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# Improving Outcomes in Elective Spine Surgery Through the Development and Implementation of a Standardized Clinical Pathway

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## Background

- Clinical pathways are evidence-based management plans used to guide providers in decision-making with the goal of standardizing care.
- A standardized care process has been shown to reduce risk of adverse events, improve clinical outcomes, and reduce length of stay and associated costs.
- Development and assessment of spine clinical pathways is critical for future practice given the expected increase in number of cases and associated costs.
- The purpose of this study is to develop and implement an elective spine surgery clinical pathway with the goal of standardizing care in order to improve patient outcomes and reduce associated cost burdens.

## Problem Statement

- This study aims to evaluate the impact of a standardized clinical pathway on outcome metrics for elective spine surgery.

## Methods

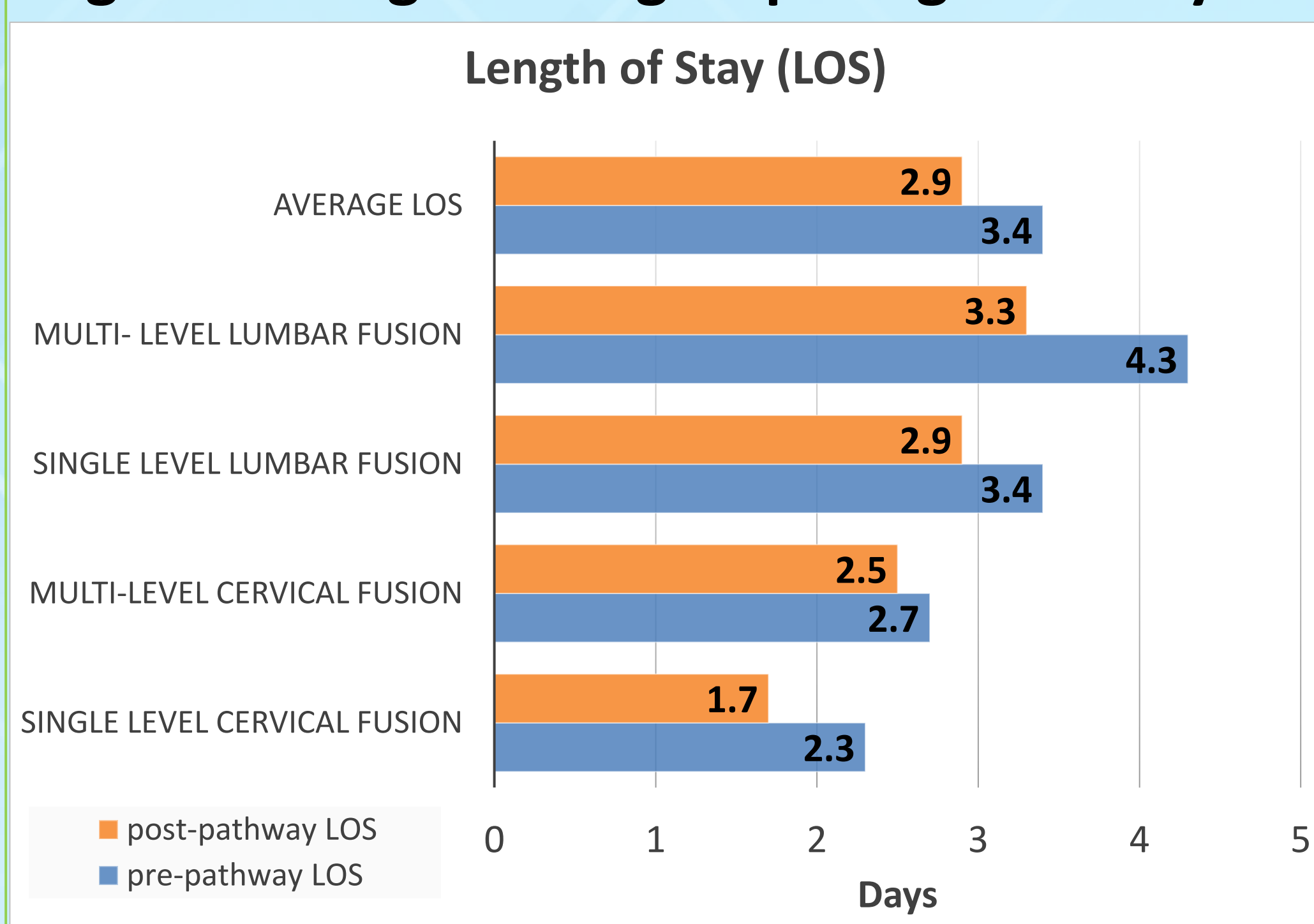
- A total of 202 patients who underwent elective spine surgery between July 2016 and December 2016 were identified for retrospective analysis.
- A clinical chart review was conducted to analyze: clinical characteristics, length of stay (LOS), surgical site infection (SSI) rates, 30-day readmission rates, discharge disposition, and post-operative mortality.
- A clinical pathway was developed based on these results in addition to team-based discussions.
- A 2<sup>nd</sup> cohort of 179 patients were identified for retrospective analysis after the pathway was fully implemented.
- Categorical variables were compared using Chi-square and independent student t test in SPSS version 25.

