

## Patient's Perceived Flexibility After a Spinal Fusion

Effat Rahman, BS<sup>1</sup>; Vishal Sarwahi, MD<sup>1</sup>; Katherine Eigo, BA<sup>1</sup>; Sayyida Hasan, BS<sup>1</sup>; Keshin Visahan, BS<sup>1</sup>; Himanshu Rao, BS<sup>1</sup>; Brittney Moncrieffe, BS<sup>1</sup>; Kiara Thompson, BS<sup>1</sup>; Hannah Travers, MS<sup>1</sup>; Sanjeev Suratwala, MD, MBA<sup>1</sup>; Yungtai Lo, PhD<sup>2</sup>; Terry Amaral, MD<sup>1</sup>

<sup>1</sup> Cohen Children's Medical Center, Northwell Health, New Hyde Park, NY, USA

<sup>2</sup> Albert Einstein College of Medicine, Bronx, NY, USA

**Category: Spine (tie)**

**Recipient: Effat Rahman, BS**



**Background:** Surgical intervention aims to prevent progression, as well as achieve optimal and permanent correction of scoliosis. Spinal fusion has been associated with loss of functional flexibility in patients postoperatively. The aim of this study is to evaluate patient's self-assessed flexibility before and after spinal fusion for AIS.

**Methods:** Retrospective chart review and survey of 330 participants, 210 AIS patients who underwent PSF between 2016-2024, and 120 non-operative control patients. The validated flexibility questionnaire, answered via phone or email, asked various questions on flexibility such as preoperative and postoperative flexibility and activity levels on a Likert scale ranging from 1 (indicating severely limited flexibility and sedentary lifestyles) to 10 (representing high flexibility and activity levels).

**Results:** 210 patients underwent PSF, with lowest instrumented vertebra of T9-L4. 151 patients were fused to L3/L4, and 59 patients were

fused to T12/L1. Demographic and radiographic information, including age, BMI; preoperative and postoperative Cobb angles, and LOS were similar between the two groups ( $p > 0.05$ ).

Preoperatively, self-assessed flexibility (L3/L4: 7.0 vs T12/L1: 7.0;  $p = 0.62$ ) and activity levels Likert scale results (L3/L4: 7.0 vs T12/L1: 7.0;  $p = 0.30$ ) were similar. Postoperatively, both groups had similar flexibility (L3/L4: 7.0 vs T12/L1: 6.0;  $p = 0.23$ ) and activity levels (L3/L4: 7.0 vs T12/L1: 8.0;  $p = 0.21$ ). Self-assessed flexibility levels did not change preoperatively and postoperatively for T12/L1 (pre: 7.0 vs. post: 7.0;  $p = 0.87$ ) patients but were lower postoperatively for L3/L4 (pre: 7.0 vs. post: 6.0;  $p = 0.001$ ). Activity levels were similar for both L3/L4 (pre: 7.0 vs. post: 7.0;  $p = 0.39$ ) and T12/L1 (pre: 7.0 vs post: 8.0;  $p = 0.15$ ) preoperatively and postoperatively.

L3/L4 patients were able to touch their toes similarly before and after surgery (pre: 64.2% vs. post: 56.3%;  $p = 0.38$ ); likewise, for T12/L1 (pre: 59.3% vs. post: 57.6%;  $p = 1.0$ ). These groups have similar preoperative toe touch rates to the nonoperative control population (L3/L4: 64.2%; T12/L1: 59.3%; Control: 52.5%;  $p = 0.21$ ). Both L3/L4 and T12/L1 patients returned to sports 3 months postoperatively ( $p = 0.40$ ). 20.4% of L3/L4 and 33.3% of T12/L1 patients who were not able to touch their toes preoperatively gained toe touch ability postoperatively.

**Conclusion:** Our study's findings suggest that adolescent's flexibility levels postoperatively returned to the same level as they were preoperatively. Although there was a statistically significant difference in flexibility level before and after surgery for the L3/L4 group, the clinical observation of toe-touch indicates these patients have similar preoperative and postoperative flexibility levels. Therefore, although the patients felt their flexibility had decreased, clinically they had similar flexibility levels before and after surgery. This is contrary to the common belief that fusion to L3/L4 restricts patients' flexibility, activities, and ability to touch toes; this belief should be further investigated being cognizant of a patient's subjective perception of their own flexibility.

*Reprinted with Permission from the American Academy of Pediatrics (AAP). The AAP Section on Orthopaedics presents the Young Investigator Awards (YIA), which recognize the best abstract presentations by students, residents, and fellows at the AAP National Conference and Exhibition. The YIA Awards are supported by a grant from POSNA through an endowment established by Dr. Robert Cady.*

<https://doi.org/10.1016/j.jposna.2024.100144>