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Collaborative Creation of Regional Opioid-Prescribing Guidelines in Orthopaedics

Description of a Process, Measurement of Its Effectiveness, and Impact on Patient Satisfaction at a Participating Institution

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Background: Interventions designed to decrease opioid prescribing in orthopaedics have been effective when employed by specific institutions, subspecialties, and procedures. The objectives of this study were to examine the effectiveness of developing regional guidelines on opioid-prescribing practices after common orthopaedic surgical procedures, to determine whether compliance with the guidelines varied by procedure, and to measure the effect of the guidelines on patient satisfaction. All objectives were assessed at 1 participating institution.

Methods: In February 2018, 53 orthopaedic surgeons representing 8 practices in Western New York attended a summit meeting to collaboratively create regional opioid-prescribing guidelines for 70 common orthopaedic procedures; these guidelines were later distributed electronically to all orthopaedists in Western New York. We retrospectively examined opioid-prescribing practices for adults undergoing an orthopaedic surgical procedure performed by 1 large practice in October 2017, 4 months before the summit meeting (776 patients), and in July 2018, 5 months after the summit meeting (653 patients). The number of opioid pills prescribed postoperatively and patient satisfaction were compared before and after the summit meeting using t tests.

Results: The overall mean number of opioid pills (and standard deviation) prescribed postoperatively decreased from 69.5 ± 45.5 pills before the summit to 43.3 ± 28.0 pills after the summit ($p < 0.0001$). Sports medicine surgeons reduced the number of pills prescribed for anterior cruciate ligament reconstruction, arthroscopic rotator cuff repair, knee arthroscopy with meniscectomy, and shoulder arthroscopy with decompression; and adult reconstruction surgeons reduced the number of pills prescribed for total hip and knee arthroplasty. There was no change in the number of pills prescribed for lumbar spine fusion or implant removal. Satisfaction with the provider did not differ from before to after the summit; 75% of patients in the pre-summit group and 76% of patients in the post-summit group reported receiving excellent service ($p = 0.62$).

Conclusions: The creation of regional opioid-prescribing guidelines in a collaborative fashion was assessed at 1 participating institution and was found to be effective at reducing the number of opioid pills prescribed by the orthopaedic surgeons participating in the project without affecting patient satisfaction, but adherence to the guidelines varied by procedure.

Opioid analgesics are commonly prescribed for pain management; however, diversion and improper use have contributed to a U.S. epidemic of opioid-related deaths, suicide, and addiction[1-3]. Orthopaedic surgeons provide approximately 7% of all opioid prescriptions in the United States, making them the third highest prescribers of opioids[4]. Furthermore, at least 30% of opioids prescribed after upper-extremity surgical procedures and spinal fusion are unused, according to recent research[5-8]. Approximately 8% of patients undergoing an ambulatory orthopaedic surgical procedure are at risk for prolonged opioid use, defined as ≥1 opioid prescription filled within 91 to 180 days after the surgical procedure[9]. Risk factors for prolonged opioid use include female sex, opioid use before the surgical procedure, mental health

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conditions, substance dependence and abuse, and preexisting pain disorders[9-11].

Despite the known misuse and abuse of opioids, standard guidelines for prescribing are lacking. In 2015, the American Academy of Orthopaedic Surgeons (AAOS) released a statement urging individual practices to establish standard prescribing practices, and the AAOS advocated for restrictive opioid prescribing for preoperative and nonsurgical patients[12]. Surgeons are faced with the quandary of balancing sufficient pain control without overprescribing opioids[9]. Surgeons may be reluctant to decrease opioid prescribing because of the concern that patient satisfaction or surgeon ratings may be impacted, although studies in general surgery and hand surgery have shown that reducing opioid prescribing does not have an effect on patient satisfaction following a surgical procedure[13,14]. Several studies have shown marked reductions in opioid prescribing following various interventions, including prescriber-driven interventions (e.g., institutional prescribing guidelines and/or education) and multimodal analgesia regimens aimed at reducing opioids, but all have involved a single institution and have focused only on specific subspecialties or limited procedures[14-19].

