



A Review of a Workers' Compensation Database 2003 to 2013: Patient Factors Influencing Return to Work and Cumulative Financial Claims After Rotator Cuff Repair in Geriatric Workers' Compensation Cases

Geriatric Orthopaedic Surgery
& Rehabilitation
2017, Vol. 8(4) 208-214
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DOI: 10.1177/2151458517732209
journals.sagepub.com/home/gos


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Abstract

Background: Workers' compensation status is associated with poor outcomes after rotator cuff repair surgery. The purpose of this study was to analyze a database of geriatric workers' compensation patients after surgical repair of the rotator cuff and identify both medical and nonmedical patient factors that influence the time it takes for them to return to work at full duty, including a comparison of arthroscopic and open techniques. **Methods:** An all workers' compensation database was queried for rotator cuff claims that were surgically managed using arthroscopic, open, or both approaches from 2003 to 2013 in patients aged ≥ 60 . Primary outcomes were the number of days for return to full work (RTW) following surgery and the total reimbursement for health care. Multivariate analysis was performed, and data are presented as average \pm standard deviation. **Results:** The database yielded 1903 claims for surgically treated rotator cuff conditions (arthroscopic $n = 935$; open $n = 926$; both $n = 42$). In multivariate RTW analyses, we did not find a significant difference between groups (RTW in days was 153 ± 134 for arthroscopy [$P = .81$], 160 ± 160 for open [Ref], and 140 ± 82 days for both [$P = .75$]). However, multivariate analysis of reimbursement claims found arthroscopic surgery claims to be 13% higher compared to claims for open surgery only (US \$29 986 \pm 16 259 for arthroscopy vs US \$26 495 \pm 13 186 for open, $P < .001$). Patients aged ≥ 65 had more medical expenses than patients aged 60 to 64 ($P = .03$). Potentially modifiable variables that significantly prolonged RTW timing and higher health-care claims included need for vocational rehabilitation services and filing of a legal suit. **Conclusions:** Return to full-duty work in geriatric workers' compensation patients after rotator cuff repair takes about 5 months regardless of surgical approach and costs significantly more in patients aged ≥ 65 . Arthroscopic repairs generated 13% more cumulative health-care costs than open surgery alone. More efficient vocational rehabilitation services and minimizing legal suits may help get patients back to work sooner and reduce overall costs.

Keywords

return to work, rotator cuff, workers' compensation, financial claims, arthroscopic repair, health-care reimbursement

Submitted February 1, 2017. Revised June 28, 2017. Accepted August 20, 2017.

Introduction

Multiple patient factors have been identified that may negatively impact functional outcomes following rotator cuff surgery; however, workers' compensation seems to be one of the most widely and consistently cited predictors.¹⁻⁵ Patients being cared for under workers' compensation have been reported to have worse outcomes after partial-thickness tear repairs,² full-thickness tears,⁵ after retear,⁴ and they may be less compliant with postoperative protocols.¹ Some have reported that nearly 90% of these patients eventually return to their preoperative level of work, but typically well over 7 months after surgery.⁶

There are European studies that return to work after rotator cuff surgery may be tied to compensation quantities and the nature of work for the individual.⁷ No study in the United

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States has evaluated specific patient factors in an entire cohort of workers' compensation patients to determine what factors influence return to work and overall costs. With the introduction of bundled payments for Medicare joint replacement and other cost-limiting reforms that are being put forward, it is important to identify additional factors that generate costs related to the patients' care that are not related to the surgical treatment itself.

The purpose of this study was to analyze a database of geriatric workers' compensation patients after surgical repair of the rotator cuff and identify both medical and nonmedical patient factors that influence the time it takes for them to return to work at full duty, including a comparison of arthroscopic and open techniques. Our hypothesis was that arthroscopic surgery would help return patients to work faster but generate higher reimbursement claims.

