

Patient Care

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Practice-Level Variation in Opioid-Free Discharge Following Surgery for T1 Renal Masses: A MUSIC-KIDNEY Analysis

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Study Need and Importance: Opioid prescription following surgery has played a role in the current opioid epidemic by increasing the risk of persistent opioid use and diverting unused medication into the community. While opioid-free discharge has been evaluated in other urologic procedures, there is limited knowledge of the safety and feasibility after nephrectomy. We evaluated practice-level variation in opioid prescribing following surgery for cT1 renal masses (T1RM) and examined the relationships between opioid-free discharge, postoperative emergency department (ED) visits, and readmissions.

What We Found: Of 414 patients who underwent surgery for T1RM across 15 practices in the Michigan Urological Surgery Improvement Collaborative–Kidney Mass: Identifying and Defining Necessary Evaluation and Therapy (MUSIC-KIDNEY) from April 2021 to March 2023, 23.7% had opioid-free discharge. Practice level variation in rates of opioid-free discharge ranged from 6.7% to 55.0% (Figure). For patients prescribed opioids, the median number of pills was 10 (IQR 6-12); oxycodone 5 mg and hydrocodone-acetaminophen 5/325 were most commonly prescribed. Patients with cT1b masses were more likely to have opioid-free discharge (44.9% vs 32%, OR 0.44; 95% CI 0.22-0.89). Rates of 30-day ED visits (7.0% vs 3.1%) and readmissions (4.1% vs 2.0%) were lower in the opioid-free discharge group but did not reach statistical significance.

Limitations: Data collected regarding opioid prescription within MUSIC-KIDNEY are limited to the number of pills prescribed at discharge. We do not currently collect types of medication, dose, refills, usage, or disposal. Additionally, we do not currently collect data regarding nonnarcotic pain

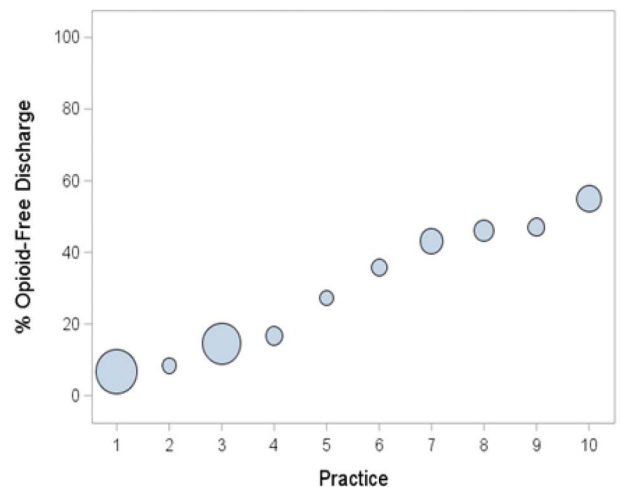



Figure. Practice-level rate of opioid-free discharge following partial or radical nephrectomy. Each circle represents a single Michigan Urological Surgery Improvement Collaborative practice; the size of each circle correlates with the number of included cases.

management, such as the use of regional anesthesia or nonsteroidal anti-inflammatory drugs.

Interpretation for Patient Care: MUSIC-KIDNEY data suggest opioid-free discharge is not associated with increased rates of postoperative ED visits or readmissions. There exists wide practice-level variation in opioid prescriptions following surgery for T1RM in the state of Michigan. Similar variation likely exists throughout the United States, and best surgical practice suggests reduction in opioid prescribing after nephrectomy.

Practice-Level Variation in Opioid-Free Discharge Following Surgery for T1 Renal Masses: A MUSIC-KIDNEY Analysis

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Abstract

Introduction: Opioid prescription following surgery has played a role in the current opioid epidemic. We evaluated practice-level variation in opioid prescribing following surgery for cT1 renal masses and examined the relationships between opioid-free discharge and postoperative emergency department (ED) visits and readmissions.

