

# Schedule II Narcotics are often Unnecessary for Pain Control in Patients with Pelvic or Acetabular Fractures

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**Objectives:** Determine if patients with pelvic and acetabular fractures require schedule II narcotics after discharge.

**Design:** Retrospective case series.

**Setting:** Level I Trauma Center

**Patients:** 124 consecutive patients with operatively managed pelvic (OTA 61B or C) and acetabular fractures (OTA 62A, 62B or C)

**Intervention:** A multimodal oral pain regimen was prescribed at discharge with schedule II narcotic only if needed for pain control.

**Main Outcome:** Primary outcomes were defined as the need for schedule II narcotic at discharge or in follow up.

Measurements: Prescription of narcotic on follow up or return to ER for pain control. Visual Analog Pain Scale score.

**Results:** Ninety-two patients (74%) with adequate follow-up were included for the final analysis (25 acetabular fractures, 50 pelvic fractures, and 17 combined injuries). Sixty-four patients (69.6%) were poly-trauma patients.

Four (4.3%) patients were discharged with a schedule II narcotic. Of the remaining patients (n=88), two (2.2%) required delayed prescription of a Schedule II narcotic after discharge and 5 (5.4%) presented to the ED for pain control.

There were no readmissions for pain. Overall, 81 of 92 (88.0%) patients had pain controlled without schedule II narcotics or ED presentation. The mean VAS pain score for all patients was 4.1±3.6 from 5 to 21 days, 3.2±3.4 at 22 to 60 days, and 2.7±3.3 at greater than 60 to 180 days after discharge, there was no significant difference between groups.

**Conclusion:** Multimodal pain control regimens without schedule II narcotics in the immediate postoperative follow-up period can effectively manage pain in most patients with pelvic or acetabular fractures.

**Level of Evidence:** IV; case series

**Keywords:** narcotics, pain control, acetabular fractures, pelvic fractures

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## INTRODUCTION

The opioid epidemic is a well-known challenge in orthopaedics.<sup>1</sup> In 2018, over 130 deaths per day were attributed to opioid overdose.<sup>2</sup> Orthopedic surgeons are among the highest prescribers of schedule II narcotics in the US.<sup>3</sup> Roughly 80% of those schedule II narcotics are not consumed by patients, contributing to the availability of excess pills.<sup>4</sup>

Pain scores for pelvic and acetabular fractures are high, and surgeons have typically responded with large schedule II narcotic prescriptions.<sup>5</sup> While this helps to treat pain, the risk of chronic opioid dependence doubles for patients prescribed greater than 5 days of schedule II narcotics.<sup>6</sup> Each additional week of schedule II narcotic prescription is associated with a 44% increase in the risk of chronic opioid dependence.<sup>7</sup>

Thus, given the societal consequences of opioids, there has been much interest in practices that can effectively control pain without schedule II narcotics. Combinations of tramadol or codeine, with gabapentin and NSAIDs, have been shown to be effective for pain mitigation after orthopaedic surgery.<sup>8,9</sup> These promising results suggest the potential expansion of this regimen to trauma patients.

While the best multimodal regimen is yet to be established, combinations of medications, injections, and alternative therapies have been shown to provide higher patient satisfaction and a reduction in schedule II narcotic usage.<sup>10-12</sup> However, it is not clear if these methods can effectively minimize the use of schedule II narcotics for patients with pelvic and acetabular fractures. We designed a retrospective review to (1) investigate the frequency that our patients with operated pelvic and acetabular fractures were discharged without schedule II narcotics and (2) to determine the frequency that our patients failed the multimodal regimen, defined as an unplanned presentation to the Emergency Department (ED) or clinic for inadequate pain control or a prescription of schedule II narcotic in follow-up.

Table 1. Demographics: patients who required schedule II narcotics were younger on average than those who did not.

	Total	No Sched II	Failed	<i>p</i>	<i>Post Hoc Power</i> (%)
	(n=92) mean ± SD	(n=81) mean ± SD	(n=11) mean ± SD		
Age	45.4±19	46.7±19	36.1±12	0.02	70.5%
BMI	29.1±5	28.8±5	30.9±6	0.26	17.0%
	% (n)	% (n)	% (n)	<i>p</i>	
Female	26.1% (24)	28.4% (23)	9.1% (1)	0.17	20.2%
Smoking	19.6% (18)	18.2% (14)	40.4% (4)	0.11	41.3%
Alcohol	35.9% (33)	35.8% (27)	40.4% (4)	0.79	5.1%
Illicit Drug	13.0% (12)	13.6% (11)	9.1% (1)	0.75	3.9%

**METHODS**

*Patients*

Institutional review board approval was obtained for this study. The trauma registry at our level 1 trauma center in the Southwest United States was queried for patients with operative pelvic or acetabular fractures (OTA 61 B or C or 62 A, B & C) between October 2016 and December 2018. Included patients were skeletally mature, with complete discharge pain medication profiles available for review and three weeks or greater of follow-up. Patients with pathologic fractures and those who expired before discharge were excluded. If patients with less follow-up met a clinical endpoint of either requiring a schedule II medication prescription, ED presentation for pain control, or readmission for pain control, they were also included. We identified 120 patients with operative pelvic or acetabular fractures. Patients were excluded for: pathological fracture (N=1), death during hospitalization (N=14), and inadequate follow-up (N=13). Of note, we did not exclude patients for multiple injuries or more than one system injury, and there was no ISS cutoff in this study.

