Expectations of Shoulder Surgery Are Not Altered by Surgeon Counseling of the Patient

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Abstract

**Purpose** The primary objective of this study was to evaluate if the current mechanisms of preoperative counseling influence patients’ expectations of shoulder surgery.

**Methods** Patients were asked to complete the Hospital for Special Surgery’s (HSS) Shoulder Surgery Expectations Survey. The first survey was completed before the first appointment with one of four fellowship-trained shoulder surgeons. The second survey was completed after patients consented for surgery. Our analysis also included patient demographics and surgical factors.

**Results** A total of 41 patients completed the HSS Shoulder Surgery Expectations Survey before and after their first appointment with the surgeon during which they consented to shoulder surgery. Before seeing the surgeon, the mean HSS Shoulder Surgery Expectations score was 72.5. After seeing the surgeon and being consented for surgery, the mean HSS Shoulder Surgery Expectations score was 74.8. The mean change in HSS Shoulder Surgery Expectations score (+2.3) was not statistically significant (p value = 0.242). We did not find any significant correlations between patients’ expectations and demographics or surgical factors. Total HSS Shoulder Surgery Expectations scores and change in scores were not statistically different between the four surgeons (p = 0.146).

**Conclusion** Patient expectations were not substantially altered after preoperative counseling. Further investigation is necessary to investigate factors correlated with expectations, the implication of unaltered expectations on the postoperative outcome, and methods for improving the preoperative counseling process.

**Level of Evidence** Level II, prospective cohort study.

Introduction

There is increasing evidence supporting the association between patient expectations of shoulder surgery and outcomes of treatment. Expectations of surgery vary by demographics, diagnosis, functional status, and reason for seeking treatment.1–4 Investigators have shown a positive association between greater preoperative expectations and self-assessed postoperative outcome.3,5,6 One study7 comparing physicians’ and patients’ expectations of knee pain and function after surgery found that physicians were more accurate at predicting pain and function, and expectations varied significantly between patients and physicians, indicating a lack of effective communication in preoperative patient counseling.

Qualitative research8 shows expectations for recovery after musculoskeletal injury are formulated based on physician
diagnosis and treatment, prior experiences with injury, others’ experiences and attitudes, information from the Internet, and a sense of self-resilience. These factors are not mutually exclusive, and further investigation is necessary to determine the relative importance of each. Patient satisfaction is correlated with met expectations, particularly regarding information and explanation of medical condition and treatment.9,10 Conversely, patients are dissatisfied when they perceive a lack of information, whether the perception is accurate, or not.11 While the implications of preoperative patient expectations have been evaluated, the effect of preoperative physician counseling on patients’ expectations of shoulder surgery remains unknown. One of the primary roles of the surgeon during preoperative counseling is to explain the risks and benefits of surgery as well as to manage expectations. The purpose of this study was to determine whether the current mechanisms of preoperative counseling by the surgeon influence patients’ expectations of shoulder surgery. We hypothesized that patient expectations of surgery would be unaffected by surgeon counseling.

Methods

After institutional board review approval, from March to April 2014, patients at a single institution were asked to complete two surveys regarding their expectations of shoulder surgery. Patients who completed the entirety of both surveys and who were consented for shoulder surgery met the inclusion criteria. The first survey was completed before the first (“new” patient) appointment with one of four fellowship-trained shoulder surgeons. The second survey was completed after patients were consented for surgery and during the surgical scheduling process. Patients with incomplete surveys and those who had previously been seen by a shoulder surgeon were excluded. While consent forms were standardized, there was no specific standardization in preoperative counseling between surgeons during the investigation. This methodology was selected as the optimal way to study the current clinical practice at our institution.

The Hospital for Special Surgery’s (HSS) Shoulder Surgery Expectations Survey was used to measure preoperative expectations.1 The 17-item questionnaire is a validated and reproducible tool used to evaluate expectations regarding physical and psychosocial function in addition to symptom relief.1 The 17 statements regarding different expectations of shoulder surgery were rated as “very important,” “somewhat important,” “a little important,” “I do not expect this,” or “this does not apply to me.” Scores were documented for each of the 17 items in addition to the cumulative score. Scores range from 0 to 100, with 100 indicating the greatest expectations.

