deceased</u> patients Missing documentation > 4 <u>Deceased</u> patients Missing documentation	5 3 0	
#5	10	Timely LMWH VTE Prophylaxis in Trauma Admits (18 mo: 1/1/22-6/30/23) ≥ 52.5 % of patients (≤ 48 hr) ≥ 50.0 % of patients (≤ 48 hr) ≥ 45.0 % of patients (≤ 48 hr) < 45.0 % of patients (≤ 48 hr)	10 8 5 0	PERFORMANCE (70%)
#6	10	Timely Surgical Repair in Geriatric (Age ≥ 65) Isolated Hip Frs (12 mo: 7/1/22-6/30/23) ≥ 92.0 % of patients (≤ 48 hr) ≥ 87.0 % of patients (≤ 48 hr) ≥ 85.0 % of patients (≤ 48 hr) < 85.0 % of patients (≤ 48 hr)	10 8 5 0	
#7	10	RBC to Plasma Ratio in Massive Transfusion (18 mo: 1/1/22-6/30/23) Weighted Mean Points in Patients Transfused ≥ 5 Units 1st 4 hr	0-10	
#8	10	Serious Complication Z-Score Trend in Trauma Admits (3 yr: 7/1/20-6/30/23) < -1 (major improvement) -1 to 1 or serious complications low outlier (average or better rate) > 1 (rates of serious complications increased)	10 7 5	
#9	10	Mortality Z-Score Trend in Trauma Admits (3 yr: 7/1/20-6/30/23) < -1 (major improvement) -1 to 1 or mortality low outlier (average or better) > 1 (rates of mortality increased)	10 7 5	
#10	5	Timely Head CT in TBI Patients on Anticoagulation Pre-Injury (12 mo: 7/1/22-6/30/23) ≥ 90% patients (≤ 120 min) ≥ 80% patients (≤ 120 min) ≥ 70% patients (≤ 120 min) < 70% patients (≤ 120 min)	5 4 3 0	
#11	10	Timely Antibiotic in Femur/Tibia Open Fractures - COLLABORATIVE WIDE MEASURE (12 mo: 7/1/22-6/30/23) ≥ 85% patients (≤ 90 min) < 85% patients (≤ 90 min)	10 0	
Total (Max Points) =			100	

Add 5 points

Reduced by 5 points

2024 Performance Index Proposed Change

Change VTE prophylaxis to weight-based protocol?

Yes 45/57 (79%)

No 12/58 (21%)

Would you like MTQIP to suggest a weight based VTE protocol for use?

Yes 45/57 (79%)

No 12/57 (21%)

Results from June 2022 Membership Survey

Weight-Based VTE Prophylaxis

3 Guideline Options

(emailed 1/6/23)

- Western Trauma Association
- AAST/COT Guideline
- Geert's Sunnybrook Guideline

Options:

- Use your existing wt based LMWH protocol
- Develop your own wt based LMWH protocol
- Use a suggested wt based LMWH protocol

MTQIP Adult Trauma Weight-Based VTE Prophylaxis Three Guideline Options

Western Trauma Association (WTA) Guideline

Ley et al., 2020 J Trauma Acute Care Surgery 89(5):971-981 [find the abstract here](#)

Renal Failure	Special Cases	Most Trauma	Obese
CrCl < 30 mL/min ↓	Age > 65 yr or CrCl ≥ 30-60 mL/min or Low Wt < 60 kg or TBI or SCI or Pregnant ↓	Age 18-65 yr CrCl > 60 mL/min Wt ≥ 60 kg No TBI, SCI ↓	Obese Wt > 100 kg ↓
Heparin 5000 u q8 hr	Enoxaparin 30 mg BID	Enoxaparin 40 mg BID	Enoxaparin 50 mg BID
Consider adjusting by Anti-Xa Levels Consider the addition of aspirin			

AAST/COT Guideline

Yorkeitis et al., 2022 J Trauma Acute Care Surgery 92(3):597-604 [find the abstract here](#)

Renal Failure	Special Cases	Most Trauma	Obese
CrCl < 30 mL/min ↓	Age > 65 yr or CrCl < 60 mL/min or Low Wt < 50 kg or TBI or SCI or Solid Organ Injury or Pregnant ↓	Age 18-65 yr CrCl ≥ 60 mg/dL Wt ≥ 50 kg; BMI < 30 No TBI, SCI ↓	BMI > 30 ↓
BMI ≤ 30 ↓	BMI > 30 ↓		
Heparin 5000 u q8 hr	Heparin 7500 u q8 hr	Enoxaparin 30 mg BID	Enoxaparin 40 mg BID
Enoxaparin 0.5 mg/kg BID			
Consider adjusting by Anti-Xa Levels			

Geert's Sunnybrook Guideline 2022

ACS VTE 2022 Consensus Conference, [find Geert's slides here](#)

Renal Failure or Low Wt	Special Cases	Most Trauma
CrCl < 30 mL/min or Wt < 40 kg ↓	High Risk Trauma: SCI or Major lower extremity fractures ↓	Usual Risk Trauma ↓
Enoxaparin 30 mg daily	Wt 40-100 kg ↓ Enoxaparin 40 mg daily → 40 mg BID	Wt 40-100 kg ↓ Enoxaparin 40 mg daily
	Wt 101-125 kg ↓ Enoxaparin 40 mg BID → 60 mg BID	Wt 101-125 kg ↓ Enoxaparin 40 mg BID
		Wt > 125 kg ↓ Enoxaparin 0.5 mg/kg BID

2024 Metric Change

#5A	8	Timely LMWH VTE Prophylaxis in Trauma Admits (18 mo: 1/1/23-6/30/24)	
		≥ 52.5 % of patients (≤ 48 hr)	8
		≥ 50.0 % of patients (≤ 48 hr)	6
		≥ 45.0 % of patients (≤ 48 hr)	3
		< 45.0 % of patients (≤ 48 hr)	0
#5B	2	Weight Based LMWH Protocol in Use (12mo: 7/1/23-6/30/24)	
		Yes	2
		No	0

#5b: Weight-Based LWMH Protocol in Use

How to Demonstrate Use?

- Protocol submitted to MTQIP as of _ date?
- Protocol in use at data validation visit?
- Submit _ # of patient examples using your weight-based protocol?

DISCUSSION

Performance Index Changes

2023	2024	2025
Death Determination Documentation	Wt Based VTE Protocol	

Potential 2025 Metric Change Suggestions

Lower time to surgical repair of geriatric hip fx from 48 hrs to 42 hrs

Yes 32/53 (60%)

No 21/53 (40%)

Results from June 2022
Membership Survey

Which would you prefer?

<=42 hrs 29/46 (63%)

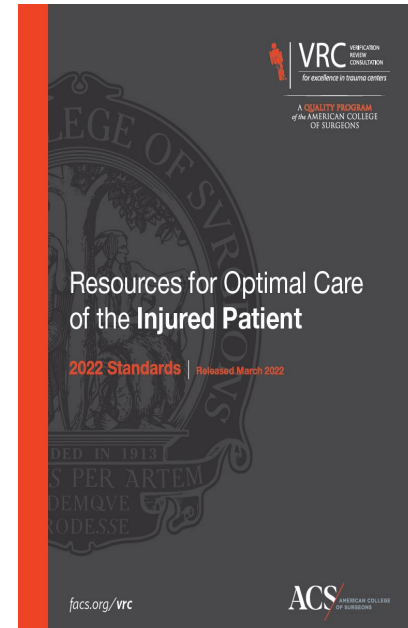
<=36 hrs 17/46 (37%)

Participate in patient-reported outcome measures (PROMs) data collection

5.28 Discharge Planning

- **NEW** Level I & II Centers
- Should use patient-centered strategies:
- Peer-to-peer mentoring
- Trauma survivor program
- Participate ATS Tr Survivors Network
- Continuous case management
 - Wrap around services
 - Navigator positions
 - Trauma center to community linkages

➤ Patient-related outcomes data collection



Performance Index Changes

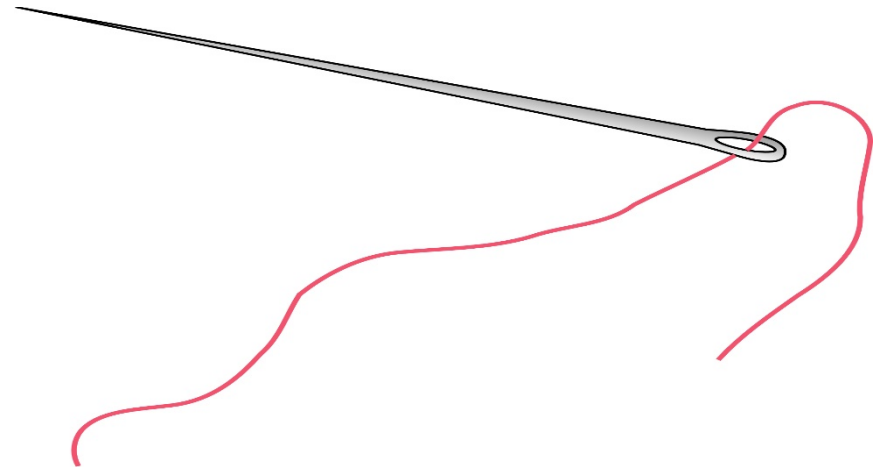
2023	2024	2025 ?
Death Determination Documentation	Wt Based VTE Protocol	Geriatric Hip Fx Repair Lower from 48 hrs to 42 hrs ———— Participate in PROMs data collection

Thinking ahead to 2026 and
beyond

MTQIP Metric Selection Sweet Spot

6 - IOM Safety AIMS

1. **Safe**-Improve outcomes, prevent harm
2. **Effective** - evidence-based (research-driven)
3. **Patient-Centered**
4. **Timely**
5. **Efficient** - appropriateness
6. **Equitable**
 - Feasible with reliable data
 - Applicable to most centers
 - Aligned to ACS verification



MTQIP Metric Selection Inspiration



Guidelines

[Acute Pain Management in Trauma Patients](#)

[Child Abuse, Elder Abuse, and Intimate Partner Violence](#)

[Geriatric Trauma Management](#)

[Imaging Guidelines](#)

[Management of Orthopaedic Trauma](#)

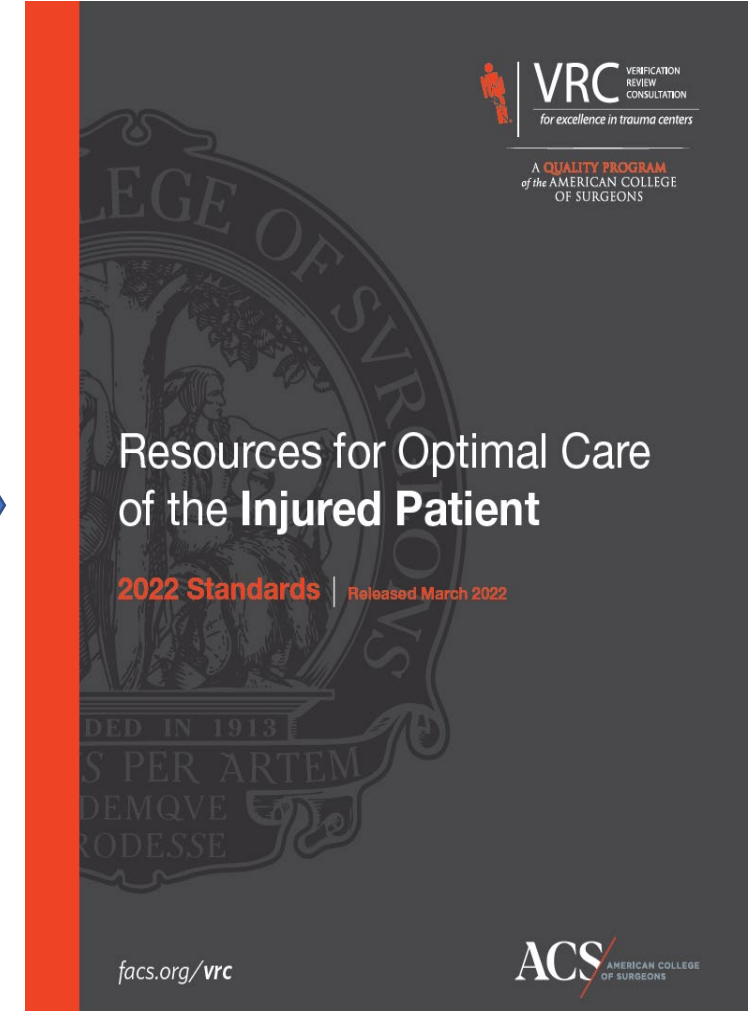
[Management of Traumatic Brain Injury](#)

[Massive Transfusion in Trauma](#)

NEW! [Mental Health and Substance Use Guidelines](#)

[Palliative Care](#)

[Spine Injury](#)



2016

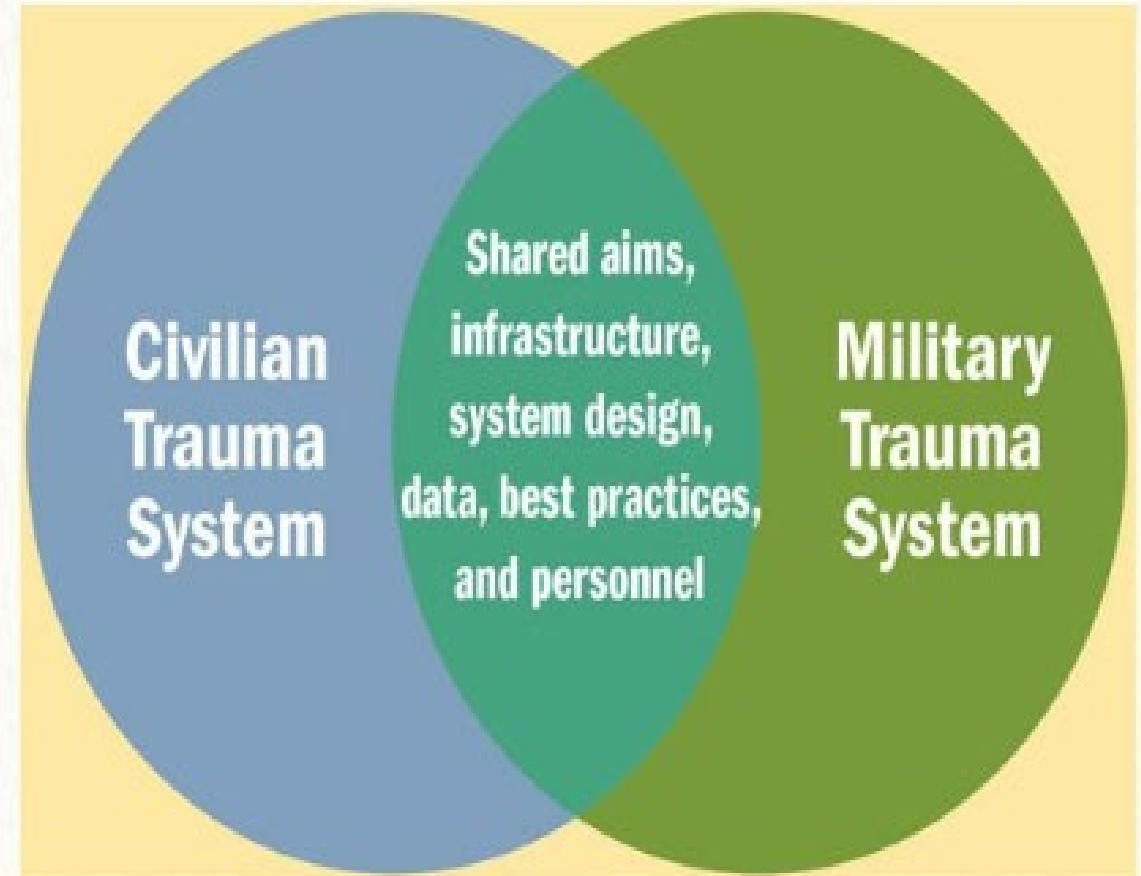
A NATIONAL TRAUMA CARE SYSTEM

Integrating Military and Civilian
Trauma Care Systems to Achieve
Zero Preventable Deaths After Injury

