

Evaluating Disparities in Access to Surgical Management for Symptomatic Rotator Cuff Tears: A National Database Study

Zachary Logan Laporte¹, Nathan J Cherian, Christopher Thomas Eberlin², Michael C Dean, Kaveh Torabian, Kieran Dowley, Stephen Gillinov¹, Bilal Sohail Siddiq, Scott David Martin

¹Massachusetts General Hospital, ²Sports Medicine - MGB

INTRODUCTION: Rotator cuff pathologies are common among the United States geriatric population. While some patients respond to conservative treatment, surgical intervention for symptomatic rotator cuff tears has been established as an effective and evidence-based treatment option. Given the expanding recommendations for surgical intervention and the increasing popularity of arthroscopic rotator cuff repair procedures, it is important to objectively identify disparities that are unduly influenced by social determinants of health. Prior investigations have been limited to source data at the state-level. Expanding on these frameworks, the purpose of this study was to identify variation in the rates of surgical management of rotator cuff tears based on race, ethnicity, insurance type, and socioeconomic status on a national scale.

METHODS:

Patients diagnosed with a full or partial rotator cuff tear from 2006-2014 were identified in the Healthcare Cost and Utilization Project's National Inpatient Sample database using International Classification of Diseases, Ninth Revision (ICD-9) diagnosis codes. ICD-9 procedure codes were used to stratify patients into surgical and nonsurgical cohorts (**Figure 1**). Bivariate analysis using chi-square tests and adjusted, multivariable logistic regression models were used to evaluate differences in the rates of surgical versus nonsurgical management for rotator cuff tear patients based on race/ethnicity, insurance type, and ZIP code median household income quartile.

RESULTS:

A total of 46,167 patients were diagnosed with a rotator cuff tear during the study period, of which 33,617 (72.8%) were managed surgically (**Table 1**). When compared with white patients, adjusted analysis showed that minority race and ethnicity were associated with lower rates of surgical management for Black [adjusted odds ratio (AOR): 0.31, 95% confidence interval (CI): 0.29-0.33; $p < 0.001$], Hispanic [AOR: 0.49, 95% CI: 0.45-0.52; $p < 0.001$], Asian or Pacific Islander [AOR: 0.72, 95% CI: 0.61-0.84; $p < 0.001$], and Native American patients [AOR: 0.65, 95% CI: 0.50-0.86; $p = 0.002$] (**Table 2**). In comparison to privately insured patients, our analysis also found that self-payers [AOR: 0.08, 95% CI: 0.07-0.10; $p < 0.001$], Medicare beneficiaries [AOR: 0.76, 95% CI: 0.72-0.81; $p < 0.001$], and Medicaid beneficiaries [AOR: 0.33, 95% CI: 0.30-0.36; $p < 0.001$] had lower odds of receiving surgical intervention. Additionally, relative to those in the bottom income quartile, patients in all other quartiles experienced nominally higher rates of surgical repair; these differences were statistically significant for the second quartile [AOR: 1.09, 95% CI: 1.03-1.16; $p = 0.004$].

DISCUSSION AND CONCLUSION:

There are significant nationwide disparities in the likelihood of receiving surgical management for rotator cuff tear patients of differing race/ethnicity, payer status, and socioeconomic status. Further investigation is needed to fully understand and address causes of these inequalities to provide equitable care.

Figure 1. Flowchart Detailing Patient Selection

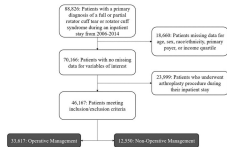


Table 1. Baseline Demographics for Patients Undergoing Inpatient Management of a Rotator Cuff Tear*

	N (n=46,167)	n (%)	p-value
Age	12,922 (27.9%)	28,245 (61.2%)	<0.001
Male	36,971 (79.9%)	4,974 (10.7%)	<0.001
Race	4,487 (9.7%)	15,588 (33.8%)	<0.001
Female	8,079 (17.5%)	18,468 (40.1%)	
Marital Status	1,882 (4.1%)	26,773 (58.0%)	<0.001
Black	2,422 (5.2%)	2,280 (4.9%)	
White	218 (0.5%)	539 (1.2%)	
Asian or Pacific Islander	46 (0.1%)	408 (0.9%)	
Hispanic	86 (0.2%)	408 (0.9%)	
Native American	26 (0.1%)	408 (0.9%)	
Primary Payer	2,281 (4.9%)	16,888 (36.6%)	<0.001
Private Insurance	1,281 (2.8%)	12,212 (26.5%)	
Medicare	1,281 (2.8%)	12,212 (26.5%)	
Medicaid	58 (0.1%)	58 (0.1%)	
Self-Pay	82 (0.2%)	28 (0.1%)	
No Charge	16 (0.0%)	16 (0.0%)	
ZIP Code Median Income Quartile	8,887 (19.2%)	8,887 (19.2%)	<0.001
Q1 (1st - 24th percentile)	2,281 (5.0%)	8,887 (19.2%)	
Q2 (25th - 49th percentile)	2,281 (5.0%)	8,887 (19.2%)	
Q3 (50th - 74th percentile)	2,281 (5.0%)	8,887 (19.2%)	
Q4 (75th - 99th percentile)	2,281 (5.0%)	8,887 (19.2%)	

*Data are reported as n (%). p-values are for chi-square tests. All statistical tests were statistically significant at $p < 0.05$.

Table 2. Results of Multivariate Logistic Regression (Adjusted Odds Ratios)

	Adjusted Odds Ratio (95% CI)	p-value
Race/Ethnicity*		
Black	0.31 (0.29-0.33)	<0.001
Hispanic	0.49 (0.45-0.52)	<0.001
Asian or Pacific Islander	0.72 (0.61-0.84)	<0.001
Native American	0.65 (0.50-0.86)	0.002
Primary Payer Status*		
Medicare	0.76 (0.72-0.81)	<0.001
Medicaid	0.33 (0.30-0.36)	<0.001
Self-Pay	0.08 (0.07-0.10)	<0.001
Median Income Quartile†		
Q2 (25th - 49th percentile)	1.09 (1.03-1.16)	0.004
Q3 (50th - 74th percentile)	1.07 (1.01-1.13)	0.024
Q4 (75th - 99th percentile)	1.02 (0.96-1.08)	0.542
Interaction Terms (p < 0.05, CI Excludes 1.0)		
Medicare: Black		
Medicare: Self-Pay		
Medicare: Native American		
Medicare: Q1 (1st - 24th percentile)		