In response to the opioid epidemic, a large group of orthopaedic surgeons representing every major practice in Western New York and 7 orthopaedic subspecialties met in February 2018 to develop regional guidelines in a collaborative fashion for postoperative opioid prescribing for 70 common orthopaedic procedures. The primary aim of this study was to measure the effectiveness of that process in decreasing the initial number of opioid pills prescribed at 1 participating institution. The secondary aims were to determine whether compliance with the new prescribing guidelines varied by procedure and to measure the effect of the guidelines on patient satisfaction, both at 1 participating institution.

Materials and Methods

Development of Regional Prescribing Guidelines

A collaborative summit meeting was held on February 26, 2018, in Buffalo, New York, to create regional opioid-prescribing guidelines following orthopaedic surgery. Fifty-three physicians and 5 physician assistants representing 8 orthopaedic practices in the Western New York region (covering 4 cities and 17 counties) attended, and physicians from each orthopaedic subspecialty developed opioid-prescribing guidelines for procedures within their respective subspecialty. We used a consensus-based method to develop postoperative opioid-prescribing guidelines for 7 different orthopaedic subspecialties (spine, sports medicine, adult reconstruction, hand, trauma, shoulder and elbow, and foot and ankle). Consensus-based methodology involves gathering experts in a field to delineate a solution to a common problem based on the best available clinical evidence, as well as personal and clinical experience[20].

Before the summit meeting, we conducted an informal survey of physicians and physician assistants in Western New York with regard to opioid-prescribing and counseling habits for the most common procedures. Billing records and informal surveys were used to identify the 70 most common orthopaedic procedures performed. At the summit meeting, we discussed current practice as well as the available literature and, by consensus, chose a recommended number of opioids for each procedure. On March 31, 2018, the final guidelines were distributed by email to all orthopaedic surgeons in Western New York, regardless of whether they attended the summit meeting (Table I). Following the dissemination of the guidelines, no other efforts were made to encourage adherence.

Sample Selection

We conducted a retrospective chart review of orthopaedic surgical procedures performed 4 months before (October 2017) and 5 months after (July 2018) the opioid summit meeting on February 26, 2018. Choosing the fourth month before and the fifth month after the summit was arbitrary, with the belief that this was a sufficient window for capturing prescribing behavior before and after the summit. We included in the guidelines the 70 orthopaedic procedures performed by 28 surgeons at the largest orthopaedic practice in Western New York (Table I). Fifty percent of the surgeons at our practice attended the summit meeting, with representation from all 7 subspecialties; however, 100% of the surgeons received the guidelines. The number of surgeons in each subspecialty in this group is as follows: 5 sports medicine, 7 trauma, 4 adult reconstruction, 4 foot and ankle, 3 shoulder and elbow, 3 spine, and 2 hand. We selected patients based on the primary Current Procedural Terminology (CPT) code that was billed for and matched 1 of the 70 procedures. Inclusion criteria were met by 776 patients pre-summit and 653 patients post-summit. Due to the retrospective nature of this study, physicians were unaware that their prescribing habits would be evaluated.

Data Collection

Data were extracted from medical records by 3 trained research assistants in a standardized fashion. Demographic factors, including age at the time of the surgical procedure, body mass index, sex, and race, were collected. The frequency of patients who received an opioid prescription and the number of pills prescribed preoperatively and postoperatively were determined. We included prescriptions from outside providers based on patient reporting at the time of their visit, but were unable to gather data from our state's prescription drug monitoring program because their database only allows for queries within 1 year of logging into the system. Patient satisfaction was assessed via a voluntary email survey sent to patients within 1 week of the surgical procedure. The satisfaction survey was ranked on a 5-point scale in which 0 equaled not satisfied and 5 equaled very satisfied. Satisfaction with overall service received from the provider was categorized as poor, fair, good, very good, and excellent. Among those prescribed opioids postoperatively, the response rate for patient satisfaction was 17% (63 of 374 patients) in the pre-summit group and 31% (92 of 294 patients) in the post-summit group.

