



## **Engaged Patients Undergoing Lumbar Procedures Report Less Pain Postoperatively**

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# Introduction

Over the years spinal procedures have increased steadily causing a growing demand for postoperative care adjustments<sup>1</sup>. Low back pain can often be treated with medication and instructed exercise. In cases where lower back pain persists, lumbar fusion or lumbar decompression may be suggested<sup>2</sup>. A lumbar fusion procedure is the joining of two or more vertebrae to relieve pain and correct deformities. During lumbar decompression surgery small pieces of bone and/or disc material is removed to alleviate stress placed on the nerves<sup>3</sup>. Major postoperative complications regarding these procedures are blood clots, persistent pain, and limited range of motion<sup>1</sup>. These complications can be avoided or minimized with both preoperative and postoperative education.

In today's fast paced world, it is important that recovery is both safe and timely. Patients who have recently undergone either lumbar decompression or lumbar fusion surgery have difficulty with everyday tasks such as bending/lifting, sitting, and managing pain. To help transition into a successful recovery, patients are informed preoperatively and throughout their recovery about the best practices to speed up the healing process. Studies have proven that educating patients preoperatively leads to a more successful recovery. Patients who were informed about medications and what to expect during their recovery preoperatively reported reduced pain compared to uninformed patients. Preoperative education can also span from exercise videos to how to sit in a chair with minimal pain.

Being informed and proper exercise is crucial to the recovery process. For this reason, information regarding exercise and posture is provided to patients prior to their surgery. Patients who actively view these instructions are more likely to perform better on the Oswestry Disability Index (ODI) and report reduced pain levels. The ODI is a validated questionnaire used to gauge how a patient with lower back pain is feeling when performing everyday activities. The care instructions provided on the Force Therapeutics platform are targeted at making everyday tasks easier postoperatively.

# Methods

A retrospective study on three hospitals containing patients undergoing either lumbar decompression or lumbar fusion surgery from the start of January 2018 to March 2021 were included for analysis. Patients reported daily pain, as well as completed standard of care outcome forms through the Force Therapeutics platform. The primary outcome form of interest is the Oswestry Disability Index Questionnaire (ODI). This questionnaire consists of ten questions regarding pain during various activities. Questions are scored from zero to five with five being the highest level of pain (Table 1). The scores of each question are then added together and categorized. When reviewing the results, it is important to note that a lower ODI raw score represents less pain reported.

**Table One: ODI Pain Values Defined**

Value + Meaning	Score Categories
0: No Pain	0-4: No Disability
1: Mild Pain	5-14: Mild Disability
2: Moderate Pain	15-24: Moderate Disability
3: Pain is Fairly Severe	25-34: Severe Disability
4: Severe Pain	35-50: Completely Disabled
5: Unbearable Pain	-

Patients were categorized into two groups: active and inactive, based on their viewing activity of the following care instruction videos: Bending/Lifting Mechanics, and Sitting Posture Tips. An active patient was defined as a patient who viewed both of the care instruction videos and an inactive patient watched either only 1 video or no videos at all. Responses to the ODI questions regarding pain, lifting, and sitting were converted to a numerical scale with 0 being no reported pain and 5 being immense pain when completing these tasks. Average ODI scores along with pain during activities were compared between active and inactive patients. A two-tailed t-test was run to determine if there was either significant difference, trending to significance, or no significant difference between the active and inactive patients for raw ODI score. Significance was defined at  $p < 0.05$ .

**Table Two:**  
**Patient Demographics for Hospitals A (Scripps), B (Northwell), and C (Geisinger)**

	Average Age of Active Patients	Average Range of Active Patients	Average Age of Inactive Patients	Average Range of Inactive Patients	Active Patients	Inactive Patients
Hospital A	64.5	[16,95]	62.9	[17,97]	722	364
Hospital B	58.6	[24,89]	60.1	[20,91]	171	273
Hospital C	55.6	[21,85]	55.2	[16,87]	219	208
Combined Hospitals	61.8	[16,95]	60.1	[16,97]	1112	845

# Results

Among the hospitals analyzed the active patients received on average lower ODI raw scores for both procedures when compared to the inactive patients (Table 1). After analyzing the overall raw score for the ODI questionnaire the questions directly correlating to the care instruction videos were examined.

On average, active patients undergoing lumbar fusion procedures received significantly lower raw ODI scores. Although there is no significant difference, active patients undergoing lumbar decompression procedures also received lower raw ODI scores. Responses to individual questions regarding overall pain, pain while bending/lifting, and pain while sitting were also analyzed. On average active patients scored lower on all three questions for both procedures. The median values of the three questions were also recorded. Little variation was found between the active and inactive groups.

Along with average score, the percentage of patients who reported a score 0-5 were also analyzed. A higher percentage of inactive patients reported a score of 5 when compared to active patients (Figure 1,2,3). These figures also show a higher percentage of active patients reporting scores of 0,1, and 2. This means when looking at the breakdown of patient responses, more active patients were reporting lower scores and more inactive patients were reporting higher scores for all three questions.

