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Original Research

# Opioid Utilization After Primary Total Hip and Knee Arthroplasty Following Sequential Implementation of Statewide Legislation

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ABSTRACT

*Background:* Following total hip arthroplasty (THA) and total knee arthroplasty (TKA), increased opioid use is associated with poor clinical outcomes. This study investigates implications of Florida legislative mandates on prescribing practices and opioid utilization following primary THA and TKA.

*Methods:* We retrospectively reviewed patients undergoing primary TKA or THA between January 1, 2018, to December 31, 2020 at our academic medical center. Three groups were identified: procedures performed prior to mandates, after seven-day prescription limit, and after mandated electronic prescribing. A multivariate analyses of variance evaluated length of stay, morphine milligram equivalents (MMEs), age, body mass index and number of prescription refills. Chi-square tests compared preoperative opioid use, readmissions, and discharge disposition.

*Results:* There were 198 patients in group one, 238 patients in group two, and 215 patients in group three (N = 651). Prior to any mandates, patients were prescribed 822.3 + 626.7 MMEs. Following a seven-day prescription limit this decreased to 465.0 + 296.0 MMEs ($P < .001$), which further decreased after mandated electronic prescribing (228.0 + 284.4 MMEs [$P < 0.001$]). Patients undergoing THA were prescribed less MME than those undergoing TKA. There was a 2.6% 90-day readmission rate, with no pain-related readmissions.

*Conclusions:* Florida legislative mandates for opioid prescription quantities and electronic prescribing have effectively reduced average MMEs prescribed following primary arthroplasty. Despite a shift towards ambulatory surgery, opioid utilization decreased without compromising patient outcomes. These findings underscore the significance of both legislative and surgical practices influencing opioid prescribing habits among orthopaedic surgeons.



## Introduction

Orthopedic surgeons are the third highest prescribers of opioid medications, accounting for 7.7% of all opioid prescriptions in the United States [1]. As a profession, it is vital to explore and engage opioid management strategies and embrace efforts to limit inappropriate and supratherapeutic use. In tandem with independent efforts among professional societies and advocacy groups, many statewide legislative changes have also been implemented including prescription limitations, electronic prescribing, prescription-drug-monitoring programs (PDMPs), and requisite standardized counseling for patients regarding opioid alternatives [2,3].

Following total hip arthroplasty (THA) and total knee arthroplasty (TKA), excessive or increased opioid abuse is associated with poor clinical outcomes [4–6]. Preoperative opioid use is associated with a higher risk of postoperative complications including ongoing pain, longer hospital stays, and lower functional scores [5,6]. Moreover, the probability of revision surgery 1 year after arthroplasty is higher in patient's consuming daily opioid medications beyond 90 days postoperatively [4]. Even among those with

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reduced pain and improved postoperative patient-reported outcomes, as many as 15% of patients who were narcotic-naive prior to elective arthroplasty will become chronic opioid users [7].

We previously published the results of our institutional opioid reduction strategy for all patients undergoing THA and TKA [8]. Since that time, Florida has implemented 3 sequential mandates. Beginning from July 1, 2019, the new legislation restricted opioid prescriptions for acute pain to a 3-day supply, though physicians can extend to a 7-day supply with specified acute pain exemption. The acute pain exemption includes all patients following elective arthroplasty procedures. In addition, beginning from January 1, 2020, all prescriptions were required to be completed electronically and in conjunction with a review of our state's online PDMP.

With this in mind, we aimed to review outcomes and changes in our arthroplasty division's prescribing practices after implementation of this series of staged, multi-faceted, statewide mandate. The primary purpose of this study was to assess whether statewide mandates regarding prescription limitations and electronic prescribing decrease opioid utilization following THA and TKA at our institution. We hypothesized that there would be a significant reduction in opioid prescriptions following each statewide mandate.