Methods: We retrospectively examined all T1 renal mass (RM) patients with data regarding postoperative opioid prescriptions within the Michigan Urological Surgery Improvement Collaborative—Kidney Mass: Identifying and Defining Necessary Evaluation and Therapy (MUSIC-KIDNEY) registry from April 2021 to March 2023. Patients were stratified into those who received opioids at discharge and those with opioid-free discharge. Associations with patient, tumor, and surgical factors were evaluated. Rates of postoperative ED visits and readmissions within 30 days were compared between cohorts. Practice-level variation was assessed.

Results: Of 414 patients who underwent surgery for T1 RM across 15 practices in MUSIC-KIDNEY, 23.7% had opioid-free discharge. Practice-level variation in rates of opioid-free discharge ranged from 6.7% to 55.0%. For patients prescribed opioids, the median number of pills was 10 (IQR 6-12). Patients with cT1b masses were more likely to have opioid-free discharge (44.9% vs 32%, OR 0.44; 95% CI 0.22-0.89). Rates of 30-day ED visits (7.0% vs 3.1%) and readmissions (4.1% vs 2.0%) were lower in the opioid-free discharge group but did not reach statistical significance.

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Conclusions: MUSIC-KIDNEY data suggest opioid-free discharge is not associated with increased rates of postoperative ED visits or readmissions. There exists wide practice-level variation in opioid prescriptions following surgery for T1 RM in the state of Michigan. Similar variation likely exists throughout the United States, and best surgical practice suggests reduction in opioid prescribing after nephrectomy.

Key Words: renal mass, renal cell carcinoma, partial nephrectomy, radical nephrectomy, opioid prescription

Opioid overdose has steadily risen over the past 20 years. In 2021 alone, there were 17,000 deaths involving prescription opioids.¹ Postoperative opioid prescriptions have been implicated in the opioid crisis, both by increasing the risk of persistent opioid use and diverting unused medication into the community. Six percent of opioid-naïve patients reported opioid use persisting for 3 months or more postoperatively.²

The CDC has published guidelines to address opioid prescription in the setting of the opioid pandemic, specifically initiating opioids, the duration of prescription, and potential risks.³ In line with these guidelines, the AUA has encouraged urologists to manage postoperative pain with minimal to no opioid prescriptions.⁴ However, it is unclear to what extent this is followed in urologic practice. Variation in opioid prescribing patterns have been noted across urologic procedures.^{5,6} Lack of standardization and variation in prescribing patterns has the potential to lead to over-prescribing; prior literature establishes that up to 77% of prescribed options go unused following prostate and kidney surgery.⁷⁻⁹ Additionally, surgical specialties continue to lack formal training on pain management, perpetuating a cycle for physicians in training.¹⁰

Opioid-free discharge has been shown to be safe and feasible for a variety of urologic procedures.¹¹⁻¹³ However, there is limited knowledge on the safety and feasibility of opioid-free discharge following nephrectomy. The Michigan Urological Surgery Improvement Collaborative (MUSIC) is a statewide quality improvement (QI) collaborative representing 46 diverse practices and over 260 urologists. MUSIC maintains a prospective registry of all patients with newly diagnosed clinical stage T1 renal masses (T1RM) among participating practices, MUSIC—Kidney Mass: Identifying and Defining Necessary Evaluation and Therapy (KIDNEY). We sought to evaluate the use and outcomes of opioid-free discharge in the state of Michigan through the MUSIC-KIDNEY registry.

Methods

MUSIC-KIDNEY

All practices participating in MUSIC have been invited to participate in MUSIC-KIDNEY, which aims to standardize and improve care for patients with T1RM. MUSIC-KIDNEY

maintains a prospective database of all newly diagnosed localized renal masses up to 7 cm (T1RM) that has enrolled patients from 20 Michigan urology practices. MUSIC is a heterogeneous group of practices including academic, hybrid, and private/community practices. Details on the design, inception, and data collection have been published previously.¹⁴ Briefly, at each clinical site, trained data abstractors review primary medical records and enter clinical data into a web-based registry at least 120 days after initial encounter. Treatment and follow-up data are recorded at regular intervals, and data are routinely audited for quality control.