Methods

After institutional review board approval, access to the Sedgwick Claims Management Services' Workers' Compensation database for Illinois was obtained for the years 2003 to 2013. The *International Classification of Diseases, Ninth Revision, Clinical Modification* diagnoses codes (726.10, 726.1, 726.13, 726.19, 727.61, 840.3, 840.4, 840.6) and Current Procedural Terminology (CPT) codes (29827, 23410, 23412, 23420) were used to identify patients with rotator cuff tears who were managed by arthroscopy, open surgery, or both.

The outcomes of interest were the number of days for return to full work (RTW) following surgery and the total reimbursement for health-care-related claims (adjusted to 2013 dollars to account for inflation and log transformed to satisfy model assumptions) in patients aged ≥ 60 . The primary independent variable was the type of surgical approach (arthroscopic, open, and both). The unadjusted association between the type of surgical approach and the outcomes of interest was analyzed using *t* tests and the Kruskal-Wallis test. Adjusted analyses utilized Cox proportional hazard models with temporal and regional fixed effects (for RTW outcome) and linear regression models with temporal fixed effects and state random effects (for health-care-related claims outcome), while controlling for relevant employee, employer, and treatment covariates that were likely to confound the association. The RTW data are presented as hazard ratios, and claims data are presented as log-transformed estimates. We used 2-tailed hypothesis tests and *P* value $< .05$ to indicate statistical significance.

Injury mechanism was classified into the following groups: (1) pushing, pulling, lifting; (2) slip, trip, falls; (3) repetitive motion; (4) motorized vehicle accidents; and (5) other. Job classifications were divided into the following categories: (1) farm related; (2) driving, flying, boating related; (3) manufacturing; (4) low demand; (5) repair, installation, maintenance work; (6) warehouse or product dealer; (7) restaurant related; (8) nonprofessional medical; (9) athletics; (10) law enforcement, firefighters; (11) professionals; (12) laborers; and (13) other.

Results

There were 1903 completed claims for rotator cuff conditions surgically managed in the database for patients ≥ 60 . Of these, 49% of the claims ($n = 935$) were arthroscopic repair, 49% ($n = 926$) open repair only, and 2% ($n = 42$) reported both open and arthroscopic repair. For claims with complete follow-up, the average time for RTW was 153 ± 134 days for arthroscopy claims, 160 ± 160 days for open surgery claims, and 140 ± 82 days for claims with both surgical approaches. The average health-care claims reimbursed were US \$29 986 \pm 16 259 for arthroscopy claims, US \$26 495 \pm 13 186 for open surgery claims, and US \$29 090 \pm 12 761 for claims with both surgical approaches. Detailed characteristics for all 3 groups are presented in Table 1.

In multivariate RTW analyses, there was no significant difference between the 3 groups in their time to RTW ($P > .05$). Causes of injury other than pushing/pulling/lifting injuries, filing during certain years, and various job classifications were significant predictors of earlier RTW ($P < .05$). The need for vocational rehabilitation services and filing of a legal suit were associated with later RTW ($P < .05$; Table 2).

After controlling for differences between states of jurisdiction, multivariate analysis of reimbursement for claims with arthroscopic surgery were found to be 13% higher (95% confidence interval: 0.06-0.14, $P < .001$). Age ≥ 65 (vs 60-64), injury due to ground-level falls (Reference Group [RG]: pushing/pulling/lifting), need for vocational rehabilitation services, loss of at least 45 working days (RG: < 45 days), filing of a legal suit, and general employees of a medical facility/hospital (RG: farm-related injuries) were significant predictors of higher health-care claims. Surgeries for injuries in 2006 (RG: 2003), service length between 10 and 20 years (RG: < 3 years), and claims filed in the South and West (RG: Midwest) were significantly associated with lower claim amounts (Table 2).

