Associations of preoperative patient mental health status, sociodemographic and clinical characteristics with baseline pain, function and satisfaction in patients undergoing revision rotator cuff repairs

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Introduction: Baseline symptoms related to pain and function are commonly used to determine surgical intervention, however, little is known about the factors that associate with baseline pain and function in patients undergoing revision rotator cuff repair. This study aimed to investigate the associations of general patient and disease-specific factors with baseline patient reported outcome measures (PROMs) in patients undergoing revision rotator cuff repair. We hypothesized that tear size and mental health status, as assessed by VR-12 MCS, would be associated with baseline total PENN Shoulder Score (PSS) and its pain, function, and satisfaction sub-scores. Baseline patient characteristics in this revision cohort were also compared to those in patients undergoing primary rotator cuff repair [1]. **Methods:** Patients undergoing revision repair of recurrent superior-posterior rotator cuff tendon tears at the Cleveland Clinic between February 2015 and May 2022 were considered for the study. Patients with superior-posterior rotator cuff tears that were not repaired, or with isolated revision repair of subscapularis tears were excluded. Preoperative patient characteristics in the revision cohort were compared to an institutional cohort of patients undergoing primary rotator cuff repair of superior-posterior rotator cuff tears with the same inclusion/exclusion criteria (n=1,442 cases). Twenty-one preoperative patient and disease-specific factors were then prospectively identified as possible statistical predictors for baseline PROMs in the revision cohort. Multivariable statistical modeling and Akaike's Information Criterion (AIC) comparisons were used to investigate the unique associations with, and relative importance of these preselected factors in statistically accounting for variation in baseline PSS. **Results:** A total of 305 cases undergoing revision superior-posterior rotator cuff tendon repair performed by 26 surgeons met inclusion criteria. Patients had a median age of 59 years, BMI of 29.7 kg/m2, 13 years of education, and VR-12 MCS of 50. Patients were most commonly white (91%), males (64%), having revision repair of a full-thickness (90%) large/massive-sized (54%) tear. When compared to patients undergoing primary rotator cuff repair, the revision repair cohort was more likely to be white (91% vs. 84%, p=0.003), with lower CCI (0.0 vs. 1.0, p<0.001), and lower VR-12 MCS (50 vs. 53, p=0.009), and more likely to have a full-thickness (90% 76%, p<0.001), large/massive-sized (54% vs. 39%, p<0.001) tear with complete rupture of the long head of the biceps tendon (37% vs. 12%, p<0.001) and some evidence of glenohumeral arthritis (19% vs. 8%, p<0.001). *Associations with Baseline PROMs:* Median baseline total PSS was 36 (median pain 11, function 23, and satisfaction 1) in the revision cohort. Eight of 21 variables investigated were associated with one or more baseline PSS scores, with general patient factors more highly associated with these scores than disease-specific factors. Higher VR-12 MCS was significantly associated with higher PSS-total, pain and function scores, and male sex was significantly associated with higher PSS-total and function scores. Insurance status was associated with PSS-function scores, with Medicare and Medicaid insurance associated with lower scores. Non-White race was associated with lower PSS-pain; higher BMI with lower PSS-function; and lower education, lower CCI, and absence of glenohumeral arthritis associated with lower PSS-satisfaction scores (Fig 1). Baseline VR12-MCS, insurance status and sex were the top three factors in the models for baseline PSS-total and function scores (Fig 2). Rotator cuff status, including type and size of the recurrent superior-posterior rotator cuff tear and subscapularis status, were not associated with baseline PSS or its sub-scores. **Discussion:** Several general patient and disease-specific factors were associated with baseline PROMs in patients undergoing revision rotator cuff repair, with mental health status most strongly associated. Patients undergoing revision rotator cuff repair were more commonly White with lower mental health status and worse rotator cuff pathology than patients undergoing primary rotator cuff repair, however, severity of the recurrent rotator cuff tear was not found to be significantly associated with baseline PROMs in this revision cohort. Further studies are needed to investigate if factors associated with poor baseline pain, function and satisfaction predict poor postoperative PROMs.

