

# **Michigan Acute Care Surgery Collaborative**

**Ypsilanti, MI  
September 15, 2022**



# Disclosures

## ◆ Mark Hemmila Grants

- Blue Cross Blue Shield of Michigan
- Michigan Department of Health and Human Services
- National Institutes of Health - NIGMS

**No Photos Please**



# Agenda

- ◆ Welcome/Updates
- ◆ Mark Hemmila
  - Power
  - Data/Reports
  - Opioids
- ◆ Lunch



# Agenda

- ◆ Jill Jakubus
  - Literature Review
- ◆ Kim Kramer
  - Data Updates
  - Data Validation
- ◆ Mark Hemmila
  - PROMs

# Future Meetings

- ◆ 3 per year
- ◆ Thursday December 8, 2022
- ◆ Wednesday April 26, 2023
- ◆ Wednesday September 7, 2023
- ◆ Thursday November 30, 2023
  
- ◆ Let us know if you see problems with dates
- ◆ In-person if possible
  - Virtual – Weather, COVID

# Recruitment

- ◆ Potentials

- Bronson

- ◆ Kalamazoo

- ◆ Battle Creek

- St. Marys Saginaw

- ◆ Slow going

# BCBSM 2022 and 2023

## ◆ SOW Deliverables

- 3 Meetings/yr
- ArborMetrix reporting - up
- Data validation program - 2022
- Performance Index
  - Participation 2022 - Not being included by BCBSM
  - 2 metrics 2023 - No target date for P4P yet
  - MVC and EGS data > discussion with BCBSM

# Meeting Goals

- ◆ A little less prescribed data reporting today
- ◆ Feedback from you
  - Questions on data/reports
  - Discussion
    - ◆ Measurable objectives
    - ◆ Clinical Guidance

# **Data and Reports**

**Mark Hemmila, MD**



# Overview of Data Capture

- ◆ Data pull July 1, 2022
- ◆ Diseases
  - Acute Appendicitis
  - Acute Gallbladder disease
    - ◆ Cholecystitis
    - ◆ Choledocholithiasis/Cholangitis
    - ◆ Gallstone pancreatitis
  - SBO
    - ◆ Hernia (if present)
  - Emergent Exploratory Laparotomy

# Reports

- ◆ Time frame
  - 7/1/2019 to 7/1/2022
  - 3 years
  - Power
- ◆ Unadjusted
- ◆ Risk-adjustment
- ◆ Tables
- ◆ Graphs

# Reports

## ◆ Index

- Primary disease for which admitted
- Days post-discharge restriction
  - ◆ Acute appendicitis, 12, 24, 36 mo
- Mortality and complications are collapsed down into the index admission
  - ◆ Joey Gall – admit and cholecystectomy, discharge home
  - ◆ Joey Gall – readmit for cystic duct stump leak
  - ◆ Joey Gall – readmit for c. diff colitis
- Joey Gall - readmit Y, cystic duct stump leak Y, and c. diff colitis Y

# Spectrum

- ◆ Two hospitals
- ◆ Butterworth
- ◆ Blodgett
- ◆ Good volume at both
- ◆ Split to provide better insight for QI
  - Butterworth = SH
  - Blodgett = SB

# Risk Adjustment Models

## ◆ Summary

- All
- Operative
- Non-operative
- Account for disease and operation

## ◆ Disease specific

- Acute appendicitis
- Gallbladder disease
- SBO
- Emergent Ex. Lap

**Total = 14,632 Index**

**2116**

37

**3426**

21

**2042**

7

**3155**

27

**310**

1

**1566**

19

**419**

9

**667**

35

**448**

13

**483**

16



# Statistical Power

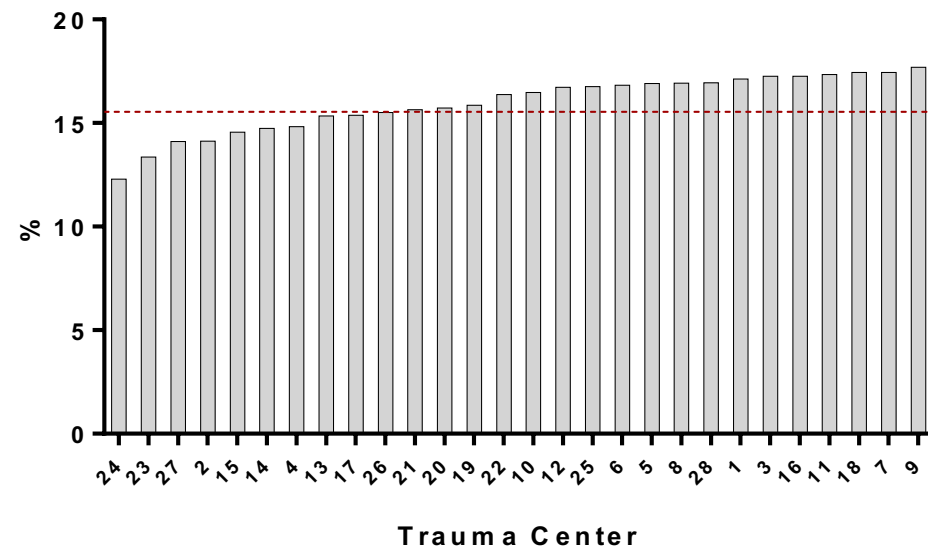
## ◆ Data

- From x date to y date
- N patients
- How much time and change elapses from x to y patients. Is the information stale?

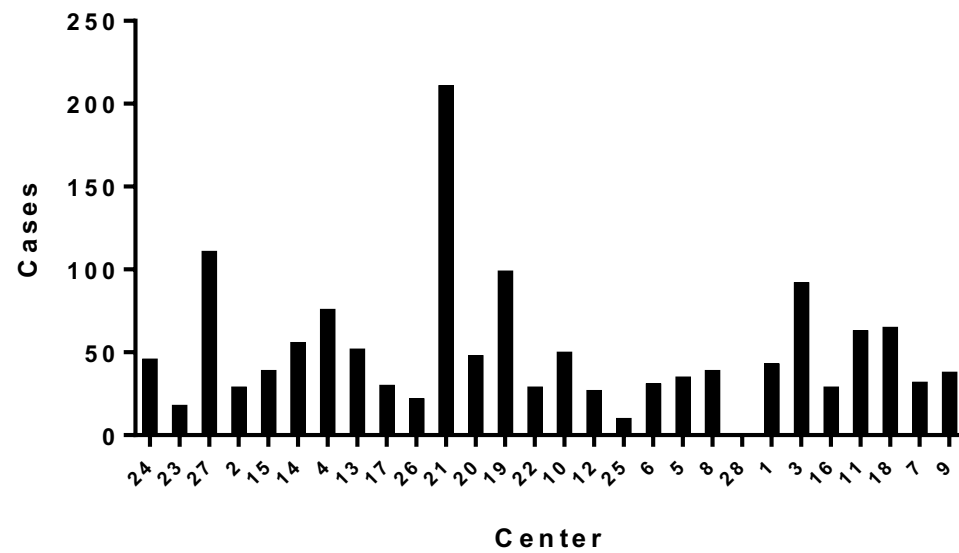
## ◆ Disease and problem specific

- Acute appendicitis
- Rate of problem (Readmission, Deep SSI)

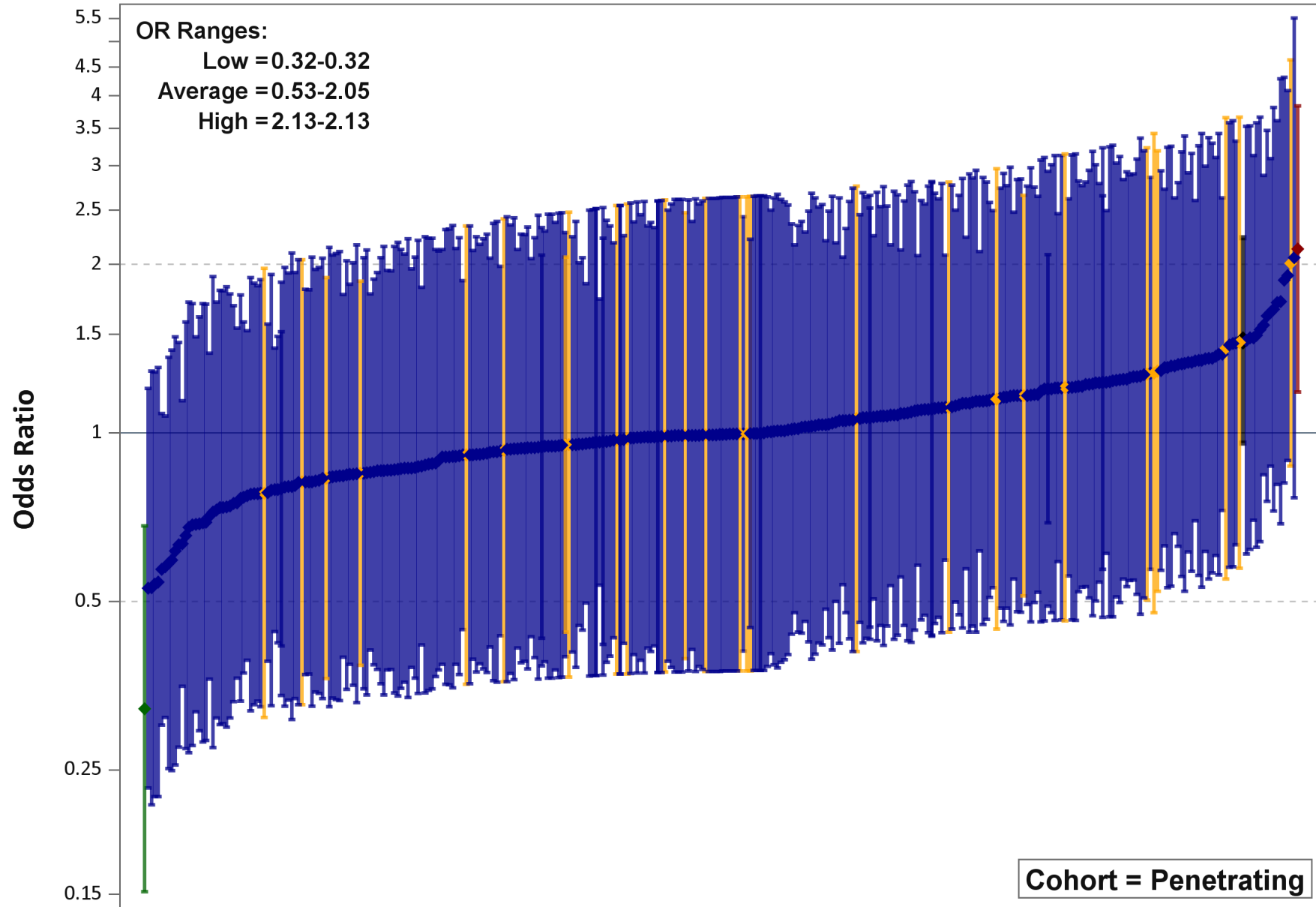
**Mortality (Cohort 3 - Blunt Multi w/o DOA's)**



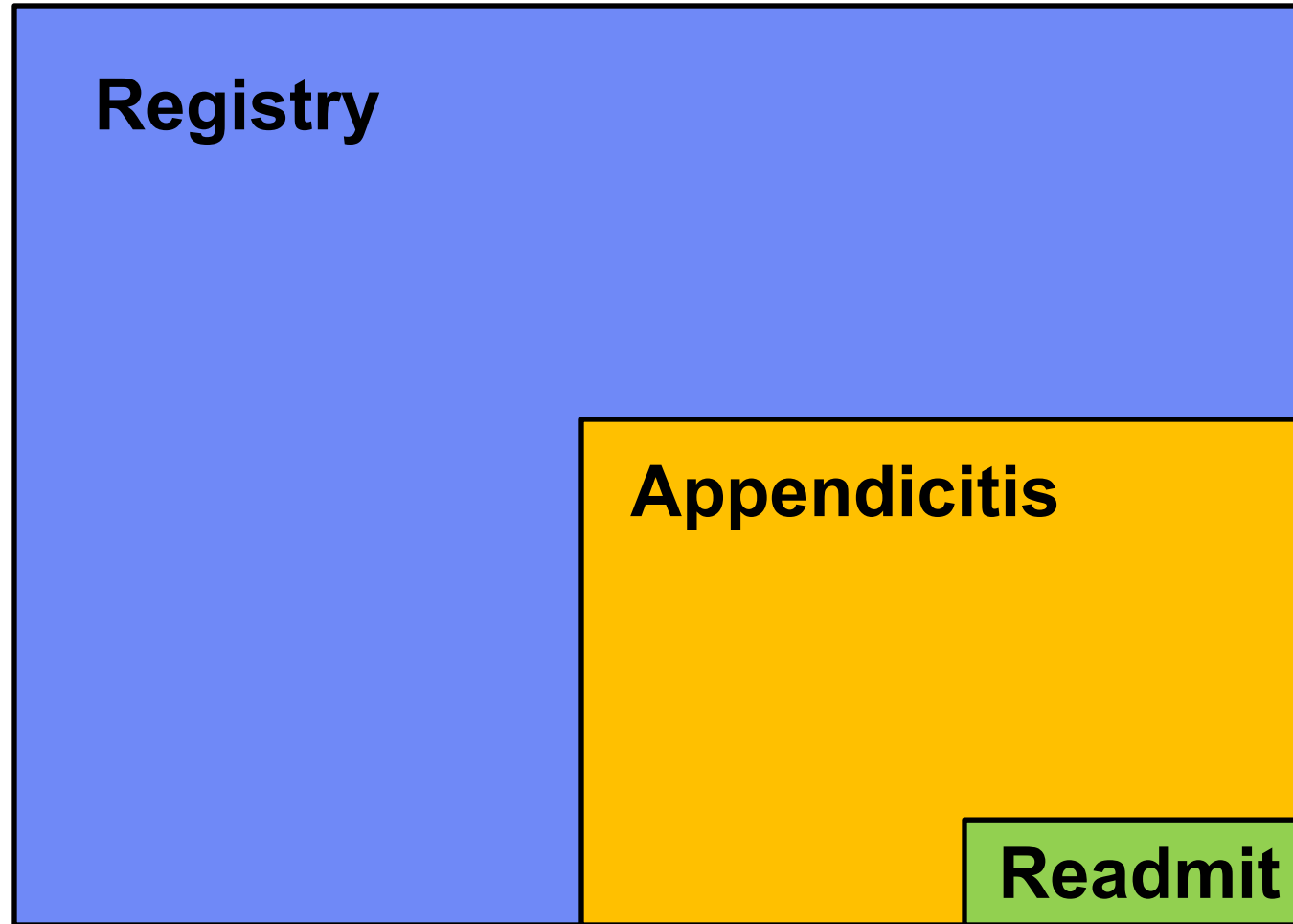
**Case Volume Mortality (Cohort 3)**



Odds Ratios (95% Confidence Intervals) by TQIP Hospital; Mortality



# Data



# Statistical Power

The power of any test of statistical significance is defined as the probability that it will reject a false null hypothesis. **Statistical power** is inversely related to beta or the probability of making a Type II error. In short,  $\text{power} = 1 - \beta$ .

# Statistical Power

Or

The **power** or sensitivity of a binary hypothesis test is the probability that the test correctly rejects the null hypothesis ( $H_0$ ) when the alternative hypothesis ( $H_1$ ) is true. It can be equivalently thought of as the probability of accepting the alternative hypothesis ( $H_1$ ) when it is true—that is, the ability of a test to detect an effect, if the effect actually exists.



# Statistical Power

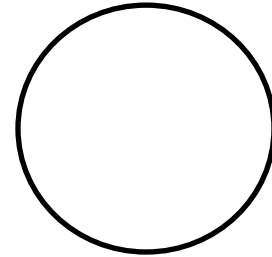
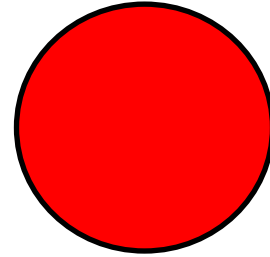
G#@& it Hemmila

# Statistical Power

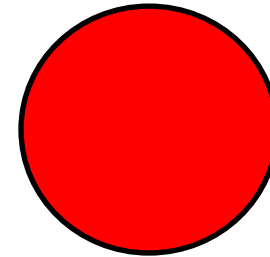
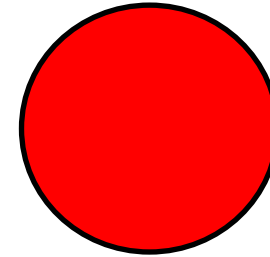
In plain English, statistical power is the likelihood that a study will detect an effect when there is an effect there to be detected.

If statistical power is high, the probability of making a Type II error, or concluding there is no effect when, in fact, there is one, goes down.

# Statistical Power

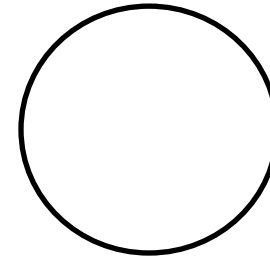
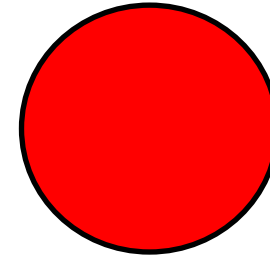


# Statistical Power



# Statistical Power

Design your study or test to  
detect a difference.



# Statistical Power

## VIEWPOINT

## Power Outage—Inadequate Surgeon Performance Measures Leave Patients in the Dark

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**ProPublica created their Surgeon** Scorecard, released in July, in an attempt to shed light on surgeons' outcomes and help patients choose high-quality surgeons for 8 common, elective procedures.<sup>1</sup> Whether the Scorecard has achieved these goals has become the subject of controversy. Its release has served as a lightning-rod for criticism, with many questioning the validity and reliability of its results. Supporters of the Scorecard argue that the ratings are an imperfect but valuable first step toward devising a transparent, accurate surgeon performance measure. Critics have questioned the use of a data set that lacks key performance indicators and potentially flawed statistical analysis, ultimately claiming that the Scorecard's imperfections render it useless.<sup>2</sup>

Low case volumes make the likelihood of type II errors (ie, incorrectly assuming surgeons are no different from the average) on the Scorecard a near certainty, and the implications are troubling. Although the Scorecard is able to correctly identify some of the most-concerning surgeons with particularly poor performance (ie, complication rates more than twice the national average), many others might be wrongfully reassured their performance is up-to-par, and patients may be falsely comforted they have chosen a safe surgeon. Ultimately, both surgeons and patients remain in the dark.

The problem of small samples is not unique to the Scorecard. Studies have found most commonly reported



# Application of power analysis to determine the optimal reporting time frame for use in statewide trauma system quality reporting

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## ARTICLE INFO

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## ABSTRACT

**Background:** Meaningful reporting of quality metrics relies on detecting a statistical difference when a true difference in performance exists. Larger cohorts and longer time frames can produce higher rates of statistical differences. However, older data are less relevant when attempting to enact change in the clinical setting. The selection of time frames must reflect a balance between being too small (type II errors) and too long (stale data). We explored the use of power analysis to optimize time frame selection for trauma quality reporting.

**Methods:** Using data from 22 Level III trauma centers, we tested for differences in 4 outcomes within 4 cohorts of patients. With bootstrapping, we calculated the power for rejecting the null hypothesis that no difference exists amongst the centers for different time frames. From the entire sample for each site, we simulated randomly generated datasets. Each simulated dataset was tested for whether a difference was observed from the average. Power was calculated as the percentage of simulated datasets where a difference was observed. This process was repeated for each outcome.

**Results:** The power calculations for the 4 cohorts revealed that the optimal time frame for Level III trauma centers to assess whether a single site's outcomes are different from the overall average was 2 years based on an 80% cutoff.

**Conclusion:** Power analysis with simulated datasets allows testing of different time frames to assess outcome differences. This type of analysis allows selection of an optimal time frame for benchmarking of Level III trauma center data.

## Simple Test to Measure Power

- ◆ 1-sample: Is a hospital different than the population benchmark?
- ◆ 1-sided: Is the hospital higher (worse) than the benchmark?
- ◆ Stata sampsi command
- ◆ Alpha = 0.05, significance
- ◆ Power = 80%
- ◆ Collaborative Mean
- ◆ 1.5x or 2.0x higher than Mean

# MACS

Report	Mean Rate (%)	Difference	n Patients	Difference	n Patients
Any Complication	21.2	2x	33	1.5x	127
Incisional SSI	1.5	2x	648	1.5x	2344
Organ space SSI	2.6	2x	368	1.5x	1335
Anastomotic leak	0.4	2x	2468	1.5x	8903
VTE	0.9	2x	1089	1.5x	3934
Pneumonia	1.3	2x	750	1.5x	2711
ED Visit	7.5	2x	119	1.5x	436
Readmission	14.3	2x	56	1.5x	209
Mortality	3.5	2x	270	1.5x	981
Low	1.0	2x	979	1.5x	3536
Medium	4.0	2x	235	1.5x	853
High	20.0	2x	36	1.5x	137

## **What I now know**

- ◆ Reports should have meaning to you
- ◆ Try to focus on outcomes with sufficient power
- ◆ 3-year time frame for reports

**Total = 14,632 Index**

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**Michigan Acute Care Surgery Report  
Summary • XX • 7/1/2019-7/1/2022**

<u>Index Admission</u>		<b>Your Center N = 3155</b>		<b>Aggregate N = 14632</b>	
<u>Variable</u>		<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>
Total Cases	Index Admissions	3155	21.6	14632	100.0
	Total Admissions (with Readmissions)	3969	23.7	16773	100.0
By Disease	Appendicitis	660	20.9	3704	25.3
	Gallbladder	978	31.0	5953	40.7
	SBO	629	19.9	2786	19.0
	Exploratory Laparotomy	268	8.5	1355	9.3
	Other/None	620	19.7	834	5.7

<u>Index Admission</u>		Your Center N = 2885		Aggregate N = 12478	
<u>Variable</u>		<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>
By Disease	Appendicitis	585	20.3	3177	25.5
	Gallbladder	883	30.6	5021	40.2
	SBO	570	19.8	2368	19.0
	Exploratory Laparotomy	226	7.8	1094	8.8
	Other/None	621	21.5	818	6.6
Operation	Appendicitis				
	Operative	424	72.5	2747	86.5
	Non-operative	161	27.5	430	13.5
	Gallbladder				
	Operative	676	76.6	4226	84.2
	Non-operative	207	23.4	795	15.8
	SBO				
	Operative	167	29.3	833	35.2
	Non-operative	403	70.7	1535	64.8
	Other/None				
	Operative	251	40.4	412	50.4
	Non-operative	370	59.6	406	49.6



<u>Index Admission</u>		Your Center N = 3155		Aggregate N = 14632	
<u>Variable</u>		<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>
Diagnosis (ICD-10) 15 most frequent	K56.609, Unspecified intestinal obs	251	8.0	1101	7.5
	K35.80, Acute appendicitis, unspe	146	4.6	1090	7.4
	K80.00, Calc of GB w/ acute chole	145	4.6	1030	7.0
	K35.30, Acute appendi, loc perit	31	1.0	992	6.8
	K81.0, Acute cholecystitis	310	9.8	808	5.5
	K80.12, Calc of GB w/ acute & chr	14	0.4	608	4.2
	K80.10, Chronic cholecystitis	9	0.3	549	3.8
	K85.10, Biliary acute pancrea	90	2.9	538	3.7
	K35.32, Acute appendi, loc per	92	2.9	490	3.3
	K56.50, Intestinal adhes, with obs	84	2.7	417	2.8
	K35.89, Other acute appendi	313	9.9	381	2.6
	K56.60, Unspec intes obs	71	2.3	348	2.4
	K35.33, Acute appendi, loc perit	41	1.3	343	2.3
	K80.50, Calculus of bile duct w/o choolangitis or cholecyst w/o obst	126	4.0	269	1.8
	K80.20, Calc of GB w/o cholecys	56	1.8	228	1.6
	All other	1373	43.5	5433	37.1



<u>Index Admission</u>		Your Center N = 3155		Aggregate N = 14632	
<u>Variable</u>		<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>
CPT Code	47562, Laparoscopic cholecystectomy	616	19.5	4052	27.7
15 most frequent	44970, Laparoscopic appendectomy	415	13.2	2979	20.4
	47563, Lap cholecystectomy w IOC	30	1.0	585	4.0
	44120, Resection of small intestine	89	2.8	443	3.0
	44005, Freeing of bowel adhesion	57	1.8	331	2.3
	47600, Open cholecystectomy	91	2.9	245	1.7
	49000, Exploration of abdomen	31	1.0	173	1.2
	44143, Partial colectomy w colostomy	40	1.3	161	1.1
	44140, Partial colectomy w anast	38	1.2	151	1.0
	43840, Gastorrhaphy, Graham patch	18	0.6	136	0.9
	44950, Open appendectomy	37	1.2	117	0.8
	44160, Partial colectomy with TI	26	0.8	109	0.7
	49561, Repair ventral/inc hernia	36	1.1	109	0.7
	49320, Laparoscopy, diagnostic	21	0.7	84	0.6
	49587, Repair umbilical hernia	22	0.7	75	0.5
	All other	334	10.6	1169	8.0



Michigan Acute Care Surgery Report  
Summary • XX • 7/1/2019-7/1/2022

Risk Adjusted Outcomes

Index Admission with Readmissions

		Your Center		Aggregate			
<u>Risk Adjusted Outcomes</u>		N = 3155		N = 14632			
<u>Index Admission with Readmissions</u>							
<u>Variable</u>		<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>P*</u>	<u>Outlier</u>
Any complication	Overall, unadjusted	707	22.4	3095	21.2	0.056	<div></div>
	Overall, risk-adjusted		22.7		21.2		
	With operation, unadjusted	495	23.9	2432	21.3	0.042	<div></div>
	With operation, risk-adjusted		23.3		21.3		
	Without operation, unadjusted	212	19.5	663	20.6	0.475	<div></div>
	Without operation, risk-adjusted		21.7		20.7		
Incisional SSI	With operation, unadjusted	46	2.2	167	1.5	0.032	<div></div>
	With operation, risk-adjusted		2.1		1.5		
Organ space SSI	With operation, unadjusted	53	2.6	302	2.6	0.525	<div></div>
	With operation, risk-adjusted		2.4		2.6		
Management	Operation	2069	65.6	11421	78.1		
	Non-operative	1086	34.4	3211	21.9		

### Key

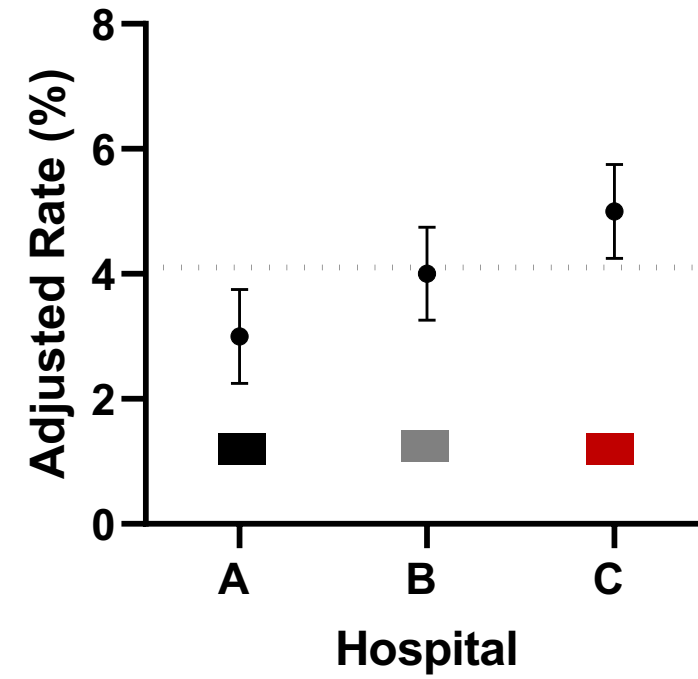
Low Outlier

Average

High Outlier



### Example

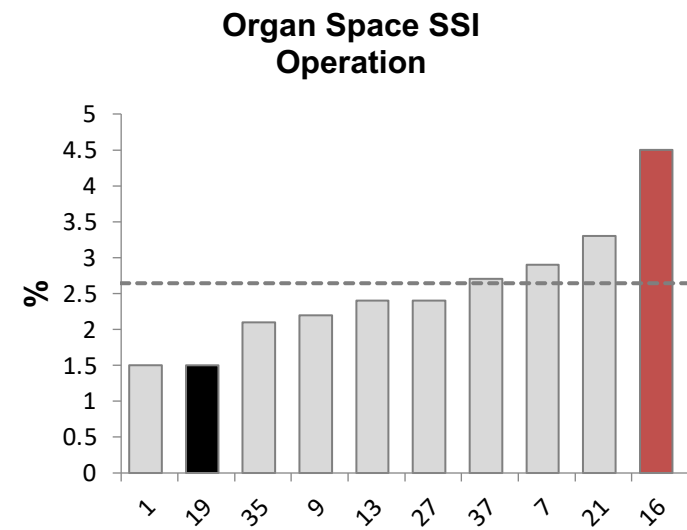
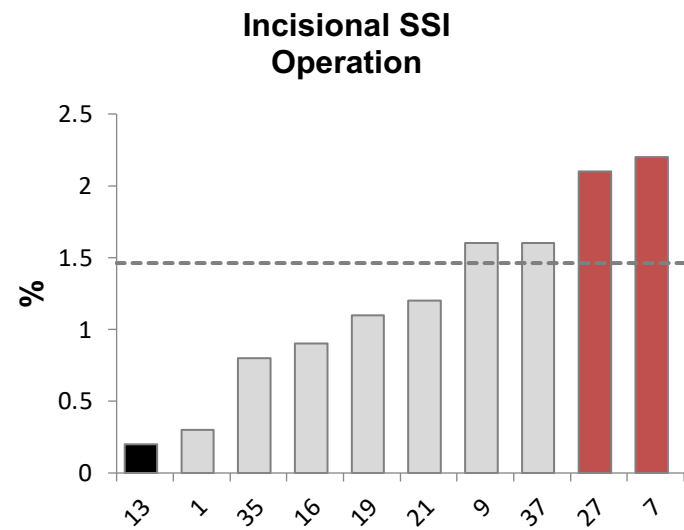


