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# Risk of Opioid Use Disorder in Surgical Patients with Medicaid and Associations with Prescription Opioid Dose and Duration

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**Introduction:** Opioids are commonly used to treat postoperative pain. Risk of opioid use disorder (OUD) in opioid-naive Medicaid patients undergoing surgery is not well studied. We investigated the incidence of OUD after opioid prescription in opioid-naïve patients undergoing surgery and estimated the association between reducing prescription duration and/or dose on risk of OUD.
**Methods:** We analyzed data from Medicaid T-MSIS Analytic Files from 25 states of opioid-naïve adults who underwent surgery and received perioperative opioid prescription from 2016 to 2019. Associations between reducing opioid prescription on risk of OUD were estimated using a non-parametric, doubly robust estimator.
**Results:** This study included 178,133 people who underwent a non-cesarean section surgery and 164,936 who underwent a cesarean section. OUD incidence, excluding cesarean section, was 0.84% and 1.47% at 1 and 2 years postoperatively, and OUD incidence after cesarean section was 0.77% and 1.44% at 1 and 2 years. For non-cesarean section patients, reducing opioid prescription duration by 20% as well as dose and duration by 20% were associated with a relative risk reduction of OUD at 2 years of 15% (95% CI 11%, 18%) and 27% (95% CI 23%, 30%), respectively. For cesarean section, the same reductions were associated with a relative risk reduction of OUD at 2 years of 18% (95% CI 14%, 22%) and 26% (95% CI 22%, 30%). Reducing dose alone did not significantly reduce risk of OUD.
**Discussion:** In opioid-naïve Medicaid patients undergoing surgery, reduction in opioid prescription duration and daily dose was estimated to reduce risk of incident OUD.

**Plain Language Summary:** In opioid-naïve Medicaid patients undergoing surgery and filling opioid prescription, the incidence of opioid use disorder (OUD) at 1 year was 0.84% in the non-cesarean section group and 0.77% in the cesarean section group. Reducing opioid prescription duration alone and duration and dose together were estimated to significantly reduce risk of OUD.

**Keywords:** analgesics, opioids, postoperative pain management

## Introduction

Drug overdose deaths have risen steadily over the last few decades, with most involving opioids. The opioid epidemic was declared a public health crisis in the United States in 2017, and opioid overdoses resulted in over 80,000 deaths in 2023.[1] Prescription opioid use is a strong risk factor for opioid dependence, abuse, and overdose and contributes significantly to the opioid epidemic.[2–4]

Opioids are commonly used to treat postoperative pain, with one study showing that 55–66% of patients undergoing surgical procedures in the United States receive an opioid prescription for postoperative pain.[5] The same study found that an average of 4.1 to 9.5 days supply of opioids are prescribed for postoperative pain, with an average daily dose of 27.3 to 62.9 daily morphine milligram equivalents (MME).[5] Opioid use after surgery is a risk factor for chronic opioid use.

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Among opioid-naïve patients undergoing surgery, the rates of new chronic opioid use, defined as at least one opioid prescription 3 to 6 months after surgery, were similar among those undergoing minor and major surgeries, ranging from 5.9% to 6.5%, while the incidence in a non-operative control group was 0.4%.[6] Another study defined chronic opioid use as filling ≥10 prescriptions or more than 120 days' supply 3 to 12 months after surgery and estimated an incidence in opioid naïve surgical patients as high as 1.41%, compared to an incidence in non-operative controls of 0.14%.[7]

Though many studies have assessed risks for chronic opioid use after surgery, fewer studies have focused on other opioid-related harms such as overdose and opioid use disorder (OUD). In studies using commercial insurance administrative databases and Veterans Health Administration records, the incidence of opioid overdose or OUD in the first year after surgery was 0.20% to 0.66%.[8,9] There is limited research on incidence of opioid overdose or OUD after surgery in Medicaid beneficiaries, a particularly vulnerable population with high rates of opioid dependence and opioid overdose. In a Michigan all-payer database analysis, the rate of chronic postoperative opioid use was 11.5% in patients with Medicaid compared to 5.6% in patients with commercial insurance.[10] In a study of incident opioid overdose after an initial opioid prescription, Medicaid patients had an almost 4-fold greater risk of opioid overdose compared to those with commercial insurance.[4]

To fill this knowledge gap, our study had two aims: 1) to estimate the incidence of OUD in an opioid-naïve adult Medicaid population undergoing minor and major surgeries and filling a perioperative opioid prescription; and 2) to estimate the association between prescription opioid dose and days supplied in the immediate perioperative period on OUD risk. We hypothesized that hypothetical reductions in opioid dose and days supplied would be associated with decreased risk of OUD.