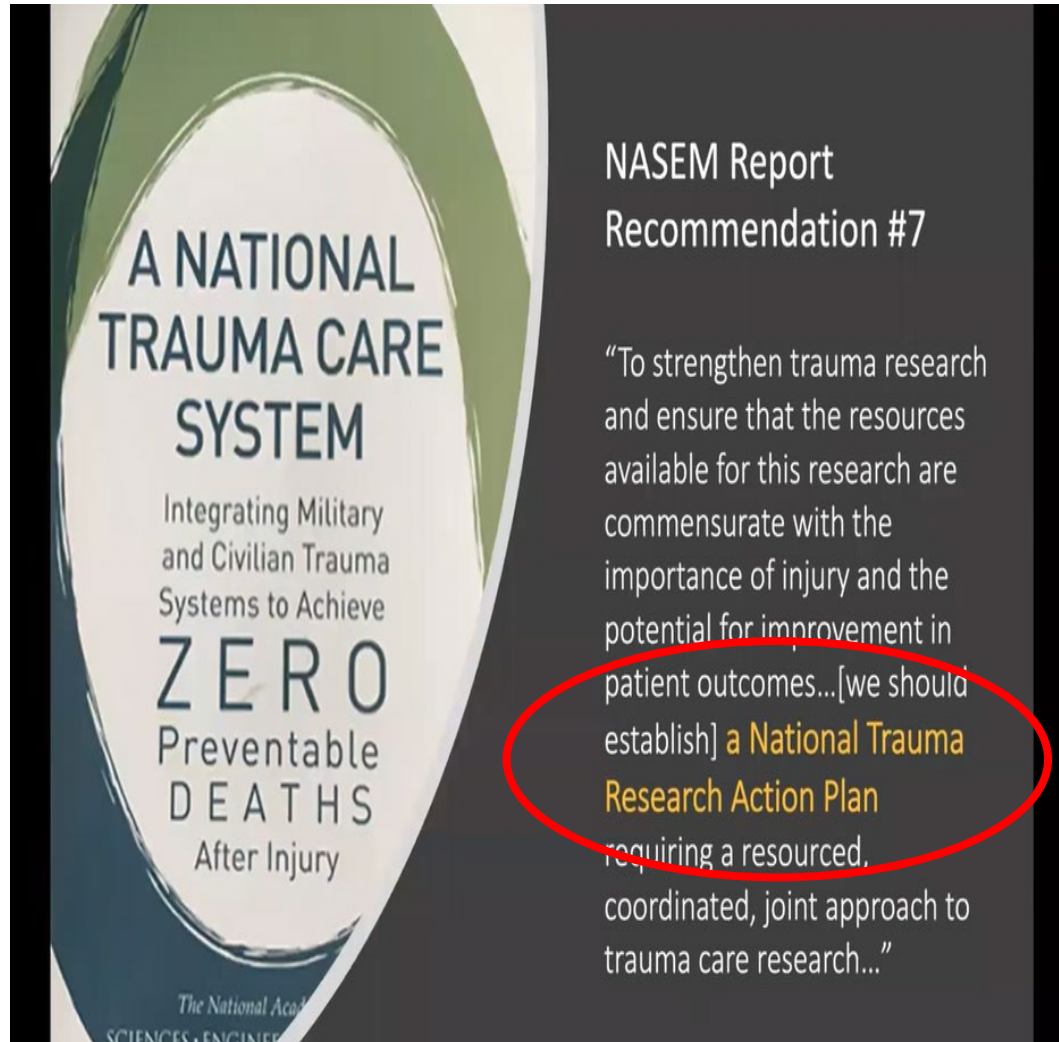
John Holcomb, MD, FACS
David Marcozzi, MD, MHS-CL, FACEP

The National Academies of
SCIENCES • ENGINEERING • MEDICINE




NATIONAL TRAUMA CARE SYSTEM



11 Recommendations



CNTR
COALITION FOR NATIONAL TRAUMA RESEARCH

NTRAP 
NATIONAL TRAUMA RESEARCH
 **ACTION PLAN** 

Funding: US Army Medical Research

11

Delphi Panel Focus Areas

- 1) Burns & Reconstructive Surgery: *Nicole Gibran*
- 2) Prehospital & Mass Casualty Triage: *Craig Newgard*
- 3) Acute Resuscitation, Evaluation & Imaging: *Todd Costantini*
- 4) Geriatric trauma: *Bellal Joseph*
- 5) Neurotrauma: *Deb Stein*
- 6) Pediatric trauma: *Jon Groner*
- 7) Trauma Systems & Informatics: *Jeff Bailey*
- 8) Injury Prevention: *Zara Cooper*
- 9) Post-admission critical care: *Karen Brasel*
- 10) Orthopedic Trauma: *Jim Ficke*
- 11) Long term functional outcomes & Rehabilitation: *Adil Haider*

Panel Experts

American Trauma
Society (ATS)

American Burn
Association (ABA)

American Public
Health Association
(APHA)

Society of Trauma
Nurses (STN)

American Association
of Neurological
Surgeons (AANS)

Orthopedic Trauma
Association (OTA)

American College of
Emergency Physicians
(ACEP)

National Association
of EMS Physicians
(NAEMSP)

National Association
of Emergency
Medical Technicians
(NAEMT)

American Society of
Anesthesiologists
(ASA)

Pediatric Trauma
Society (PTS)

Society of Critical
Care Medicine
(SCCM)

American College of
Rehabilitation
Medicine (ACRM)

American Geriatric
Society (AGS)

American Urological
Association (AUA)

American College of
Radiology (ACR)

Regional Advisory
Council(s) (RAC)

American Health
Information
Management
Association (AHIMA)

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History 

Trial of Antibiotic Restraint in Presumed Pneumonia: A Surgical Infection Society Multicenter Pilot

Study Population



94.6% Trauma pts

Guidry et al. *Journal of Trauma and Acute Care Surgery* November 2022

@JTraumaAcuteSurg

Trial of antibiotic restraint in presumed pneumonia: A Surgical Infection Society multicenter pilot

In this multicenter, cluster-randomized controlled trial, a protocol of specimen-initiated antibiotics for suspected ICU-acquired pneumonia did not

22 Hottest Articles of 2022

21 Hottest Articles of 2021

Best of Videos

NTRAP Manuscripts

AAST OIS papers

AAST Presidential Addresses

EAST Practice Management

EAST Presidential Addresses

PTS Presidential Addresses

WTA Critical Decisions in Trauma

WTA Presidential Addresses

Classics of Trauma

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Estradiol provokes hypercoagulability and affects fibrin biology: A mechanistic exploration of sex dimorphisms in coagulation



Trial of antibiotic restraint in presumed pneumonia: A Surgical Infection Society multicenter pilot



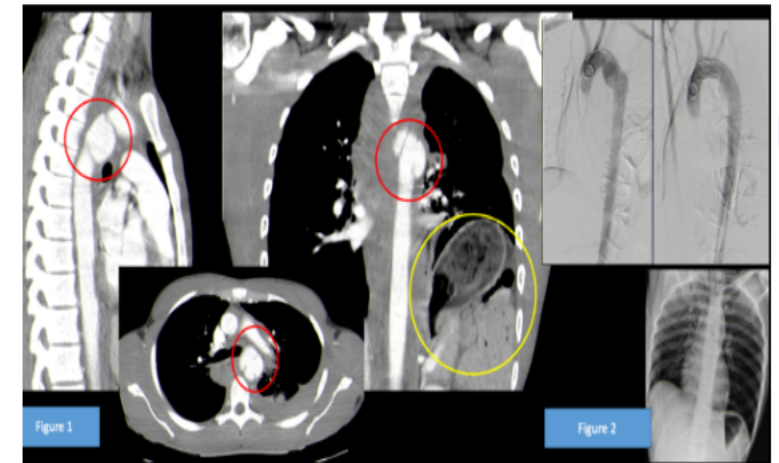
Case volume and rate are associated with outcomes in geriatric trauma: A case for geriatric trauma centers?



Greater spatial access to care is associated with



Image of the Month



Related Article: [Blunt thoracic aortic injury: A Western Trauma Association critical decisions algorithm](#)



Acute Resuscitation, Initial Patient Evaluation, Imaging and Management



Developing a National Trauma Research Action Plan (NTRAP): Results from the Acute Resuscitation, Initial Patient Evaluation, Imaging and Management Research Gap Delphi Survey



METHODS

Experts in trauma care and injury research identified gaps in knowledge, generated research questions and prioritized questions using a *consensus-driven Delphi survey approach*.



RESULTS

43 subject matter experts generated 992 questions that reached a consensus level of 60% agreement:

- High Priority: 327 questions (33%)
- Medium Priority: 621 questions (62.6%)
- Low Priority: 44 questions (4.4%)

CONCLUSION

Highly prioritized research topics related to interventions:

- Pharmaceuticals
- Fluid/blood product resuscitation

Highly prioritized research questions were most frequently related to:

- Traumatic Brain Injury
- Vascular injury
- Pelvic fracture
- VTE prophylaxis



Todd W. Costantini, MD, Joseph M. Galante, MD, MBA, Maxwell A. Braverman, DO, Jimmy Phuong, PhD, Michelle Price, PhD, Joseph Cuschieri, MD, Laura N. Godat, MD, John B. Holcomb, MD, Raul Coimbra, MD, PhD, Eileen Bulger, MD FACS, and the NTRAP Acute Resuscitation, Evaluation & Imaging Panel Group. *Journal of Trauma and Acute Care Surgery*. [doi]

@JTraumAcuteSurg

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Acute
Resus
Delphi
Take-Aways

What stood out most starkly:

- Wide breath of topics/questions from this panel
 - 992 questions reached consensus
 - 327 (33%) were considered high priority



Acute Resus Research Questions

Hemorrhagic Shock / Transfusion

Rank	Question
1	Does early whole blood given pre-hospital improve outcomes in patients with hemorrhagic shock?
20	In what patient population should TXA be administered in the prehospital setting?

Fluid Resuscitation / Resuscitation Adjuncts

Rank	Question
2	What are the effects of permissive hypotension on multi-injury patients with TBI ?
8	Do geriatric patients require higher blood pressure goals compared to younger counterparts?

Acute Resus Research Questions

Venous Thromboembolism (VTE)

Rank	Question
3	What is the optimal timing , agent, dose and risk of intracranial hemorrhage after starting chemoprophylaxis in TBI with intracranial hemorrhage?
5	Does early prophylaxis after spine injury/surgery prevent VTE, and is there an increased risk of bleeding complications?
7	On discharge , in trauma patients that are not fully ambulatory, how long should anticoagulation be continued?

Secondary Analysis of VTE Research Gaps Across All Panels

86 Questions from 9 NTRAP Panels

Panel	Questions
Acute Resus	32
Burn	21
Critical Care	14
Pediatric	8
Neuro	6
Geriatric	2
Trauma Systems	1
Ortho Trauma	1
Pre-Hospital	1

Topic	Question
Timing of Initiation	17
Risk Factors for VTE	16
TXA	11
Dosing	8
Medication Choice	6
Reversal Agents	5
Treatment of VTE	5
Complications	4
Patient Factors	4
Diagnosis	3
Post-DC Prophylaxis	3
IVC Filter	3
Patient Education	1

Developing a National Trauma Research Action Plan: Results from the acute resuscitation, initial patient evaluation, imaging, and management research gap Delphi survey

Todd W. Costantini, MD, FACS, Joseph M. Galante, MD, MBA, Maxwell A. Braverman, DO, Jim Phuong, MSPH, PhD, Michelle A. Price, PhD, Joseph Cuschieri, MD, Laura N. Godat, MD, John B. Holcomb, MD, Raul Coimbra, MD, PhD, Eileen M. Bulger, MD, and NTRAP Acute Resuscitation Panel,
San Diego, California

BACKGROUND: Injury is the leading cause of death in patients aged 1 to 45 years and contributes to a significant public health burden for individuals of all ages. To achieve zero preventable deaths and disability after injury, the National Academies of Science, Engineering and Medicine called for the development of a National Trauma Research Action Plan to improve outcomes for military and civilian trauma patients. Because rapid resuscitation and prompt identification and treatment of injuries are critical in achieving optimal outcomes, a panel of experts was convened to generate high-priority research questions in the areas of acute resuscitation, initial evaluation, imaging, and definitive management on injury.

METHODS: Forty-three subject matter experts in trauma care and injury research were recruited to perform a gap analysis of current literature and pri-

Announcing 2024 VBR Timeline Change

- BCBSM requests earlier submission of results: Now due 12/1
- Original measurement period: 7/1/22 to 6/30/23
- Need to shift earlier by 2 months
- New measurement period: 5/1/22 to 4/30/23
- Submit optional data in August to provide time to fix issues



Break

Back at 12:05p



Data Validation EMR Access

Shauna Di Pasquo, BSN RN



Update Validation Process

M·TQIP


Remote Data Validation

Workflow

4 Weeks Prior

- **MTQIP:** Provides center staff with validation confirmation, IT letter, validation process, conference link, and case list.
- **Program Manager/Abstraction Staff:** Provides IT with IT letter, validation process, validation date, and agreements (BAA and RAA). Adds preferred patient identifier to highlighted cases on case list and re-uploads to Box (HIPAA-approved platform).
- **IT Staff:** Provides EMR access credentials and instructions.

1 Week Prior

- **MTQIP:** Tests credentials and EMR view. Provides confirmation of EMR view to Program Manager/Abstraction Staff.
-  If MTQIP EMR access is not functional by noon on the Friday prior to validation, then the visit will be cancelled and added to next scheduling poll if possible. Centers that do not reschedule by the end of the calendar year will receive 0 points for the performance index validation measure.

April 2023

**Friday deadline
changing to
Wednesday**

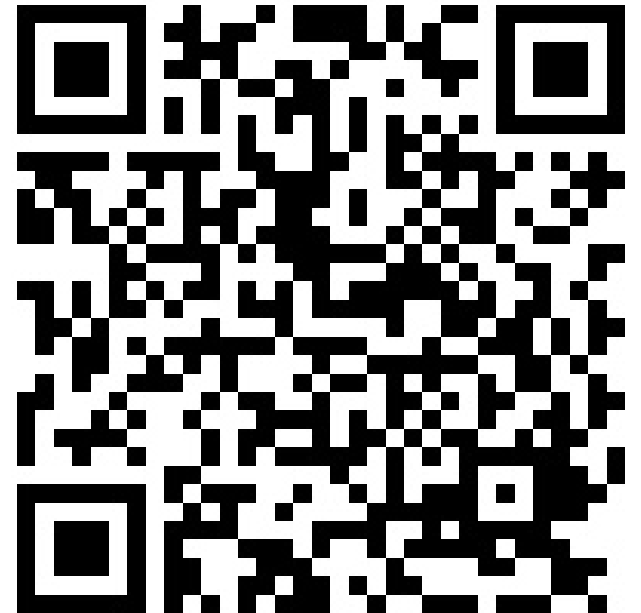
Orthopaedic Update

Bryant Oliphant, MD MBA MSc



TMD Survey

- Want to hear about your orthopaedic issues/ideas at your center
- Help with direction of ortho working group
- Future discussion topics
- Very brief



Combined Fall Ortho Meeting?

- MTIQP Fall Meeting – October 10, 2023
- OTA - October 18 – 21, 2023
- Very positive response from last meeting



Ortho Liaison Contact List – Still to Confirm

- Center 36
- Center 12
- Center 34
- Center 28
- Center 4
- Center 22
- Center 5
- Center 32
- Center 7
- Center 25

bryantol@med.umich.edu



Ortho Working Group Items

- VTE Prophylaxis
 - Weight Based
 - ASA vs. Lovenox (PREVENT CLOT)
- Deeper Dive into Ortho Process Measures
- Breaking Down Silos
- ArborMetrix Access




Antibiotic administration within 1 hour for open lower extremity fractures is not associated with decreased risk of infection

Areg Grigorian, MD, Morgan Schellenberg, MD, Kenji Inaba, MD, Matthew Martin, MD,
Kazuhide Matsushima, MD, Michael Lekawa, MD, and Jeffry Nahmias, MD, MHPE, *Orange, California*

- Only Inpatient Admissions – No Post D/C data
- Difficult to risk adjust orthopaedic injuries
 - Gustilo Anderson Type
 - Fx severity
- Rebuttal Letter Submitted to JTACS



Questions

- Contact info:
- Bryant W. Oliphant, MD, MBA, MSc
- bryantol@med.umich.edu
- Cell: XXX-XXX-XXXX
-  @BonezNQuality