In addition to data regarding preoperative expectations of shoulder surgery, our analysis also included patient demographics, body mass index (BMI), patient-reported comorbidities, previous shoulder surgeries, diagnosis, type of surgery the patient was consented for (arthroplasty versus arthroscopic versus open nonarthroplasty), preoperative active range of motion, and patient-reported outcomes (PROs). The PROs used were American Shoulder and Elbow Surgeons (ASES) score, the visual analog score for pain (VAS), Single Assessment Number Evaluation (SANE), Simple Shoulder Test (SST), and the Veterans RAND 12 Item Health Survey (VR-12). The subjective ASES score measures shoulder comfort and function on a scale of 0 to 100, with 100 being the highest score.12 The VAS pain score was recorded when patients were asked: “How bad is your pain today?” Responses could range from 0 to 10 with 0 being “no pain at all” and 10 being “pain as bad as it could be.” The SANE is an outcomes measure in which patients answer the question, “How would you rate your shoulder today as a percentage of being normal (0–100% scale with 100% being normal)?”13 The SST is a 12-question survey that measures comfort and physical function of the shoulder.14 The VR-12 is a health-related quality of life assessment in which patients answer questions related to eight domains of physical and mental health. A composite score is generated, which can be compared with the mean U.S. population score of 50.15

Statistical Analysis

For continuous variables, an absolute skewness less than 2 and an absolute kurtosis less than 12 was used to define data as normally distributed and appropriate for parametric testing.16 As all continuous data in this analysis was normally distributed, mean and standard deviation (SD) for descriptive statistics. A paired t-test was performed to analyze the mean expectations scores pre- and postvisit with the surgeon. Student’s t-test and Pearson’s correlation were used detecting associations between patients’ expectations and age, gender, BMI, the number of comorbidities, marital status, employment status, mechanism of injury, duration of symptoms, type of surgery scheduled, the surgeon performing the counseling, preoperative range of motion, and PROs. To confirm findings of the univariate analysis, multivariate linear regression including only significant variables in univariate analysis was performed for identifying predictors of precounseling expectations. All statistical tests were performed using R 3.2.3 (R Foundation for Statistical Computing, Vienna, Austria).

Results

A total of 41 patients completed the HSS Shoulder Surgery Expectations Survey before and after their appointment with the physician and were consented for shoulder surgery. The mean age was 57.9 years (SD: 12.6). Women comprised 41.5% (17 of 41 patients) of the study group. The mean patient BMI was 31.2 (SD: 6.05). Patients self-reported an average of 2.6 medical comorbidities (SD: 1.9) (►Table 1). Out of 41 patients, 10 patients (24.4%) had a disability, lawsuit, or workman’s compensation claim related to their shoulder injury. Nine patients (22.0%) had a previous shoulder surgery, five of which were on the ipsilateral side. Eight patients (19.5%) consented for arthroplasty, 31 patients (75.6%) consented for arthroscopic surgery, and 2 patients (4.9%) consented for open, nonarthroplasty surgery.
The mean ASES score was 40.2 (SD: 20.1). Patients reported a mean VAS pain score of 5.5 (SD: 2.7). The mean SANE score was 33.5 (SD: 27.7). The mean number of "yes" responses on the SST was 3.9 (SD: 2.9). Mean VR-12 mental and physical component scores were 55.3 (SD: 10.4) and 37.7 (SD: 8.1), respectively. Patients achieved a mean preoperative active forward elevation of 120 degrees (SD: 43.1 degrees) and a mean preoperative active external rotation of 42 degrees (SD: 23.3 degrees) (Table 2).

Before seeing the surgeon, the mean HSS Shoulder Surgery Expectations score was 72.5 (SD: 17.0). After seeing the surgeon and being consented for surgery, the mean HSS Shoulder Surgery Expectations score was 74.8 (SD: 17.0). The mean change in HSS Shoulder Surgery Expectations score (2.3; SD: 12.3) was not statistically significant (p value = 0.242; Table 3) for all comers. Patients with traumatic injuries leading to shoulder surgery and those undergoing nonarthroplasty surgeries had higher expectations before counseling (Table 1). Higher precounseling expectations were also associated with worse shoulder function as determined by the ASES, VAS pain score, and SST functional scores (Table 2). Also, females had lower precounseling HSS Shoulder Surgery Expectations score (66.0 vs. 73.2; p = 0.01). Multivariate analysis found that only a traumatic injury (B = 25.9; p = 0.003) was independently associated with precounseling expectations. Total HSS Shoulder Surgery Expectations scores and the change in scores were not statistically different between the four surgeons (p = 0.146; Table 4).