## Methods

This study was approved by the Columbia University Institutional Review Board. All code to replicate the analyses is available at: https://github.com/CI-NYC/post_surgery_opioid_use.

## Study Sample

We used data from the T-MSIS Analytic Files (TAF) Demographics, Other Services, Inpatient, and Pharmacy claims, in years 2016–2019, across the 25 states that had expanded Medicaid under the Affordable Care Act by 2014 (ND, VT, NH, CA, OR, MI, IA, NV, OH, IL, NY, MD, MA, RI, HI, WV, WA, KY, DE, AZ, NJ, MN, NM, CT, CO, and AR; MD was excluded due to unreliable diagnosis code data).[11,12] We included these early expansion states because they covered nearly all low-income (≤138% of the Federal Poverty Limit), non-elderly adults.[12]

The cohort consisted of patients who had an ICD-10 or CPT code for common elective surgeries and who filled an opioid prescription in the perioperative period, defined as 1 month prior to the surgery date to 14 days after hospital discharge. The full list of included surgeries is given in eTable 1–3. Some participants may have undergone multiple procedures during the years covered by our data. In these cases, we consider only the first procedure. The six months prior to surgery was designated as the washout period, during which we evaluated eligibility criteria and characterized baseline covariates. Beneficiaries were excluded for any of the following: younger than 18 or older than 65 years; dual eligible; cancer diagnosis; OUD diagnosis, medication for OUD (MOUD), or an opioid overdose during the washout period or prior to hospital discharge; not continuously enrolled from the start of washout to the end of the perioperative period; had an opioid prescribed within the washout period prior to perioperative period; and if length of time between surgery date and discharge was greater than 1 week (eFigure 1). We restricted to participants with a 1 week stay or less, because the surgeries considered in this analysis are not expected to have hospital stays longer than one week; <1% of cohort participants were excluded for this reason.

## Measures

### Stratification by Cesarean Section Surgical Procedure

Included in our list of surgeries are codes for cesarean section (C-section) procedures. Because 48% of the surgical procedures in our cohort were C-sections, and because C-section accounts for the highest proportion of postoperative opioid prescription dispensed to young adults,[13] we stratified our analyses by whether or not the surgical procedure was a C-section.

### Covariates

We characterized each beneficiary's baseline covariates during the initial 6 month washout period: age; biological sex; diagnosis of psychiatric disorders including bipolar disorder, anxiety disorder, depressive disorder; diagnosis of any pain disorders, including back, neck, arthritis, headache, or neurological pain; whether the surgery was major or minor (for the non-C-section strata); and the length of hospital stay (for the non-C-section strata due to lack of variation in the C-section strata).

### Exposures

We considered two exposures: prescription opioid dose and days supplied. We included all prescription opioids formulated for managing pain (as opposed to treating OUD or withdrawal symptoms) that had a start date during the perioperative period from 1 month before surgery through 14 days after discharge. If a prescription lasted beyond the end of the perioperative period, we ignored any of the days and doses beyond the end of the period. In some cases, the fill date for an opioid prescription fell between a patient's date of surgery and date of discharge; we delayed the start date for these prescriptions to be the date of discharge.

We measured the average mean daily opioid dose in morphine milligram equivalents (MME) for all days within the perioperative period with a non-zero dose for opioids. We measured the duration during which a patient received an opioid prescription within the perioperative period.

### Outcome

Our primary outcome was incident postoperative OUD diagnosis, defined as the presence of ICD-10 diagnosis codes indicating opioid abuse or dependence (as used previously),[14–16] occurring during a follow-up period of 24 months starting immediately after the perioperative period. We considered two secondary outcomes: i) MOUD (methadone, buprenorphine, or injection naltrexone), and ii) a broader definition of incident OUD diagnosis that included OUD ICD-10 codes, nonfatal, unintentional opioid overdose ICD-10 diagnosis codes, and MOUD treatment, as has been used previously.[16,17] We provide the ICD-10 OUD diagnosis codes in the Supplement in eTable 4.

