



# Unplanned emergency department or urgent care visits after outpatient rotator cuff repair: potential for avoidance

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**Background:** With the cost of health care rising, the potential to avoid costs from an unplanned return to the emergency department (ED) or urgent care center (UC) after elective outpatient rotator cuff repair (RCR) has been discussed but not extensively assessed.

**Methods:** Outpatient RCR procedures were queried in a closed health care system, and all unplanned ED and UC visits within 7 days of procedures were collected and compared with other typical outpatient orthopedic procedures (knee arthroscopy, carpal tunnel release, and anterior cruciate ligament reconstruction). Avoidable diagnoses (ADs) for the unplanned visits were defined in advance as visits for (1) constipation, (2) nausea or vomiting, (3) pain, and (4) urinary retention. Final tallies of all visits versus visits with ADs were compared.

**Results:** From June 2015 to May 2016, 1306 outpatient RCRs were performed (729 male and 577 female patients; average age, 60 years). Of the patients, 90 returned for ED or UC visits (6.9%), with 34 for ADs (2.6%). Pain was the most common AD. However, when RCR was compared with other case types, ED or UC visits for urinary retention were significantly more common ( $P = .007$ ), whereas there was no significant difference with the other ADs. The 1306 RCRs led to a greater proportion of ED or UC visits than the combined 5825 other cases studied ( $P < .001$ ).

**Discussion and Conclusions:** Unplanned ED visits within 7 days of outpatient RCR are measurable and in many cases, such as ED or UC visits for pain, are avoidable. Visits for urinary retention are seen more commonly after RCR. Outpatient RCR led to more unplanned ED and UC visits than other common outpatient orthopedic surgical procedures.

**Level of evidence:** Level III; Retrospective Cohort Design; Treatment Study

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Rotator cuff repair (RCR) is a commonly performed outpatient orthopedic surgery procedure that has continued to increase in frequency.<sup>6,22</sup> Although it has been established as a relatively safe outpatient procedure, there is little literature that has discussed the return to emergency departments

(EDs) or urgent care centers (UCs) in the short-term postoperative period to seek medical care.

With the cost of health care rising, attention has been placed on each part of surgical care paths to reduce avoidable costs while maintaining value. Previous studies have looked in detail at unplanned revisits after ambulatory sinonasal surgery, pediatric tonsillectomy, treatment of urinary stones, and endoscopy.<sup>4,12,19,21</sup> Few studies have looked at unplanned contact in the short-term postoperative period specifically in orthopedics.<sup>5,8,14,15</sup> Most studies that did focus on outpatient orthopedic procedures<sup>3,17,22</sup> reported readmission rates and did not account for unplanned patient contact in urgent and emergent settings where no admission occurred; therefore, those studies missed a portion of the financial impact of unplanned patient care after ambulatory surgery. Thus, the potential to avoid costs from an unplanned return to the ED or UC after elective outpatient RCR has not been extensively assessed.

The purpose of this work was to evaluate the reasons for unplanned ED or UC visits after outpatient RCR and potential for avoidance and to perform a comparison with unplanned ED or UC visits after other common outpatient orthopedic surgical procedures.

## Materials and methods

This is a retrospective, case-control, level III study that compared ED and UC visits after RCR and compared these with other common outpatient orthopedic surgical procedures. A closed health care system was retrospectively queried for all RCR procedures between June 2015 and May 2016. Furthermore, data for all knee arthroscopy, carpal tunnel release, and anterior cruciate ligament reconstruction procedures were collected and defined as “other outpatient orthopedic procedures.” All unplanned ED and UC visits within 7 days of the procedure were identified. A period of 7 days after the surgical procedure was selected because these revisits were deemed the most actionable before discharge after ambulatory surgery.

Avoidable diagnoses (ADs) were defined in advance as unplanned visits for (1) constipation, (2) nausea or vomiting, (3) pain, and (4) urinary retention. All other diagnoses at the time of presentation were considered unavoidable. Patient sex and age were also collected. Statistical analysis was done with the R program (version 3.4; R Foundation for Statistical Computing, Vienna, Austria, [www.r-project.org](http://www.r-project.org)) using the Student *t* test for parametric data and the  $\chi^2$  test for categorical data, with statistical significance defined as  $P < .05$ .

## Results

A total of 1306 RCRs were identified and compared with a total of 5825 other procedures (anterior cruciate ligament reconstruction, carpal tunnel release, and knee arthroscopy). Compared with the other outpatient surgical procedures, RCR had a statistically significantly greater proportion of male patients than female patients (55.8% and 44.2% vs 50.8% and

**Table I** Demographic characteristics of patients undergoing outpatient orthopedic procedures

	Rotator cuff repair (n = 1306)	Other procedures (n = 5825)	P value
Sex, %			.001
Male patients	55.8	50.8	
Female patients	44.2	49.2	
Age stratification, %			<.001
0-20 yr	0.2	11.7	
21-40 yr	3.2	23.1	
41-60 yr	49.7	41.6	
61-80 yr	45.7	21.2	
>80 yr	1.2	2.4	

**Table II** ED or UC visits within 7 days and visits with ADs

ED or UC visit	Rotator cuff repair (n = 1306)	Other procedures (n = 5825)	P value
Within 7 d, %	6.9	3.9	< .001
With AD, %	2.6	1.3	< .001

ED, emergency department; UC, urgent care center; AD, avoidable diagnosis.

49.2%,  $P = .001$ ) (Table I). In addition, the average age of patients undergoing RCR was 60 years, and RCR patients were mostly in the age range of 41 to 80 years, with the greatest number of patients in the 41- to 60-year age range. Among the patients undergoing the other procedures, the patient ages were statistically significantly younger, with an average age of 47 years ( $P < .001$ ). The proportion of patients undergoing other procedures was greatest in the 41- to 60-year age range as well, but patients tended to be slightly younger, with a nearly equal proportion of patients in the 21- to 40-year age group and the 60- to 80-year age group.

There were 90 ED or UC visits within 7 days after RCR. When compared with the other surgical procedures, RCR showed a statistically significantly greater proportion of visits, at 6.9% versus 3.9% for the other surgical procedures ( $P < .001$ ) (Table II). There were 34 visits with ADs in the RCR group; however, 1 patient presented with 2 ADs, yielding a total of 35 complications (37.8% of total ED or UC visits). Among the patients undergoing the other surgical procedures, there were 75 visits with ADs. This resulted in a statistically significantly greater proportion of patients who returned with ADs after RCR, at 2.6% versus 1.3% ( $P < .001$ ).

Pain was the greatest reason for returning to the ED or UC within 7 days in both groups, at 68.6% (24 visits) for RCR and 82.7% (62 visits) for the other surgical procedures (Table III). In assessing the different ADs in RCR alone, pain was statistically significantly more prevalent than the other ADs ( $P < .001$ ) (Fig. 1). This was followed by urinary

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