

Understanding Preferences for Treatment After Hypothetical First-Time Anterior Shoulder Dislocation

Surveying an Online Panel Utilizing a Novel Shared Decision-Making Tool

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Investigation performed at Duke University Health System, Durham, North Carolina, USA

Background: Although surgical management of a first-time anterior shoulder dislocation (FTASD) can reduce the risk of recurrent dislocation, other treatment characteristics, costs, and outcomes are important to patients considering treatment options. While patient preferences, such as those elicited by conjoint analysis, have been shown to be important in medical decision-making, the magnitudes or effects of patient preferences in treating an FTASD are unknown.

Purpose: To test a novel shared decision-making tool after sustained FTASD. Specifically measured were the following: (1) importance of aspects of operative versus nonoperative treatment, (2) respondents' agreement with results generated by the tool, (3) willingness to share these results with physicians, and (4) association of results with choice of treatment after FTASD.

Study Design: Cross-sectional study; Level of evidence, 3.

Methods: A tool was designed and tested using members of Amazon Mechanical Turk, an online panel. The tool included an adaptive conjoint analysis exercise, a method to understand individuals' perceived importance of the following attributes of treatment: (1) chance of recurrent dislocation, (2) cost, (3) short-term limits on shoulder motion, (4) limits on participation in high-risk activities, and (5) duration of physical therapy. Respondents then chose between operative and nonoperative treatment for hypothetical shoulder dislocation.

Results: Overall, 374 of 501 (75%) respondents met the inclusion criteria, of which most were young, active males; one-third reported prior dislocation. From the conjoint analysis, the importance of recurrent dislocation and cost of treatment were the most important attributes. A substantial majority agreed with the tool's ability to generate representative preferences and indicated that they would share these preferences with their physician. Importance of recurrence proved significantly predictive of respondents' treatment choices, independent of sex or age; however, activity level was important to previous dislocators. A total of 125 (55%) males and 33 (23%) females chose surgery after FTASD, as did 37% of previous dislocators compared with 45% of nondislocators.

Conclusion: When given thorough information about the risks and benefits, respondents had strong preferences for operative treatment after an FTASD. Respondents agreed with the survey results and wanted to share the information with providers. Recurrence was the most important attribute and played a role in decisions about treatment.

Keywords: shoulder; instability; economic and decision analysis

The incidence of shoulder dislocation varies in different populations, with substantially increased incidence in young males and athletes.^{20-22,25,33} Treatment of first-time anterior shoulder dislocation (FTASD) can be operative or nonoperative, with the goal of reducing the risk of recurrent dislocation.^{12,19,29,30}

Although it is known that younger patients have high rates of dislocation, it is unclear which specific patients will develop instability after FTASD, making operative intervention after FTASD controversial. In young, active adults, lower rates of recurrent dislocation and increased rates of return to sport are reported with operative stabilization.^{6,13,16,19,30} Other analyses, however, have shown no significant difference in rates of recurrent dislocation among active and nonactive cohorts treated nonoperatively.^{12,29} Furthermore, decision modeling suggests that operative treatment after FTASD may confer higher

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probabilities of future shoulder stability irrespective of pre- or postdislocation activity levels.²⁴

Operative stabilization, however, requires patients to forgo months of contact sports and overhead shoulder activities. Information provided by clinical experts for this study suggests this break period is often significantly longer for operative than nonoperative treatment, and for the in-season athlete or active individual, this may be particularly burdensome. Therefore, patient-specific circumstances and motivations must also be considered.²⁶

One approach to eliciting information on an individual's preferences is conjoint analysis. Long a mainstay in marketing research, conjoint analysis provides an objective measure of the relative importance among features of a given product or service.³¹ For example, when buying a car, different models have different combinations of attributes, including cost, fuel economy, reliability, and warranty. One consumer may feel fuel economy and cost are more important while another may value reliability and warranty over cost. Adaptive conjoint analysis (ACA) measures consumer-level estimates of the relative importance of attributes associated with various product or treatment options. Conjoint analysis has been increasingly applied to health care decision-making^{2-4,9,23,32} in settings as diverse as balancing the benefits and side effects of medications¹¹ and exploring treatment options in scoliosis bracing⁵ and knee osteoarthritis.¹⁰

After FTASD, operative and nonoperative treatment options vary along several attributes, including the risk of recurrent dislocation and cost. The ACA exercise outlined below uses responses to survey questions to measure the relative importance of these attributes to each person. This proof-of-concept study thereby aims to create a novel tool to measure respondent preferences relevant to the selection of operative versus nonoperative management of FTASD and to facilitate efficient, evidence-based, shared decision-making. The study seeks to measure the (1) importance of aspects of treatment after FTASD, (2) respondents' agreement with results generated by the tool, (3) respondents' willingness to share these results with their physicians, and (4) association of results with choice of treatment after FTASD.

METHODS

Survey Construction and Development of Conjoint Analysis Exercise

A survey was created (see the Appendix) using Sawtooth Software SSI Web (Sawtooth Software) and included an

TABLE 1
Attributes and Levels for Treatment of FTASD^a

Attribute	Level
Limited ability to move your arm	No limit on arm movement Cannot lift arm above shoulder level Arm in a sling
Avoid contact sports and lifting overhead	1 mo 3 mo 1 y
Duration of physical therapy	4 wk 8 wk 12 wk
Chance of another shoulder dislocation	5% (5/100) 20% (20/100) 80% (80/100)
Out-of-pocket cost, US\$	0 1000 2000

^aFTASD, first-time anterior shoulder dislocation.

ACA exercise to elicit individuals' relative preferences for each of several scenarios that vary based on a fixed set of attributes. Attributes, which are crucial to design of conjoint analyses, are features of treatment alternatives that are important to patients or stakeholders.¹⁴

Utilizing processes defined elsewhere for best practices in conjoint analysis,² a panel of experts in conjoint analysis, clinical research, and 2 board-certified orthopaedic surgeons fellowship-trained in sports medicine selected the attributes relevant to the clinical management of FTASD. Reducing the risk of recurrent dislocation and time out of and return to sports are often cited as benefits of surgery and therefore made appropriate attributes.^{15,16} Additional attributes were selected to represent treatment-associated features, including limits on arm movement and duration of physical therapy. Also included was out-of-pocket costs incurred by patients, as cost sharing is an increasingly important aspect of patient decision-making.

The levels for each attribute were chosen to span the range of possible clinical scenarios relevant to operative and nonoperative treatment of FTASD (Table 1). The levels representing the likelihood of a repeat shoulder dislocation were based on ranges reported in previous studies.²⁹ For limitations on arm movement, the levels represented the period of arm immobilization with operative management, an intermediate level of limited arm

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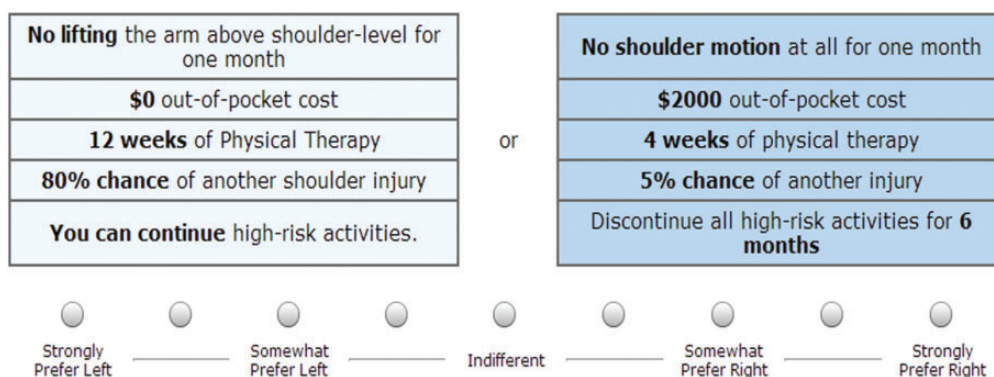


Figure 1. Example of rating question in adaptive conjoint analysis with 5 attributes.