## Material and methods

After receiving institutional review board approval, we performed a retrospective review of all patients undergoing unilateral primary TKA or THA between January 1, 2018, and December 31, 2020, at our academic medical center. All procedures were performed by one of the 7 fellowship-trained arthroplasty surgeons. We previously reported a prescription pathway adopted by our arthroplasty division which designates patients into 1 of 4 prescription categories (ie, opioid sparing, opioid naïve, standard narcotic, or chronic narcotic) while patients were designated based on reported opioid use at their preoperative appointment [8,9]. Each prescription category corresponds with a structured postoperative prescription pathway as depicted in Table 1. Other than iterative adaptations following statewide mandates, our arthroplasty division did not alter prescribing pathways over the course of this study. Deidentified opioid prescription data and the prescription pathway were acquired from our institutional electronic medical record (EPIC Systems, Verona, WI) using Current Procedural Terminology (CPT) codes 27447 and 27130. This information was cross-referenced using Florida's PDMP. All postoperative opioid outpatient prescriptions were recorded up to 90 days following the procedure. The prescription, amount of opioids, and number of refills were used to calculate morphine milligram equivalents (MMEs). In addition, preoperative opioid use (ie, narcotic naive, narcotic-sparing, standard narcotic, chronic narcotic), LOS, discharge disposition (ie, home, inpatient rehabilitation facility), procedure type (ie, THA, TKA), and the percentage of pain-related readmissions among the procedure type and groups were recorded. Patients undergoing revision procedures or simultaneous bilateral arthroplasties were excluded.

Patients were allocated into 3 groups. The first group (Group 1) included procedures performed between January 2018 and March 2018 which represented the baseline before any statewide mandates were implemented. The second group (Group 2) included procedures performed between January 2019 and March 2019 which occurred after the initiation of the Florida statewide 7-day prescription limit for acute pain. The third group (Group 3) included procedures performed between June 2020 and August 2020 that represented the period after the implementation of mandatory electronic prescribing in conjunction with a review of the statewide PDMP for all opioid medications. We selected this 3-month interval for the third group to minimize the effects of restrictions on elective surgery during the COVID-19 pandemic. In our state and institution, there were no limitations on volume or scope of elective procedures during this period.

Statistical analysis was carried out using SPSS 28.0 (IBM, Armonk, NY) with significance set to $P < .05$ for all statistical tests. Chi-square tests were used to evaluate categorical variables, and a multivariate analysis of variance was used for continuous variables. The multivariate analysis of variance was performed to evaluate length of stay, age, body mass index, total MME, and number of refills among the 3 groups (ie, Group 1, Group 2, or Group 3) and across procedures (ie, THA and TKA). In addition, post-hoc testing was performed using Bonferroni corrections. Chi-square tests were used to compare differences in preoperative opioid use, discharge disposition, procedure type, and percentage of pain-related readmissions among the procedure type and groups.

## Results

A total of 643 patients were identified for this study. Of those patients, 6 patients had a staged bilateral TKA, and 2 patients had a staged bilateral THA. As such, there was a total sample of 651 procedures included in the final analysis. There was a total of 260 (39.9%) THA procedures and 391 (60.1%) TKAs; of those, there were 198 (30.4%) procedures included in Group 1 (ie, baseline), 238 (36.6%) procedures included in Group 2 (ie, following 7-day prescription mandate), and 215 (33.0%) procedures included in Group 3 (ie, following mandatory electronic prescribing with PDMP review). Demographic data are depicted in Table 2 and Figure 1.

Overall, there was no significant interaction in total MMEs prescribed across the 3 groups between procedures (ie, TKA or THA) ($F [2, 613] = 0.97$, $P = .378$; Table 2 and Figure 1). However, there was a significant difference in the total MMEs prescribed between the 3 groups ($F [2, 613] = 57.06$, $P < .001$); post-hoc testing revealed that patients were prescribed an average of $822.31 \pm 626.7$ (SD) MMEs prior to the implementation of any statewide mandates to reduce opioid utilization. Following the implementation of a

**Table 1**
Stratified opioid prescription pathway following implementation of statewide mandatory e-prescribing and 7-day prescription limitation.

| Medication | "Opioid sparing" (#tablets) | "Narcotic naive" (#tablets) | | "Standard" (#tablets) | "Long-term use" (#tablets) |
|---|---|---|---|---|---|
| Multimodal (Tylenol, NSAIDs, gabapentinoids) | | | | | |
| Tramadol | 21 | 0 | X | 0 | 21 |
| Hydrocodone/ACAP (5- to 325-mg tablet) | 0 | 28 | | 0 | 0 |
| Oxycodone (5-mg tablet) | 0 | 0 | | 28 | 28 |
| OME (daily/total) | 15/105 | 20/140 | | 30/210 | 45/315 |

"X" implies that all patients received this regardless of category.
The "narcotic-naive" and "opioid-sparing" protocols were typically used for primary arthroplasty cases, with the "opioid sparing" reserved for patients who were averse or allergic to traditional opioid narcotics. The "standard" protocol was typically used for complex primary cases (prior open surgery, post-traumatic arthritis, and so on), revisions, and patients who used occasional narcotics previously. The "long-term use" protocol was reserved for patients who met our criteria for chronic continuous opioid use.
ACAP, acetaminophen.

