

Rate of Arthroscopic Rotator Cuff Repair Performed at Ambulatory Surgery Centers Remains Low Despite Significant Cost Savings for the Healthcare System

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INTRODUCTION: The objectives of this study are to 1) understand the differences in costs between rotator cuff repair (RCR) performed in ambulatory surgery center (ASC) versus outpatient hospital (OH) settings; 2) determine the patient's out-of-pocket expenditure and surgical team reimbursement; and 3) characterize trends in expenditure for RCR over time.

METHODS: We identified patients who had undergone outpatient arthroscopic RCR in the United States (US) using a large healthcare database. The database was chosen for its large, national sample of privately insured patients. Patients who had Current Procedural Terminology (CPT) code 29827 between April 1, 2013 and June 30, 2018 were included. Revision RCR procedures and procedures with a concomitant arthroscopic or open biceps tenodesis, Bankart repair, superior labrum anterior and posterior (SLAP) repair, lysis of adhesions (CPT: 29828, 23430, 29806, 29807, 29825) were excluded. Day-of-surgery expenditure was identified by summing all claims billed with an "immediate-procedure-related code" in a 3-day window surrounding the date of the procedure (Procedure Date \pm 1 Day). The day-of-surgery expenditure was broken down into anesthesia services, nerve block, operating room facility, surgical team, patient out-of-pocket expenditure, and other expenditures. Median and interquartile range were calculated for each variable. The breakdown of day-of-surgery expenditure and patient out-of-pocket expenditure between the OH and ASC settings were compared using two-tailed Mann Whitney U Tests. Spearman Rank Order Correlation was done for all variables to test for association between expenditure and year to determine trends over time. All values were inflation adjusted to 2018 dollars using the consumer price index for medical care.

RESULTS: A total of 43,020 patients were identified; 24,850 in the OH setting and 18,170 in the ASC setting. This converts to an ASC utilization of 42 percent over the study period. In 2018, ASC utilization was at 45%. We found that RCR performed in the OH setting resulted in 55% greater day-of-surgery expenditure ($p < 0.001$) than in the ASC setting. In the OH setting, operating room facility cost was 35% greater ($p < 0.001$), anesthesia services was 7.4% greater ($p < 0.001$), but nerve block was 2.4% lower ($p < 0.001$) (Figure 1). Additionally, for RCRs performed in the OH setting, Spearman coefficients demonstrated that immediate procedure cost ($\rho = 0.209$, $p < 0.001$) increased along with expenditure for anesthesia services ($\rho = 0.085$, $p < 0.001$), nerve block ($\rho = 0.135$, $p < 0.001$), and operating room facility cost ($\rho = 0.108$, $p < 0.001$) over our study period. For RCRs performed in the ASC setting, immediate procedure cost ($\rho = 0.309$, $p < 0.001$) increased along with expenditure for anesthesia services ($\rho = 0.116$, $p < 0.001$), nerve block ($\rho = 0.086$, $p < 0.001$), and operating room facility cost ($\rho = 0.148$, $p < 0.001$). Surgical team reimbursement was 6.3% greater in the ASC setting ($p < 0.001$), but decreased over time in both the ASC ($\rho = -0.069$, $p < 0.001$) and OH ($\rho = -0.046$, $p < 0.001$) settings. Lastly, there was no difference in patient out-of-pocket expenditure for RCRs performed in the OH setting vs. ASC setting (Table 1). However, patient out-of-pocket expenditure for RCRs is increasing in both settings (OH: $\rho = 0.147$, $p < 0.001$; ASC: $\rho = 0.203$, $p < 0.001$).

DISCUSSION AND CONCLUSION: RCR performed in an ASC setting results in significant cost savings for payers with a slight change in surgeon reimbursement and no change in patient-out-of-pocket expenditure. Most of the cost savings came from operating room facility expenditure. For the surgeon, surgical team reimbursements are higher in the ASC setting. However, the overall trend in surgical team reimbursement is downward in both the ASC and OH settings whereas the cost per RCR to the healthcare system is increasing. Thus, surgeon reimbursement is becoming a smaller percentage of the immediate procedure cost and should not be further cut when policy makers evaluate strategies to decrease the economic burden of RCRs on the healthcare system, especially when the cost savings from performing a RCR far outweigh both the amount the surgeon is reimbursed as well as the difference in surgeon reimbursement between an ASC and OH. For a healthcare system, especially under a population health perspective, the incentive to perform RCRs at an ASC is significant. The cost savings come from almost every breakdown category. The cost savings achieved per RCR in an ASC vs. an OH equals about \$4,000. With nearly 400,000 RCRs performed per year, the US healthcare system could save a projected \$1.6 billion per year on RCRs alone when the surgery is performed in an ASC. Thus, our study shows that there is a clear financial advantage to the healthcare system for RCRs being done at ASCs, although the patient does not realize these cost savings.

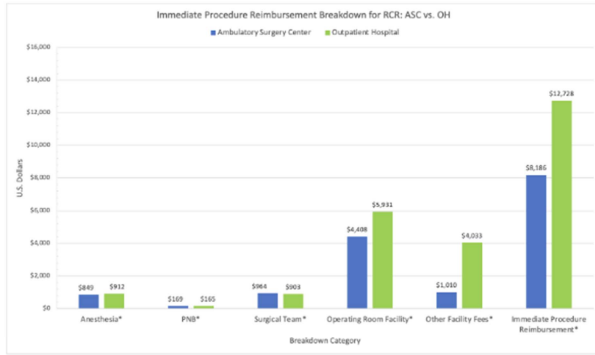


Figure 1: Breakdown of Day-of-Surgery Costs by Location procedure performed: ASC vs OH. ASC and OHs were identified using the "Place of Service" variable. The figure details expenditure for breakdown categories that were identified in >50% of cases. Categories that were coded on less than 50% of cases were excluded. The "other" category includes excluded cases and claims that were not able to be classified. * indicates statistical significance done using Mann Whitney U Test with $p < 0.001$. Day-of-surgery expenditure was lower for RCRs performed in the ASC setting, but surgical team reimbursement was essentially equivalent between the two settings.

Table 1: Patient out-of-pocket expenditure for RCR performed in ASC vs. OH surgical setting. The median, 25th percentile, and 75th percentile for patient out-of-pocket expenditure (POPE) are reported for both cohorts. Mann Whitney U analysis was used to assess for differences in POPE between the two cohorts. Over the study period, there were more RCRs performed in the OH setting vs. ASC, but there is no financial incentive for the patient to have their RCR done at an OH ($p=0.117$).

	Ambulatory Surgery Center Cohort (n = 18,170)	Outpatient Hospital Cohort (n = 24,850)
Median POPE	\$787	\$785
25th Percentile POPE	\$90	\$52
75th Percentile POPE	\$1,687	\$1,850
Mann Whitney U p-value		0.117