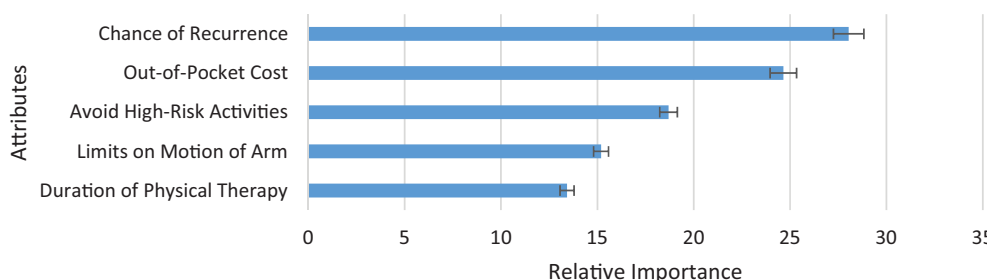


Figure 2. Mean importance weights, all respondents. Error bars represent 95% confidence intervals.

movement, and no limitations. Likewise, the levels pertaining to the period over which patients would be restricted from participation in contact sports and durations of physical therapy were based on clinical experience for patients undergoing surgical and nonsurgical management of FTASD. These levels are similar to those reported in the literature.^{13,15,16} Levels for out-of-pocket costs were chosen to be reflective of average marketplace deductibles and representative of patients with and without insurance deductibles while recognizing the wide variability in costs inherent in individual treatment.

After the initial selection of attributes and corresponding levels, 5 additional sports medicine orthopaedic surgeons reviewed and confirmed that the attributes represented the key characteristics that they believe patients should consider when selecting a management strategy for FTASD and that the levels represented realistic ranges for the large majority of FTASD cases.

The ACA exercise was constructed by first presenting detailed attribute descriptions and then by gathering individuals' preliminary importance ratings on each attribute. Next, as shown in Figure 1, combinations of different levels of attributes are created and placed side-by-side as hypothetical situations, asking the individual to rate their preference for one relative to the other. These pairs are customized for each individual to efficiently gather relative preferences for each attribute.¹⁴ Respondents were asked to rate their preferences for 10 pairs of alternatives. To make the task easier, 2 attributes were shown in the first 2 pairs. An additional attribute was added for every 2 tasks completed until 5 attributes were shown for each alternative

and 10 pairs of alternative scenarios were completed, as shown in Figure 1. The tool, via software algorithm, then estimates the relative importance of each attribute based on that respondent's preference ratings for the 10 pair tasks.

Measures and Outcomes

The survey and ACA exercise were designed to measure (1) the relative importance of attributes of treatment after FTASD, (2) respondents' acceptance and accuracy of preference measurements generated by the tool, (3) choice of treatment for FTASD as associated with these generated preferences, and (4) willingness to share these preference results with their physicians.

To measure the relative importance of attributes, as described, the tool generated values for each of the 5 attributes for each individual respondent. A unique relative importance distribution was generated for each individual based on answers in the ACA exercise, similar to the averaged example shown in Figure 2.

To measure accuracy of generated importance values, respondents were shown a graphical representation of their individual relative importance values (again, similar to Figure 2). Respondents then indicated the degree to which the generated preference weights represented their preferences on a 5-point Likert-type scale from "very well" to "very poorly."

To measure the relationship between their preferences and their treatment choices, respondents were then asked to choose "surgery" or "no surgery," as shown in Table 2.

TABLE 2
Choice Between Surgery and No Surgery as Presented to Respondents

Attribute	Surgery	No Surgery
Limited ability to move your arm	Arm in a sling for 1 mo	No limit on moving arm
Avoid contact sports and lifting overhead	Discontinue all high-risk activities for 6 mo	Discontinue all high-risk activities for 1 month
Duration of physical therapy	12 wk of physical therapy	4 wk of physical therapy
Chance of another shoulder dislocation	5% chance of another dislocation	Age- and sex-dependent risk of another dislocation
Out-of-pocket cost, US\$	1000	0

The levels for each attribute were selected to approximate the clinical differences between operative and nonoperative management, assuming that individuals would be responsible for a US\$1000 greater cost if they chose operative management. All respondents saw the same operative and nonoperative alternatives, with the exception of recurrence risk with nonoperative treatment, which has been shown to depend on age and sex of the individual, from up to 80% for an 18-year-old male to less than 15% for a female 35 years or older.²⁹ For this attribute, the respondent's age and sex were used to estimate an individualized risk of recurrence in the ensuing 2 years, with values taken from Robinson et al²⁹ and rounded to the nearest 5% for ease of comprehension, as shown in Table 3.

To measure the willingness or desire to share preference results with providers, respondents were asked to imagine that they were seeking treatment for shoulder dislocation and were asked whether they would want to share the preference weights generated by the ACA exercise with their physician.

To characterize the respondent population, the survey collected demographics (age, sex, education level, and insurance status), activity level, and most frequently played sports. Additionally, respondents were asked about feelings toward surgery, marking the degree to which they were concerned about the following on a 5-point Likert-type scale from "not concerned" to "extremely concerned": the pain or risk of complications of surgery in general, needing to take time off work or school to undergo surgery, having surgical scars, and requiring assistance after surgery.

Study Population

The survey was administered to participants of Amazon Mechanical Turk (AMT; Amazon.com, Inc), an online marketplace where anonymous users can complete surveys or other small tasks in exchange for compensation. Respondents were recruited by a post on the AMT forum, which requested participation of adults older than 18 years who were physically active and may have had a shoulder injury or dislocation. Respondents were paid \$1.25 for completing the survey.

TABLE 3
Age and Percent Risk of Recurrent Dislocation in the 2 Years After Nonoperative Treatment for FTASD^a

Age, y	Percent Recurrence in 2 Years After FTASD With Nonoperative Treatment	
	Male	Female
18	80	45
19	75	40
20	70	40
21	70	35
22	65	35
23	60	30
24	60	30
25	55	30
26	55	25
27	50	25
28	45	20
29	45	20
30	40	20
31	40	15
32	35	15
33	35	15
34	30	15
≥35	30	15

^aData from Robinson et al²⁹ and rounded to nearest 5%. FTASD, first-time anterior shoulder dislocation.

Exclusion criteria were designed to ensure data quality from AMT respondents. Respondents who were among the fastest 20% of individuals who completed the survey were identified. These individuals may have sped through the survey without reading attribute descriptions or instructions or chose responses without careful consideration of the alternatives. Respondents with suspected inconsistent answers to ACA questions were identified using the R^2 "fit" value as generated by the conjoint analysis. R^2 "fit" values for a respondent's utilities measures how consistent a given user applied their preferences in the conjoint exercise. Low values suggest that answers were chosen haphazardly or that a given user may have been unable to sufficiently understand and complete the exercise. Respondents in the lowest 20th percentile of ACA fit and fastest 20% of completion times were excluded.

Shoulder dislocation was described in detail in the survey, including information to help distinguish true shoulder dislocation from subluxation or other shoulder injuries. Thereafter, respondents reporting shoulder dislocation were asked about the circumstances surrounding their first dislocation. Understanding that dislocation is a universally painful occurrence, respondent data were excluded if they reported having a prior shoulder dislocation and reported that they did not need pain medication or other treatment for pain.

Demographic data were obtained in the survey, including age, sex, participation in sports in general and activities deemed high risk of dislocation including contact or overhead sports, feelings toward surgery in general, education, income level, and health insurance status.