## Statistical Analysis

We first estimated the risk of developing a new OUD at 6, 12, 18, and 24 months post-surgery, adjusting for differential censoring conditional on the covariates and prescription opioid dose and days supplied. We next estimated the association between hypothetically reducing perioperative prescription opioid dose and/or duration by 20% (versus dose and/or duration remaining at their observed values) on risk of incident OUD, separately for C-section and non-C-section surgeries, controlling for covariates and censoring. Specifically, we estimated the difference in risk of incident OUD associated with: i) reducing dose and duration both by 20%, ii) reducing only dose by 20% and leaving duration at its observed value, and iii) reducing only duration by 20% and leaving dose at its observed value, as compared to no hypothetical reductions in dose nor duration, and for both components of the contrast, hypothetically intervening to prevent all censoring. In the eAppendix 1, we formalize each of these estimands using mathematical notation and delineate the assumptions under which they can be interpreted causally.

We estimated the adjusted OUD risks and the adjusted associations, specified above, using two different implementations of a nonparametric, doubly robust targeted minimum loss-based estimator, cross-fit with 4 folds. We used a targeted minimum loss-based estimator for a mean outcome to estimate the adjusted OUD risks,[18] and data-adaptively fit regressions for the outcome and censoring models using an ensemble[19] of the following machine learning algorithms: an intercept-only model, a generalized linear model, multivariate adaptive regression splines,[20] and gradient boosted machines.[21] We estimated the adjusted associations between hypothetical shifts in prescription opioid doses and durations and OUD risk using a targeted minimum loss-based estimator for the mean outcome under a modified treatment policy that shifts the distribution of exposure values,[22] and data-adaptively fit regressions for the exposure, outcome, and censoring models using an ensemble[19] of the following machine learning algorithms: an intercept-only model, a generalized linear model, multivariate adaptive regression splines,[20] and gradient boosted machines.[21] We conducted the analyses using R (version 4.4.1)[23] with the lmtp[24] package. As part of a sensitivity analysis, we assessed the impact of redefining the start of the outcome period as the date of hospital discharge (eTable 5 and eFigures 2–7).

## Results

This Medicaid-enrolled cohort of surgery patients filling a perioperative opioid prescription consisted of 343,069 people (Table 1). There were 178,133 who underwent a non-C-section surgery (median age of 40 years) and 164,936 who underwent a C-section (median age of 28 years). Anxiety disorders were prevalent; 71% of C-section patients and 44% of non-C-section patients had such a diagnosis during the six months prior to surgery. Pain diagnoses were also common, affecting 52.6% of non-C-section patients and 29.3% of C-section patients. Among non-C-section surgeries, 82% were minor surgeries, while 18% were major surgeries. The majority of C-section patients (91.6%) filled just one opioid prescription during the defined perioperative period; for non-C-section patients, 80% filled just one opioid prescription. Prescription opioid dose strength and duration were similar between the two strata. The median of the mean daily MME for non-C-section patients was 35.6 mg compared to 37.5 mg for the C-section patients. Both groups had a median of 5-days supply of opioids.