Statistical Analyses

Descriptive statistics were calculated for demographic characteristics, opioid prescribing done preoperatively and

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TABLE I Postoperative Opioid-Prescribing Guidelines from a Single Institution Stratified by Orthopaedic Procedure*

Procedure (CPT Code[s])	Final Recommendation *(no. of pills)*
Spine	
Lumbar discectomy without fusion (63030)	20
Lumbar fusion (22612, 22614, 22633, 22845, 22853)	40
Cervical discectomy and fusion - anterior (22551)	20
Scoliosis - adult (22804, 22840, 22844)	40
Lumbar laminectomy (63047, 63048)	20
Posterior cervical fusion (22595)	40
Reconstruction/revision thoracic/lumbar (22849)	40
Sports medicine	
ACL reconstruction (29888)	20
Arthroscopic RCR with or without biceps tenotomy or tenodesis (29827)	20
Arthroscopic distal clavicle excision (23120, 29824)	20
Arthroscopic labral repair (29807)	20
Open glenohumeral stabilization (23462)	20
Hip arthroscopy for femoroacetabular impingement with or without labral repair (29862, 29915, 29916)	15
Knee arthroscopy and meniscectomy (29880, 29881)	10
Shoulder arthroscopy with decompression (29826)	20
Distal biceps tendon repair (24342)	15
Patellar stabilization (27420, 27422)	20
Hip arthroscopy with debridement (29861, 29863, 29999)	15
High tibial osteotomy (27457)	40
Meniscus repair (27403, 29882)	15
Patellar/quadriceps tendon rupture (27380, 27381, 27385)	20
Clavicle ORIF (23515)	20
Adult reconstruction	
Total knee replacement (27447)	40
Revision total knee replacement (27486, 27487)	40
Unicompartmental knee replacement (27446)	40
Total hip arthroplasty (27130)	40
Revision total hip arthroplasty (27134)	40
Trauma	
ORIF ankle fracture (27766, 27792, 27814, 27822, 27823, 27829)	40
ORIF femoral neck fracture (27235)	40
Hemiarthroplasty for hip fracture (27236)	40
ORIF trochanteric fracture (27244, 27245)	40
Debridement of skin/muscle/bone/fracture (11011, 11012, 11042, 11043, 11044)	20
Tibial shaft fracture fixation (27536, 27758, 27759)	40
Femoral shaft fracture fixation (27506, 27507)	40
Humeral shaft fracture fixation (24515, 24516)	40
Radius/ulna shaft fracture fixation (24635, 24685, 25515, 25545, 25574, 25575)	20
Removal of hardware (20680)	20
Bone graft for nonunion (20902, 20930)	40
Hand	
Carpal tunnel release (64721)	0 to 10
Removal of support implant (20670)	10
Basal joint arthroplasty (25447)	20
Trigger finger release - single finger (26055)	10

continued

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TABLE I (*continued*)

Procedure (CPT Code[s])	Final Recommendation *(no. of pills)*
Wrist arthroscopy (29848, 29848.5)	20
Distal radius fracture fixation - pinning (25606)	16
Ulnar nerve transposition (64718)	20
Excision ganglion (25111)	10
ORIF metacarpal fracture (26615)	20
ORIF distal radius fracture (25607, 25608, 25609, 25612, 25613)	20
First Dupuytren's contracture (25000)	10
ORIF implant removal (20680)	10
Flexor tendon repair (26350)	20
Shoulder and elbow	
Total shoulder arthroplasty (23472)	40
Reverse total shoulder arthroplasty (23472R)	40
Mini-open RCR (23410)	20
Ulnar nerve transposition (64718)	20
Arthroscopic debridement and biceps tendon (23430, 29828)	20
ORIF (23615)	40
Distal biceps/triceps (24342)	15
Foot and ankle	
Achilles tendon repair (27650, 27654)	20
Bunionectomy (28296)	12
Ankle arthroscopy with debridement (29898)	20
Hammer toe correction (28285)	20
Hindfoot fusion (28715, 28725)	40
Midfoot fusion (28730, 28740)	20
Tenosynovectomy (27626, 27680)	10
Tendon transfer (27691)	20
Lateral ligament repair or reconstruction (27664, 27698)	20
Ankle arthrodesis (27820, 27870)	20
Total ankle arthroplasty (27702)	20
Excision Morton's neuroma (28080)	10

