

# Impact of a Structured Preoperative Assessment on Surgical Outcomes in Patients on Methadone, Buprenorphine and Naltrexone: A Retrospective Cohort Study

Addyson E. Sand, BSN, SRNA, Helen T. Marry, BSN, SRNA, Heather R. Rathbun BSN, SRNA, Jenna R. Steege, APRN, CRNA, DNP, Allison LeMahieu, MS, Oludare O. Olatoye, MD.  
Mayo School of Health Sciences, Doctor of Nurse Anesthesia Practice Program Mayo Clinic, Rochester, MN

## BACKGROUND

### RESEARCH

- Adverse postoperative outcomes associated with patients who have chronic pain and substance use disorder include increased postoperative pain, delayed wound healing, surgical re-intervention, prolonged hospital stays, higher readmission rates, and increased mortality.
- Substance use disorder populations present additional unique concerns including withdrawal, relapse, and risk for overdose.
- Long-term therapies for chronic pain and substance use disorder include methadone, buprenorphine, and naltrexone.
- To achieve adequate analgesia and mitigate adverse perioperative outcomes, special considerations are warranted for patients taking these medications.
- The need for preoperative evaluation by providers with extensive pharmacologic education and experience with these populations is a critical component of providing safe, quality care.
- Targeted preoperative evaluations (POE) are integral to enhancing perioperative planning and may improve postoperative outcomes.

### GAP IN PRACTICE

- Despite the well-known advantages of POE clinic assessments, the impact on patients utilizing methadone, buprenorphine, and naltrexone for either chronic pain or substance use disorder remains understudied.

## AIMS

### PRIMARY

To evaluate the effectiveness of formal POE and assess the impact on perioperative and postoperative outcomes of patients with chronic pain or substance use disorder.