**Table 1** Cohort Characteristics Stratified by Cesarian Section

| Characteristic | Other Surgical Procedures N=178,133 | Cesarian Section N=164,936 |
|---|---|---|
| Age | 40 (30, 52) | 28 (24, 32) |
| Sex: | | |
| Male | 44929 (25.22%) | |
| Female | 133204 (74.78%) | |
| Psychiatric Conditions: | | |
| Anxiety | 78578 (44.11%) | 117576 (71.29%) |
| Depression | 26605 (14.94%) | 11210 (6.8%) |
| Bipolar | 6373 (3.58%) | 3100 (1.88%) |
| Substance Abuse Disorders: | | |
| Alcohol | 4850 (2.72%) | 1123 (0.68%) |
| Other substances | 4380 (2.46%) | 5625 (3.41%) |
| Nicotine | 36640 (20.57%) | 26868 (16.29%) |
| Pain Disorders: | | |
| Back pain | 27591 (15.49%) | 18192 (11.03%) |
| Neck pain | 10783 (6.05%) | 1977 (1.2%) |
| Arthritis | 64131 (36%) | 18297 (11.09%) |
| Neurological pain | 14750 (8.28%) | 3030 (1.84%) |
| Headache | 9697 (5.44%) | 4838 (2.93%) |
| Miscellaneous pain | 23671 (13.29%) | 17920 (10.86%) |
| Unspecified pain, back or neck | 410 (0.23%) | 22 (0.01%) |
| Surgery Type: | | |
| Major | 32392 (18.18%) | |
| Minor | 145741 (81.82%) | |
| Number of prescriptions: | | |
| 1 | 142867 (80.2%) | 151022 (91.56%) |
| >1 | 35266 (19.8%) | 13914 (8.44%) |
| Length of hospital stay (days): | | |
| 1 day | 143077 (80.32%) | |
| 2 days | 13573 (7.62%) | |
| 3 days | 13416 (7.53%) | |
| 4 days | 4482 (2.52%) | |
| 5 days | 1797 (1.01%) | |
| 6 days | 1043 (0.59%) | |
| 7 days | 745 (0.42%) | |
| Dose (MME) | 35.6 (26.7, 50) | 37.5 (30, 50) |
| Days supplied | 5 (3, 7) | 5 (3, 6) |

(*Continued*)

**Table 1** (Continued).

| Characteristic | Other Surgical Procedures N=178,133 | | Cesarian Section N=164,936 | |
|---|---|---|---|---|
| OUD (ICD only): | | | | |
| At 6 months | (n=178133)[a] | 826 (0.46%)[b] | (n=164936)[a] | 708 (0.43%)[b] |
| At 12 months | (n=138983)[a] | 1346 (0.84%)[b] | (n=135061)[a] | 1174 (0.77%)[b] |
| At 18 months | (n=105975)[a] | 1716 (1.18%)[b] | (n=111724)[a] | 1565 (1.12%)[b] |
| At 24 months | (n=76987)[a] | 1939 (1.47%)[b] | (n=85366)[a] | 1841 (1.44%)[b] |
| MOUD: | | | | |
| At 6 months | (n=178133)[a] | 229 (0.13%)[b] | (n=164936)[a] | 231 (0.14%)[b] |
| At 12 months | (n=139580)[a] | 420 (0.27%)[b] | (n=135538)[a] | 405 (0.27%)[b] |
| At 18 months | (n=107390)[a] | 595 (0.43%)[b] | (n=112885)[a] | 555 (0.4%)[b] |
| At 24 months | (n=78683)[a] | 678 (0.53%)[b] | (n=86907)[a] | 695 (0.56%)[b] |
| OUD (comprehensive): | | | | |
| At 6 months | (n=178133)[a] | 891 (0.5%)[b] | (n=164936)[a] | 765 (0.46%)[b] |
| At 12 months | (n=138918)[a] | 1454 (0.9%)[b] | (n=135004)[a] | 1266 (0.83%)[b] |
| At 18 months | (n=105821)[a] | 1857 (1.28%)[b] | (n=111581)[a] | 1663 (1.19%)[b] |
| At 24 months | (n=76778)[a] | 2094 (1.59%)[b] | (n=85200)[a] | 1950 (1.52%)[b] |

**Notes**: All descriptive statistics are median (interquartile range, IQR) for continuous measures, and n (%) for categorical measures. [a]Number of individuals at risk. [b]Risk represented as cumulative incidence.

Figure 1 shows, among C-section patients filling an opioid prescription, the A) estimated adjusted incident risk (absolute risk, expressed as a proportion, on the y-axis) of OUD by the month of follow-up (given on the x-axis) under a hypothetical 20% reduction in i) both opioid dose and duration, ii) dose only, and iii) duration only. The estimated adjusted risk under no such reduction is also given on the same plots for reference. Figure 1 also shows the B) adjusted risk difference among C-section patients filling an opioid prescription for each of the hypothetical reductions in i)-iii) as compared to the reference adjusted risk. The shaded areas represent 95% confidence intervals (CIs). We see that reducing opioid duration alone by 20% as well as dose and duration together by 20% would be predicted to reduce risk of OUD by 24 months of follow-up by 0.31 percentage points (95% CI: 0.23, 0.39) and 0.44 percentage points (95% CI: 0.36, 0.53), respectively. For reference, this cohort's unadjusted risk of OUD by 24 months was 0.0144. These risk differences correspond to relative risk reductions of 18% (RR: 0.82, 95% CI: 0.78, 0.86) and 26% (RR: 0.74, 95% CI: 0.70, 0.78). In contrast, reducing opioid dose alone for C-section patients was estimated to reduce risk by a more modest 7.5% (risk difference: 0.13 percentage points, 95% CI: 0.01, 0.25; RR: 0.93, 95% CI: 0.86, 1.00), and this risk reduction did not reach statistical significance at earlier follow-up times.

