

# How Accurate Is the CMS Definition of Success for Patients Undergoing Total Hip Arthroplasty?

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## INTRODUCTION:

Total hip arthroplasty (THA) is a highly effective treatment for patients with advanced arthritis. The U.S. Centers for Medicare & Medicaid Services (CMS) defines a successful THA as achieving a minimum 22-point improvement in the HOOS-JR score. However, the accuracy of this criterion and how it correlates with patient satisfaction remains unclear. This study aimed to evaluate the validity of the CMS success criteria following primary THA.

## METHODS:

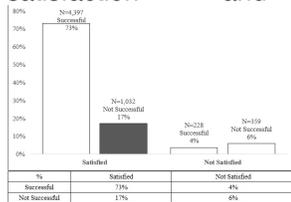
A multicenter cohort of 6,016 patients undergoing primary THA was prospectively enrolled. Patient demographics, medical and musculoskeletal comorbidities, and patient reported outcomes including SF-36 MCS and HOOS-JR scores were collected preoperatively and at one year after THA. Patient satisfaction was assessed using the International Society of Arthroplasty Registries (ISAR) satisfaction scale at one year after THA. Patients were categorized as successful or unsuccessful based on CMS criteria and as satisfied or dissatisfied based on the ISAR scale. Univariate analysis (Mann-Whitney U test for continuous variables and Chi-square test for categorical variables) was performed to show the differences between the satisfied and successful groups. Cross-classification of outcomes was performed, and a multivariate logistic regression model was used to identify factors associated with patients satisfied after THA yet labelled as “unsuccessful” by the CMS-definition.

## RESULTS:

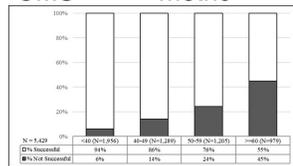
At one-year post-op, 90% of patients reported satisfaction; however, only 77% met the CMS criteria for success. Among satisfied patients, just 73% were classified as successful by CMS standards (**Figure 1**). There were significant differences between the satisfied and successful patients’ groups with respect to age, health literacy, narcotic use, back pain, contralateral hip pain, and baseline SF-36 mental and HOOS-JR scores (**Figure 2**). Discordance between success and satisfaction was strongly associated with baseline HOOS-JR scores. Among satisfied patients with low baseline scores (HOOS-JR < 40), 94% met the CMS success definition. Conversely, only 55% of satisfied patients with higher baseline scores (HOOS-JR ≥ 60) were deemed successful (**Figure 3**). Predictors of satisfied patients classified as unsuccessful based on the CMS-definition included obesity, narcotic use, back pain, contralateral hip pain, limited health literacy, and poor SF-36 mental health and HOOS-JR scores (**Figure 4**).

## DISCUSSION AND CONCLUSION:

A substantial discrepancy exists between patient satisfaction and the CMS definition of success following THA. A more nuanced, risk-adjusted success metric that accounts for preoperative baseline scores may better align with patient satisfaction and improve the CMS metric for success after THA.



Variables	N	%	% Satisfied	% Successful
<b>Total</b>	<b>6,016</b>	<b>100%</b>	<b>90.2</b>	<b>76.9</b>
Age				
<65	2,373	40%	89.8	78.5 *
≥65	3,545	60%	90.6	75.9
Sex				
Female	3,447	58%	89.8	77.6
Male	2,518	42%	91.0	76.0
Body Mass Index				
<20	142	2%	90.1	76.1
20 to <30	2,950	50%	90.6	77.3
30 to <40	2,396	41%	89.7	76.2
≥40	379	6%	90.5	79.4
Health Literacy				
Extremely	3,979	69%	91.2	77.4
Quite a bit	1,638	18%	87.6	75.3
Somewhat	480	8%	87.3	74.2
A little bit	127	2%	89.8	74.0
Not at all	150	3%	89.3	83.5
Narcotic Use for >90 Days				
Yes	473	8%	85.4	73.8
No	5,300	92%	90.6	77.1
Back Pain				
None	2,325	41%	91.6	76.9
Mild	1,551	27%	91.6	76.1
Moderate	1,374	24%	89.5	77.4
Severe	487	8%	85.2	76.8
Pain in non-surgical Hip				
None	3,158	53%	92.6	78.8 ***
Mild	1,338	22%	88.0	73.6
Moderate	818	14%	87.3	73.5
Severe	684	11%	87.6	79.2
Mental Health Score <sup>a</sup>				
<40	960	16%	84.3	79.2
40-49	1,224	20%	88.1	76.9
≥50	3,825	64%	92.4	76.3
Baseline HOOS-JR <sup>b</sup>				
<40	2,220	37%	88.1	90.0 ***
40-49	1,428	24%	90.2	80.7
50-59	1,309	22%	92.1	71.1
≥60	1,059	18%	92.5	51.5



Variables	N	OR	95% CI	P-value
Age in 10 years	5,340	0.98	0.90, 1.07	0.601
Male	2,291	0.96	0.81, 1.14	0.638
BMI				
<20	128	0.90	0.51, 1.60	
20 and <30 (Reference)	2,973	1	1	
≥30	2,149	1.36	1.14, 1.62	<b>0.003</b>
Health Literacy (Reference)	3,600	1	1	
Extremely	3,979	1.21	0.97, 1.51	
Quite a bit	1,638	1.58	1.00, 2.50	<b>0.009</b>
Somewhat	479	1.50	1.00, 2.06	
A little bit	114	1.98	1.00, 3.61	
Not at all	134	1.58	0.90, 2.78	
Narcotic Use for >90 Days	468	1.39	1.15, 1.67	<b>0.006</b>
Back Pain (Reference)	2,329	1	1	
Mild	1,421	1.25	1.02, 1.53	
Moderate	1,229	1.66	1.33, 2.07	<b>&lt;0.001</b>
Severe	415	1.17	1.20, 1.54	
Pain in non-surgical Hip (Reference)	2,924	1	1	
Mild	1,177	1.45	1.18, 1.78	
Moderate	714	1.88	1.46, 2.42	<b>&lt;0.001</b>
Severe	599	2.73	1.90, 3.74	
Diabetes	61	1.82	0.70, 3.85	0.253
Diabetes	654	1.26	0.97, 1.63	0.080
Connective Tissue Disease	521	1.35	1.00, 1.82	0.049
Cardiac Disease	308	1.10	0.75, 1.60	0.637
Pulmonary Vascular Disease	134	1.45	0.83, 2.52	0.191
Ischemic Disease	139	0.69	0.43, 1.17	0.002
SF-36 MCS - Global Mental Health Score in 10 years	5,423	0.85	0.78, 0.92	<b>&lt;0.001</b>
Baseline HOOS-JR Score in 10 years	5,429	2.71	2.50, 2.94	<b>&lt;0.001</b>
AUC			<b>0.80</b>	