Study Sample

We retrospectively examined all T1RM patients with data regarding prescription of postoperative opioids from April 2021, when an opioid prescription variable was implemented in our database, to March 2023. Patients with benign renal masses, simple cysts, Bosniak 2 and 2F cysts, positive nodes, metastases, and bilateral tumors were excluded. Patients were stratified into 2 cohorts based on opioid status at discharge (opioid-free discharge vs opioids at discharge). Opioid-free discharge was defined as the absence of opioid prescriptions at the time of discharge and does not account for inpatient opioids or opioid prescription acquired after discharge. For each patient, the following variables were extracted and included for analysis: demographic and clinical information including age, gender, race, BMI, insurance type, and Charlson Comorbidity Index; tumor factors including tumor staging (T1a vs T1b) and tumor complexity using the R/E/N/L components of the R.E.N.A.L. (for radius, exophytic/endophytic, nearness of tumor to collecting system, anterior/posterior, location relative to polar line) nephrometry score¹⁵; and surgery factors including surgery type (partial nephrectomy [PN] vs radical nephrectomy [RN]), surgical approach (minimally invasive vs open), and length of stay in the hospital. For patients receiving opioids at discharge, the number of opioid pills prescribed at discharge was evaluated. Outcome measures included emergency department (ED) visit and/or readmission within 30 days postoperatively. These specific outcome measures were chosen because patients experiencing unmanageable postoperative pain may present to the ED with possible readmission. Practice variation in the use of opioid-free discharge was evaluated for all practices with at least 10 cases total during the study period.

Objectives

Our primary objective was to assess the safety and feasibility of opioid-free discharge by comparing postoperative ED visits and readmissions between cohorts. Our secondary objectives were to assess variability of opioid-free discharge within MUSIC-KIDNEY as well as factors associated with opioid-free discharge within our collaborative.

Statistical Analysis

All patient, practice, and surgical-level characteristics were compared between patients with and without opioid-free discharge. χ^2 test was used for categorical variables, and Wilcoxon rank-sum test was used for continuous measures. Fisher's exact test was used for comparison of patient insurance types, and Jonckheere-Terpstra test was used for comparison of Charlson Comorbidity Index, tumor complexity, and length of stay. A multivariate logistic regression model for opioid-free discharge was performed to identify factors associated with opioid-free discharge; variables in the model included BMI, tumor stage, surgery type, surgery approach, and length of stay. Odds ratio (OR) and 95% CI were generated for each variable. All analyses were performed using SAS 9.4, and statistical significance was set at $P = .05$.

Results

We identified 414 patients who underwent surgery for T1RM with opioid prescription data within our database from 15 practices, representing 62% of cases ($n = 666$) in the MUSIC-KIDNEY registry during this time frame. Of these, 98 (24%) had opioid-free discharge. Patients with lower BMI and larger tumor (T1b vs T1a) were more likely to have an opioid-free discharge ($P = .04$, $P = .02$, respectively). No significant difference in opioid-free discharge status was observed between surgery type (PN vs RN), surgical approach (minimally invasive vs open), and length of stay in the hospital ($P = .5$, $P = .07$, and $P = .17$, respectively). Table 1 compares the patient and tumor characteristics by opioid prescription status at discharge.

Thirty-Day ED Visits and Readmissions

Overall rates of ED visits were 6.1% ($n = 25$) and of readmissions were 3.6% ($n = 15$) within 30 days of surgery. Among patients who underwent opioid-free discharge vs those who received opioids at discharge, there was no significant difference in 30-day ED visits (3.1% vs 7.0%, $P = .16$) and readmissions (2.0% vs 4.1%, $P = .5$; Figure 1).

Table 1.