Discussion

This study identified litigation and vocational rehabilitational services as the only modifiable variables that negatively impacted return to work and overall health-care costs in geriatric workers' compensation patients undergoing rotator cuff repair, both completely unrelated to their medical care. This is the first study to our knowledge reporting the time to return to work, health-care claims, and patient variables that influence these outcomes after arthroscopic and open surgery in an all workers' compensation patient population. Contrary to our hypothesis, patients undergoing arthroscopic repair had similar return to work times compared with open surgery; however, arthroscopic surgery resulted in more health-care claims. The majority of significant variables identified that influenced return to work and reimbursement claims were nonmodifiable.

Previous studies have reported return to work timing after rotator cuff repair in workers' compensation patients. The data in this study suggest it takes around 5 months for compensated patients to return to full-duty work. This is actually less than

Table 1. Cohort Characteristics by Surgical Treatment.

Variable	Open (n = 926)	Arthroscopic (n = 935)	Both (n = 42)	Total (n = 1903)
Age in years, n (%)				
<65 ^a	654 (70.63)	667 (71.34)	27 (64.29)	1348 (70.84)
≥65	272 (29.37)	268 (28.66)	15 (35.71)	555 (29.16)
Age in years, mean (SD)	63.73 (4.09)	63.67 (3.94)	63.97 (3.42)	63.71 (4.00)
Female, n (%)	326 (35.21)	346 (37.01)	17 (40.48)	689 (36.21)
Marital status: n (%)				
Single, divorced, widowed	220 (23.76)	218 (23.32)	11 (26.19)	449 (23.59)
Married	474 (51.19)	510 (54.55)	16 (38.10)	1000 (52.55)
Dependents: n (%)				
None	782 (84.45)	834 (89.20)	41 (97.62)	1657 (87.07)
One or more	144 (15.55)	101 (10.80)	1 (2.38)	246 (12.93)
Cause of injury: n (%)				
Pushing/pulling/lifting	244 (26.35)	250 (26.74)	11 (26.19)	505 (26.54)
Slip/trip/fall	322 (34.77)	299 (31.98)	11 (26.19)	632 (33.21)
Repetitive motion	85 (9.18)	66 (7.06)	5 (11.90)	156 (8.20)
Motor vehicle injuries	11 (1.19)	10 (1.07)	0 (0.00)	21 (1.10)
Other	264 (28.51)	310 (33.16)	15 (35.71)	589 (30.95)
Treated in ED, n (%)	48 (5.18)	54 (5.78)	4 (9.52)	106 (5.57)
Vocational rehabilitation, n (%)	97 (10.48)	37 (3.96)	4 (9.52)	138 (7.25)
Legal suit, n (%)	244 (26.35)	215 (22.99)	11 (26.19)	470 (24.70)
Program type, n (%)				
Insured	436 (47.08)	460 (49.20)	20 (47.62)	916 (48.13)
Self-insured	490 (52.92)	475 (50.80)	22 (52.38)	987 (51.87)
Regular employment, n(%)	773 (83.48)	778 (83.21)	34 (80.95)	1,585 (83.29)
Service length in years, n (%)				
0: <3 years	150 (16.20)	187 (20.00)	3 (7.14)	340 (17.87)
1: ≥3 and <10	275 (29.70)	257 (27.49)	12 (28.57)	544 (28.59)
2: ≥10 and <20	192 (20.73)	221 (23.64)	7 (16.67)	420 (22.07)
3: ≥20	309 (33.37)	270 (28.88)	20 (47.62)	599 (31.48)
Region: n (%)				
Midwest	307 (33.15)	291 (31.12)	7 (16.67)	605 (31.79)
South	253 (27.32)	330 (35.29)	16 (38.10)	599 (31.48)
Northeast	109 (11.77)	150 (16.04)	3 (7.14)	262 (13.77)
West	257 (27.75)	164 (17.54)	16 (38.10)	437 (22.96)
Job classification: n (%)				
Farm related	9 (0.97)	12 (1.28)	1 (2.38)	22 (1.16)
Driving/flying/boating	44 (4.75)	59 (6.31)	2 (4.76)	105 (5.52)
Manufacturing	235 (25.38)	183 (19.57)	9 (21.43)	427 (22.44)
Low demand	143 (15.44)	157 (16.79)	6 (14.29)	306 (16.08)
Repair/installation/maintenance work	138 (14.90)	118 (12.62)	10 (23.81)	266 (13.98)
Warehouse or product dealer	283 (30.56)	299 (31.98)	10 (23.81)	592 (31.11)
Restaurant	9 (0.97)	9 (0.96)	0 (0.00)	18 (0.95)
Medical (general hospital employee, nurses)	0 (0.00)	4 (0.43)	0 (0.00)	4 (0.21)
Athletics	3 (0.32)	6 (0.64)	1 (2.38)	10 (0.53)
Law enforcement/firefighting	5 (0.54)	6 (0.64)	0 (0.00)	11 (0.58)
Professionals (physicians, engineer, architect)	46 (4.97)	64 (6.84)	3 (7.14)	113 (5.94)
Laborer	10 (1.08)	17 (1.82)	0 (0.00)	27 (1.42)
Lost work days, n (%)				
0: <45 days	192 (20.73)	196 (20.96)	6 (14.29)	394 (20.70)
1: ≥45 and <90	149 (16.09)	136 (14.55)	5 (11.90)	290 (15.24)
2: ≥90 and <180	225 (24.30)	240 (25.67)	10 (23.81)	475 (24.96)
3: ≥180 and <360	178 (19.22)	230 (24.60)	11 (26.19)	419 (22.02)
4: ≥360	182 (19.65)	133 (14.22)	10 (23.81)	325 (17.08)
Lost work, days, mean (SD)	245.50 (358.24)	202.16 (279.01)	245.33 (242.99)	224.21 (319.98)
Percent of impairment, mean (SD)	5.04 (12.60)	5.05 (27.30)	5.10 (7.18)	5.05 (21.08)
Outcomes				
Return to work (days)	160	153	140	156
Medical expenses paid	US \$26 495	US \$29 986	US \$29 090	US \$28 309

