

Conservative or Surgical Treatment? Developing a Parent-Centered Decision Tool with Conjoint Analysis in Low-Grade Pediatric Spondylolisthesis

Eva Doi¹, Carter Rigby¹, Sachin Sengupta¹, Joshua Broussard¹, Rutledge C. Clement, MD²

¹Louisiana State University Health Sciences Center, School of Medicine and Children's Hospital of New Orleans,

²Department of Orthopedics

INTRODUCTION: Spondylolisthesis in adolescents is a relatively common pediatric complication that can result from a variety of insults, including congenital, sports trauma, and degeneration. Spondylolisthesis occurs when a vertebra is displaced (slipped) in front of the vertebra below it¹. Most often, it is accompanied by or secondary to spondylolysis, a fracture of pars interarticularis. The degree of the forward slip is indicated by grades: grade 1 (0-25%), grade 2 (26-50%), grade 3 (51-75%), and grade 4 (76-100%). Grades 3 and 4 are considered high-grade slips and are most often treated with surgery. Low-grade slips are often successful with conservative treatment but can sometimes progress to requiring surgery¹. For this purpose, our study will focus on low-grade spondylolisthesis. Conjoint analysis has been extensively utilized to explore patient preferences in medical decision-making across a spectrum of orthopedic pathologies and procedures. However, its application specifically to investigate treatment preferences in low-grade pediatric spondylolisthesis has yet to be explored within scholarly discourse. This study's objective is to quantify parent preferences for surgical versus non-surgical treatment of low-grade pediatric spondylolisthesis by using conjoint analysis to assess the relative importance of key treatment factors influencing shared decision-making.

METHODS: This study will use an online conjoint analysis survey, distributed via the Prolific platform, to assess U.S. parents' preferences for surgical versus non-surgical treatment of low-grade pediatric spondylolisthesis. Eligible participants will be adults over 18 with at least one child aged 13–17. Surveys, created in Sawtooth software, will present treatment scenarios varying in risk of requiring surgical intervention, treatment failure, and surgical complications. Data will be self-reported, anonymous, and analyzed in Sawtooth to determine the relative importance of each factor. Approximately 200 participants will be recruited through Prolific.

RESULTS: Based on a review of literature, the likelihood of a child failing conservative treatment for low-grade spondylolisthesis can range between 10 and 16%. The risk of serious surgical complications was estimated to be 5%. From the literature, we created 3 attributes, each with 3 levels of possible clinical outcomes.

DISCUSSION: The main purpose of this study is to determine when parents would prefer their child with low-grade spondylolisthesis to undergo surgery. We predict that the risk of requiring surgery after initial treatment course be the most important to parents, as has been documented in other conjoint analyses of orthopedic conditions². Potential limitations to this study include various latencies between onset of symptoms and presentation.

SIGNIFICANCE/CLINICAL RELEVANCE: Current treatment decisions for low-grade pediatric spondylolisthesis lack standardization and often rely on clinician judgment, making conjoint analysis a useful tool to quantify patient preferences and support more personalized, evidence-based care.

REFERENCES:

1. Margetis, K., & Gillis, C. C. (2025, March 28). *Spondylolisthesis*. In *StatPearls*. StatPearls Publishing.
2. Catanzano, A. A. Jr., Hutyr, C., Risoli, T. J., Green, C. L., Mather, R. C., & Alman, B. (2023). Cast or nail? Using a preference-based tool for shared decision-making in pediatric femoral shaft fracture treatment. *Journal of Pediatric Orthopaedics*, 43(8), 498–504.

ACKNOWLEDGEMENTS: Dr. Carter Clement, Armandi Smith, and the LSUHSC Department of Orthopedics