

1 **Short Running Title:** Rotator Cuff Repair and Study Designs

2 **Title:** How Do Rotator Cuff Repair Study Designs Correlate with Revision Rates? A Systematic Review

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8 **Abstract**

9 *Background:*

10 The most common cause of shoulder disability is a rotator cuff tear. Advances in surgical techniques and  
11 patient risk factor identification have allowed for significant improvements in functional outcomes after  
12 rotator cuff repairs. Revision rate is a ubiquitously utilized primary outcome for rotator cuff repair  
13 studies. Understanding how this metric correlates to different elements of study designs across academic  
14 papers is key to interpreting results.

15 *Purpose:*

16 To assess the correlation between study designs elements and revision rates following rotator cuff repair.

17 *Study Design:*

18 Systematic Review

19 *Methods:*

20 A systematic search of the PubMed, Embase, and Cochrane Library databases was conducted. The  
21 following search terms were used by two different researchers on 3/20/21 and 4/2/21 - ((Rotator cuff  
22 repair[Title/Abstract]) AND (Revision[Title/Abstract]) NOT (Systematic Review[Title/Abstract]) NOT  
23 (arthroplasty[Title/Abstract])). All English-language studies published between 2002 and 2021 were  
24 manually reviewed for revision rate as a primary outcome to primary rotator cuff repair. Revision rate for  
25 the purposes of this review is defined as the percentage of primary rotator cuff repairs that underwent  
26 revision. If a paper had multiple study groups, they were separated for purposes of this systematic review.

27 *Results:*

28 We included 16 studies with 25 total treatment groups. 5 level IV studies and 11 level III studies  
29 encompassed a total of 95,578 patients. Of these treatment groups, the revision rate was compared by the  
30 study style (prospective vs retrospective), sample size, time required to follow up, time to follow up,  
31 average age, and post-operative American Shoulder and Elbow Surgeons (ASES) score. Quantitatively,  
32 no significant difference was found between revision rates of retrospective and prospective studies. Not  
33 statistically significant increases in revision rate were seen with a larger number of patients, time required  
34 to follow-up, average age of patient, and post-operative ASES scores. The only statistically significant  
35 correlation was between time required to follow up and revision rate (.42, p<0.05).

36 *Conclusions:*

37 A statistically significant positive correlation between time required to follow-up and revision rate is  
38 logically consistent with the idea that more time passing will result in more rotator cuff repair failures.  
39 The results of this study provide a useful methodological reference for reviewers to use when evaluating  
40 the validity of rotator cuff repair studies and trends in data.

41 *Keywords:*

42 Rotator Cuff Repair; Rotator Cuff Tear; Revision; Reference; ASES; Arthroscopy; Systematic Review

43 *Level of Evidence:*

44 Level of Evidence of Evidence I

45 *What is known about the subject:*

46 Previous work has discussed the relevance of the study design and how it effects outcomes for shoulder  
47 dislocation rates, but at this point, multiple large rotator cuff repair studies have not been pooled together  
48 to look at trends that correlate with outcomes.

49 *What this study adds to existing knowledge:*

50 This systematic review should serve as a useful reference for reviewers of papers focusing on rotator cuff  
51 tears in order to compare revision rates to other papers' interventions and study designs.