# Summary Risk Adjustment

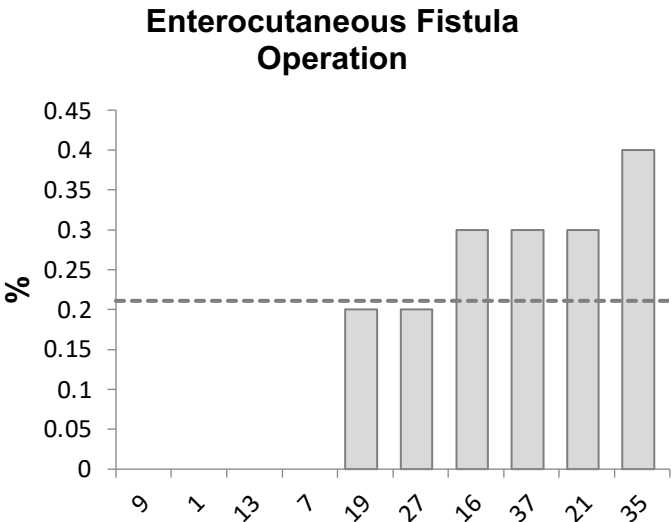
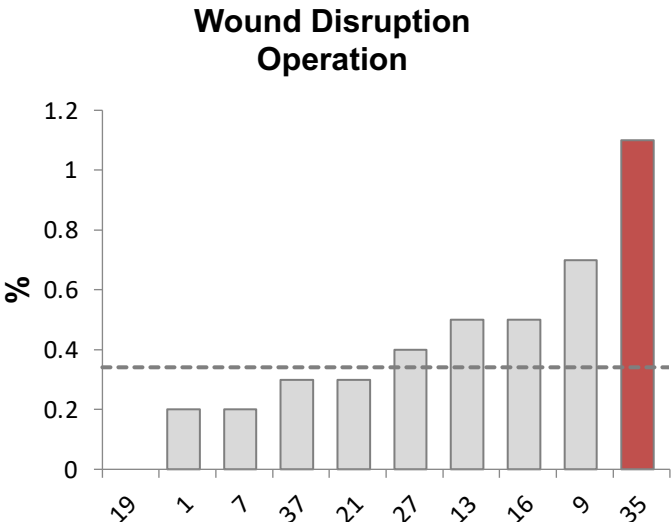
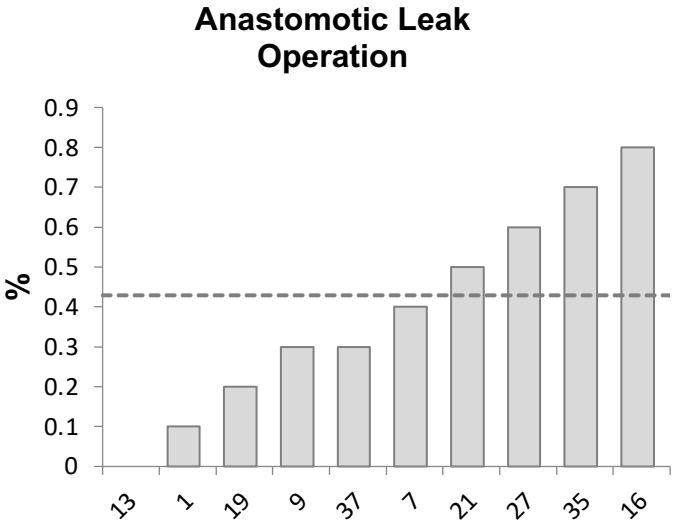
- ◆ Age (categorical)
- ◆ Sex
- ◆ Race
- ◆ Ethnicity
- ◆ Transfer
- ◆ Insurance type
- ◆ Disease
- ◆ AAST grade  $\geq 3$
- ◆ ASA score  $\geq 3$
- ◆ Operation
- ◆ Operation type
- ◆ Time to operation
- ◆ Perforation
- ◆ Ostomy
- ◆ IR procedure index admit
- ◆ Number of comorbid conditions
- ◆ BMI (categorical)
- ◆ Individual comorbid
- ◆ Risk ratio mortality
- ◆ Risk ratio any complication

**C-index = 0.961 to 0.610**

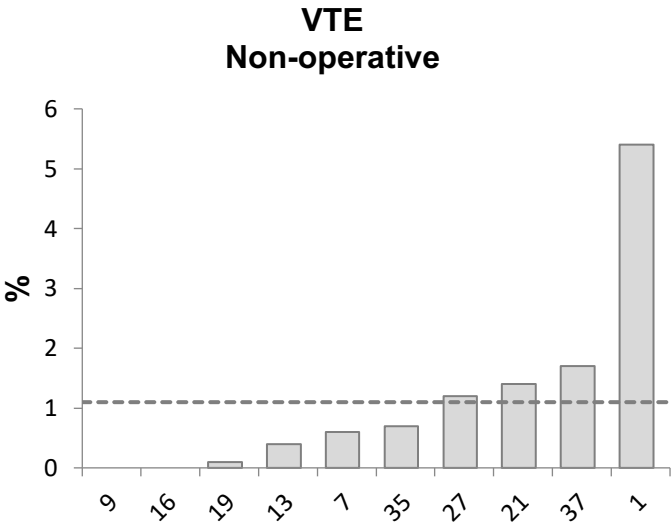
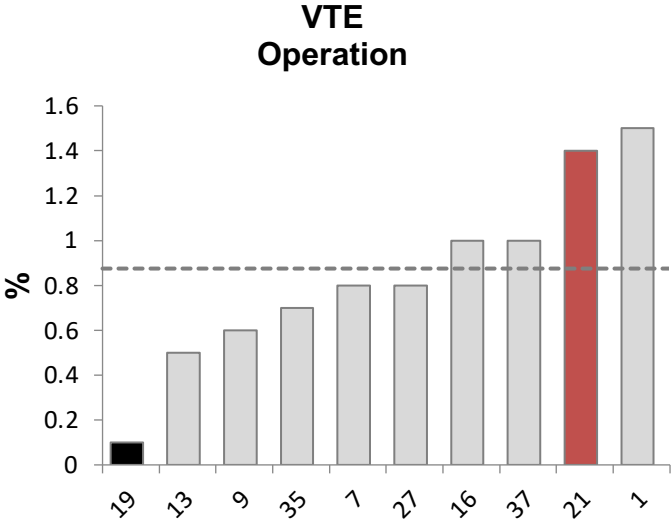
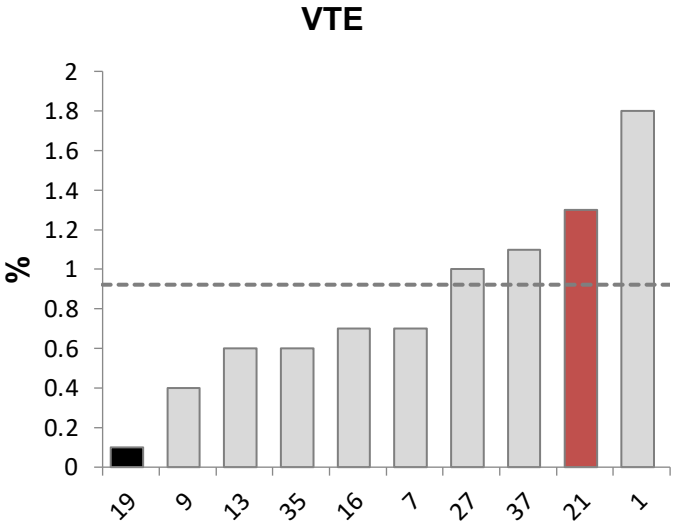
Summary



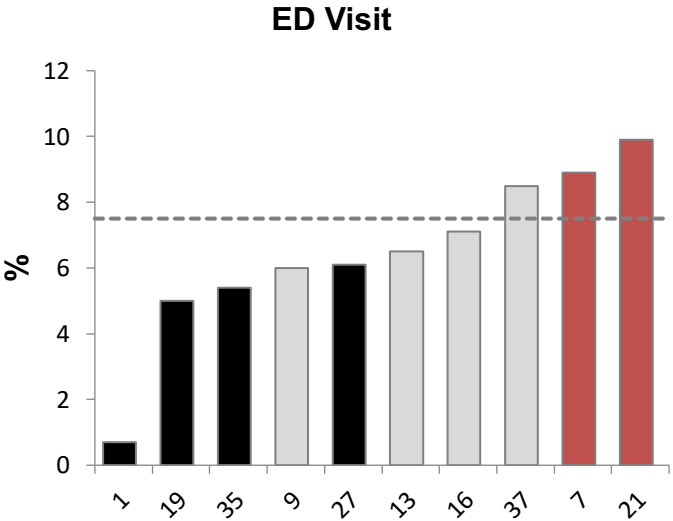
# Summary



Summary

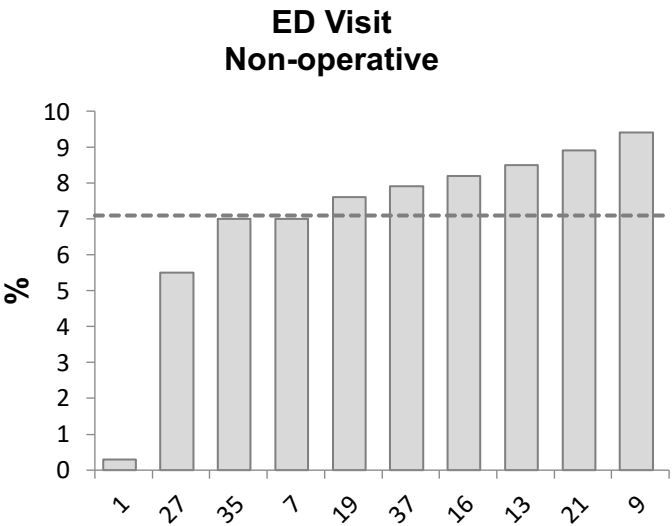
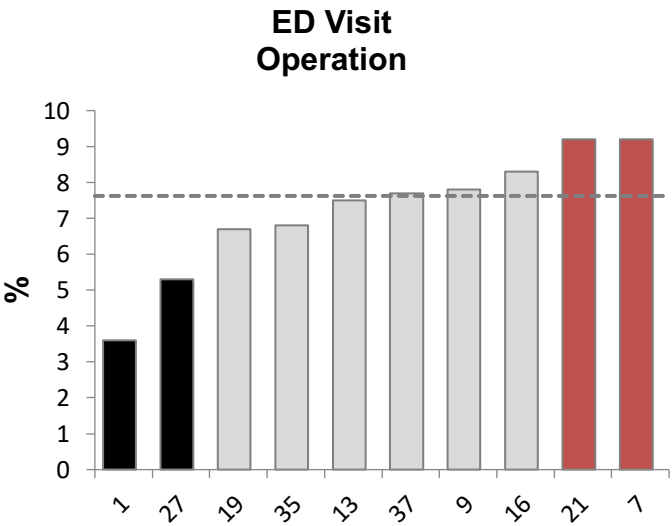


Summary



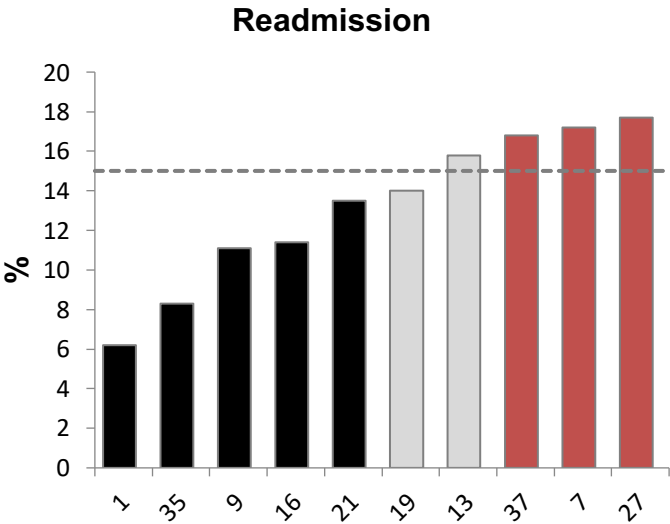
7.5% x 14,632 = 1,097 patients

\$1,273

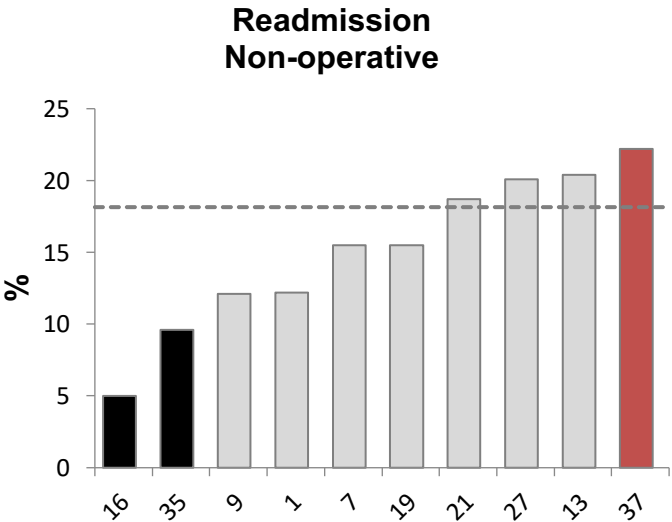
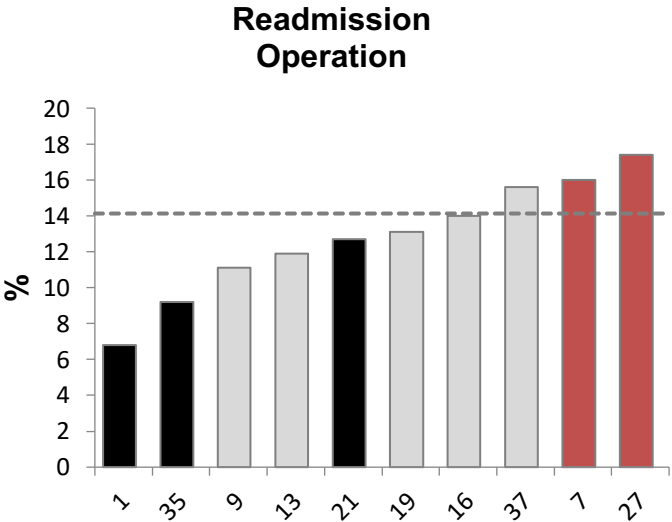




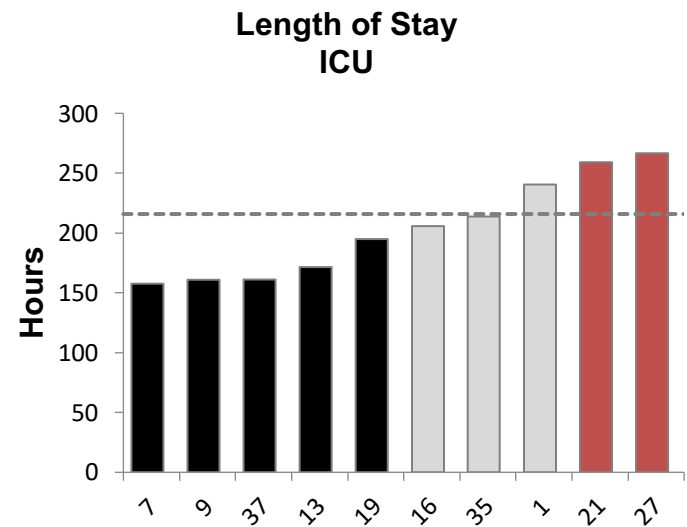
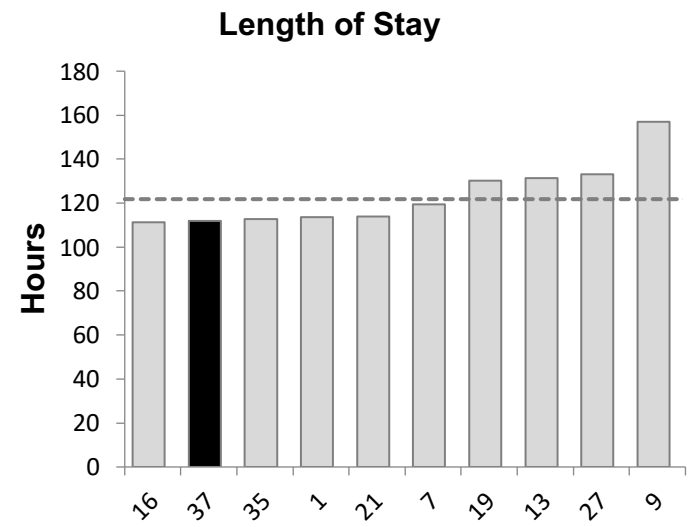
# Summary



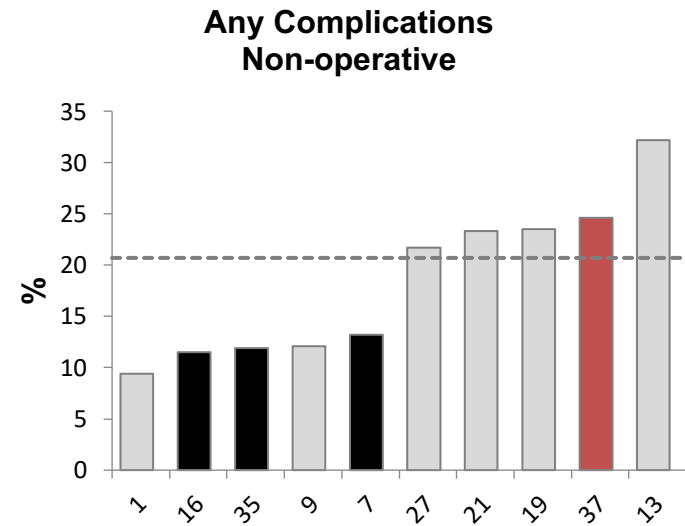
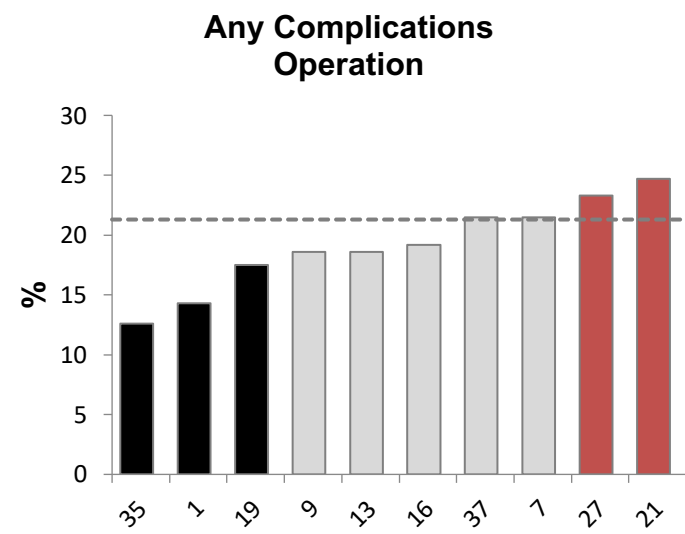
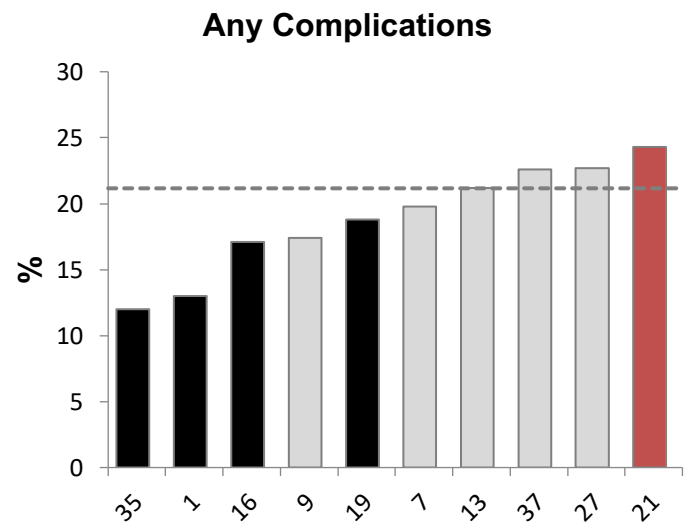
14.3% x 14,632 = 2,092 patients



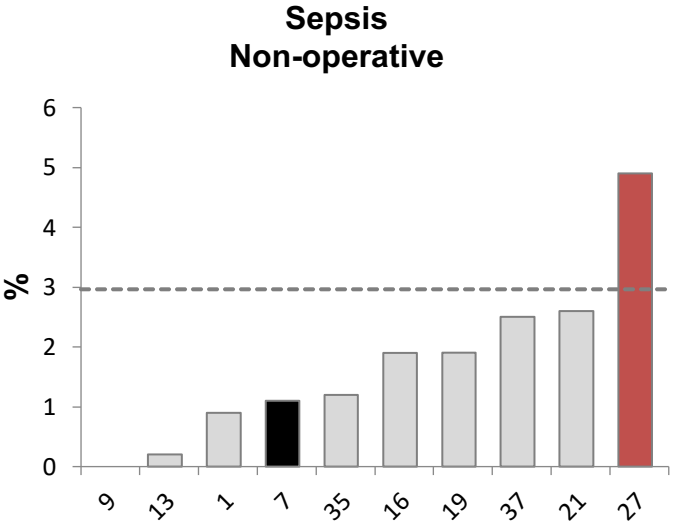
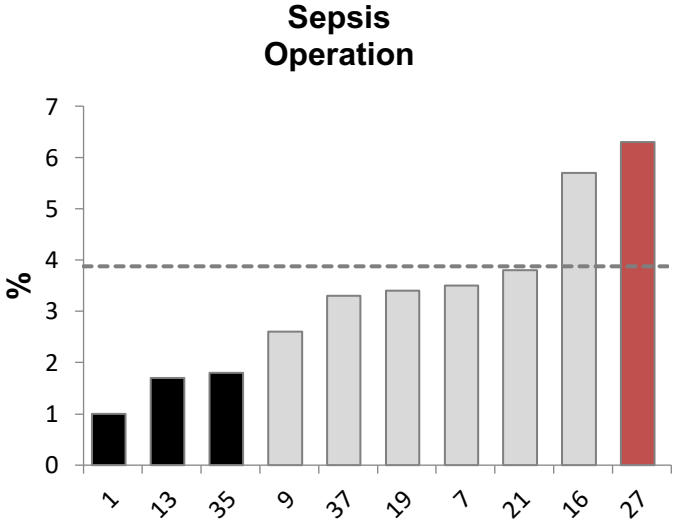
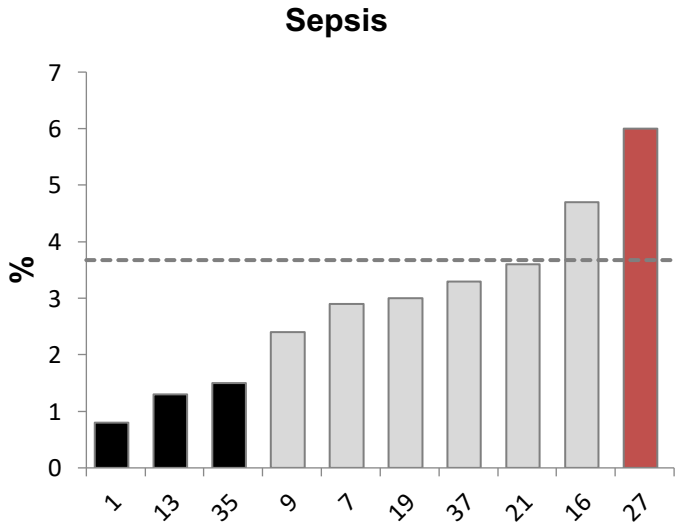
Summary



Summary



Summary



<u>Index Admission</u>		<b>Your Center</b> <b>N = 3155</b>		<b>Aggregate</b> <b>N = 14632</b>	
<u>Variable</u>		<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>
Risk Factors	Height (cm)				
	Mean ± Standard deviation	169.4	±10.6	169.2	±10.7
	Median (25th — 75th percentiles)	168.9	(162.6—177.8)	167.6	(162.0—177.8)
	Weight (kg)				
	Mean ± Standard deviation	84.2	±24.7	87.1	±25.0
	Median (25th — 75th percentiles)	81	(68.0—96.7)	83.9	(70.1—100.0)
	BMI				
	Mean ± Standard deviation	29.3	±8.2	30.4	±8.2
	Median (25th — 75th percentiles)	28.3	(23.8—33.1)	29.2	(24.7—34.6)
	Ascites	54	1.7	159	1.1
	CHF within 30 days	30	1.0	157	1.1
	COPD (severe)	92	2.9	477	3.3
	Covid-19 (confirmed positive)	44	1.4	282	1.9
	Current cancer/malignancy	245	7.8	684	4.7
	Diabetes mellitus				
	Insulin	113	3.6	632	4.3
	Non-insulin	140	4.4	914	6.2
	Dialysis within 2 weeks	55	1.7	154	1.1
	Disseminated cancer	128	4.1	290	2.0
	Hypertension	677	21.5	4041	27.6
	Functional health status (Dependent)	107	3.4	466	3.2
	Personal history of DVT/PE	210	6.7	758	5.2
	Pregnancy	4	0.1	26	0.2
	Preoperative sepsis				
	Severe sepsis/septic shock	168	5.3	867	5.9
	Sepsis	283	9.0	1734	11.9
	Sleep apnea	523	16.6	2125	14.5
	Solid organ transplant	26	0.8	60	0.4
	Steroid/Immunosuppressive medication	204	6.5	612	4.2
	Tobacco within 1 year - cigarette	239	7.6	1676	11.5
	Ventilator dependent within 48 hours	77	2.4	211	1.4

# Index

Sepsis Complication -

Sepsis Complication +

Sepsis  
Comorbid -

Risk-adjust

11,764 patients

Include/Exclude in any complication  
Include in sepsis complication ?

