A Clavien-Dindo 30-Day Adverse Event Burden Analysis of Racial Disparities Trends in Total Shoulder Arthroplasty 2012-2021

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INTRODUCTION: Total shoulder arthroplasty (TSAs) is an increasingly common glenohumeral joint procedure utilized to treat a variety of pathologies including arthritis, proximal humerus fractures, and rotator cuff injuries. As the number of TSAs performed continues to rise, concerns persist that racial disparities analogous to those observed in total knee and total hip arthroplasty may arise. This project aims to perform a temporal analysis of TSA racial disparities in utilization and adverse events trends observed in a national database from 2012-2021.

METHODS: This study utilized the American College of Surgeons National Surgical Quality Improvement Database (ACS-NSQIP). Adult patients who underwent a TSA as defined by Current Procedural Terminology (CPT) code between 2012-2021 were included. The primary outcome was the proportion of TSAs performed by race, and secondary outcomes included the Clavien-Dindo Classification (CD) score by case volume over time. The CD Classification score standardizes the grading of surgical complications and correlates in a weighted fashion with the severity of adverse events from a quality of life and cost perspective. Chi-Square analyses were conducted to assess categorical variables.

RESULTS:
From 2012-2021, a total of 32,365 TSAs were identified in the ACS-NSQIP database. Analysis revealed 90% of TSAs were conducted on White patients, 5.1% on Black patients, 0.79% on Hispanic patients, and 4.1% on White Hispanic patients. From 2012 to 2021, the proportion of TSAs performed in White patients decreased from 93% to 88%, while Black, Hispanic, and White Hispanic patient proportions saw a slight increase, though this was not statistically significant (Figure 1). A statistically significant difference in CD classification was noted when comparing White, Black, Hispanic only, and White Hispanic patients undergoing TSA(p<.01, Table 1).

DISCUSSION AND CONCLUSION:
This study underscores an important dichotomy: while there has been a significant rise in TSAs from 2012-2021, a persistent racial disparity in their utilization remains. Moreover, substantial differences in surgical complications, as demonstrated by CD score analyses, were found among varying racial and ethnic groups. Future research must thoroughly investigate the contributing factors and potential barriers to these disparities. The identification and understanding of such elements are critical for creating strategies that encourage more equal utilization of TSAs among diverse   populations.
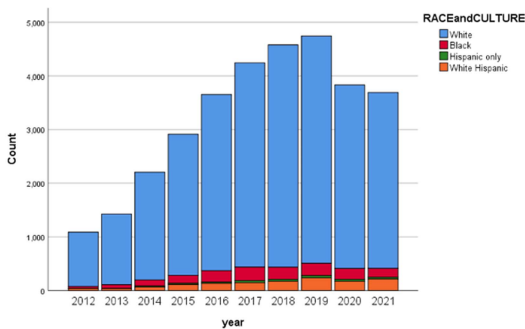

Figure 6. Proportion of Surgeries by Race/Culture for Each Year.

Table 1. Comparison of Clavien-Dindo Classification across Race/Ethnicity Groups.

CD Classification	White	Black or AA	Hispanic Only	White and Hispanic	P Value
CD classification without Death	.25 (1.27)	.34 (1.43)	.28 (1.45)	.36 (1.44)	P<.01
CD classification with Death	.26 (1.32)	.35 (1.47)	.30 (1.72)	.36 (1.49)	P<.01