

# Extended Prophylactic Antibiotic Use Following Total Hip Arthroplasty Does Not Impact Patient-Reported Outcome Measures: Propensity-Matched Analysis

Isaiah Freeman, BSc<sup>1</sup>; Muhammad Hamza Ilyas, MD<sup>1</sup>; Hahn Kang, BSc<sup>1</sup>; William Sampson, BA<sup>1</sup>; Pengwei Xiao, PhD<sup>1</sup>; Carlo Mannina, BSc<sup>1</sup>; Oh-Joon Kwon<sup>1</sup>; Zhijun Li, PhD<sup>1</sup>; Oh-Jak Kwon<sup>1</sup>; Margaret Arthur<sup>1</sup>; Sina Afzal, MD<sup>1</sup>; Michelle Shimizu, MD<sup>1</sup>; Young-Min Kwon, MD, PhD<sup>1</sup>  
<sup>1</sup>Bioengineering Laboratory, Massachusetts General Hospital/Harvard Medical School, Boston, MA  
[ymkwon@mgh.harvard.edu](mailto:ymkwon@mgh.harvard.edu)

**Disclosures:** Isaiah Freeman (N), Muhammad Hamza Ilyas (N), Hahn Kang (N), William Sampson (N), Pengwei Xiao (N), Carlo Mannina (N), Oh-Joon Kwon (N), Zhijun Li (N), Oh-Jak Kwon (N), Margaret Arthur (N), Sina Afzal (N), Michelle Shimizu (N), Young-Min Kwon (5-MicroPort, 5- Depuy, 5- Smith & Nephew, 5- Stryker, 5- Zimmer Biomet, 5- Medacta)

**INTRODUCTION:** Periprosthetic joint infection (PJI) is the most common cause of revision following primary total hip arthroplasty (THA), accounting for up to 26% of cases. The use of extended prophylactic antibiotics (EPAs) following primary THA has been suggested to decrease the risk of 90-day postoperative infection in high-risk patient populations. However, there is currently no consensus on their utility in primary THA patients with paucity of data on their potential influence on Patient-Reported Outcome Measures (PROMs). The aim of this study was to analyze the potential impact of extended prophylactic antibiotics use following primary THA on PROMs with a propensity-matched analysis.

**METHODS:** An institutional database was utilized to retrospectively identify 8,085 patients who underwent primary THA. Nearest neighbor propensity-controlled matching was conducted in 1:3 ratio with a 0.2 caliper based on the following covariates: age, sex, body mass index, American Society of Anesthesiologists Score, diabetes, congestive heart failure, renal and liver disease, osteoporosis, osteopenia, chronic obstructive pulmonary disease, stroke, and smoking and alcohol status. The Patient-Reported Outcomes Measurement Information System (PROMIS) Physical Function Short Form 10a (SF-10a), PROMIS Global Health Physical (PROMIS Physical), PROMIS Global Health Mental (PROMIS Mental), and the Hip Disability and Osteoarthritis Outcome Score-Physical Function Short Form (HOOS-PS) were extracted. Absolute preoperative and postoperative scores, change in scores (delta score), and the Minimal Clinically Important Difference (MCID) were calculated for each PROM. Proportions of improvement, no change, and worsening were tabulated for both groups.

**RESULTS:** After matching, 165 patients with extended prophylactic antibiotics (EPAs) and 495 patients without EPA remained for analysis with no differences in cohort demographics (p>0.05). No differences in 90-day surgical site infection, readmission, reoperation, pulmonary embolism, deep vein thrombosis, cardiac arrest, myocardial infarction, sepsis, or acute kidney injury were observed (p>0.05). One- and two-year complication rates of revision, PJI, dislocation, periprosthetic fracture, and osteolysis showed no significant differences between groups (p>0.05). Absolute preoperative and postoperative scores, delta scores, and the proportion of patients with improvement, no change, and worsening were equal in the SF-10a, PROMIS Mental, PROMIS Physical, and HOOS-PS between EPA and non-EPA patients (p > 0.05).

**DISCUSSION:** Despite suggested benefits in PJI mitigation in high-risk patients, in the current study, extended prophylactic antibiotics following primary THA had no significant impact on complications or PROMs. These findings suggest that extended prophylactic antibiotic use does not confer improvements in outcomes following primary THA. Future prospective randomized trials are needed to identify which patient subgroups derive the most significant benefit and to determine the optimal duration of extended prophylaxis while avoiding unnecessary antibiotic use.

**SIGNIFICANCE/CLINICAL RELEVANCE:** Extended prophylactic antibiotic use following primary total hip arthroplasty was not associated with significant changes in complication rates or patient-perceived outcomes.

	No Antibiotic Use	Antibiotic Use	P Value
<b>SF-10a</b>	N = 466	N = 143	
Postop Score	43.72 ± 9.16	44.29 ± 8.86	0.6723
Delta Score	8.70 ± 8.60	9.52 ± 8.28	0.4329
Improved	326 (70%)	107 (75%)	0.3087
<b>PROMIS Global Mental</b>	N = 467	N = 154	
Postop Score	51.84 ± 9.44	52.47 ± 8.62	0.6385
Delta Score	2.73 ± 7.46	2.45 ± 7.78	0.5828
Improved	206 (44%)	62 (40%)	0.4575
<b>PROMIS Global Physical</b>	N = 466	N = 154	
Postop Score	47.01 ± 9.42	47.90 ± 9.50	0.3145
Delta Score	7.59 ± 8.53	8.06 ± 8.93	0.532
MCID-I	311 (67%)	110 (71%)	0.3264
<b>HOOS -PS</b>	N = 384	N = 115	
Postop Score	81.55 ± 15.90	80.05 ± 16.85	0.4849
Delta Score	27.31 ± 19.34	24.43 ± 19.34	0.0768
Improved	333 (87%)	92 (80%)	0.1033

**Table 1.** Patient-Reported Outcome Measures of patients with and without prophylactic extended antibiotics following primary total hip arthroplasty.