TABLE 4
Demographics and Shoulder Dislocation Characteristics

	Male, n (%)	Female, n (%)	Total, n (%)
All respondents	229 (61 ^a)	145 (39 ^a)	374 (100)
Age, y			
18-22	47 (21)	27 (19)	74 (20)
23-29	111 (48)	68 (47)	179 (48)
30-40	68 (30)	46 (32)	114 (30)
≥41	3 (1)	3 (2)	6 (2)
Participate in exercise or athletics weekly	203 (90)	128 (88)	331 (89)
Participate in high-risk activities weekly	175 (76)	108 (75)	283 (76)
Graduated high school or more	226 (99)	144 (99)	370 (99)
Current health insurance	185 (81)	122 (84)	307 (82)
Previous shoulder dislocation	76 (33)	43 (30)	119 (32)
Surgery for dislocations ^b	4 (5)	1 (2)	5 (4)
1 dislocation only ^b	55 (72)	30 (70)	85 (71)
Age at first dislocation, y, mean ^b	18.6 (SD, 5.4)	18.4 (SD, 6.5)	18.5 (SD, 5.8)
Mechanism of dislocation ^b			
Contact sports	43 (57)	8 (19)	51 (43)
Noncontact sports	13 (17)	14 (33)	27 (23)
Motor vehicle accident	4 (5)	7 (16)	11 (9)
Seizure	1 (1)	1 (2)	2 (2)
Assault	3 (4)	2 (5)	5 (4)
Fall from >6 ft	2 (3)	2 (5)	4 (3)
Fall from <6 ft	4 (5)	8 (18)	12 (10)
Other	6 (8)	1 (2)	7 (6)
Where treated for dislocation ^b			
Emergency department	42 (55)	30 (70)	72 (60)
Shoulder relocated, doctor visit	25 (33)	5 (11)	30 (25)
Shoulder relocated, no doctor visit	5 (7)	7 (16)	12 (10)
Other	4 (5)	1 (2)	5 (4)

^aPercent represents sex of full sample.

^bPercent of those with previous dislocation.

The use of an anonymous AMT Worker ID for each completed survey allowed for cross-referencing with earlier rounds of testing this survey and others at the authors' institution.⁷ To avoid the same individuals contributing survey data in multiple rounds of testing and to exclude individuals who may provide purposefully inaccurate information to participate (and receive payment for) the survey, respondents were excluded if they participated in a previous round of testing of this survey or another survey under development at our institution that targeted a mutually exclusive population (>50 years old, smokers).

Statistical Analysis

Descriptive statistics are reported for the study population. Exclusion criteria were applied, and the ACA R^2 fit value, as provided by Sawtooth Software for each individual, was examined to explore differences in the predicted values for each attribute. Responses to the ACA exercise for each individual were transformed by Sawtooth Software into utility weights for each attribute and level and then normalized to calculate relative importance values for that individual. Responses to questions gauging concern about aspects of surgery in general were combined, and an average score indicating "very" or "extremely" concerned determined

aversion. In addition to analysis of the entire sample, subgroup analysis was performed for those reporting dislocation without prior surgery and those reporting no dislocation. Choice of operative versus nonoperative treatment by age, sex, and history of prior dislocation was compared using chi-square tests. Regression was performed using JMP Pro (SAS Institute). Logistic regression was performed to model choice of treatment: operative versus nonoperative management. Included in the covariate analysis were demographic variables, preference weights as determined by the ACA exercise, and stated aversion to surgery. The risk of recurrent dislocation with nonoperative treatment, known to have significant age and sex variability,²⁹ was included in logistic regression to compare the effects of the recurrence rate as shown to respondents. A critical value of $\alpha = 0.05$ was chosen for all statistical tests.

RESULTS

As shown in Table 4, 501 respondents completed the survey. Sixty-five (13%) respondents completed the survey in the fastest 20% while also in the 20% lowest consistency on ACA questions (average ACA R^2 fit, 198). Seventeen (3%) reported no pain with dislocation, and 36 (7%) had completed a previous survey during testing or were found in

survey testing of other surveys that suggested falsifying of personal information.

Hereafter, analysis was performed with all exclusion criteria applied, leaving 374 (75%) respondents who took an average of 13 minutes 37 seconds to complete the survey. As shown in Table 4, most respondents were male (61%), younger than 30 years (68%), and active (89%), especially in sports that carry a high risk of dislocation such as football, lacrosse, hockey, basketball, swimming, or weightlifting (76%). The vast majority (99%) had graduated from high school. Most reported having current health insurance (82%). Nearly one-third (32%) reported a prior shoulder dislocation, and several reported undergoing surgery to stabilize their shoulder. More than 70% of those reporting dislocations had only a single dislocation. The most common injury mechanism for males was contact sports (57%) and for females was noncontact sports (33%). After dislocating, 61% visited an emergency department, and 10% reported no contact with a physician regarding their dislocation.

Importance of Attributes

The relative importance of the 5 attributes was computed for individuals and averaged over subsets based on demographic or other criteria. The preference weights for each attribute averaged over all respondents are shown in Figure 2. Chance of recurrence and out-of-pocket costs proved the most important attributes.

Agreement With Generated Results

When shown the importance of attributes that the tool generated (Figure 2) based on their answers to conjoint analysis questions, 87% of respondents reported that these represented their preferences “well” or “very well.”

Choice of Treatment

Respondent choices of operative or nonoperative treatment are shown in Table 5. Because the risk of recurrence with nonoperative treatment shown to respondents was varied according to the respondent’s age and sex, the findings were stratified by sex, age group, and prior dislocation. The total choosing operative treatment was 158 (42%), with 125 (55%) males and 33 (23%) females choosing operative treatment. Persons younger than 30 years preferred operative treatment at higher rates compared with those older than 30 years (48% vs 30%, $P = .001$). Respondents generally chose operative treatment at different rates based on sex and age, though not based on whether they had previously sustained dislocation.

Variables such as age group, sex, aversion to surgery, participation in high-risk activities, and preference values were included in the logistic regression to model the choice of operative treatment at US\$1000 versus nonoperative treatment. Age, sex, and importance of recurrent dislocation proved significant predictors of treatment choice for the entire sample (Table 6). When stratified by prior dislocation, significant variables included sex and participation in high-risk activities. However, when adjusting for

TABLE 5
Respondents Choosing Operative Treatment by
Age and Sex^a

	Male, n (%)	Female, n (%)	Total, n (%)
All ages, y	125/229 (55)	33/144 (23)	158/373 (42)
≤29	95/158 (60)	27/95 (28)	122/253 (48)
≥30	30/71 (42)	6/49 (12)	36/120 (30)
Prior dislocation,	34/72 (47)	8/42 (19)	42/114 (37)
no surgery			
Age ≤29 y	24/45 (53)	7/27 (26)	31/72 (43)
Age ≥30 y	10/27 (37)	1/15 (7)	11/42 (26)
No prior dislocation	89/153 (58)	25/101 (25)	114/254 (45)
Age ≤29 y	69/110 (63)	20/67 (30)	89/177 (50)
Age ≥30 y	20/43 (47)	5/34 (15)	25/77 (32)

^aRespondents answering “unsure” about dislocation were not included in subgroup analysis. Based on sex, treatment choices were significantly different in all age groups and dislocation status ($P < .05$), except for ≥30 and prior dislocation. Based on age, treatment choices were significantly different for younger than 29 versus 30 or older in the total sample ($P = .01$) and those without dislocation ($P = .01$) but not in those with prior dislocation ($P = .11$). Based on dislocation status, treatment choices were not significantly different in the entire sample, between males and females, or between age groups.

nonoperative risk of recurrent dislocation for age and sex, only the individual’s importance of recurrent dislocation, as determined by the ACA exercise, remained significant for the entire sample (Table 7). For those without prior dislocation, nonoperative recurrence risk and sex were significant, while in those with prior dislocation, participation in high-risk activities remained significant even with the consideration of nonoperative recurrence risk.