Clinical and Demographic Characteristics by Status of Opioid-Free Discharge

	Opioids at discharge N = 316 (76%)		Opioid-free discharge N = 98 (24%)		P value
Age, median (IQR)	61	(52-68)	62	(54-71)	.14
Sex, No. (%)					
Male	192	(77)	58	(23)	.8
Female	124	(76)	40	(24)	
Race, No. (%)					
White	255	(78)	73	(22)	.3
African American	22	(67)	11	(33)	
Other/unknown	39	(74)	14	(26)	
BMI, median (IQR)	31.0	(27.2-35.8)	29.4	(26.3-32.9)	.037
Charlson Comorbidity Index, No. (%)					
0	153	(74)	54	(26)	.3
1	73	(82)	16	(18)	
≥ 2	90	(76)	28	(24)	
Tumor stage, No. (%)					
T1a	215	(80)	54	(20)	.019
T1b	101	(70)	44	(30)	
Tumor complexity (R.E.N.A.L. score), No. (%)					
Low	86	(77)	26	(23)	.8
Intermediate	105	(75)	36	(26)	
High	39	(77)	12	(24)	
Surgery type, No. (%)					
Partial nephrectomy	223	(77)	66	(23)	.5
Radical nephrectomy	93	(74)	32	(26)	
Surgery approach, No. (%)					
Minimally invasive	300	(77)	88	(23)	.067
Open	16	(62)	10	(38)	
Length of stay (d), No. (%)					.17
≤ 1	172	(79)	45	(21)	
2	92	(77)	27	(23)	
≥ 3	43	(65)	23	(35)	
Insurance, No. (%)					
Private	171	(76)	54	(24)	.11
Public or none	145	(77)	44	(23)	

Abbreviations: BMI, body mass index; IQR, interquartile range; R.E.N.A.L., radius, exophytic/endophytic, nearness of tumor to collecting system, anterior/posterior, location relative to polar line; T1a/T1b, clinical stages of renal masses.

Data were not available for BMI in 3 patients, tumor complexity in 110, and length of stay in 12.

Bolded P values are statistically significant.

Practice Variation and Prescribing Patterns

Among practices with at least 10 cases, the opioid-free discharge rate significantly differed across practices ($P < .0001$), with a range from 6.7% to 55% (Figure 2). In these practices, opioid prescribing data were complete in 28% to 100% of patients. Practices with higher number of PN and RN cases tended to have lower rates of opioid-free discharge. Practice type was not significantly associated with opioid-free discharge. Among the patients prescribed opioids at discharge, the median number of pills prescribed was 10 (IQR 6-12). When broken down by surgery type, the median number of pills prescribed after PN was 8 (IQR 5-12) vs 7 (IQR 0-12) after RN.

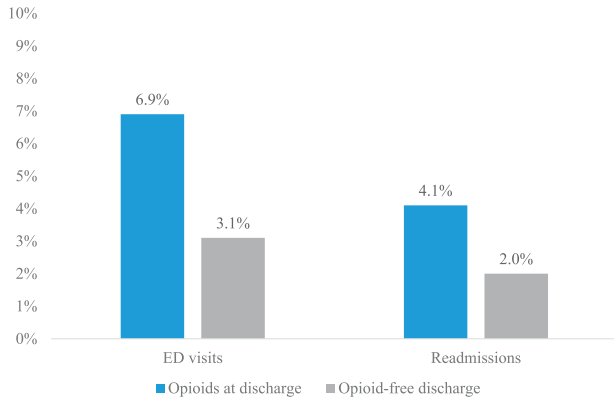


Figure 1. Proportion of patients with emergency department (ED) visits or readmissions within 30 days of nephrectomy stratified by status of opioid-free discharge. *P* value for ED = .16; *P* value for readmission = .5.

Participating practices were also retrospectively surveyed on their prescribing practices. The most common medications prescribed were oxycodone 5 mg (8 practices, 6-12 pills) and hydrocodone-acetaminophen 5/325 (5 practices, 5-18 pills). Most providers reported that the number of pills prescribed was dependent on the individual patient’s postoperative pain levels.

Predictors of Opioid-Free Discharge in MUSIC-KIDNEY

On logistic regression model for opioid-free discharge (Table 2), patients with higher BMI (OR = 0.92, 95% CI 0.87-0.97) and T1a vs T1b tumor (OR = 0.44, 95% CI 0.22-0.89) were less likely to have an opioid-free discharge. However, T1b tumors were also more likely to receive RN (*P* < .0001) and open surgery (*P* = .0008) compared to T1a tumors. Patients with T1b tumors had a longer hospital stay,

Table 2.

