

Opioid-Reducing Multimodal Pain Management Following Total Knee Arthroplasty (TKA)

Leland Van Deventer¹, Peter Yager, Matthew James Bennett, Claudia Leonardi, Amy Bronstone², Vinod Dasa³
¹Louisiana State University Health Sciences Center New Orleans, ²Louisiana State University Health Sciences Center,
³LSU Health Sciences Center

INTRODUCTION:

Multimodal analgesia, which targets numerous pain pathways, is now the standard of care to reduce opioid consumption while controlling pain after TKA. The purpose of this retrospective cohort study was to compare opioid use, among patients that all received a multimodal analgesia protocol aimed at significantly reducing postoperative opioid use, during the first 12 weeks following TKA between patients that either automatically received an opioid prescription at time of discharge or were only provided an opioid prescription upon the patient's request following discharge.

METHODS:

A single orthopedic surgeon performed 144 consecutive unilateral primary TKAs first using an automatic discharge opioid prescription (n=72) and subsequently an opioid prescription only after requesting it from the attending physician (n=72). In all cases, the multimodal analgesia protocol consisted of preoperative cryoneurolysis, perioperative pregabalin, celecoxib, acetaminophen, neuraxial (spinal) anesthesia, regional peripheral nerve blocks, and intraoperative periarticular infiltration of 0.25% bupivacaine hydrochloride.

Variables included Knee Injury and Osteoarthritis Outcome Score (KOOS) and the patient-reported outcomes measurement information system (PROMIS) pain intensity and pain interference scales assessed at 2 and 12 weeks, opioid naïve (no opioid prescriptions in 3 months before TKA) versus opioid experienced (≥1 opioid prescription in 3 months before TKA) status, number of initial and refill opioid prescriptions written 12 weeks after TKA, morphine milligram equivalents (MME) per prescription MME and total MME 12 weeks after TKA, and provider who wrote the opioid prescription. Opioid data were obtained from a statewide prescription monitoring program.

RESULTS:

Demographics (except age and insurance type) and preoperative KOOS/PROMIS scores were similar between groups. Requiring patients to request an opioid prescription upon after TKA discharge was associated with a lower percentage of patients receiving ≥1 initial opioid prescription (44.4% vs 95.8%, p<0.0001) and ≥1 refill opioid prescription (25.0% vs 43.1%, p=0.022) without negatively affecting KOOS/PROMIS scores at 2 and 12 weeks.

DISCUSSION AND CONCLUSION:

Requiring patients to request opioid prescriptions after TKA discharge was associated with significantly lower opioid prescribing without increasing self-reported pain 12 weeks after TKA compared with automatic opioid prescribing.

Figure 1: Number of patients who (1) filled opioid prescriptions, (2) used opioids for 30 days, and (3) were opioid naïve in 30 days prior to TKA, stratified by a provider (dark grey) and non-provider (light grey) of the outpatients area written the automatic and the Opioid Request prescription or discharge groups.

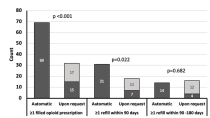


Table 1: Patient Baseline Demographics and Clinical Characteristics.

Characteristic	Automatic	Opioid Request	P value
Sex, % (n)	33 (28)	27 (23)	0.468
Male	66 (49)	73 (27)	
Female	27 (27)	27 (27)	0.257
Race or Ethnicity	27 (27)	27 (27)	
White or Caucasian	24 (24)	24 (24)	
Other	3 (3)	3 (3)	0.004
Insurance type, % (n)	36 (27)	41 (31)	0.004
Private	18 (13)	8 (7)	
Medicaid	15 (10)	22 (16)	
Medicare Advantage	12 (8)	22 (16)	
Other	1 (1)	4 (3)	0.137
KOOS - Pain sub-score (n)	76 (55)	64 (46)	0.739
1	4 (3)	4 (3)	
2	10 (7)	11 (8)	
3	16 (11)	17 (12)	
4	13 (9)	16 (11)	
5	34 (24)	39 (28)	0.257
6	14 (10)	18 (13)	
7	16 (11)	18 (13)	
8	12 (8)	13 (9)	
9	12 (8)	12 (8)	
10	11 (7)	12 (8)	
11	8 (5)	9 (6)	
12	5 (3)	6 (4)	
13	1 (0.7)	1 (0.7)	
14	1 (0.7)	1 (0.7)	0.004
15	1 (0.7)	1 (0.7)	
16	0 (0)	0 (0)	
17	0 (0)	0 (0)	
18	0 (0)	0 (0)	
19	0 (0)	0 (0)	
20	0 (0)	0 (0)	0.001
21	0 (0)	0 (0)	
22	0 (0)	0 (0)	
23	0 (0)	0 (0)	
24	0 (0)	0 (0)	
25	0 (0)	0 (0)	
26	0 (0)	0 (0)	
27	0 (0)	0 (0)	
28	0 (0)	0 (0)	
29	0 (0)	0 (0)	
30	0 (0)	0 (0)	
31	0 (0)	0 (0)	
32	0 (0)	0 (0)	
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140	0 (0)	0 (0)	
141	0 (0)	0 (0)	
142	0 (0)	0 (0)	
143	0 (0)	0 (0)	
144	0 (0)	0 (0)	