Figure 2 shows analogous results for the non-C-section patients filling an opioid prescription. As in Figure 1, we see that reducing prescription opioid duration alone by 20% as well as dose and duration together by 20% would be estimated to significantly reduce risk of OUD by 24 months of follow-up by 0.28 percentage points (95% CI: 0.20, 0.36) and 0.51 percentage points (95% CI: 0.42, 0.59), respectively. For reference, this cohort's unadjusted risk of OUD by 24 months was 0.0147. These risk differences correspond to relative risk reductions of 15% (RR: 0.85, 95% CI: 0.82, 0.89) and 27% (RR: 0.73, 95% CI: 0.70, 0.77). In contrast, reducing opioid dose alone for non-C-section patients would not be expected to significantly reduce risk of OUD (risk difference: 0.02 percentage points, 95% CI: −0.10, 0.15; RR: 0.99, 95% CI: 0.92, 1.05).

We include results for our secondary outcomes in eFigures 8–11. Inferences were unchanged.

## Discussion

In this study from a large cohort of opioid-naïve adult Medicaid patients who filled an opioid prescription perioperatively, the incidence of OUD, excluding C-section, was 0.84% and 1.47% at 1 and 2 years postoperatively, respectively. In patients undergoing C-sections and filling perioperative opioid prescriptions, the incidence was 0.77% and 1.44% at 1 and 2 years postoperatively, respectively. We estimated that reducing perioperative opioid prescription dose and duration