Multivariate Logistic Regression Model Analysis of Factors Associated With Opioid-Free Discharge

	Odds ratio	95% Confidence interval		<i>P</i> value
		Lower limit	Upper limit	
BMI	0.92	0.88	0.97	< .001
Tumor stage: T1a vs T1b	0.47	0.23	0.93	.029
Surgery type: partial vs radical nephrectomy	1.00	0.49	2.04	.9
Surgery approach: minimally invasive vs open	0.64	0.19	2.18	.5
Length of stay, d (reference ≤1)				
2	0.85	0.44	1.66	
≥3	1.19	0.53	2.67	.8

Abbreviations: BMI, body mass index; T1a/T1b, clinical stages of renal masses. Model was adjusted for age, sex, race, Charlson Comorbidity Index, tumor complexity, practice type, surgery type, surgery approach, hospital length of stay, and insurance, which were not significant factors. Only higher BMI and tumor stage T1b were significant for lower odds of opioid-free discharge.

Bolded *P* values are statistically significant.

especially ≥ 3 days (Supplementary Table 1, <https://www.urologypracticejournal.com>). No other demographic, clinical, or surgical variables were identified to be significantly associated with opioid-free discharge.

Discussion

Opioid-free discharge was achieved in 24% of patients undergoing nephrectomy in MUSIC-KIDNEY, with wide variability across participating practices. Our overall rate of opioid-free discharge is comparable to the previously reported rates of 22% and 51.9% for patients undergoing all types of urologic procedures.^{6,16} Cheung et al reported an opioid-free discharge rate of 32.6% for all nephrectomies included in the Ontario Cancer Registry.¹⁷ Okoro et al showed wide variations in prescribing practices following kidney cancer surgery; however, that study included T2 and T3 renal masses and did not evaluate opioid-free discharge.¹⁸ To our knowledge, we are the first to evaluate opioid-free discharge following the surgical management of T1RM specifically. Moreover, utilization of a statewide registry provides the opportunity to evaluate real-world practice patterns with the goal of identifying areas for QI and standardization of care.

Poorly managed postoperative pain has been shown to be associated with readmissions and ED visits for pain management.¹⁹ Concerns regarding inadequate analgesia may deter urologists from decreasing or eliminating opioid prescriptions at discharge. However, our data demonstrate that patients without prescribed opioids at discharge did not

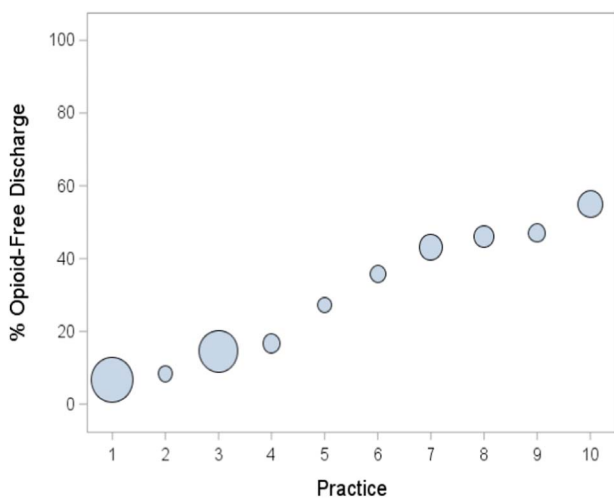


Figure 2. Practice-level rate of opioid-free discharge following partial or radical nephrectomy. Each circle represents a single Michigan Urological Surgery Improvement Collaborative practice; the size of each circle correlates with the number of included cases.

have increased ED utilization or readmissions following surgery. Similar results for ED visits were previously shown by Hawken et al for ureteroscopy.¹¹ These results may provide reassurance to urologists that opioid analgesia may not be necessary in all cases and can often be safely reduced or eliminated. Furthermore, results from other analyses suggest that higher levels of opioid prescription may negatively impact recovery postoperatively. A retrospective analysis using linked Surveillance, Epidemiology, and End Results—Medicare data examining postoperative opioid prescribing patterns following kidney cancer surgery found that higher doses of opioids were associated with higher rates of 90-day readmissions.¹⁸ Postoperative readmissions are a major driver of health care costs, and identifying strategies to decrease opioid prescribing postoperatively may help in reducing this burden.