Abbreviations: SD, standard deviation; ED, Emergency Department.

^aPatient group of <65 years only includes ages 60 to 64.

Table 2. Results of the Multivariate Analysis for RTW and Health-Care Expense Claims.

Variable	Return to Work			Medical Expenses Paid		
	HR	95% CI	P	LTE	95% CI	P
Surgical approach						
Open	Ref			Ref		
Arthroscopic	0.99	0.88-1.11	.81	0.10*	0.06-0.14	<.01
Both	0.95	0.70-1.29	.75	0.06	−0.01 to 0.14	.10
Age in years						
<65	Ref			Ref		
≥65	0.90	0.80-1.02	.10	−0.05*	−0.10 to −0.00	.03
Gender						
Male	Ref			Ref		
Female	0.94	0.85-1.03	.19	−0.04	−0.08 to 0.00	.08
Unknown	0.56	0.27-1.15	.11	0.11	−0.20 to 0.42	.48
Marital status						
Single, divorced, widowed	Ref			Ref		
Married	1.10	0.99-1.21	.07	0.03	−0.02 to 0.08	.21
Separated	0.41	0.16-1.07	.07	−0.13	−0.51 to 0.26	.52
Unknown	1.04	0.90-1.20	.58	0.06	−0.01 to 0.12	.08
Dependents						
None	Ref			Ref		
1 or more	1.02	0.80-1.30	.88	−0.04	−0.10 to 0.02	.22
Year of injury						
2003	Ref			Ref		
2004	0.94	0.66-1.34	.72	−0.09	−0.22 to 0.03	.15
2005	0.93	0.73-1.18	.55	−0.11	−0.22 to 0.01	.07
2006	1.32	1.00-1.73	.05	−0.12*	−0.23 to −0.02	.03
2007	1.16	0.81-1.66	.42	−0.01	−0.12 to 0.09	.78
2008	1.15	0.87-1.52	.34	−0.01	−0.12 to 0.09	.79
2009	1.08	0.83-1.41	.57	0.03	−0.08 to 0.14	.58
2010	1.14	0.85-1.52	.40	0.01	−0.09 to 0.12	.79
2011	1.71	1.31-2.25	<.001	0.00	−0.12 to 0.12	.95
2012	1.85	1.33-2.57	<.001	0.02	−0.11 to 0.15	.74
Cause of injury						
Pushing/pulling/lifting	Ref			Ref		
Slip/trip/fall	1.35	1.15-1.58	<.001	0.13	0.08 to 0.17	<.001
Repetitive motion	1.27*	1.01-1.60	.04	0.00	−0.09 to 0.09	.99
Motor vehicle injuries	1.91	0.99-3.70	.05	0.05	−0.14 to 0.24	.63
Other (including unknown)	1.25	1.11-1.41	<.001	0.05	−0.01 to 0.12	.12
Treated in ED						
No	Ref			Ref		
Yes	1.14	0.93-1.39	.20	0.04	−0.04 to 0.11	.36
Overnight stay						
No	Ref			Ref		
Yes	0.56	0.28-1.11	0.10	0.09	−0.24 to 0.42	.58
Percent of impairment						
Vocational rehabilitation	1.00	1.00- 1.00	0.15	0.00	−0.00 to 0.00	.62
Vocational rehabilitation						