267 patients

Sepsis  
Comorbid +

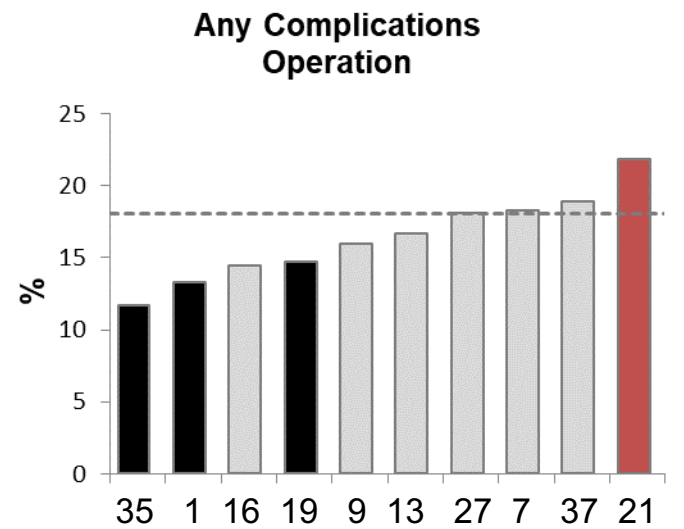
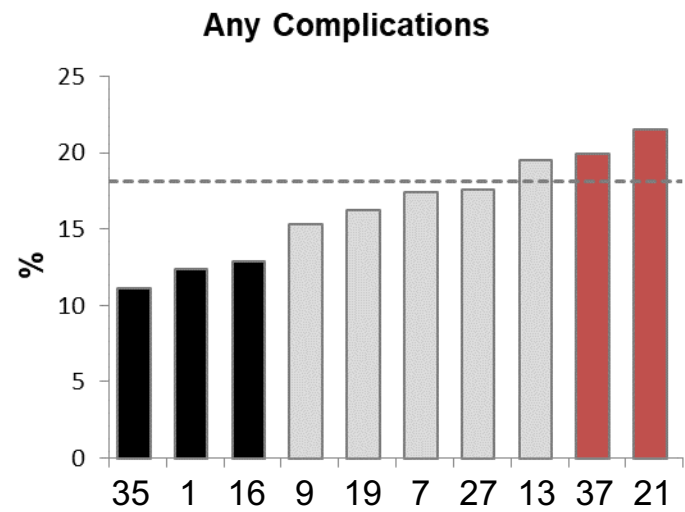
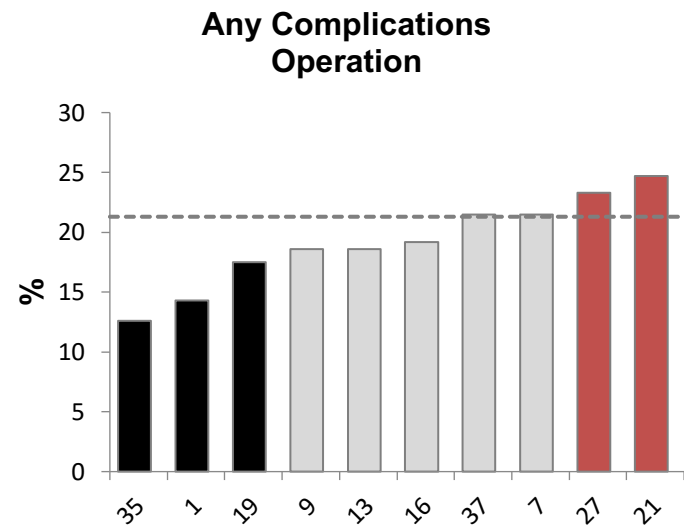
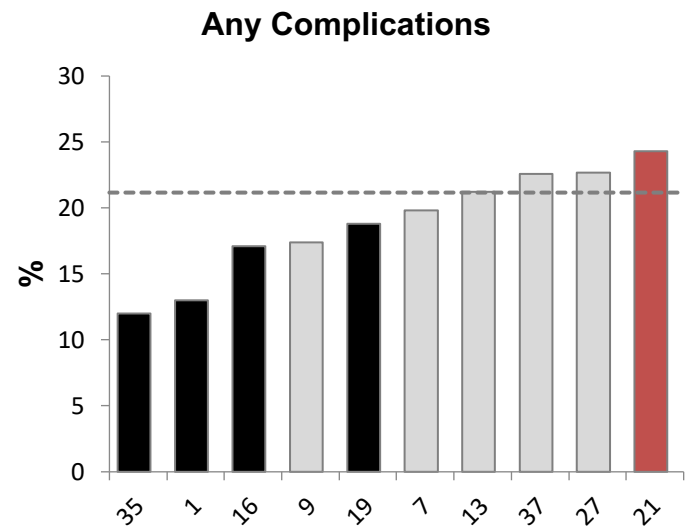
Risk-adjust

2,416 patients

Exclude in any complication ?  
Exclude in sepsis complication ?

185 patients

# Summary



Without  
Sepsis

# Questions





# Questions

Should any of the individual complications be excluded from any complications category? Example sepsis.

If sepsis is present as a comorbid does this negate it as a complication? Is it part of the disease?

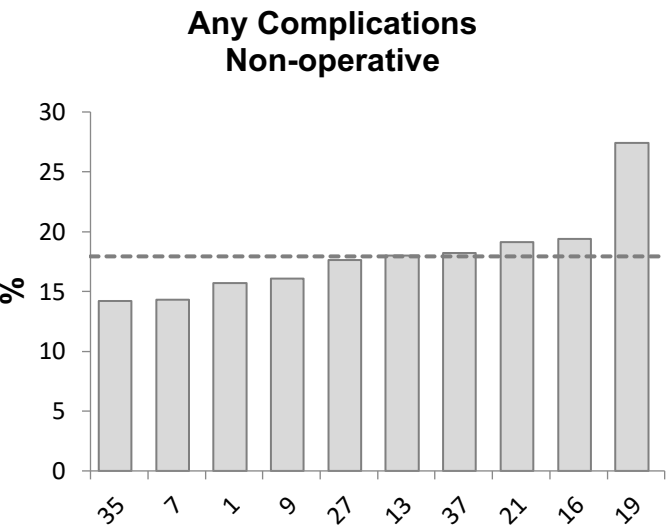
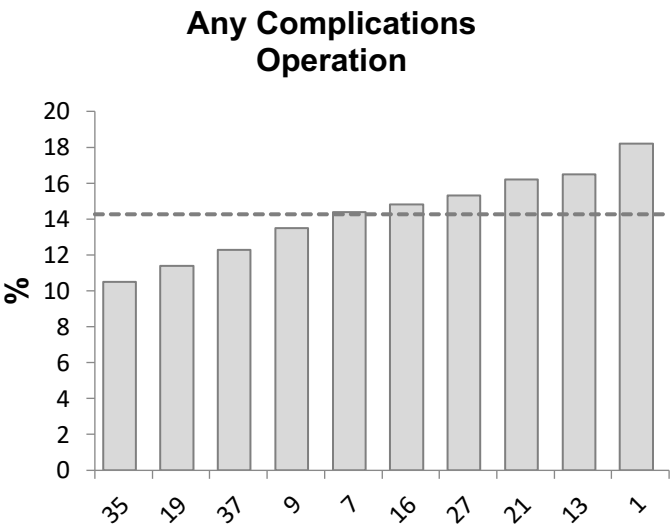
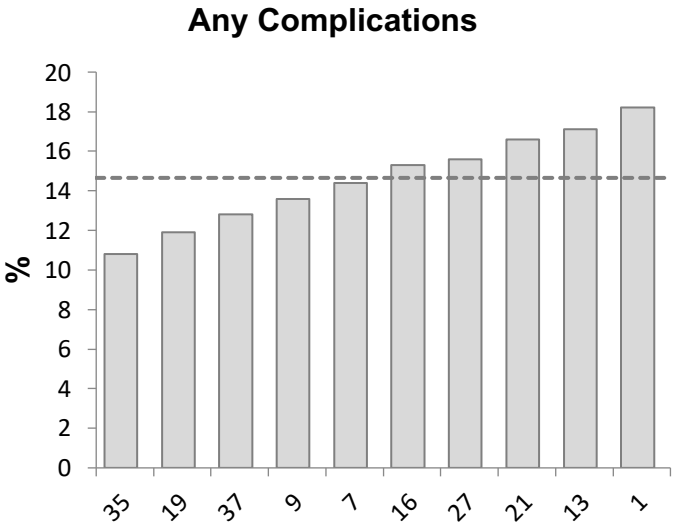


## Michigan Acute Care Surgery Report

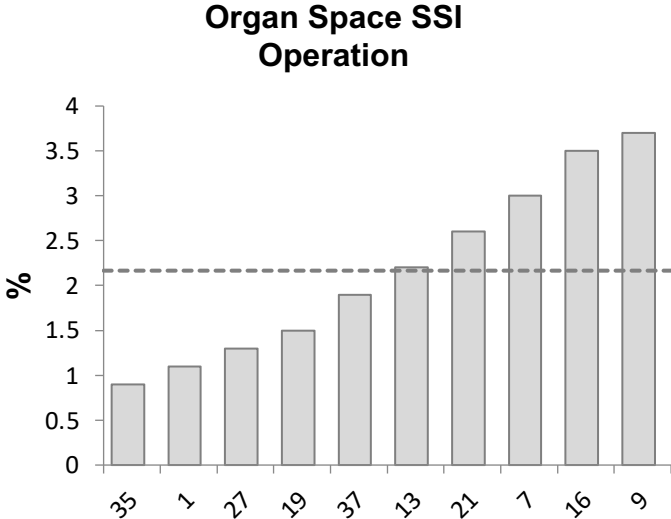
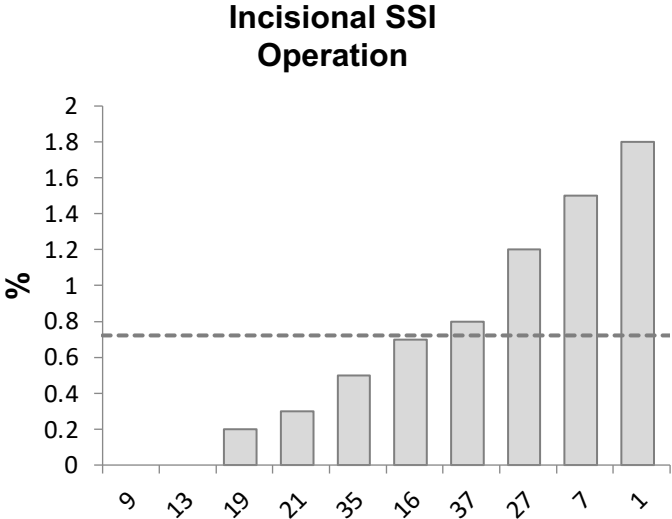
Appendicitis • XX • 7/1/2019-3/4/2022

<u>Index Admission</u>		Your Center N = 588		Aggregate N = 3188	
<u>Variable</u>		<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>
Total Cases	Index Admissions	588	18.4	3188	100.0
	Total Admissions (with Readmissions)	655	18.9	3463	100.0
Management	Total cases	588	100.0	3188	100.0
	Operation	425	72.3	2754	86.4
	Non-operative	163	27.7	434	13.6
AAST Grade	AAST grade in operative patients				
	1	300	70.6	1942	70.5
	2	31	7.3	226	8.2
	3	42	9.9	300	10.9
	4	34	8.0	141	5.1
	5	8	1.9	93	3.4
	NA	6	1.4	47	1.7

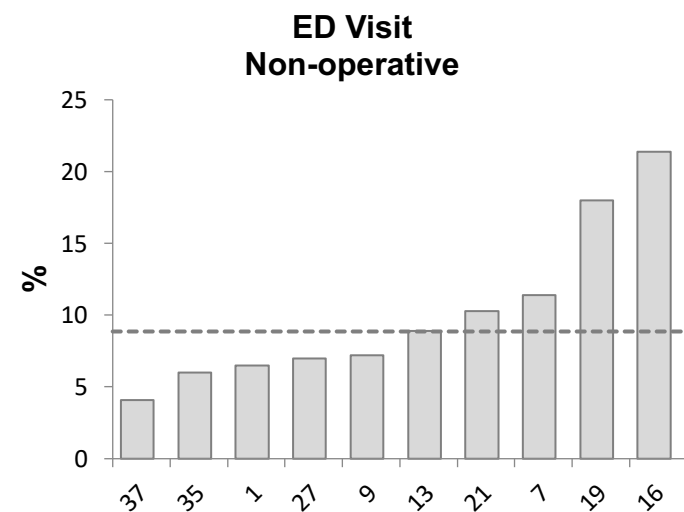
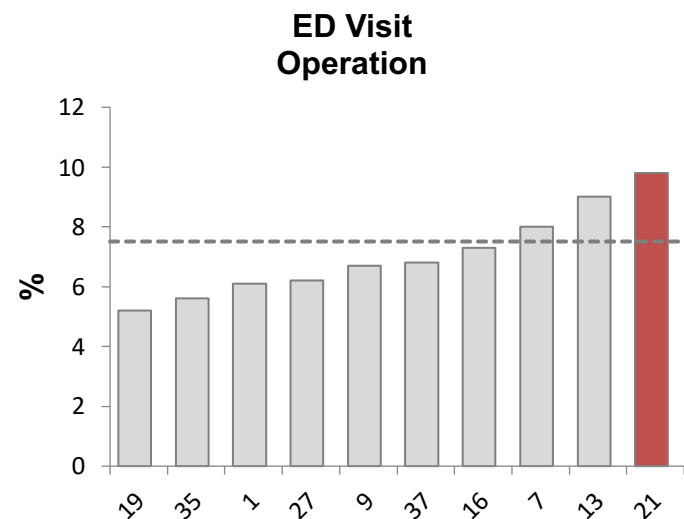
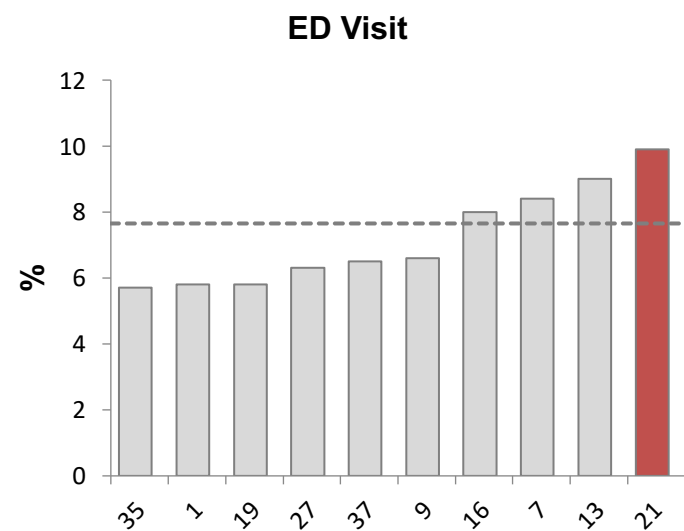
# Risk Adjusted Outcomes



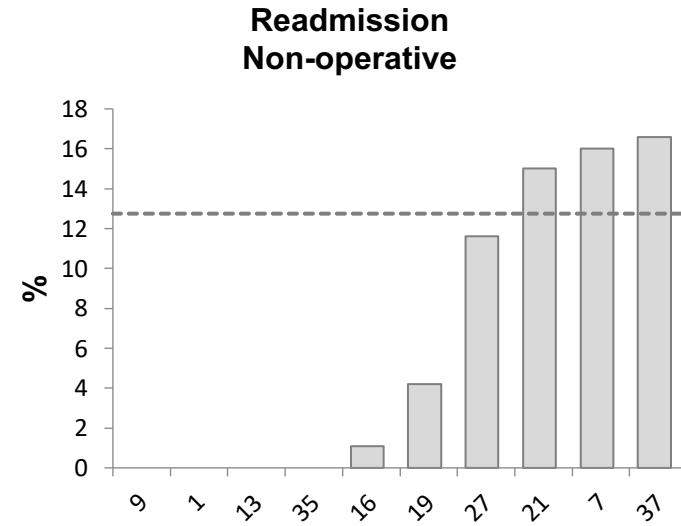
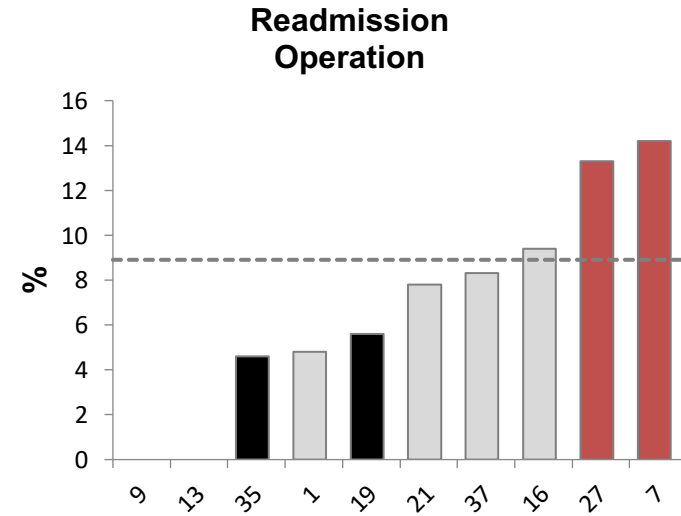
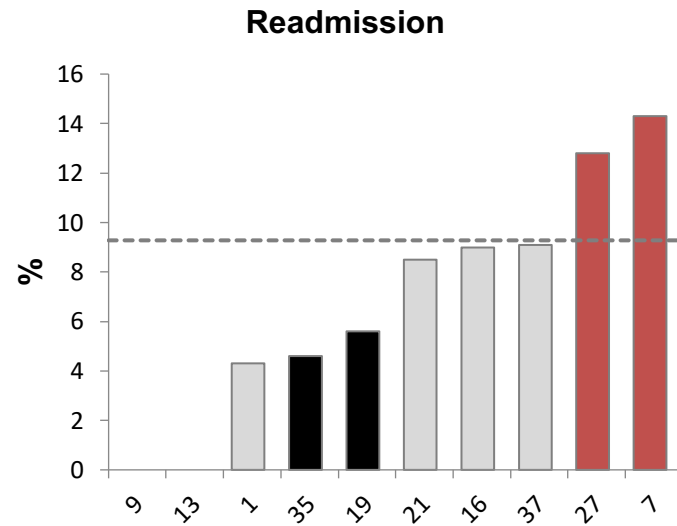
# Risk Adjusted Outcomes



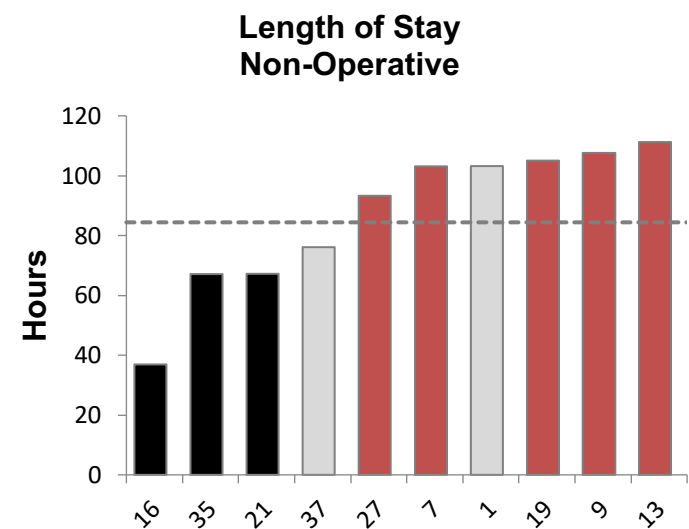
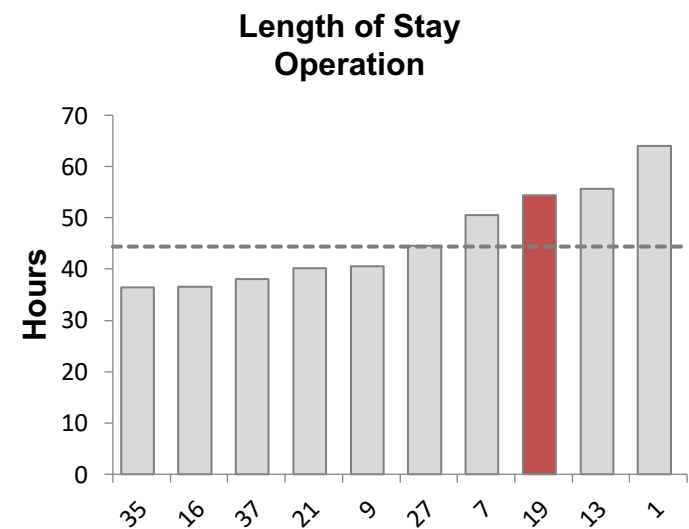
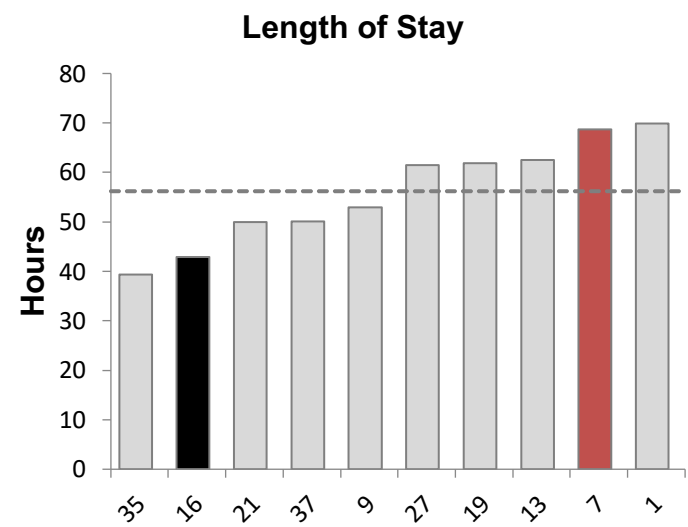
# Risk Adjusted Outcomes



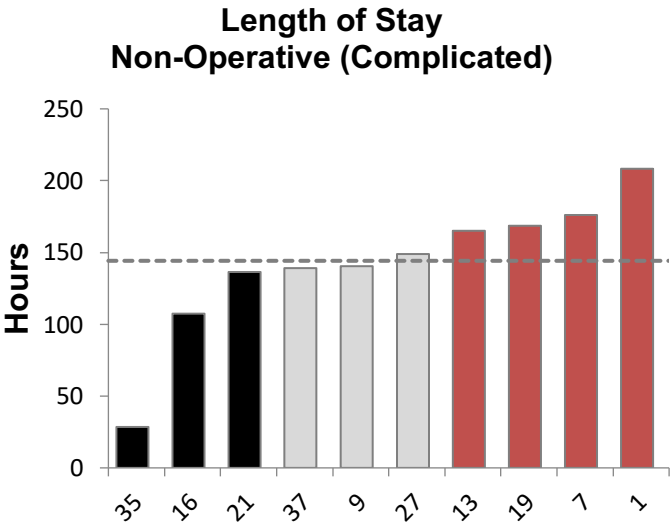
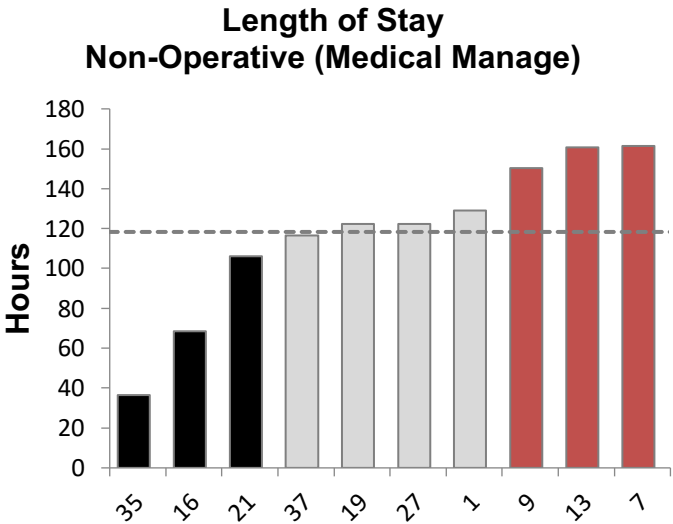
# Risk Adjusted Outcomes



# Risk Adjusted Outcomes



# Risk Adjusted Outcomes





# Acute Appendicitis - Medical Management

- ◆ Medical management = 13.8%, 512 patients
- ◆ 21 failed and got operation index = 4.1%
- ◆ 12 months
  - 136 operation = 26.6%
- ◆ 24 months and 36 months
  - 137 operation = 26.8%
  - 2.25 years on Qualtrics data
- ◆ Type
  - Emergent = 38 patients
  - Interval = 75 patients (66%)

# Index

## Uncomplicated

## Complicated

Operation

What patients?  
Why? 92%

What patients?  
Why? Why not? 68%

No  
Operation

What patients?  
Why? 8%  
216 pts  
No interval appendectomy

What patients?  
Why? 32%  
290 pts  
Interval appendectomy?  
Workup? For what age?

# Acute Appendicitis - Guidance

- ◆ CODA data
- ◆ Uncomplicated
  - Fecalith > OR
  - Non-op
    - ◆ Oral abx
    - ◆ Discharge from ED
    - ◆ Antibiotic choice
    - ◆ Interval appendectomy > No
- ◆ Complicated
  - Studies
  - Interval appendectomy - Who?



# Questions



# Questions

Combine ED visit and Readmit ? Z-score trend ?

- Readmission = 10% (371 pts)
- Post-discharge ED visit = 7.6% (284 pts)

Guidance on uncomplicated ?

Antibiotic choice

No admit

Who gets an interval appendectomy ?

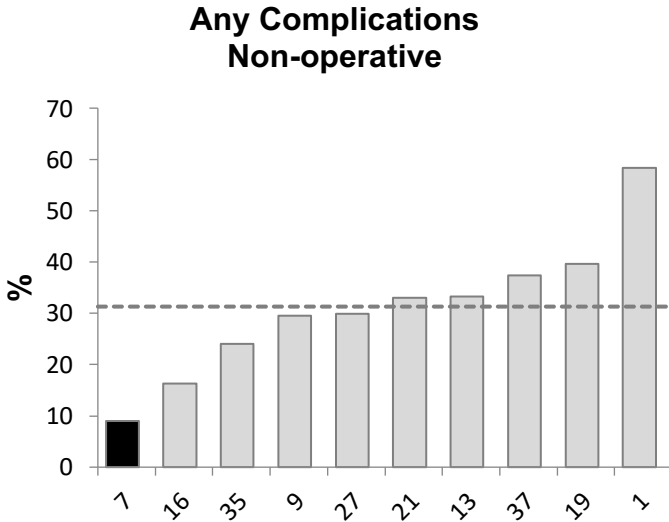
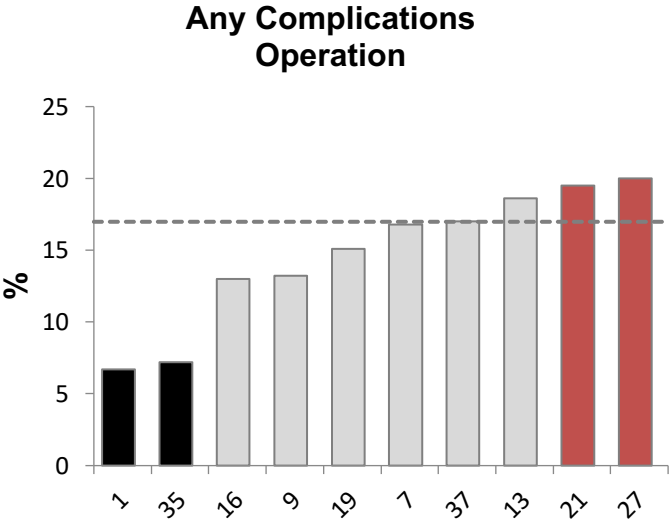
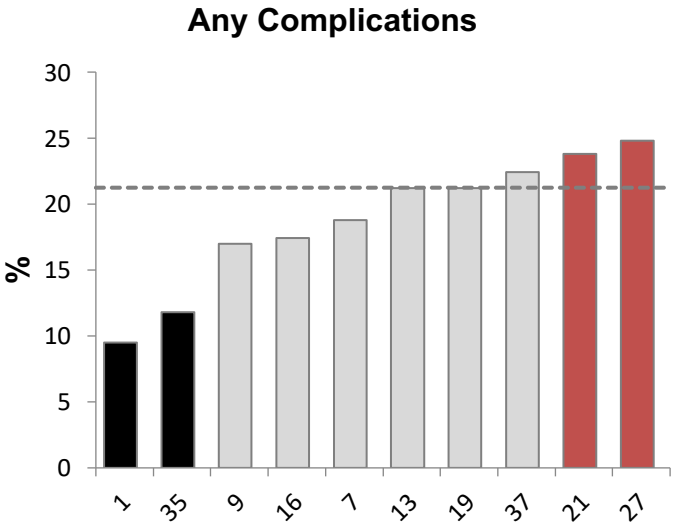


**Michigan Acute Care Surgery Report**  
**Gallbladder • XX • 7/1/2019-7/1/2022**

<u>Index Admission</u>		<b>Your Center</b>		<b>Aggregate</b>	
		<b>N =</b>	<b>1003</b>	<b>N =</b>	<b>5996</b>
<u>Variable</u>		<u><b>N</b></u>	<u><b>%</b></u>	<u><b>N</b></u>	<u><b>%</b></u>
Total Cases	Index Admissions	1003	16.7	5996	100.0
	Total Admissions (with Readmissions)	1154	17.7	6536	100.0
Diagnosis	Acute cholecystitis	673	67.1	4660	77.7
	Symptomatic cholelithiasis	23	2.3	197	3.3
	Cholangitis	44	4.4	155	2.6
	Choledocholithiasis	254	25.3	1253	20.9
	Gallstone pancreatitis	97	9.7	567	9.5
	Other	15	1.5	97	1.6
Operation	All diagnoses	751	74.9	5029	83.9
	Acute cholecystitis	520	77.3	4104	88.1
	Symptomatic cholelithiasis	21	91.3	160	81.2
	Cholangitis	15	34.1	63	40.6
	Choledocholithiasis	189	74.4	1031	82.3
	Gallstone pancreatitis	75	77.3	446	78.7
	Other	8	53.3	43	44.3