**Table 2**
Demographics, disposition, and narcotic prescription data.

| Variable | Group 1 | Group 2 | Group 3 | *P* value |
|---|---|---|---|---|
| Age (years; ±SD) | | | | .799[a] |
| THA | 64.3 ± 11.50 | 65.59 ± 12.76 | 67.03 ± 10.65 | |
| TKA | 66.85 ± 8.44 | 66.24 ± 10.47 | 67.16 ± 10.23 | |
| BMI (±SD) | | | | .115[a] |
| THA | 30.6 ± 6.74 | 29.34 ± 5.96 | 31.21 ± 7.46 | |
| TKA | 32.71 ± 6.54 | 32.63 ± 6.62 | 32.39 ± 7.04 | |
| Sex | | | | .518[b] |
| Male | 82 (41.8%) | 89 (37.9%) | 91 (42.9%) | |
| Female | 114 (58.2%) | 146 (62.1%) | 121 (57.1%) | |
| Procedure (%) | | | | .337[b] |
| THA | 78 (39.4%) | 88 (37.0%) | 94 (43.7%) | |
| TKA | 120 (60.6%) | 150 (63.0%) | 121 (56.3%) | |
| Patient type (%) | | | | **<.001**[b] |
| Inpatient | 154 (77.8%) | 176 (73.9%) | 78 (36.3%) | |
| Ambulatory surgery | 44 (22.2%) | 62 (26.1%) | 137 (63.7%) | |
| Opioid use type (%) | | | | **<.001**[b] |
| Sparing | 19 (9.5%) | 37 (15.5%) | 4 (1.9%) | |
| Naïve | 110 (55.6%) | 157 (66.0%) | 192 (89.3%) | |
| Standard | 54 (27.3%) | 34 (14.3%) | 9 (4.2%) | |
| Chronic | 15 (7.6%) | 10 (4.2%) | 10 (4.7%) | |
| MME (±SD) | | | | .378[a] |
| THA | 695.41 ± 455.18 | 413 ± 205.16 | 177.91 ± 176.61 | |
| TKA | 905.83 ± 707.06 | 465 ± 338.39 | 266.67 ± 284.42 | |
| Prescription refills (±SD) | | | | **.017**[a] |
| THA | 0.48 ± 9.12 | 0.16 ± 0.62 | 0.19 ± 0.54 | |
| TKA | 1.36 ± 1.51 | 0.54 ± 0.85 | 0.49 ± 0.85 | |
| LOS (days ±SD) | | | | .815[a] |
| THA | 1.91 ± 1.33 | 1.76 ± 1.36 | 1.17 ± 2.43 | |
| TKA | 1.27 ± 1.36 | 1.20 ± 1.36 | 0.73 ± 1.32 | |
| Discharge disposition (%) | | | | **<.001**[b] |
| Home | 169 (85.4%) | 207 (87.0%) | 209 (97.2%) | |
| Rehab/Nursing facility | 29 (14.6%) | 31 (13.0%) | 6 (2.8%) | |
| Readmission (%) | | | | .075[b] |
| THA | 1 (1.3%) | 0 (0.0%) | 3 (3.2%) | |
| TKA | 5 (4.2%) | 2 (1.4%) | 6 (5.1%) | |

Significant *P* values are denoted with bold formatting.
[a] Multivariate analysis of variance (MANOVA).
[b] Chi-square calculations.

statewide 7-day prescription limit, the average MMEs per patient decreased to 465.0 ± 296.0 MMEs (mean difference = 344.31, $P < .001$). Lastly, there was another significant decrease in the average opioids prescribed per procedure after the implementation of the mandated electronic prescribing to 228.0 ± 284.4 MMEs (mean difference = 233.83; $P < .001$). In addition, there was a significant difference in the total MMEs between procedures (ie, THA or TKA) with those undergoing a THA being prescribed significantly less total MMEs than those undergoing a TKA ($F [1, 613] = 7.33$, $P = .007$).