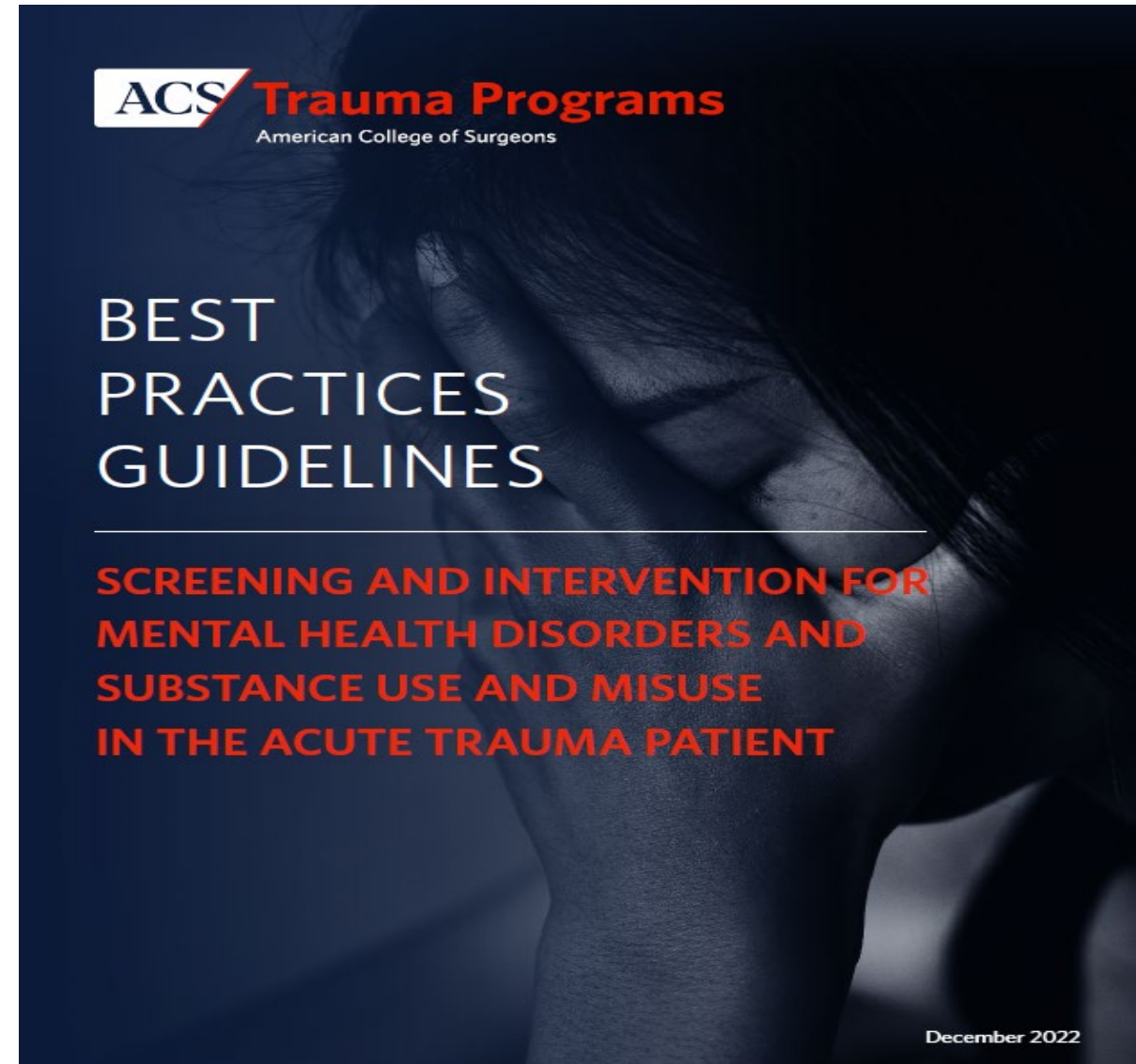
Mental Health Screening in Trauma

Gaby Iskander, MD
Judy Mikhail, PhD



Mental Health Services for Trauma

Judy Mikhail, PhD, MBA, RN
MTQIP Program Manager

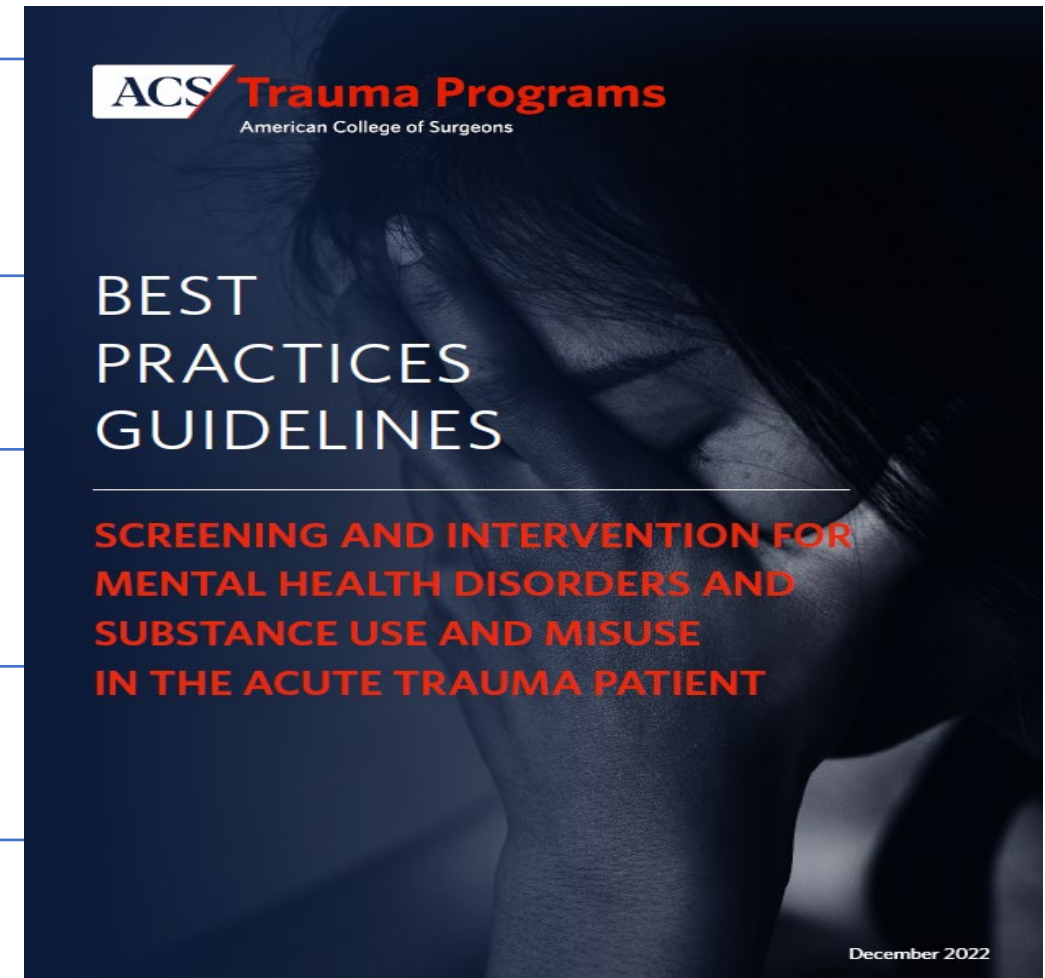


100 page document

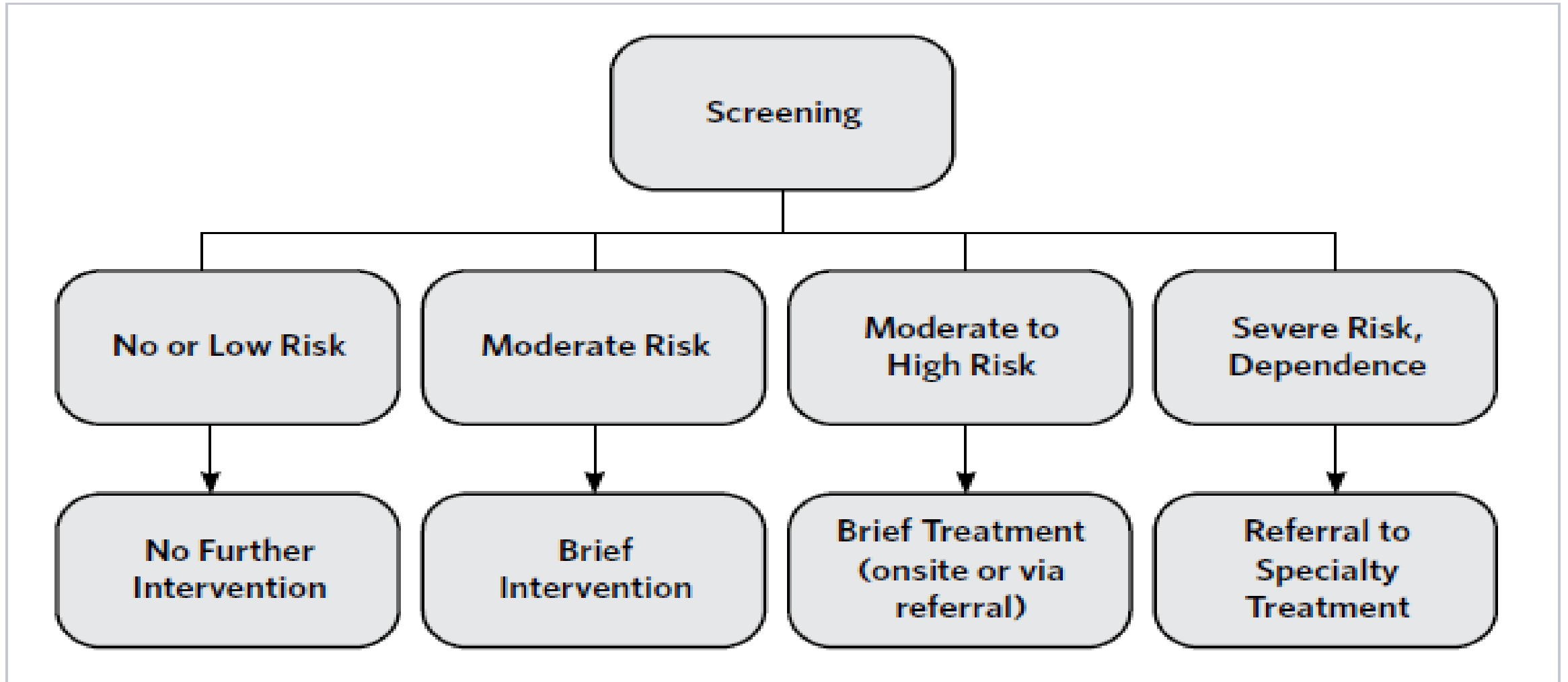
Identify at risk patients

Intervene to reduce risk

Refer chronic patients



SBIRT



Alcohol Misuse -Type II

5.30 Alcohol Misuse Screening (min 80%)

- All centers must screen all admitted trauma patients (age >12 yr) by:
 - validated tool *OR*
 - routine blood alcohol testing

5.31 Alcohol Misuse Intervention (min 80%)

- All centers, at least 80% of patients who have screened positive for alcohol misuse:
 - must receive a brief intervention before discharge
 - by staff trained & credentialed by center

Teachable Moment

- Trauma event
- ↑ Receptiveness

SBIRT

- Screening
- Brief Intervention
- Referral to
- Treatment

ISSUE

- ✓ Alcohol
- Drugs
- PTSD
- Depression

Efficacy of SBIRT

Issue

- Alcohol
 - good success
- Drugs
 - mixed results

Patient

- TBI?
- Race/Ethnicity
- Cultural factors
- Pt/Provider concordance

Provider

- Credentials
- Training
- Internal training
- Internal experts
- Contract outside

Ripe for More Research

Table 4. Clinical Screening Tools for PTSD and Depression in Adults (See Appendix B-1 to review these mental health screening tools.)

Validated Screening Tools for Injured Patients	PTSD	Depression	Tool Description	Timing
Automated PTSD Screen	X		Automated risk abstraction tool based on several EMR data points	Inpatient
Injured Trauma Survivor Screen	X	X	9-item yes/no response screener assessing pre-, peri-, and posttrauma risk factors.	Inpatient
Patient Health Questionnaire (PHQ)		X	2-item or 9-item Likert self-report depression symptom screener	Inpatient; outpatient
Peritraumatic Distress Inventory (PDI)	X	X	13-item self-report Likert scale screener assessing physiological and emotional responses during and after trauma	Inpatient; outpatient—validated for 30 days postinjury
Posttraumatic Adjustment Screen (PAS)	X	X	10-item Likert scale screener assessing pre-, peri-, posttrauma risk factors	Inpatient
PTSD Checklist-5	X		4-item, 8-item, or 20-item Likert self-report questionnaire assessing PTSD symptoms	Inpatient following brief screen; Outpatient

Various Models

- Partner with Psychology Departments
- Integrate trauma psychologists → trauma team
- Stepped care model
 - Screen-BI → clinic follow up → long term follow up
- Trauma team screens → Consultation-Liaison Service
- Tech solutions
 - automated text messaging
 - telephone screen 30-day p/dc
 - Tele-med follow up

Table 5. Implementation Gap Analysis Tool

5 pages long

Management Guidelines	Met	Partially Met	Not Met	Priority	Comments
Trauma verification and state designation requirements specific to screening and interventions for mental health and substance use are reviewed by trauma leadership, the Trauma Operations Committee members, and stakeholders.					
Hospital regulatory requirements specific to mental health screening and substance use requirements are reviewed.					
Trauma-informed care principles are implemented for all facility units participating in trauma care.					
The integration of screening and interventions for mental health and substance use integration into the trauma center's scope of responsibility is supported by trauma leadership.					
Guidelines for substance misuse and interventions are documented.					
Guidelines for mental health screening and interventions are documented.					
The trauma center has standardized processes to screen patients for acute ASD and PTSD that include standardized screening documentation.					

Administrative Support



Challenges

- Money, time, resources...
- Limited infrastructure of mental health care services nationwide
- Both inside and outside of trauma centers
- Trauma centers → invest?

5.29 Mental Health Screening -Type II

- **NEW** All centers must meet trauma patient mental health needs
 - Must have a protocol to screen patients at high risk for psychological sequelae with subsequent referral to a mental health provider
- **Compliance**
 - Mental health screening and referral protocol (LI, LII, PTCI, PTCII)





MENTAL HEALTH SCREENING IN TRAUMA PATIENT

5.29

Corina Dulecki LMSW-clinical

Gaby Iskander MD MS FACS

5.29 MENTAL HEALTH SCREENING—TYPE II

Applicable Levels

- LI, LII, LIII, PTCI, PTCII

Definition and Requirements

- All trauma centers must meet the mental health needs of
 - trauma patients by having:
 - A protocol to screen patients at high risk for psychological sequelae with subsequent referral to a mental health provider (LI, LII, PTCI, PTCII)
-
- A process for referral to a mental health provider when required (LIII)



Additional Information

- Level I and II trauma centers are required to have a structured approach to identify patients at high risk for mental health problems while Level III trauma centers are required to have a means of referral should a problem or risk be identified during inpatient admission.

Measures of Compliance

- • Mental health screening and referral protocol (LI, LII,PTCI, PTCII)
- • Mental health referral process (LIII)

No Resources or references mentioned

MENTAL HEALTH

a person's condition with regard to their psychological and emotional well-being.(Oxford)

Mental health includes our emotional, psychological, and social well-being. It affects how we think, feel, and act.(CDC)

A person's cognitive, behavioral, and emotional well-being. It affects how people react to stressors, engage with others, (medical News today)

Mental health is a state of mental well-being that enables people to cope with the stresses of life, realize their abilities, learn well (WHO)

MENTAL HEALTH

Trauma can affect your mental health in myriad ways, contributing to the development of PTSD, substance use disorders, anxiety, and depression.

What is trauma. Crashes, falls, violence , abuse etc..

Of the 70% of people in the US who experience trauma, 5-20% go on to develop PTSD



ASD/PTSD

Post-Traumatic Stress Disorder (PTSD)

Acute Stress Disorder (ASD)

Secondhand Trauma

Reactive Attachment Disorder (RAD)

Disinhibited Social Engagement Disorder (DSED)

Adjustment Disorders

Other and Unspecified Trauma- and Stressor-Related Disorders



MENTAL HEALTH IN TRAUMA

- <https://www.ncbi.nlm.nih.gov/books/NBK207191/>
- The Other Side of Trauma: Resilience



VERIFICATION REQUIREMENT

- A protocol
- to screen patients at high risk for psychological sequelae
- subsequent referral to a mental health provider

SCREENING TOOLS

- The National Stressful Events Survey Acute Stress Disorder Short Scale (NSESSS)
- Acute Stress Disorder Scale/ASDS and ASDS, 12

PCL-C Becks depression short form and ASQ and PHQ-9

PDEQ (Peritraumatic Behavioral Questionnaire)(Combat) Peritraumatic dissociative Experiences questionnaire)

- The DSM-5 describes acute stress disorder as the development of specific fear behaviors that last from 3 days to 1 month after a traumatic event. These symptoms always occur after the patient has experienced or witnessed death or threat of death, serious injury or sexual assault.

WHAT DO WE HAVE?

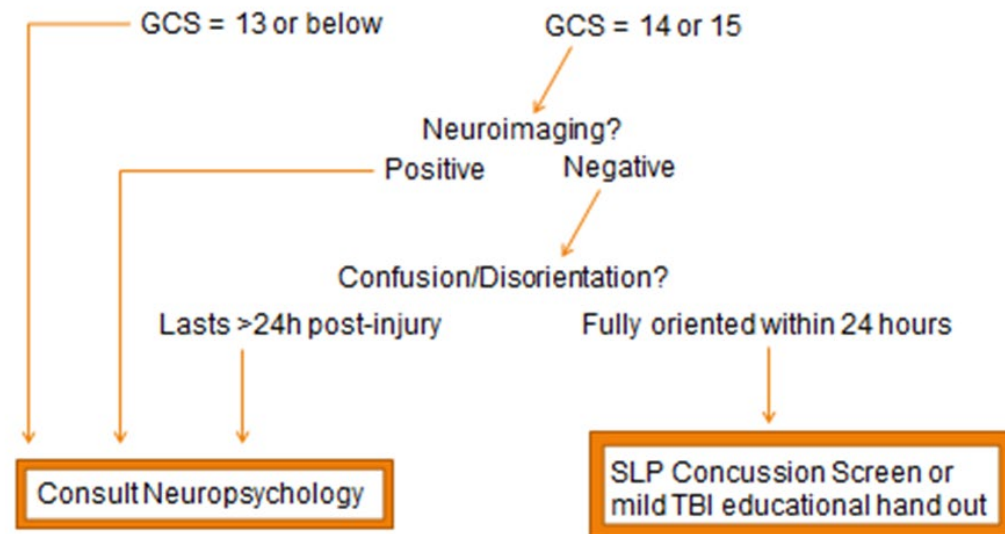
Alcohol and
substance abuse
screening and
brief intervention

SLP and
Neuropsychiatry
evaluation for TBI

TBI SCREENING

Decision Tree for Neuropsych

Suspected brain injury



ASSEMBLING THE TEAM

Interested,
passionate Social
worker.

Interested,
passionate
Neuropsychologist

Interested,
passionate TMD

PROCESS



BUILD THE CASE



CLEAR
EXPECTATION AND
ASK(MAKE IT PART
OF EVERYDAY TASK,
MEDICAL RECORD,
RESEARCHABLE,
DASHBOARD)



ELEVATE TO
LEADERSHIP



GET THE FINANCIAL
SUPPORT



START THE PROCESS



MEETING, MEETING,
MEETING,



FINAL PRODUCT



PCL-5

Referral :



ITSS

- The Injured Trauma Survivor Screen (ITSS)

The 9-items ITSS is a screening tool used to identify risk for the development of PTSD and depression in individuals who have experienced a traumatic injury.

Injured Trauma Survivor Screen (ITSS)

User Guide

Joshua C. Hunt, Ph.D. & Terri A. deRoos-Cassini, Ph.

Six-month Follow Up of the Injured Trauma Survivor Screen (ITSS): Clinical Implications and Future Directions

Joshua C. Hunt, Ph.D., Samantha A. Chesney, M.S., Karen Brasel, M.D., MPH, and Terri A. deRoon-Cassini, Ph.

Validation of the Injured Trauma Survivor Screen: An American Association for the Surgery of Trauma multi-institutional trial

Joshua C Hunt¹, Erick Herrera-Hernandez, Amber Brandolino, Kelley Jazinski-Chambers, Kathryn Maher, Brianna Jackson, Randi N Smith, Diane Lape, Mackenzie Cook, Carisa Bergner, Andrew T Schramm, Karen J Brasel, Marc A de Moya, Terri A deRoon-Cassini

Tier 1: The ITSS is administered by a social worker during the inpatient screening process (< 5 minutes).