*RCR = rotator cuff repair and ORIF = open reduction and internal fixation.

postoperatively, and patient satisfaction scores. Pre-summit data were compared with post-summit data using the t test for continuous data and the chi-square or Fisher exact test for categorical data. The number of pills prescribed postoperatively and patient satisfaction scores were also stratified by surgical procedure and then were compared between pre-summit and post-summit. This exploratory analysis was only performed for surgical procedures that had a sample size of ≥10 within each group. Data analyses were performed with SAS version 9.4 (SAS Institute).

Results

Baseline Demographic Characteristics

There was no difference in age, body mass index, or sex between pre-summit and post-summit groups. There was a greater proportion of White patients pre-summit (588 patients [75.8%]) compared with post-summit (413 patients [63.2%]) (p = 0.03) (Table II).

Opioid Prescribing and Patient Satisfaction Overall

As shown in Table III, a minority of patients received an opioid prescription before the surgical procedure both pre-summit (89 [11.5%]) and post-summit (43 [6.6%]) (p = 0.05). In patients receiving an opioid prescription before the surgical procedure, the number of pills prescribed was reduced significantly (p = 0.005) from pre-summit (74 pills) to post-summit (46 pills). There was no overall difference (p = 0.23) in the percentage of patients who received an opioid prescription after the surgical procedure in the pre-summit group (374 [48.2%]) compared with the post-summit group (294 [45.0%]). However, there was a reduction in the number

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TABLE II Demographic Data by Study Group

	Pre-Summit (N = 776)	Post-Summit (N = 653)	P Value
Age* *(yr)*	56.76 ± 15.80	56.70 ± 16.70	0.95
Body mass index*† *(kg/m²)*	30.38 ± 6.96	30.40 ± 7.63	0.98
Sex†			0.24
Male	377 (48.6%)	297 (45.5%)	
Female	399 (51.4%)	356 (54.5%)	
Race‡			0.03
White	588 (75.8%)	413 (63.2%)	
Black	48 (6.2%)	52 (8.0%)	
Other	10 (1.3%)	7 (1.1%)	
American, Indian/Alaskan, Native	5 (0.64%)	0 (0%)	
Asian	2 (0.26%)	1 (0.2%)	
Asian Indian	1 (0.13%)	0 (0%)	
Declined to answer or unknown	5 (0.64%)	4 (0.6%)	
Multiple races	2 (0.26%)	0 (0%)	
Missing	115 (14.8%)	176 (27.0%)	

*The values are given as the mean and the standard deviation. †Of the body mass index data, 14% were missing pre-summit and 34% were missing post-summit. ‡The values are given as the number of patients, with the percentage in parentheses.

of pills prescribed after the surgical procedure from pre-summit (69.5 pills) to post-summit (43 pills) ($p < 0.0001$). There was no overall difference in satisfaction-with-provider scores (4.74 compared with 4.67; $p = 0.32$) and no difference in the number of patients who rated service from their provider as excellent (47 [74.6%] compared with 70 [76.1%]; $p = 0.62$) (Table IV).

Postoperative Opioid Prescribing and Patient Satisfaction by Subspecialty and Orthopaedic Procedure

The number of pills prescribed postoperatively (Table V) and patient satisfaction scores (Table VI) were stratified by surgical procedures that had sufficient data, and the results of this exploratory analysis are summarized below. Although 6 of 8 procedures showed a significant and clinically important decrease in the number of pills prescribed, none of these procedures reached the mean recommended number of pills prescribed in the guidelines.

Spine

There was no difference in the number of pills prescribed postoperatively (93 compared with 82; $p = 0.37$) and no difference in satisfaction with provider from pre-summit to post-summit for lumbar fusion.

