

No Difference Exists in Total Cost of Care Between Orthopaedic Surgeons and Neurosurgeons for Patients Undergoing Primary 1- and 2-Level Decompression and Fusion

David Bernstein¹, Bradley Hammor, Daniel Tobert², Thomas D Cha, Jessica Pelow Aidlen, Stuart H Hershman², Christopher M Bono², Joseph Hasbrouck Schwab³, Harold Fogel²

¹Harvard Combined Orthopaedic Residency Program, ²Massachusetts General Hospital, ³MGH Dept. of Ortho Surg.

INTRODUCTION:

There is a growing pressure to reduce the cost of spine care while simultaneously optimizing clinical outcomes. Prior studies have compared clinical outcomes between spine surgeons who were orthopaedic surgery trained versus those who were neurosurgery trained. However, there is a paucity of literature examining differences in total cost of care based on specialty training. Our study had two purposes: 1) To compare the total cost of care and other patient, surgical, and site characteristics between orthopaedic surgery spine surgeons and neurosurgical spine surgeons; 2) To compare the variation in total cost by specialty training, as well as the breakdown of pre-, intra-, and postoperative cost by specialty training.

METHODS:

Patients undergoing primary 1- or 2-level lumbosacral decompression and fusion surgery at one quaternary referral academic medical center or one community hospital between November 2, 2021 and December 2, 2022 were identified. Each case was identified as being done by an orthopaedic surgery spine surgeon or a neurological spine surgeon. TDABC methodology was used to calculate total cost and the cost for three phases of care: pre-, intra-, and postoperative. Patient, surgery, and site characteristics were identified. To abide by institutional requirements, total cost was normalized to a mean of 1. Bivariate analysis was done to compare characteristics and cost between the two groups. The percentage of total cost driven by each phase was calculated. The variation of total cost was assessed by looking at the most and least expensive total cost.

RESULTS: A total of 405 patients were identified. There was no difference in total cost, as measured by normalized dollars, between orthopaedic surgery spine surgeons and neurosurgical spine surgeons (1.00 (SD:0.39) versus 1.03 (SD: 0.37), p=0.52). This was despite patients being treated by neurosurgical spine surgeons staying, on average, one day more in the hospital (3.4 days (SD: 1.5 days) versus 2.4 days (1.8 days), p<0.001). The variation in total cost was nearly double that for orthopaedic surgery spine surgeons compared to neurosurgical spine surgeons (9.5x versus 4.9x). Intraoperative cost was by far the highest percentage of the total cost for both surgeon groups.

DISCUSSION AND CONCLUSION: There is no difference in total cost for primary 1- and 2-level decompression and fusion between spine surgeons trained via orthopaedic surgery or neurosurgery. While both surgeon groups have a wide variation between the most and least expensive total cost of care, the orthopaedic surgeon cohort has almost a two-times greater variation. This suggests that much of the difference in cost for the same indication is driven by individual surgeon behavior and is not engrained in the type of training received to become a spine surgeon.

Table 1. Overall Sample Characteristics (n = 405)

Characteristic	n (%) or mean (standard deviation)	Surgeon Training		p-value
		Orthopaedic Surgery (n=285)	Neurosurgery (n=120)	
Total Cost (Normalized)	1.01 (0.38)	1.00 (0.39)	1.03 (0.37)	0.52
Surgery Care Type				0.001
Outpatient	84 (21)	72 (25)	12 (10)	
Inpatient	321 (79)	213 (75)	108 (90)	
Hospital Type				<0.001
Community	181 (45)	160 (56)	21 (18)	
Academic Medical Center	224 (55)	125 (44)	99 (82)	
Age, years	63 (13)	62 (13)	65 (13)	0.005
Sex				0.89
Male	198 (49)	140 (49)	58 (48)	
Female	207 (51)	145 (51)	62 (52)	
Insurance Type				0.03
Commercial	215 (53)	155 (54)	60 (50)	
Medicaid	16 (4.0)	11 (3.9)	5 (4.2)	
Medicare	145 (36)	93 (33)	52 (43)	
Other	29 (7.2)	26 (9.1)	3 (2.5)	
Length of Stay (LOS), days	2.7 (1.7)	2.4 (1.8)	3.4 (1.5)	<0.001

Table 2. Cost Comparison by Specialty Training

Characteristic	Surgeon Training	
	Orthopaedic Surgery (n=285)	Neurosurgery (n=120)
Variation From Most to Least Costly	9.5x	4.9x
Breakdown of Total Cost By Phase of Care (Average & Range)		
Pre-	0.9% (0.3% to 2.4%)	0.9% (0.4% to 1.8%)
Intra-	88% (54% to 98%)	85% (66% to 97%)
Post-	11% (1% to 45%)	14% (3% to 32%)