Injured Trauma
Survivor Screen
(ITSS)

Tier 2: Trauma/Critical Care providers receive a *Best Practice* alert recommending a trauma psychology consultation.

PTSD:
Negative risk
(score < 2)

PTSD:
Positive risk
(score \geq 2)

Depression:
Positive risk
(score \geq 2)

Depression:
Negative risk
(score < 2)

Tier 3: Symptoms are assessed by a psychologist as a part of a full initial consultation and evaluation.

PCL-5:
negative risk
(score < 16)

PCL-5:
positive risk
(score \geq 16)

Depression measure
(e.g., CESD-R)
negative risk

Depression measure
(e.g., CESD-R)
positive risk

Tier 4: Implementation of psychological intervention.

Psychoeducation about
distress after trauma & signs
of increasing pathology;
resources for outpatient
services


Trauma-focused,
exposure-based
interventions initiated in
the hospital

Psychoeducation about
distress after trauma & signs
of increasing pathology;
resources for outpatient
services

Early
psychological
intervention

CLINIC FOLLOW UP.

- Completion of the PCL-5
 - After 6 Months
 - Referral for positive test: (mental Health Providers) SHORTAGE!!!!!!!
 - Clinical Social Worker
 - Licensed Practical Counselor
 - Certified psychologist
 - Psychiatrist.
 - Feed back
- 6 months project



are 644 unique patients that have had ITSS screening, of those 261 have scored a 2 or higher on either the PTSD Risk Summary or Depression Risk Summary.



of the people who scored positive on the ITSS, there have been 45 patients who scored over 30 on the PCL-5



Build the case.



Support and Finance (it is a CD), COVID impact



Implementation , Who(Social work, nurse, intern, APP)



ITSS screen, new residents



PCL-5 ,



Referral



Feed Back

MTQIP Analytic Updates

Jill Jakubus, PA-C, MHSA, MS



M·TQIP

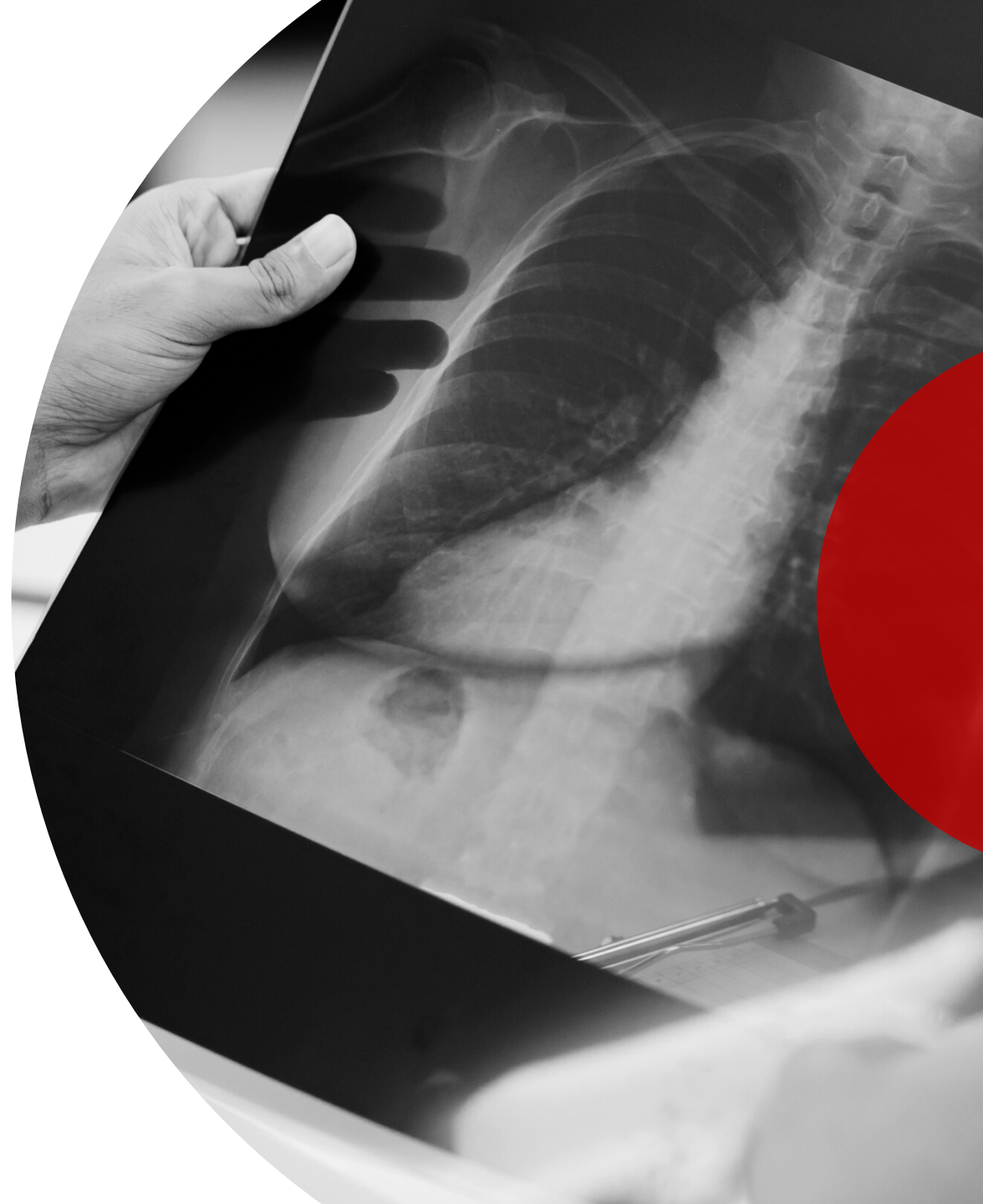
SSRF

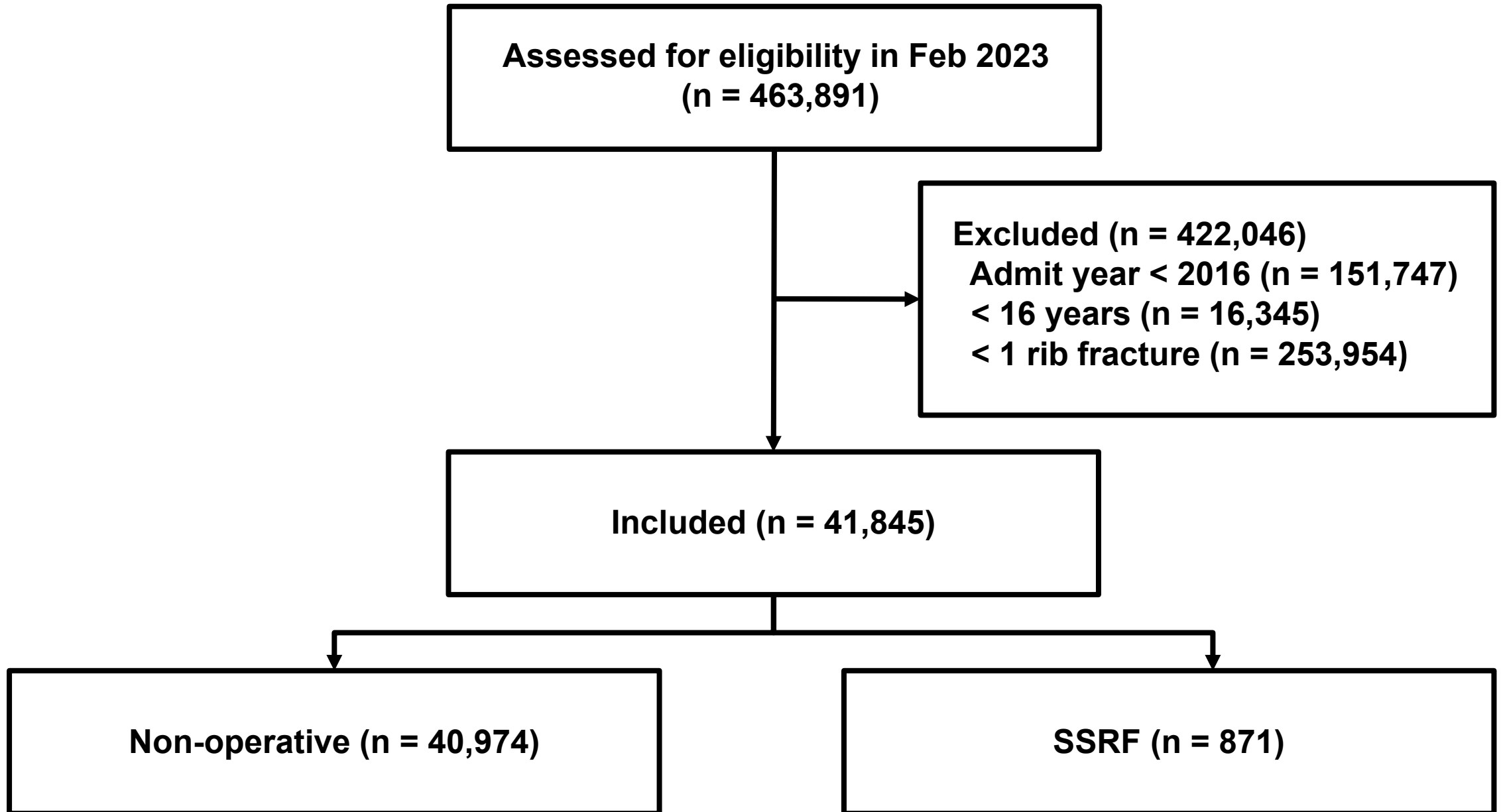
I N M I C H I G A N

Exploring surgical stabilization of rib fractures (SSRF) across all Level I and II trauma centers in Michigan.



Approach



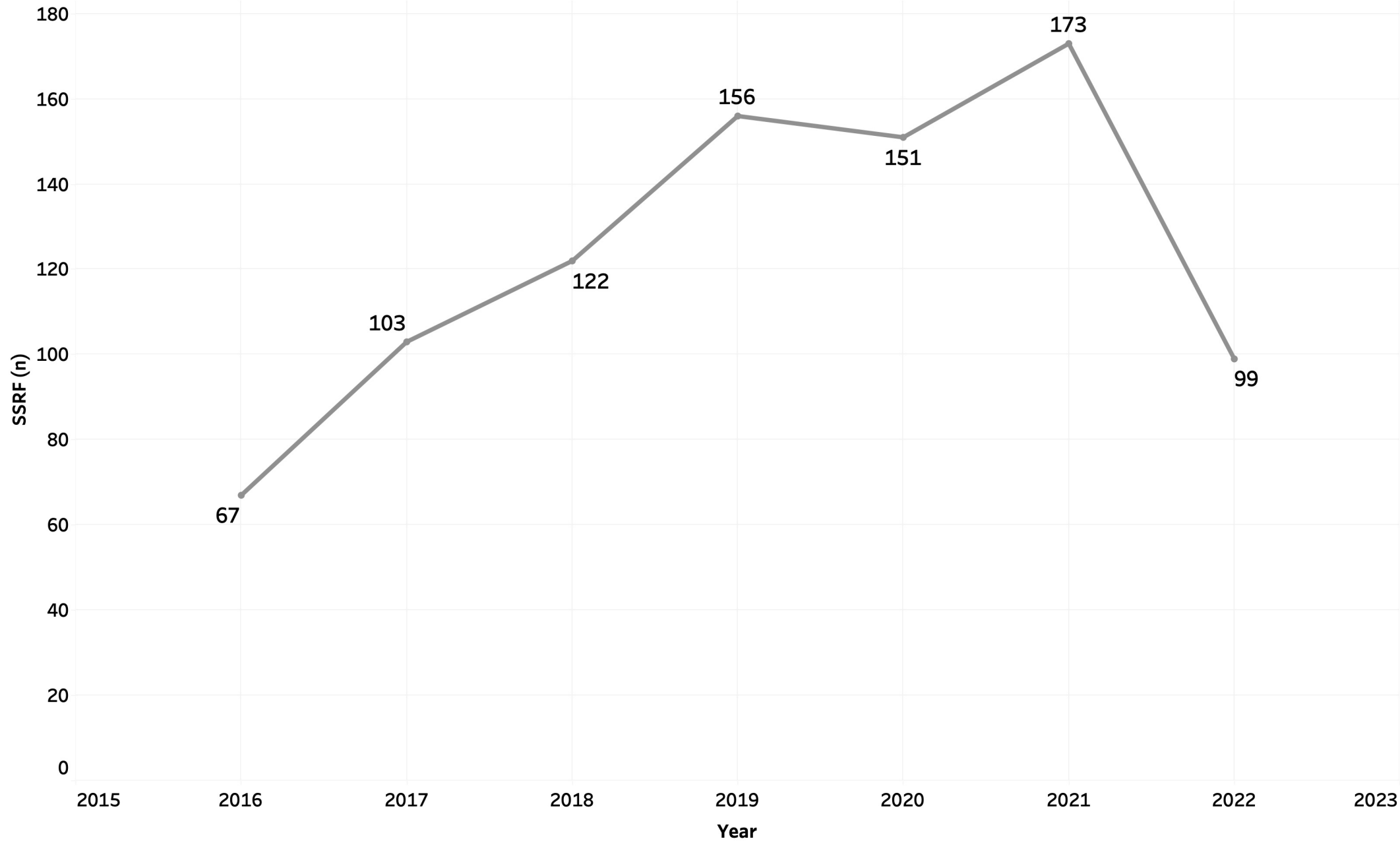


Patient demographics and characteristics.

	Total N=41,845	No Rib Fix N=40,974	Rib Fix N=871	p-value
Age, mean (SD)	60 (20)	61 (21)	57 (16)	<0.001
Sex, (% male)	64%	63%	71%	<0.001
Mechanism				<0.001
Blunt	96%	96%	99%	
Penetrating	4%	4%	1%	
Payor				<0.001
Medicaid	11%	10%	12%	
Self-Pay	4%	4%	3%	
Private	24%	24%	27%	
Automobile	18%	18%	23%	
Medicare	37%	37%	26%	
Other	7%	7%	9%	
Length of Stay, median (IQR)	4 (2-7)	4 (2-7)	10 (7-16)	<0.001
ISS, median (IQR)	12 (9-17)	12 (9-17)	17 (11-24)	<0.001
Head AIS >= 3	13%	13%	11%	0.025
Multiple rib fx	71%	71%	64%	<0.001
Flail chest	4%	4%	38%	<0.001
Died	7%	7%	2%	<0.001
Pneumonia	3%	3%	12%	<0.001
Ventilator Days				<0.001
None	86%	87%	64%	
1 day	3%	3%	2%	
2-4 days	5%	5%	12%	
>= 5 days	6%	6%	22%	

The cohort who underwent SSRF is different in a statistically significant way that cannot be explained by chance.

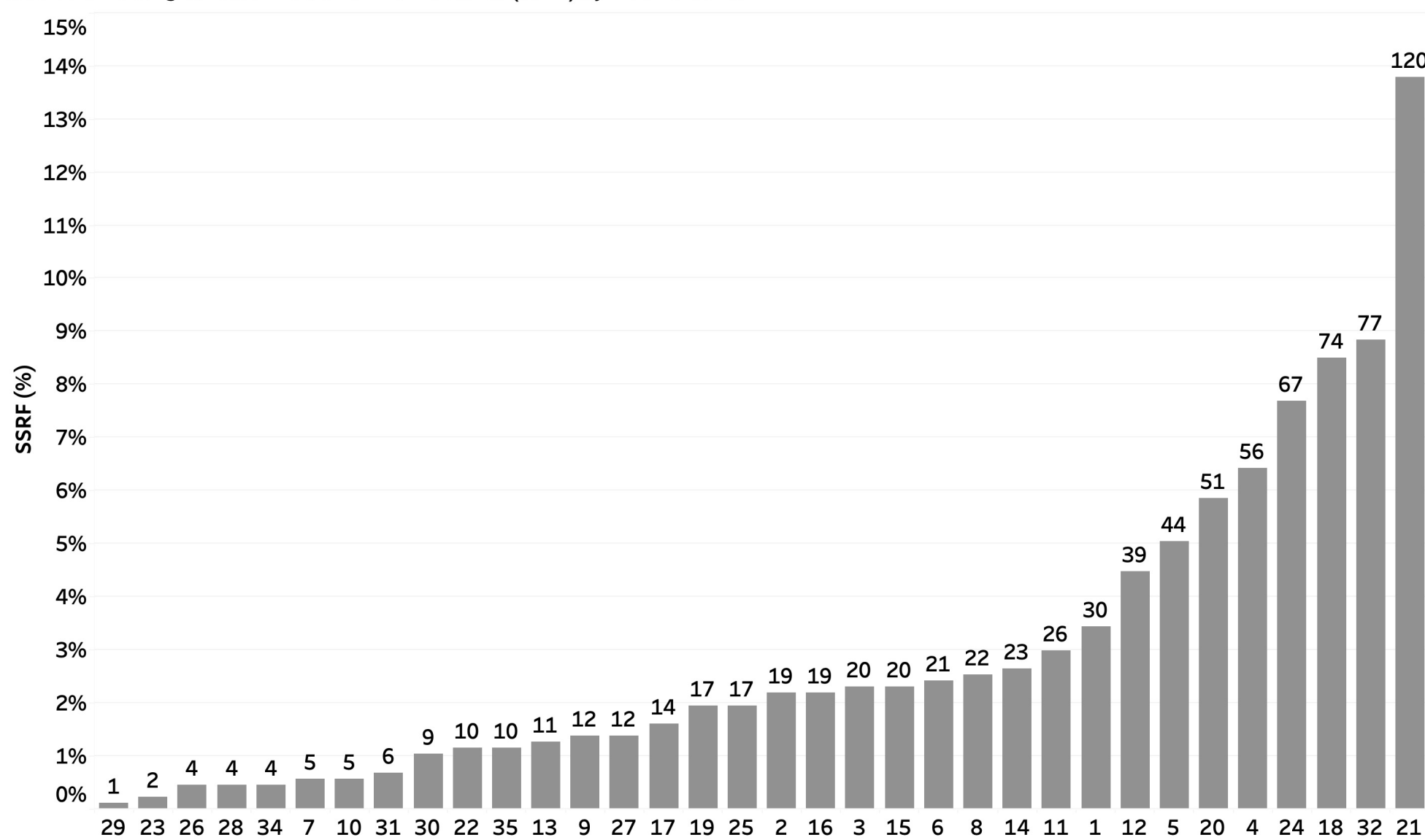
Collaborative Case Volume Surgical Stabilization of Rib Fractures (SSRF) by Year



Summary		
SUM(SSRF)	Count:	7
	Sum:	871
	Average:	124.43
	Minimum:	67
	Maximum:	173
	Median:	122.00
Standard deviation:		37.6

- Comments
- 2022 data reflects a partial submission period through minimum 8/31/22
- Findings
- Overall upward trend reflecting an increase in SSRF over time

Case Volume Surgical Stabilization of Rib Fractures (SSRF) by Trauma Center



Summary	
Count:	34
SUM(SSRF)	
Average:	25.62
Minimum:	1
Maximum:	120
Median:	18.00
Standard deviation:	26.6
AGG(SSRF % TC)	
Average:	3%
Minimum:	0%
Maximum:	14%
Median:	2%
Standard deviation:	3.1%

Case Volume by Approach	
Approach Open	862
Approach Percutaneous	5
Approach Percutaneous Endoscopic	4

Case Volume by Ribs Repaired	
Ribs Repaired 1-2	142
Ribs Repaired >= 3	729

Comments

- Column values reflect raw (n) case volume.