TABLE III Opioid Prescriptions Before and After Surgery by Study Group

	Pre-Summit (N = 776)	Post-Summit (N = 653)	P Value
Prescription received before surgery*			0.05
Yes	89 (11.5%)	43 (6.6%)	
No	686 (88.4%)	486 (74.4%)	
Missing	1 (0.13%)	124 (19.0%)	
No. of pills prescribed before surgery†	74.25 ± 56.50	46.00 ± 43.47	0.005
Prescription received after surgery*			0.23
Yes	374 (48.2%)	294 (45.0%)	
No	402 (51.8%)	359 (55.0%)	
No. of pills prescribed after surgery†	69.47 ± 45.53	43.32 ± 27.97	<0.0001

*The values are given as the number of patients, with the percentage in parentheses. †The values are given as the mean and the standard deviation.

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TABLE IV Patient Satisfaction by Group Among Patients Who Were Prescribed Opioids After Surgery

Patient Satisfaction Question	Pre-Summit* (N = 63)	Post-Summit† (N = 92)	P Value
Satisfaction-with-provider score‡	4.74 ± 0.39	4.67 ± 0.45	0.32
Satisfaction with overall service you received from your provider§			0.62
Excellent	47 (74.6%)	70 (76.1%)	
Very good	13 (20.6%)	14 (15.2%)	
Good	3 (4.8%)	7 (7.6%)	
Fair	0 (0%)	1 (1.1%)	
Poor	0 (0%)	0 (0%)	
Overall experience score‡	4.84 ± 0.41	4.68 ± 0.57	0.05

*In this group, 374 surveys were sent and 63 patients completed the surveys. †In this group, 294 surveys were sent and 92 patients completed the surveys. ‡The values are given as the mean and the standard deviation. §The values are given as the number of patients, with the percentage in parentheses.

Sports Medicine

The number of pills prescribed postoperatively was reduced from pre-summit to post-summit for anterior cruciate ligament (ACL) reconstruction (55 compared with 30; $p = 0.01$), arthroscopic rotator cuff repair with or without biceps tenotomy or tenodesis (54 compared with 31; $p = 0.001$), knee arthroscopy and meniscectomy (41 compared with 19; $p < 0.0001$), and shoulder arthroscopy with decompression (54 compared with 38; $p = 0.02$). However, there was no difference in satisfaction-with-provider scores between pre-summit and post-summit for any of these procedures.

Adult Reconstruction

The number of pills prescribed postoperatively was reduced from pre-summit to post-summit for total knee arthroplasty (109 compared with 48; $p < 0.0001$) and total hip arthroplasty (98 compared with 42; $p = 0.0003$). However, there was no difference in patient satisfaction scores for either procedure.

TABLE V Opioid Pills Prescribed in the First Prescription After the Surgery by Group and Surgical Procedure*

Procedure (CPT Code[s])	Recommended No. of Pills	Actual No. of Pills Prescribed in First Prescription: Pre-Summit No. of Procedures	Pre-Summit No. of Pills†	Post-Summit No. of Procedures	Post-Summit No. of Pills†	P Value
Spine						
Lumbar fusion (22612, 22614, 22633, 22845, 22853)	40	16	92.81 ± 38.81	15	81.87 ± 27.36	0.37
Sports medicine						
ACL reconstruction (29888)	20	23	54.52 ± 36.15	10	30.00 ± 12.47	0.01
Arthroscopic RCR with or without biceps tenotomy or tenodesis (29827)	20	29	54.34 ± 32.38	29	30.69 ± 15.71	0.001
Knee arthroscopy and meniscectomy (29880, 29881)	10	41	41.24 ± 16.88	28	18.57 ± 9.55	<0.0001
Shoulder arthroscopy with decompression (29826)	20	23	54.26 ± 26.83	12	37.92 ± 11.51	0.02
Adult reconstruction						
Total knee replacement (27447)	40	42	108.93 ± 72.11	27	48.44 ± 10.01	<0.0001
Total hip arthroplasty (27130)	40	23	97.61 ± 60.41	19	42.47 ± 13.39	0.0003
Trauma						
Removal of hardware (20680)	20	22	55.82 ± 28.27	11	57.73 ± 26.10	0.85

*RCR = rotator cuff repair. †The values are given as the mean and the standard deviation.