No	Ref			Ref		
Yes	0.48	0.40-0.58	<0.001	0.08*	0.01 to 0.16	.03
Legal suit						
No	Ref			Ref		
Yes	0.62	0.53-0.72	<0.001	0.08	0.02 to 0.14	.01
Subrogation						
No	Ref			Ref		
Yes	1.47*	1.10-1.98	0.01	−0.01	−0.17 to 0.15	.91
Self-insured program						
No	Ref			Ref		
Yes	1.05	0.92-1.19	0.48	−0.05	−0.10 to 0.00	.05
Regular employment						

(continued)

Table 2. (continued)

Variable	Return to Work			Medical Expenses Paid		
	HR	95% CI	P	LTE	95% CI	P
No	Ref			Ref		
Yes	1.10	0.94-1.28	0.23	-0.03	-0.06 to 0.01	.15
Service length in years						
<3 years	Ref			Ref		
≥3 and <10	1.05	0.92-1.21	0.46	-0.03	-0.08 to 0.02	.20
≥10 and <20	1.05	0.87-1.27	0.62	-0.06*	-0.11 to -0.01	.02
≥20	0.94	0.84-1.07	0.36	-0.05	-0.11 to 0.02	.17
Job classification category						
Farm related	Ref			Ref		
Driving/flying/boating	1.41	0.77-2.58	0.27	-0.11	-0.27 to 0.05	.19
Manufacturing	1.49	0.84-2.65	0.17	-0.11	-0.26 to 0.04	.14
Low demand	1.96*	1.11-3.47	0.02	-0.03	-0.18 to 0.12	.69
Repair/installation/maintenance work	1.69	0.98-2.90	0.06	-0.12	-0.28 to 0.03	.13
Warehouse or product dealer	1.79*	1.05-3.04	0.03	-0.04	-0.19 to 0.10	.55
Restaurant	1.64	0.84-3.22	0.15	-0.17	-0.41 to 0.07	.16
Medical (general hospital employee, nurses)	1.32	0.38-4.61	0.66	0.41	0.11 to 0.72	.01
Athletics	1.14	0.43-3.05	0.79	-0.01	-0.35 to 0.34	.97
Law enforcement/firefighting	2.11	0.81-5.48	0.13	0.01	-0.20 to 0.23	.92
Professionals (physician, engineer, architect)	2.07*	1.12-3.82	0.02	-0.08	-0.23 to 0.07	.28
Unable to determine	0.65	0.03-12.37	0.77	-0.50	-0.66 to -0.33	<.001
Laborer	1.91	0.98-3.69	0.06	-0.19	-0.42 to 0.05	.12
Geographic region						
Midwest	Ref			Ref		
South	0.90	0.75-1.08	0.27	-0.21*	-0.41 to -0.01	.04
Northeast	0.78*	0.61-1.00	0.05	-0.23	-0.49 to 0.03	.08
West	0.93	0.76-1.15	0.51	-0.27	-0.46 to -0.08	.01
Loss of work in days						
<45				Ref		
≥45 and <90				0.07*	0.00 to 0.14	.04
≥90 and <180				0.11	0.04 to 0.17	<.001
≥180 and <360				0.20	0.14 to 0.26	<.001
≥360				0.46	0.36 to 0.56	<.001