Overall, patients were prescribed on average 1.01 ± 1.37 refills in Group 1, 0.39 ± 0.87 refills in Group 2, and 0.36 ± 0.75 refills in Group 3 (Table 2 and Figure 1). There was a significant interaction in refills prescribed per patient over the 3 groups between procedures ($F [2, 613] = 4.08$, $P = .02$; Table 2 and Figure 1). Post-hoc testing revealed that there was a significant decrease in refills per patient from Group 1 to Group 2 (mean difference = 0.57; $P < .001$) and from Group 1 to Group 3 (mean difference = 0.577; $P < .001$). In addition, those patients who underwent a THA were prescribed significantly less refills than those who underwent a TKA ($F [1, 613] = 30.54$, $P < .001$).

There was a significant increase in outpatient surgical procedures over the course of the study. Group 1 consisted of 22.2% outpatient surgical procedures, which increased to 26.1% in Group 2 and 63.7% in Group 3 ($\chi^2 = 19.32$, $P < .001$). More specifically, the THA group increased outpatient procedures from 1.3% to 57.4% ($\chi^2 = 8.27$, $P = .016$). In addition, the TKA increased outpatient procedures from 35.8% to 68.8% ($\chi^2 = 11.78$, $P = .003$). Overall, 89.9% of patients were discharged home after surgery, while 10.1% were discharged to a rehab or skilled nursing facility. There was a gradual shift in discharge disposition to home for the total study population over the course of the study period; 85.7% of patients in Group 1, 86.8% of patients in Group 2, and 97.2% of patients in Group 3. In patients who underwent a TKA, the increase of discharge to home occurred over the 3 groups (ie, 86.7%, 88.4%, and 98.3%, respectively). In patients who underwent a THA, discharge to home remained similar between Group 1 (84.2%) and Group 2 (84.1%) but increased in Group 3 (95.7%).

There was no significant difference in the average number of refills between outpatient and inpatient procedures by procedure type ($F [1, 613] = 0.04$, $P = .284$). Overall, ambulatory surgical patients were given an average of 0.51 ± 0.98 refills, whereas inpatients were given 0.61 ± 1.10 refills ($F [1, 613] = 2.43$, $P = .119$). Moreover, within each group, there was no difference in the average MME prescribed to ambulatory surgical patients vs inpatients ($F [2, 613] = 0.67$, $P = .512$; Figure 2).

Overall, there was a 2.6% 90-day readmission rate across all 3 groups with no significant difference in readmission rates between the 3 groups ($\chi^2 = 5.18$, $P = .08$). Group 1 had a 3.1% readmission rate (N = 6); 2 patients were admitted with wound dehiscence after a fall, 2 patients with dislocations that failed closed reduction, 1 patient was admitted for intravenous antibiotics to treat lower-extremity cellulitis, and 1 patient with a periprosthetic fracture after a fall. Group 2 had a 0.9% readmission rate (N = 2); 1 patient was admitted for a manipulation under anesthesia to treat postoperative stiffness, and 1 patient was admitted for treatment of a