*Pain control regimen*

Our post-operative pain regimen included acetaminophen with codeine or tramadol, as well as pregabalin or gabapentin, baclofen or cyclobenzaprine, and a nonsteroidal anti-inflammatory medication (NSAID). In polytrauma

patients, this regimen was utilized to treat all of the patients' pain, not just from their pelvic and acetabular fractures. All patients received one-on-one education from a trained orthopaedic trauma nurse practitioner who taught patients appropriate medication use and guided postoperative expectations.

For all inpatients at our institution pain was assessed using a visual analog scale hung on the wall of every patient room. Of note, polytrauma patients were asked about their overall pain from all injuries. Patients were asked what their pain level was and what a "manageable level" was. Pain assessment was documented every shift as adequate or inadequate based on pain being below the patient's stated "manageable" pain level after medications were given. If pain was not adequately controlled without the use of a schedule II medication, then either hydrocodone or oxycodone was prescribed at the discretion of the treating surgeon.

Schedule II drugs are defined in the United States Controlled Substances Act and are those deemed to have a high risk for abuse and include most opiates. If hydrocodone and oxycodone were ineffective, then IV morphine was used. Codeine and tramadol were discontinued if a schedule 2 narcotic was prescribed. Pain control with oral medication alone was a pre-requisite to discharge. Patients who required hydrocodone or oxycodone for pain control as inpatients were discharged with a 10-day supply of the same.

*Outcome variables*

Variables included age, sex, body mass index (BMI), mechanism of injury (MOI), tobacco use, alcohol use, other injuries, OTA/AO fracture pattern, abbreviated injury severity (AIS), injury severity score (ISS), length of stay (LOS), time from presentation to surgery, VAS score at each follow-up, pain medications at discharge and follow up, presentation to ED for pain control, and ED narcotic prescriptions. Failure of the multimodal regimen was defined as an unplanned presentation to the emergency department (ED) or clinic for inadequate pain control, or a prescription of a schedule II narcotic at follow-up.

Table 2. Injury Characteristics were not significantly different between groups

	Total (n=92)	No Schedule II (n=81)	Failed (n=11)		<i>Post hoc</i> <i>power</i>
	mean ±SD	mean ±SD	mean ±SD	<i>p</i>	(%)
ISS Score	17.5±6.9	17.3±6.8	18.6±7.9	0.55	7.5%
AIS Head	2.0±0.5	1.8±0.9	1.5±0.7	0.65	25.0%
AIS Chest	2.3 ±0.6	2.3±0.8	2.0±0.1	0.07	89.2%
AIS Abdomen	2.5±0.7	2.4±0.7	3.7±0.6	0.01	100%
Initial LOS	12.6±9.4	12.7±9.6	12.0±8.2	0.83	4.5%
	n	% (n)	% (n)	<i>p</i>	
Polytrauma	64	69% (56)	73% (8)	0.81	4.1%
High Energy Mechanism	82	88% (71)	100% (11)	0.22	3.6%
Motor Vehicle Collision	36	37% (30)	54% (6)	0.47	19.5%
Motorcycle Collision	14	14% (11)	27% (3)		24.0%
Pedestrian vs Auto	10	11% (9)	9% (1)		3.0%
High Energy Fall	19	22% (18)	9% (1)		10.2%
Crush Injury	3	4% (3)	0% (0)		0%
Open Fractures	3	4% (3)	0% (0)	0.52	0%
Pelvic Fx	50	58% (47)	27% (3)	0.08	49.0%
Acetabulum Fx	25	24% (19)	55% (6)		57.1%
Pelvic & Acetabular Fx	17	19% (15)	18% (2)		2.8%

*Statistical methods*

Continuous variables were compared using Levene’s test to determine equality of variance for Students T-Test. Categorical variables were compared using chi-squared or Fisher’s exact test as appropriate for expected values. Significance was set at an alpha of 0.05. Patients were grouped by those who required outpatient narcotics for pain control and those who did not. Analysis was conducted in IBM SPSS Statistics for Mac, Version 25.0. Armonk, NY: IBM Corp.

**RESULTS**

Ninety-two patients with 25 (27.2%) acetabular fractures, 50 (54.3%) pelvic ring fractures, and 17 (18.5%) combined acetabular and pelvic ring fractures were included in the final analysis. Sixty-four patients (69.6%) had injuries other than pelvic and acetabular fractures. Patients were predominantly male (73.9%) and were an average age of 45.4 ± 19.0 years old. 20.7% endorsed smoking.