Patel et al conducted a prospective opioid reduction intervention for radical prostatectomy as part of the ORIOLES (Opioid Reduction Intervention for Open, Laparoscopic, and Endoscopic Surgery) initiative; the study demonstrated higher BMI was associated with greater postdischarge opioid use.²⁰ Similarly, our analysis also identified that higher BMI was less likely to be associated with opioid-free discharge. Our finding that lower BMI was associated with opioid-free discharge may be expected, since higher BMI has been found to be associated with chronic pain, receiving prescription opioids, and opioid use for longer periods.^{21,22} Also, deeper incisions are needed in patients with greater amounts of abdominal fibroadipose tissue. Interestingly, opioid-free discharge was more common for larger masses (T1b) than T1a masses in univariable and multivariable analysis. This is somewhat counter-intuitive, as compared to T1a masses, T1b masses require larger extraction incisions, especially as they were more commonly treated with RN in our practices. Perhaps the shorter operative times and lesser intra-abdominal manipulation associated with RN vs PN contributed to this result.²³ Our results also show that T1b masses were more likely to have a longer length of stay in the hospital. These patients may have received inpatient opioids and achieved better pain control by the time of discharge compared to patients who were discharged earlier. It is also possible that higher stage masses may be more likely to be operated on at centers with more robust opioid-minimization practices in place.

Interestingly, there was no significant difference in rates of opioid-free discharge between PN and RN or between minimally invasive and open approaches on our analysis. This is in contrast to prior literature in which surgical type and approach were both associated with differences in opioid prescription.^{8,17,24} Okoro et al found that patients undergoing open surgery for kidney cancer were more likely to receive higher doses of opioids.¹⁸ However, we hypothesize that patients undergoing open surgery had a longer hospital

recovery with inpatient opioids; these patients are more likely to have achieved pain control at discharge, resulting in a comparable opioid-free discharge rate compared to patients with minimally invasive surgery. For example, T1b tumors were associated with higher rates of opioid-free discharge, along with higher rates of open surgery and longer length of stay. Our overall lack of positive findings in the context of significant practice variation suggest that opioid prescribing patterns may not be entirely driven by specific clinical or surgical factors, but rather, by surgeon or practice factors such as provider preference or existing institutional protocols. Additionally, while it is widely accepted that robotic and other minimally invasive surgical approaches result in less pain than with traditional open approaches, our data highlight the need to focus on opioid stewardship for both open and minimally invasive kidney surgery. Lastly, the majority of our cohort underwent minimally invasive surgery, with only 6% of patients with open surgery; the small sample size of open surgeries may lack the power to show a significant difference in opioid-free discharge from the perspective of surgical approach.

There are several published guidelines and implementation trials that have successfully reduced opioid prescriptions for major urologic surgeries.²⁵⁻²⁷ Some institutions have implemented a standardized protocol for opioid prescriptions at discharge.²⁶⁻³⁰ Alternatively, individualized opioid prescribing patterns may address postoperative pain control and reduce extra pills diverting into the community. The ORIOLES initiative constructed a predictive calculator to guide opioid prescribing based on factors associated with postdischarge opioid use.³¹ To this date, MUSIC has implemented several QI initiatives to this effect across its kidney stone, prostate, and renal mass programs. MUSIC-ROCKS (Reducing Operative Complications From Kidney Stones) has been successful in reducing opioid prescriptions post-ureteroscopy for kidney stone disease by more than 70% within the state of Michigan.¹¹ MUSIC-Prostate implemented a quality incentive for opioid-free vasectomies that led to a reduction of more than 8000 5 mg oxycodone pills prescribed in Michigan during the first year of implementation.³² Patient resources, including videos, brochures, and placards, exist to help set expectations regarding postoperative pain management (<https://musicurology.com/programs/prostate/reducing-opioid-prescribing/>), which may be a key component of reducing opioid utilization in this setting.³³ Likewise, MUSIC-KIDNEY is currently developing provider- and patient-centered resources with the goal of reducing opioid utilization post kidney cancer surgery. We have included our brochure for patients addressing pain management after kidney surgery (Supplementary Appendix A, <https://www.urologypracticejournal.com>) and pain optimization pathway for providers (Supplementary Appendix

B, <https://www.urologypracticejournal.com>). While all practices have access to these resources, not all practices may be using them and there may be variable adherence. The pain optimization pathway was developed during the study period, and there may have been variable adoption by our practices.