Findings

- There's variability in SSRF across the collaborative.
- 99% of cases are performed using an open approach.
- 84% of cases involve repair of >= 3 ribs.

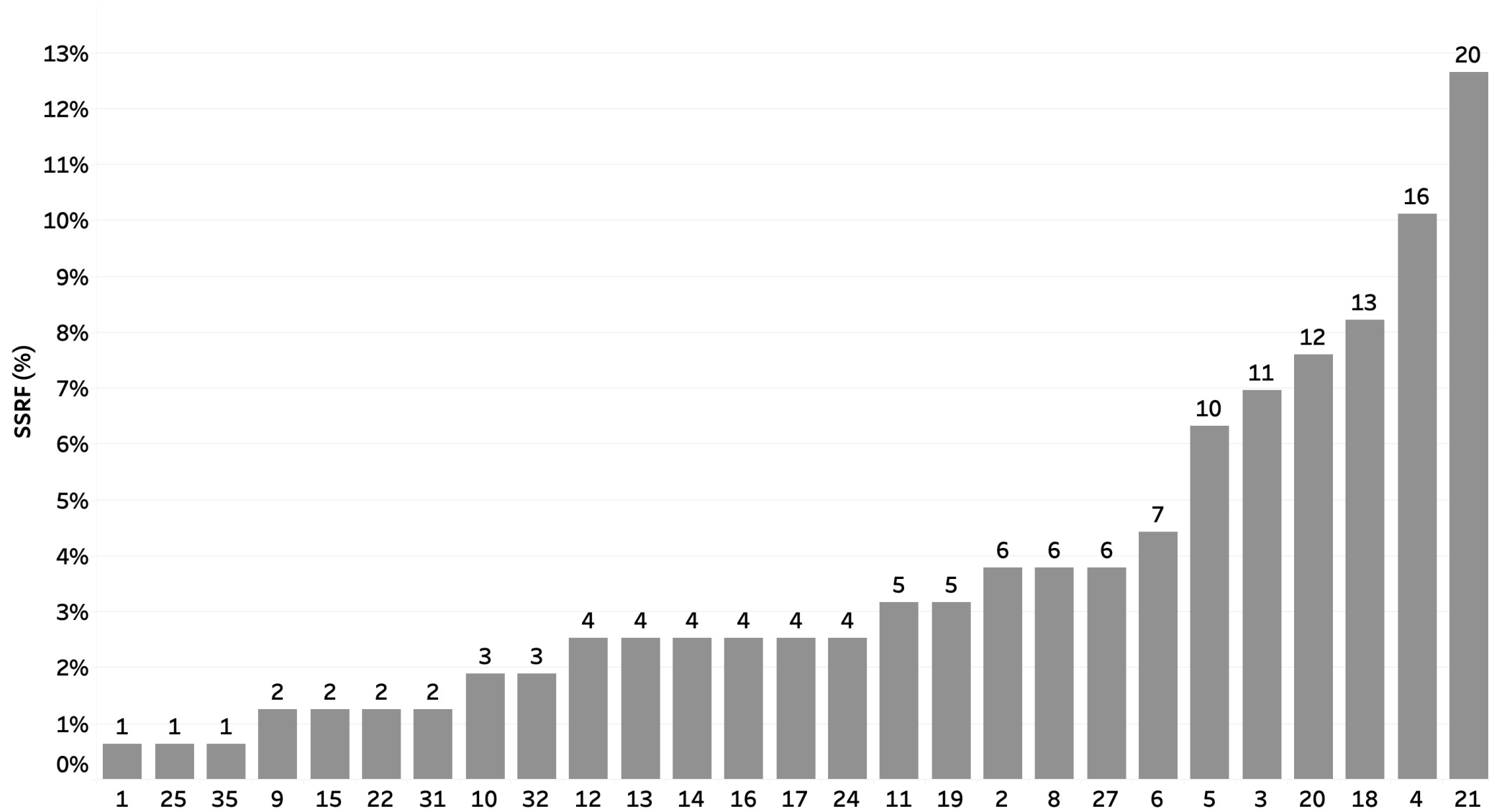
Indications

Good Quality Evidence

- **Flail chest with resultant respiratory failure requiring mechanical ventilation**

1. Tanaka H, Yukioka T, Yamaguti Y, et al. Surgical stabilization of internal pneumatic stabilization? A prospective randomized study of management of severe flail chest patients. J Trauma 2002; 52:727.
2. Granetzny A, Abd El-Aal M, Emam E, et al. Surgical versus conservative treatment of flail chest. Evaluation of the pulmonary status. Interact Cardiovasc Thorac Surg 2005; 4:583.
3. Marasco SF, Davies AR, Cooper J, et al. Prospective randomized controlled trial of operative rib fixation in traumatic flail chest. J Am Coll Surg 2013; 216:924.
4. Liu T, Liu P, Chen J, et al. A Randomized Controlled Trial of Surgical Rib Fixation in Polytrauma Patients With Flail Chest. J Surg Res 2019; 242:223.
5. Coughlin TA, Ng JW, Rollins KE, et al. Management of rib fractures in traumatic flail chest: a meta-analysis of randomised controlled trials. Bone Joint J 2016; 98-B:1119.

Case Volume Surgical Stabilization of Rib Fractures (SSRF) by Trauma Center
Cohort: Flail rib fracture injury, ventilator day >= 1



Summary		
Count:		27
SUM(SSRF)		
Average:		5.85
Minimum:		1
Maximum:		20
Median:		4.00
Standard deviation:		4.83
AGG(SSRF % TC)		
Average:		4%
Minimum:		1%
Maximum:		13%
Median:		3%
Standard deviation:		3.1%

Comments

- Column values reflect raw (n) case volume.
- 8 trauma centers not listed did not have any patients that met criteria.
- This graph is asking the question “What percentage of your patients who have flail injury and required mechanical ventilator support during their stay underwent SSRF?”

Limitations

- Unable to account for the relation of mechanical ventilation to SSRF.

Findings

- There's variability in SSRF use across the collaborative.

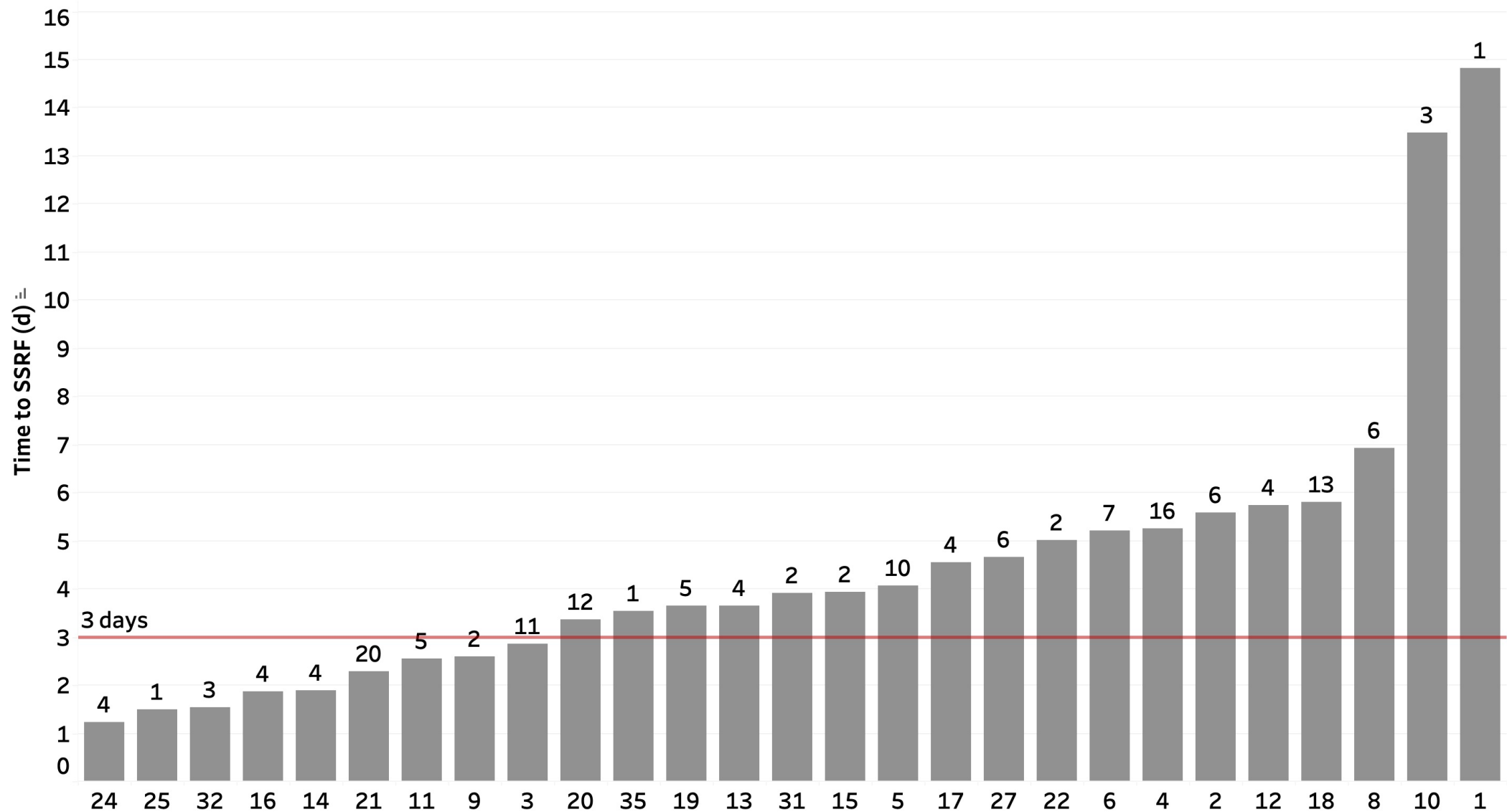
Early operation rather than later is aimed at mitigating pain and avoiding or resolving the need for mechanical ventilation.

1. Nirula R, Diaz JJ Jr, Trunkey DD, Mayberry JC. Rib fracture repair: indications, technical issues, and future directions. *World J Surg* 2009; 33:14.
2. Pieracci FM, Leasia K, Bauman Z, et al. A multicenter, prospective, controlled clinical trial of surgical stabilization of rib fractures in patients with severe, nonflail fracture patterns (Chest Wall Injury Society NONFLAIL). *J Trauma Acute Care Surg* 2020; 88:249.
3. Pieracci FM, Rodil M, Stovall RT, et al. Surgical stabilization of severe rib fractures. *J Trauma Acute Care Surg* 2015; 78:883.
4. Nirula R, Allen B, Layman R, et al. Rib fracture stabilization in patients sustaining blunt chest injury. *Am Surg* 2006; 72:307.
5. Sarani B, Schulte L, Diaz JJ. Pitfalls associated with open reduction and internal fixation of fractured ribs. *Injury* 2015; 46:2335.

A review of nine studies evaluating the impact of timing to surgical stabilization of rib fractures found that surgical stabilization of rib fractures within 72 hours of injury was associated with significantly shorter ICU and hospital lengths of stay, duration of mechanical ventilation, incidence of pneumonia, and need for tracheostomy.

1. Prins JTH, Wijffels MME, Pieracci FM. What is the optimal timing to perform surgical stabilization of rib fractures? *J Thorac Dis* 2021; 13:S13.

Median Time to Surgical Stabilization of Rib Fractures (SSRF) by Trauma Center
Cohort: Flail rib fracture injury, ventilator day >= 1



Summary	
Count:	27
MEDIAN(SSRF Time to OR 1)	
Average:	5
Minimum:	1
Maximum:	15
Median:	4
Standard deviation:	3.17
SUM(SSRF)	
Average:	5.85
Minimum:	1
Maximum:	20
Median:	4.00
Standard deviation:	4.83

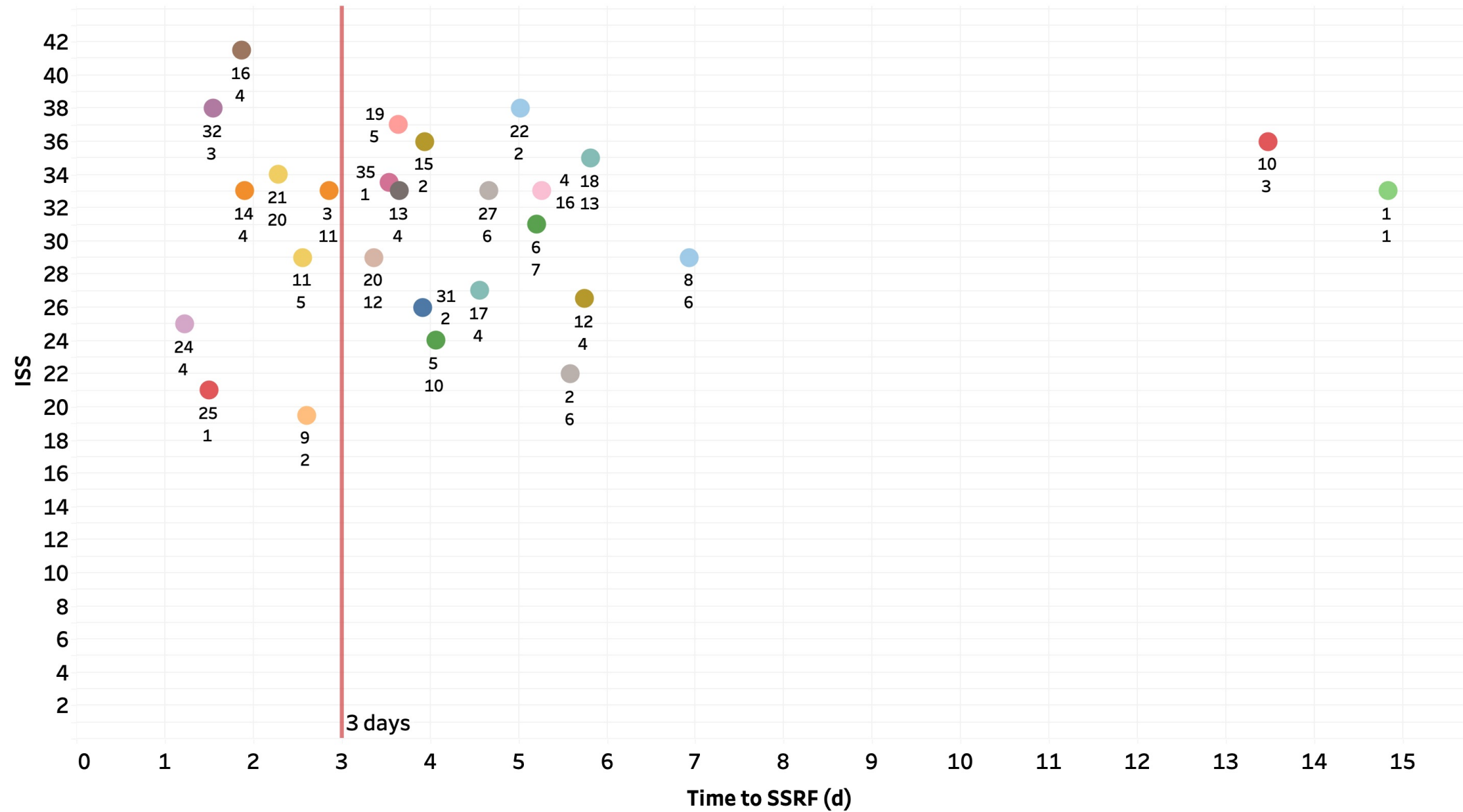
- Comments
- Column values reflect raw (n) case volume
 - Median time to stabilization calculated from arrival and not injury due to missing values and the ability to surgeon to control time to intervention.
 - 8 trauma centers not listed did not have any patients that met criteria.
 - Center 6 missing time from 2 cases. Center 11 missing time from 1 case.
 - This graph is asking the question “Is there an opportunity to improve care by getting patients to the OR earlier?”

- Limitations
- Retrospective evidence.
 - Potential for co-existing injuries contributing to respiratory failure such as severe TBI or severe pulmonary contusion.
 - Unable to account for the relation of mechanical ventilation to SSRF.

- Findings
- 35% (n = 55) of cohort patients had SSRF performed within 3 days.