Overall, 52 (56.5%) patients were treated with open reduction internal fixation (ORIF), 24 (26.1%) with percutaneous screw fixation, and 16 (17.4%) with a combination of techniques. All 25 acetabular fractures were

treated with ORIF. Of the 50 pelvic ring fractures, 19 (38%) were treated with ORIF, 21 (42%) with percutaneous screw fixation, and 10 (20%) with a combination of techniques. Of the 17 patients with combined acetabular and pelvic ring fractures, 8 (47.1%) required ORIF, 3 (17.6%) required percutaneous screw fixation, and 6 (35.3%) required both. Overall, 88 (95.7%) patients were discharged with the multimodal regimen without a schedule II narcotic. Two patients (2.3%) later required a Schedule II narcotic prescription during clinical follow-up, and five (5.4%) presented to the ED for pain control. In total, 11 (12%) patients failed the multimodal regimen including the 4 patients who were discharged with schedule II narcotics.

Patients who required schedule II narcotics were significantly younger than those who did not (36±12 vs 47±20 p=0.02). Of the 11 patients who failed schedule II narcotic-sparing pain management, none required more than one prescription for schedule II narcotics. All unplanned ED visits occurred within the first three weeks post-operatively. Tobacco, alcohol, and illicit substance use were not significantly different in those patients who failed opioid-sparing pain control (Table 1). There was no significant difference between those who failed the opioid-sparing

Table 3: Outcomes

	Total n= 92	No Schedule II prescribed (n=81)	Failed (n=11)		<i>PostHoc Power</i>
	Mean ±SD	Mean ±SD	Mean ±SD	<i>p</i>	%
Mean VAS 5 – 21 days (n=65)	4.1±3.6	3.8±3.6	6.3±2.4	0.09	85.6%
Mean VAS 22 – 60 days (n=76)	3.2±3.4	3.2±3.4	3.4±3.5	0.84	3.7%
Mean VAS 60 – 180 days (n=49)	2.7±3.3	2.8±3.3	2.6±3.6	0.91	3.7%

regimen and those who did not in terms of ISS, LOS, polytrauma, open fractures, and high energy mechanism of injury (Table 2). Regarding fracture pattern, the 25 patients with acetabular fractures and 17 patients with the combined pelvis and acetabular fractures were more likely to require schedule II medications, however, this was not statistically significant (p=0.07). Abdominal injuries as measured by abdominal AIS were associated with failure of schedule II narcotic-sparing pain control (p=0.01).

The mean 10-point Visual Analog Pain Scale (VAS) score for all patients was 4.1±3.6 from 5 to 21 days, 3.2±3.4 at 22 to 60 days, and 2.7±3.3 at greater than 60 to 180 days after discharge. There were no differences in VAS pain scores between patients on opioid sparing regimens and patients who were not at 5-21 days (p = 0.09), 31-60 days (p = 0.84), and more than 60 days (p = 0.91) after discharge (Table 3).

**DISCUSSION**

The efficacy of a postoperative pain regimen without schedule II narcotics for treating patients with pelvic and acetabular fractures has not been shown previously. The current study demonstrates that most patients (88%) with operatively treated acetabular or pelvic fractures do not require schedule II narcotics at any point after discharge. This is consistent with data from prior studies on patients with hip, femur, tibia, and ankle fractures.<sup>9,13,14</sup>

Previous research has shown misuse of tobacco, alcohol, and other substances correlated with increased opioid use in orthopaedic trauma patients.<sup>15</sup> However, this study, consistent with our previous work on femur and tibia fractures<sup>9</sup>, did not show any association between gender, high-energy mechanism, tobacco use, alcohol use, and illicit substance use with the need for schedule II narcotics. Instead, we found several factors associated with the need for schedule

II narcotics including younger patients, acetabular fractures, and concomitant abdominal injuries. Younger patients have been shown to have increased pain scores and narcotic requirements.<sup>16</sup> Factors often associated with increased pain in younger patients, such as higher energy mechanisms and polytrauma, were not correlated with an increased need for schedule II narcotics in our population.<sup>17</sup> Although not statistically significant, the majority (72%) of the patients who required schedule II narcotics had fractures of the acetabulum. These intra-articular injuries may be more painful, and these patients may be less likely to tolerate an opioid-sparing pain regimen. Physicians should be aware of these constellations of injuries when evaluating patients for pain and medication needs post-operatively.

Our study has limitations. This is a retrospective study which has the inherent risk of bias. The population consisted of adult patients from a single Level 1 trauma center, and our results therefore may not be generalizable. We were only able to review patient follow-up and pain prescriptions within our health system and were not able to assess for prescriptions by outside providers.

**CONCLUSION**

In conclusion, the use of opioid-sparing multimodal pain control regimens post-operatively for pelvic and acetabular fractures results in post-operative VAS under the patient’s subjective manageable level. In this study, 88.0% of patients had pain controlled without the use of schedule II narcotics. This represents a significant reduction in the prescription of potentially addictive pain medication. This suggests that an opioid-sparing protocol can be an effective first-line pain regimen in pelvic and acetabular fracture patients.

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