Limitations of this study include all those associated with nonrandomized, observational studies. Data collected regarding opioid prescription within MUSIC-KIDNEY are limited to number of pills prescribed at discharge. We do not currently collect types of medication, dose, refills, usage, or disposal in order to limit burden on data abstractors. As such, we are unable to determine actual morphine milligram equivalents of perioperative opioid utilization. However, to address this limitation, we retrospectively surveyed MUSIC-KIDNEY urologists regarding their opioid prescription practices after kidney surgery. We do not currently collect data regarding nonnarcotic pain management, such as the use of regional anesthesia or nonsteroidal anti-inflammatory drugs. Our registry unfortunately does not collect data regarding preoperative opioid use, including patients with baseline opioid use, inpatient opioid use, and pain scores. We currently do not collect data to distinguish the reasons for ED presentation and readmission through our registry. Although patient-facing materials are available to MUSIC practices, we are limited in our ability to evaluate the specific practice-level educational patterns associated with successful opioid-free discharge. As is the case with all data registries, there is the potential for incorrect data entry or missing data, although this is limited by MUSIC's robust system of quality auditing.

Conclusions

MUSIC-KIDNEY data demonstrate that opioid-free discharge following surgery for T1RM is not associated with increased rates of postoperative ED visits or readmissions. The wide variation in rates of opioid-free discharge in the state of Michigan highlights potential for QI in this metric. MUSIC has several initiatives underway to reduce unnecessary prescribing of opioids after kidney cancer surgery and promote opioid stewardship.

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Editorial Commentaries

The prevalence of opioid overprescription after urological surgery and the urgency of opioid stewardship in urology are now well established in our literature. Initial studies suggested that up to 77% of opioids prescribed following renal and prostate surgery go unused.¹ Evidence-based recommendations for opioid prescribing following minimally invasive surgery have since confirmed the feasibility of prescribing 0 to 10 tablets of oxycodone 5 mg, or equivalent, for partial and radical nephrectomy,^{2,3} alongside stewardship strategies like assessing and reducing practice-level variation.

The present study builds upon these objectives by analyzing the feasibility of opioid-free discharge in patients undergoing surgery for T1 renal masses using the MUSIC-KIDNEY (Michigan Urological Surgery Improvement Collaborative—Kidney Mass: Identifying and Defining Necessary Evaluation and Therapy) database.⁴ Almost a quarter of patients were able to be discharged safely without an opioid prescription and, importantly, without significant adverse impact on unplanned emergency department visits and readmissions.

These findings add context to ongoing quality improvement efforts not only to reduce opioid overprescription overall, but also to introduce sustainable changes in prescription behavior. In our practice, a 3-tiered opioid prescribing guideline resulted

in durable and substantial decreases in opioid prescriptions across 21 urological procedures, including nephrectomy.⁵ Implementation of evidence-based guidelines within practices and coordinated health systems can assist prescribers in large-scale stewardship efforts, limit the potential diversion and misuse of postoperative opioids, and facilitate patient counseling and appropriate expectations.

Several interesting questions in this analysis warrant further evaluation. Characterizing patient-reported pain outcomes and satisfaction scores following discharge with and without opioids would help strengthen the feasibility findings, in particular which patients may be at highest risk for inadequate pain management. Furthermore, hospital-based reimbursement has been tied to patient satisfaction scores through the Hospital Value-Based Purchasing program to prioritize patient experience, so more granular data on the impact of pain control on patient satisfaction may help accelerate adoption of these recommendations and replication of the authors' promising experience.

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This study retrospectively examined 414 patients who underwent open or minimally invasive surgery for cT1 renal masses noting significant practice variation in opioid-free discharge with 24% overall discharged without opioid medications.¹ Patients with higher BMI and, counterintuitively, T1a masses were less likely to have opioid-free discharge. Importantly, opioid-free discharge did not increase emergency department presentation or readmission within 30 days of surgery.

Given the ongoing national opioid crisis, reducing unnecessary postoperative opioid prescriptions remains an important priority. To this end, a few educational and behavioral interventions have been reported to reduce the prescription of opioids after prostate or kidney surgery.^{2,3} The present study adds to the literature by exploring variations in prescribing practices within a large consortium of urologists and how differences may affect patient outcomes. However, there are some important considerations when interpreting these data as practice variation may be even higher at the national level compared to within a collaborative such as MUSIC (the Michigan Urological Surgery Improvement Collaborative).