Willingness to Share Information

Nearly 9 of 10 (89%) respondents reported that they would be willing to share their personal preferences generated by this survey with their physician.

DISCUSSION

This study serves as a first step toward development of a tool to measure preferences about features that are relevant to choosing a treatment for shoulder dislocation. It successfully measured data along our primary outcomes: Respondents agreed with the survey’s assessment of their preferences, preferences were predictive of treatment choice in the aggregated sample, and respondents wanted to share this information with their provider. By acknowledging operative management of FTASD is a preference-sensitive intervention, this study suggests such a tool may facilitate shared decision-making.

When viewing personal preferences derived by ACA, respondents felt that the conjoint exercise performed well. Furthermore, an overwhelming majority wished to share their preference information with their doctor. This positive feedback and data quality suggest the survey was well

TABLE 6
Logistic Regression Modeling of Covariates Favoring Choice of Surgery^a

Term	All		No Dislocation		Prior Dislocation	
	Odds Ratio [95% CI]	P	Odds Ratio [95% CI]	P	Odds Ratio [95% CI]	P
Male sex	4.63 [2.74, 8.01]	<.0001	5.19 [2.72, 10.27]	<.0001	5.13 [1.89, 15.55]	.001
Age <30 y	2.50 [1.45, 4.40]	<.001	2.77 [1.37, 5.77]	.0042	2.32 [0.88, 6.50]	.088
Importance of recurrence	1.09 [1.01, 1.17]	.02	1.14 [1.04, 1.24]	.0037	0.96 [0.84, 1.10]	.57
Concerned about surgery	0.86 [0.52, 1.43]	.57	0.84 [0.44, 1.58]	.58	0.87 [0.33, 2.28]	.78
Importance of cost	0.96 [0.90, 1.03]	.30	0.98 [0.89, 1.07]	.64	0.89 [0.76, 1.02]	.10
Income <US\$50,000/y	0.80 [0.48, 1.33]	.39	0.73 [0.39, 1.37]	.33	0.88 [0.34, 2.28]	.78
Had prior dislocation	0.82 [0.48, 1.40]	.47				
Participate in high-risk activities	1.16 [0.64, 2.10]	.63	0.67 [0.31, 1.41]	.29	4.39 [1.28, 18.6]	.017
Had any prior surgery	0.95 [0.57, 1.58]	.84	0.84 [0.45, 1.57]	.58	1.38 [0.52, 3.83]	.52
Have health insurance	0.93 [0.49, 1.78]	.83	0.69 [0.29, 1.63]	.41	2.21 [0.72, 7.42]	.17
Importance of limits on high-risk activities	1.01 [0.93, 1.10]	.74	1.05 [0.94, 1.16]	.39	0.93 [0.80, 1.08]	.38
Importance of limits on shoulder motion	1.00 [0.90, 1.10]	.92	1.02 [0.90, 1.15]	.73	0.91 [0.75, 1.10]	.34

^aBoldfaced values indicate significant values.

TABLE 7
Logistic Regression Modeling of Covariates Favoring Choice of Surgery, Controlling for Recurrence Risk^a

Term	All		No Dislocation		Prior Dislocation	
	Odds Ratio [95% CI]	P	Odds Ratio [95% CI]	P	Odds Ratio [95% CI]	P
Importance of recurrence	1.10 [1.02, 1.19]	.008	1.14 [1.05, 1.25]	.003	0.99 [0.86, 1.15]	.91
Nonoperative recurrence risk	1.03 [1.00, 1.07]	.049	1.01 [0.97, 1.06]	.53	1.09 [1.01, 1.19]	.02
Concerned about surgery	0.86 [0.51, 1.43]	.56	0.84 [0.44, 1.59]	.59	0.87 [0.32, 2.33]	.78
Male sex	1.90 [0.67, 5.37]	.23	3.63 [1.04, 12.96]	.043	0.46 [0.04, 4.43]	.51
Income <US\$50,000/y	0.79 [0.47, 1.31]	.35	1.39 [0.74, 2.62]	.31	0.82 [0.30, 2.23]	.70
Age <30 y	1.31 [0.56, 3.08]	.53	2.13 [0.74, 6.27]	.16	0.45 [0.08, 2.44]	.36
Importance of cost	0.97 [0.90, 1.05]	.49	0.98 [0.89, 1.08]	.74	0.90 [0.77, 1.05]	.18
Importance of limits on high-risk activities	1.03 [0.94, 1.12]	.55	1.05 [0.95, 1.17]	.34	0.95 [0.80, 1.11]	.51
Have health insurance	0.88 [0.45, 1.70]	.70	0.68 [0.28, 1.60]	.38	2.00 [0.64, 6.82]	.24
Had prior dislocation	0.88 [0.51, 1.52]	.65				
Had any prior surgery	0.95 [0.57, 1.57]	.83	0.83 [0.44, 1.55]	.56	1.56 [0.56, 4.55]	.39
Participate in high-risk activities	1.09 [0.60, 1.99]	.77	0.65 [0.30, 1.38]	.27	3.69 [1.04, 16.02]	.04
Importance of limits on shoulder motion	0.99 [0.91, 1.11]	.87	1.03 [0.91, 1.16]	.65	0.92 [0.75, 1.13]	.44

^aBoldfaced values indicate significant values.

received and understood, which echoes findings from other surveys that include interactive or thought-provoking exercises surrounding treatment choice.^{8,17,27} Utilizing a similar survey tool in a clinical environment, such as during or prior to the visit with the physician, may therefore be possible without excessive time or resource demands.

Risk of recurrence emerged as the most important attribute among those considered after FTASD. Respondents to this survey at an individual level, however, differed in the importance of this factor, thus supporting a patient-centered approach to management of FTASD. After recurrence, cost was the next most important attribute. While it is widely known that cost is an important concern to patients, discussions about cost in practice may not be occurring with the frequency or depth to adequately address patient concerns.¹ Among other attributes, limitations on motion of the arm, avoiding high-risk activities, and duration of physical therapy had lower importance.

Forty-two percent of respondents chose surgery after a hypothetical FTASD, with 37% of those with prior dislocation and 45% without prior dislocation. Significant age and sex variation was present in choice of treatment in each subgroup; however, notably, those reporting prior dislocation and those without chose treatment at similar rates. Surgical utilization rates after FTASD are not well described, but some data suggest that approximately one-third of patients will undergo surgery after repeat dislocation,²¹ similar to our subgroup who had sustained dislocation. Respondents utilizing our tool chose surgery at similar rates to those described after dislocation, which suggests that our tool may serve as an acceptable novel platform for clinical testing.

Subset evaluation of those reporting dislocation showed low surgical utilization (5/119), though this pilot study was not designed to fully explore this small cohort. Further research in patients with shoulder dislocation is necessary to corroborate these findings and explore the

reasons patients may be motivated or reluctant to undergo surgery.

Several factors examined in this study were predictive of choice of surgery after FTASD. The importance of recurrence was significantly predictive of choosing surgery, as were the demographic factors of younger age and male sex. However, when controlling for the wide variation in risk of recurrence shown for different age groups and by sex in logistic regression, only the importance of recurrence remained a significant predictor of treatment choice overall. These findings have profound implications for shared decision-making between patients and providers. The reduction in probability of recurrent dislocation, which patients report as most important on average and which literature deems the most important outcome of treatment, is shown to be more important than other aspects of treatment. Since variables predicting treatment choice were different in those who had sustained dislocation, further study is warranted in that target subgroup. Furthermore, the nonoperative recurrence risk shown in the survey was highly predictive, suggesting a role for presenting individualized evidence-based recommendations to the patient. Overall, to align with an individual's preferences, providers may benefit from obtaining preference information from patients considering treatment after FTASD.

While the study sample focused on higher risk individuals—those more likely to be young, male, active, and relatively well educated compared with the general population—the sample was appropriate for the study, as a younger, male-dominated sample is representative of patients with FTASD. Moving forward, however, the next step would be to replicate this study in a sample with clinically confirmed diagnosis of FTASD.