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TABLE VI Satisfaction-with-Provider Scores by Group and Surgical Procedure*

Procedure (CPT Code[s])	Recommended No. of Pills	Satisfaction-with-Provider Scores				P Value
		Pre-Summit		Post-Summit		
		No. of Procedures	Score†	No. of Procedures	Score†	
Spine						
Lumbar fusion (22612, 22614, 22633, 22845, 22853)	40	4	4.68 ± 0.47	5	4.74 ± 0.58	0.86
Sports medicine						
ACL reconstruction (29888)	20	4	4.60 ± 0.46	6	4.73 ± 0.41	0.65
Arthroscopic RCR with or without biceps tenotomy or tenodesis (29827)	20	7	4.96 ± 0.11	7	4.74 ± 0.50	0.30
Knee arthroscopy and meniscectomy (29880, 29881)	10	5	4.84 ± 0.36	12	4.64 ± 0.46	0.41
Shoulder arthroscopy with decompression (29826)	20	3	4.57 ± 0.51	4	4.93 ± 0.15	0.23
Adult reconstruction						
Total knee replacement (27447)	40	5	4.78 ± 0.35	6	4.83 ± 0.26	0.78
Total hip arthroplasty (27130)	40	5	5.00 ± 0.00	5	4.62 ± 0.40	0.10
Trauma						
Removal of hardware (20680)	20	1	4.00 ± NC	3	4.67 ± 0.29	NC

*RCR = rotator cuff repair and NC = not calculable. †The values are given as the mean and the standard deviation.

Trauma

There was no difference in the number of pills prescribed postoperatively for implant removal (56 compared with 58; p = 0.85). There were insufficient data for calculating the group comparison for patient satisfaction.

Discussion

We found that a collaborative process to establish regional opioid-prescribing guidelines was an effective measure to decrease the overall number of opioid pills prescribed following orthopaedic procedures at a participating institution, although adherence to the guidelines was not achieved for the individual procedures analyzed. We found that patient satisfaction with their provider was not affected by reduced opioid prescribing. To our knowledge, this is the first study to show the effectiveness of a physician-led collaborative regional approach (albeit as measured at a single participating institution) and can serve as a model for regional approaches to reduce opioid prescribing for all orthopaedic subspecialties. It is interesting to note that the number of opioid-related deaths in the region of our study fell slightly from 3.9 deaths per 100,000 population in the last 6 months of 2017 to 3.0 deaths per 100,000 population in the last 6 months of 2018[21].

Multiple studies have shown that prescriber-driven interventions (e.g., institutional prescribing guidelines and increased prescribing awareness initiatives) can markedly reduce opioid prescribing at the institutional and small group level[15-19,22-27]. Prescribing guidelines plus patient education or consultation with a pharmacist have also been shown to reduce opioid prescribing[14,28-31]. A large hospital created institutional guidelines for opioid prescribing and found a significant decrease in pills and oral morphine equivalents after guideline dissemination for hand and sports procedures but not for foot and ankle procedures[16]. In contrast, our study examined all of the adult orthopaedic subspecialties including both outpatient and inpatient procedures, making the results more generalizable. We performed an exploratory analysis for each procedure with sufficient sample sizes and found a significant reduction in opioid prescribing for sports medicine, shoulder, and adult reconstructive procedures.

We have identified that there is an opportunity to further educate and improve compliance with our prescribing guidelines for the procedures examined in this study. Choo et al. demonstrated a procedure for successfully educating prescribers about their own and their peers' prescribing habits[22]. In the study by Choo et al., de-identified reports were sent to orthopaedic providers every 2 months presenting them with the median discharge oral morphine equivalents per patient, leading to a decrease in postoperative opioid prescribing. Further work will go into identifying why adherence was not ultimately reached among the subspecialties and procedures in our study.

Hartford et al. found that opioid use decreased and patient satisfaction increased following implementation of a new standardized pain care bundle to reduce opioid prescribing after outpatient general surgery[32]. Louie et al. surveyed provider satisfaction before and after implementation of an education initiative that resulted in decreased postoperative opioid prescribing, but there was no change in provider satisfaction following general surgery[13]. Also, Dwyer et al. found no

difference in satisfaction with pain control after reduced opioid prescribing following hand surgery[14]. Our study shows that reducing opioid prescribing does not impact patient satisfaction across a wide range of orthopaedic procedures.