Furthermore, the outcomes of the study—emergency department visits and readmission—are short-term considerations. The goal of reducing opioid prescriptions at discharge is to hopefully impact consequences of long-term persistent opioid use and improper disposal of medications. Therefore, identifying those with the highest risk for persistent postoperative opioid use or an undetected surgical complication is an important task; this may be associated with individual

patients' opioid use prior to surgery, BMI, amount of inpatient opioid use, and subjective pain scores.⁴ Future studies might focus on measuring inpatient opioid use and pain for patients undergoing nephrectomy to identify high-risk patients where targeted efforts above baseline education may be helpful.

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This article reports the latest efforts by the Michigan Urological Surgery Improvement Collaborative (MUSIC) to reduce opioid prescriptions within their collaborative and elsewhere.¹ Similar to MUSIC's work with other urologic procedures, Wang and colleagues, under the leadership of Rogers and Lane, describe discharge opioid prescribing

patterns with results suggesting that opioid-free discharges following nephrectomy (partial and radical) are both safe and feasible.

Our department has similarly made efforts to limit opioid usage over the past few years,² and instead encourage a multimodal analgesia approach using acetaminophen, nonsteroidal

anti-inflammatory drugs, and gabapentinoids. Our Pennsylvania-based collaborative has also studied postoperative opioid prescriptions.³ Lee et al identified gaps between evidence supporting opioid-sparing postoperative discharge and implementation into actual practice. Despite these recent studies, some providers may be hesitant about discharging their patients without opioids due to concerns of increased emergency department visits, readmissions, or phone calls from patients asking for additional pain medications. These providers may be more comfortable prescribing opiates which they know will control pain for their patients, despite the known possible harms. Efforts by MUSIC and others continue to provide data that opioid-sparing approaches work for many, if not most, patients. The next step is making sure this knowledge is shared among urologists and then making efforts to implement change into practice.

Ultimately, the onus rests with us as urologists and leaders of the care team to limit opioid prescriptions. Opioid-sparing discharge requires communication and buy-in from the entire team, especially if the discharge process is entrusted to residents, advanced practice providers, or nonurologist physicians. Opioid prescriptions carry risks of persistent use and diversion into the community.⁴ Limiting opioid prescriptions, when appropriate, is a goal that should be shared by all in

health care. And now we have even more data to suggest that we can achieve this goal safely for our patients.

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Reply by Authors

We appreciate the valuable insights provided in these editorial commentaries. In this manuscript, MUSIC-KIDNEY (Michigan Urological Surgery Improvement Collaborative—Kidney Mass: Identifying and Defining Necessary Evaluation and Therapy) reports practice-level variation of opioid prescription after kidney surgery and provides real-world evidence supporting opioid-free discharge.¹ Contrary to some concerns, short-term emergency department visits and readmissions were not significantly higher for patients with opioid-free discharge.

Our manuscript adds to the existing literature on prescription stewardship in response to the ongoing opioid pandemic. As noted, there are several limitations. Data regarding opioid prescriptions were included into our registry starting in 2021, limiting our analysis to the past 2 years. While MUSIC providers utilize multimodal anesthesia both during admission and after discharge, these practices are not adequately reflected in our study. Additionally, we were not able to collect patient reported outcomes and actual usage of medications.

Despite the limitations, we recently developed a new value-based metric and quality improvement initiative to reduce opioid discharge prescriptions with the goal of 6 pills or less. We hope this metric in conjunction with our patient and provider resources will discourage overprescription in

MUSIC-KIDNEY and decrease unused medications in the community. We are encouraged to hear the efforts in place at the Mayo Clinic and appreciate the insights into obtaining patient-reported outcomes as these can be tied to value-based reimbursement.² Additionally, ORIOLES (Opioid Reduction Intervention for Open, Laparoscopic, and Endoscopic Surgery) is an important contribution.³ We will consider how to encourage adaptation of this tool within MUSIC practices to determine risk for inadequate pain control and future long-term use.

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