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## ORIGINAL ARTICLE

# The effect of expedited rotator cuff surgery in injured workers: a case-control study

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**Background:** Expediting rotator cuff surgery is expected to facilitate recovery and return to work in injured workers. This case-control study examined the effect of expedited rotator cuff surgery on recovery and work status in injured workers.

**Materials and methods:** Injured workers who had undergone an expedited rotator cuff surgery funded by parallel-pay insurance (study group) were compared with workers who had used the public health insurance (control group) while adjusting for sex, age, severity of pathology, and follow-up period. Disability was measured by the American Shoulder and Elbow Surgeons (ASES) Standardized Assessment Form score. The percentage of patients who exceeded the minimal clinically important difference of 17 points in the ASES was calculated.

**Results:** The study group waited less time to have surgery than the control group ( $P < .0001$ ), reported less disability after surgery, and had a higher number of patients whose improvement exceeded the minimal clinically important difference (119 vs. 65,  $P < .0001$ ). The study group was more likely to be working at the time of the final follow-up ( $P < .0001$ ). The final multivariable regressions, which adjusted for unmatched variables, such as dominant side involvement, mechanism of injury, and associated operations that were different between groups, were consistent with univariable analyses indicating superior results in the study group.

This study received ethics approval from the Human Ethics Research Board of the Sunnybrook Health Sciences Centre, Toronto, ON, Canada (REB# 006-2013).

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**Conclusions:** Injured workers who underwent expedited rotator cuff surgery reported less disability and had a more successful return to work after surgery than injured workers who waited longer for specialist assessment and surgery within the public health system.

**Level of evidence:** Level III; Case-Control Design; Treatment Study

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Work-related injuries to the shoulder joint are a significant cause of disability and increased health care costs, with the rotator cuff being the most common structure affected.<sup>5,6,21,27</sup> Compared with the general population, injured workers are reported to have a suboptimal recovery after surgery.<sup>2,4,8,10</sup> However, surgical interventions have shown to be beneficial in the working population if candidates are screened and chosen according to strict criteria.<sup>10</sup>

Workers' compensation in Canada is a system of social insurance established in the early 1900s whereby injured workers receive compensation for workplace injuries and illnesses. Each province and territory administers its own Workers' Compensation Board, although all share the principles of no-fault compensation, no worker right to litigation, full funding by employers, and benefits linked to preinjury income, as cited by Hurley et al.<sup>12</sup>

During the mid-1990s, service delays, physician shortage, and hospital budget cuts had a negative effect on the waiting time for all Canadians, including injured workers, particularly in imaging services and orthopedic surgery.<sup>12</sup> Longer waiting times to see a specialist or receive surgery have a linear relationship with increased chronic disability and a reduced likelihood of a successful return to work (RTW).<sup>9,15,16,18,19</sup> Therefore, Workers' Compensation Boards introduced innovative strategies to expedite management of injured workers in Canadian provinces. In Ontario, the Workplace Safety and Insurance Board (WSIB) provides expedited access to specialist assessment and surgery by purchasing operative time in publicly funded hospitals, with the hope that expedited care will facilitate recovery and RTW in injured workers. The program has been in place for a number of years, but no direct comparative studies have been done to prove that this strategy has been successful. Comparative studies that use a control group can adjust for important confounding factors.

In this study, workers who had a preferred access to early specialist assessment and expedited rotator cuff surgery financed by the WSIB were compared with injured workers who had followed the standard care pathway funded by the public insurance plan, known as the Ontario Health Insurance Plan (OHIP). The comparison was made in baseline characteristics, waiting times, recovery, and postoperative work status.

## Materials and methods

### Design

A case-control design was used to examine the potential differences in waiting time, recovery, and postoperative work status between injured

workers who had undergone expedited surgery funded by the WSIB (study group) and injured workers who had used the public health insurance (control group), while adjusting for sex, age, severity of pathology, and follow-up period. Appropriate statistical analyses were used to account for the influence of unmatched group differences.

### Sample size justification

Because we lacked information on odd ratios (ORs) and exposure probability required to calculate the sample size for case-control studies in the population of workers, a minimum sample size of 240 patients (120 in each group) was required for a comparative study design to detect a statistically significant difference in the primary outcome, the American Shoulder and Elbow Surgeons (ASES) score, with a power of 0.8 and  $\alpha = 0.05$ .<sup>3</sup>

### Patient population

#### Study group

The study group comprised injured workers who followed an expedited care pathway, which included an orthopedic evaluation at a specialty shoulder and elbow clinic and an expedited arthroscopic rotator cuff decompression or repair, or both. The data of the study group were collected prospectively. The inclusion criteria were an active work-related shoulder claim (traumatic, repetitive injury, or insidious onset), age  $\geq 18$  years, and diagnosis of tendonitis or partial-thickness or full-thickness rotator cuff tear. Patients with tendonitis or a partial-thickness tear had a trial of comprehensive conservative treatment with a structured physiotherapy component.

The study excluded patients who had evidence of advanced osteoarthritis of the glenohumeral joint, previous surgery on the affected side, inflammatory arthropathy, superior labral anterior and posterior (SLAP) lesions, or Bankart lesions that required a repair, or were unable to speak or read English.

A total of 154 patients met the inclusion criteria for the study group; of whom 5 patients were excluded at the time of surgery (1 patient had an isolated subscapularis repair, 2 patients required a SLAP repair, and 2 underwent an associated glenohumeral stabilization procedure). Of 149 patients in the study group, 2 patients did not attend their follow-up visits, and 1 declined to complete the follow-up questionnaires. Therefore, 146 patients (43 women [29%] and 103 men [71%]), with a mean age 52 of years (standard deviation [SD], 8) comprised the study group.

#### Control group

The control group included 258 workers with an active compensable injury who had undergone a publicly funded operation for rotator cuff decompression or repairs. Patients in the control group had participated in previous prospective studies, and their clinical and surgical data were kept in a research database and used for secondary data analysis. Patients with advanced osteoarthritis of the glenohumeral

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