Table 2: Opioid-related Outcomes at 12 Weeks After TKA.

Characteristic	Automatic	Opioid Request	P value
% of patients receiving ≥1 initial opioid prescription	95.8 (70)	44.4 (32)	<0.0001
% of patients receiving ≥1 refill opioid prescription	43.1 (31)	25.0 (18)	0.022
% of patients who were opioid naïve in 30 days prior to TKA	4.2 (3)	55.6 (40)	<0.0001
Total MME in 12 weeks	102 (74)	189 (139)	0.0001
% of patients receiving ≥1 opioid prescription	95.8 (70)	44.4 (32)	<0.0001
% of patients receiving ≥1 refill opioid prescription	43.1 (31)	25.0 (18)	0.022
% of patients who were opioid naïve in 30 days prior to TKA	4.2 (3)	55.6 (40)	<0.0001
Total MME in 30 days	22 (16)	42 (30)	0.0001
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% of patients who were opioid naïve in 30 days prior to TKA	4.2 (3)	55.6 (40)	<0.0001
Total MME in 12 weeks	102 (74)	189 (139)	0.0001
% of patients receiving ≥1 opioid prescription	95.8 (70)	44.4 (32)	<0.0001
% of patients receiving ≥1 refill opioid prescription	43.1 (31)	25.0 (18)	0.022
% of patients who were opioid naïve in 30 days prior to TKA	4.2 (3)	55.6 (40)	<0.0001
Total MME in 30 days	22 (16)	42 (30)	0.0001

Table 3: Patient-reported Outcomes at 12 Weeks After TKA.

Characteristic	Automatic	Opioid Request	P value
KOOS Pain	66.7 (51)	67.7 (50)	0.712
KOOS Function	60.9 (46)	61.4 (45)	0.896
KOOS Symptoms	48.4 (36)	48.4 (36)	0.939
KOOS Quality of Life	59.3 (45)	59.3 (45)	0.935
PROMIS-28	58.0 (44)	58.0 (44)	0.982
2 weeks	58.0 (44)	58.0 (44)	0.982
12 weeks	58.0 (44)	58.0 (44)	0.982

Table 4: Patient-reported Outcomes at 2 and 12 Weeks After TKA.

Characteristic	Automatic	Opioid Request	P value
KOOS Pain	66.7 (51)	67.7 (50)	0.712
KOOS Function	60.9 (46)	61.4 (45)	0.896
KOOS Symptoms	48.4 (36)	48.4 (36)	0.939
KOOS Quality of Life	59.3 (45)	59.3 (45)	0.935
PROMIS-28	58.0 (44)	58.0 (44)	0.982
2 weeks	58.0 (44)	58.0 (44)	0.982
12 weeks	58.0 (44)	58.0 (44)	0.982

Table 5: Patient-reported Outcomes at 2 and 12 Weeks After TKA.

Characteristic	Automatic	Opioid Request	P value
KOOS Pain	66.7 (51)	67.7 (50)	0.712
KOOS Function	60.9 (46)	61.4 (45)	0.896
KOOS Symptoms	48.4 (36)	48.4 (36)	0.939
KOOS Quality of Life	59.3 (45)	59.3 (45)	0.935
PROMIS-28	58.0 (44)	58.0 (44)	0.982
2 weeks	58.0 (44)	58.0 (44)	0.982
12 weeks	58.0 (44)	58.0 (44)	0.982

AAC = activation of daily drug; KOOS = Knee Injury and Osteoarthritis Outcome Score; PROMIS = Patient-Reported Outcomes Measurement Information System; QOL = quality of life; TKA = total knee arthroplasty.