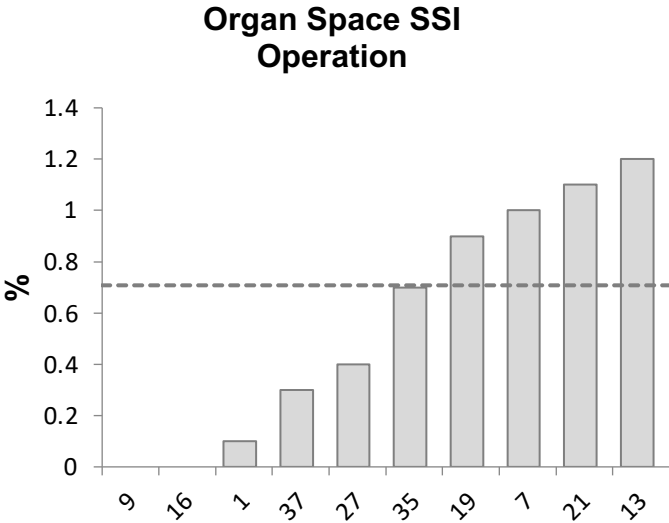
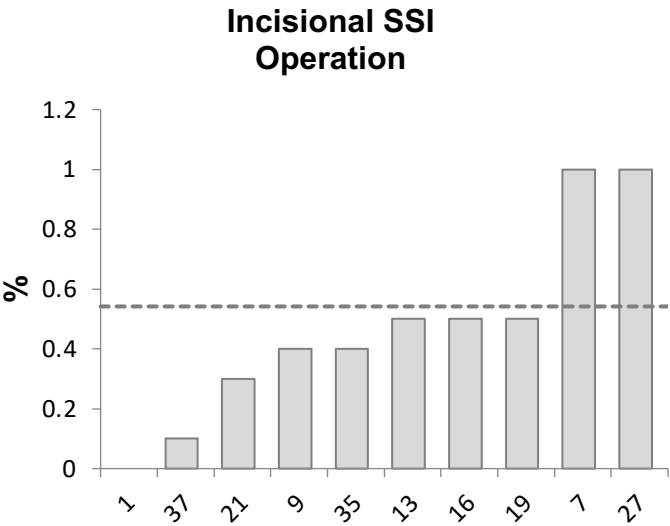
<u>Index Admission</u>		Your Center		Aggregate	
		N =	1003	N =	5996
<u>Variable</u>		<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>
CPT Code (5 most frequent)	47562 Lap cholecystectomy	615	81.9	4045	80.4
	47563 Lap Chole w Cholangio	29	3.9	585	11.6
	47600 Cholecystectomy	95	12.6	247	4.9
	47605 Excision biliary tract	8	1.1	42	0.8
	47564 Laparoscopic Procedures on the Biliary Tract	1	0.1	25	0.5
	All others	3	0.4	69	1.4
Lap vs Open	Open	35	4.7	98	1.9
	Laparoscopic	644	85.8	4630	92.1
	Laparoscopic to Open	71	9.5	214	4.3
	Robotic	0	0.0	54	1.1

# Gallbladder

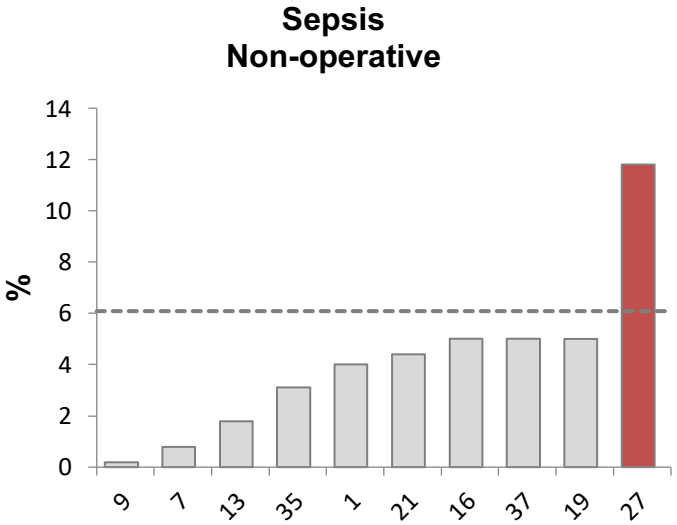
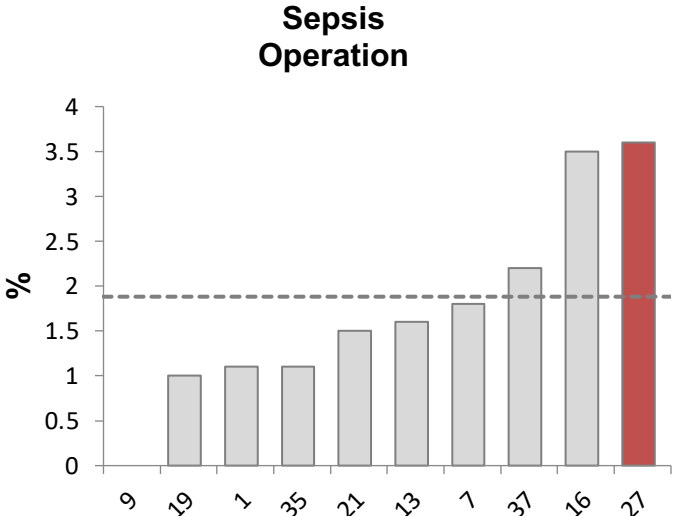
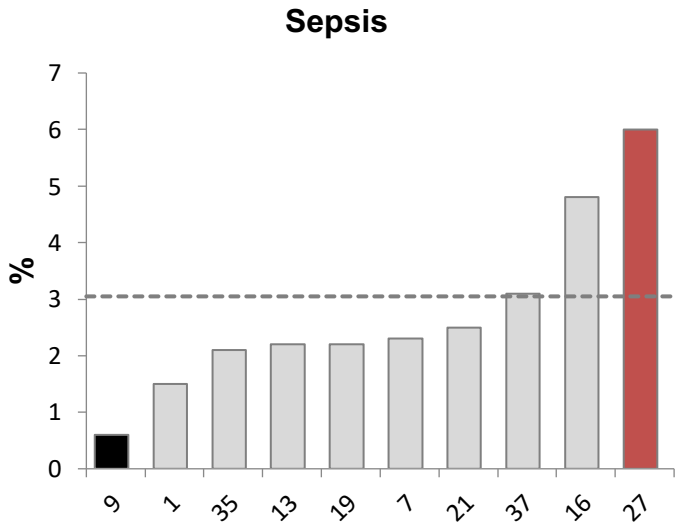




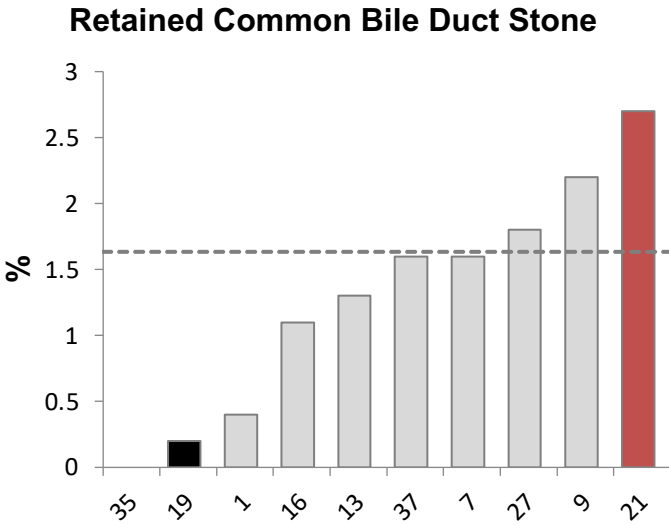
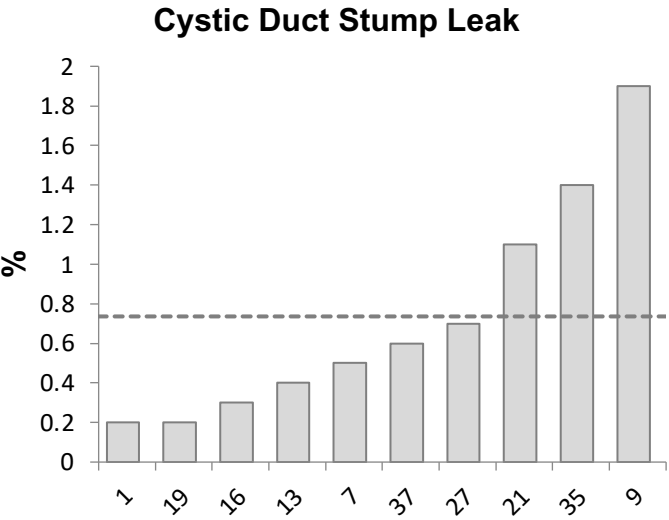
# Gallbladder



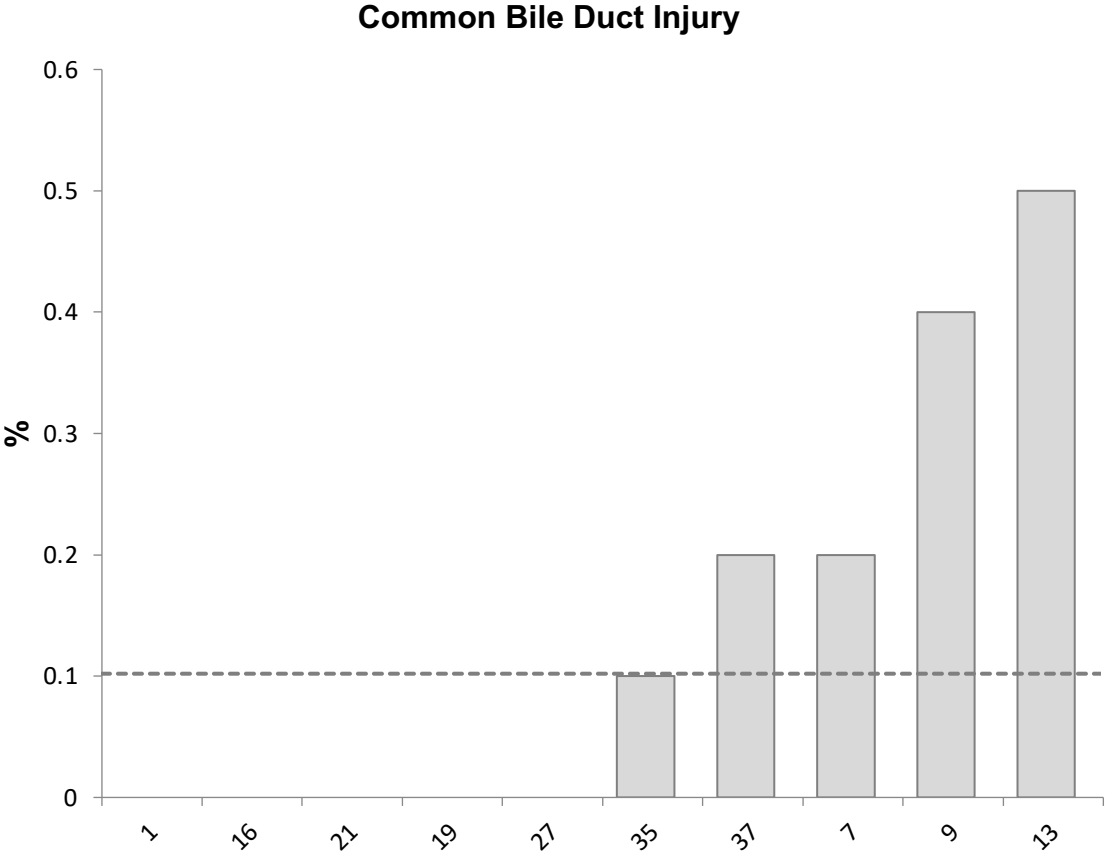
# Gallbladder



# Gallbladder



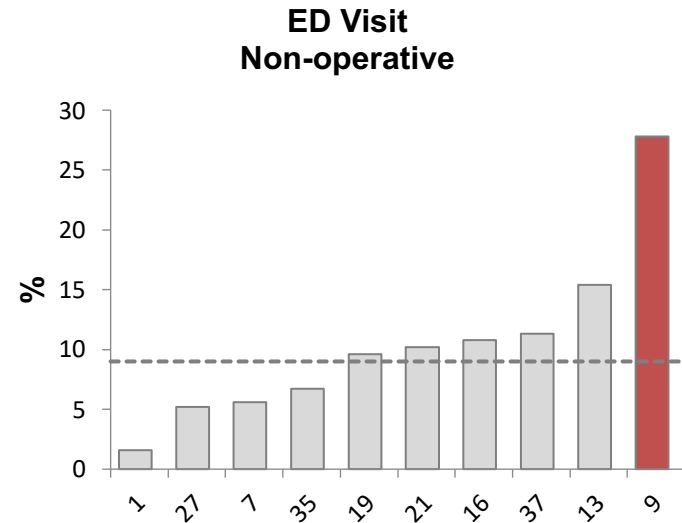
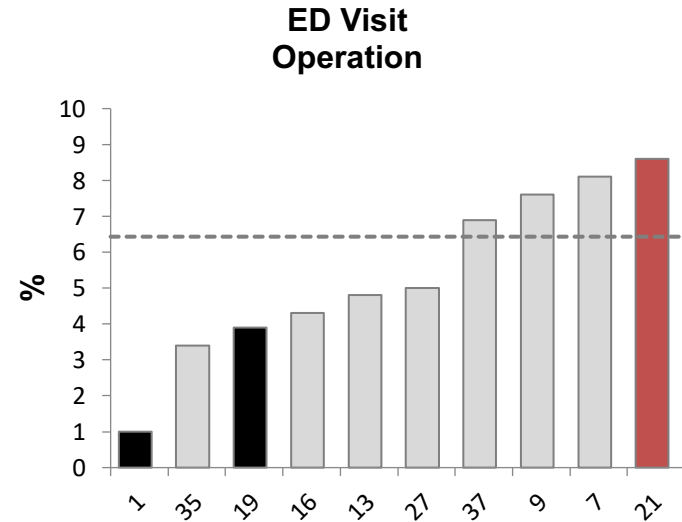
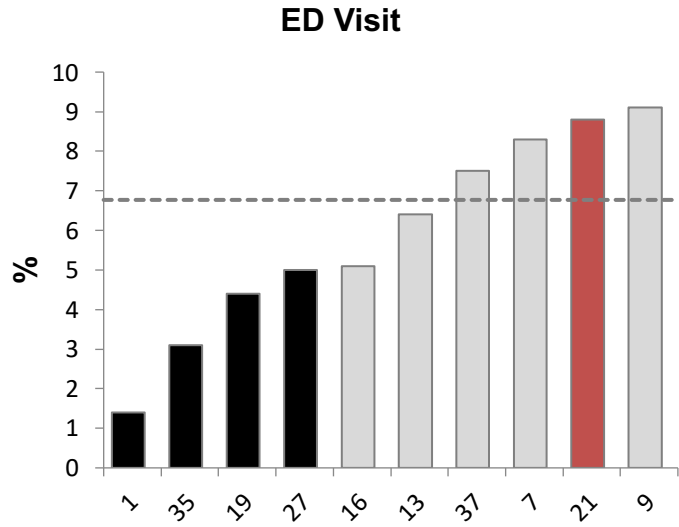
# Gallbladder



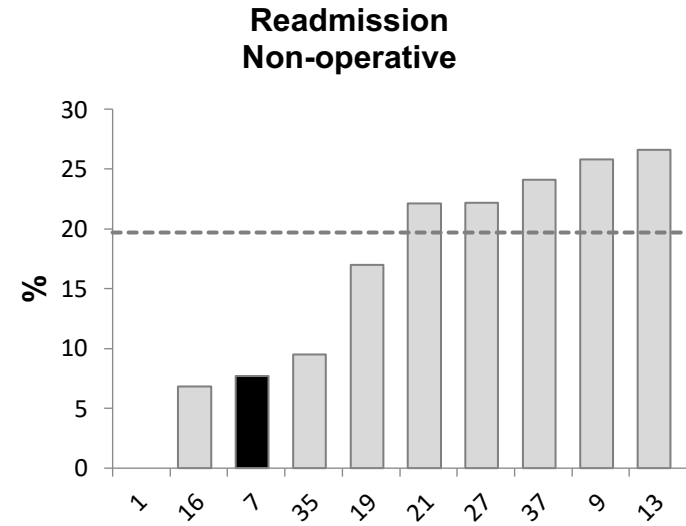
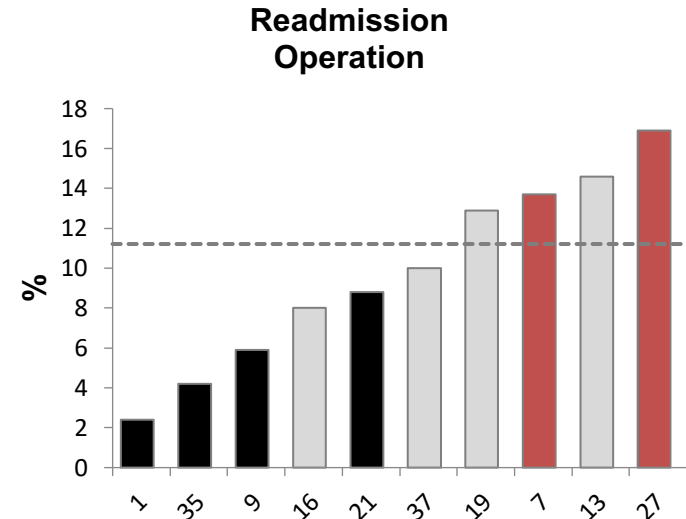
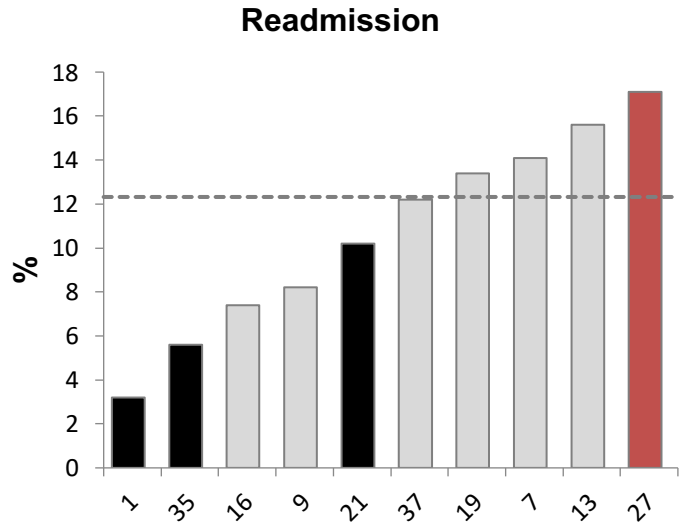
6 patients out of 5,029 operations = 0.12%

0.25 to 0.2% Flum, JAMA Surgery

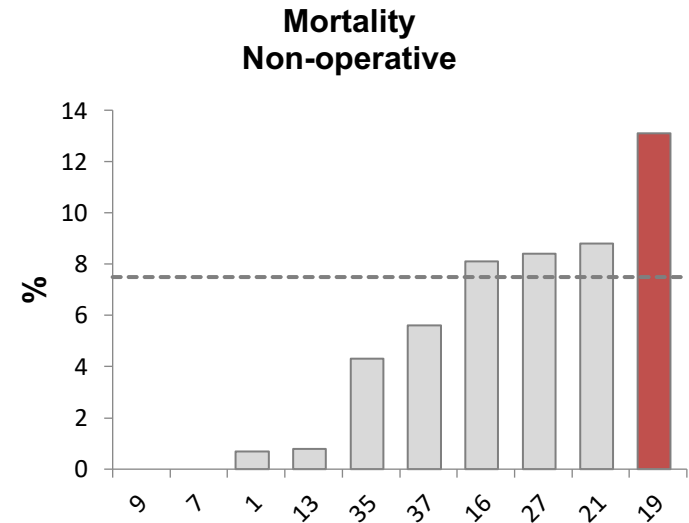
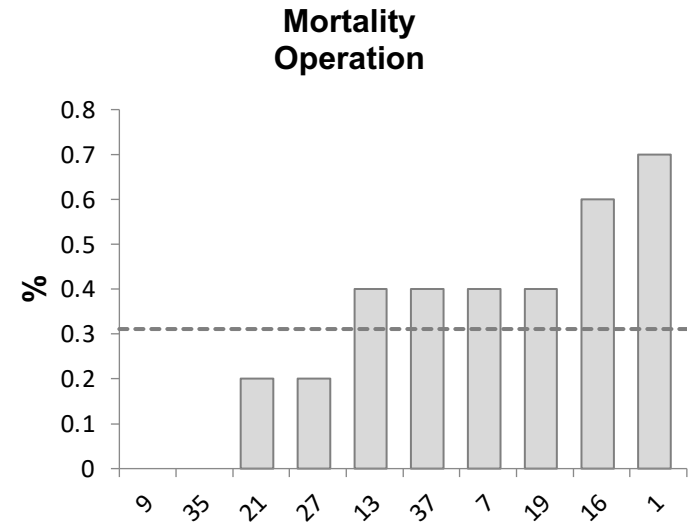
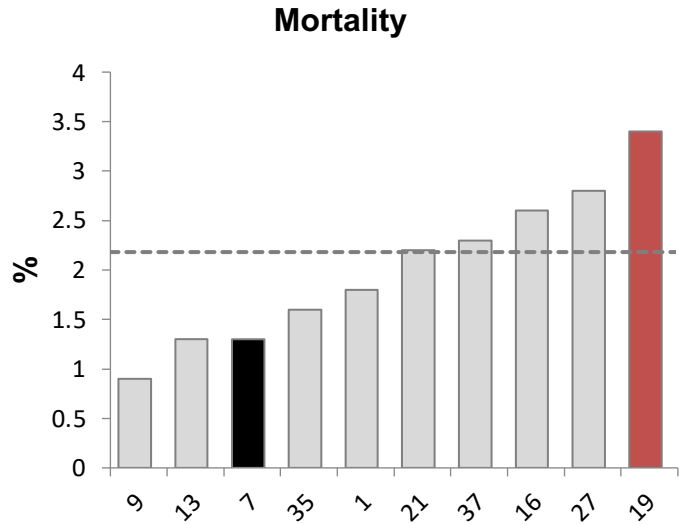
# Gallbladder



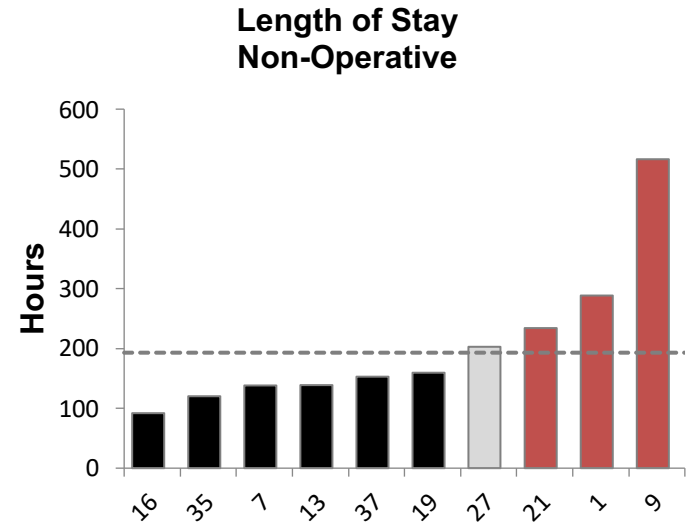
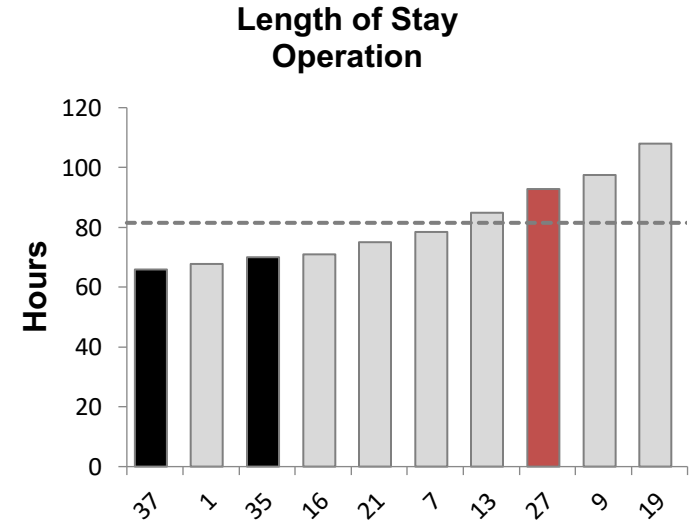
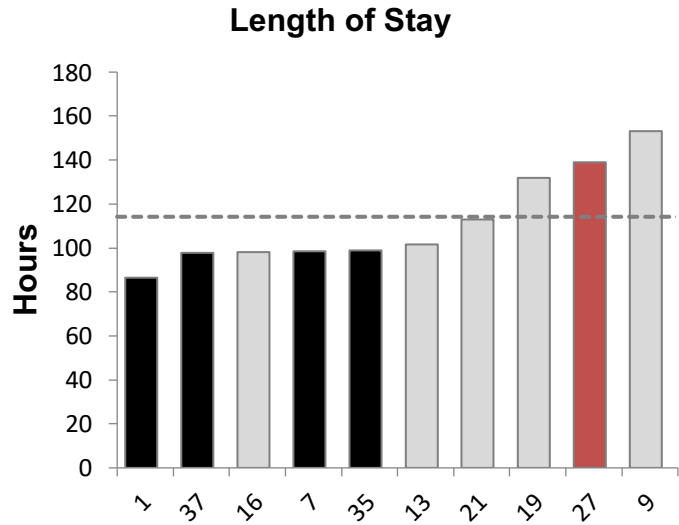
# Gallbladder



# Gallbladder

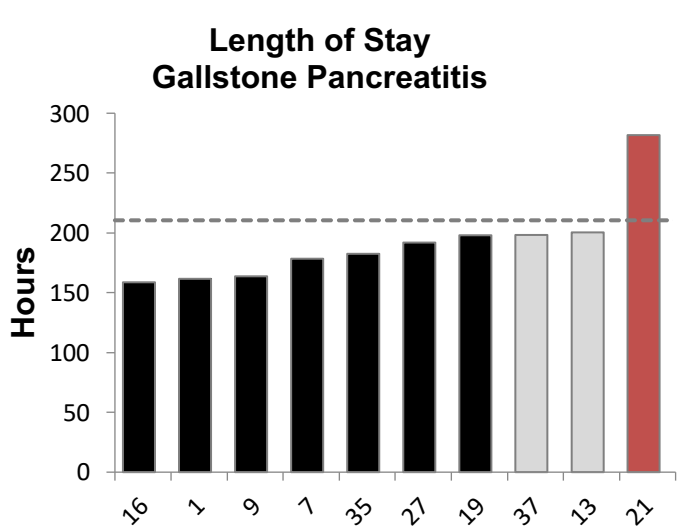
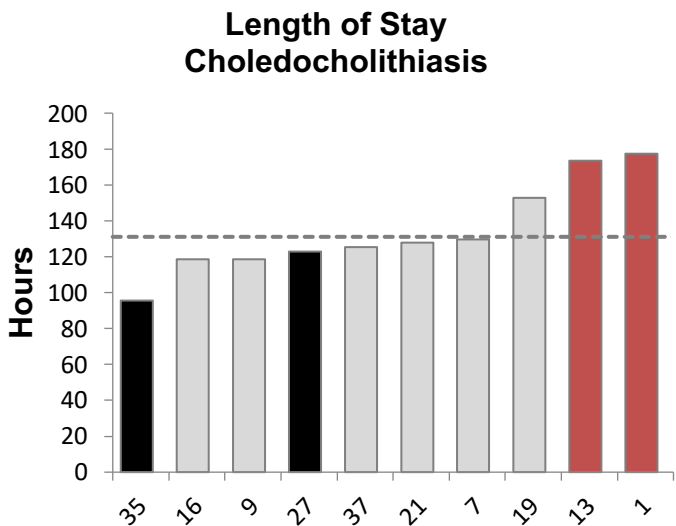
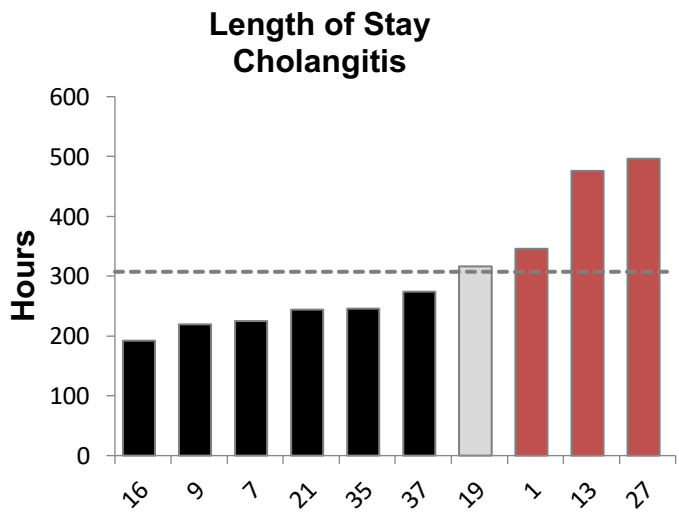
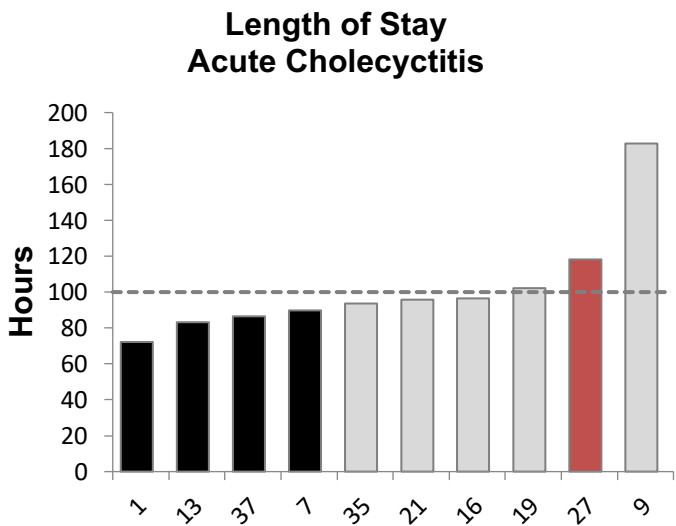


# Gallbladder





# Gallbladder



# Acute Cholecystitis – Bailout Operation

Cholecystectomy Technique	Freq.	Percent	Cum.
Total Excision	3,688	96.98	96.98
Sub-Total Excision w/Fenestration	51	1.34	98.32
Sub-Total Excision w/Reconstitution	31	0.82	99.13
Sub-Total Excision Other/Not Specified	33	0.87	100.00
Total	3,803	100.00	

3.0%

# Cholecystostomy Tube (Non-op)

**15.8% of GB patients received non-operative management (968 pts)**  
**34% of non-op pts get a C-tube (298 pts), PTC (14), or Drain (20)**

center	IR Procedure								
	Drain	Aspiratio	Angiogram	Embolizat	PTC	Cholecyst	Paracente	Thoracent	Biopsy
9	0 0.00	0 0.00	0 0.00	0 0.00	1 11.11	7 77.78	0 0.00	0 0.00	0 0.00
1	0 0.00	0 0.00	0 0.00	0 0.00	0 0.00	0 0.00	0 0.00	0 0.00	1 100.00
13	1 12.50	0 0.00	1 12.50	0 0.00	0 0.00	6 75.00	0 0.00	0 0.00	0 0.00
35	2 11.76	0 0.00	0 0.00	0 0.00	0 0.00	14 82.35	1 5.88	0 0.00	0 0.00
16	0 0.00	1 6.25	0 0.00	0 0.00	0 0.00	14 87.50	0 0.00	0 0.00	1 6.25
37	6 11.11	0 0.00	0 0.00	0 0.00	4 7.41	36 66.67	2 3.70	2 3.70	4 7.41
21	2 2.60	0 0.00	0 0.00	2 2.60	2 2.60	64 83.12	3 3.90	3 3.90	1 1.30
7	3 8.82	0 0.00	0 0.00	0 0.00	0 0.00	29 85.29	0 0.00	0 0.00	2 5.88
19	1 2.27	0 0.00	1 2.27	0 0.00	2 4.55	36 81.82	2 4.55	1 2.27	1 2.27
27	5 4.55	1 0.91	0 0.00	1 0.91	5 4.55	92 83.64	1 0.91	1 0.91	4 3.64
Total	20 5.41	2 0.54	2 0.54	3 0.81	14 3.78	298 80.54	9 2.43	7 1.89	14 3.78

# Questions



# Questions

Do you have access to advanced endoscopy ?