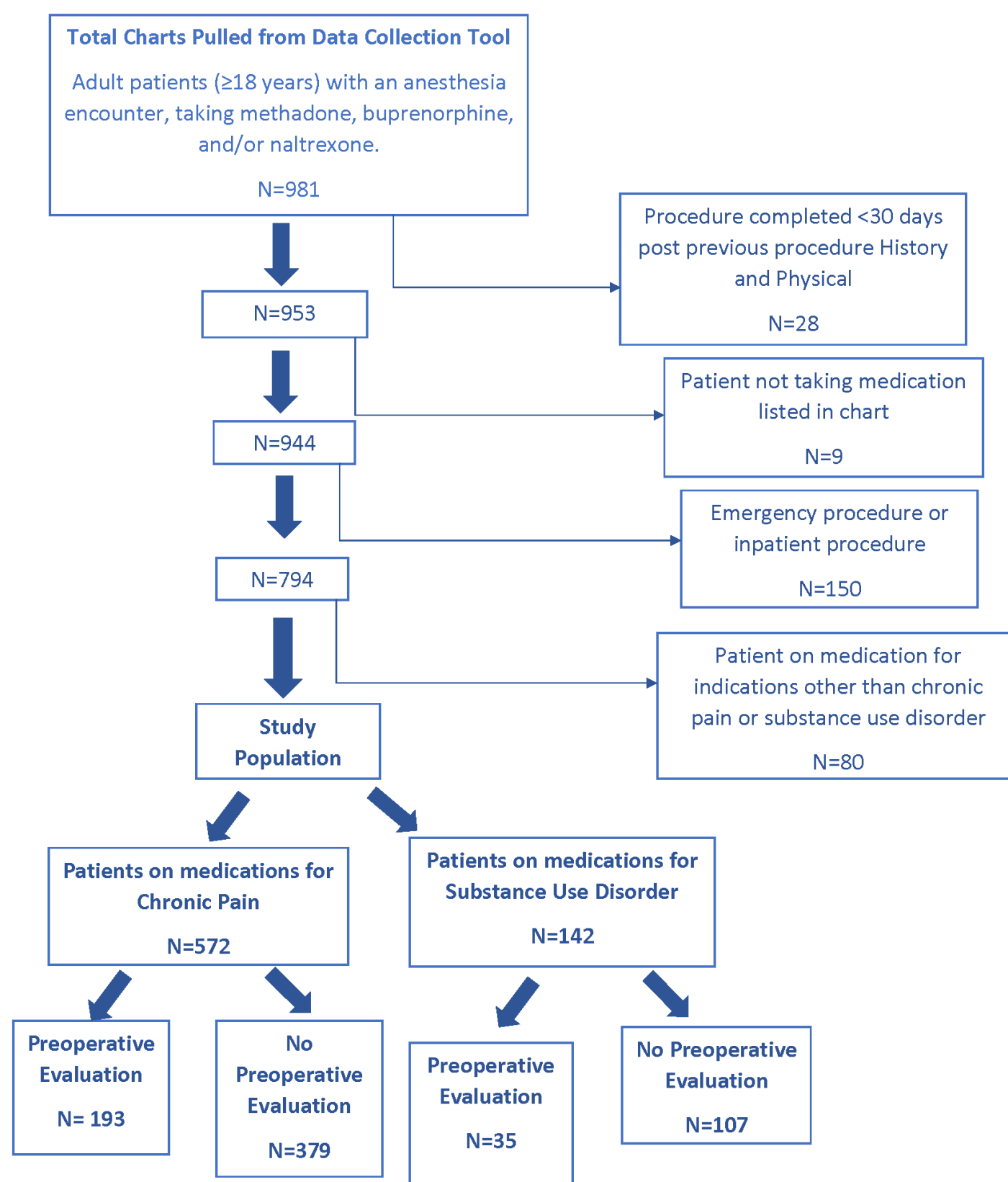
### SECONDARY

To assess the utilization of formal POE prior to surgical procedures in patients receiving methadone, buprenorphine, or naltrexone for chronic pain or substance use disorders.

## METHODS

- Following Institutional Review Board approval, a single-center retrospective review of electronic health records of adult patients on methadone, buprenorphine, and naltrexone who underwent elective surgery between January 1, 2010, and December 31, 2020, at Mayo Clinic-Rochester was performed.
- Perioperative outcomes of patients who were assessed in the POE Clinic before elective surgery were analyzed and compared to those who did not have a POE Clinic evaluation.
- A sub-analysis of patients on these medications for substance use disorder versus chronic pain was also performed.

### STUDY DESIGN FLOWCHART



## RESULTS

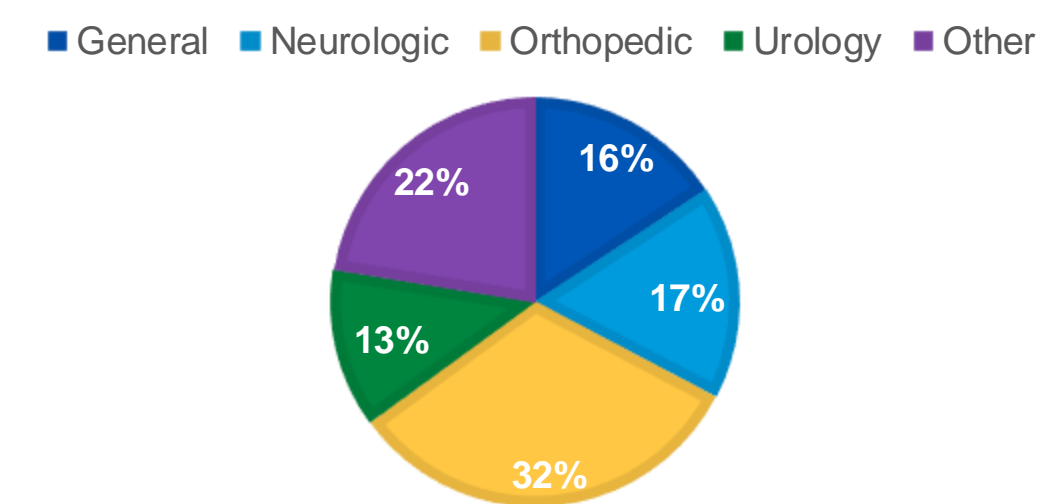
### STATISTICAL ANALYSIS

- Demographic and procedure characteristics summarized using median (interquartile range [IQR]) for continuous variables and counts and percentages for categorical variables
- Binary outcomes were analyzed with logistic regression with GEE
- Propensity-adjusted analyses were performed using inverse probability of treatment weighting (IPTW) to account for potential confounding
- Continuous outcomes were analyzed using linear regression with generalized estimating equations (GEE) and robust variance estimates

