

How Low Can We Go? A Randomized Controlled Trial of Low-quantity Initial Opioid Prescriptions for Shoulder Surgery

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INTRODUCTION: Orthopaedic surgeons are the third most frequent prescribers of opioid medications. Given the current opioid addiction crisis, it is critical to limit opioid prescriptions to the lowest effective dose. In this study, we investigated how the initial opioid prescription after shoulder surgery affects maximum possible opioid consumption. We hypothesized that fewer pills in the initial opioid prescription would lead to less opioid consumption, fewer refill requests, and fewer post-surgery office contacts for pain.

METHODS: This randomized controlled clinical trial was approved by our IRB and included 74 adults who underwent shoulder arthroplasty, rotator cuff repair, or other arthroscopic shoulder procedures were enrolled from December 2020 to July 2022. Follow-up was completed by February 2023. Participants were randomly assigned to receive postoperative prescriptions of seven 5-mg oxycodone pills (n=20), 15 pills (n=29), or 23 pills (n=25). The primary outcome was maximum possible opioid consumption within 2 weeks after surgery, calculated by assuming consumption of all pills in the initial prescription, as well as any refills. Secondary outcomes were the opioid prescription refill request rates, post-surgery pain-related telephone calls or messages to the provider's office ("office contacts") within 2 weeks after surgery, and American Shoulder and Elbow Surgeons (ASES) pain scores at 2 weeks after surgery. Baseline characteristics did not differ significantly among groups except for mean age, which was younger in the 7-pill group (p=0.047).

RESULTS SECTION: Maximum possible opioid consumption increased with the number of pills prescribed, with means of 78 morphine milligram equivalents (MME) for the 7-pill group, 118 MME for the 15-pill group, and 199 MME for the 23-pill group (p<0.001). None of the secondary outcome measures differed significantly among groups. Refill request rates were 20% for the 7-pill group, 3.4% for the 15-pill group, and 12% for the 23-pill group (p=0.2). The proportions of patients with at least 1 office contact were 35% in the 7-pill group, 45% in the 15-pill group, and 28% in the 23-pill group (p=0.4). Mean ASES pain scores were 49 in the 7-pill group, 44 in the 15-pill group, 40 in the 23-pill group (p=0.2).

DISCUSSION: After shoulder surgery, an initial prescription of fewer opioid pills was associated with less maximum possible opioid consumption without an increase in the percentage of patients requesting opioid refills or contacting the provider's office for pain-related concerns. An initial postoperative prescription of seven 5-mg oxycodone pills may be sufficient for most patients.

CLINICAL SIGNIFICANCE: Opioid medications have a role in pain management. However, the opioid epidemic has demonstrated that there are clear drawbacks and that these medications should be prescribed judiciously. Here, we have shown that patient reported outcomes and administrative burden are not adversely affected by low-quantity initial opioid prescription following shoulder surgery.

Table I. Variables related to opioid consumption and refill requests 2 weeks after shoulder surgery, by number of initial opioid pills prescribed

Variable	All Patients (N=74)	7-Pill Group (n=20)	15-Pill Group (n=29)	23-Pill Group (n=25)	P*
	Mean ± SD				
Maximum possible opioid consumption, MME	134 ± 75	78 ± 58	118 ± 29	199 ± 78	<0.001
No. of pills prescribed in refill(s)	2 ± 8	3 ± 8	1 ± 4	3 ± 10	0.2
ASES pain score at 2 weeks	44 ± 16	49 ± 19	44 ± 13	40 ± 17	0.2
	N (%)				P*
Requested refill	8 (11)	4 (20)	1 (3.4)	3 (12)	0.2
Office contact [†]	27 (36)	7 (35)	13 (45)	7 (28)	0.4

[†]ASES, American Shoulder and Elbow Surgeons; MME, morphine milligram equivalents; SD, standard deviation.

*All models were adjusted for age, sex, race, body mass index value, surgery side, and surgery type.

[†]Whether the participant contacted the provider's office for pain-related concern within 2 weeks after surgery.

Table II. Report adjusted analysis results for all outcomes within 2 weeks

Treatment Group	Outcome*							
	Maximum Possible Opioid Consumption, MME		Requested Refill		Office Contact		ASES Pain Score	
	Coefficient (95% CI)	P	OR (95% CI)	P	OR (95% CI)	P	Coefficient (95% CI)	P
15 Pills	48 (13, 82)	0.007	0.1 (0.01, 1.7)	0.11	1.4 (0.3, 5.8)	0.65	-6.2 (-16, 3.9)	0.22
23 Pills	131 (95, 167)	<0.001	0.7 (0.1, 4.9)	0.67	0.7 (0.2, 3.5)	0.72	-13 (-23, -2.4)	0.02

[†]ASES, American Shoulder and Elbow Surgeons; CI, confidence interval; MME, morphine milligram equivalents; OR, odds ratio.

*All outcomes adjusted for age, sex, BMI, race, laterality and surgery type.

There are three treatment arms in the exposure variable with the 7-Pill treatment arm as the reference group.

Figure I. Of 74 participants who underwent shoulder surgery, 8 requested refills after the initial postoperative prescription. The percentage of participants requesting refills did not differ according to whether the initial prescription was for 7, 15, or 23 pills (p= 0.2).