Median Time to Surgical Stabilization of Rib Fractures (SSRF) by Median Injury Severity Score (ISS)

Cohort: Flail rib fracture injury, ventilator day >= 1



Summary		
Count:	27	
MEDIAN(ISS)		
Average:	30.96	
Minimum:	19.50	
Maximum:	41.50	
Median:	33.00	
Standard deviation:	5.62	
MEDIAN(SSRF Time to OR 1)		
Average:	4.50	
Minimum:	1.23	
Maximum:	14.83	
Median:	3.92	
Standard deviation:	3.17	
SUM(SSRF)		
Average:	5.85	
Minimum:	1	
Maximum:	20	
Median:	4.00	
Standard deviation:	4.83	

- Comments
- Top value below the dot is the center id.
 - Bottom value below the dot reflect raw (n) case volume
 - Median time to stabilization calculated from arrival and not injury due to missing values and the ability to surgeon to control time to intervention.
 - 8 trauma centers not listed did not have any patients that met criteria.
 - Center 6 missing time from 2 cases. Center 11 missing time from 1 case.
 - This graph is asking the question "Is there an opportunity to improve care by getting patients to the OR earlier?"

- Limitations
- Unable to account for the relation of mechanical ventilation to SSRF.

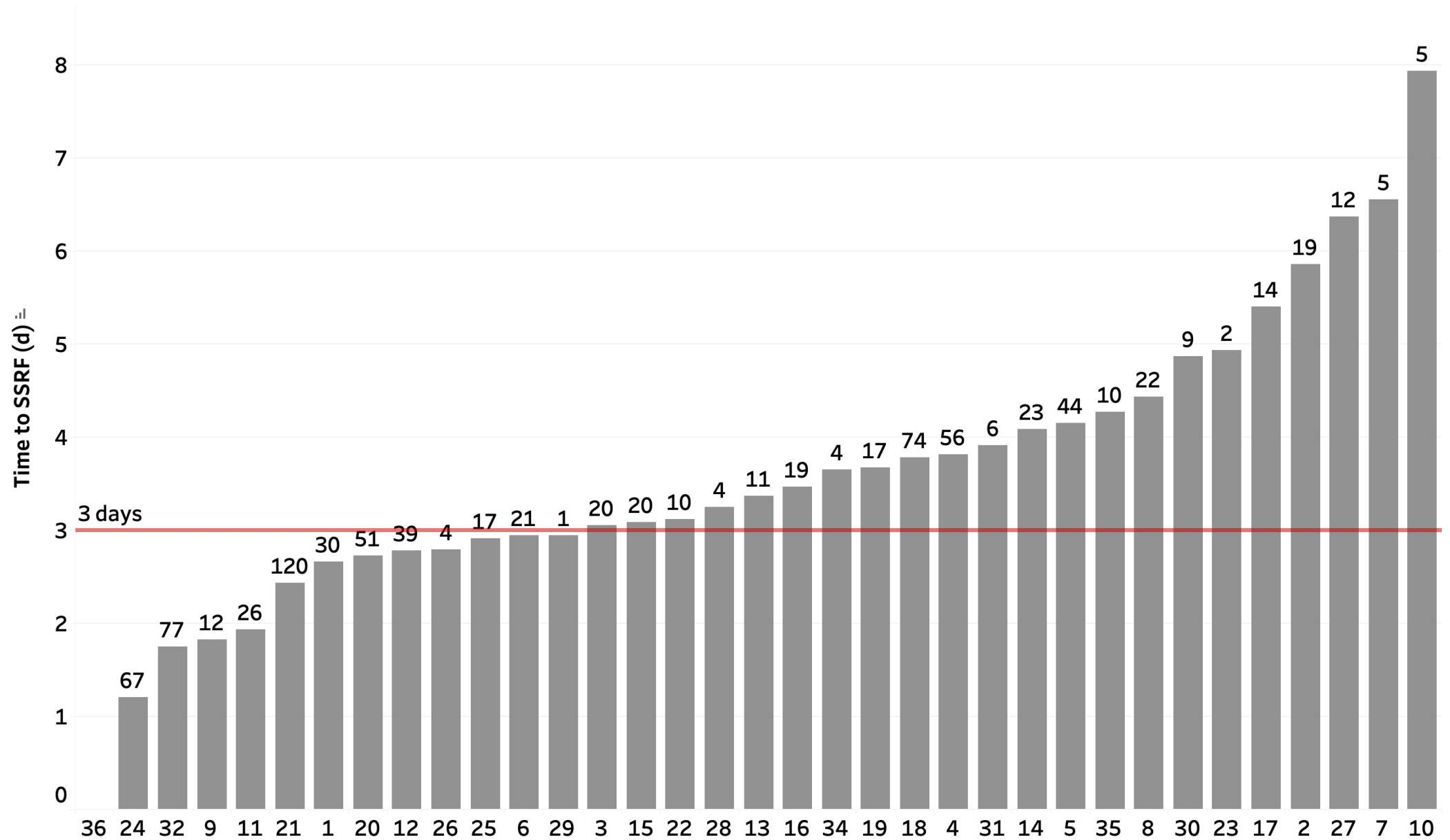
- Findings
- 35% (n = 55) of cohort patients had SSRF performed within 3 days

Indications

Generally Accepted Criteria

- **Impending or actual respiratory failure due to painful, movable ribs refractory to pain management strategies**
- **Significant chest wall deformity**
- **Failure to wean from mechanical ventilation not related to pulmonary contusion.**
- **Significantly displaced ribs found at thoracotomy being performed for other reasons**
- **Ongoing chest wall instability/deformity or pain due to nonunion or malunion of rib fractures**

Median Time to Surgical Stabilization of Rib Fractures (SSRF) by Trauma Center



Summary	
Count:	34
MEDIAN(SSRF Time to OR 1)	
Average:	4
Minimum:	1
Maximum:	8
Median:	3
Standard deviation:	1.457
SUM(SSRF)	
Average:	24.89
Minimum:	0
Maximum:	120
Median:	17.00
Standard deviation:	26.6

Comments

- Column values reflect raw (n) case volume
- Median time to stabilization calculated from arrival and not injury due to missing values and the ability to surgeon to control time to intervention.
- 10 cases missing time values.
- This graph aims to provide a macroscopic view of collaborative care.

Limitations


- Heterogenous cohort.
- Potential for co-existing injuries contributing to respiratory failure such as severe TBI or severe pulmonary contusion.
- Unable to account for the relation of mechanical ventilation to SSRF.

Findings

- 52% (n = 444) of cohort patients had SSRF performed within 3 days

Indications

Knowledge Gaps

- **No prospectively validated or generalizable scoring systems that can be used to predict which patients will fail conservative pain management**
 - **No evidence-based guidelines to determine at what threshold patients should be considered candidates for operative rib fixation**
 - **No studies that demonstrate a benefit to operative rib fixation for pain control alone**
- 

Contact Me

Have additional questions on today's topic you'd like to see presented or have a meeting topic you'd like us to feedback using evidence and data?



+734-763-8229



jjakubus@umich.edu



mtqip.org



calendly.com/jjakubus

Thank You

mtqip.org



ICU and OR Handoffs

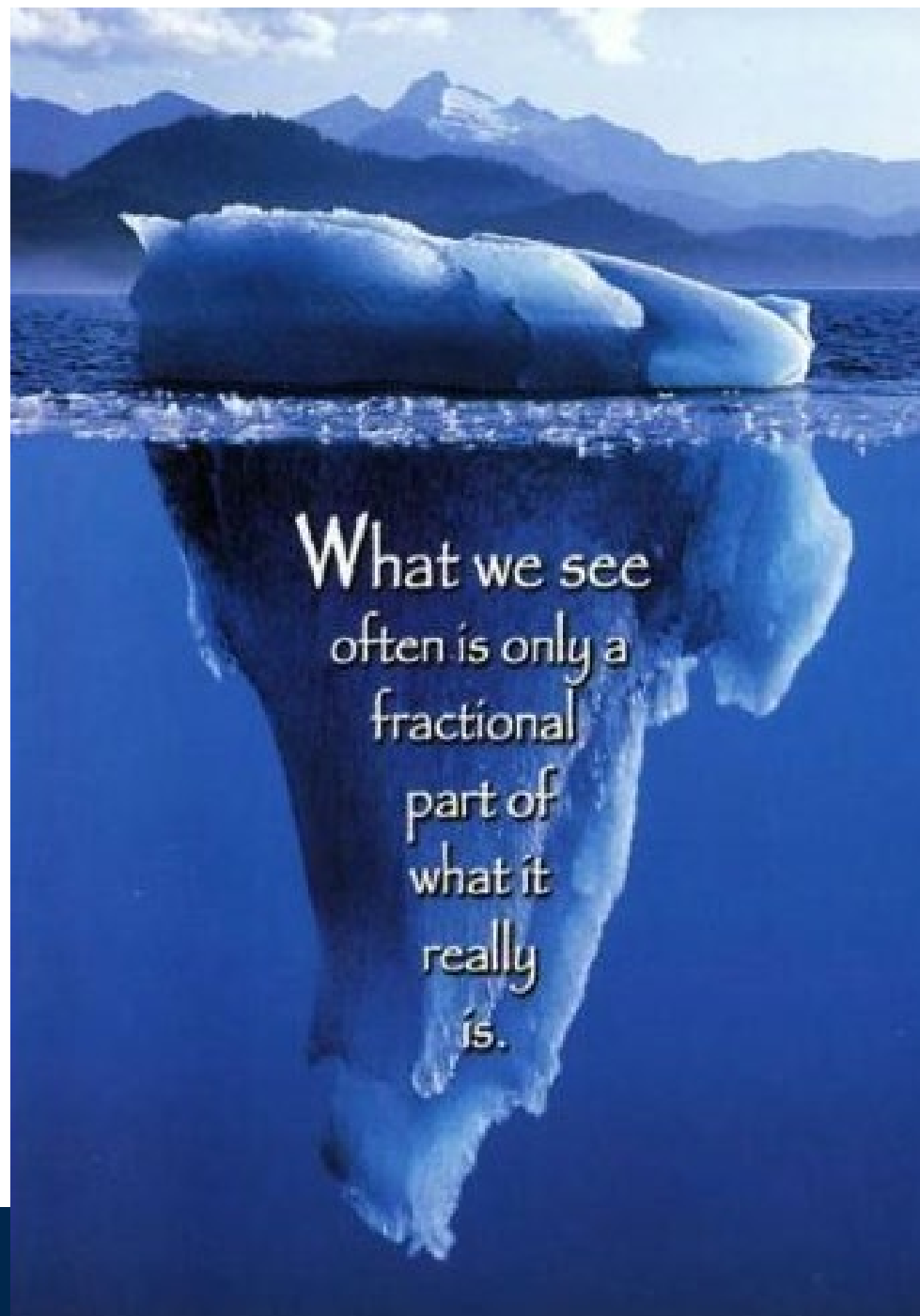
Anna Krzak PA-C, U of M





Clinical Handoffs and Communication: It's All in the Details

Anna Krzak, PA-C
Trauma Burn ICU
Michigan Medicine



SBAR

- SITUATION

- Michigan Medicine lacked a standardized tool for communication and handoff of ICU patients transferring to and from the OR.

- BACKGROUND

- Poor handoff between medical teams during transfers of care has led to sentinel events.

- ASSESSMENT

- Handoff programs improve communication and decrease preventable medical errors and adverse effects.

- RECOMMENDATION

- Assemble a task force to develop and implement a standardized communication handoff tool to be utilized for transfers to and from the OR.



Why are handoffs important?

- Patient safety
- Critical information can be lost in transfers of care
 - Poor communication leads to adverse events
- Provides structure and consistency
- Time savings
 - 2 minute handoff can save 20 min in chart digging

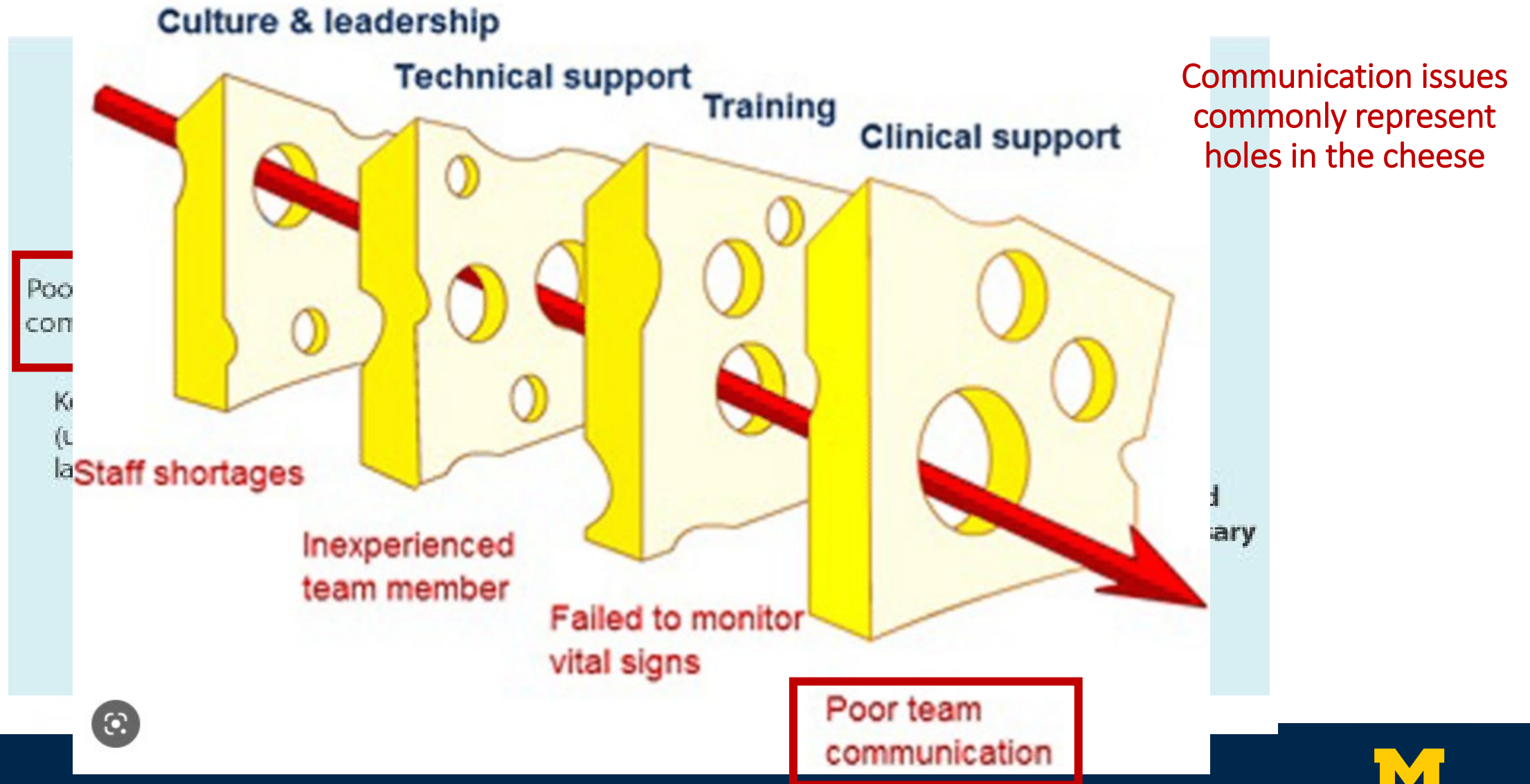
Why handoffs fail?

