Patient Reported Outcomes at Six Months Predict Two Year Outcomes and Healthcare Utilization Following Arthroscopic Rotator Cuff Repair

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Background: Rotator cuff tears are common, particularly in older populations, and are often treated with arthroscopic rotator cuff repair (RCR). While recovery can be prolonged, early functional outcomes are thought to predict long-term success. The American Shoulder and Elbow Surgeons Standardized Shoulder Assessment Form (ASES) is widely used to assess shoulder function, but its predictive value at 6 months postoperatively remains unclear. This study aims to determine whether ASES scores at 6 months can predict successful long-term outcomes at 2 years and assess its correlation with healthcare utilization.

Materials and Methods: We examined patient reported outcomes (PROs) at 6 months to understand their predictive value for future PRO success and orthopaedic visit utilization. All patients who underwent RCR and had documented PRO data preoperatively, at 6 months, and at 2-years postoperatively were considered. These patients were linked to an Orthopaedic Patient Data Repository (OPDR) to determine their shoulder-related health system encounters in the first 2 years post-RCR. Encounters were summed between 6 months and 2 years and dichotomized into <2 versus 2 or more. A receiver operator curve (ROC) was used to establish a cut point of ASES at 6 months that predicted a successful outcome at 2 years, which was defined as a terminal ASES score ≥86. Area under the curve (AUC) and the ASES cut score with 95% confidence intervals (CIs) were calculated. The lower bound of the CI was used as the ultimate cut point from which additional analyses were performed. Logistic regression, using this lower bound cut score, established odds ratios that a patient would attend 2 or more E&M visits and achieve a terminal ASES score ≥86 in the next 18 months. Significance was determined a priori at α=0.05.

Results: Three-hundred eighty (380) patients met the inclusion criteria of having all requisite information. A slight majority of patients were male (53%), and mean age was 66.2 ± 9.2 years at the time of surgery. Mean pre-operative ASES was 48.0 ± 18.0 and mean 2-year ASES was 88.0 ± 15.5. Seventy-two percent of patients achieved a successful 2-year ASES (≥86). A ROC curve had an AUC of 0.773 and established a 6-month ASES score of 79.8 (95% CI 69.9, 84.9) as predictive of a successful 2-year outcome. Patients that failed to achieve the lower bound ASES at 6 months (≥70) were 2.4 (95% CI: 1.4, 4.0) times more likely to have 2 or more shoulder-related encounters and 92% (95% CI: 85%, 96%) less likely to achieve a successful 2-year ASES (≥86).

Conclusion: Our findings indicate that patients who do not achieve an adequate 6-month ASES score of 70 are not as likely to achieve successful 2-year outcomes and 2.4 times more likely to require increased shoulder-related care over the following 18 months. These results align with previous studies demonstrating that the majority of functional improvement occurs within the first six months postoperatively and that the six-month timepoint is critical for identifying patients at risk of poor recovery and increased healthcare utilization. Early identification enables targeted interventions to optimize rehabilitation outcomes and reduce unnecessary healthcare resource use. Further research is needed to validate these findings and explore additional factors that may influence patient recovery and outcomes following RCR.

Patient Information	All & by 2-Year ASES PASS Status			p-value
	All	<86	≥86	
Count	392	108 (28%)	284 (72%)	<0.001
Sex = Female	182 (46%)	56 (52%)	126 (44%)	0.225
Age	66.2±9.1	64.4±9.6	66.9±8.8	<0.001
Pre-Op ASES	48.3±18.0	43.3±17.5	50.1±17.8	0.020
Pre-Op VR12‡ PCS*	36.6±8.1	34.9±8.1	37.3±8.0	0.012
Pre-Op VR12‡ MCS**	52.7±10.7	49.1±11.7	54.1±10.0	<0.001
Smoking Status = Not Current	19 (5%)	320 (9%)	136 (11%)	0.068
Tear Size = Large/Massive	208 (53%)	57.4±12.5	61.6±11.5	0.855

‡Veterans RAND 12-Item General Health Survey *Physical & **Mental Component Score

ASES by PASS: RCR

RCR - 2-Year PASS Achieved: Baseline ASES 50, 6-Month ASES 85, 2-Year ASES 96
RCR - 2-Year PASS Not Achieved: Baseline ASES 43, 6-Month ASES 69, 2-Year ASES 69