

Collecting Long-Term (5 to 10 Years) Patient-Reported Outcome Measures May Be Unnecessary for Total Hip Arthroplasties

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INTRODUCTION: The clinical relevance ratio (CRR) was developed to account for the loss of follow up in clinical studies reporting patient-reported outcomes measures (PROMs). However, no study has tested its use with original outcome data for total hip arthroplasties (THA). Therefore, this study aimed to 1) determine the proportion of patients that had a clinically significant improvement in PROMs at each follow-up visit following THA; and 2) calculate the CRR over time for PROMs following THA.

METHODS:

Eight independent studies reporting PROMs at baseline to 10 years for 2,540 patients who underwent primary THA in Europe, or the United States were aggregated. In total, 2,653 THAs performed from 1996 to 2021 were included (**Table 1**). A distribution-based minimal clinically important difference (MCID) threshold was used to determine which patients had a clinically significant improvement in PROMs. The CRR was calculated by dividing the number of cases that met the MCID threshold by the number of cases at the beginning of the study. The maximum follow-up time was 10 years.

RESULTS:

The proportion of THA patients that had a clinically significant improvement in PROMs at each follow-up visit is summarized separately for US and EU studies (**Tables 2-3**). For US studies, MCID attainment was higher for Harris Hip Score (HHS), Physical Composite Score (PCS), and European Quality of Life-5 Dimensions Questionnaire subscale for Time Trade-Off (EQ5DTTO) compared to other PROMs (**Table 2**). For EU studies, MCID attainment was greatest for HHS and Oxford Hip Score (OHS; **Table 3**). General health PROMs for EQ5D-Visual Analog Scale (VAS) and Mental Composite Score (MCS), as well as the Lower Extremity Activity Scale (LEAS), had the lowest percentages of score improvements. Overall, most improvements in PROM scores stabilized 1 year postoperatively (**Figure 1**). However, while the proportion of cases with clinically significant improvements in PROM scores for THA was stable after a short period of fluctuations at early follow-up visits, the CRR decreased remarkably over time (**Figure 2**). The tipping point where the CRR began decreasing for THA studies was mainly at the 1-year follow-up timepoint.

DISCUSSION AND CONCLUSION:

The clinical relevance ratio for PROMs decreases significantly after short-term follow-up periods for THA patients. Long-term PROM collection at 5 to 10 years and analysis may be unnecessary following THA. Arthroplasty surgeons should focus on 1-year PROMs to assess clinically significant improvements after THA.

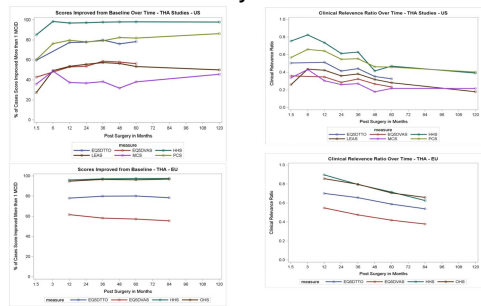


Table 1. Demographic characteristics of the study cohorts

Characteristic	n (%)
Region	US, n (%)
Number of cases	2,540
Number of patients	2,540
Age in years	69.7 (SD 13.88)
Gender, n (%)	
Male	1,273 (50.1%)
Female	1,267 (49.9%)
BMI (kg/m ²)	28.8 (4.1) (IQR 24.7-31)
Ethnicity, n (%)	
White	4,526 (95.2%)
Not Hispanic or Latino	1,650 (97.2%)
Unspecified	884
Race, n (%)	
American Indian or Alaska	7 (0.4%)
Asian	13 (0.5%)
Black or African	109 (4.3%)
Native Hawaiian or other	2 (0.1%)
Pacific	2 (0.1%)
White	1,560 (62.2%)
Unspecified/NA	895
Cigarette use, n (%)	
Never	1,295 (50.9%)
Current cigarette smoker	242 (9.5%)
Ex cigarette smoker	455 (17.9%)
Unspecified	464
Alcohol use, n (%)	
Never	1,217 (47.9%)
Not in last year	391 (15.4%)
< 1 Drink/Week	914 (35.6%)
1-2 Drink/Week	476 (18.7%)
3-4 Drink/Week	170 (6.7%)
5+ Drink/Week	53 (2.1%)
Unspecified	489
Primary diagnosis, n (%)	
Osteoarthritis	2,469 (97.2%)
Rheumatoid Arthritis	23 (0.9%)
Alcohol-Related	11 (0.4%)
Other	48 (1.9%)
Unspecified	1
Medical condition, n (%)	
None	446 (16.9%)
Cancer	273 (10.7%)
Cardiovascular	1,315 (49.8%)
Diabetes	175 (6.9%)
Dementia	376 (14.8%)
Depressive/Anxiety	699 (27.5%)
Immune system/Infectious	11 (0.4%)
Neurological	199 (7.8%)
Non-skeletal	346 (13.6%)
Respiratory	393 (15.5%)
Schizophrenia	26 (1.0%)
Unspecified	86 (3.4%)
Other	583 (22.9%)