- Human factors
 - fatigue, info overload
- Systemic factors
 - lack of standardization
 - lack of reinforcement
- Communication errors
 - Incorrect information
 - Varying clinical knowledge between providers
- Clinical factors
 - Complexity in care

Source: Lane-fall. Handoff from OR to ICU



Swiss Cheese Model of Adverse Events



Review of Evidence

- The Joint Commission reports:
 - Typical teaching hospital has 4,000 patient handoffs every day (*1.6 million per year*)
 - 70% of sentinel events were caused by communication breakdowns
 - Handoffs (incomplete or poor quality) play a role in 80% of preventable adverse events
- TJC requires healthcare organizations to implement a standardized approach to handoff communications, including
 - face-to-face report with opportunity to ask and respond to questions
 - verification process

O'Reilly et al. *AMedNews*
2010



Review of Evidence



- Starmer et.al. (Boston Children's Hospital/Harvard) – New England Journal of Medicine 2014
 - I-PASS Handoff Bundle - 7 elements:
 - I-PASS mnemonic for oral and written handoffs
 - 2-hour workshop (TeamSTEPPS teamwork, communication skills, handoff techniques)
 - 1-hour role-playing and simulation session
 - Computer module
 - Faculty development program
 - Direct-observation tools to provide feedback
 - Process/culture-change campaign (logo, posters)
 - Reviewed 10,740 patient admissions (5516 preintervention and 5224 postintervention)
 - Medical-error rate decreased by 23% ($P < 0.001$)
 - Rate of preventable adverse events decreased by 30% ($P < 0.001$)
 - no significant changes in duration of oral handoffs or resident workflow

I	Illness Severity	<ul style="list-style-type: none"> • Stable, “watcher,” unstable
P	Patient Summary	<ul style="list-style-type: none"> • Summary statement • Events leading up to admission • Hospital course • Ongoing assessment • Plan
A	Action List	<ul style="list-style-type: none"> • To do list • Time line and ownership
S	Situation Awareness and Contingency Planning	<ul style="list-style-type: none"> • Know what's going on • Plan for what might happen
S	Synthesis by Receiver	<ul style="list-style-type: none"> • Receiver summarizes what was heard • Asks questions • Restates key action/to do items

Source: Wolinska et al. JPedSurg 2022



Review of Evidence

- Starmer et.al. (Boston Children's Hospital/Harvard) - Journal of Hospital Medicine 2022
 - Prospective Type 2 Hybrid effectiveness implementation study
 - Participation:
 - 32 hospitals
 - 2735 resident physicians, 760 faculty champions
 - Multiple specialties (16 internal medicine, 13 pediatric, 3 other)
 - Results:
 - Collected 1942 error surveillance reports
 - Major and minor handoff-related reported adverse events decreased 47% following implementation
 - 1.7 to 0.9 major events/person-year ($p < .05$)
 - 17.5 to 9.3 minor events/person-year ($p < .001$)



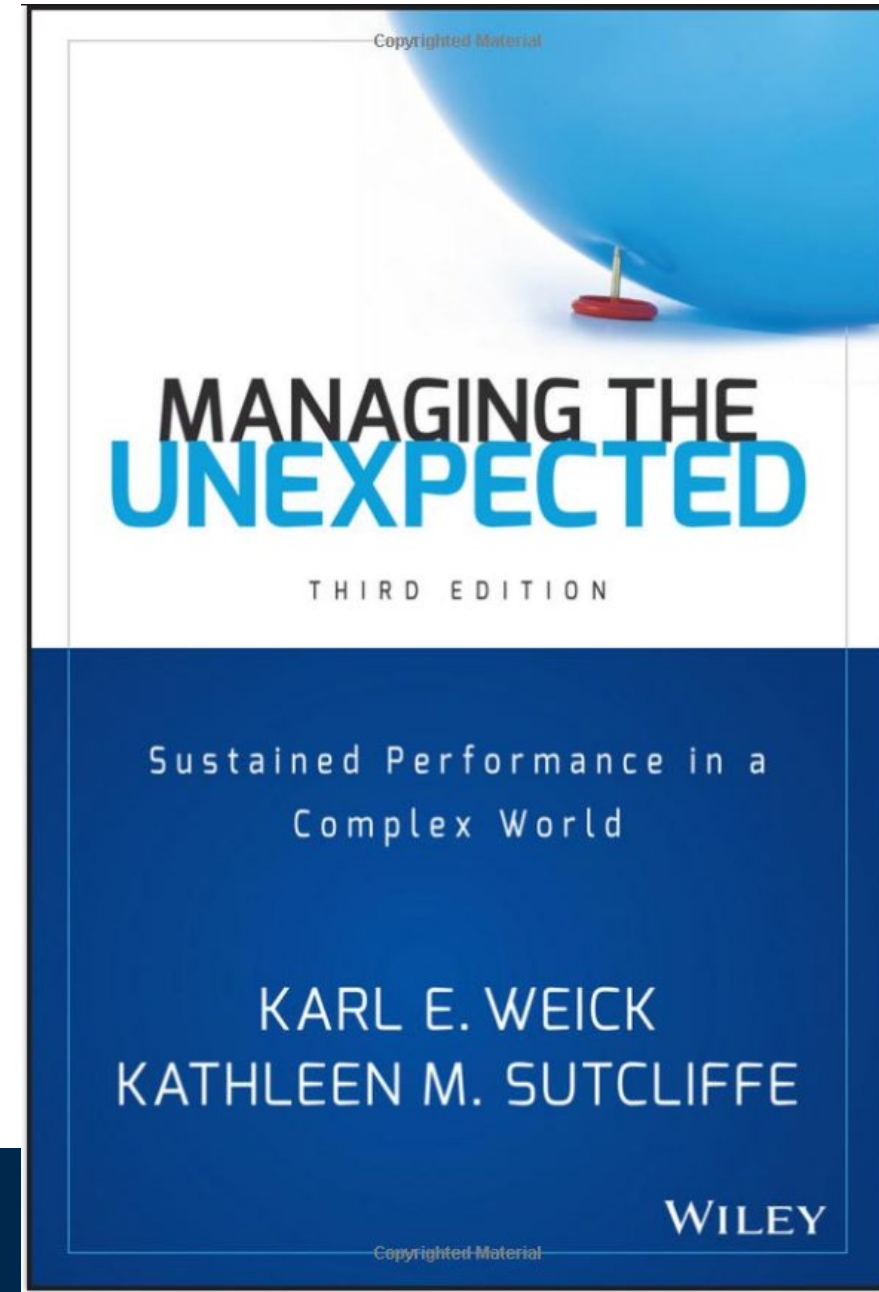
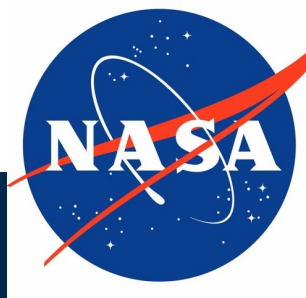
High Reliability Organizations (HROs)

“operate under very trying conditions all the time and yet manage to have fewer than their fair share of accidents.”

Managing the unexpected (Weick & Sutcliffe)

HROs operate as to make systems ultra-safe despite massive complexity and high risk.

Examples: FAA Air Traffic Control system, nuclear power plants, aircraft carriers, NASA





SAFE. RELIABLE. TOGETHER.

HIGH RELIABILITY

MICHIGAN MEDICINE SAFETY PROMISE

***Our** promise to patients, families, and employees: Your safety is our most important priority.*

***We** are open and transparent about errors,
and will stand up for those who speak up.*

***We** are accountable for our actions.*

***We** learn from our errors without blame.*

***We** do not tolerate reckless or disrespectful behavior*

Examples of Standardized Framework

- All handoffs must involve face to face communication (oral & written)
 - SBAR
 - I PASS the BATON
 - Talk back/Teach back method – closed loop communication
 - Electronic health record (EHR) technology
 - greater efficiency, accountability, data completeness
 - create a standardized report sheet from preselected, relevant data already in the record
- Formula 1 racing team approach - What can we learn from Formula 1 pit stops and aviation?
 - “The hand- off is like a pit stop: You have to do lots of different things under time pressure, and if you make a mistake, it can have consequences down the road.”
 - An effective handoff protocol includes:
 - Minimal variability
 - Identifying tasks and assigning responsibility
 - If it’s not someone’s responsibility, it’s no one’s responsibility
 - Providing education and easy-to use resources
 - Measuring results

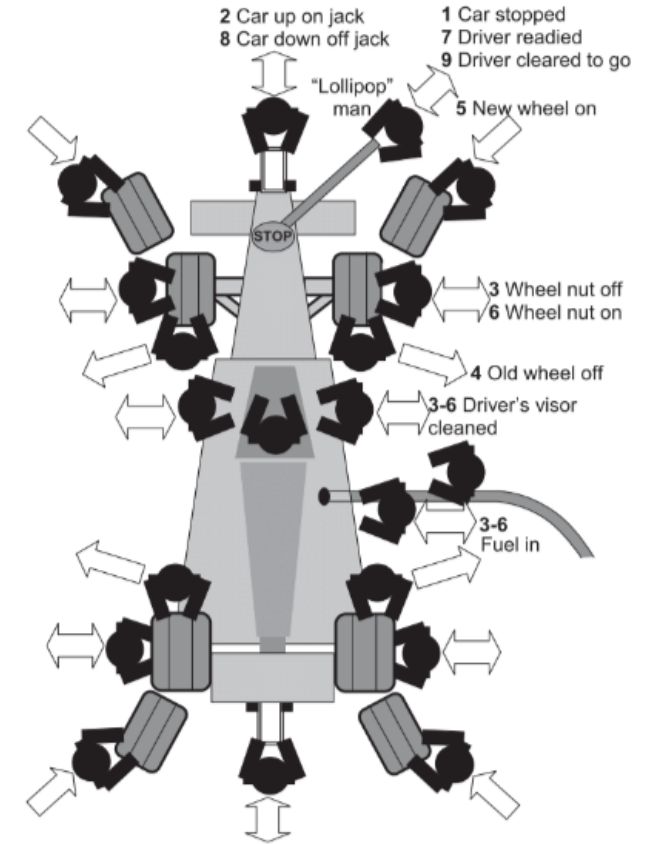


Figure 1
A Formula 1 pit-stop.

Catchpole et al. PedAnes 2007

S	<u>Situation:</u> <ul style="list-style-type: none"> – What is the situation you are writing about? – Identity self, health care site, area, title, date, etc. – Briefly state the problem/issue, what is it, when it happened or started, and how severe.
B	<u>Background:</u> <p>Pertinent background information related to the situation:</p> <ul style="list-style-type: none"> – History of problem/issue, include date/time. – List of current situations. – Most recent occurrences. – National standards, policy, regulations, standard requirements.
A	<u>Assessment:</u> <ul style="list-style-type: none"> – What is your assessment of the situation?
R	<u>Recommendation:</u> <ul style="list-style-type: none"> – What is your recommendation or what do you want (say what you want done)?

“I PASS the BATON” mnemonic for handoffs and healthcare transitions

I	Introduction	Introduce yourself and your role/job (include patient)
P	Patient	Name, identifiers, age, sex, and location
A	Assessment	Presenting chief complaint, vital signs, symptoms, and diagnosis
S	Situation	Current status, circumstances, including code status, level of (un)certainity, recent changes, response to treatment
S	Safety concerns	Critical lab values/reports, socioeconomic factors, allergies, alerts (falls, isolation)
THE		
B	Background	Comorbidities, previous episodes, current medications, family history
A	Actions	What actions were taken or are required, and provide brief rationale
T	Timing	Level of urgency and explicit timing, prioritization of actions
O	Ownership	Who is responsible (nurse/physician/team), including patient/family responsibilities?
N	Next	What will happen next? Anticipated changes? What’s the plan? Contingency plans?

Source: U.S. Department of Defense. *Department of Defense Patient Safety Program: Healthcare Communications Toolkit to Improve Transitions in Care*. <http://www.teamsteppportal.org/component/phocadownload/category/39-essentials-course>. Used with permission.

HATRICC-US study (Penn)

* Handoffs and transitions in critical care
– understanding scalability

- 4 year data collection
- Studying effectiveness of an intervention and how to get it into practice

OUTCOMES

- Implementation
 - Acceptability
 - Appropriateness
 - Sustainability
- Intervention
 - handoff and teamwork quality
 - information omissions
 - patient outcomes

STUDY PROTOCOL

Open Access



Handoffs and transitions in critical care—understanding scalability: study protocol for a multicenter stepped wedge type 2 hybrid effectiveness-implementation trial

Meghan B. Lane-Fall^{1*}, Athena Christakos², Gina C. Russell³, Bat-Zion Hose⁴, Elizabeth D. Dauer⁵, Philip E. Greilich⁶, Bommy Hong Mershon⁷, Christopher P. Potestio⁸, Erin W. Pukenas⁹, John R. Kimberly¹⁰, Alisa J. Stephens-Shields¹¹, Rebecca L. Trotta¹², Rinad S. Beidas¹³ and Ellen J. Bass¹⁴

Abstract

Background: The implementation of evidence-based practices in critical care faces specific challenges, including intense time pressure and patient acuity. These challenges result in evidence-to-practice gaps that diminish the impact of proven-effective interventions for patients requiring intensive care unit support. Research is needed to understand and address implementation determinants in critical care settings.

Methods: The Handoffs and Transitions in Critical Care—Understanding Scalability (HATRICC-US) study is a Type 2 hybrid effectiveness-implementation trial of standardized operating room (OR) to intensive care unit (ICU) handoffs. This mixed methods study will use a stepped wedge design with randomized roll out to test the effectiveness of a customized protocol for structuring communication between clinicians in the OR and the ICU. The study will be conducted in twelve ICUs (10 adult, 2 pediatric) based in five United States academic health systems. Contextual inquiry incorporating implementation science, systems engineering, and human factors engineering approaches will guide both protocol customization and identification of protocol implementation determinants. Implementation mapping will be used to select appropriate implementation strategies for each setting. Human-centered design will be used to create a digital toolkit for dissemination of study findings. The primary implementation outcome will be fidelity to the customized handoff protocol (unit of analysis: handoff). The primary effectiveness outcome will be a composite measure of new-onset organ failure cases (unit of analysis: ICU).

Discussion: The HATRICC-US study will customize, implement, and evaluate standardized procedures for OR to ICU handoffs in a heterogeneous group of United States academic medical center intensive care units. Findings from this study have the potential to improve postsurgical communication, decrease adverse clinical outcomes, and inform the implementation of other evidence-based practices in critical care settings.



* Correspondence: LaneMe@pennmedicine.upenn.edu

¹423 Guardian Drive, 309 Blockley Hall, Philadelphia, PA 19104, USA
Full list of author information is available at the end of the article



Michigan Medicine QI Project

Transitions of Care – ICU to OR & OR to ICU

- Anesthesia led initiative with multidisciplinary involvement
 - ICU providers (intensivists, surgeons)
 - Nurse leadership
 - OR leadership
- PHASE 1 – Report Build – 12/2015 through 8/2016
 - Initially paper document → EMR document → currently paper document
- PHASE 2 – Pilot Site Implementation in TBICU – 8/2016
- PHASE 3 – Pilot roll-out to remaining ICUs – 9/2016
- PHASE 4 – Monitoring and process review – ongoing
- 2020-2021????
- 2022 – Breathe, Reboot, Revise, Reteach



Launch of TBICU & SICU Structured Handoff Process

Key Information

SUBJECT: Launch of TBICU & SICU Structured Handoff Process

APPLIES TO: All Clinical Anesthesia Providers

LOCATION: UH & CVC

LAUNCH DATE: Monday, May 30

ACTION NEEDED: Be aware that all patients in the TBICU & SICU going directly to/from the OR will require a structured bedside handoff utilizing the attached SBAR tool. Please review the attached workflow and communication plan for full details.

On Monday, May 30 the TB ICU and SICU, in conjunction with anesthesia and the nursing teams, will begin a structured handoff process for all patients going directly to/from the OR.

The transfer of patients directly to the TBICU or SICU will be **followed by a robust, structured bedside handoff** involving the anesthesia provider, the bedside ICU RN, an ICU team member (intensivist, APP, etc), a member of the surgical team, and RT (when necessary). The attached SBAR will be completed in the OR prior to transfer to ensure that all relevant information is shared. The ICU should be informed of

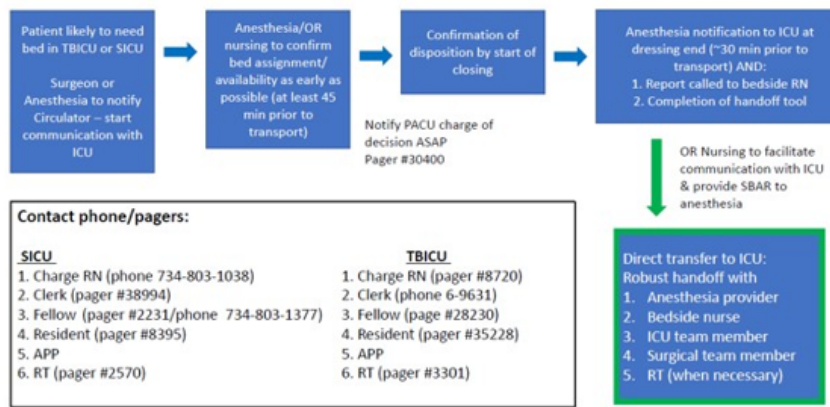
COMMUNICATION

- Global clinical email alerts
- Posters
- Orientation of nursing and providers on each unit

pending transfer approximately 30 min prior to leaving the OR. A copy of the expected bedside workflow upon arrival to the ICU is also attached.

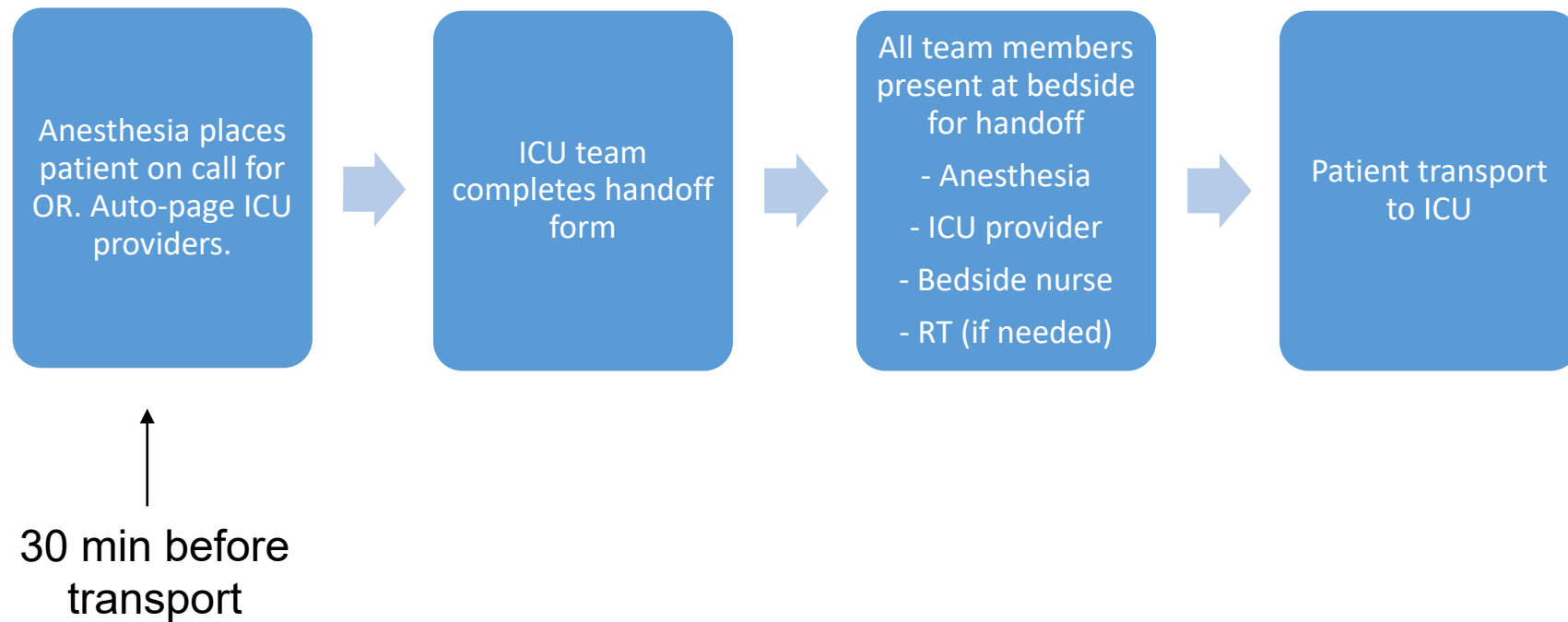
Communication will be crucially important to ensure the process runs smoothly and all team members are aware of the patient disposition post procedure. **Please discuss the intended destination as early as possible with the surgical team.** OR nursing will have copies of the SBAR and facilitate communication between the operating room, ICU, and PACU. The contact information and communication plan will be posted in all of the ORs for reference.