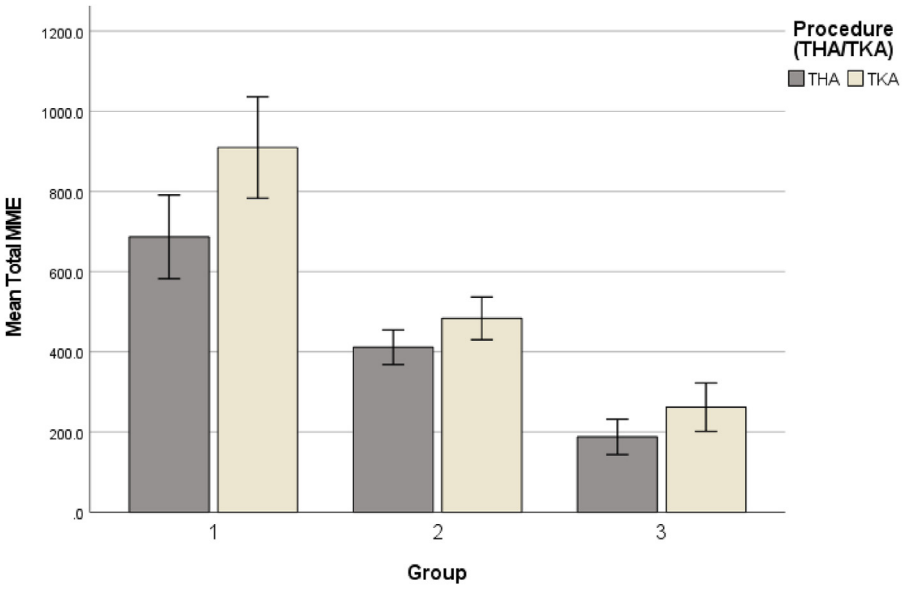


**Figure 1.** Average morphine milligram equivalents (MMEs) per procedure. Group 1 represents opioid utilization before the implementation of statewide mandates. Group 2 represents opioid utilization after the implementation of the 7-day prescription limit, but prior to electronic prescribing. Group 3 represents opioid utilization after mandatory electronic prescribing. Error bars represent the 95% confidence intervals.

pulmonary embolism. Group 3 had a 4.2% readmission rate (N = 9); 2 patients were admitted for chest pain, 1 postoperative anemia, 1 adrenal insufficiency, 1 urinary retention, 1 dislocation that failed closed reduction, and 2 superficial surgical site infections treated with intravenous antibiotics. In addition, there were more readmits for the TKA group (ie, 3.4%, N = 13) than for the THA group (ie, 1.6%, N = 4). There were no pain-related hospital readmissions following either mandate.

Over the course of the study, there was an increase in the opioid-naïve designation and a decrease in standard narcotic, opioid-sparing, and chronic narcotic designations (Table 1). In Group 1, 9.7% of patients were designated opioid sparing, 56.1% opioid naive, 26.5% standard narcotic, and 7.7% chronic narcotic. In Group 2, 15.7% of patients were designated opioid sparing, 66.0% opioid naive, 14.0% standard narcotic, and 4.3% chronic narcotic. In Group 3, 1.9% of patients were designated opioid sparing, 89.2% opioid naive, 4.2% standard narcotic, and 4.7% chronic narcotic.

## Discussion

The opioid epidemic is a public health crisis responsible for an estimated 70,000 deaths and an economic burden of $78.5 billion each year [10,11]. In the arthroplasty community, there has been growing interest in initiatives to control postoperative narcotics as

