

# General vs. Non-general Anesthesia use In spinal Surgery: Assessment of Risk Factors, Outcomes and Complications using a National Registry

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Results



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## Introduction

Endotracheal anesthesia is one of the most commonly used anesthetic techniques when performing thoracic and lumbar surgeries. However, spinal and epidural anesthesia (non-general) have recently been increasingly used for lumbar decompressions and lumbar fusion. They are much more cost-effective than general anesthesia, but much more difficult to perform. The objective of this study was to investigate the outcomes of general and non-general (spinal and epidural) anesthesia in patients undergoing posterior lumbar fusion (PLF) and lumbar decompression (LD) using a national registry.

## Methods

The American College of Surgeons National Surgical Quality and Improvement Program (NSQIP) database was queried to identify patients who underwent LD or PLF with general or non-general anesthesia between 2011 and 2015. Patient characteristics and postoperative variables were compared. Multivariable regression was used to identify predictors of thirty-day readmission, any complication and length of hospital stay (LOS). Three-to-one propensityscore matching and conditional logistic regression were used to adjust for potential bias.



Posterior Lumbar Fusion Propensity Score Unmatched 1000 800 600 400 200 0 .01 .015 .005 Matched 909 400 50 0 .015 .005 .01 Treated Untreated

## A total of 60,222 patients who underwent LD were identified; 59,876(99.4%) received general anesthesia and 342(0.6%) were given non-general anesthesia. After propensity matching, 1000 patients received general anesthesia and 341 received non-general anesthesia there were On multivariable conditional regression, anesthesia type was found to have no significant effect on any of the outcomes analyzed(Readmission: OR: 0.90, p=0.79; Any Complication: OR: 0.75, p=0.75; LOS: Coef.: 0.18, p=0.35, respectively). A total of 31,419 patients who underwent PLF were identified; 31,377(99.9%) were given general anesthesia and 42(0.1%) were given non-general anesthesia. After propensity matching, 126 patients received general anesthesia and 42 received nongeneral anesthesia The type of anesthesia had no significant effect on any of the outcomes analyzed(Readmission: OR: 0.78, p=0.83; Any Complication: OR: 0.50, p=0.40; LOS: Coef.: 0.17, p=0.68, respectively).

## Conclusions

Our analysis showed that nongeneral anesthesia had equivalent outcomes with respect to readmission, LOS, or any complication, when compared to general anesthesia in patients undergoing LD or PLF. While the choice of anesthesia type remains a matter of preference, our results show that non-general anesthesia is associated with equivalent

#### Posterior Lumbar Fusion Conditional Regression



#### Lumbar Decompression Conditional



Variables	Lumbar Decompression			Posterior Lumbar Fusion		
	General Anesthesia (n=1000)	Non-general Anesthesia (n=341)	SMD	General Anesthesia (n=126)	Non-general Anesthesia (n=42)	SMD
Age, mean (SD)	49.58 (16.2)	50.23 (15.1)	0.041	63.2 (13.6)	62.6 (13)	0.046
Female sex, n(%)	445 (44.5)	147 (43.1)	0.028	67 (53.2)	26 (61.9)	0.177
Race, n(%)						
White	827 (82.7)	298 (87.4)	0.128	106 (84.1)	34 (81.0)	0.083
African American	62 (6.2)	16 (4.7)	0.064	7 (5.60)	2 (4.80)	0.035
Other	22 (2.2)	2 (0.6)	0.121	3 (2.40)	1 (2.40)	0
Unknown	89 (8.9)	25 (7.3)	0.057	10 (7.90)	5 (11.9)	0.091
BMI, mean (SD)	28.95 (5.96)	29 (5.52)	0.009	29.2 (6.19)	29.2 (5.53)	0.005
BMI, median (range)	28.4 (10.6- 64.2)	28.2 (17.9- 50.7)	N/A	28.2 (17.5- 52.9)	29.0 (17.3- 40.3)	N/A
Functional Status (dependent) (%)	6 (0.60)	1 (0.30)	0.046	1 (0.80)	0 (0)	0.126
Outpatient (%)	664 (66.4)	230 (67.4)	0.022	4 (3.20)	2 (4.80)	0.081
Smoker within 1 year (%)	217 (21.7)	58 (17.0)	0.119	18 (14.3)	7 (16.7)	0.066
Alcohol use (%)	1 (0.10)	1 (0.30)	0.084	0 (0)	0 (0)	
Steroid use (%)	33 (3.30)	8 (2.30)	0.058	5 (4.00)	3 (7.14)	0.139
Weight loss (%)	1 (0.10)	2 (0.60)	0.083	0 (0)	0 (0)	
Diabetes (%)	100 (10.0)	25 (7.30)	0.095	14 (11.1)	7 (16.7)	0.161
Dyspnea (%)	27 (2.70)	10 (2.90)	0.014	10 (7.90)	1 (2.40)	0.253
COPD (%)	16 (1.60)	7 (2.10)	0.034	7 (5.60)	2 (4.80)	0.036
Dialysis (%)	0 (0)	1 (0.30)	0.077	0 (0)	0 (0)	
Bleeding disorder (%)	10 (1.00)	2 (0.60)	0.047	1 (0.80)	0 (0)	0.104
Open wound/wound infection (%)	2 (0.20)	1 (0.30)	0.019	1 (0.80)	0 (0)	0.104
Preoperative blood transfusion (%)	1 (0.10)	0 (0)	0.045	1 (0.80)	0 (0)	0.104
Operative Variables			10			
ASA Class (%)						
1	204 (20.4)	63 (18.5)	0.048	12 (9.50)	3 (7.14)	0.083
2	603 (60.3)	221 (64.8)	0.093	60 (47.6)	21 (50.0)	0.048
3	189 (18.9)	56 (16.4)	0.065	54 (42.9)	18 (42.9)	0
4	4 (0.40)	1 (0.30)	0.016	0 (0)	0 (0)	
5	0 (0)	0 (0)		0 (0)	0 (0)	
Not assigned	0 (0)	0 (0)		0 (0)	0 (0)	
Wound class 1 or 2 (%)	2 (0.20)	1 (0.30)	0.019	125 (99.2)	42 (100)	0.126
Mean operative time (min, SD)	90.9 (56.7)	72.0 (46.1)	0.365	208.1 (99.5)	181.3 (78.7)	0.299
Median operative time (median, range)	80 (15-759)	62 (22-607)	N/A	181 (61-558)	169 (0-339)	N/A
Emergency (%)	13 (1.30)	3 (0.90)	0.04	2 (1 60)	0 (0)	0.18