OR to TBICU/SICU Communication for Structured Handoff



When the patient is going from the ICU to the OR, anesthesia should notify the unit when the patient is placed on call (approximately 30-45 min prior to pick up the patient). A member of the ICU team will complete the SBAR, and a bedside handoff will be performed before anesthesia transports to the OR.

ICU to OR Workflow





ICU to OR Handoff Communication Tool

Name: _____
DOB: (PATIENT LABEL HERE) _____
REG: _____

Date: _____ Procedure: _____

ID band on	YES / NO	Chart w/ patient	YES / NO
Surgical consent	YES / NO	Blood consent	YES / NO
Site marked	YES / NO	Metal implants	YES / NO
Belongings off	YES / NO	Family updated	YES / NO
NPO	YES / NO	Since	_____
Isolation precautions	YES / NO		_____
Latex allergy	YES / NO		_____
Allergies:	_____		

<u>AIRWAY</u>			
Difficult airway/Airway Concerns	YES / NO / Unknown		

<u>NEUROLOGIC</u>			
Preop neuro status:	_____		

C-spine cleared	YES / NO	_____	
Current sedation	Propofol / Fentanyl / Midazolam / Dexmedetomidine		
Other:	_____		
ICP monitor	YES / NO	ICP/ CPP Goal	_____
Other NEURO concerns:	_____		

<u>RESPIRATORY</u>			
Supplemental O ₂	YES / NO	_____	
BiPAP	YES / NO	_____	
Intubated	YES / NO	ETT secured at	_____
FiO ₂	_____	PEEP	_____ mPaw _____
Mode/Settings	_____		
Transport Vent?	YES / NO	_____	
Nitric Oxide	YES / NO	_____	
Chest Tubes	YES / NO	Require suction?	_____
Other RESPIRATORY concerns:	_____		

<u>CARDIOVASCULAR</u>			
<u>Vascular Access</u>			
Central	YES / NO	_____	
Arterial	YES / NO	_____	
PA catheter	YES / NO	_____	
Sheath	YES / NO	_____	
Other:	_____		

Infusions Norepinephrine / Vasopressin / Epinephrine / Phenylephrine
Milrinone / Dopamine / Dobutamine / Isoproterenol
Esmolol / Fenoldopam / Nitroglycerin / Nicardipine
NaHCO₃ / Hydrocortisone / Furosemide
Other: _____

Hemodynamic Goals
MAP/SBP: _____
Fluid Balance: _____
Other: _____

Devices
Pacemaker YES / NO Setting _____
ICD YES / NO On / Off, Need to reprogram? _____
IABP YES / NO _____
VAD YES / NO _____
ECMO YES / NO _____
Other CV concerns: _____

HEMATOLOGIC
Active T&S YES / NO Ab Screen _____
Products ordered YES / NO _____
Transf. trigger YES / NO _____
Coagulopathy YES / NO _____
Heparin infusion YES / NO On / Off, Since _____
Other infusion YES / NO On / Off, Since _____
Other HEMATOLOGIC concerns: _____

OTHER
Preop Antibiotics YES / NO _____
Important scheduled meds: _____

TF/TPN YES / NO _____
Insulin infusion YES / NO _____
CRRT YES / NO Need in OR? _____
iHD/PD YES / NO Last run _____
Skin issues YES / NO _____

Recent events/other concerns: _____

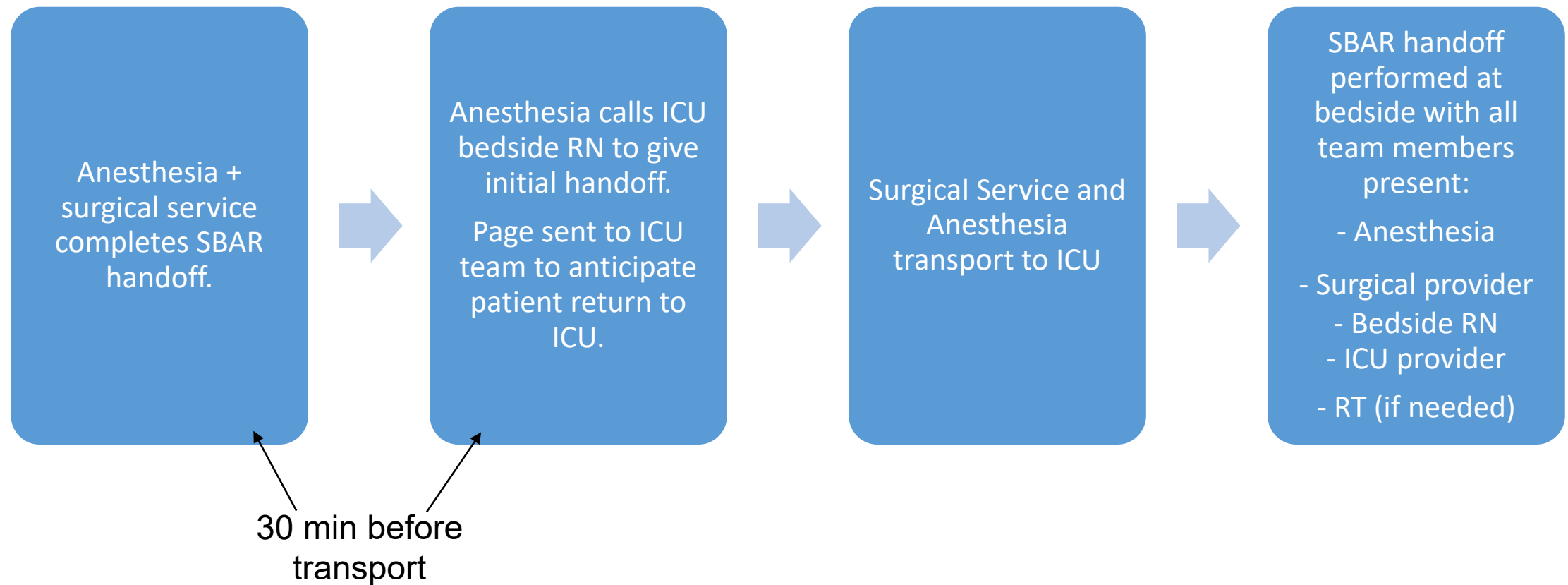
Code Status: _____
ICU Contact: _____ Pager/Phone: _____

Attach last ABG Here:

Detailed, systems-based
checklist to support the
needs of different ICUs



OR to ICU Workflow





OR to ICU Handoff Communication Tool

Patient Label Here

Completed by:
Nursing
Anesthesia
Surgeon

Report given by:

Report received by:

S
Situation

Surgical procedure: _____
Surgeon: _____ Allergies: _____

B
Background

Pre-OP

History of present illness:

PMHx:

Intra-OP

Specimens: ☐ None ☐ Frozen _____ ☐ Permanent _____ ☐ Cultures _____

Airway: Difficult Airway? Yes No Aspiration risk? Yes No Intubated? Yes No

Mask: _____ Technique/Grade View: _____ Vent settings: _____

ETT Size/Secured at: _____ Trach Size/Type: _____

Fluids: Crystalloid: _____ Colloid: _____ Output: EBL: _____ UO: _____

Blood Products: RBC: _____ FFP: _____ Platelets: _____ Cryo: _____ Cell Saver: _____

Other hemostatic agents: _____

Intra-op Concerns: _____

Medications:

Muscle relaxant: _____ Last dose: _____ Last TOF: _____ Reversed? Y/N

Antibiotic: _____ Last dose: _____ Next dose due: _____

Antibiotic: _____ Last dose: _____ Next dose due: _____

Drips: _____

Attach last ABG Here:

A
Assessment

Line Locations:

☐ Peripheral: _____

☐ Central Line: _____

☐ Arterial Lines: _____

Analgesia:

☐ PCA _____

☐ Epidural _____

Drain Locations/character:

☐ Chest Tubes: _____

☐ NG/OG/DHT: _____

☐ J-Tube: _____

☐ Penrose: _____

☐ Other: _____

☐ Foley present (KEEP/REMOVE)

Precautions:

☐ Contact (MRSA / VRE)

☐ C-Diff

☐ Respiratory (TB, COVID)

R
Recommendation

Post op CXR ☐ Yes ☐ No

Airway plan: _____

Post op labs ☐ ABG q __ hr ☐ CBC q __ hr ☐ BMP q __ hr ☐ CMP q __ hr ☐ Coag q __ hr ☐ ROTEM q __ hr

Blood Management Plan: _____

Activity Restrictions (e.g. lay flat time): _____

Anticoagulation/DVT Prophylaxis: _____

Feeding Recommendations: Start with _____ diet on _____ (date)

Drain Management: _____

SURGERY CONTACT: _____



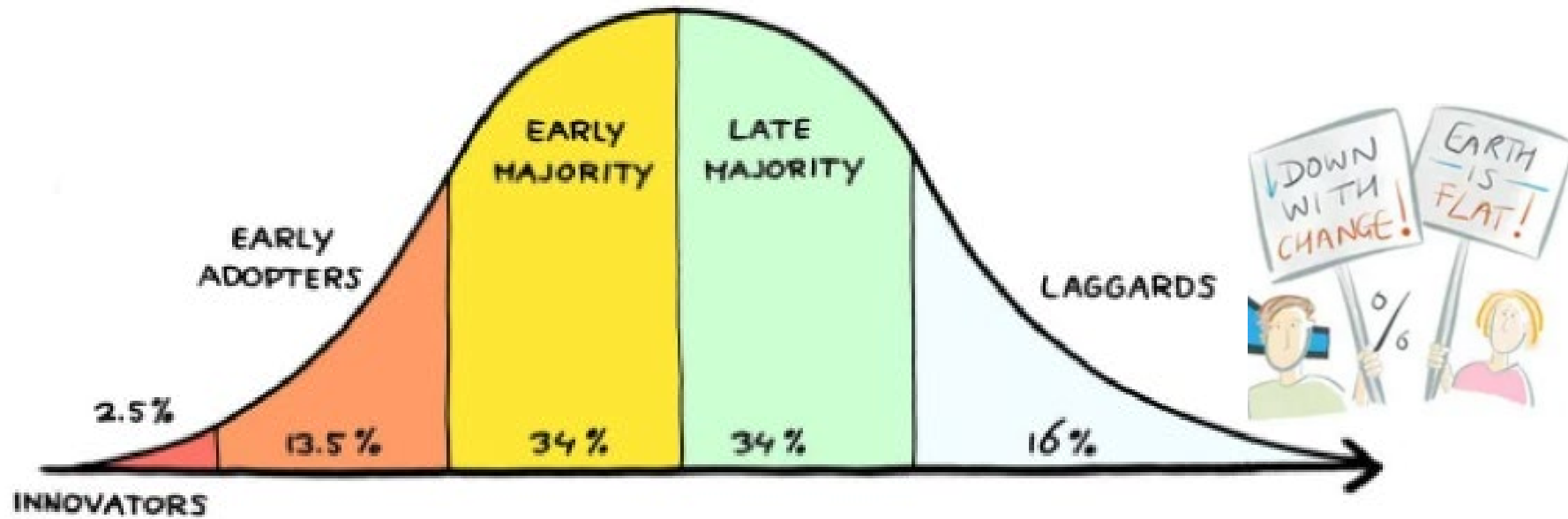
Avoiding Pitfalls and Major Barriers

- **FOSTER LEADERSHIP SUPPORT**
 - Leaders must hold people accountable or non-adherence becomes major issue
- **RESPECT THE STAKEHOLDERS AND THE TEAM**
 - Consider viewpoints of everyone who is involved
- **ENCOURAGE A FEELING OF “ENTITLEMENT”**
 - We have a right to good handoff during transitions of care
 - Recognize it’s a two-way street – quarterback and the receiver must both take responsibility
- **CHAMPION STANDARDIZATION**
- **ADAPT FROM OTHER INSTITUTIONS**
- **START SMALL**
 - Look for innovators and early adopters
- **RE-EVALUTE AND MEASURE OUTCOMES FREQUENTLY (Quarterly)**

Source: Anders- Avoiding Pitfalls in Patient Safety: Starting with Quality Assessment and Improvement



Diffusion of Innovation



Source: Anders - Avoiding Pitfalls in Patient Safety: Starting with Quality Assessment and Improvement

Need some inspiration?

Dr. Megan Lane-Fall - Anesthesiology and Critical Care at U Penn

**“Handoffs from operating room to intensive care unit:
figuring out how to spread and scale an intervention”**

*HATRICC-US study

<https://www.youtube.com/watch?v=2hYI9M70gN0>



References

- Starmer, A.J. Changes in Medical Errors after Implementation of a Handoff Program. N Engl J Med 2014;371:1803-12.
- Jackson, P.D. Evidence Summary and Recommendations for Improved Communication During Care Transitions. Rehabilitation Nursing 2016, 41, 135–148
- Wheeler KK. Effective Handoff Communication. Nursing Critical Care 2015, 10, 13-16.
- O'Reilly KB. Joint Commission quality initiative reduces poor patient handoffs. www.ama-assn.org/amednews/2010/11/01/prsd1104.htm.
- Catchpole, KR. Patient handover from surgery to intensive care: using Formula 1 pit-stop and aviation models to improve safety and quality. Pediatric Anesthesia 2007, 17,470–478.
- Abraham, J. A systematic review of the literature on the evaluation of handoff tools: implications for research and practice. J Am Med Inform Assoc 2014;21:154–162
- Lane-Fall et al. Handoffs and transitions in critical care—understanding scalability: study protocol for a multicenter stepped wedge type 2 hybrid effectiveness-implementation trial. Implementation Science, 2021, 16:63.
- Starmer et al. Implementation of the I-PASS handoff program in diverse clinical environments: A multicenter prospective effectiveness implementation study. Journal of Hospital Medicine, 2022.
- Wolinska JM. I-PASS enhances effectiveness and accuracy of hand-off for pediatric general surgery patients. Journal of Pediatric Surgery 2022, 57, 4: 598-603.
- Anders, M. Avoiding Pitfalls in Patient Safety: Starting with Quality Assessment and Improvement. <http://maryland.ccproject.com/2015/12/30/anders-avoiding-pitfalls-in-patient-safety-starting-with-quality-assessment-and-improvement/>





ICU and OR Handoffs

Nadia Obeid MD, Henry Ford Detroit





O.R. TO SICU TRANSFER OF CARE (POST-OP TIMEOUT)

- Critical monitor connections are to be made by RN/RT in this order:
 - 1) Pulse oximeter
 - 2) Arterial Line / NIBP
 - 3) ECG leads
 - 4) Vent / ETCO₂
 - 5) Tubes (chest tubes, NGT, etc)
- **ONLY** immediate patient care needs should be discussed while connecting a patient to monitors.
- **Once critical connections complete & everyone (RN, Surgery, Anesthesia, SICU, & RT) is present, it is safe to begin report.**

ANESTHESIOLOGY TEAM

- ☐ Pertinent History (Medical, Surgical, Allergies, Medications)
- ☐ Code Status
- ☐ Type of anesthesia (eg. general, local, spinal)
- ☐ Airway: difficult airway?(Y/N), intubation technique, airway issues (if any)
- ☐ Breathing: ventilator settings, ventilation concerns (if any), treatments given
- ☐ Circulation/Hemodynamics: Intra-op issues, vasopressors
- ☐ Paralytic status
- ☐ Operative Volume Summary _____ →
- ☐ Summary of narcotics given
- ☐ Current Infusions (pressors, sedation, insulin)
- ☐ Lines/IV access & location: ☐ Arterial line ☐ Central line ☐ Cordis ☐ Swan-Ganz ☐ Peripheral IV
- ☐ **ANESTHESIA'S PRIMARY CONCERN IS** _____

EBL: _____
Fluids: _____
Urine: _____
PRBC: _____
FFP: _____
Platelets: _____
Cryo: _____
Cell-saver: _____

SURGERY TEAM

- ☐ Surgery performed
- ☐ Unanticipated findings, complications
- ☐ Expected postop exam (e.g. pulse/doppler exam, known neuro deficits)
- ☐ Postop ABX and duration (if needed)
- ☐ Postop labs needed
- ☐ DVT Prophylaxis or Anticoagulation
- ☐ Diet (e.g. NPO, regular diet, TPN, tube feeds)
- ☐ Dressings/wound care instructions
- ☐ Drain/Tube care instructions (e.g. chest tube to suction, NGT to LIS, G tube to gravity)
- ☐ Special Instructions (e.g. do not manipulate NGT, Q1h neurovasc/neuromotor checks, HOB limit/positioning, empty drain q4h)
- ☐ **Specific order set needed? (Carotid Endarterectomy/Carotid Artery Stenting; Aortic Dissection— medications & treatment)**
(MUST USE CEA Post-Op/Aortic Dissection order sets; DO NOT use the General Adult ICU Admission Order Set for these patients)
- ☐ **SURGERY'S PRIMARY CONCERN IS** _____

PRIMARY TEAM:

STAFF SURGEON:

CONTACT #:

Wrap Up

Judy Mikhail, PhD MBA



Conclusion

- ◆ Thank you for attending
- ◆ Evaluations
 - Look for email
 - Fill out and submit
- ◆ Questions?
- ◆ See you in May