## Results Gathered

**Table 1. Patient Characteristics**

	Pre-pathway	Post-pathway
<b>Total patients</b>	202	179
<b>Age (median, range)</b>	65 (29-86)	62 (26-91)
<b>Sex</b>		
<b>Males (n, %)</b>	99 (49)	83 (46)
<b>Females (n, %)</b>	103 (51)	96 (54)
<b>Single level cervical fusion (n, %)</b>	15 (7.4)	7 (4)
<b>Multi-level cervical fusion (n, %)</b>	33 (16.3)	24 (13.4)
<b>Single level lumbar fusion (n, %)</b>	105 (52)	96 (53.6)
<b>Multi-level lumbar fusion (n, %)</b>	49 (24.3)	52 (29)

**Figure 1. Surgical Subgroup Length of Stay**



**Table 2. Outcome Measures**

	Pre-pathway	Post-pathway	p-value
<b>Average LOS (days)</b>	3.4 ± 2.3	2.9 ± 1.9	0.02
<b>30-day readmission rate (n, %)</b>	14 (6.9)	9 (5.0)	0.44
<b>SSI rate (n, %)</b>	1 (0.5)	2 (1.1)	0.51
<b>Discharge to Home or Self-Care (n, %)</b>	121 (60)	143 (80)	<0.0001
<b>Discharge to Home Health (n, %)</b>	51 (25)	7 (4)	<0.0001
<b>Discharge to Rehab Facility (n, %)</b>	14 (7)	16 (9)	0.47
<b>Discharge to Skilled Nursing Facility (n, %)</b>	16 (8)	13 (7)	0.71

## Discussion

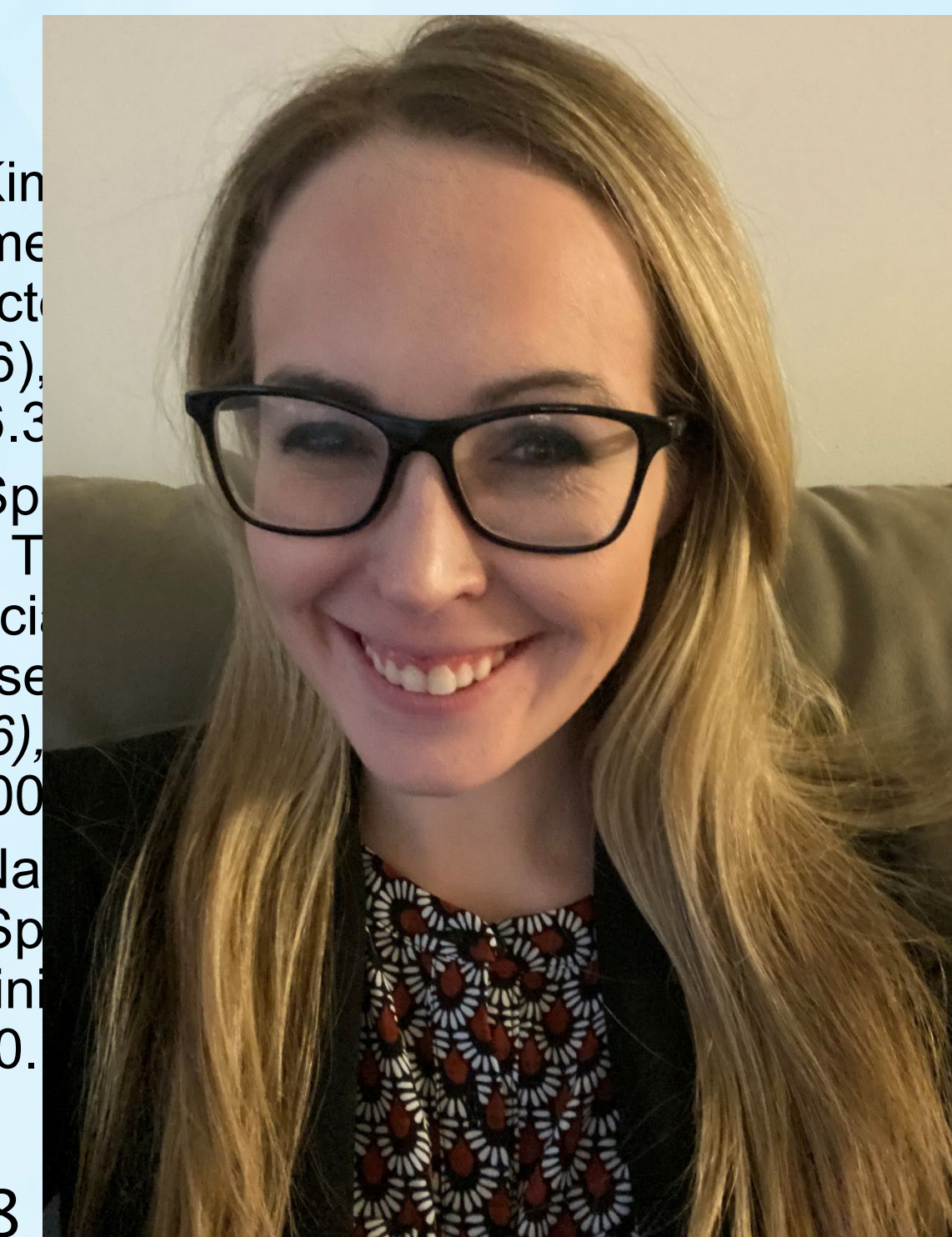
- Development and implementation of a clinical pathway for patients undergoing elective spine surgery demonstrated a potential impact on reducing LOS and improving discharge disposition.
- Reductions in length of stay and resources required after discharge help alleviate cost burden.
- A valid concern associated with reduced LOS is a consequential increase in 30-day readmissions rates. This study demonstrated a reduction rather than an increase in 30-day readmission rates.
- The national rate of SSIs among individuals undergoing primary lumbar fusions is reported to be close to 8.8%, significantly greater than the SSI rates in this study's cohorts.

## Conclusions and Implications

- Implementation of a clinical pathway for patients undergoing elective spine surgery shows the potential to reduce LOS and increase rates of discharge to home, without any increase in readmission rates.
- The next step in this project will investigate the theoretical cost savings aspect of this quality improvement endeavor.

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