

# **Complexity of Lumbar Surgery Does Not Dictate Surgeons' Assessment of Functional Outcome**

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# Background

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Postoperative assessments often occur 3 months after complex lumbar surgery.

Rate of recovery at 3 months varies with some patients achieving marked improvement and others achieving slow improvement.

Follow-up assessments at 3 months provide surgeons with necessary information to advise advancement of physical activity and resumption of work and desired life activities.

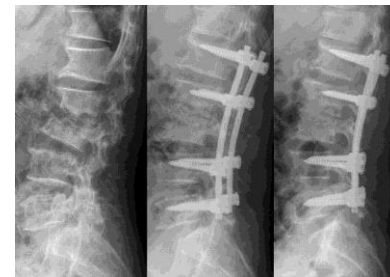
Although patients with more complex surgery may be more likely to limit their activities, more complex surgery may not necessarily predispose to more functional limitations if the surgery was technically successful.



Marked Improvement



Slow Improvement



# Objectives

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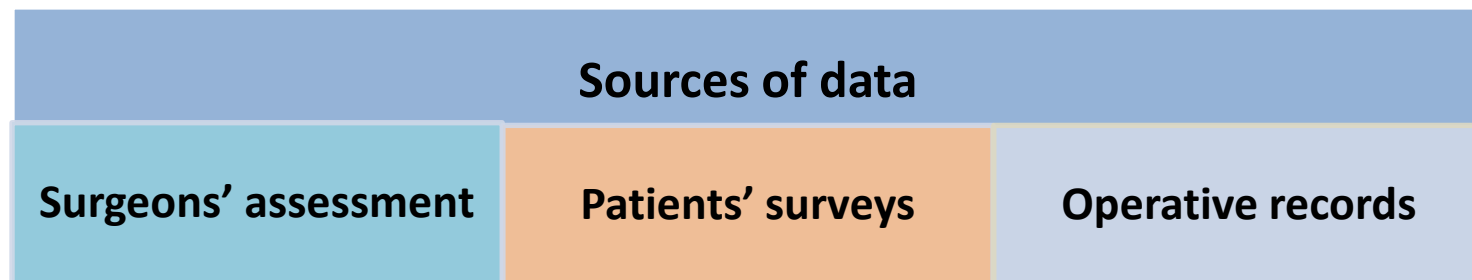
Among patients who had complex lumbar surgery, the objectives of this study were to compare the surgeon's assessment of ***functional*** outcome 3 months after surgery with:

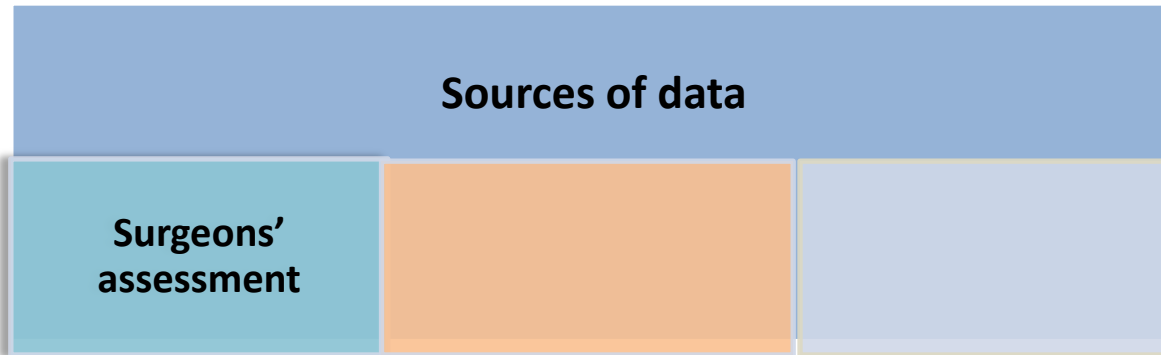
- the complexity of surgery
- the surgeon's assessment of technical outcome
- patient characteristics.

# Methods

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- Report of enrollment data for 134 patients from a randomized trial to increase physical activity after recuperation from multi-level, fusion lumbar surgery
- Enrolled during a routine 3-month post-operative visit





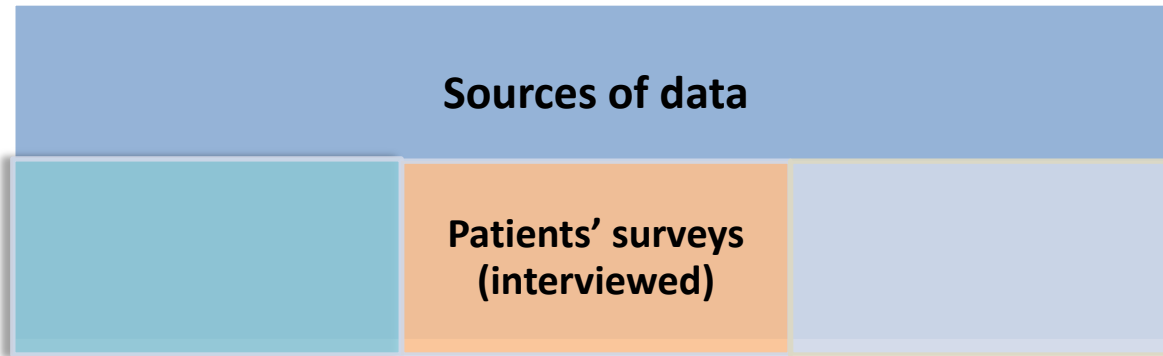
After surgeons completed their discussion and physical examination with patients and reviewed post-operative radiographs, surgeons were asked to rate the current outcome of surgery with the following questions:

***“Right now, how would you rate the functional outcome of surgery?”***

***“Right now, how would you rate the technical outcome of surgery?”***



- **Functional outcome (0=poor, 10=excellent)**
- **Technical outcome (0=worst, 10=best)**



**Oswestry Disability Index (ODI)** (0-100, higher is worse)

**Numerical Pain Rating** for current back pain (0-10, higher is worse)

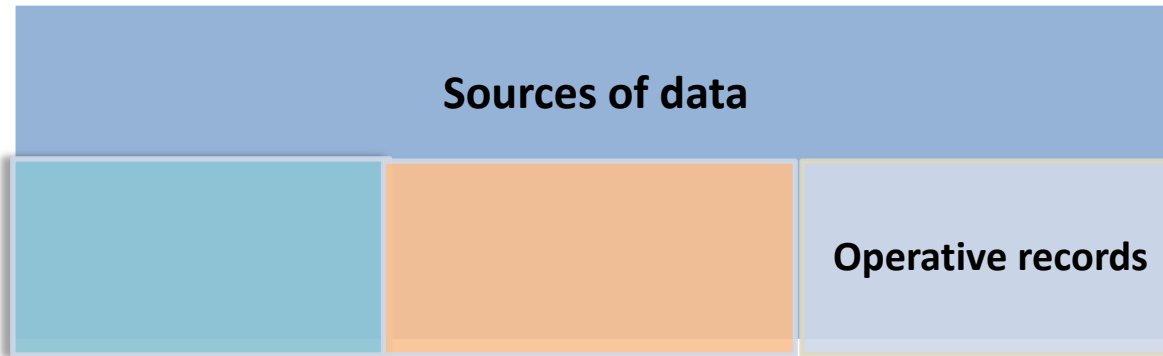
**Change in pain** *“Compared to the pain before surgery, how is your pain now?”* (improved, the same, worse)

**Patient Health Questionnaire (PHQ-8)** (depressive symptoms, 0-24, higher is more symptoms)

**Current clinical characteristics** (medication use)



- ODI
- PHQ-8
- Change in pain



### Surgical Invasiveness Index (SII)

- compendium of surgical features
- number of vertebrae involved, decompression, fusion, instrumentation, approach
- points assigned for each feature, maximum of 10 points for each vertebral level
- total score is calculated as the sum of points from all levels
- higher score is greater complexity

HSS  
Medical  
Record

- **Operative Record**

# Data analysis

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Definition of  
primary  
outcome

Surgeon's rating of function outcome:  
0 (poor) – 10 (excellent)

Bivariate

Bivariate comparisons between surgeon's rating and  
patient and clinical characteristics

Multivariable

Multivariable ordinal logistic regression with the  
surgeon's rating of functional outcome as the  
dependent variable

## Results (N=134)

<b>Demographics and clinical characteristics</b>	
Mean time since surgery, months, (range)	2.9 (2.3-4.8)
Age, years, mean	63
Men	50%
Employment	
working	31%
disability	30%
other (i.e. retired, homemaker)	39%
Depressive symptoms score*, mean (range)	5 (0-21)
Oswestry Disability Index score†, mean (range)	33 (8-78)
Pre- to post-operative change in pain	
improved	90%
the same	5%
worse	5%
Opioid use before surgery	57 (43%)
still taking opioids at 3 months	38 (28%)
newly taking opioids	9 (7%)
* PHQ-8 possible range 0-24 (higher is more depressive symptoms)	
† ODI possible range 0-100 (higher is worse function)	



# Results

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<b>Surgeons' assessment</b>	
<b>Functional outcome, mean (range)</b>	<b>8 (3-10)</b>
Technical outcome, mean (range)	8 (5-10)

<b>Complexity of surgery</b>	
Surgical Invasiveness Index (SII) score	
mean	11
range	1-41
median	10
inter-quartile range	7-14

# Results (Multivariable analysis)

Dependent variable: surgeon-assessed *worse functional outcome*

Variables	Bivariate			Multivariable		
	OR	95%CI	P value	OR	95%CI	P value
Increased pre-op to post-op pain	1.7	1.4 - 2.3	< .0001	1.8	1.4 - 2.4	<.0001
Opioid use at 3 months	2.7	1.4 - 5.2	.003	2.0	1.0 - 4.0	.04
More depressive symptoms	1.2	1.1 - 1.3	< .0001	1.2	1.1 - 1.3	<.0001
Worse surgeon-assessed technical outcome	1.9	1.4 - 2.5	< .0001	2.4	1.7 - 3.3	< .0001
More complex surgery (SII)	1.0	1.0 - 1.1	.38	--	--	--

***Thus, the complexity of surgery did not dictate the surgeon's assessment of functional outcome if the technical outcome was good.***

# Conclusions

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- Surgeons' assessment of functional outcome 3 months after complex lumbar surgery was associated with their assessment of technical outcome, pain, and mood-related patient characteristics, but not with the complexity of surgery.
- Thus more complex lumbar surgery does not automatically dictate worse functional outcome.
- Patients should be informed that more complex surgery is not necessarily a restriction to advancing physical activity if the technical outcome is successful.

# Disclosure

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None of the authors has any potential conflict of interest