There are several limitations of our survey. First, injury and treatment for our respondents is hypothetical, and despite attempts to describe the situation, real patients will no doubt behave differently. Arguably, however, treatment decisions made immediately after a painful dislocation may distort preferences, and preference measurement prior to an injury may better reflect stable long-term preferences. Second, the cost of treatment in our survey is imagined, and individuals' choices may vary if requiring actual personal expense. Cost of operative treatment will also likely vary between individuals and insurance plans, as will nonoperative costs of physical therapy copays. However, the purpose of the cost attribute is not to reflect exact costs but to estimate the general importance of out-of-pocket cost and to obtain utility values in other attributes that can be converted to dollar amounts to communicate relative value.

Additional limitations include the timing of the decision, which may be important for an in-season athlete.²⁶ There also may be inconsistent application of the current literature by orthopaedic providers, which favors more aggressive treatment in certain populations.^{12,13,16,24} Finally, despite our attempts to describe dislocation in detail, participants may have reported dislocation despite having other shoulder injuries such as subluxation.

Several limitations are noted concerning the use of conjoint analysis as well. Although a panel of experts was convened to establish important attributes in FTASD, patient

input was informal during survey development. Long-term sequelae of shoulder instability were also not included. Hovelius and Saeboe¹⁸ describe increased radiographic evidence of arthropathy after follow-up of dislocation, although verification of these findings and their clinical significance is lacking. Nevertheless, patients with FTASD may have preferences about distant or future risks that may be important determinants of surgical or nonsurgical management. Additional concerns relevant to survey research or development of decision aids include the impact of attribute descriptions, framing of questions, and design of the conjoint exercise.²⁸

CONCLUSION

Treatment of shoulder dislocation presents an opportunity to explore patient preferences objectively. As individual patient circumstances vary widely in terms of activity levels, participation in sport or other activities, and demographic characteristics, patient preferences may play a role in decisions about treatment. This study tests a preliminary model for collecting patient preferences about shoulder dislocation and treatment and serves as a foundation for future research.

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APPENDIX

Thank you for participating in our survey.

We are interested in understanding your reaction to possible shoulder dislocations and their treatment. The information you give us will help doctors provide patients with the best possible treatments for their dislocations.

This survey will help us understand the kinds of activities you now do that use your shoulder, how a shoulder dislocation would affect your quality of life, and which effects of such a dislocation are most important to you. We also will ask you how you feel about possible treatment options.

If you have not previously had a shoulder dislocation, we will ask you to imagine how you would react if you had the dislocation that we will describe.



(continued)

About you

First, we would like to know something about your background and activities.

Please enter your Amazon Worker ID to ensure proper payment.

What is your age?

What is your gender?

- Male
 Female

What is your marital status?

- Single
 Married
 Widowed
 Divorced
 Other

What is your student status?

- Full-time student.
 Part-time student.
 Not a student.

What is your employment status?

- Employed full time (30+ hours)
 Employed part-time (<30 hours)
 Not employed



0%  100%

Physical activity at home or at work.

Please select the one option that best describes the most strenuous activity you do at home or at work.

- Sedentary work.* You lift no more than 10 pounds at a time and occasionally lift or carry things like small boxes and tools.
- Light work.* You lift no more than 20 pounds at a time and frequently lift or carry things that weigh up to 10 pounds.
- Medium work.* You lift no more than 50 pounds at a time and frequently lift or carry things that weigh up to 25 pounds.
- Heavy work.* You lift no more than 100 pounds at a time and frequently lift or carry things that weigh up to 50 pounds.
- Very heavy work.* You lift things that weigh more than 100 pounds and frequently lift or carry things that weigh 50 pounds or more.



0%  100%

(continued)

Using your shoulders

In the last month, how many times have you lifted things that weigh 50 pounds or more (about the weight of a heavy suitcase or a 5 year old child)?

- 0 times
- 1-2 times
- 3 to 10 times
- More than 10 times

In the last month, how many times have you lifted things that weigh 25 pounds or more (about the weight of a 2-year old child)?

- 0 times
- 1-2 times
- 3 to 10 times
- More than 10 times



Sports activities in the past year

Check any of the activities below you have participated in during the last 12 months.

- | | | |
|---|---|--|
| <input type="checkbox"/> Aerobics | <input type="checkbox"/> Golf | <input type="checkbox"/> Soccer |
| <input type="checkbox"/> Baseball | <input type="checkbox"/> Gymnastics | <input type="checkbox"/> Skiing |
| <input type="checkbox"/> Basketball | <input type="checkbox"/> Horseback riding | <input type="checkbox"/> Tennis |
| <input type="checkbox"/> Boxing | <input type="checkbox"/> Ice hockey | <input type="checkbox"/> Swimming |
| <input type="checkbox"/> Cross-training | <input type="checkbox"/> Lacrosse | <input type="checkbox"/> Wrestling |
| <input type="checkbox"/> Cycling | <input type="checkbox"/> Martial arts | <input type="checkbox"/> Weightlifting |
| <input type="checkbox"/> Dancing | <input type="checkbox"/> Racquetball/squash | <input type="checkbox"/> Volleyball |
| <input type="checkbox"/> Diving | <input type="checkbox"/> Rowing | <input type="checkbox"/> Yoga |
| <input type="checkbox"/> Field hockey | <input type="checkbox"/> Running | <input type="checkbox"/> Other (please specify) <input type="text"/> |
| <input type="checkbox"/> Football | <input type="checkbox"/> Rugby | |



(continued)

Please indicate how many times you have participated in each activity **in the past 12 months**.

For example, if you run once weekly, you will have run 52 times in the past 12 months. If you ski 2 times per week for 5 weeks each year, you have skied 10 times in the past 12 months.

	1-5 times	6-15 times	16-100 times	More than 100 times
Aerobics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Baseball	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Basketball	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Boxing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cross-training	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cycling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dancing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Diving	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Field hockey	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Football	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Golf	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gymnastics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Horseback riding	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ice hockey	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lacrosse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Martial arts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Racquetball/squash	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rowing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Running	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rugby	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Soccer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Skiing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tennis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Swimming	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wrestling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Weightlifting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Volleyball	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Yoga	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (please specify) <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



(continued)

A dislocated shoulder

A **dislocated shoulder** is caused when lifting heavy things, involved in active sports, or simply falling in such a way that the bone of the arm is pulled out of its socket. A dislocation is very painful and usually requires a visit to a hospital emergency room.

A doctor will generally put your shoulder joint back in place and tell you what you need to do to reduce the pain, to restore your ability to move your arm, and to avoid another dislocation.

Have you ever had a dislocated shoulder?

- Never
- 1 time
- 2 times
- 3 times
- 4 or more times
- Unsure



(continued)

You indicated that you previously dislocated your shoulder. We are interested to know more about the **first time** you dislocated your shoulder.

How old were you when you had a shoulder dislocation for the **first time**?

How did you dislocate your shoulder the **first time**?

- Participating in contact sports (football, lacrosse, hockey, etc)
- Participating in non-contact sports (tennis, volleyball, running, etc)
- Car accident
- Seizure
- Physical assault
- Fall from greater than 6 feet off the ground
- Fall from less than 6 feet off the ground
- Other (please specify)

Which of the following best describes the **first time** you dislocated your shoulder?

- I went to the Emergency Department or an urgent care facility to have them help put my shoulder in place.
- Someone helped put my shoulder back in place when it happened, then I went to the doctor.
- Someone helped put my shoulder back in place when it happened, and I did not see a doctor after that.
- Other (please specify):

What was the highest level of pain you experienced the **first time** you dislocated your shoulder?