ERCP

Cystic duct stent

Combine ED visit and Readmit ? Z-score trend ?

What to focus on ? Studies, lots but not really in our control.

# **Opioids**

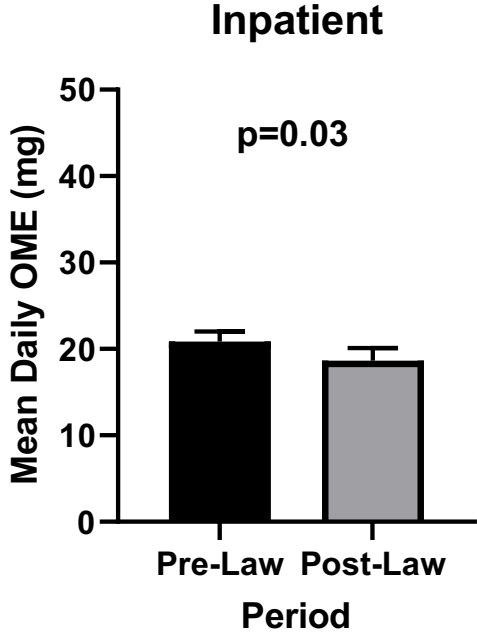
**Mark Hemmila, MD**

# Trauma - AAST Poster

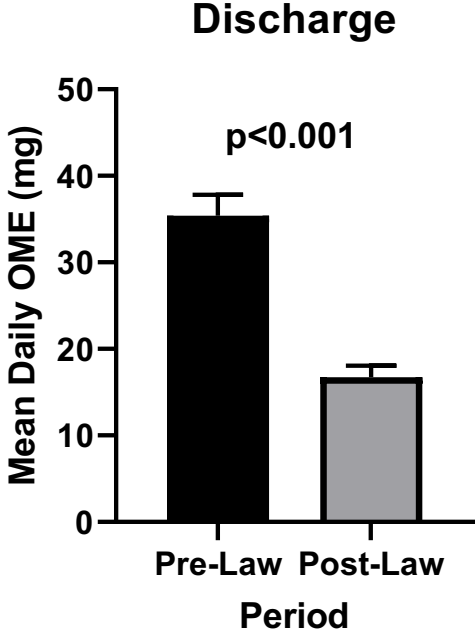
- ◆ University of Michigan Patients
  - Pre and post Public Act 246 limiting opioid prescribing
  - Inpatient oral opioids – 48 hrs prior to discharge
  - Discharge prescription
  - Refills
  - Oral morphine equivalents (OME)

**Mean daily (24 hours) oral morphine equivalents in milligrams (OME)**

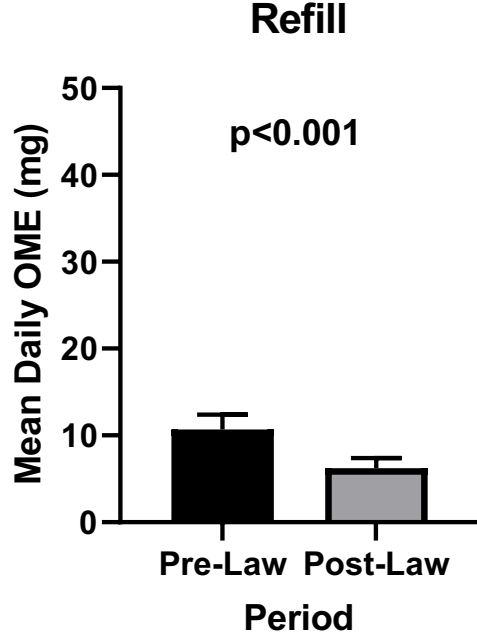
**A.**



**B.**



**C.**

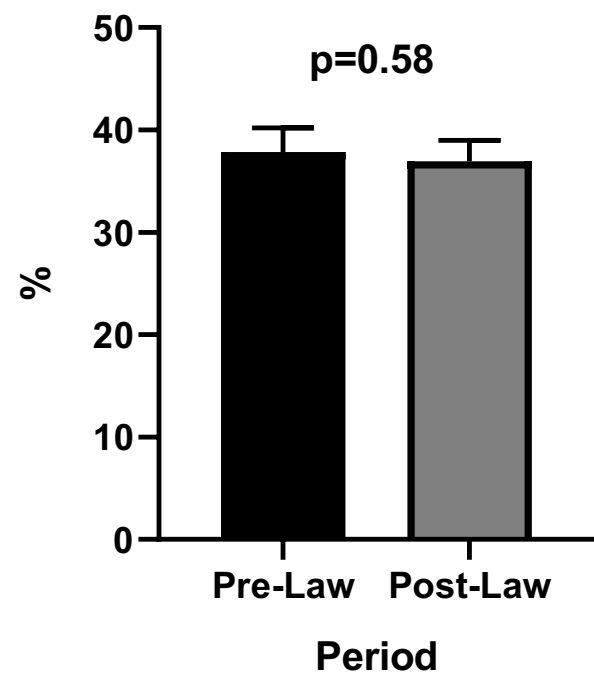




# Refills

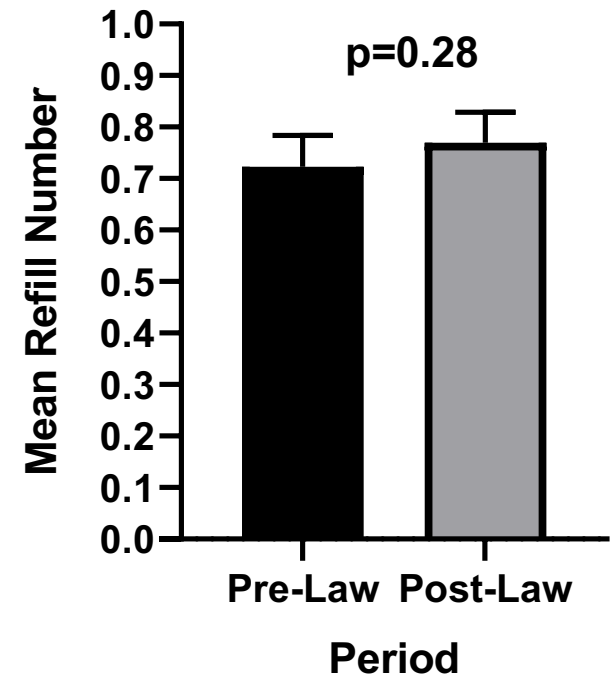
A.

Proportion of Patients with a Refill

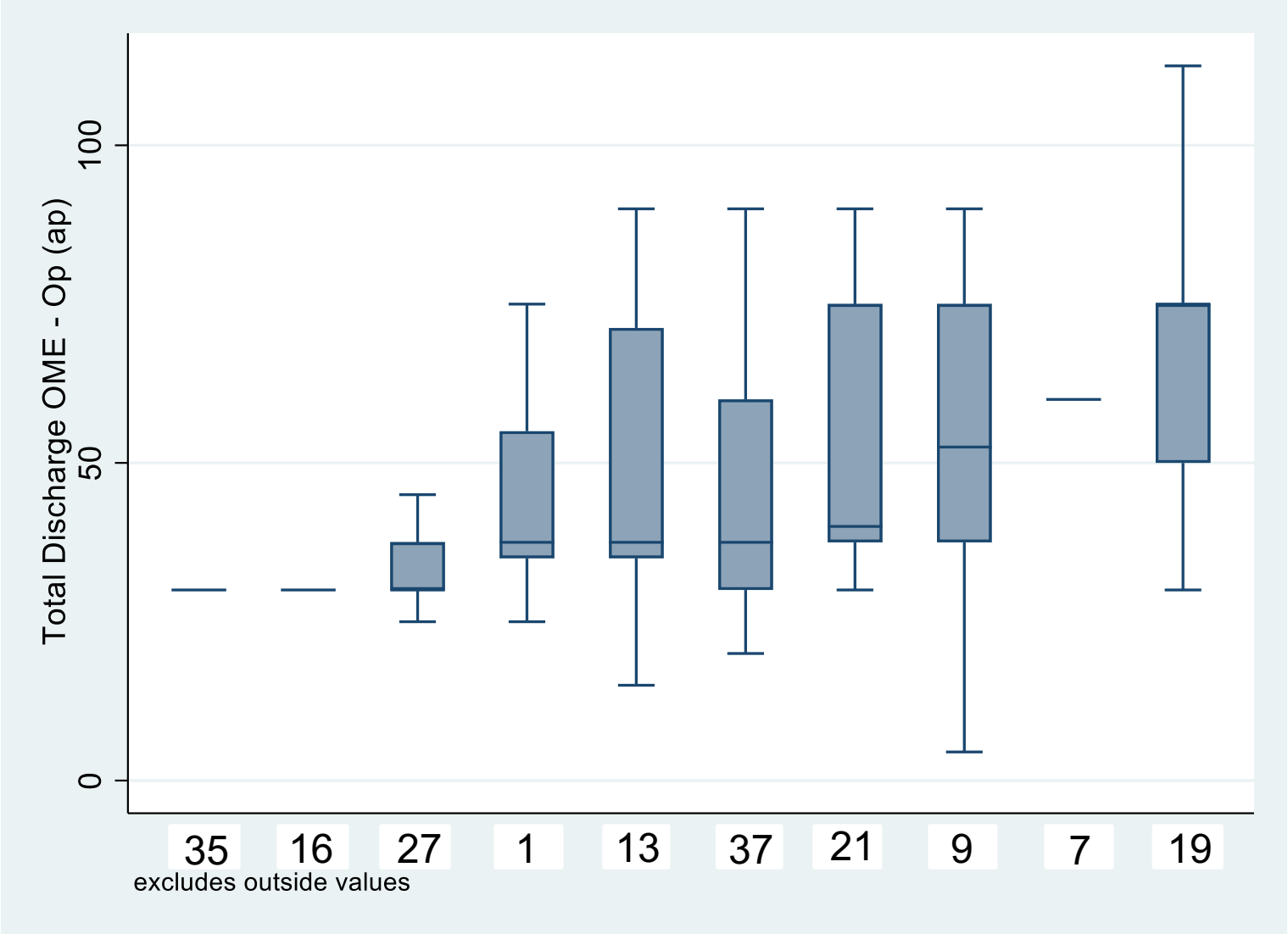


B.

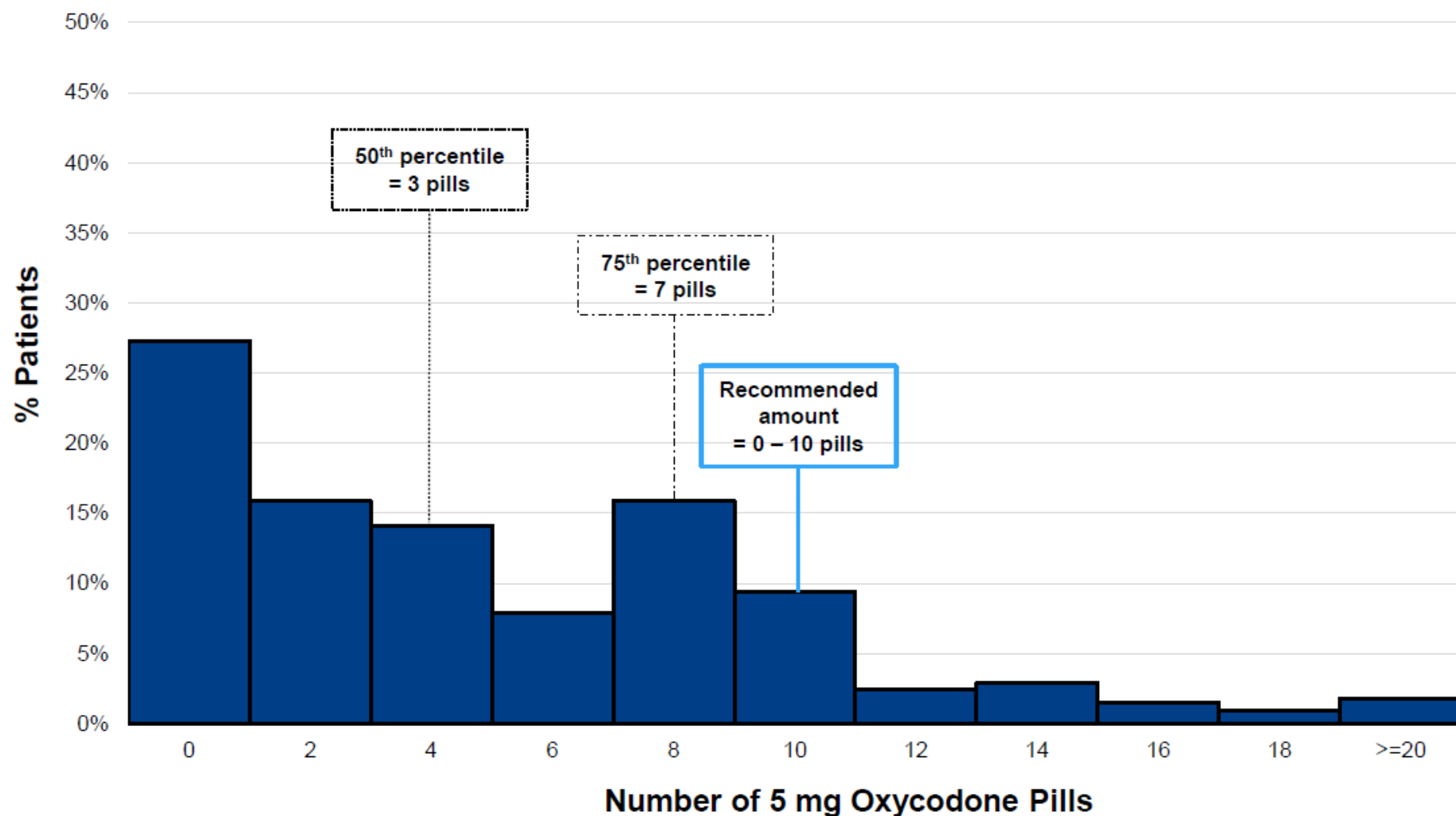
Number of Refills per Patient



# Acute Appendicitis w Operation



## Patient Reported Consumption for Laparoscopic Appendectomy



**957**

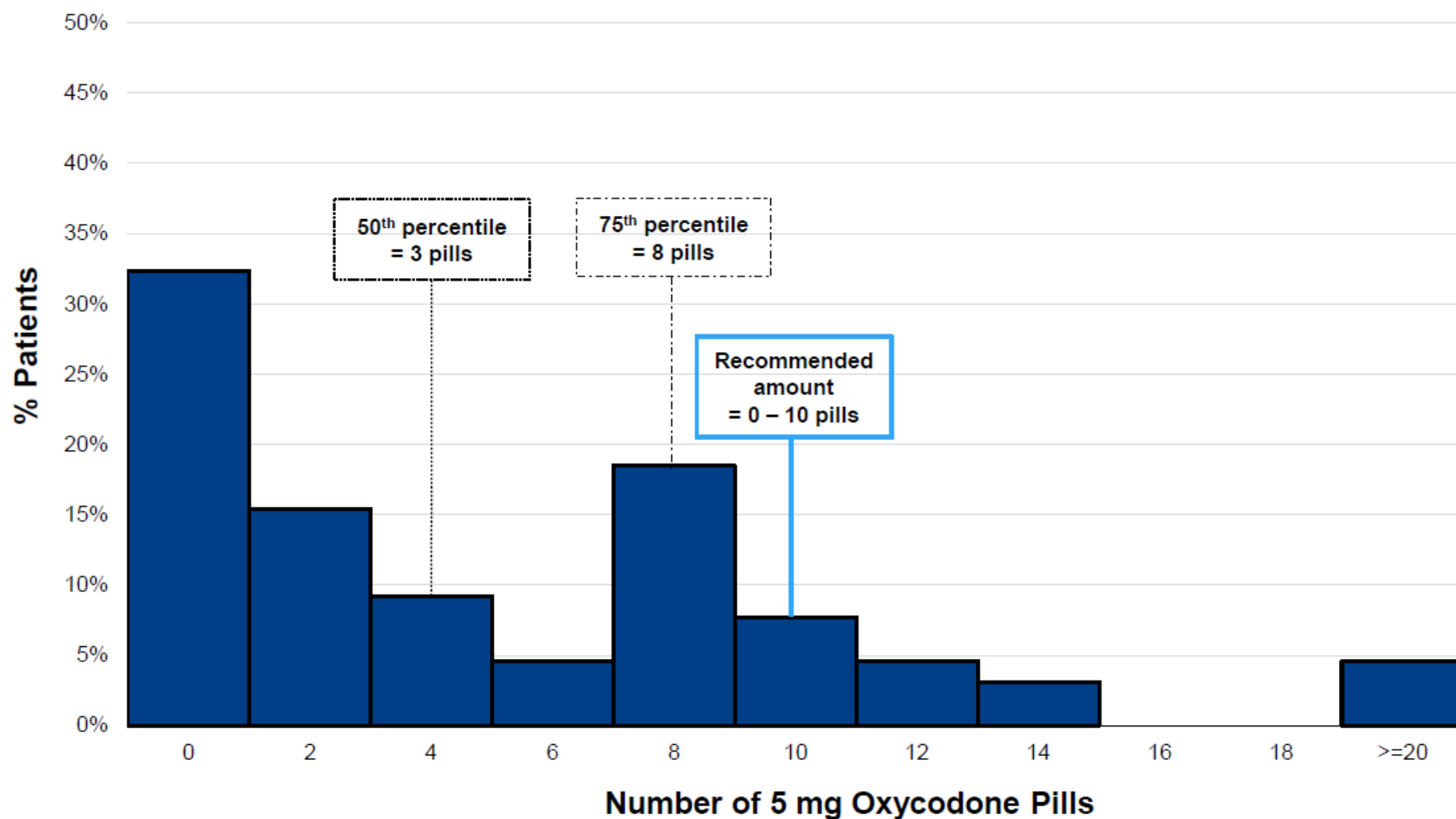
opioid naïve  
patients

**58**

hospitals

January 1, 2018  
to  
May 31, 2019

## Patient Reported Consumption for Open Appendectomy



**65**

opioid naïve  
patients

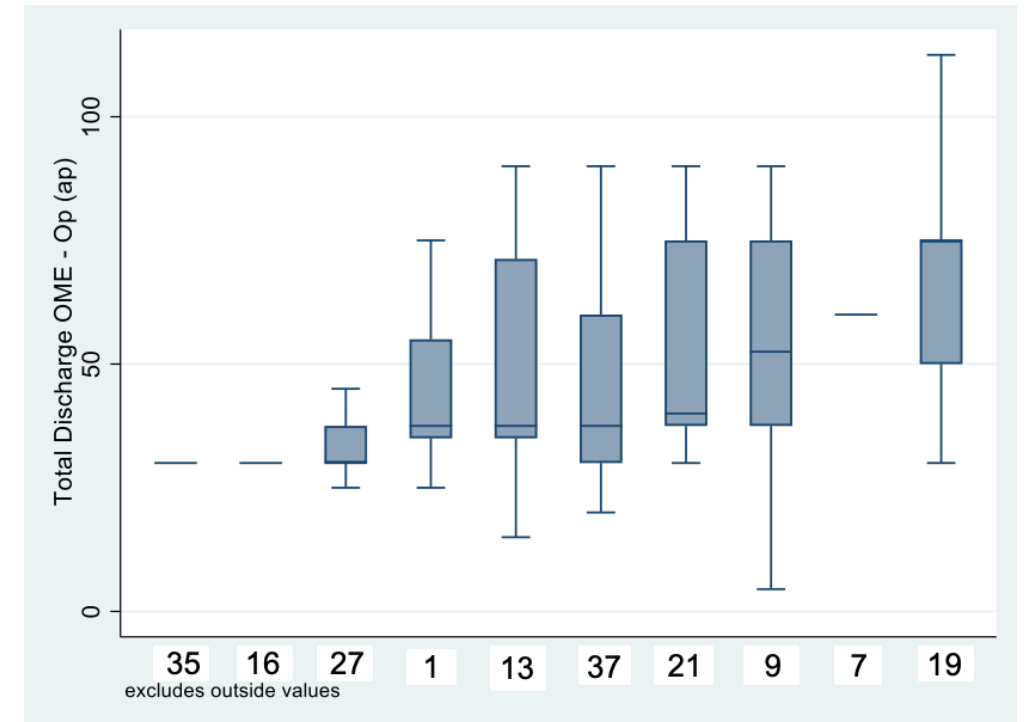
**23**

hospitals

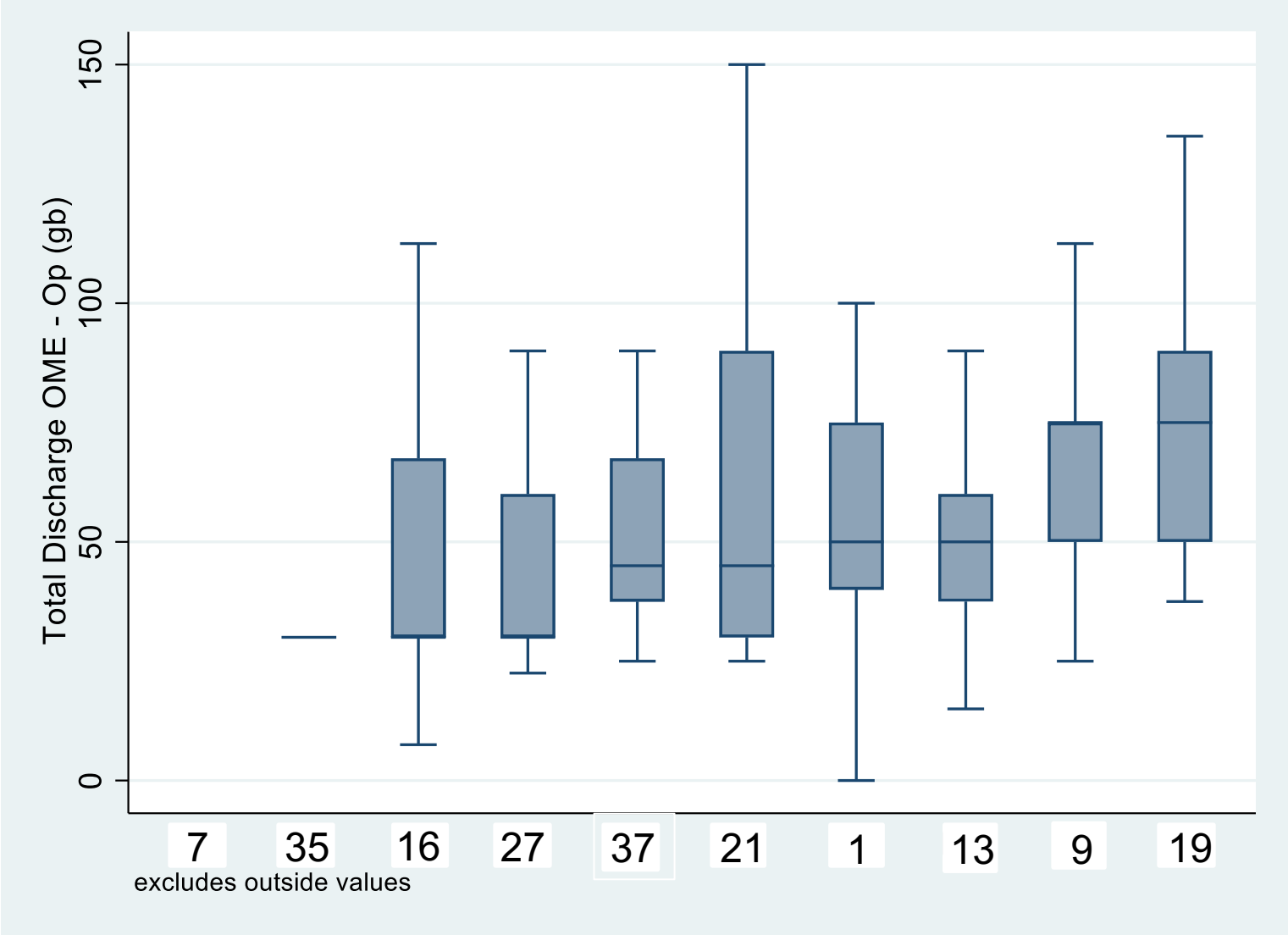
January 1, 2018  
to  
May 31, 2019

# Recommendation

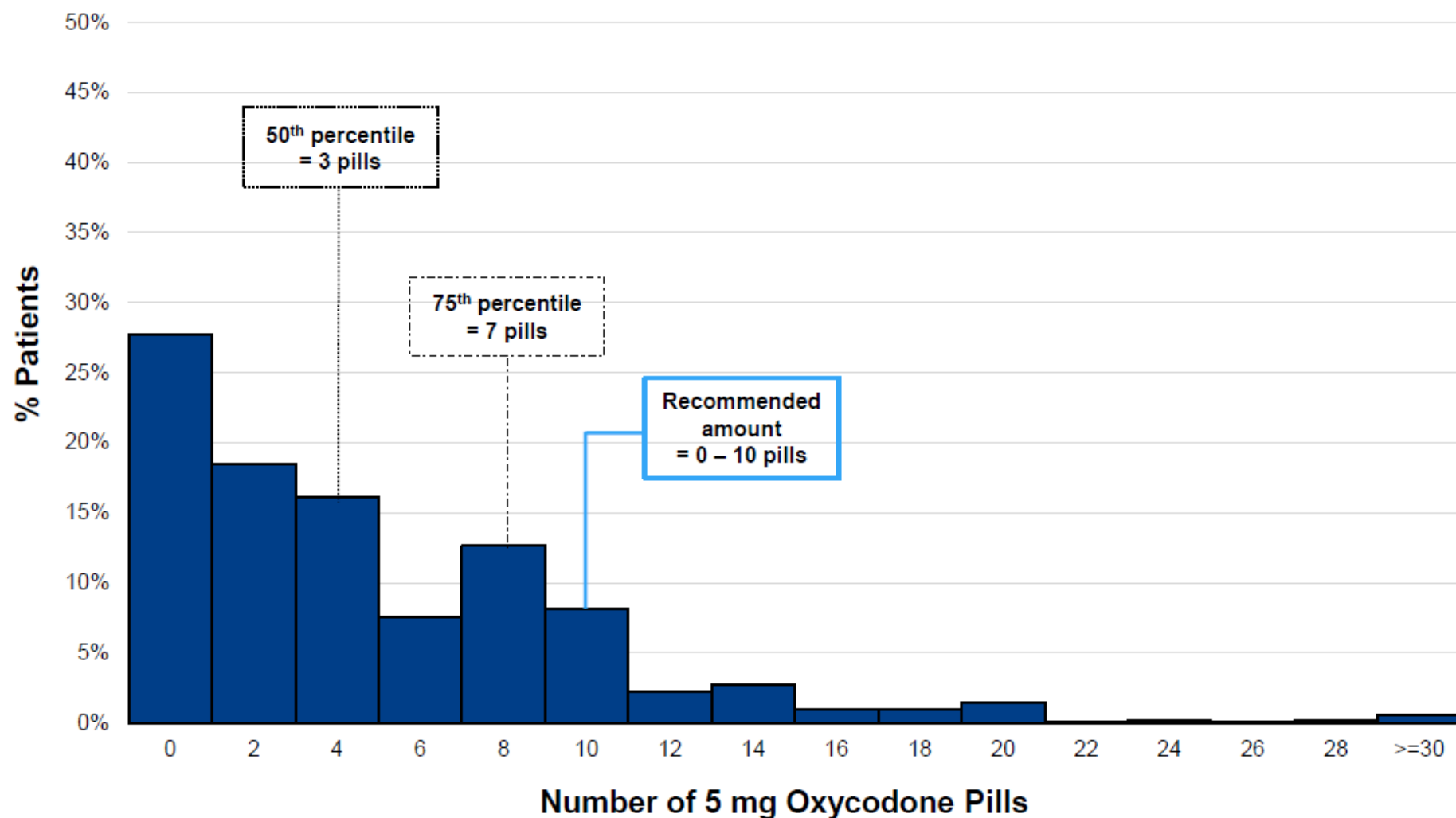
- ◆ 0-10 5 mg pills of Oxycodone
- ◆ Conversion = 1.5 OME per mg Oxycodone
- ◆ 10 pills x 5mg x 1.5 = 75 mg OME
- ◆ Data so far 30-60 mg OME



