

A Sliding-Scale for the Minimum Clinically Important Difference in ODI for Lumbar Spine Surgery

Ahilan Sivaganesan MD; Matthew J. McGirt MD; Anthony L. Asher MD FACS; Clinton J. Devin MD

Vanderbilt University Department of Neurosurgery and Orthopaedics, Nashville TN

Carolina Neurosurgery and Spine Associates, Charlotte NC

Introduction

The achievement of a minimum clinically important difference (MCID) in the Oswestry Disability Index (ODI) has emerged as a prominent proxy for success after lumbar spine surgery. However, it has become clear that patients with low baseline ODI have a more difficult time achieving MCID in ODI, despite being more likely to be satisfied after surgery. Here we present a novel sliding-scale MCID for ODI that is dependent on a patient's pre-operative ODI.

Methods

This study included all patients in the Quality and Outcomes Database (QOD) who underwent elective one-level lumbar fusion surgery for degenerative disease between January 2012 and December 2016. We performed a logistic regression analysis with 12-month satisfaction as the outcome, and baseline and 12-month ODI as covariates.

Results

A total of 2407 patients were included in this study. Our regression model reveals a significantly positive association between baseline ODI and the odds of satisfaction ($p < 0.0001$) and a significantly negative association between 12-month ODI and satisfaction ($p < 0.0001$). With bootstrap-based internal validation, the area under the ROC curve for this model is 0.86. Figure 1 is a three-dimensional surface plot which graphically displays the predicted probability of satisfaction in relation to baseline and 12-month ODI. Table 1 lists the minimal ODI improvement necessary for at least a 50% probability of satisfaction, for each decile of baseline ODI, based on that plot.

Conclusions

There is a clear "goal-line" effect wherein the achievement of MCID for ODI becomes more difficult as baseline ODI decreases. This highlights the need for an alternative conception of MCID, not as a uniform threshold for every patient, but as a sliding-scale. We present this sliding scale MCID for ODI, in which the threshold value decreases as baseline ODI decreases.

Learning Objectives

By the conclusion of this session, participants should be able to: 1) Describe the relationship between baseline ODI and the ease of achieving traditional MCID for ODI, 2) Discuss the weaknesses of a uniform MCID threshold for all lumbar surgery patients, and 3) Understand the usefulness of a sliding scale MCID threshold as presented here.

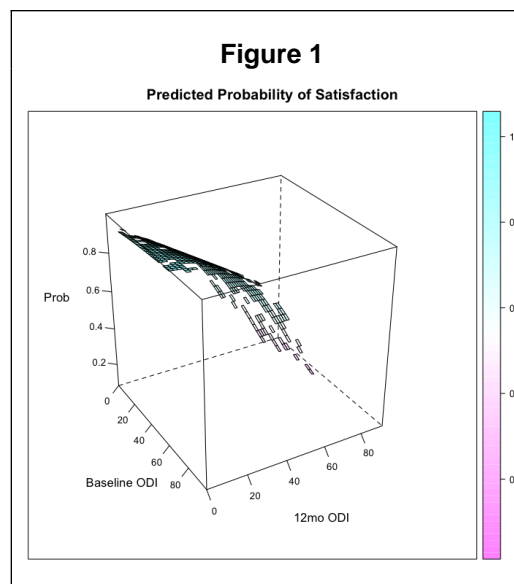


Table 1

Baseline ODI	MCID
100	30
90	23
80	17
70	10
60	3
50	0
40	0
30	0
20	0
10	0

A sliding scale of MCID thresholds