- I needed to go to the hospital to control my pain.
- I needed prescription pain medicine to control my pain.
- I needed over-the-counter medicine to control my pain (Tylenol, Advil, etc.).
- I used other ways to control my pain without medicine.
- Even at its worst, I didn't need to do anything to control the pain.

Have you ever had surgery on your shoulder to help **with your shoulder dislocations**? If you had surgery on your shoulder for another reason (rotator cuff tear, broken bone), put "No".

- Yes
- No
- Unsure



0%  100%

(continued)

There are five effects of a dislocated shoulder and its treatment:

1. Limited ability to move your arm
2. Avoid activities that increase the risk of a repeat injury
3. Required physical therapy
4. Chance of another dislocation
5. Out-of-pocket cost to you

We will explain each of these of these effects and later in the survey we will ask you to think about how important these effects are to you.



Limited ability to move your arm

In the first month following a dislocated shoulder, it can be painful to move your arm. We will ask you to think about 3 possible limitations:

- No limit on moving arm
- Cannot lift arm above shoulder level for one month
- Arm in a sling for one month

Limits on moving your arm can affect your ability to do your daily activities. Which of these difficulties would be **most** frustrating for you to deal with **for one month**?

- Lifting a full suitcase over your head
- Washing your own hair
- Reaching for a shelf above your head
- Inability to throw a ball or play a sport requiring raising an arm above the shoulder

How difficult would it be for you to deal with having **your arm in a sling for one month**?

- Not burdened
- Moderately burdened
- Greatly burdened
- Unacceptably burdened



(continued)

Avoid activities that increase the chance of another dislocation

After getting a dislocated shoulder, it will be important to avoid lifting heavy things or participating in active sports that increase your chance of getting another dislocated shoulder.

Later in this survey we will ask you how you feel about limits on these activities for different lengths of time.

- Avoid lifting and active sports for one month
- Avoid lifting and active sports for 3 months
- Avoid lifting and active sports for 1 year

Certain activities are high-risk for repeat shoulder dislocation, including contact sports, sports involving the use of the arm over the head, and lifting heavy objects. [\[SSi Script\]](#) [\[SSi Script\]](#) [\[SSi Script\]](#) [\[SSi Script\]](#)

If continuing your usual activities **for 1 year** would increase your chance of having another dislocated shoulder by **25%**, how likely is it that you would stop these activities?

- Absolutely would not stop these activities
- Not likely to stop these activities
- Somewhat likely to stop these activities
- Very likely to stop these activities
- Certain to stop these activities



0%  100%

(continued)

Consequence 3: Physical Therapy

Physical therapy is needed to treat a dislocated shoulder.

Suppose that you are required to have physical therapy in a clinic 1 hour per week and do physical therapy at home for at least 30 minutes every day for a number of weeks. The physical therapy will not be painful but you can have some mild discomfort.

Later in this survey we will ask you to think about how long you will have to do physical therapy.

- 4 weeks
- 8 weeks
- 12 weeks

People often find it is hard to complete the required physical therapy. If you were prescribed 30 minutes of physical-therapy exercises **every day for the next 12 weeks**, how many days each week would you realistically do all 30 minutes of exercise?

- None
- Less than 3 days per week
- 3 to 4 days per week
- 5 to 6 days per week
- All 7 days of the week



(continued)

Chance of Another Dislocation

Even if you avoid activities that can lead to a dislocation, it can still happen again. With each repeat dislocation, you will have the same high level of pain, have to reset your shoulder, have arm-movement limitations, and physical therapy requirements.

Each repeat dislocation weakens your shoulder and can result in long-term pain and limited use of your shoulder.

Later in this survey, we will ask you to think about various chances of dislocating your shoulder again in the next two years:

- **5% chance** (5 out of 100)
- **20% chance** (20 out of 100)
- **80% chance** (80 out of 100)

Thinking about your normal lifting and active sports activities, would you completely stop doing these activities for one year if the chance you would have a repeat dislocation were 20% (20 out of 100)?

- Yes
- No
- Don't know

Special braces have been designed to reduce the risk of shoulder dislocation, but may prevent movement of the arm above the shoulder. If wearing a brace that prevented you from using your arm fully could reduce your chance of having another dislocation from **80% to 20%**, how likely is it that you would wear this brace for the next 3 months?

- Absolutely wouldn't wear the brace
- Not likely to wear the brace
- Somewhat likely to wear the brace
- Very likely to wear the brace
- Certainly would wear the brace



0%  100%

(continued)

Out-of-Pocket Cost

Even if you are insured, injuries involve some costs you must pay personally. These include copays for treatment, copays for physical therapy, cost of travel, and sometimes lost wages. In all, these costs could add up to thousands of dollars.

Later in this survey we will show you different total personal costs of treating a dislocation. Even if you have good insurance, please consider how you would feel if you actually had to pay the costs shown.

Would you personally pay **\$2000** for a treatment that would reduce your chance of a repeat dislocation in the next two years from **20% to 5%**?

- Absolutely would not pay
- Not likely to pay
- Somewhat likely to pay
- Very likely to pay
- Certainly would to pay



(continued)

Thinking about what could happen following a dislocation

We now will ask you how you feel about the effects of a dislocated shoulder.

If the effects from your shoulder dislocation and treatment were acceptable in **all other ways**, how important would **this difference** be to you?

Not Important Somewhat Important Very Important Extremely Important

No limit on moving arm
 ---instead of---
Arm in a sling for one month

If the effects from your shoulder dislocation and treatment were acceptable in **all other ways**, how important would **this difference** be to you?

Not Important Somewhat Important Very Important Extremely Important

Avoid lifting and active sports for **1 month**.
 ---instead of---
 Avoid lifting and active sports for **1 year**

If the effects from your shoulder dislocation and treatment were acceptable in **all other ways**, how important would **this difference** be to you?

Not Important Somewhat Important Very Important Extremely Important

4 weeks of physical therapy
 ---instead of---
12 weeks of Physical Therapy

If the effects from your shoulder dislocation and treatment were acceptable in **all other ways**, how important would **this difference** be to you?

Not Important Somewhat Important Very Important Extremely Important

5% chance of another injury
 ---instead of---
80% chance of another shoulder injury

If the effects from your shoulder dislocation and treatment were acceptable in **all other ways**, how important would **this difference** be to you?

Not Important Somewhat Important Very Important Extremely Important

\$0 out-of-pocket cost
 ---instead of---
\$2000 out-of-pocket cost



(continued)

Thinking about what could happen following a dislocation

We will now ask you to consider several pairs of scenarios describing what could happen to you. To answer each question, **suppose that you have just had a dislocated shoulder** and now need to consider what will happen next.

You may not have experienced anything like these scenarios before. We want you to suppose that each scenario could be one that happens to you, and that the scenarios represent the only possible alternatives.

Remember that the costs shown are the costs you **personally** would have to pay out-of-pocket in addition to any costs that are covered by your insurance. Even if you have good insurance, please consider how you would feel if you actually had to pay the costs shown.

Your answers are important to help us understand your concerns about shoulder injuries and treatments. Please take your time to consider your feelings about each question. There are no right or wrong answers.



Below we will ask how you feel about different kinds of consequences from a dislocated shoulder. Please pick the rating that shows how much you prefer one over the other.

You might not like either of the consequences very much. Please rate them on how you would feel if they happened to you.

Avoid lifting and active sports for 1 year 20% chance of another shoulder injury	or	Avoid lifting and active sports for 3 months 80% chance of another shoulder injury
---	----	---

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Strongly Prefer Left		Somewhat Prefer Left		Indifferent		Somewhat Prefer Right		Strongly Prefer Right



Below we will ask how you feel about different kinds of consequences from a dislocated shoulder. Please pick the rating that shows how much you prefer one over the other.

You might not like either of the consequences very much. Please rate them on how you would feel if they happened to you.