**Table Three:**  
**Differences in ODI Results in Lumbar Fusion Active Patients and Inactive Patients**

	Active Patients	Inactive Patients	p Value
Average ODI Raw Score (lumbar fusion)	43.2	47.3	p<0.05
Average ODI Raw Score (lumbar decompression)	41.1	42.8	0.13

**Table Four:**  
**Median Pain Responses for Lumbar Fusion Procedure**

	Active Patients	Inactive Patients
Median Reported Overall Pain	3.00 [1]	3.00 [2]
Median Reported Pain when Bending/Lifting	3.00 [2]	3.00 [2]
Median Reported Pain when Sitting	2.00 [2]	2.00 [2]

\*\*brackets contain IQR for median values

**Table Five:**  
**Median Pain Responses for Lumbar Decompression Procedure**

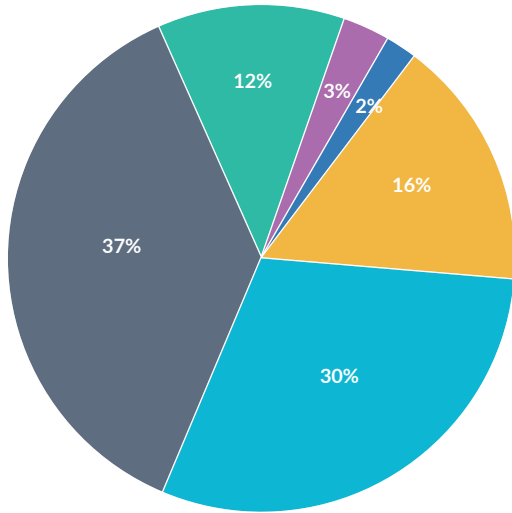
	Active Patients	Inactive Patients
Median Reported Overall Pain	2.00 [1]	3.00 [1]
Median Reported Pain when Bending/Lifting	3.00 [2]	3.00 [2]
Median Reported Pain when Sitting	3.00 [2]	3.00 [2]

\*\*brackets contain IQR for median values

**Figure One:**  
**Overall Pain Responses Broken Down for Active and Inactive Patients**

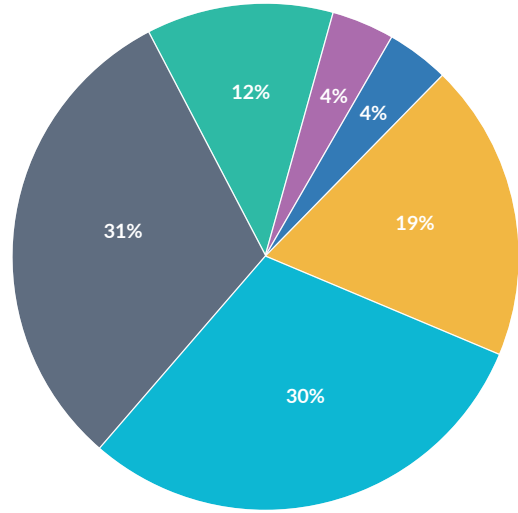
Overall Pain Reported by Active Patients

5 4 3 2 1 0



Overall Pain Reported by Inactive Patients

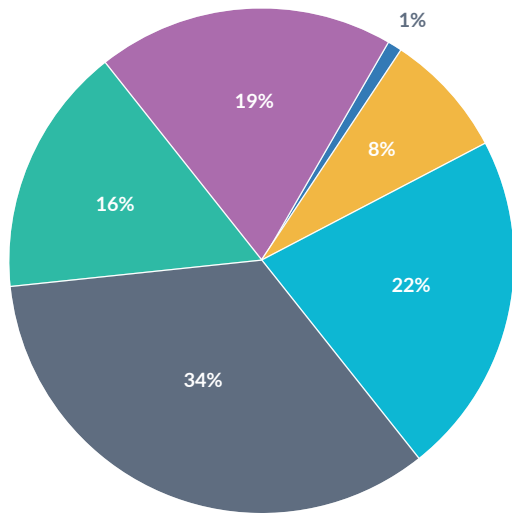
5 4 3 2 1 0



**Figure Two:**  
**Pain while Sitting Responses Broken Down for Active and Inactive Patients**

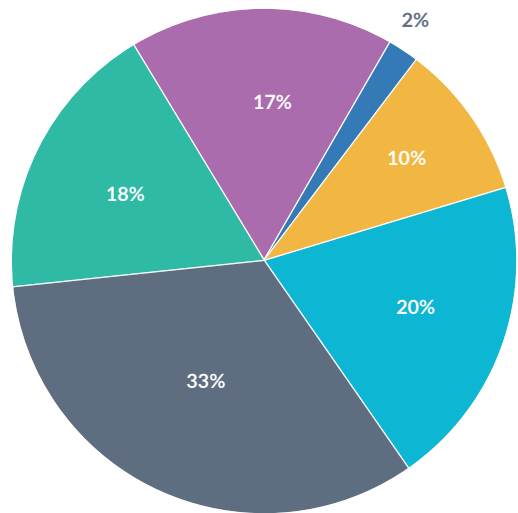
Reported Pain While Sitting by Active Patients