# Cholecystectomy - All



## Patient Reported Opioid Consumption for Laparoscopic Cholecystectomy



**2792**

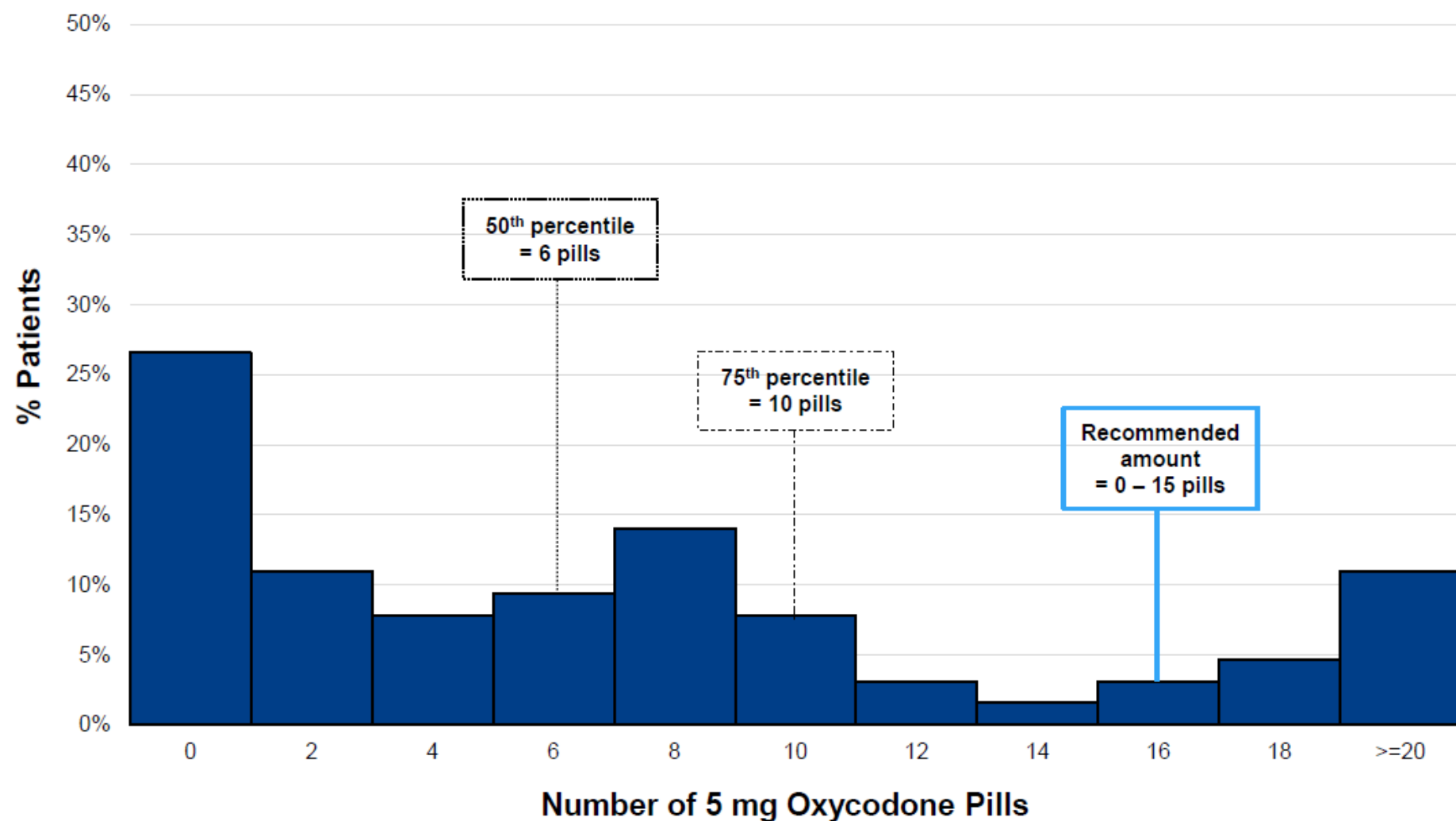
opioid naïve  
patients

**64**

hospitals

January 1, 2018  
to  
May 31, 2019

## Patient Reported Opioid Consumption for Open Cholecystectomy



**64**

**opioid naïve  
patients**

**26**

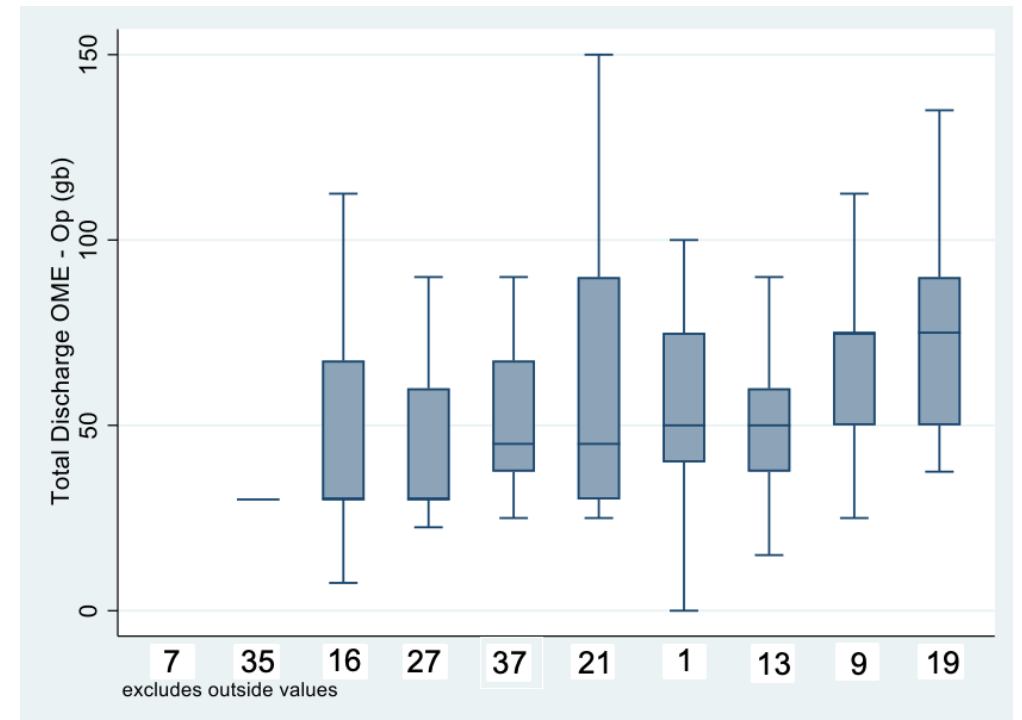
**hospitals**

**January 1, 2018  
to  
May 31, 2019**

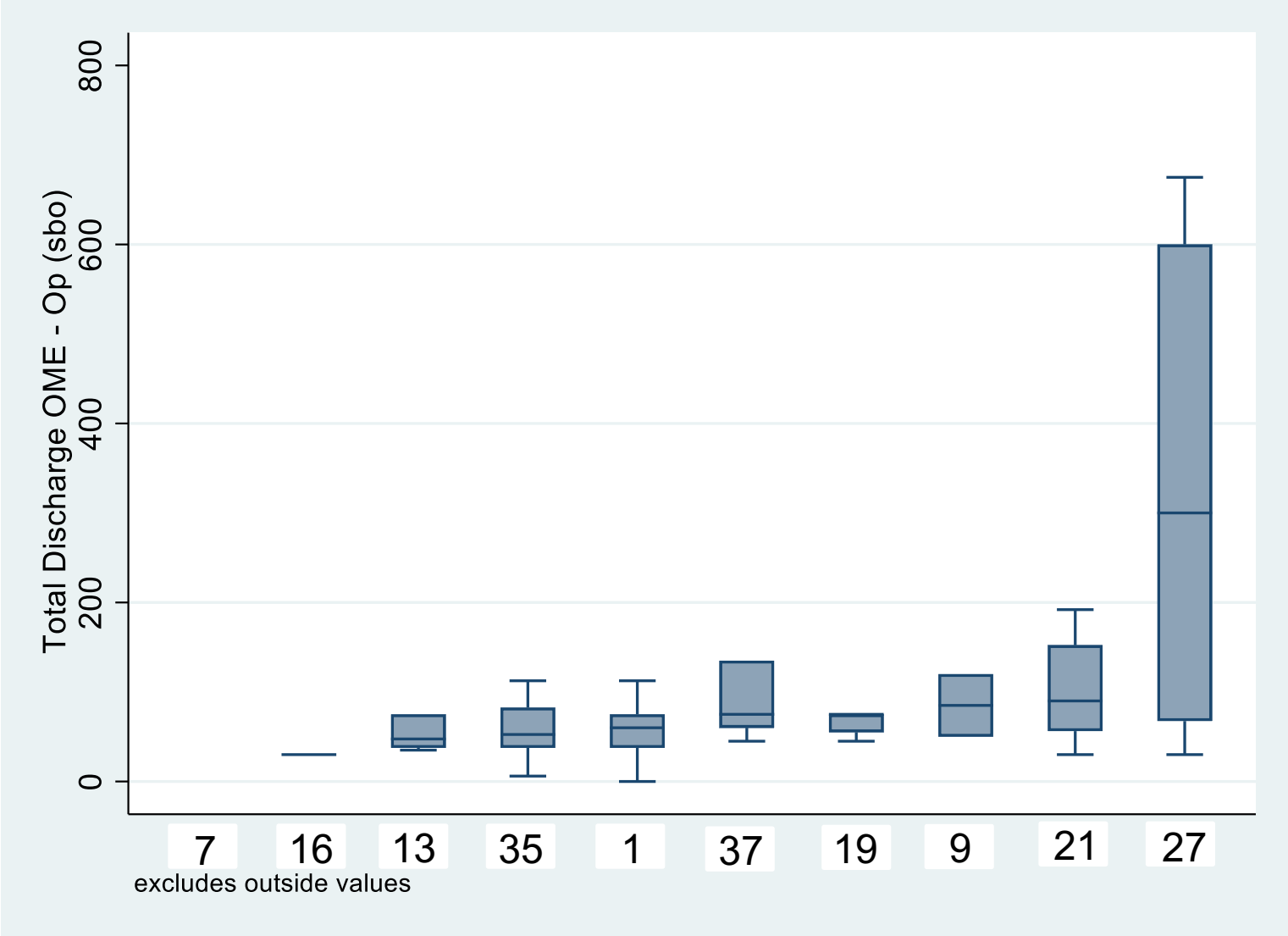


## Recommendation

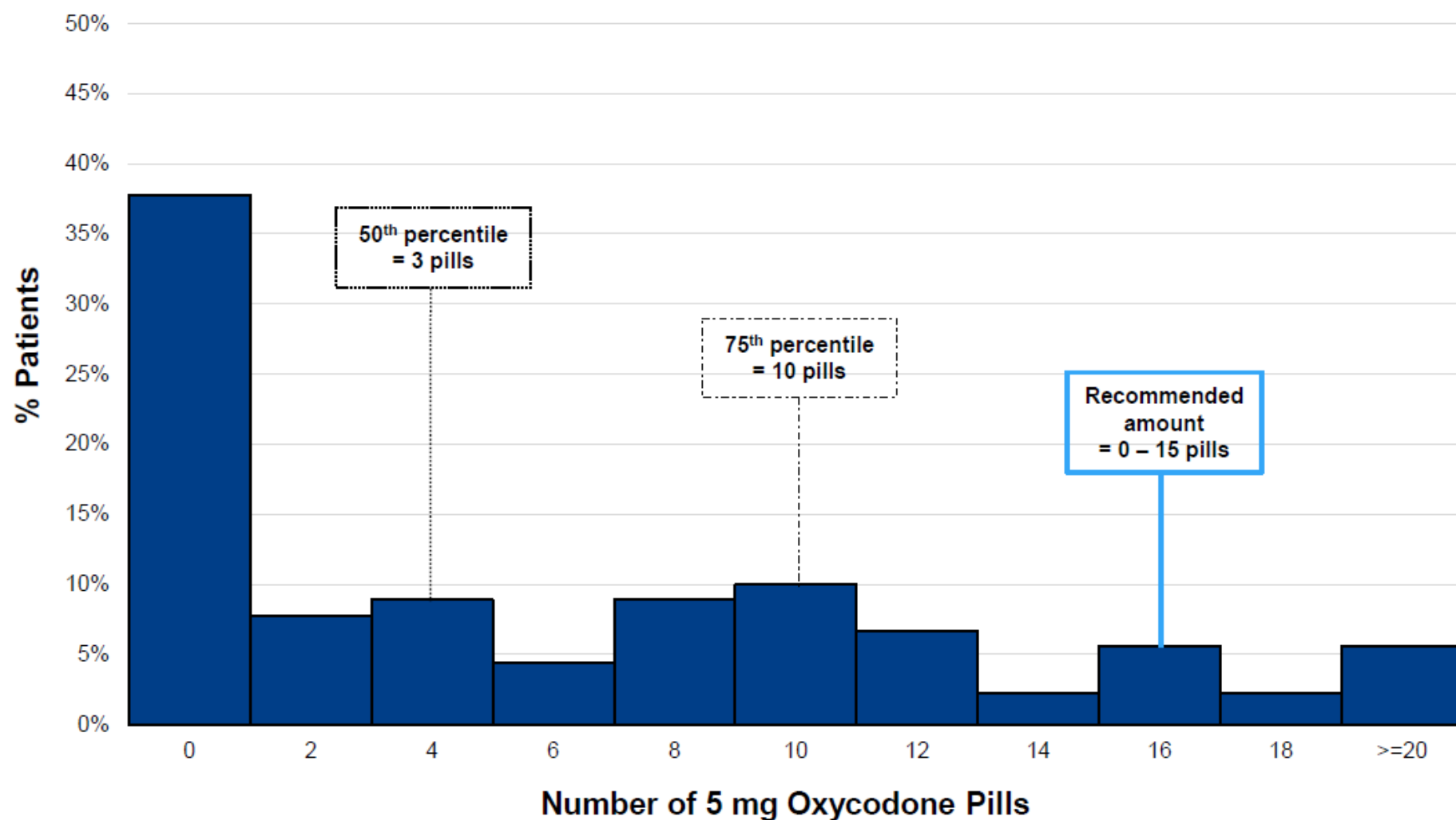
- ◆ 0-10 5 mg pills of Oxycodone
- ◆ Conversion = 1.5 OME per mg Oxycodone
- ◆ 10 pills x 5mg x 1.5 = 75 mg OME
- ◆ Data so far 30-75 mg OME



# SBO - Operation



## Patient Reported Opioid Consumption for Open Small Bowel Resection or Enterolysis



**90**

**opioid naïve  
patients**

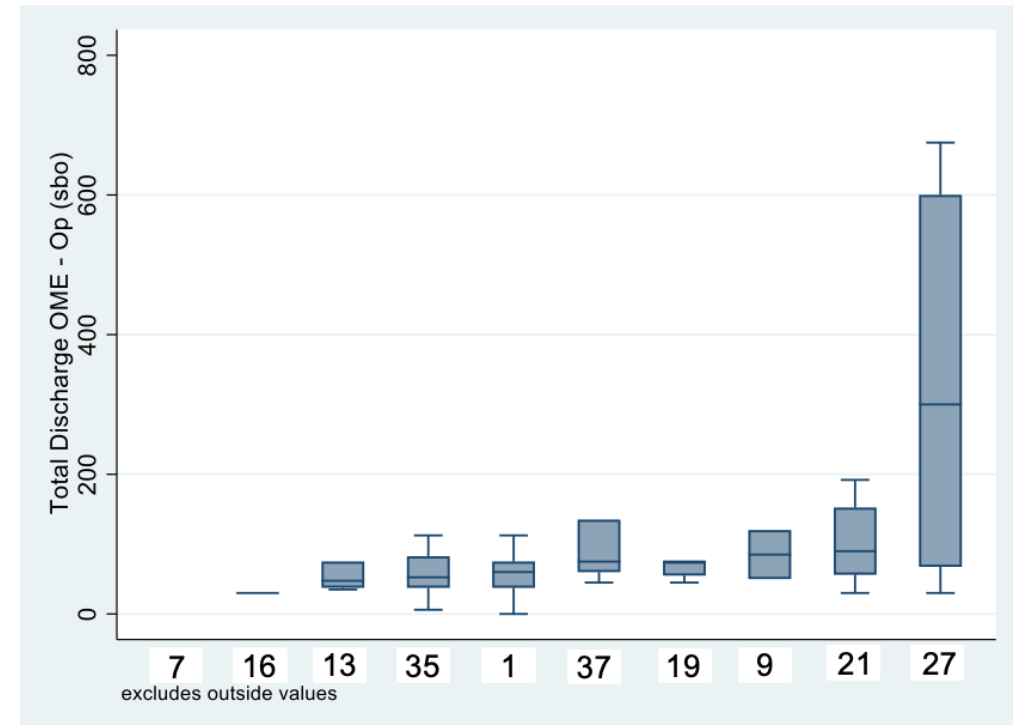
**33**

**hospitals**

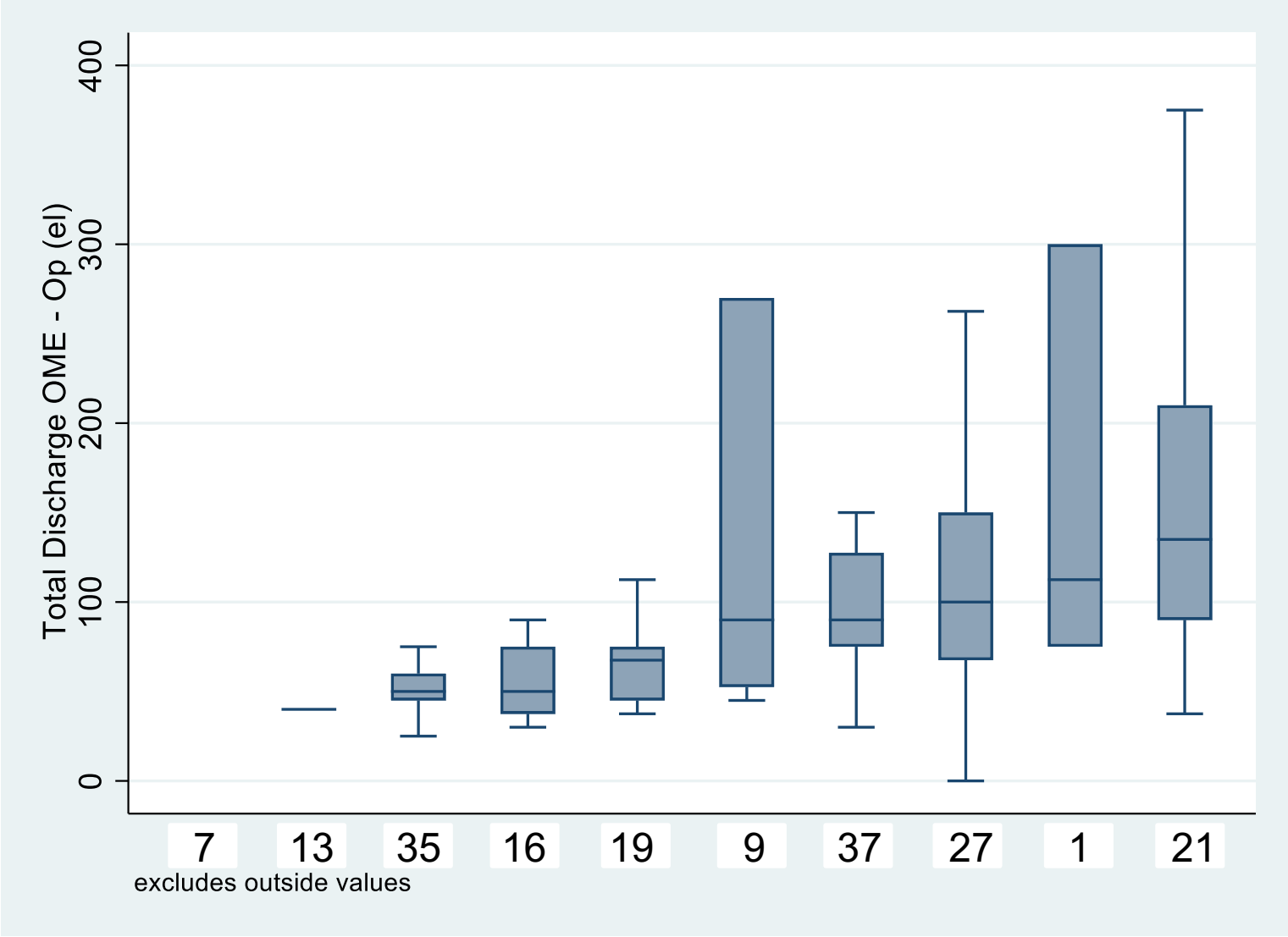
**January 1, 2018  
to  
May 31, 2019**

# Recommendation

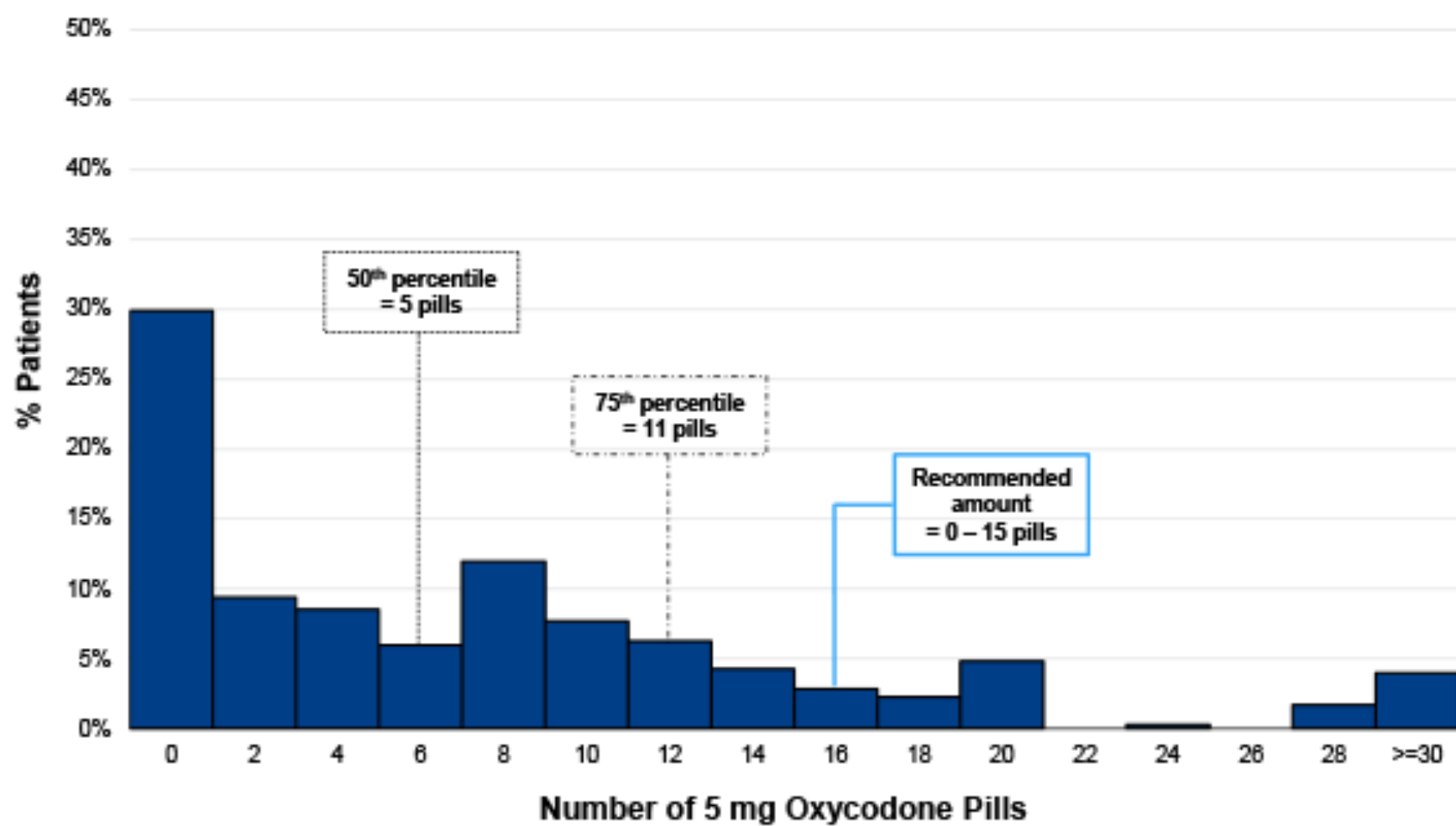
- ◆ 0-15 5 mg pills of Oxycodone
- ◆ Conversion = 1.5 OME per mg Oxycodone
- ◆ 10 pills x 5mg x 1.5 = 113 mg OME
- ◆ Data so far 75-300 mg OME



# Exp. Laparotomy



## Patient Reported Opioid Consumption for Open Colectomy



**351**

opioid naïve  
patients

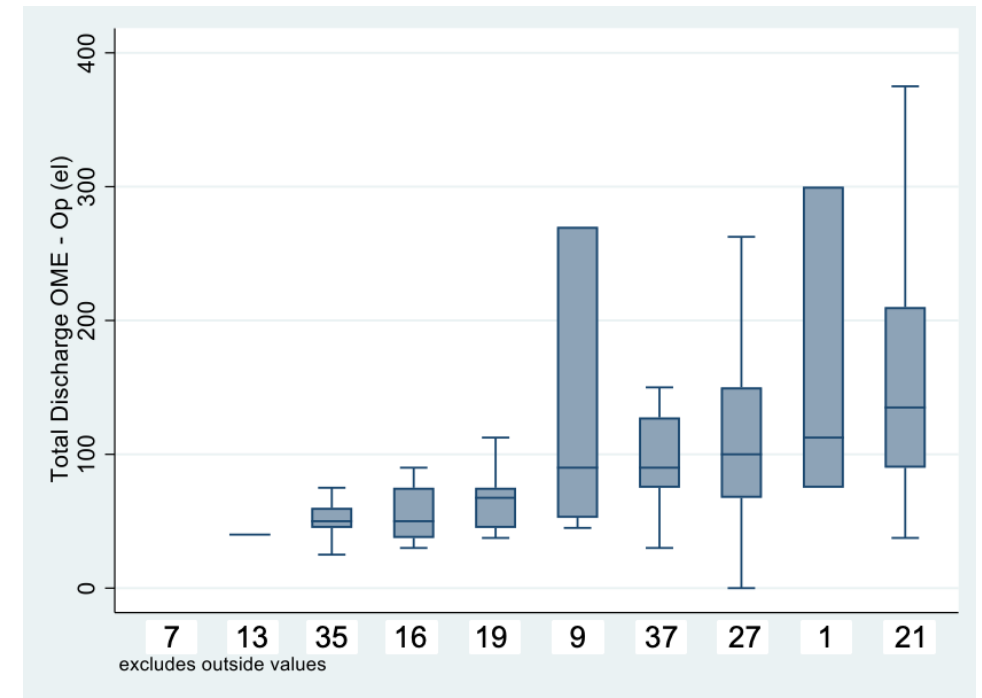
**47**

hospitals

January 1, 2018  
to  
May 31, 2019

## Recommendation

- ◆ 0-15 5 mg pills of Oxycodone
- ◆ Conversion = 1.5 OME per mg Oxycodone
- ◆ 10 pills x 5mg x 1.5 = 113 mg OME
- ◆ Data so far 50-130 mg OME





# Questions





# Questions

Are you aware of these prescribing guidelines?