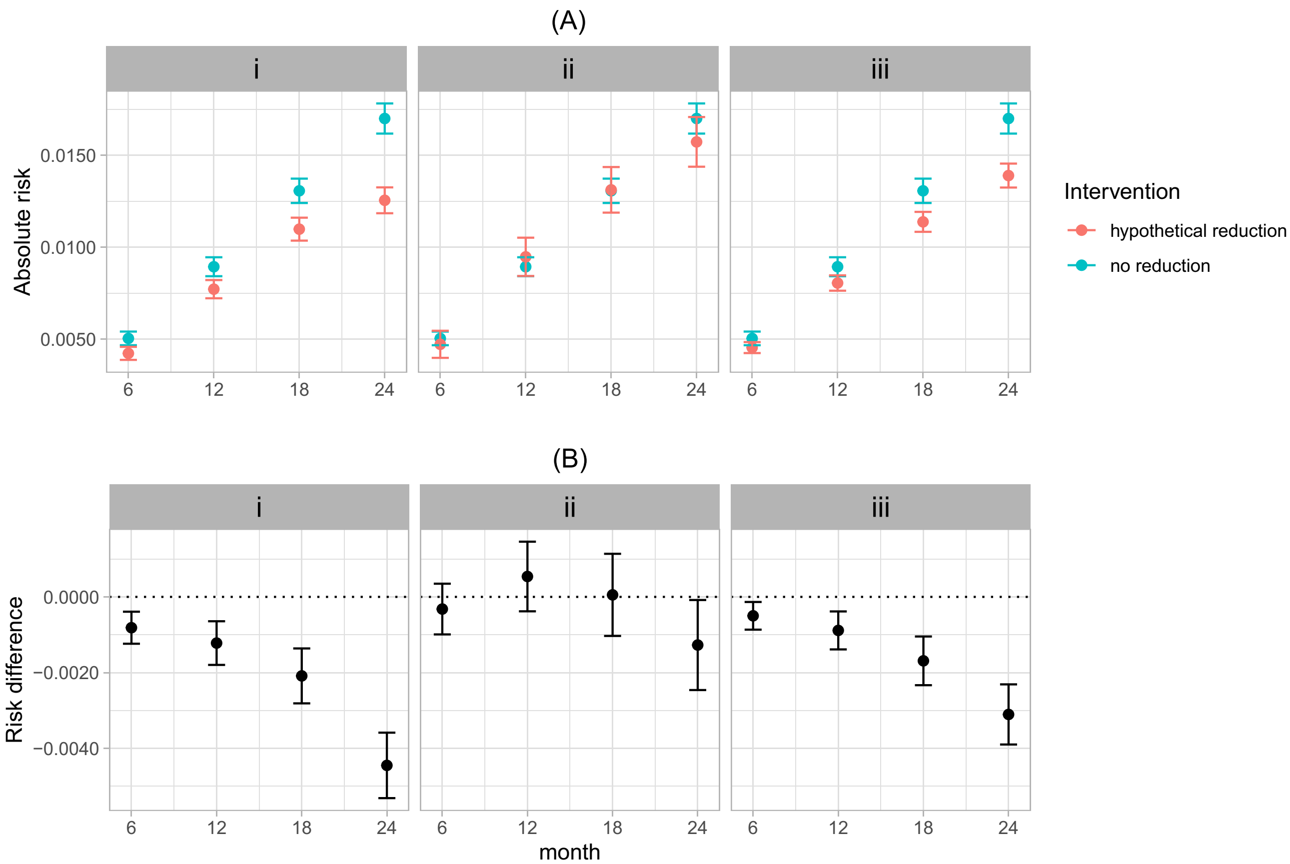


**Figure 1** Cesarean section patients receiving a perioperative opioid prescription.

**Notes**: (**A**) Estimated absolute risk of incident OUD by month under hypothetical 20% reductions in opioid prescribing dose and/or duration (panels i–iii) and no disenrollment (orange curve), and leaving opioid prescribing as observed and under no disenrollment (teal curve). (**B**) Estimated difference in risk of incident OUD by month comparing the hypothetical 20% reductions in opioid prescribing dose and/or duration (panels i–iii) and no disenrollment versus the reference of leaving opioid prescribing as observed and under no disenrollment. Panel (i): hypothetical reductions in both opioid dose and duration, panel (ii): hypothetical reduction in dose only, and panel (iii) hypothetical reduction in duration only. Shaded regions denote the 95% CI of the estimate.

by 20%, as well as prescription duration by 20% would significantly reduce risk of OUD over 24 months of follow-up for both C-section and non-C-section surgery patients.

The incidence of OUD and/or overdose in this study is similar to that estimated in other studies of opioid-naïve patients undergoing surgery with either Medicaid or Veterans Health Administration insurance, and, as expected, is higher than studies using commercial or Medicare insurance. In a study of opioid-naïve women who underwent C-section enrolled in Tennessee Medicaid, of whom 87% filled an opioid prescription within 5 days of delivery, the incidence of OUD, MOUD, or overdose at 1 year was 0.8%.[25] In a study using Veterans Health Administration data, approximately 0.7% of patients undergoing surgery, of whom 66% received an opioid prescription within one week after surgery, developed OUD at one year, based on ICD-9/10 codes for opioid abuse or dependence or prescription for MOUD, and the incidence of OUD or overdose was 4% at a median follow-up of 5.56 years.[8] In a single center study using electronic medical record data, the incidence of opioid dependence, abuse, and overdose based on ICD-9/10 codes in surgical patients receiving an opioid prescription in the 4 weeks before or after surgery was 0.2% at a median follow-up of 3.47 years; patients with Medicaid had the highest rates of OUD and overdose compared to commercial insurance and Medicare in this cohort.[26] Finally, in a study utilizing a commercial insurance database, the incidence of opioid misuse, based on ICD-9 codes for opioid dependence, abuse, or overdose, was 0.2% at 1 year and 0.6% over a median follow-up of 2.67 years in surgical patients (including those receiving maternity care), 56% of whom filled an opioid prescription within 30 days of discharge after surgery.[9]