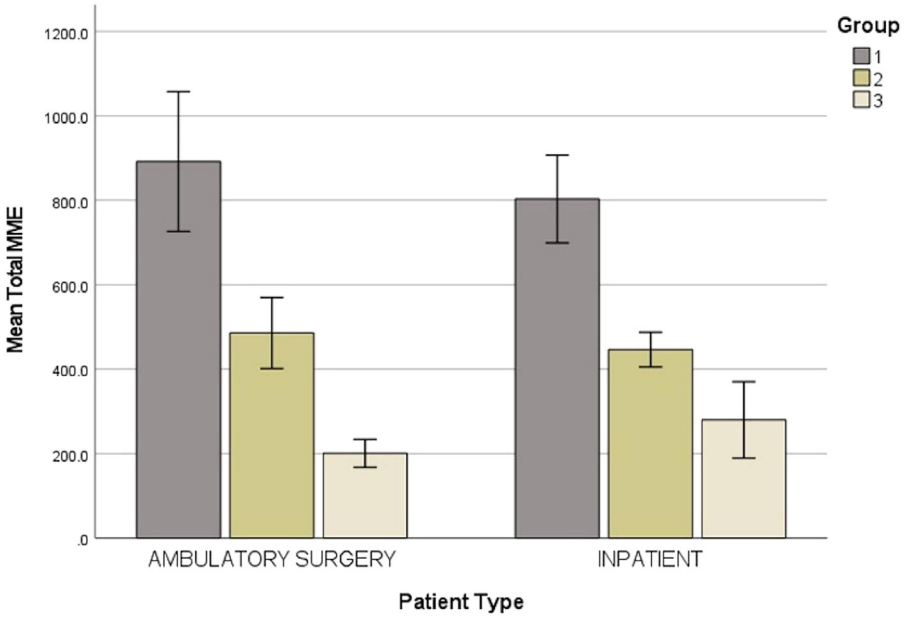


**Figure 2.** Average morphine milligram equivalents (MMEs) per procedure for ambulatory surgical patients vs inpatients. There was no statistically significant difference in average MMEs prescribed to inpatients vs ambulatory surgical patients across all 3 groups. Group 1 represents opioid utilization before the implementation of statewide mandates. Group 2 represents opioid utilization after the implementation of the 7-day prescription limit but prior to electronic prescribing. Group 3 represents opioid utilization after mandatory electronic prescribing. Error bars represent the 95% confidence intervals.

a growing body of literature demonstrates an association between opioid usage and poor clinical outcomes [4–6]. Over the last 4 years, Florida has implemented 3 sequential mandates in an attempt to reduce opioid usage.

Following the implementation of a statewide 7-day prescription limitation for acute pain, we noted a 43.6% decrease in the number of MMEs per patient, a significant reduction that was seen across both TKA and THA patients alike and across sites of care. We believe the significant reduction in the number of MMEs per patient following the first statewide prescription mandate is multifactorial. Restricting opioid prescriptions for acute pain to a 7-day supply allows for a more personalized pain regimen as it gives prescribers the ability to have smaller, targeted prescriptions with the options of refills. Smaller prescription durations also promote more active patient involvement in managing their postoperative pain and limit excess opioid medication, thereby decreasing the potential for abuse and protracted usage. Moreover, while our arthroplasty division originally developed a robust multi-media educational program, the subsequent release of state-approved educational materials augmented our discussion and likely added credibility to our recommendations.

We also noted a decrease in the mean MMEs per patient following mandatory electronic prescribing, with no significant increase in refills. In theory, the convenience of electronic prescribing could increase the number of medication refills because of improved access for both patients and physicians compared to historic requirements for written prescriptions and in-person encounters. However, our findings revealed that there was no significant change in the number of refills following this mandate. The authors believe electronic prescribing offers providers the opportunity for convenient refills that enable smaller targeted initial prescriptions. Similarly, this mandate also required a review of the statewide PDMP prior to prescribing a controlled substance. In addition to the continued evolution of prescription limits, the more efficient and accurate tracking of opioid utilization data with a formal PDMP prevents inclusion of unused tablets associated with larger prescriptions.

Total joint arthroplasty procedures continue to migrate to the ambulatory setting, a shift that was accelerated during and immediately following the COVID-19 pandemic. At our academic medical center, we employ a uniform perioperative pathway, catering to the needs of both inpatient and outpatient arthroplasty patients. Within this framework, both patient subgroups are provided with the option of regional nerve blocks coupled with early postoperative rehabilitation. During the study period, our outpatient utilization increased nearly three-fold. Ambulatory surgery shifts the acute pain period from inpatient to home. Theoretically, this could contribute to a disproportionate increase in outpatient narcotic prescriptions as ambulatory surgery shifts immediate postoperative pain control needs to the outpatient setting. However, we demonstrated a continued and significant decrease in average MMEs prescribed per procedure despite a significant increase in ambulatory surgical patients over the course of this study. In addition, there were no pain-related hospital readmissions, which should reassure surgeons that outpatient surgery, even in the setting of narrower narcotic prescriptions, does not sacrifice patient recovery or comfort. While not the primary aim of our investigation, we feel that this secondary finding supports further investigation into the presence of a newer prescription paradigm for arthroplasty patients undergoing ambulatory surgery.

Other studies have demonstrated a decline in opioid prescriptions following institutional mandates [12–15]. Wyles et al reported nearly 50% decrease in average MMEs to total joint arthroplasty patients after implementation of institutional guidelines to reduce opioid prescriptions, with no increase in number of refills per patient [16]. While individual prescribers should be cognizant of their prescribing practices, this demonstrates the effectiveness of large-scale efforts to systematically reduce narcotic usage. Sun et al noted adequate patient pain control despite restricting patients to a single prescription of low-dose opioids [17]. They also emphasized the importance of patient counseling and multimodal anesthesia [17]. These were pillars of our protocols that existed throughout the entire study period, yet we still noted significant sequential reductions in narcotic utilization as mandates were implemented.