How to make into a process measure?

**Break**

**Back at 12:45p**

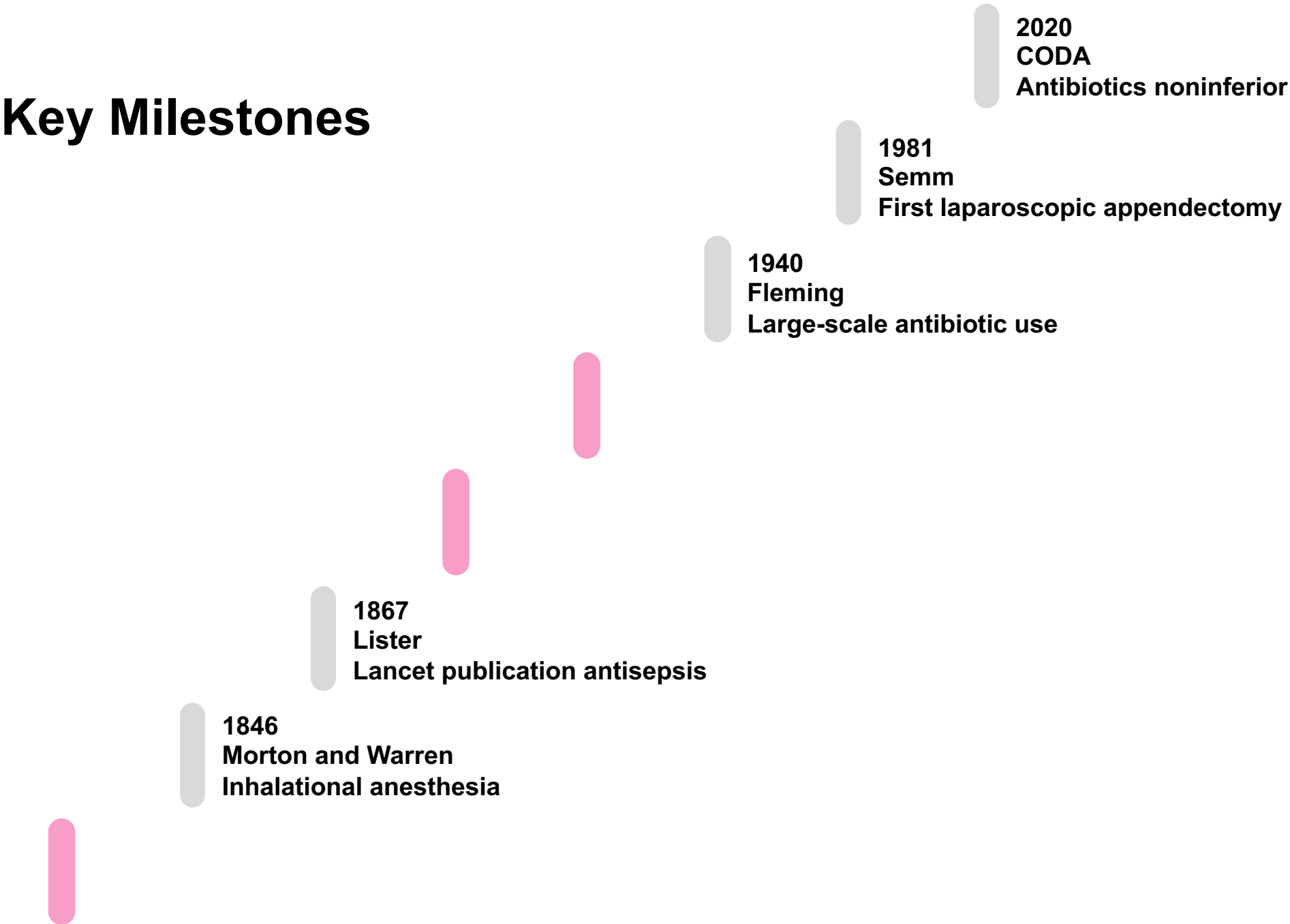
# **The future of appendicitis**

**Jill Jakubus, PA-C**

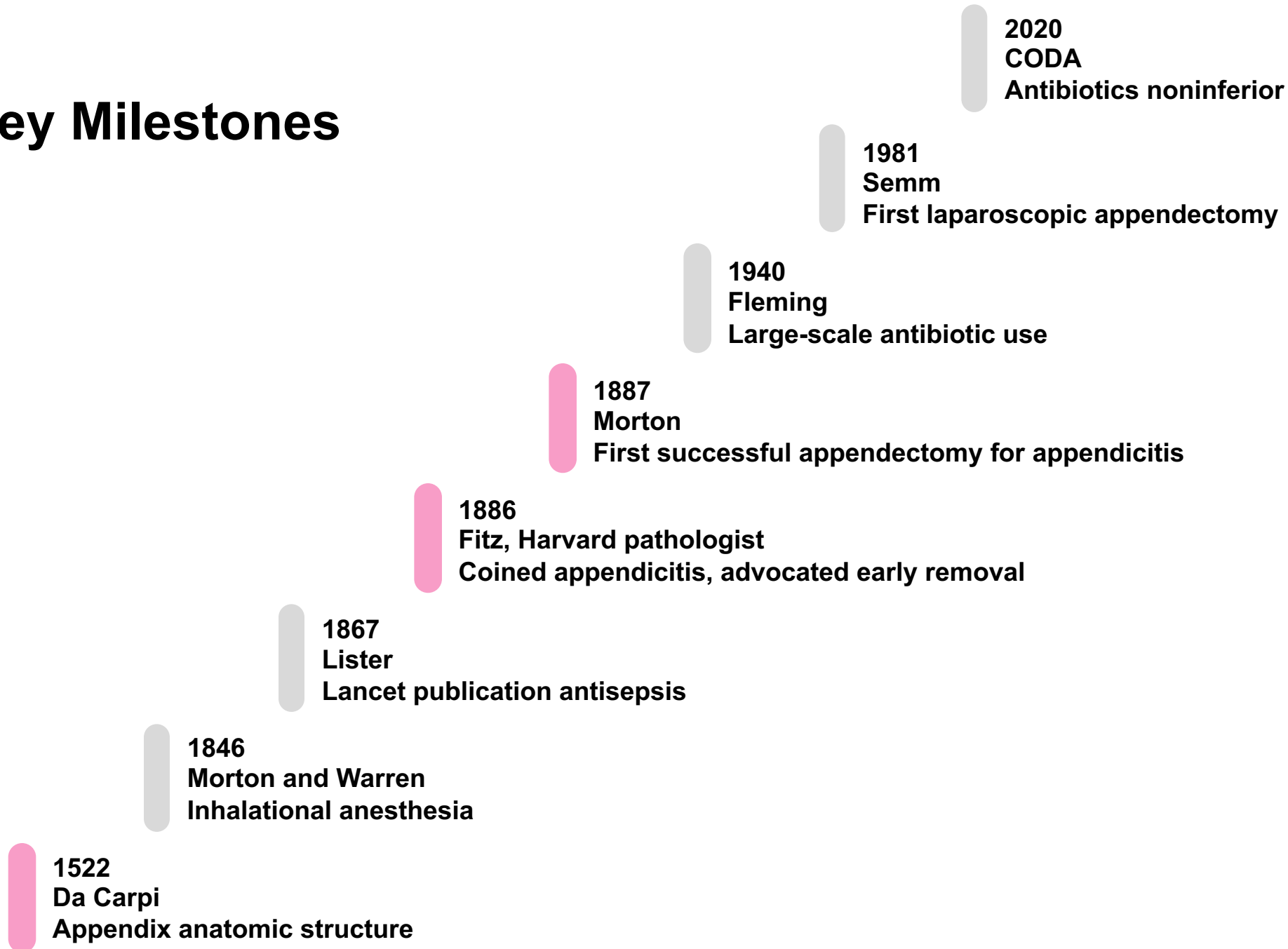
**M·ACS**

**What is the future of appendicitis?**

# Key Milestones



# Key Milestones





THIS PRESENT  
MOMENT  
USED TO BE  
THE UNIMAGINABLE  
FUTURE



**Do you think it's safe to discharge  
stable medically managed  
appendicitis patients from the ED?**

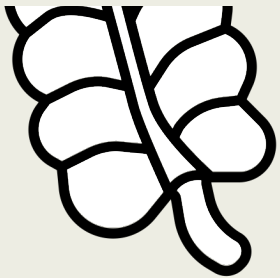


**QUESTION:** Is outpatient management with hospital discharge within 24 hours safe among adults receiving antibiotic treatment for acute appendicitis?

**CONCLUSION:** Outpatient antibiotic management is safe for selected adults with acute appendicitis, with no greater risk of complications or appendectomy than hospital care.

## POPULATION

462 Men, 264 Women



Patients with imaging-confirmed appendicitis who received antibiotics within 24 hours

Median (range), 36 (18-86) y

## EXPOSURE

776 Participants antibiotic-randomized  
726 Participants antibiotics-randomized study population



335 Outpatient  
Discharged  $\leq 24$  h

391 Hospitalization  
Discharged  $> 24$  h

## LOCATIONS

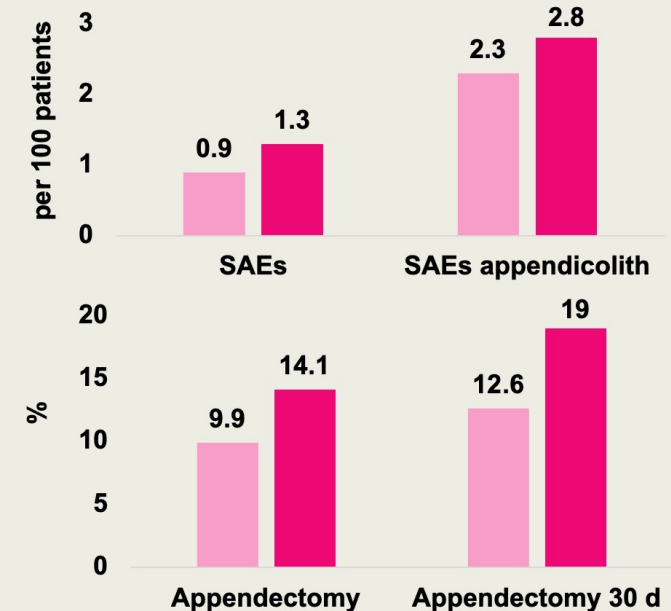


25 hospitals in the  
United States

## PRIMARY OUTCOME

Comparison outpatient vs. inpatient care serious adverse events (SAEs) over 7 days, appendectomies, health care encounters, satisfaction, missed workdays at 7 days, and EuroQol 5-dimension (EQ-5D) at 30 days

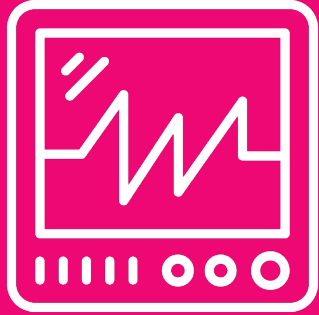
## FINDINGS



Missed Work (d) 2.6 vs. 3.8

EQ-5D Score 0.93 vs. 0.92

# Discharge Criteria



**Hemodynamically  
Stable**



**Tolerate PO  
Intake**



**Afebrile**



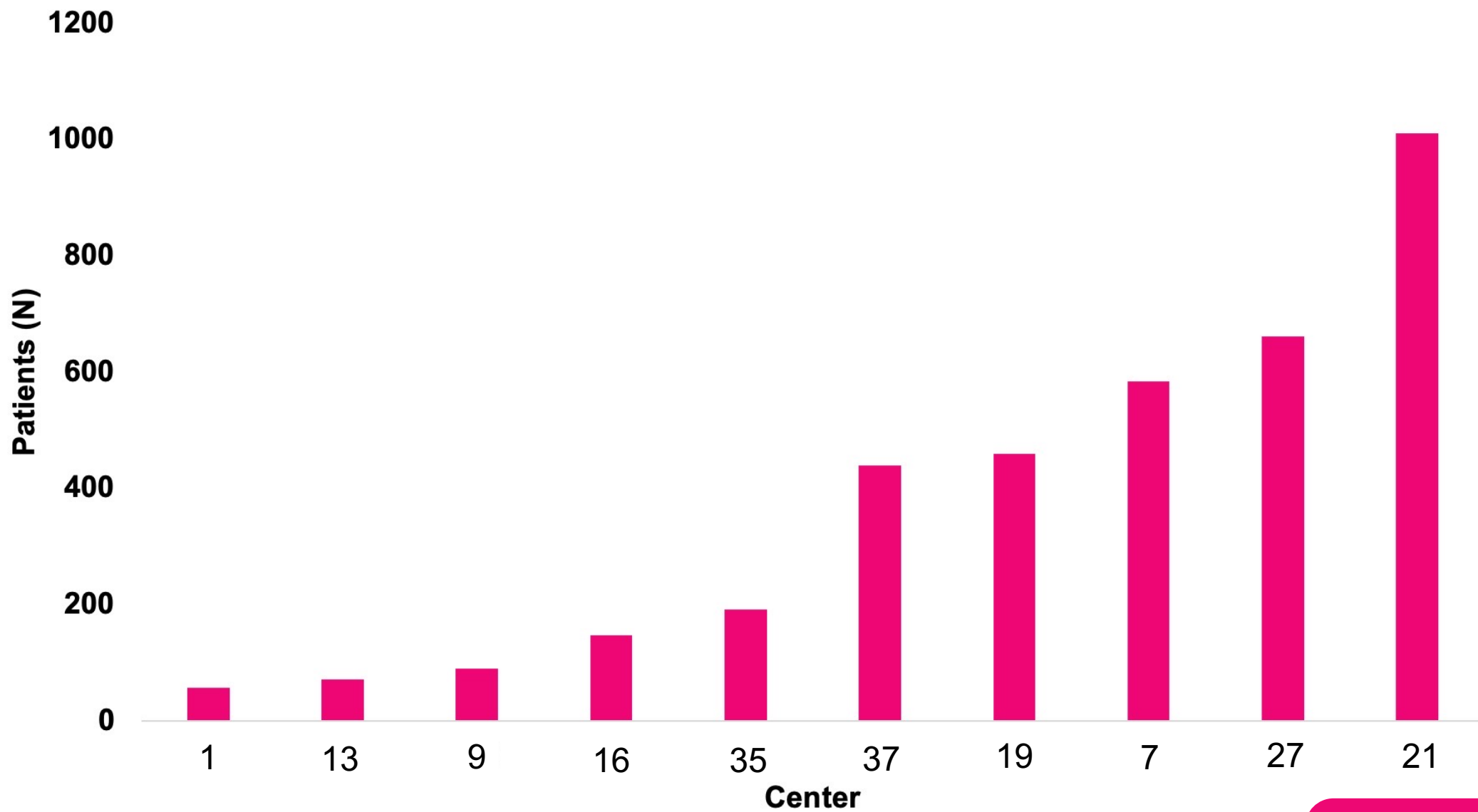
**Pain Controlled**



**Follow-Up  
Confirmed**

**What care are patients  
receiving in Michigan?**

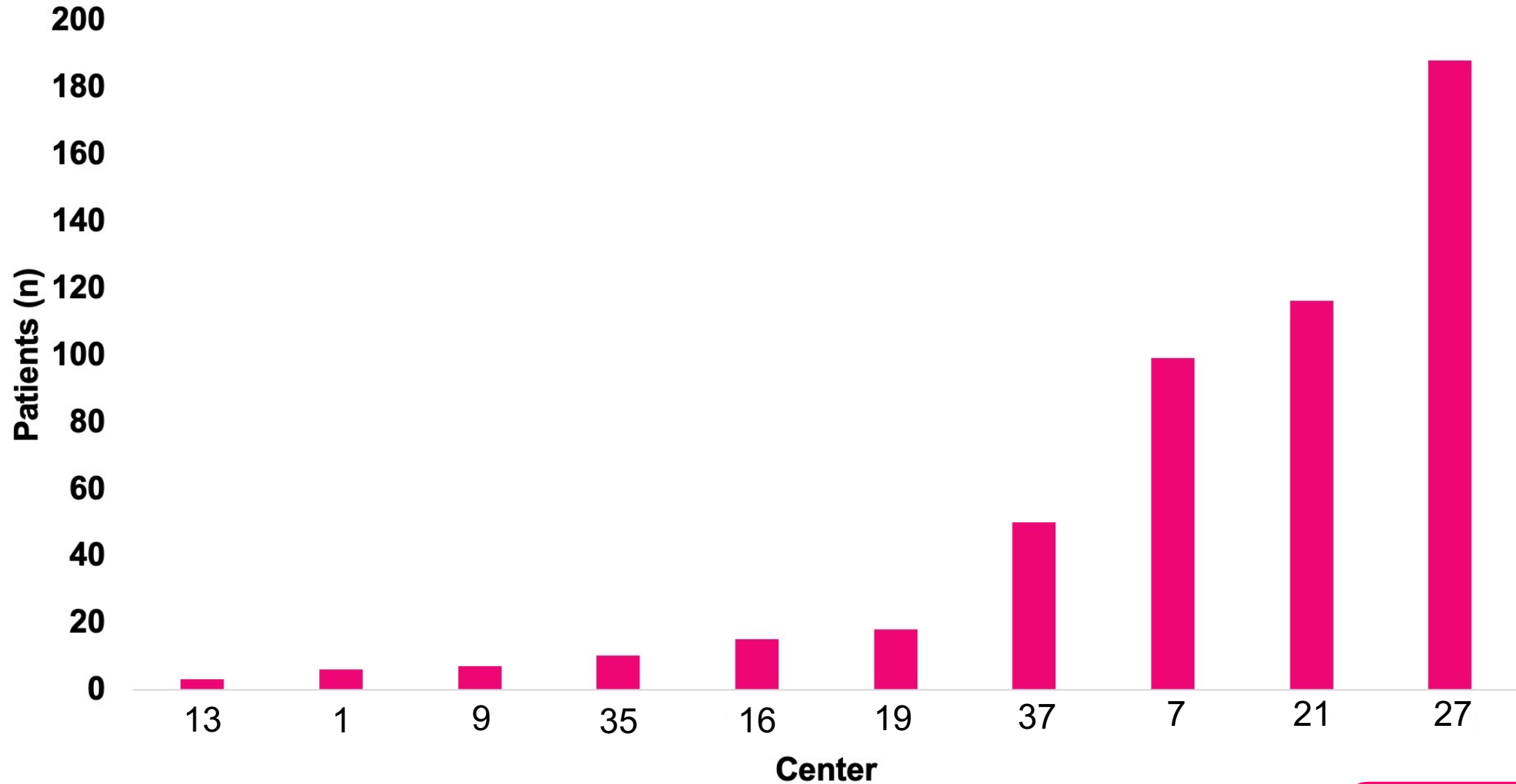
## Total Appendicitis Patients 2019-2022



**3717 Total**

**How many patients are being  
medically-managed?**

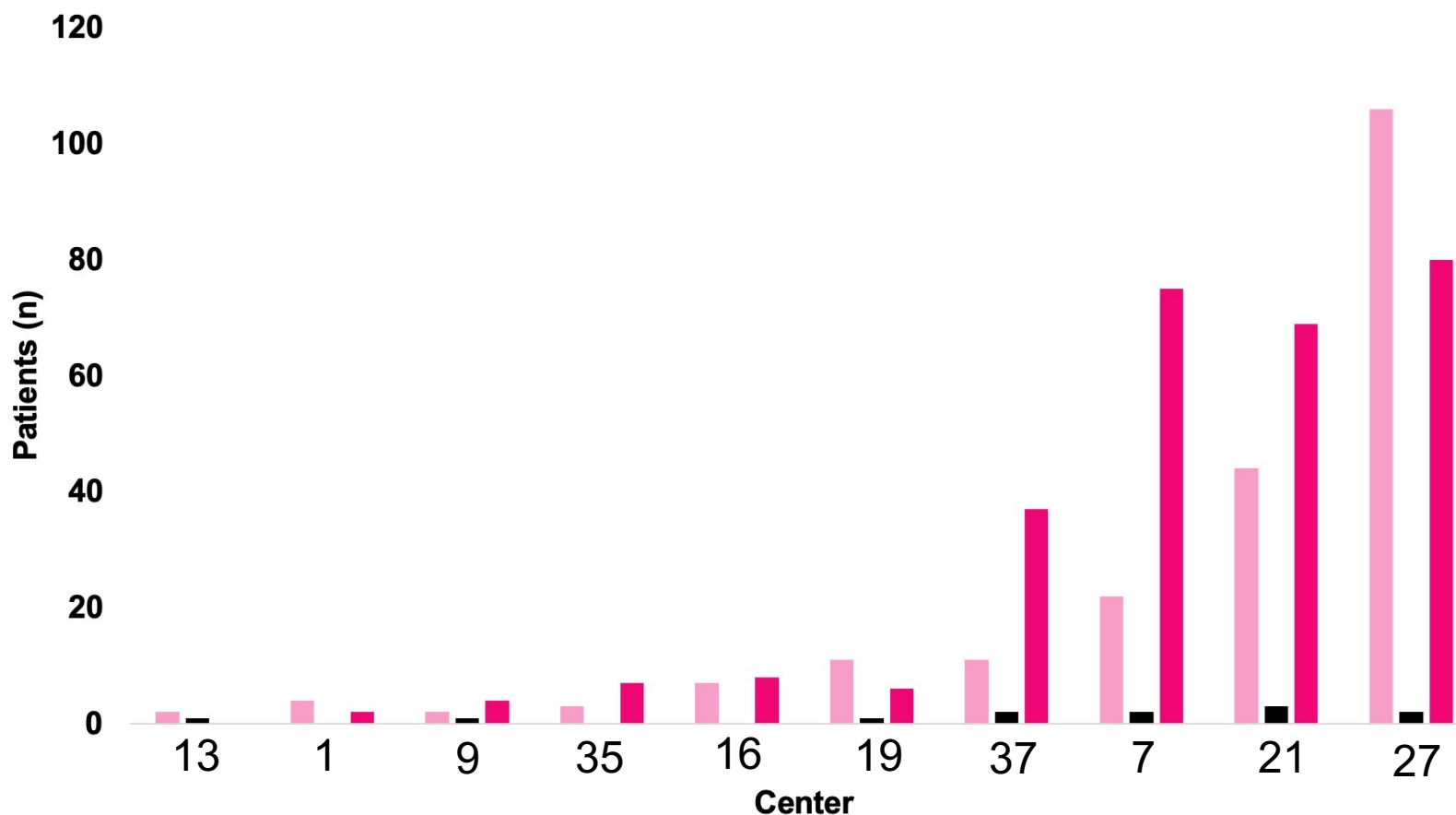
## Medically Managed Appendicitis Patients 2019-2022



**512 Total**

**But maybe some of these patients  
are perforated or complicated?**

## Medically Managed Appendicitis by Appendicitis Type 2019-2022



**Uncomplicated 212**

Uncomplicated (e.g., non-perforated appendicitis)

i. CT or physicians' notes indicate uncomplicated appendicitis

**Comorbidity 12**

Complicated-Comorbidity (e.g., patient with non-perforated appendicitis but who cannot be operated on due to other pre-existing conditions)

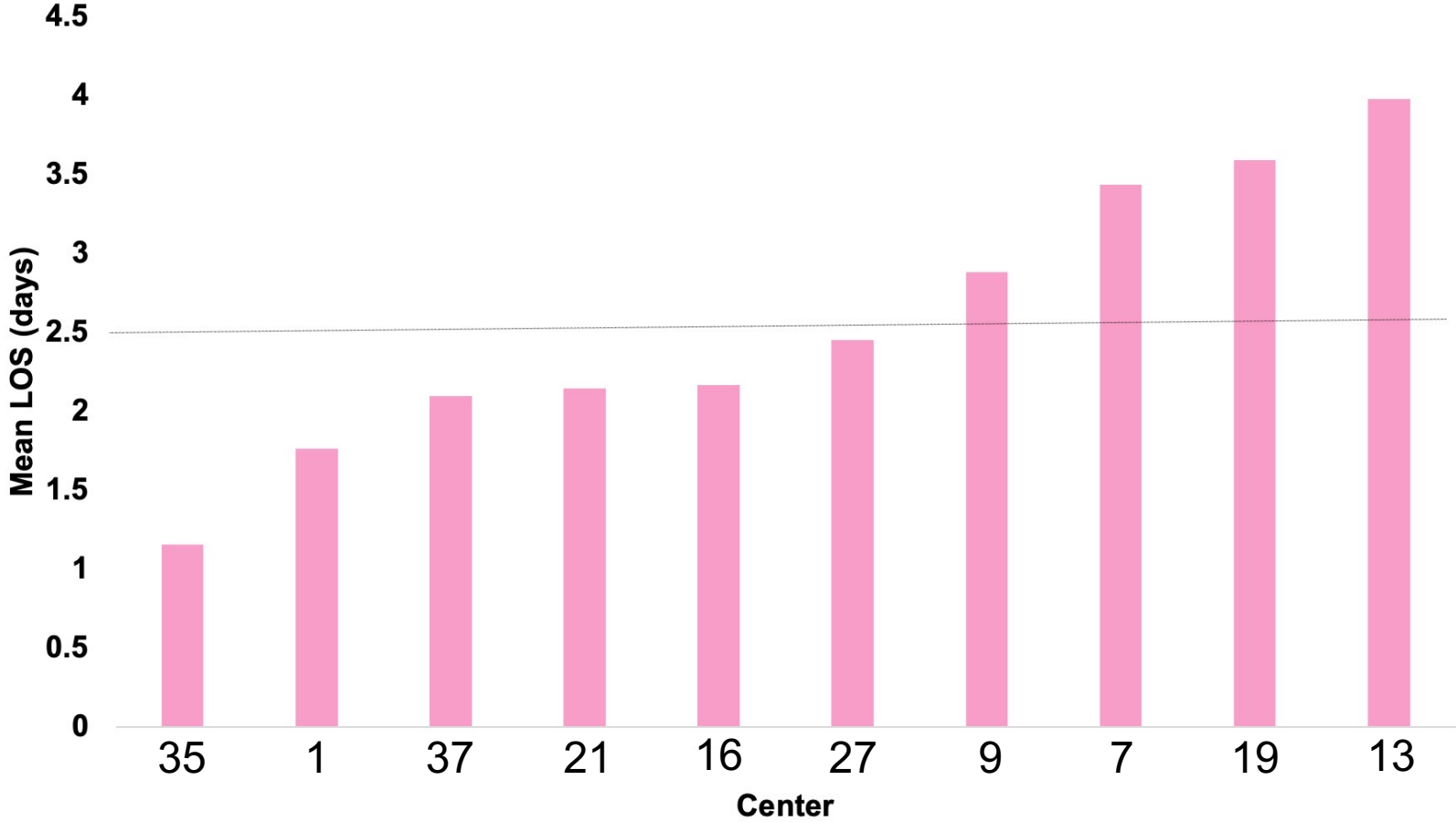
**Complicated 288**

Complicated (e.g., perforated appendicitis, appendiceal carcinoma)