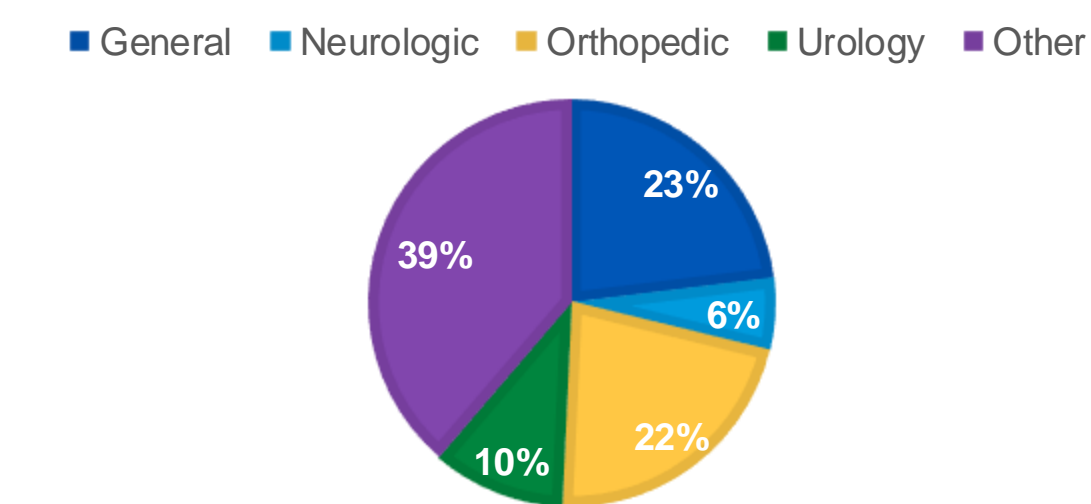
### DEMOGRAPHICS

Variable	POE Visit (N=228)	No POE Visit (N=486)
<b>Sex, n (%)</b>		
Female	104 (46%)	252 (52%)
Male	123 (54%)	234 (48%)
Unknown	1 (0%)	0 (0%)
<b>Race, n (%)</b>		
White	208 (91%)	455 (94%)
American Indian/Alaskan Native	9 (4%)	5 (1%)
Asian	2 (1%)	2 (0%)
Black or African American	3 (1%)	6 (1%)
Other	6 (3%)	18 (4%)
<b>BMI, median (Q1, Q3)</b>		
	28.3 (24.9, 33.5)	27.3 (23.3, 32.7)
<b>Surgery duration (min) median (Q1, Q3)</b>		
	127.0 (78.5, 204.5)	103.5 (46.0, 197.0)
<b>Charlson Score median (Q1, Q3)</b>		
	3.0 (2.0, 5.0)	3.0 (1.0, 5.0)
<b>OR Regional Block</b>		
	10 (4%)	21 (4%)
<b>ASA Type, n (%)</b>		
I	0 (0%)	12 (2%)
II	109 (48%)	212 (44%)
III	112 (49%)	226 (47%)
IV	6 (3%)	23 (5%)
Unknown	1 (0%)	13 (3%)