Our analysis revealed that fewer patients received opioid prescriptions preoperatively after the summit (6.6%) compared with before the summit (11.5%). This may be a secondary effect of the summit as appropriate opioid prescribing was emphasized. This is desirable because preoperative opioid use is associated with higher complication rates, more postoperative narcotics, and lower satisfaction rates with poorer outcomes following a surgical procedure[33]. However, these results should be interpreted cautiously because preoperative opioid data may have been underreported and less accurate as prescribing outside our practice (e.g., by a general practitioner) was based on self-reporting.

This study was not without limitations. Data were collected from the single largest orthopaedic group in Western New York, which may have limited the generalizability of the results; however, this group serves a large region of Western New York, covering 4 cities and 17 counties. We also do not know how adherence to the guidelines directly affected pain because pain scores were not measured in this study. Prescribing data for patients undergoing inpatient procedures may have been underreported because we did not track length of stay and inpatients may have received a higher amount of overall postoperative opioid medication. Also, prescribing data from outside providers may not have been complete because we relied on patient recall. Although New York State has an electronic prescription drug monitoring program designed to decrease "doctor shopping" for narcotic prescriptions, we were not able to obtain retrospective data for the time period of our study from our state's program because the database only allows for queries within 1 year of logging into the system. However, we did audit a recent series of patients to investigate the possible effect of doctor shopping. Fifty-three patients (11 who underwent ACL reconstruction, 11 who underwent rotator cuff repair, 11 who underwent total hip arthroplasty, 10 who underwent meniscectomy, and 10 who underwent total knee arthroplasty) randomly selected from billing records for surgical procedures performed in 2020 were audited to determine whether the consensus recommendations were leading to refill prescriptions being filled by outside providers. Fifty-two of these patients were prescribed no more than 2 pills over the consensus recommendations (1 patient who underwent total knee arthroplasty received 56 pills). Three patients received an additional narcotic prescription within a year of the surgical procedure: 1 patient undergoing a rotator cuff repair received an opioid refill from the surgeon, 1 patient who underwent a rotator cuff repair received 60 tablets of a different narcotic 75 days after the surgical procedure, and 1 patient who underwent ACL reconstruction received 12 narcotic pills from the dentist 7 weeks after the surgical procedure. The 2 "late" refills were considered unrelated to the orthopaedic procedure. We were only able to stratify opioid-prescribing and patient satisfaction data for 8 of the 70 different surgical procedures with sufficient sample sizes for analysis, and, because of the small numbers, this exploratory analysis should be interpreted with caution. We only assessed opioid prescribing and not any other forms of pain management (i.e., patient education, non-opioid medications), which may have confounded our results.

The 5-month interval between the summit and data collection should have been sufficient to distinguish between surgeons who had made sustained changes and those who later reverted to prior prescribing habits or had not adopted them at all. The surgeons were not aware that their prescribing habits were being analyzed. Longer follow-up could show if the impact of the summit extinguishes after a period of time. Causality could not be determined because providers may have changed their prescribing habits over time based on other factors unrelated to the guidelines such as increased media exposure regarding the ill effects of overprescribing narcotics. Most patients completed a patient satisfaction survey within 1 to 2 weeks after the surgical procedure, but some forms were completed later. This could potentially have led to bias because satisfaction may have varied on the basis of the patient's recovery stage. Also, we queried patients about how satisfied they were with their provider and overall experience in the clinic but did not query specifically about satisfaction with pain management. Patient satisfaction surveys were emailed to patients and were completed voluntarily, which led to a high percentage of missing data. However, our response rate is similar to previous research, which has found a 30% response rate to be reasonable for patient satisfaction surveys[34,35].

In conclusion, creating regional opioid-prescribing guidelines in a collaborative fashion via a 1-time summit meeting was effective at reducing the overall number of opioid pills prescribed by the orthopaedic surgeons participating in the project, although strict adherence to the guidelines was not achieved for the analyzed procedures. Patient satisfaction was not affected by the reduction in opioids. ■

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