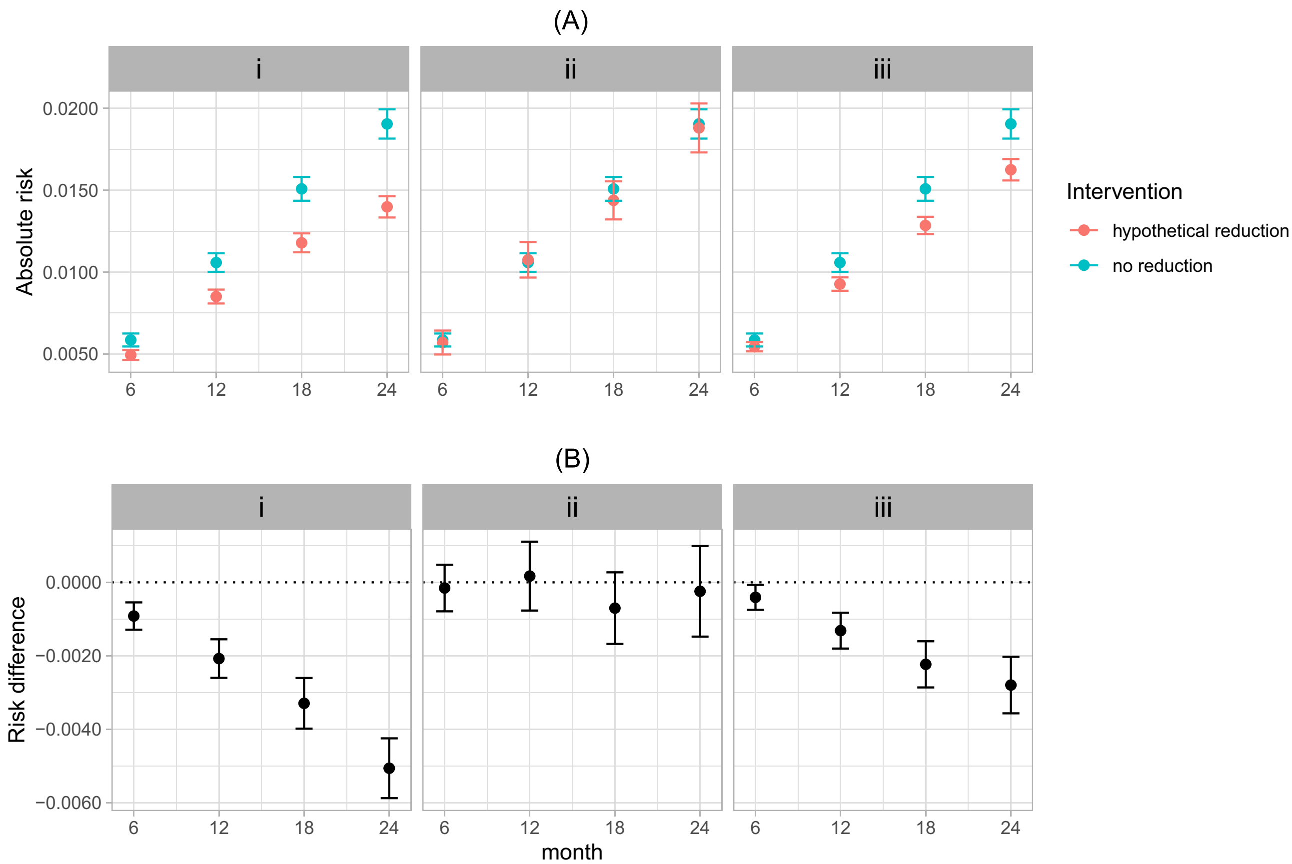


**Figure 2** Non-cesarean section surgical patients receiving a perioperative opioid prescription.

**Notes**: (**A**) Estimated absolute risk of incident OUD by month under hypothetical 20% reductions in opioid prescribing dose and/or duration (panels i–iii) and no disenrollment (orange curve), and leaving opioid prescribing as observed and under no disenrollment (teal curve). (**B**) Estimated difference in risk of incident OUD by month comparing the hypothetical 20% reductions in opioid prescribing dose and/or duration (panels i–iii) and no disenrollment versus the reference of leaving opioid prescribing as observed and under no disenrollment. Panel (i): hypothetical reductions in both opioid dose and duration, panel (ii): hypothetical reduction in dose only, and panel (iii) hypothetical reduction in duration only. Shaded regions denote the 95% CI of the estimate.