**What is the LOS of uncomplicated medically managed appendicitis patients?**

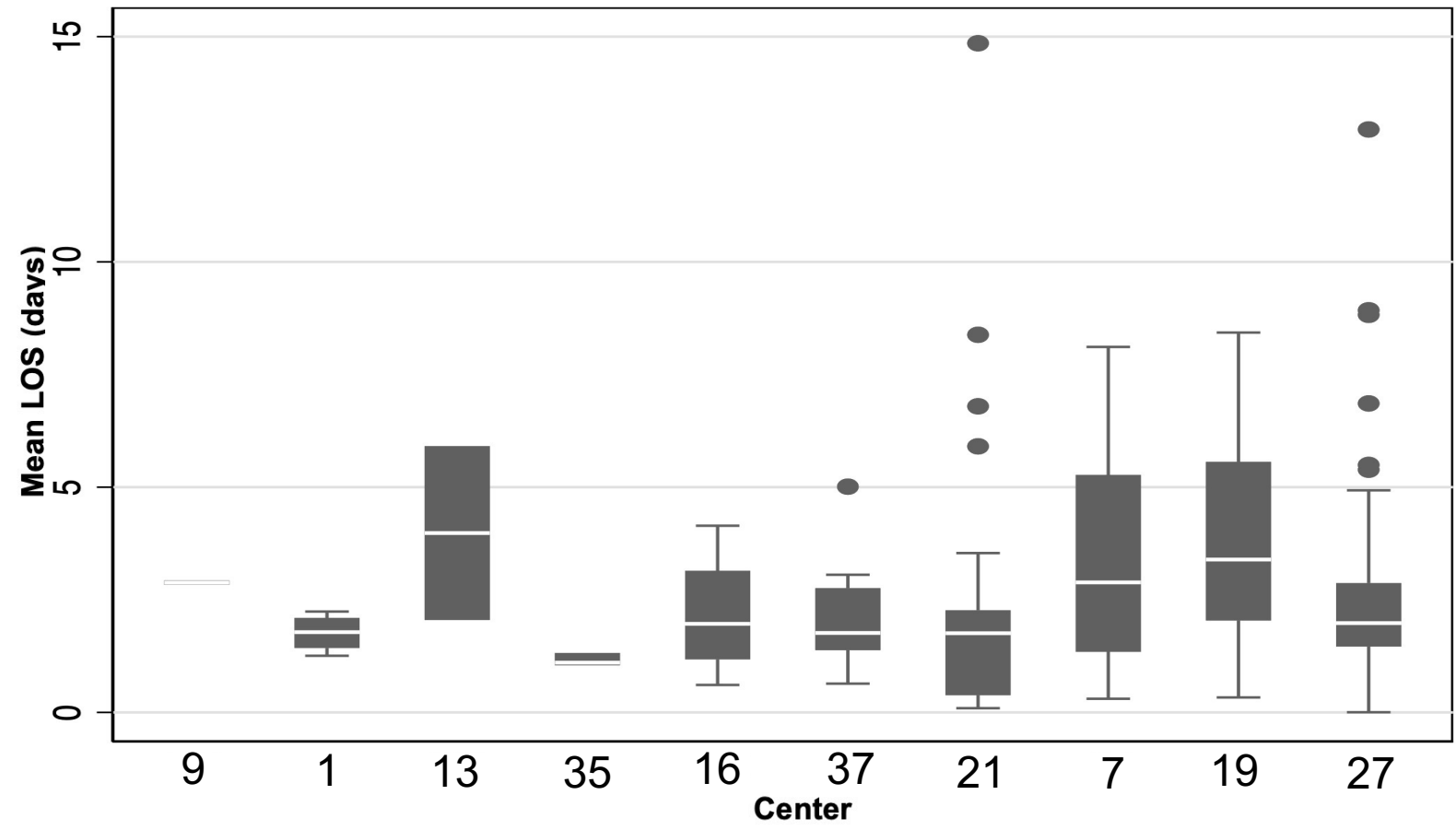
**LOS Medically Managed Appendicitis  
2019-2022**



Center	N	Mean LOS	SD	Min	Max
9	2	2.880	0.068	2.832	2.928
1	4	1.764	0.426	1.257	2.239
13	2	3.981	2.729	2.051	5.911
35	3	1.157	0.143	1.047	1.319
16	6	2.168	1.364	0.610	4.144
37	11	2.095	1.176	0.639	5.011
21	42	2.149	2.669	0.094	14.853
7	21	3.436	2.286	0.303	8.113
19	11	3.589	2.385	0.333	8.431
27	102	2.454	1.821	0.004	12.939
Total	204	2.512	2.071	0.004	14.853

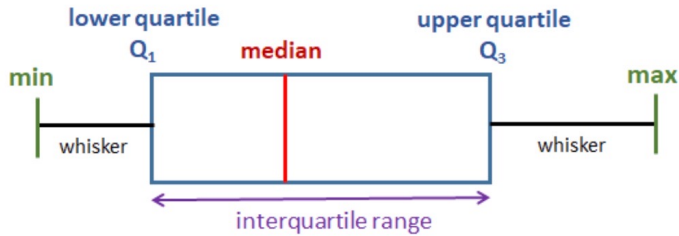
Missing Date 8

# LOS Medically Managed Appendicitis 2019-2022



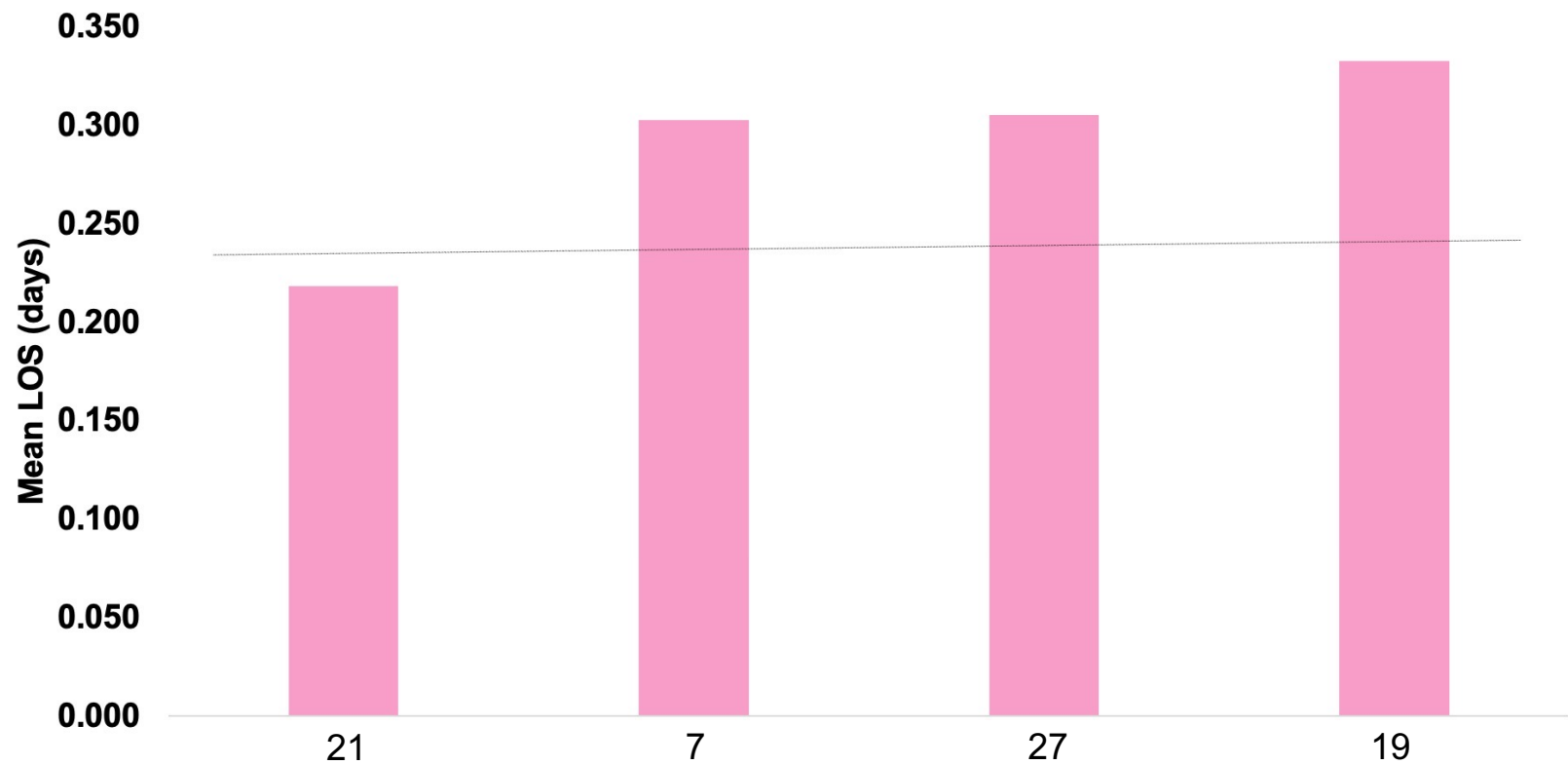
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27	102	2.454	1.821	0.004	12.939
<b>Total</b>	<b>204</b>	<b>2.512</b>	<b>2.071</b>	<b>0.004</b>	<b>14.853</b>

Missing Date 8



**Are any centers discharging medically managed uncomplicated appendicitis patients from the ED?**

LOS Medically Managed Appendicitis Discharged from ED  
2019-2022



Center					
Center	Mean LOS	N	SD	Min	Max
21	0.218	9	0.088	0.094	0.384
7	0.303	1	.	0.303	0.303
19	0.333	1	.	0.333	0.333
27	0.305	2	0.004	0.302	0.308
Total	0.247	13	0.085	0.094	0.384

**How to ensure a safe discharge for  
medically managed appendicitis  
patients from the ED?**

**What are the current antibiotic  
recommendations for  
appendicitis patients?**

Appendicitis	
Empiric Therapy	Duration
<p><u>Community Acquired, No Severe Sepsis/Shock</u></p> <p><i>1<sup>st</sup> line:</i></p> <p><b>Cefuroxime*</b> 1.5 g IV q8h + <b>Metronidazole</b> 500 mg PO/IV q8h</p> <p><i>High-risk allergy<sup>3</sup>/contraindications<sup>4</sup> to beta-lactams:</i></p> <p><b>Ciprofloxacin*</b> 400 mg IV q8h + <b>Metronidazole</b> 500 mg PO/IV q8h</p> <p><u>Community Acquired with Severe Sepsis/Shock OR MDR-GNR Risk:</u></p> <p><i>1<sup>st</sup> line:</i></p> <p><b>Piperacillin-tazobactam*</b> 4.5 g IV q6h</p> <p><i>Low/medium-risk allergy<sup>2</sup> to penicillins:</i></p> <p><b>Cefepime*</b> 2 g IV q8h + <b>Metronidazole</b> 500 mg PO/IV q8h</p> <p>Consider the addition of <b>vancomycin</b> to cefepime for Enterococcus coverage in <i>critically ill</i> patients with risk factors defined in comments.</p> <p><i>High-risk allergy<sup>3</sup>/contraindication<sup>4</sup> to beta-lactams:</i></p> <p><b>Vancomycin*</b> + <b>Aztreonam*</b> 2 g IV q8h + <b>Metronidazole</b> 500 mg PO/IV q8h</p> <p><u>Step-down oral therapy</u> if tolerating orals and susceptibilities (if available) do not demonstrate resistance</p> <p><b>Amoxicillin-clavulanic acid*</b> 875 mg PO BID OR <b>Cefuroxime*</b> 500 mg PO BID + <b>Metronidazole</b> 500mg PO TID</p> <p><i>High-risk allergy<sup>3</sup>/contraindications<sup>4</sup> to beta-lactams OR MDR-GNR risk:</i></p> <p><b>Ciprofloxacin</b> 750 mg PO BID + <b>Metronidazole</b> 500 mg PO TID</p> <p>MDR-GN risk:</p> <ul style="list-style-type: none"> <li>History of cefuroxime-resistant infection or colonization in prior year</li> <li>History of hospitalization &gt;48 hours in prior 90 days</li> <li>Current hospitalization &gt; 48 hours</li> <li>Intravenous antibiotic or quinolone use within prior 90 days</li> <li>Significant immunocompromise</li> <li>Presence of an at-risk device<sup>1</sup></li> </ul>	<p><u>Non-perforated:</u></p> <p>Discontinue after appendectomy. If no appendectomy performed a 10-day duration is recommended <sup>ref1</sup></p> <p><u>Perforated:</u></p> <p>4 full days after source control <sup>ref3</sup></p> <p>Duration of therapy may be extended with inadequate source control or persistent clinical symptoms or signs of infection.</p> <p><u>Patients with bacteremia:</u></p> <p>7-14 days</p> <p>For patients with secondary gram-negative bacteremia, a 7-day duration of IV therapy (or oral quinolone at discharge) may be appropriate <sup>ref5</sup> in conjunction with ID consultation for patients with source control and:</p> <ul style="list-style-type: none"> <li>Transient bacteremia (single day) and rapid clinical improvement within 72 hours</li> <li>Not polymicrobial or bacteremic with <i>Pseudomonas</i></li> <li>Not neutropenic, HCST/SOT, HIV with CD4 &lt;200</li> <li>Remains hemodynamically stable at day 7</li> <li>Been afebrile ≥48 hours (at day 7)</li> </ul> <p><b>Comments</b></p> <ul style="list-style-type: none"> <li>Ciprofloxacin use is not preferred unless necessary due to allergy or need for <i>Pseudomonas</i> coverage due to increasing resistance amongst <i>E. coli</i>.<sup>ref14</sup> UMHS susceptibility in 2019 was only 74%.</li> <li>Enterococcus coverage:             <ul style="list-style-type: none"> <li>Risk factors in ICU patients include septic shock, recent complex abdominal surgery, prosthetic valve, and recent cephalosporin or quinolone use.</li> </ul> </li> <li>Adjust antibiotics based on organism and susceptibilities</li> <li>Patients with low/medium-risk allergy<sup>2</sup> to penicillins and cephalosporins other than cefepime, ceftriaxone, cefpodoxime, and cefotaxime can receive cefepime</li> </ul>



**Thank you**





Michigan Acute Care Surgery Collaborative

September 15, 2022

Data Validation

Kim Kramer PA-C

# Upcoming Validations:

Mercy Health St. Mary's

McLaren Macomb

Ascension Borgess

# Data Abstractor Meeting



December



Discuss 2023 data dictionary updates



Table with edits available



Please email me any surgeon or service changes

# Thought Journey

---

- What data we have
- Ideas on what we can do
  - Performance metrics
  - Care bundles



September is Sepsis Awareness Month!

Systematic screening with early identification and early treatment are critical.

What is the best way to measure a dysregulated host response?

- SIRS
- qSOFA
- NEWS
- MEWS
- MD Calc website

Sepsis is a  
challenge  
to define

\*No gold standard diagnostic test

## SPOT SEPSIS, STOP SEPSIS: EARLY DETECTION AND FAST ACTION SAVE LIVES

March 24, 2021 // FOUND IN: Strategy & Leadership, Sepsis, Top Story



**Act fast. Save lives.**

“In the U.S., someone dies every two minutes of sepsis,” said Pat Posa, M.S.A., B.S.N., R.N., CCRN-K, FAAN, quality and patient safety program manager for University Hospital and Frankel Cardiovascular Center. “It is one of the leading causes of deaths in hospitals.”



Defining Criteria		
<p><b>#1 Recent history of new infection source, within 72 hours before surgery start time</b></p> <ul style="list-style-type: none"> <li>Must have documentation of (or meet MSQC criteria for) confirmed or suspected infection source</li> <li>Physician diagnoses are acceptable of infections such as SSI, Pneumonia, and UTI</li> <li>Infection can be bacterial, fungal, viral or parasitic</li> <li>"Suspected Sepsis", "Sepsis Manifestation" and "Septic Syndrome" are NOT considered documented sources of infection</li> <li>Suspected or confirmed infection sources include, but are not limited to: acute appendicitis, acute cholecystitis, empyema, acute abdominal infection, meningitis, skin/soft tissue infection, bone/joint infection, wound infection, bloodstream catheter infection, endocarditis, implantable device infection, anastomotic leak, acute diverticulitis, acute sinus infection, organ perforation/ perforated viscus, abscess, positive cultures, anastomotic leak and/or gangrene/necrosis.</li> <li>Acute pancreatitis is not considered a source of infection unless there is additional information to support the infectious process. Some things to consider: a) CT/MRI study that demonstrates an abscess; b) biopsy or aspiration of pancreatic tissue/fluid identifying an infectious organism; c) blood cultures (positive); or d) antibiotics ordered to treat the pancreatitis.</li> <li>Documentation of 'suspected/possible infection from xx' is acceptable as a source (e.g., 'suspected infection from intraabdominal source'). This may be noted in progress notes, consult notes, nursing notes or similar physician/APN/PA documentation.</li> <li>Nursing documentation referencing an infection, suspected infection, or current treatment of a new infection is acceptable.</li> </ul>	SEPSIS (#1 & #2)	SEVERE SEPSIS/ SEPTIC SHOCK (#1, #2 & #3)
<p><b>#2 Presence of at least TWO of the following systemic signs/symptoms:</b></p> <ul style="list-style-type: none"> <li>Temperature &gt; 38.3°C (101.0°F) or &lt; 36°C (96.8°F)</li> <li>Heart Rate (HR) &gt; 90 beats per minute</li> <li>Respiratory Rate (RR) &gt; 20 breaths per minute</li> <li>White Blood Cells (WBC) &gt; 12,000 cells/mm<sup>3</sup> or &lt; 4000 cells/mm<sup>3</sup></li> </ul> <p>Signs/symptoms must be new, not related to a chronic condition (e.g., WBC &lt;4 r/t leukemia, etc.)</p> <p>For Lab values, use the time the specimen was obtained (not resulted) for determining the timeframes</p>		
<p><b>#3 Presence of at least ONE of the following organ dysfunction/tissue hypoperfusion elements:</b></p> <ul style="list-style-type: none"> <li>Systolic Blood Pressure (SBP) &lt; 90 mm Hg</li> <li>Mean Arterial Pressure (MAP) &lt; 65 mm Hg</li> <li>Systolic Blood Pressure (SBP) decrease &gt; 40 mm Hg from baseline</li> <li>Creatinine &gt; 2.0 mg/dL (176.8 µmol/L)</li> <li>Urine output &lt; 0.5 mL/kg/hr for at least two hours despite adequate fluids</li> <li>Bilirubin &gt; 2 mg/dL (34.2 µmol/L)</li> <li>Platelet count &lt; 100,000 µL</li> <li>INR &gt; 1.5 or aPTT &gt; 60 seconds</li> <li>Lactate/Lactic Acid &gt; 2.0 mmol/L</li> <li>Hypotension requiring vasopressor therapy to maintain or elevate MAP ≥65 mm Hg</li> </ul> <p>Organ dysfunction criteria must be present at a site remote from the infection source and cannot be related to a chronic condition (e.g., INR &gt;1.5 r/t anticoagulants, bili &gt; 2 r/t liver disease, etc.)</p> <p>Only documented blood pressures are acceptable, regardless of vasopressor administration</p> <p>For Lab values, use the time the specimen was obtained (not resulted) for determining the timeframes</p>		

Sepsis = SIRS + infection source:

- Temp > 38.0 or < 36.0
- HR > 90
- RR > 20
- WBC ct > 12k or < 4k

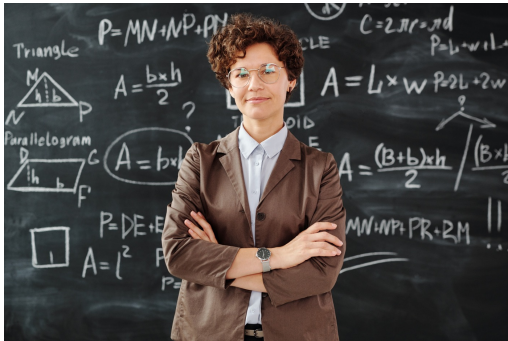
Severe Sepsis: Organ Dysfunction, Hypotension, Hypoperfusion

qSOFA:

- GCS < 15
- RR ≥ 22
- SBP ≤ 100



“I have a young healthy patient coming into the ED with acute appendicitis. They have a WBC ct of 12.5k and one HR of 91 pre-op. All other VS are stable. It doesn't really seem like this patient has pre-op sepsis...”



Complex  
Situation



Single  
Model



**Perfection**

\*A complex situation will always get oversimplified when applied to a single model. What matters is how we use and apply the data. Some over capture and under capture will occur.

# Sepsis Care Bundles

Recommendation updates from 2016 to 2021

- IVF administration- rate and type
- Antibiotic timing
- Vasopressor reccs- start vasopressors peripherally right away rather than waiting until a central line has been placed
- IV vitamin C- advise against this
- IV corticosteroid reccs
- Post-discharge reccs

## SPECIAL ARTICLE

### Executive Summary: Surviving Sepsis Campaign: International Guidelines for the Management of Sepsis and Septic Shock 2021

Evans, Laura<sup>1</sup>; Rhodes, Andrew<sup>2</sup>; Alhazzani, Waleed<sup>3</sup>; Antonelli, Massimo<sup>4</sup>; Coopersmith, Craig M.<sup>5</sup>; French, Craig<sup>6</sup>; Machado, Flávia R.<sup>7</sup>; McIntyre, Lauralyn<sup>8</sup>; Ostermann, Marlies<sup>9</sup>; Prescott, Hallie C.<sup>10</sup>; Schorr, Christa<sup>11</sup>; Simpson, Steven<sup>12</sup>; Joost Wiersinga, W.<sup>13</sup>; Alshamsi, Fayez<sup>14</sup>; Angus, Derek C.<sup>15</sup>; Arabi, Yaseen<sup>16</sup>; Azevedo, Luciano<sup>17</sup>; Beale, Richard<sup>18</sup>; Beilman, Gregory<sup>19</sup>; Belley-Cote, Emilie<sup>20</sup>; Burry, Lisa<sup>21</sup>; Cecconi, Maurizio<sup>22</sup>; Centofanti, John<sup>23</sup>; Yataco, Angel Coz<sup>24</sup>; De Waele, Jan<sup>25</sup>; Dellinger, R. Phillip<sup>26</sup>; Doi, Kent<sup>27</sup>; Du, Bin<sup>28</sup>; Estenssoro, Elisa<sup>29</sup>; Ferrer, Ricard<sup>30</sup>; Gomersall, Charles<sup>31</sup>; Hodgson, Carol<sup>32</sup>; Møller, Morten Hylander<sup>33</sup>; Iwashyna, Theodore<sup>34</sup>; Jacob, Shevin<sup>35</sup>; Kleinpell, Ruth<sup>36</sup>; Klompas, Michael<sup>37</sup>; Koh, Younsuck<sup>38</sup>; Kumar, Anand<sup>39</sup>; Kwizera, Arthur<sup>40</sup>; Lobo, Suzana<sup>41</sup>; Masur, Henry<sup>42</sup>; McGloughlin, Steven<sup>43</sup>; Mehta, Sangeeta<sup>44</sup>; Mehta, Yatin<sup>45</sup>; Mer, Mervyn<sup>46</sup>; Nunnally, Mark<sup>47</sup>; Oczkowski, Simon<sup>48</sup>; Osborn, Tiffany<sup>49</sup>; Papathanassoglou, Elizabeth<sup>50</sup>; Perner, Anders<sup>51</sup>; Puskasich, Michael<sup>52</sup>; Roberts, Jason<sup>53</sup>; Schweickert, William<sup>54</sup>; Seckel, Maureen<sup>55</sup>; Sevransky, Jonathan<sup>56</sup>; Sprung, Charles L.<sup>57</sup>; Welte, Tobias<sup>58</sup>; Zimmerman, Janice<sup>59</sup>; Levy, Mitchell<sup>60</sup>

#### Author Information

Critical Care Medicine: November 2021 - Volume 49 - Issue 11 - p 1974-1982

doi: 10.1097/CCM.0000000000005357

Future plan: align sepsis definition & sepsis care bundle



M·ACS

# NEWS2

No	Yes
----	-----

Supplemental O <sub>2</sub>	+2
Room air	0

≤40	+3
41-50	+1
51-90	0
91-110	+1
111-130	+2
≥131	+3

Alert	0
New-onset confusion (or disorientation/agitation), responds to voice, responds to pain, or unresponsive	+3

Temp
------

Hypercapnic respiratory failure
---------------------------------

O <sub>2</sub> sat +Hypercapnic resp failure
---

RA or Supplemental O <sub>2</sub>
-----------------------------------

RR
----

HR
----

SBP
-----

Level of consciousness or new confusion
---

≤35.0°C (95°F)	+3
35.1-36.0°C (95.1-96.8°F)	+1
36.1-38.0°C (96.9-100.4°F)	0
38.1-39.0°C (100.5-102.2°F)	+1
≥39.1°C (102.3°F)	+2

≤83%	+3
84-85%	+2
86-87%	+1
88-92%, ≥93% on room air	0
93-94% on supplemental O <sub>2</sub>	+1
95-96% on supplemental O <sub>2</sub>	+2
≥97% on supplemental O <sub>2</sub>	+3

≤8	+3
9-11	+1
12-20	0
21-24	+2
≥25	+3

≤90	+3
91-100	+2
101-110	+1
111-219	0
≥220	+3

- Patients ≥16 years old.
- Do not use in children <16 years old or pregnant patients.
- [The Royal College of Physicians](#) recommends the NEWS2 in the following settings:
  - Emergency: for initial assessment, serial monitoring, and assessment for triage.
  - Ward: for initial inpatient assessment and serial monitoring.
  - Prehospital: for communication of illness severity to receiving hospitals.

Points/Score = Risk level = Frequency of





# Questions

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What should our timeframe for NEWS2 data point collection be?

- All data elements within 1 hr?
- All data elements within 2 hrs?
- Keep this unspecified?
- Retroactive collection of data poses a challenge, rarely ever a complete set of NEWS2 data elements collected at the same time

Currently, we have a 12-hour window to collect the NEWS2 data.

# ELPQuIC 2

This pathway should be started for ALL patients presenting with acute abdominal conditions that may need unscheduled surgery.

Patient name:	.....
NHS no:	.....
Hospital no:	..... Please affix patient ID label within this box
DOB:	.....

## 1. Immediate assessment and resuscitation

- EWS within 30 minutes of admission
- MRCS grade surgical registrar review within 2 hours of referral (30 minutes if EWS > 3)
- Arterial lactate measurement to identify sick patients
- Early fluid resuscitation

## 2. Early antibiotics

- Within 1 hour of admission/referral if sepsis or suspected peritonitis/perforation

## 3. Rapid diagnosis and surgical plan

- Rapid CT scan - within 2 hours of request, verbal report within 1 hour
- Communication with consultant surgeon for within 1 hour of CT

## 4. Surgery within 6 hours of admission/referral for urgent/emergency cases

- Prioritise theatre – next available slot on CEPOD
- Consultant-led perioperative care

## 5. Clear management plan for 'expedited' cases, e.g. bowel obstruction

- CT scan within 12 hours to confirm diagnosis
- Regular review with consideration of lactate estimation if sepsis or possible ischaemic bowel
- 12 hourly consultant surgical review, 6 hourly MRCS registrar review if sepsis

## 6. Goal Directed Fluid therapy

- Stroke volume optimisation using cardiac output monitoring intra- and postoperatively

## 7. Postoperative ICU for patients with predicted mortality >5%

- ICU admission for all patients with P-POSSUM predicted mortality  $\geq 5\%$
- ICU admission for patients with P-POSSUM < 5% at discretion of perioperative team

P-POSSUM scores can be calculated from the tab for each patient on Plato, or using the 'Surgical risk' app on a smart phone

Emergency Laparotomy Pathway Version 2  
 Approved by: Surgery and Critical Care Governance Groups  
 Approved by Health Records Documentation Approval Group: Jan 2014  
 Review date: June 2015

Health Records:  
 Clinical Notes  
 UID:

## UK Emergent Ex-lap Care Bundle

### Possible future performance metric?

- Time to antibiotic
- Time to CT
- For metric, limit to only pts arriving to your ED (omitting transfers)?

# Definition clarification to standardize capture across the collaborative

---

## **CT date/time (ex-lap)**

- CT time – end time when surgeon has availability to see films? Can everyone get this from their EMR?
- OSH CT date/time leave blank? Take arrival time? Or enter PACS time on scout image (will get a negative CT time)?

## **IV Antibiotic date/time (ex-lap)**

Limit metric to just pts coming directly into your ED with an acute abdomen and have emergent ex-lap?

- Concern for limited access to OSH data across the collaborative for pts transferring in.
- Omit pts already admitted for another reason prior to ACS consult for metric? Take first IV antibiotic given on day of ACS consult?

Thank you

Please make sure you have signed the confidentiality statement for credit and to receive a meeting eval survey.

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# CQI Index

- ◆ 2022
  - Attendance
  - Data Submission
  - Validation visit
- ◆ 2023
  - 1-2 Metrics
- ◆ 2024
  - Earliest to count
  - Uncertain

Michigan Acute Care Surgery (MACS) 2022 Performance Index January 1 to December 31, 2022					
Measure	Weight	Measure Description	Points	PARTICIPATION (100%)	
#1	30	<b>Data Submission</b>			
		On time and complete 3 of 3 times	30		
		On time and complete 2 of 3 times	5		
		On time and complete 1 of 3 times	0		
#2	25	<b>Meeting Participation-Surgeon</b>			
		Participated in 3 of 3 meetings	25		
		Participated in 2 of 3 meetings	10		
		Participated in 1 of 3 meetings	5		
#3	25	<b>Meeting Participation-Program Manager or Data Abstractor</b>			
		Participated in 3 of 3 meetings	25		
		Participated in 2 of 3 meetings	10		
		Participated in 1 of 3 meetings	5		
#4	20	<b>Data Validation</b>			
		Completed	20		
		Not completed	0		
		Total (Max Points) =			100

## Additional Information

**Measure 1: Data Submission:** Partial/incomplete submissions receive no points. Complete data submission is defined as all cases submitted for the requested interval.

**Measure 2: Meeting Participation:** Surgeon represents one center only; alternate must be an attending level equivalent.

# To Do

- ◆ New Data Elements
  - IR
  - ERCP
- ◆ Questions from last meeting and today

# Feedback ([mhemmila@umich.edu](mailto:mhemmila@umich.edu))

- ◆ Reports
  - Questions
  - Problems/Mistakes
  - Improvements
- ◆ CQI Index for 2023
- ◆ Speakers, Topics, Information
- ◆ See you in December