Reference: 1. Sahoo *et al*, AJSM 2020; 48(2):432–443

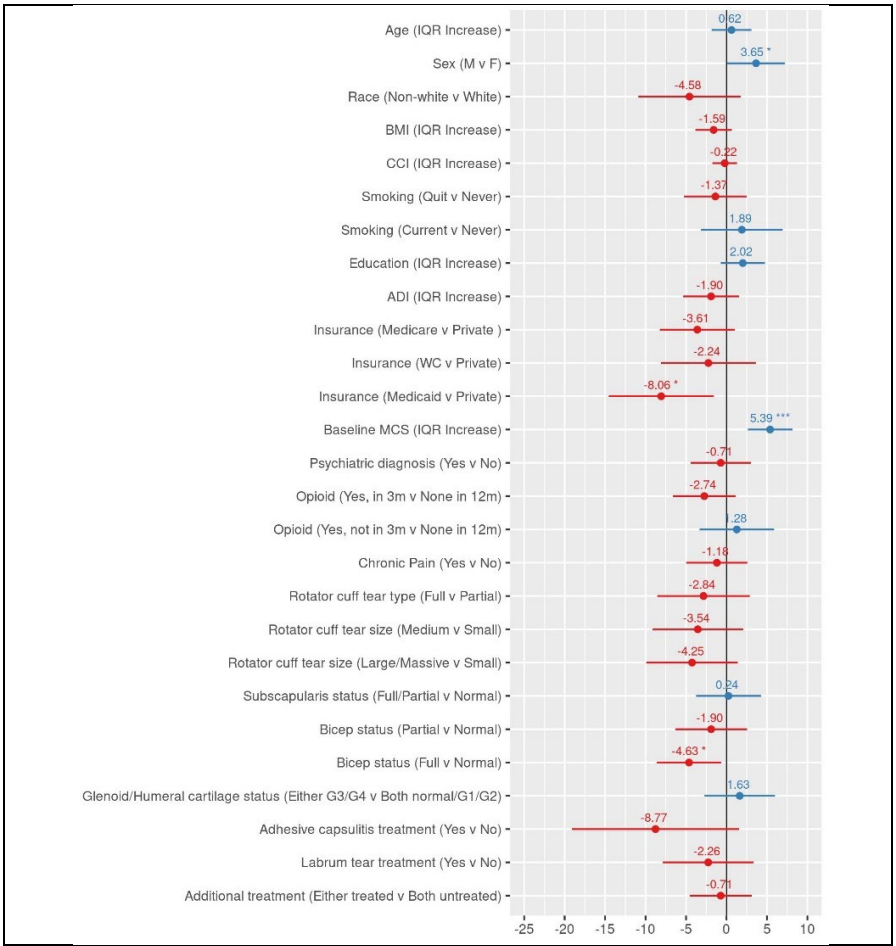

Figure 1. Estimated coefficients and 95% confidence intervals of predictors for baseline total PSS. Negative associations are indicated by red lines, while positive associations are represented by blue lines. The significance of each estimate is denoted by asterisks (*p < 0.05, ***p < 0.001).

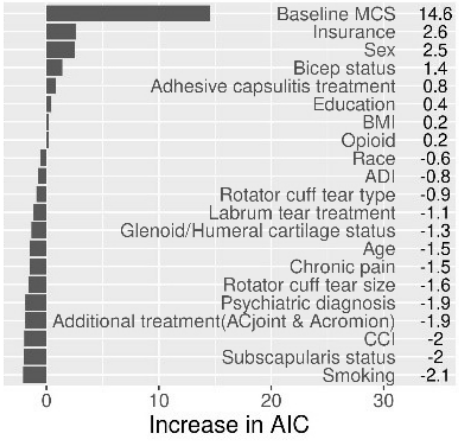

Figure 2. Relative variable importance of general patient and disease-specific factors on baseline total PSS, based on the increase in AIC upon removal from the full model. The most influential variables are listed at the top of the chart.