80% chance of another shoulder injury \$0 out-of-pocket cost	or	5% chance of another injury \$2000 out-of-pocket cost
---	----	--

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Strongly Prefer Left		Somewhat Prefer Left		Indifferent		Somewhat Prefer Right		Strongly Prefer Right



Below we will ask how you feel about different kinds of consequences from a dislocated shoulder. Please pick the rating that shows how much you prefer one over the other.

You might not like either of the consequences very much. Please rate them on how you would feel if they happened to you.

No limit on moving arm	or	Arm in a sling for one month
Avoid lifting and active sports for 1 year		Avoid lifting and active sports for 1 month.
4 weeks of physical therapy		12 weeks of Physical Therapy

Strongly
Prefer Left

Somewhat
Prefer Left

Indifferent

Somewhat
Prefer Right

Strongly
Prefer Right

0% 100%

Below we will ask how you feel about different kinds of consequences from a dislocated shoulder. Please pick the rating that shows how much you prefer one over the other.

You might not like either of the consequences very much. Please rate them on how you would feel if they happened to you.

No limit on moving arm	or	Cannot lift arm above shoulder level for one month
8 weeks of Physical Therapy		12 weeks of Physical Therapy
\$2000 out-of-pocket cost		\$1000 out-of-pocket cost

Strongly
Prefer Left

Somewhat
Prefer Left

Indifferent

Somewhat
Prefer Right

Strongly
Prefer Right

0% 100%

(continued)

Below we will ask how you feel about different kinds of consequences from a dislocated shoulder. Please pick the rating that shows how much you prefer one over the other.

You might not like either of the consequences very much. Please rate them on how you would feel if they happened to you.

Avoid lifting and active sports for 1 month .	or	Avoid lifting and active sports for 3 months
4 weeks of physical therapy		8 weeks of Physical Therapy
20% chance of another shoulder injury		5% chance of another injury
\$1000 out-of-pocket cost		\$0 out-of-pocket cost

Below we will ask how you feel about different kinds of consequences from a dislocated shoulder. Please pick the rating that shows how much you prefer one over the other.

You might not like either of the consequences very much. Please rate them on how you would feel if they happened to you.

Cannot lift arm above shoulder level for one month	or	Arm in a sling for one month
Avoid lifting and active sports for 1 year		Avoid lifting and active sports for 3 months
5% chance of another injury		80% chance of another shoulder injury
\$1000 out-of-pocket cost		\$0 out-of-pocket cost

(continued)

Below we will ask how you feel about different kinds of consequences from a dislocated shoulder. Please pick the rating that shows how much you prefer one over the other.

You might not like either of the consequences very much. Please rate them on how you would feel if they happened to you.

No limit on moving arm Avoid lifting and active sports for 3 months 4 weeks of physical therapy 20% chance of another shoulder injury \$2000 out-of-pocket cost	or	Cannot lift arm above shoulder level for one month Avoid lifting and active sports for 1 month . 12 weeks of Physical Therapy 80% chance of another shoulder injury \$0 out-of-pocket cost
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Strongly Prefer Left — Somewhat Prefer Left — Indifferent — Somewhat Prefer Right — Strongly Prefer Right

0% 100%

We realize that it can be difficult to rate these scenarios, but your responses will be important to our study!

Only 3 more scenarios to go!

0% 100%

Below we will ask how you feel about different kinds of consequences from a dislocated shoulder. Please pick the rating that shows how much you prefer one over the other.

You might not like either of the consequences very much. Please rate them on how you would feel if they happened to you.

Arm in a sling for one month Avoid lifting and active sports for 1 year 4 weeks of physical therapy 5% chance of another injury \$1000 out-of-pocket cost	or	Cannot lift arm above shoulder level for one month Avoid lifting and active sports for 1 month . 8 weeks of Physical Therapy 20% chance of another shoulder injury \$2000 out-of-pocket cost
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Strongly Prefer Left — Somewhat Prefer Left — Indifferent — Somewhat Prefer Right — Strongly Prefer Right

0% 100%

(continued)


Below we will ask how you feel about different kinds of consequences from a dislocated shoulder. Please pick the rating that shows how much you prefer one over the other.

You might not like either of the consequences very much. Please rate them on how you would feel if they happened to you.

<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="text-align: center;">Arm in a sling for one month</td></tr> <tr><td style="text-align: center;">Avoid lifting and active sports for 1 year</td></tr> <tr><td style="text-align: center;">8 weeks of Physical Therapy</td></tr> <tr><td style="text-align: center;">20% chance of another shoulder injury</td></tr> <tr><td style="text-align: center;">\$1000 out-of-pocket cost</td></tr> </table>	Arm in a sling for one month	Avoid lifting and active sports for 1 year	8 weeks of Physical Therapy	20% chance of another shoulder injury	\$1000 out-of-pocket cost	or	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="text-align: center;">No limit on moving arm</td></tr> <tr><td style="text-align: center;">Avoid lifting and active sports for 3 months</td></tr> <tr><td style="text-align: center;">12 weeks of Physical Therapy</td></tr> <tr><td style="text-align: center;">80% chance of another shoulder injury</td></tr> <tr><td style="text-align: center;">\$2000 out-of-pocket cost</td></tr> </table>	No limit on moving arm	Avoid lifting and active sports for 3 months	12 weeks of Physical Therapy	80% chance of another shoulder injury	\$2000 out-of-pocket cost
Arm in a sling for one month												
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8 weeks of Physical Therapy												
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80% chance of another shoulder injury												
\$2000 out-of-pocket cost												
<input type="radio"/> Strongly Prefer Left	<input type="radio"/> Somewhat Prefer Left	<input type="radio"/> Indifferent	<input type="radio"/> Somewhat Prefer Right	<input type="radio"/> Strongly Prefer Right								
												
<div style="display: flex; align-items: center; justify-content: center;"> 0% <div style="width: 100%; height: 10px; background: linear-gradient(to right, blue 50%, gray 50%);"></div> 100% </div>												

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<div style="display: flex; align-items: center; justify-content: center;"> 0% <div style="width: 100%; height: 10px; background: linear-gradient(to right, blue 50%, gray 50%);"></div> 100% </div>												

(continued)

What is important to you

This is what your answers told us about what is important to you. Longer lines show more importance, while shorter lines show less importance.

Importance of Effects

Limited Ability
to Move Your Arm

Avoid
Activities that
Increase the
Chance of
Another
Dislocation

Required
Physical
Therapy

Chance of
another
dislocation in
the next 2
Years

Total Out-of-
Pocket Cost
to You

How well does this show what is important to you?

- Very well
- Well
- Fairly well
- Poorly



(continued)

Adjust our results

Importance of Effects

- Limited Ability to Move Your Arm
- Avoid Activities that Increase the Chance of Another Dislocation
- Required Physical Therapy
- Chance of another dislocation in the next 2 Years
- Total Out-of-Pocket Cost to You

Which effects do you feel are **more important to you** than shown? That is, which values on the graph should be **longer**? Check all that apply.

- Limited ability to move your arm
- Avoid activities that increase the chance of another dislocation
- Required Physical Therapy
- Chance of another dislocation in the next 2 years
- Total Out-of-Pocket Cost to You
- None should be changed

Which effects do you feel are **less important to you** than represented on the graph above? That is, which values on the graph should be **smaller**? Check all that apply.

- Limited ability to move your arm
- Avoid activities that increase the chance of another dislocation
- Required Physical Therapy
- Chance of another dislocation in the next 2 years
- Total Out-of-Pocket Cost to You
- None should be changed



(continued)

Now assume you dislocated your shoulder ! [SSI Script] !

After the initial treatment to put the shoulder joint back in place, you have the option of exploring further treatment to minimize the chances of a repeat dislocation in the future.

To help your doctor understand what is important to you, would you be willing to share with your doctor what you have just told us?

