Does Achieving MCID-W Predispose Patients to Higher Rates of Revision?

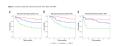Perry Lee Lim, Christopher Michael Melnic, Hany S Bedair[1]
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INTRODUCTION: The Minimally Clinically Important Difference (MCID) has been a benchmark in assessing patient-reported outcomes following orthopedic interventions, particularly in total joint arthroplasty (TJA). However, recent research has highlighted an under-investigated facet of MCID, Minimally Clinically Important Difference for Worsening (MCID-W), and its potential impact on surgical outcomes in TJA patients. This study aims to elucidate the association between achieving MCID-W and rates of future revision, shedding light on a previously overlooked aspect of patient outcomes in orthopedic surgery.

METHODS: This retrospective study was performed using 2,787 primary TJA (1,563 TKAs and 1,224 THAs) patients with minimum five-year follow-up. Patient-Reported Outcomes Measurement Information System (PROMIS) Physical Function Short Form 10a (PF-10a) scores were collected at the preoperatively and one-year postoperatively. Patients were classified based on reaching MCID for Improvement (MCID-I), MCID-W, or "no change" after TJA (scores between MCID-I and MCID-W). MCID-W and MCID-I values were determined by a distribution method. Revision-free survival was compared at 1-year, 3-year, and 5-year postoperatively.

RESULTS:

A total of 2,787 primary TJA cases were included in this study **(Table 1)**. Among the cohort, 1,967 patients achieved MCID-I, 573 patients experienced "No Change," and 247 patients achieved MCID-W. Patients with MCID-W had significantly higher revision rates at 1-year (3.6% vs. 0.8%, P < .001), 3-year (5.3% vs. 1.1%, P < .001), and 5-year (5.7% vs. 1.5%, P < .001) compared to those with MCID-I **(Table 2)**. Stratifying the data into TKAs and THAs similarly showed that patients with MCID-W had higher revision rates at 1-year, 3-year, and 5-year intervals. Revision-free survival curves for TJA patients achieving MCID-W demonstrated lower survival at 1-year, 3-year, and 5-year (P < .001 for all) **(Figure 1)**. The most common revision indications for TKA were aseptic loosening (24%) and infection (22%) **(Table 3)**, while for THA, they were infection (30%) and dislocation (26%) **(Table 4)**.

DISCUSSION AND CONCLUSION: The present study underscores the significance of MCID-W in TJA patients, revealing its association with higher revision rates compared to those achieving MCID-I. Incorporating MCID-W into outcome assessments could aid early complication detection and intervention and guide clinicians in proactive management. Future studies utilizing MCID-W as a predictive tool are needed to determine its effectiveness in optimizing TJA patient outcomes.

Figure 1. 5-year revision-free survival curves for TJA, TKA, and THA.

Table 1. Demographics Table Comparing TJA PROMIS PF-10a MCID-I and MCID-W

Table 2. TJA PROMIS PF-10a MCID-I and MCID-W Revision Outcomes

Table 3. Indications for Revision TKA

Indication	Patients, % (n = 41)
Aseptic Loosening	10 (24%)
Infection	9 (22%)
Pain	8 (20%)
Instability	7 (17%)
Arthrofibrosis/Stiffness	5 (12%)
Other	2 (5%)

TKA, total knee arthroplasty

Table 4. Indications for Revision THAs

Indication	Patients, % (n = 27)
Infection	8 (30%)
Dislocation	7 (26%)
Periprosthetic Fracture	6 (22%)
Aseptic Loosening	4 (15%)
Pain	2 (7%)

THA, total hip arthroplasty