To situate our estimates within this prior work, it is important to highlight two aspects of our cohort. First, we focus on patients enrolled in Medicaid, a socioeconomically vulnerable population with a high burden of chronic illness, including elevated rates of developing OUD.[4,27] Other work has shown that surgical patients with Medicaid are at higher risk of chronic opioid use and OUD compared to other types of insurance.[10] Second, we limited our cohort to surgery patients who fill a perioperative opioid prescription, which we expected would result in higher OUD incidence rates than we would have estimated without this restriction.

Similar to other studies, we found that longer duration of opioid prescription and higher daily dose were associated with greater risk for OUD.[2,9,28] However, decreasing daily opioid dose alone did not significantly impact risk for OUD in this cohort. This finding is consistent with other studies of surgical patients showing limited impact of daily opioid dose in the immediate perioperative period on OUD.[28] Note that we limited examination of opioid prescription to the immediate perioperative period. Higher daily opioid dose may be associated with risk of OUD when examining longer duration of opioid prescription.[9] Our study also extends prior work by estimating impact of potentially clinically attainable reductions of opioid prescription duration and daily dose on reducing risk of incident OUD. In our study cohort, the majority of patients filled only one opioid prescription in the immediate perioperative period with a median duration of 5 days. A 20% reduction in duration would be one less day of opioids. The median MME was 37 mg; a 20% reduction in daily dose is equivalent to one less tablet of oxycodone 5 mg or hydrocodone 7.5 mg per day.[29]

Treating acute postoperative pain is important, as high levels of acute pain may lead to complications including impaired recovery and chronic postsurgical pain. Protocols incorporating multimodal analgesia and clinician and patient education have been shown to decrease opioid use and decrease discharge opioid prescription while maintaining effective pain control in the acute, postoperative period.[30] Patient education and shared-decision making have led to fewer prescribed opioids at discharge without adversely affecting pain scores for patients undergoing C-sections.[31] In a large tertiary cancer center, a protocol maximizing use of non-opioid analgesics, setting a maximum three-day supply of opioids at discharge, and including clinician and patient education had a 95% compliance rate and led to a decrease in refill requests and overall postoperative opioid prescription after surgery. Surgical patients treated under this protocol had lower rates of chronic opioid use compared to those pre-implementation of the protocol.[32] Future prospective studies are needed to evaluate whether such interventions also impact risk of OUD.

Efforts to identify those at risk of OUD after opioid prescription for surgery are important. Ideally, these efforts can start preoperatively. However, the post-discharge period is also important to identify patients having a difficult post-operative pain course and/or concerning opioid use. Transitional pain services have been shown to help manage pain and taper opioids in the postoperative period.[33] For systems without these resources, coordinated care between surgeons and primary care or other specialists are needed, using clear communication during transitions of care.[34]

This study has limitations. This is a retrospective study of administrative data using diagnoses codes and pharmacy claims. Miscoding and underreporting of diagnoses may occur, though in a study of patients with OUD receiving MOUD in the hospital setting, Medicaid claims data identified 84.2% of these patients with ICD-10 codes.[35] Prescription fills were measured through pharmacy claims, and prescriptions covered by self-pay were not included. Details on actual opioid consumption are unknown, including preoperative illicit use. 54.5% in the non-C-section cohort had a diagnosis for a pain condition, and it is possible opioid prescriptions were for an indication other than postoperative pain. Nonetheless, the rates of postoperative OUD are concerning, regardless of reason for opioid prescription. Though we controlled for length of stay, time in the hospital may affect the opioid prescription at discharge. Pain severity and postoperative pain trajectories are unknown. This was a study of adults with Medicaid, limiting generalizability.

## Conclusion

In this study of opioid-naïve Medicaid patients undergoing surgery and receiving a perioperative opioid prescription, OUD is a serious complication occurring in 0.77% of patients undergoing C-section and 0.84% of patients undergoing common non-C-section surgeries at 1 year postoperatively. Reduction in opioid prescription duration and reduction in both duration and daily dose is estimated to decrease the risk of incident OUD. Reduction in daily dose alone is not estimated to significantly reduce the risk of incident OUD. Non-opioid postoperative pain management strategies, judicious opioid prescribing, and risk assessment for OUD should be considered.

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## Disclosure

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