### POE VISIT SURGERY TYPE

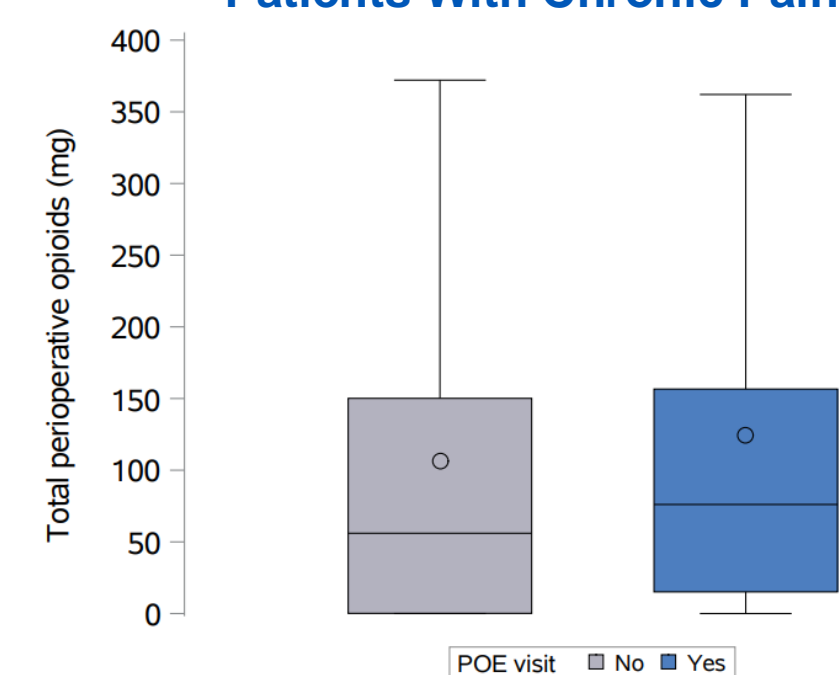


### NO POE VISIT SURGERY TYPE

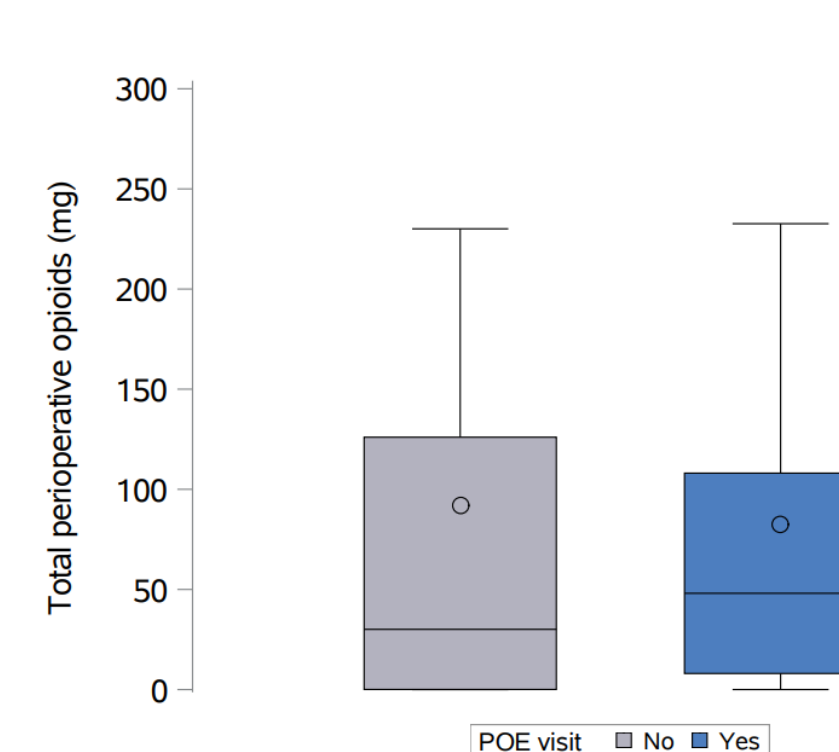


### PERIOPERATIVE OPIOID ADMINISTRATION

#### Patients With Chronic Pain

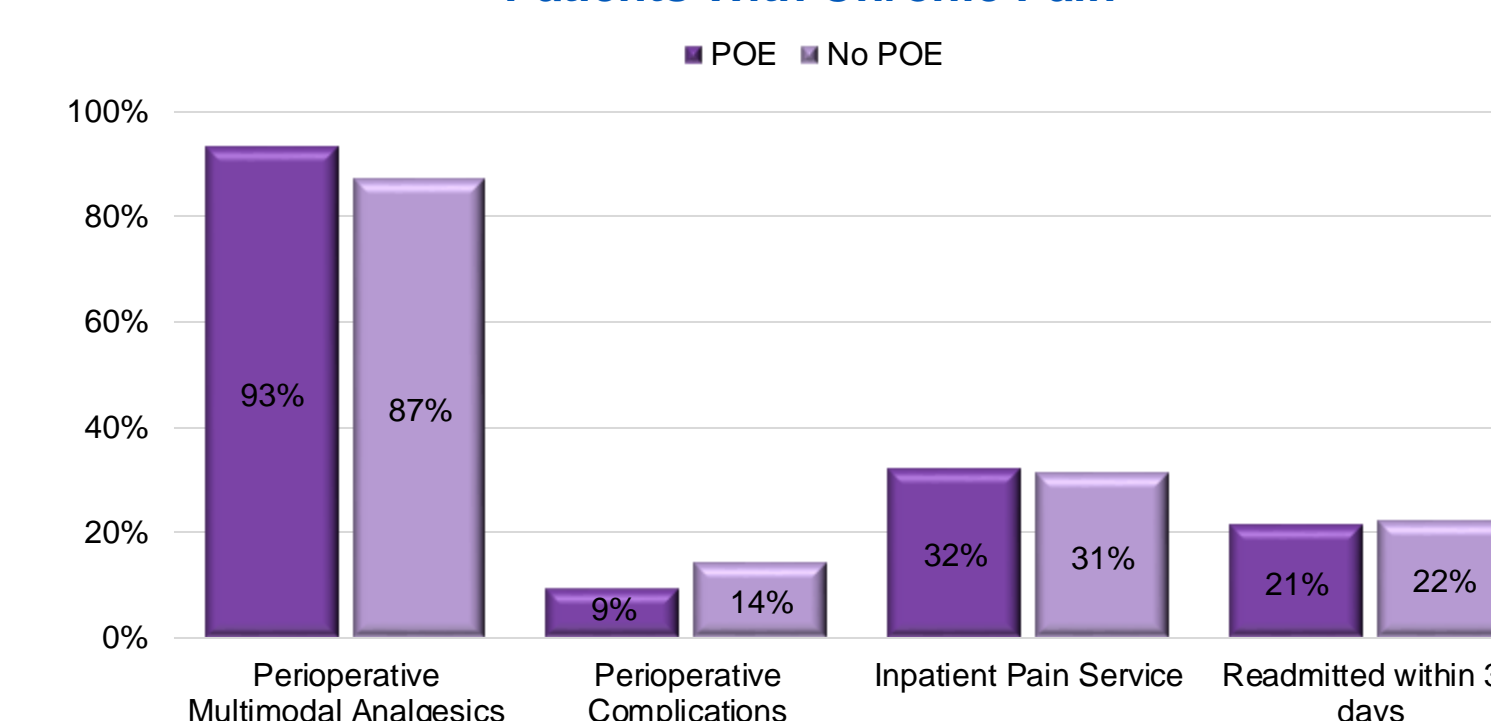


#### Patients With Substance Use Disorder

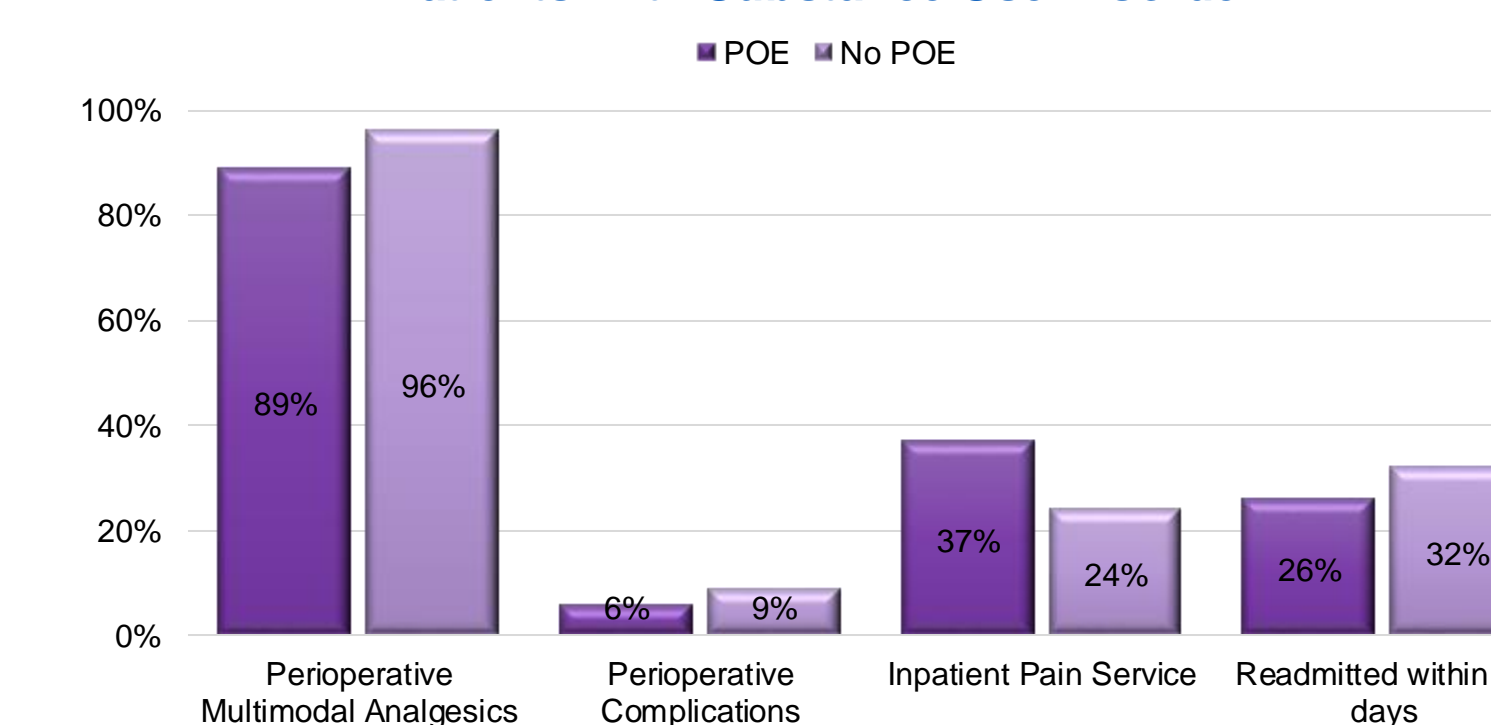


### PERIOPERATIVE OUTCOMES

#### Patients With Chronic Pain



#### Patients With Substance Use Disorder



## DISCUSSION

- Patients with chronic pain who had a POE visit had significantly more perioperative multimodal analgesics administered (p=0.016) compared to chronic pain patients who did not have a POE visit.
- Patients who had POE visits for both subpopulations had fewer perioperative complications and fewer readmissions within 30 days than those who did not have POE visits. These outcomes were not statistically significant but are considered clinically significant. Decreased complications and readmissions benefit patients' health and satisfaction while lowering institutional healthcare costs.
- We speculate that our institution's formal POE clinic is underutilized in our studied populations. Despite perioperative risks described in literature, our study found only a third of chronic pain patients and a quarter of substance use disorder patients had a formal POE.

## LIMITATIONS

- This study is limited by its retrospective nature, relying on limited availability and accuracy of data found in chart reviews. Additionally, a new electronic medical record was implemented partway through the timeline of charts reviewed, changing the documentation process.
- This study may lack generalizability for the following reasons: 1) certain specialties (Orthopedics) had higher POE clinic referral rates, 2) limited population diversity in Rochester, MN, 3) a small sample size after extensive exclusionary criteria.

## CONCLUSIONS

- This study demonstrates that a formal POE aided anesthesia providers in developing a multimodal analgesic approach, thus decreasing perioperative complications and readmission rates.
- The project institution could potentially benefit from a standardized process for patients on methadone, buprenorphine, and naltrexone that includes a visit to the POE clinic prior to surgery.
- Future studies are needed with larger sample sizes and a more diverse patient population to further examine the impact of a preoperative evaluation for this patient population.

## REFERENCES