There have been previous reports on the implications of statewide opioid prescription mandates among orthopedic patients. Chalmers et al demonstrated significantly less postoperative MMEs prescribed to patients residing in a state with strict opioid regulations than to patients residing in a state without these policies [18]. A systematic review performed by Randall et al demonstrated the success of opioid-reducing legislation at reducing average MME prescribed following elective arthroplasty procedures [19]. Pannu et al also reported reduction in total morphine equivalents among arthroplasty patients following Florida's statewide prescription limitation although this study only examined the effect of the first sequential mandate and does not examine the effects of mandated electronic prescribing [20]. To our knowledge, this is the first study to report on the individual impacts of a staged, multi-faceted statewide mandate including prescription limitation and mandated electronic prescribing. In addition, our institution had an established modern pain management protocol prior to legislation, which minimizes confounding and allows for more accurate analysis of the direct impact of these statutes as no other changes to our prescribing practices were made during this time interval.

There are several limitations to this study beyond inherent bias associated with retrospective reviews. First, our follow-up was limited to 3 months postoperatively, which limits comparison of prolonged opioid prescribing following total joint arthroplasty. However, Cook et al reported as many as 80% of patients undergoing hip and knee arthroplasty discontinued opioid use after 90 days postoperatively [7]. Future studies with long-term follow-up would be necessary to determine the impact of these policies on prolonged opioid use following THA or TKA. We included patients who discharged to locations other than home such as rehab or skilled nursing facility, which introduces potential variation in opioid prescribing. In addition, our study design does not allow analysis of whether patients consumed every pill prescribed to them. However, with smaller prescriptions, these errors theoretically would be minimized, and the same limitation was applied across all groups. We also included only primary unilateral THA or TKA, which may limit the application of the data to conversion and revision arthroplasty, or arthroplasty performed for fracture. However, Deen et al previously reported on the dramatic halo effect of institutional opioid mitigation strategies on revision arthroplasty patients [9]. Lastly, over the course of the study, we significantly increased our proportion of outpatient arthroplasty procedures and shifted more patients to the "opioid-sparing" or "narcotic-naïve" pathways. As a result, outpatient prescriptions might be confounded by the simultaneous flux in site of care and the effect of institutional norms.

Similarly, there was a third mandate that was implemented in July of 2020, which occurred midway through the third patient group. This required counseling on risks of opioid medications and provide information on non-opioid alternatives. As these discussions were already the standard of care for our division, this mandate was not specifically incorporated into our data collection. However, the authors acknowledge that this may have raised awareness among patients at large, creating a bias away from

opioids that may have impacted their utilization. Future studies comparing opioid prescription data before and after this most recent mandate are needed to quantify the effect of prescriber counseling.

## Conclusions

Legislative changes to limit opioid utilization have effectively reduced average MMEs per procedure following THA and TKA in the state of Florida. To our knowledge, this is the first study to sequentially compare prescribing practices for patients undergoing total joint arthroplasty before and after the implementation of a series of staged, statewide regulatory mandates. We reported a significant reduction in opioid prescriptions after the implementation of both prescription limits and mandatory electronic prescribing. Moreover, we demonstrated a significant increase in ambulatory surgical patients without significant increases in opioid prescription refills, confuting the theory that outpatient surgery will require more narcotic medication. Surgeons should be conscientious of the impacts of both legislative and surgical practices on opioid prescribing habits.

## Conflicts of interest

H.K.P. receives research support from Osteal Therapeutics and is in the editorial or governing board of *Journal of Arthroplasty*, *Arthroplasty Today*, and *Operative Techniques in Orthopaedics*. C.F.G. is a paid consultant for Smith & Nephew Orthopaedics and is an AAOS committee member. for OrthoDevelopment, is a reviewer for the *Journal of Arthroplasty*; is in the Board of Directors of the Florida Orthopaedic Society, and is a vice chair, quality measures committee, the American Association of Hip and Knee Surgeons. H.A.P. is a paid consultant or Smith & Nephew, receives research support from Zimmer Biomet, Inc; is a reviewer for the *Journal of Arthroplasty, the Journal of Knee Surgery, and Arthroplasty Today*; and is in the Board of Directors of the Florida Orthopaedic Society. All other authors have nothing to disclose.

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