Table 2. PROMs Data for the U.S. (n=1,273)

Study	MCID Attainment	Clinical Relevance Ratio	Visit Months for Group
EQU5DTTO	Baseline n (%)	270	21.2
	Baseline n (%)	270	21.2
	Baseline n (%)	270	21.2
	Baseline n (%)	270	21.2
EQU5DVAS	Baseline n (%)	114	9.0
	Baseline n (%)	114	9.0
	Baseline n (%)	114	9.0
	Baseline n (%)	114	9.0
EQU5DPCS	Baseline n (%)	211	16.6
	Baseline n (%)	211	16.6
	Baseline n (%)	211	16.6
	Baseline n (%)	211	16.6
EQU5DLEAS	Baseline n (%)	101	7.9
	Baseline n (%)	101	7.9
	Baseline n (%)	101	7.9
	Baseline n (%)	101	7.9
HHS	Baseline n (%)	270	21.2
	Baseline n (%)	270	21.2
	Baseline n (%)	270	21.2
	Baseline n (%)	270	21.2
LEAS	Baseline n (%)	101	7.9
	Baseline n (%)	101	7.9
	Baseline n (%)	101	7.9
	Baseline n (%)	101	7.9
MCS	Baseline n (%)	270	21.2
	Baseline n (%)	270	21.2
	Baseline n (%)	270	21.2
	Baseline n (%)	270	21.2
PCS	Baseline n (%)	270	21.2
	Baseline n (%)	270	21.2
	Baseline n (%)	270	21.2
	Baseline n (%)	270	21.2

Table 3. PROMs Data for the EU (n=1,267)

Study	MCID Attainment	Clinical Relevance Ratio	Visit Months for Group
EQU5DTTO	Baseline n (%)	270	21.2
	Baseline n (%)	270	21.2
	Baseline n (%)	270	21.2
	Baseline n (%)	270	21.2
EQU5DVAS	Baseline n (%)	114	9.0
	Baseline n (%)	114	9.0
	Baseline n (%)	114	9.0
	Baseline n (%)	114	9.0
EQU5DPCS	Baseline n (%)	211	16.6
	Baseline n (%)	211	16.6
	Baseline n (%)	211	16.6
	Baseline n (%)	211	16.6
EQU5DLEAS	Baseline n (%)	101	7.9
	Baseline n (%)	101	7.9
	Baseline n (%)	101	7.9
	Baseline n (%)	101	7.9
HHS	Baseline n (%)	270	21.2
	Baseline n (%)	270	21.2
	Baseline n (%)	270	21.2
	Baseline n (%)	270	21.2
OHS	Baseline n (%)	270	21.2
	Baseline n (%)	270	21.2
	Baseline n (%)	270	21.2
	Baseline n (%)	270	21.2

EQ5D: EuroQol-5 Dimensions Questionnaire; EQ5DVAS: EQ5D Visual Analog Scale; EQ5DPCS: EQ5D Physical Composite Score; EQ5DLEAS: EQ5D Lower Extremity Activity Scale; HHS: Harris Hip Score; MCS: Mental Composite Score; PCS: Physical Composite Score.