

Socioeconomic Deprivation is Associated with Discharge to Non-Home Facilities Following Revision Total Hip and Knee Arthroplasty

Blake M. Bacevich BSc¹, Michelle Shimizu BSc¹, Anirudh Buddhiraju MD¹, Jona Kerluku BSc¹, Oh-Jak Kwon¹, Tony Lin-Wei Chen MD, PhD¹, Ziwei Huang MD, PhD¹, MohammadAmin RezazaadehSaatlou MD¹, Shane Fei Chen MA¹, Henry Hojoon Seo BA¹, Young-Min Kwon MD, PhD¹

¹Bioengineering Laboratory, Department of Orthopaedic Surgery, Massachusetts General Hospital, Harvard Medical School, Boston, MA
ymkwon@mgh.harvard.edu

Disclosures: Blake M. Bacevich (N), Michelle Shimizu (N), Anirudh Buddhiraju (N), Jona Kerluku (N), Oh-Jak Kwon (N), Tony Lin-Wei Chen (N), Ziwei Huang (N), MohammadAmin RezazaadehSaatlou (N), Shane Fei Chen (N), Henry Hojoon Seo (N), Young-Min Kwon (5- MicroPort; 5- Depuy; 5- Smith & Nephew; 5- Stryker; 5- Zimmer Biomet)

INTRODUCTION: Non-home discharge (NHD) after total hip and knee joint arthroplasty (TJA) has been consistently associated with higher rates of adverse events and increased healthcare utilization. Understanding the factors influencing NHD rates in patients undergoing revision TJA is crucial due to the unique challenges of their recovery process. While social determinants of health have gained recognition for having an influential role in the health outcomes of TJA patients, research into their relationship with discharge disposition in revision TJA patients is limited. The social deprivation index (SDI) is a well-established measure of socioeconomic deprivation; however, its association with NHD rates in revision TJA patients has yet to be explored. Thus, the aim of this study was to evaluate the association between SDI and NHD following revision TJA.

METHODS: A retrospective analysis was conducted on 1,043 consecutive patients who underwent a revision THA or TKA from a single tertiary referral institution following Institutional Review Board approval. The primary outcome was discharge disposition, categorized into home or non-home discharge, with the latter category including rehabilitation and skilled nursing facilities. SDI scores were analyzed as both a linear variable and categorized into quartiles within the study cohort: quartile 1 (Q₁; representing the least deprived, below the 25th percentile), quartile 2 (Q₂; 25th–50th percentile), quartile 3 (Q₃; 50th–75th percentile), and quartile 4 (Q₄; above the 75th percentile). To compare patient characteristics between the two discharge disposition groups (i.e., home vs. non-home discharge), independent t-tests or Chi-square tests were utilized depending on the variable type. Univariate and multivariate logistic regression analyses were also conducted to investigate the association between SDI and discharge disposition.

RESULTS: 334 (32%) patients were discharged to services such as rehabilitation or skilled nursing facilities following revision TJA. The average SDI was significantly higher in patients with NHD following surgery compared to their home discharge counterparts (31 vs. 25; p<0.001). SDI was a significant determinant of discharge disposition in patients who have undergone revision hip or knee TJA on univariate analysis (OR=1.01; 95% CI=1.00–1.01; p=0.002; Table 1). SDI continued to be an independent variable associated with discharge on multivariate logistic regression, with higher SDI scores demonstrating higher odds of NHD. When categorized into quartiles, SDI remained a statistically significant factor of discharge disposition (p=0.016). Patients living in areas of greater disadvantage (Q₄) had 1.86 higher odds of non-home discharge compared to patients in the least deprived (Q₁) group (p=0.007; Table 2). Older age, public or no insurance, higher ASA score (≥ 3), and higher CCI score were also all associated with higher odds of NHD (Table 1, 2).

DISCUSSION: This study found that higher social deprivation index (SDI) scores, reflecting greater social disadvantage, are associated with increased odds of non-home discharge (NHD), suggesting that patients residing in areas with higher levels of socioeconomic disadvantage may face additional challenges and barriers to recovery and rehabilitation after revision total hip and knee joint arthroplasty. These findings highlight the importance of integrating social determinants of health into discharge planning and resource allocation for patients undergoing revision TJA to improve overall patient outcomes and promote equitable healthcare delivery.

SIGNIFICANCE/CLINICAL RELEVANCE: Integration of social determinants of health into discharge planning and resource allocation for patients undergoing revision TJA is important to improve overall patient outcomes, promote equitable healthcare delivery, and foster a more inclusive healthcare system.

Table 1. Univariate logistic regression for discharge disposition in revision TJA patients.

Variables	Odds ratio (95% confidence interval)	P-value
Age	1.08 (1.07–1.10)	<0.001
BMI	1.00 (0.97–1.02)	0.663
Sex (female)	0.70 (0.54–0.91)	0.007
Race (white)	1.54 (0.88–2.70)	0.135
Ethnicity (Non-Hispanic)	2.03 (0.76–5.43)	0.159
Insurance (private)		<0.001
Public	2.21 (1.64–2.96)	<0.001
No insurance	2.85 (1.03–7.88)	0.044
ASA (1–2)	3.81 (2.86–5.07)	<0.001
Depression	1.21 (0.82–1.79)	0.343
Drug abuse	0.35 (1.56–0.62)	0.345
Alcohol	0.82 (0.62–1.09)	0.166
CCI score	1.23 (1.15–1.32)	<0.001
SDI	1.01 (1.00–1.01)	0.002

Table 2. Multivariate logistic regression to determine the association between SDI and discharge disposition.

Variables	Odds ratio (95% confidence interval)	P-value
Age	1.07 (1.05–1.10)	<.001
BMI	1.01 (0.98–1.03)	0.54
Sex (female)	0.74 (0.539–1.00)	0.052
Race (white)	1.95 (0.952–3.99)	0.068
Ethnicity (Non-Hispanic)	7.25 (0.75–70.13)	0.087
Insurance (private)		0.268
Public	1.34 (0.94–1.91)	0.111
No insurance	1.50 (0.39–5.78)	0.554
ASA (1–2)	3.07 (2.23–4.24)	<.001
Depression	1.07 (0.67–1.71)	0.785
Drug abuse	1.66 (0.54–5.09)	0.378
Alcohol	0.64 (0.46–0.88)	0.007
CCI score	0.99 (0.90–1.08)	0.748
SDI, continuous	1.01 (1.00–1.02)	0.004
SDI, categorical (Q ₁)		0.016
Q ₂	0.96 (0.64–1.43)	0.837
Q ₃	0.97 (0.63–1.49)	0.883
Q ₄	1.86 (1.18–2.91)	0.007