5 4 3 2 1 0

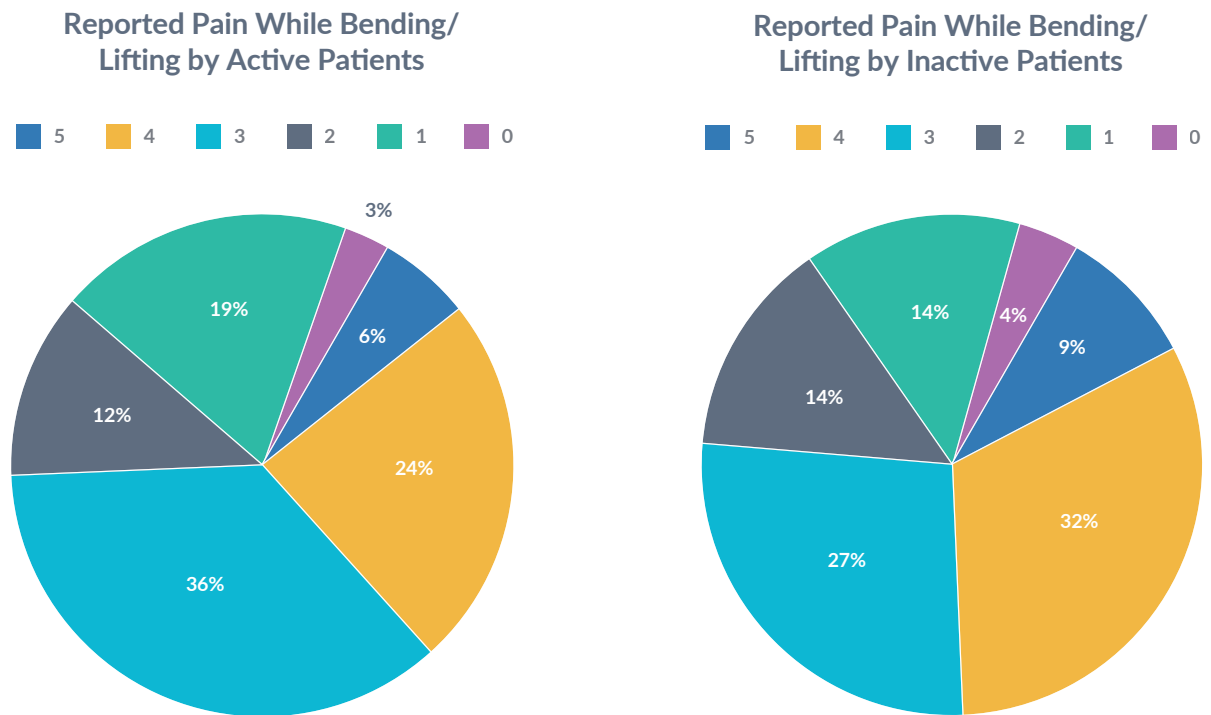


Reported Pain While Sitting by Inactive Patients

5 4 3 2 1 0



**Figure Three:**  
**Pain while Bending/Lifting Responses Broken Down for Active and Inactive Patients**





## Discussion

Results indicate that active patients scored on average lower on the overall ODI questionnaire. This means that these patients reported less pain in day-to-day tasks when compared to inactive patients. When looking at the responses to the questions pertaining to bending/lifting, sitting, and overall pain the active patients tend to report less pain than the inactive patients. These results show that when patients are educated on the best practices for recovery, they tend to report less pain thus an easier recovery.

These findings match those of previous studies. Educating patients about their recovery and best postoperative practices have shown to reduce pain and assist in making the postoperative experience easier. This information can assist clinicians in reducing the amount of postoperative complications which will save both time and resources. Further research is needed to determine if this trend holds true when various care instructions are implemented. As spinal procedures continue to grow in number it is important that new methods are developed to help patients perform day-to-day tasks without pain.

## Conclusion

Patients who were more active with online patient engagement technology reported less pain when performing daily tasks. As spinal procedures are trending upward it is important to continue researching best practices for a smooth recovery. Force Therapeutics provides educational care instructions to all patients to better plan for their recovery beforehand. Additional studies can be administered to determine if engagement in various care instructions will further decrease the overall raw score of the ODI questionnaire.

# About Force

Force Therapeutics was founded in 2010 as an episode-based digital care platform and research network designed to help clinicians intelligently extend their reach. Our platform leverages video and digital connections to directly engage patients at every step of the care journey – from the point of surgery scheduling, to post-op recovery and beyond. Backed by the insights of more than 60 leading healthcare centers across the country, Force is proven to drive more effective recovery, lower costs, and achieve better patient outcomes.

## References

- 1 [https://journals.lww.com/clinorthop/fulltext/2006/02000/trends\\_and\\_variations\\_in\\_the\\_use\\_of\\_spine\\_surgery.23.asp](https://journals.lww.com/clinorthop/fulltext/2006/02000/trends_and_variations_in_the_use_of_spine_surgery.23.asp)
- 2 <https://www.umms.org/ummc/health-services/orthopedics/services/spine/patient-guides/complications-spine-surgery>
- 3 <https://www.columbiaspine.org/condition/spinal-deformities/>