

# Comparison of Opioid-Free versus Traditional Opioid-Containing Postoperative Pain Management Pathways for Idiopathic Scoliosis

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**INTRODUCTION:** A number of standardized pain management protocols have been reported following instrumented posterior spinal fusion (PSF) for idiopathic scoliosis, aimed at hastening recovery while lowering opioid consumption. However, many of these involve indwelling pain catheters that carry inherent risks and/or still rely on opioids for early postoperative analgesia. Further, while there are growing efforts to investigate and adopt opioid-free (OF) protocols in adult orthopaedic patients, such protocols have yet to be thoroughly evaluated in the pediatric population. The purpose of this study was to compare a comprehensive, multimodality, OF pain management pathway with a traditional opioid-containing (OC) pathway in pediatric idiopathic scoliosis patients undergoing instrumented PSF.

**METHODS:** A database of patients who underwent instrumented PSF by a fellowship-trained pediatric orthopaedic surgeon was reviewed retrospectively. Patients 10-20 years of age at the time of surgery who had a diagnosis of idiopathic scoliosis and underwent primary instrumented PSF were included. Patients with non-idiopathic scoliosis or who underwent revision surgery were excluded. Patients were assigned to one of two groups, based on date of surgery: OF pathway (surgery between June 2019 and July 2020) or OC pathway (control; surgery between June 2018 and June 2019). Total morphine milligram equivalents (MME) were recorded, beginning once patients reached the inpatient unit postoperatively.

**RESULTS:** A total of 93 patients (OF = 37, OC = 56) were included. Groups were similar with respect to age and body mass index (Table 1). Patients in the OF group had significantly more levels fused compared with patients in the OC group (11 versus 9.5, respectively;  $P=0.0363$ ), though both groups had a similar median length of stay (LOS; 2 days,  $P=0.9613$ ). For patients in the OF group, 19/37 (51.4%) required “rescue” doses of opioid medications during admission; 11/37 (29.7%) were prescribed opioids at discharge, compared with 55/56 (98.2%) in the OC group ( $P<0.0001$ ).

**DISCUSSION AND CONCLUSION:** The results of this study support that an OF pathway following instrumented PSF for idiopathic scoliosis results in equivalent LOS and fewer opioids prescribed at discharge compared with an OC pathway. To our knowledge, this is the first study to show that OF pain management is possible in this population.

	Opioid-Free	Opioid-Containing	P-value
Number of patients	37	56	-
Number of females	32 (86.5%)	38 (67.9%)	<b>0.0415*</b>
Age at surgery (years)	15 [13, 16] Range: 10-18	15 [13, 16] Range: 11-19	0.9115
BMI (kg/m <sup>2</sup> )	20.1 [17.9, 23.4] Range: 15.1-37.4	20.7 [18.6, 25.5] Range: 15.0-44.7	0.1647
Total levels fused	11 [8, 12] Range: 7-14	9.5 [8, 11] Range: 6-13	<b>0.0363*</b>
Patients administered opioids inpatient	19 (51.4%)	56 (100.0%)	-
<b>Postoperative Inpatient MME</b>			
PO	0.0 [0.0, 15.0] Range: 0.0-112.5	50.0 [35.0, 77.5] Range: 5.0-207.5	<b>&lt;0.0001*</b>
IV	0.0 [0.0, 0.0] Range: 0.0-14.0	9.5 [6.0, 14.6] Range: 0.0-112.5	<b>&lt;0.0001*</b>
Total (IV and PO combined)	1.2 [0.0, 15.0] Range: 0.0-112.5	65.0 [44.5, 90.0] Range: 14.0-233.5	<b>&lt;0.0001*</b>
Inpatient LOS (days)	2 [2, 2] Range: 1-3	2 [2, 2] Range: 1-5	0.9613
Patients prescribed opioids at discharge	11 (29.7%)	55 (98.2%)	<b>&lt;0.0001*</b>

**Table 1:** Comparison of patient characteristics and postoperative inpatient opioid consumption between groups. Reported values reflect median and [interquartile range] unless noted otherwise. \*Denotes significance,  $P<0.05$ . BMI, body mass index; MME, morphine milligram equivalents (mg/day); IV, intravenous; PO, per os; LOS, length of stay.