

Acute Opioid Strength Increases Chronic Opioid Use in Joint Arthroplasty

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INTRODUCTION:

Opioids are commonly prescribed medications with varying strengths. With opioid overdose and addiction rising in the United States, analyses could identify opioid strength impact during recovery. This study aims to identify postoperative 30-day Morphine Milligram Equivalents (MMEs), the strongest prescribed 30-day postoperative opioid, and observe recovery impact.

METHODS: 2,607 joint arthroplasty patients (hip = 1,063; knee = 1,544) from seven physicians in 2018-2020 had surgical details (surgery, date), and opioid information collected (medication, date filled, quantity, refills). Patients were grouped by joint and analyzed through two modes: 30-day postoperative daily MMEs (0 MME, 1-20 MME, 20-50 MME, 50+ MME) and strongest opioid prescribed (None, Tramadol, Hydrocodone). A custom opioid use survey collected information whereby a patient selected “Yes” or “No” to the question “Are you currently taking opiates for pain related to your surgery (Norco/Hydrocodone/Codeine)?” at 6 weeks, 6 months, and 1-year postoperatively.

RESULTS: Any 30-day acute postoperative daily MMEs impacted 6-week opioid use in hips (Table 1) and knees (Table 2) compared to 0 daily MMEs ($P < .001$). Tramadol did not significantly increase 6-week, 6 month, or 1-year postoperative opioid use for either joint ($P = .204$). Hydrocodone use increased 6-week postoperative use for both joints ($P < .001$), 6 months for knees ($P = .032$), and 1 year for hips ($P = .043$).

DISCUSSION AND CONCLUSION: All MME cohorts had significant subacute opioid use, but all groups had insignificant chronic use. Acute postoperative opioid strength is correlated with chronic opioid use for both hip and knee arthroplasty procedures. Given the CDC recommended MME conversion factor for tramadol (.2), and hydrocodone (1.0), additional research is warranted to confirm what opioid strength range has a significant impact on chronic opioid use.

Table 1. Hip Patient HOOS JR and VR-12 Results by 30-Day MME

Survey	Time	0 MME	1-20 MME	20-50 MME	50+ MME	P - Value
HOOS JR	Preop	48.3 ± 16.3 (n = 795)	46.5 ± 16.6 (n = 144)	47.1 ± 18.3 (n = 66)	39.1 ± 18.0 (n = 20)	.056
	6 Weeks	77.6 ± 12.6 (n = 628)	71.7 ± 14.5 (n = 111)	73.2 ± 14.4 (n = 56)	74.0 ± 16.8 (n = 13)	<.001
	6 Months	83.9 ± 15.1 (n = 417)	78.0 ± 17.4 (n = 64)	80.3 ± 15.3 (n = 30)	78.3 ± 18.9 (n = 17)	.025
	1 Year	84.9 ± 15.9 (n = 447)	81.7 ± 14.5 (n = 71)	84.0 ± 16.3 (n = 40)	84.0 ± 14.1 (n = 13)	.349
VR-12 MCS	Preop	52.5 ± 11.5 (n = 783)	50.7 ± 12.6 (n = 132)	51.3 ± 10.7 (n = 65)	50.4 ± 13.1 (n = 19)	.355
	6 Weeks	55.1 ± 8.7 (n = 679)	52.0 ± 10.8 (n = 118)	53.5 ± 10.8 (n = 59)	50.4 ± 13.3 (n = 15)	.004
	6 Months	55.3 ± 8.2 (n = 415)	52.2 ± 11.8 (n = 61)	57.1 ± 8.0 (n = 30)	54.9 ± 8.1 (n = 16)	.041
	1 Year	54.6 ± 9.1 (n = 443)	52.8 ± 10.8 (n = 73)	56.2 ± 9.2 (n = 40)	53.8 ± 13.2 (n = 12)	.248
VR-12 PCS	Preop	30.4 ± 9.6 (n = 783)	29.2 ± 9.1 (n = 132)	29.4 ± 10.4 (n = 65)	28.9 ± 12.0 (n = 19)	.557
	6 Weeks	39.9 ± 8.7 (n = 679)	36.3 ± 10.1 (n = 118)	36.3 ± 10.9 (n = 59)	38.7 ± 10.6 (n = 15)	<.001
	6 Months	45.3 ± 10.2 (n = 415)	42.7 ± 9.86 (n = 61)	42.8 ± 11.1 (n = 30)	43.1 ± 10.2 (n = 16)	.244
	1 Year	46.0 ± 10.3 (n = 443)	42.6 ± 10.9 (n = 73)	44.2 ± 10.6 (n = 40)	44.2 ± 12.0 (n = 12)	.044

Table 2. Knee Patient KOOS JR and VR-12 Results by 30 Day MME

Survey	Time	0 MME	1-20 MME	20-50 MME	50+ MME	P - Value
KOOS JR	Preop	48.3 ± 14.8 (n = 977)	46.6 ± 14.7 (n = 278)	44.8 ± 15.3 (n = 177)	51.3 ± 12.6 (n = 63)	.014
	6 Weeks	67.7 ± 11.7 (n = 838)	62.3 ± 11.7 (n = 234)	62.7 ± 12.4 (n = 145)	63.6 ± 11.9 (n = 51)	<.001
	6 Months	75.1 ± 15.9 (n = 491)	72.7 ± 15.4 (n = 150)	68.0 ± 14.9 (n = 78)	74.9 ± 14.9 (n = 36)	.001
	1 Year	77.7 ± 15.8 (n = 557)	74.1 ± 14.5 (n = 153)	72.1 ± 16.7 (n = 95)	77.8 ± 18.3 (n = 29)	.007
VR-12 MCS	Preop	54.4 ± 10.3 (n = 960)	54.5 ± 10.0 (n = 272)	53.5 ± 10.8 (n = 175)	53.4 ± 10.0 (n = 63)	.724
	6 Weeks	54.4 ± 9.1 (n = 839)	51.1 ± 10.6 (n = 232)	52.0 ± 10.9 (n = 144)	49.4 ± 11.1 (n = 51)	<.001
	6 Months	56.2 ± 8.1 (n = 484)	54.4 ± 8.5 (n = 150)	53.2 ± 8.3 (n = 82)	53.7 ± 8.2 (n = 37)	.011
	1 Year	55.0 ± 9.0 (n = 545)	54.3 ± 9.5 (n = 153)	53.9 ± 10.0 (n = 96)	51.6 ± 11.5 (n = 29)	.195
VR-12 PCS	Preop	31.8 ± 9.6 (n = 960)	31.6 ± 9.7 (n = 272)	30.4 ± 9.2 (n = 175)	30.7 ± 11.1 (n = 63)	.251
	6 Weeks	38.1 ± 8.6 (n = 839)	35.5 ± 8.2 (n = 232)	34.2 ± 9.4 (n = 144)	35.1 ± 9.0 (n = 51)	<.001
	6 Months	44.5 ± 9.4 (n = 484)	43.1 ± 9.3 (n = 150)	40.7 ± 10.1 (n = 82)	41.7 ± 12.2 (n = 37)	.005
	1 Year	45.0 ± 9.6 (n = 545)	43.8 ± 9.5 (n = 153)	43.3 ± 9.8 (n = 96)	43.7 ± 11.3 (n = 29)	.352