

BACKGROUND

- Patients undergoing surgery are often discharged with an opioid prescription.
- Overprescribing of opioids can lead to increase opioid related adverse effects including constipation, nausea, and confusion. It can also lead to more serious outcomes including addiction and overdose in some patients.

Objective: Determine if there is an association between the length of surgery and potentially overprescribed opioids.

METHODS

Study Design: Retrospective case-control study.

Data Sources: Electronic health records were extracted from a single academic medical center located in the southern region of the United States.

Study Sample:

- Patients were included if they had an inpatient stay of at least 24 hours between January 1, 2018 and December 31, 2019 during which surgery was performed, and were administered an opioid within 24 hours before discharge or were prescribed an opioid at discharge.
- Patients discharged to a skilled nursing or rehabilitation facility were excluded.

Study Measures:

- The outcome variable was potential opioid overprescribing defined as receiving a morphine equivalent daily dose (MEDD) at discharge greater than the MEDD administered during the 24 hours before discharge.
- The primary interest was the length of surgery.
- Patient demographic information, mental health disorder history, substance abuse history, opioid use before admission, surgery type, and inpatient pain scores were also collected.
- **Statistical Analysis:** Multivariable logistic regression model.

RESULTS

Table 1: Patient Characteristics and Opioid Prescription.

Characteristic	Total N = 4525	Not Overprescribed n = 3146	Potential Overprescribing n = 1379	p-value ^a
Age at surgery , mean (SD)	45.18 (17.27)	43.11 (16.63)	49.90 (17.78)	<0.0001
Surgery duration hours , mean (SD)	1.41 (1.49)	1.26 (1.30)	1.74 (1.81)	<0.0001
Average inpatient pain score , mean (SD)	4.54 (1.72)	4.76 (1.6)	4.02 (1.86)	<0.0001
Gender				<0.0001
Female	2532 (55.96%)	1880 (59.76%)	652 (47.28%)	
Male	1993 (44.04%)	1266 (40.24%)	727 (52.72%)	
Race/ethnicity				0.2418
White	2873 (63.49%)	1980 (62.94%)	893 (64.76%)	
Non-White	1652 (36.51%)	1166 (37.06%)	486 (35.24%)	
Mental health disorder history				0.0006
No	4139 (91.47%)	2848 (90.53%)	1291 (93.62%)	
Yes	386 (8.53%)	298 (9.47%)	88 (6.38%)	
Substance abuse history				0.0011
No	3400 (75.14%)	2320 (73.74%)	1080 (78.32%)	
Yes	1125 (24.86%)	826 (26.26%)	299 (21.68%)	
Opioids prior to admission				0.0037
No	2422 (53.52%)	1639 (52.10%)	783 (56.78%)	
Yes	2103 (46.48%)	1507 (47.90%)	596 (43.22%)	
Surgery type				<0.0001
Genitourinary	1217 (26.9%)	1038 (32.99%)	179 (12.98%)	
Musculoskeletal	976 (21.57%)	724 (23.01%)	252 (18.27%)	
General	696 (15.38%)	348 (11.06%)	348 (25.24%)	
Digestive	612 (13.52%)	434 (13.80%)	178 (12.91%)	
Cardiovascular-pulmonary	565 (12.49%)	348 (11.06%)	217 (15.74%)	
Neurosurgery	281 (6.21%)	153 (4.86%)	128 (9.28%)	
Head or neck	178 (3.93%)	101 (3.21%)	77 (5.58%)	

Notes: ^a Groups were compared using t-tests for continuous variables, and chi-square tests for categorical variables.

Race/ethnicity 'Non-White' includes Black or African American, Asian, American Indian or Alaskan Native, Native Hawaiian or Other Pacific Islander, the others and unknown.

Table 2: Adjusted Odds Ratios (AOR) for Potential Overprescribing.

Characteristic	AOR (95% CI)	p-value ^a
Age at surgery	1.008 (1.004-1.013)	0.0003
Surgery duration hours	1.087 (1.037-1.140)	0.0006
Average inpatient pain score	0.797 (0.765-0.831)	<0.0001
Gender		0.4265
Female	ref.	
Male	1.062 (0.915-1.232)	
Race/ethnicity		0.0613
White	ref.	
Non-White	1.149 (0.993-1.329)	
Mental health disorder history		0.2741
No	1.173 (0.881-1.560)	
Yes	ref.	
Substance abuse history		0.2768
No	1.108 (0.921-1.332)	
Yes	ref.	
Opioids prior to admission		0.0750
No	1.142 (0.987-1.321)	
Yes	ref.	
Surgery type		<0.0001
Genitourinary	ref.	
Musculoskeletal	1.883 (1.467-2.418)	
Digestive	2.259 (1.723-2.960)	
Cardiovascular-pulmonary	2.775 (2.103-3.662)	
Neurosurgery	3.470 (2.489-4.838)	
Head or neck	3.673 (2.549-5.293)	
General	4.302 (3.344-5.536)	

Note: ^a p-values were from Type III tests for whether an effect differs from zero.

CONCLUSION

- ✓ Longer procedures increase the risk of overprescribing, which suggests providers may be less vigilant when examining inpatient opioid use for patients undergoing longer procedures.
- ✓ Older patients had a higher risk of overprescribing. This is a patient group who may experience increased opioid adverse effects and so it is important to prescribe only what may be needed.
- ✓ Factors such as duration of the procedure, age, and average pain score can influence this prescribing decision. Making information on opioid administration easily accessible to prescribers could increase the reliance of this measure on prescribing.