Abbreviations: 95% CI, 95% confidence interval for the value reported; HR, hazard ratio; LTE, log-transformed estimate; Ref, reference group.

^aStatistically significant variables have been bolded and an asterisk (*) placed next to them.

^bIn this analysis, an HR >1 indicates an earlier return to work, where as an HR <1 indicates a later return to work.

^cIn this analysis, a positive LTE suggests higher health-care expenses, while a negative LTE suggests lower health-care expenses.

previous studies, which ranged from 7.6 to 9.8 months.^{6,8,9} Aside from being a negative predictor for outcomes,^{4,5} workers' compensation status has additionally been a predictor for inability to return to work by 6 months after rotator cuff repair.¹⁰ The RTW timing average for our cohort was somewhat better than previous reports, but still much longer than noncompensated patients. Non-workers' compensation patients in the United States and the lowest compensated patients in Belgium (self-employed) after rotator cuff repair all seem to return to work at around 2 months postoperatively on average, compared to prolonged recovery of compensated patients.^{7,8} Compensated patients having prolonged return to work timing compared with noncompensated have been documented for multiple orthopedic procedures.¹¹

The prolonged recovery and worse outcomes in compensated patients likely leads to more health-care utilization and subsequently higher costs of care after work-related shoulder injuries.¹²⁻¹⁷ The slow recovery and lower outcome scores

would be expected to result in more therapy, potentially more imaging, and more physician office appointments relative to noncompensated patients. The data in this study were generated from large cohorts, with overall health-care costs averaging around US \$30 000 by the time the average worker returned to full-time work, with arthroscopy being slightly more expensive. The authors were unable to find any previously published data from workers' compensation databases looking at total health-care costs for comparison. The majority of studies reporting on costs after rotator cuff surgery seem to focus more on the actual surgical costs, which were roughly US \$8000 to US \$9000,^{7,18,19} and were not specific to workers' compensation patients. Some of these data have shown that arthroscopic rotator cuff repair requires more operating room time and generates higher surgical center costs, possibly from a combination of longer surgical time and more expensive implants.¹⁸ This may partially explain the difference in cost between the 2 groups. Despite the high cost of treating

compensated patients in our study, the potential savings to society appear to be even greater, and getting these patients back to work ultimately reduces the economic burden to society despite the high initial costs.²⁰

Although prolonged recovery of workers' compensation patients is well-documented, specific risk factors within this patient population for prolonged recovery are lacking. Older age significantly prolonged return to work in our study, and this has also been previously reported.⁹ Unfortunately, the majority of risk factors identified for both return to work and increased financial burden are unable to be modified (age, marital status, injury mechanism, and length of employment). Data of this nature are useful for identifying and documenting which patients would be at high risk of delayed return to work and increased health-care costs, but are not useful for actually working to decrease these costs. Incentivizing patient to return to work sooner by tapering their compensation after a defined time point (like the average return to work of noncompensated patients, ie, 2 months) or attempting to eliminate or modify variables that negatively impact return to work and cost, such as vocational rehabilitation and litigation, are potential avenues for improving return to work and costs associated with workers' compensation patients based on this study.