- Yes
- No
- I don't know



Option 1: No Surgical Repair

Suppose your doctor tells you that an operation to repair your shoulder is not necessary, but you are more likely to have another dislocated shoulder without an operation. Continuing lifting and active sports will make it even more likely that you will have another dislocation.

! [SSI Script] ! ! [SSI Script] ! ! [SSI Script] ! ! [SSI Script] !

With each repeat dislocation, you will have the same high level of pain, a hospital visit to reset your shoulder, arm-movement limitations, physical therapy requirements, and personal costs. You will also have an increased risk of developing arthritis when you are older, which causes pain when moving your shoulder.



(continued)

Option 2: Surgical Repair

An operation will decrease your chance of having another dislocation. The operation fixes the damaged parts of the shoulder using a camera and small instruments that enter the shoulder through several 1-inch cuts.

Side effects of an operation are rare and happen in fewer than 1 in 100 operations. These side effects include permanent shoulder stiffness, possible nerve damage, infection, or bleeding.

Pain

In the first few days after the operation, you will have to take a prescription medicine for pain that will make you sleepy and unable to go to school or work or to drive a car. By the end of the first week, you can take an over-the-counter medicine for the pain and go to school or work and drive a car.

Physical limitations

For one month following the operation, you will have to wear a sling to keep your shoulder from moving. For another month after you are out of the sling, you will not be able to lift things heavier than 5 pounds above your head. At six months, you can again lift heavy things and play active sports.

Physical therapy

You will have to go to physical therapy once a week for 12 weeks, and complete up to 30 minutes of exercises at home every day. The physical therapy will not be painful but you can have some mild discomfort.

Return to high risk activities

At six months, you will have the option to fully return to contact sports and lifting heavy objects.



0%  100%

(continued)

Have you ever had surgery where you were put to sleep under anesthesia **or** had to spend a night in the hospital?

- Yes
- No

People often have concerns about surgery. Indicate how concerned you are for each of the items below.

	Not concerned	Somewhat concerned	Concerned	Very concerned	Extremely concerned
Possibility of complications	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Need for help during recovery	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Out-of-pocket costs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fear	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Scarring	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Time lost from work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Suppose your doctor asked you to consider having surgery. The effects of having and not having surgery are shown below. Which would you choose if **these were the only options**?

<u>Surgery</u>	<u>No Surgery</u>
<u>12 weeks</u> of Physical Therapy	<u>4 weeks</u> of Physical Therapy
Avoid lifting and sports for <u>6 months</u>	Avoid lifting and sports for <u>1 month</u>
Arm in a sling for <u>1 month</u>	<u>No restriction</u> on movement of shoulder
<u>5 out of 100 (5%)</u> chance of another dislocation in the next 2 years	<u>15 out of 100 (15%)</u> chance of repeat injury in the next 2 years
<u>\$1000</u> out-of-pocket cost	<u>\$0</u> out-of-pocket cost
<input type="radio"/>	<input type="radio"/>

(make selection above)



(continued)

Suppose the out-of-pocket cost were **\$2000** instead of **\$1000**. Which would you choose now?

<p><u>Surgery</u></p> <p><u>12 weeks</u> of Physical Therapy</p> <p>Avoid lifting and sports for <u>6 months</u></p> <p>Arm in a sling for <u>1 month</u></p> <p><u>5 out of 100 (5%)</u> chance of another dislocation in the next 2 years</p> <p>\$1000 \$2000 out-of-pocket cost</p>	<p><u>No Surgery</u></p> <p><u>4 weeks</u> of Physical Therapy</p> <p>Avoid lifting and sports for <u>1 month</u></p> <p><u>No restriction</u> on movement of shoulder</p> <p><u>15 out of 100 (15%)</u> chance of repeat injury in the next 2 years</p> <p>\$0 out-of-pocket cost</p>
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(make selection above)



Suppose the out-of-pocket cost was **\$0** instead of **\$1000**. Which would you choose?

<p><u>Surgery</u></p> <p><u>12 weeks</u> of Physical Therapy</p> <p>Avoid lifting and sports for <u>6 months</u></p> <p>Arm in a sling for <u>1 month</u></p> <p><u>5 out of 100 (5%)</u> chance of another dislocation in the next 2 years</p> <p>\$1000 \$0 out-of-pocket cost</p>	<p><u>No Surgery</u></p> <p><u>4 weeks</u> of Physical Therapy</p> <p>Avoid lifting and sports for <u>1 month</u></p> <p><u>No restriction</u> on movement of shoulder</p> <p><u>15 out of 100 (15%)</u> chance of repeat injury in the next 2 years</p> <p>\$0 out-of-pocket cost</p>
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(make selection above)



(continued)

Now suppose it is a year later and you have had another shoulder dislocation. Which would you choose?

<p style="text-align: center;"><u>Surgery</u></p> <p style="text-align: center;"><u>12 weeks</u> of Physical Therapy</p> <p style="text-align: center;">Avoid lifting and sports for <u>6 months</u></p> <p style="text-align: center;">Arm in a sling for <u>1 month</u></p> <p style="text-align: center;"><u>5 out of 100 (5%)</u> chance of another dislocation in the next 2 years</p> <p style="text-align: center;"><u>\$0</u> out-of-pocket cost</p>	<p style="text-align: center;"><u>No Surgery</u></p> <p style="text-align: center;"><u>4 weeks</u> of Physical Therapy</p> <p style="text-align: center;">Avoid lifting and sports for <u>1 month</u></p> <p style="text-align: center;"><u>No restriction</u> on movement of shoulder</p> <p style="text-align: center;"><u>15 out of 100 (15%)</u> chance of repeat injury in the next 2 years</p> <p style="text-align: center;"><u>\$0</u> out-of-pocket cost</p>
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(make selection above)



(continued)

Thank you for your help. You're almost done, but we'd like to know a little more about you before ending the survey.

Including you, how many people live in your household?

- 1
- 2
- 3
- 4 or more

What is your approximate household income?

- Less than \$20,000 per year
- Between \$20,000 and \$35,000 per year
- Between \$35,000 and \$50,000 per year
- Between \$50,000 and \$100,000 per year
- Over \$100,000 per year
- Prefer not to answer

What is the highest level of education you have completed?

- Grade school or some high school
- Graduated high school
- Attended some college
- Bachelor's degree
- Master's degree or other advanced degree
- Prefer not to answer

In the last year, how often have you participated in organized or group religious activity?

- At least once per week
- At least once per month
- At least once per year
- Less than once per year
- Prefer not to answer

Do you currently have health insurance?

- Yes
- No
- Not sure, prefer not to answer



(continued)

You indicated that you currently have health insurance.

Most health insurance plans have certain levels of:

- monthly or yearly premium costs
- out-of-pocket costs for healthcare services
- a set deductible amount, above which insurance pays a certain percentage

Below are the descriptions of several common plans. Select the option that is most similar to your current plan.

- Lowest monthly premium, highest deductible. Insurance pays approximately 60% of all healthcare costs, while 40% of healthcare costs are paid out-of-pocket.
- Lower monthly premium, higher deductible. Insurance pays approximately 70% of all healthcare costs, while 30% of healthcare costs are paid out-of-pocket.
- Higher monthly premium, lower deductible. Insurance covers approximately 80% of healthcare costs, while 20% of healthcare costs are paid out-of-pocket.
- Highest monthly premium, lowest deductible. Insurance pays approximately 90% of all healthcare costs, while 10% of healthcare costs are paid out-of-pocket.
- Not sure, prefer not to answer

Who pays for the majority of your insurance premiums?

- I pay the majority of my costs
- My family or significant other pays the majority of my costs.
- My company or school pays the majority of my costs.
- The federal or state government pays the majority of my costs (ie, Medicare or Medicaid).
- Not sure, prefer not to answer



0%  100%

Thank you for taking part in our survey.

Please give us suggestions about how we might improve this survey

! [SSI Script] !



0%  100%