Vocational rehabilitation services are designed to get patients back to work in a timely manner and may implement any number of resources, including physical therapy, psychological counseling, facilitating job modifications, job analysis, and any number of private sector services that might help injured workers get back to work.²¹ These services are expensive, and numerous areas have been identified that could lead to more cost-effective care, some of which are underway in Washington state.²¹ Modifications could include reducing repeat referrals, more timely implementation of recovery plans, incentivizing completion of rehabilitation, and shorter or more accelerated rehabilitation plans.²¹ Additionally, changing the reimbursement models by linking payment to outcomes has been proposed to be a potential way to decrease costs and improve return to work timing.²² Interestingly, a worker's desire or expectation to return to work may play a larger role in their recovery than the actual rehabilitation services,²³ suggesting that patient expectations should be considered when developing a rehabilitation plan, which may help reduce utilization and costs.

In this all workers' compensation cohort, filing of a legal suit was a significant predictor of not only prolonged RTW but also higher health-care costs. This finding only adds to the growing number of sources that consistently find litigation negatively affecting the utilization of health-care resources. Defensive medicine by US orthopedic trauma surgeons has been estimated to be roughly US \$94 000 annually per surgeon.²² When considering all subspecialties in the field of orthopedic surgery, the costs may be even higher, with an estimated 24% of tests being performed for defensive measures, resulting in US \$100 000 of additional health-care costs per year, per surgeon.²⁴ The mere act of defending a law suit can generate huge fees, with 30% of litigation costs being legal

fees.²⁵ Although previous data have been published suggesting workers' compensation patients generate more health-care costs for similar injuries relative to non-workers' compensation patients,²⁶ this is the first study in the orthopedic literature to our knowledge linking litigation (against an employer) in workers' compensation cases to delayed return to work and with increased health-care costs for rotator cuff injuries. Lawsuits associated with workers' compensation claims represent a significant secondary gain issue that would actually incentivize the patient to report lower functional outcomes and resist going back to work, regardless of the surgical technique, rehabilitation program, and overall care by their surgeon. These variables are clearly beyond the control of the surgeon in these complex cases and should be factored into determining the "quality" of care provided.

This study is weakened by the lack of demographic information on these patients, as well as the lack of information regarding the size of the rotator cuff tears. No imaging or intraoperative data were available. This places our data at risk of selection bias. Information regarding the acuity of the tears was also not available, and although injury mechanisms were given, it was not possible to accurately determine the level of energy for specific injuries. Another important point is that the levels of duty descriptor were not available to us from the database, and therefore, we were forced to break up job descriptors into broad categories, in which there is undoubtedly a large variation in the actual physical demand. Information regarding surgical technique beyond arthroscopic or open CPT codes was also not available and would have added additional information to this study. There was no breakdown of health-care costs, and thus we were unable to determine how much was attributed to imaging, surgery, rehabilitation, and so on.

Conclusions

Return to full-duty work in geriatric workers' compensation patients after rotator cuff repair takes about 5 months regardless of surgical approach and costs significantly more in patients aged ≥ 65 . Arthroscopic repairs generated 13% more cumulative health-care costs than open surgery alone. More efficient vocational rehabilitation services and minimizing legal suits may help get patients back to work sooner and reduce overall costs.

Authors' Note

This manuscript is an original work that has never been published previously. It has been reviewed by all of the above authors. Institutional review board approval was exempt for this study.


Declaration of Conflicting Interests

The author(s) declared the following potential conflicts of interest with respect to the research, authorship, and/or publication of this article: Ilya Voloshin is a paid consultant for Zimmer, Arthrex, and Smith & Nephew.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: Ilya Voloshin receives speaking fees from Zimmer, Arthrex, and Smith & Nephew.

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