### Table 1 Patient demographics

<table>
<thead>
<tr>
<th>Measure</th>
<th>Total cohort (n = 41)</th>
<th>SD</th>
<th>Association with pre-counseling Expectations</th>
<th>Association with change in Expectations with counseling</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>p Value</td>
<td>p Value</td>
</tr>
<tr>
<td>Age (y)</td>
<td>57.9</td>
<td>12.6</td>
<td>R = –0.24</td>
<td>0.13 R = 0.04</td>
</tr>
<tr>
<td>Female</td>
<td>17 (41.5%)</td>
<td>–</td>
<td>Mean: 66.0</td>
<td>0.04 Mean: 7.3</td>
</tr>
<tr>
<td>Male</td>
<td>24 (58.5%)</td>
<td>–</td>
<td>Mean: 77.1</td>
<td>–  Mean: –1.3</td>
</tr>
<tr>
<td>BMI</td>
<td>31.2</td>
<td>6.1</td>
<td>R = –0.08</td>
<td>0.63 R = 0.07</td>
</tr>
<tr>
<td>No. of self-reported comorbidities</td>
<td>2.6</td>
<td>1.9</td>
<td>R = –0.27</td>
<td>0.09 R = 0.06</td>
</tr>
<tr>
<td>Traumatic injury</td>
<td>28 (68.3%)</td>
<td>–</td>
<td>Mean: 79.2</td>
<td>&lt; 0.001 Mean: 1.7</td>
</tr>
<tr>
<td>Atraumatic injury</td>
<td>13 (31.7%)</td>
<td>–</td>
<td>Mean: 58.1</td>
<td>–  Mean: 3.7</td>
</tr>
<tr>
<td>Arthroplasty</td>
<td>13 (31.7%)</td>
<td>–</td>
<td>Mean: 59.7</td>
<td>0.02 Mean: 2.5</td>
</tr>
<tr>
<td>Nonarthroplasty</td>
<td>28 (68.3%)</td>
<td>–</td>
<td>Mean: 75.6</td>
<td>–  Mean: 2.2</td>
</tr>
</tbody>
</table>

Abbreviations: Expectations Score, Hospital for Special Surgery’s Shoulder Surgery Expectations Survey Score; n, number of patients; R, Pearson’s correlation coefficient; SD, standard deviation.

### Table 2 Patient preoperative outcomes measures

<table>
<thead>
<tr>
<th>Measure</th>
<th>Mean</th>
<th>Range</th>
<th>SD</th>
<th>Association with pre-counseling Expectations Score</th>
<th>Association with change in Expectations Score with counseling</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Range</td>
<td>SD</td>
<td>Correlation (R)</td>
<td>p Value</td>
</tr>
<tr>
<td>ASES</td>
<td>40.2</td>
<td>3.3–81.7</td>
<td>20.1</td>
<td>–0.47</td>
<td>0.01</td>
</tr>
<tr>
<td>VAS pain</td>
<td>5.5</td>
<td>0.0–10.0</td>
<td>2.7</td>
<td>0.37</td>
<td>0.03</td>
</tr>
<tr>
<td>SANE</td>
<td>33.5</td>
<td>0.0–90.0</td>
<td>27.7</td>
<td>–0.16</td>
<td>0.32</td>
</tr>
<tr>
<td>SST (mean “yes” responses)</td>
<td>3.9</td>
<td>0.0–11.0</td>
<td>2.9</td>
<td>–0.34</td>
<td>0.03</td>
</tr>
<tr>
<td>VR-12 M</td>
<td>55.3</td>
<td>33.4–69.7</td>
<td>10.4</td>
<td>–0.16</td>
<td>0.32</td>
</tr>
<tr>
<td>VR-12 P</td>
<td>37.7</td>
<td>25.9–59.8</td>
<td>8.1</td>
<td>–0.15</td>
<td>0.36</td>
</tr>
<tr>
<td>AFE</td>
<td>120 degrees</td>
<td>30–175 degrees</td>
<td>43.1</td>
<td>–0.14</td>
<td>0.38</td>
</tr>
<tr>
<td>AER</td>
<td>42 degrees</td>
<td>–10 to 70 degrees</td>
<td>23.3</td>
<td>0.11</td>
<td>0.51</td>
</tr>
</tbody>
</table>

Abbreviations: AER, active external rotation; AFE, active forward elevation; ASES, American Shoulder and Elbow Surgeons Score; Expectations Score, Hospital for Special Surgery’s Shoulder Surgery Expectations Survey Score; R, Pearson’s correlation coefficient; SANE, Single Assessment Number Evaluation; SD, standard deviation; SST, Simple Shoulder Test; VAS, visual analog score for pain; VR-12 M, Veterans RAND 12 Item Health Survey Mental Component; VR-12 P, Veterans RAND 12 Item Health Survey Physical Component.
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discussed preoperatively is limited and since our current
would alter patient expectations of the surgical procedure.
unclear whether improving patient recall after counseling
operative counseling process on changing expectations. It is
surgery may also underscore the ineffectiveness of the pre-
poor patient recall of the risks, bene
25% of the information spontaneously. It is plausible that
immediate after viewing a 5-minute video
sessed information recall in healthy volunteers who were
change in expectations before and after visiting the surgeon.
The literature does show that patient comprehension, and
risks, benefits, and complications of surgery are
limited in orthopedic patients. Hutson et al17 have shown that
immediately after the preoperative discussion of total
joint arthroplasty, only 66% of patients recalled the potential
benefit of relief of pain, 53% the benefits of improved function,
and 24% recalled discussion of the potential benefit of
increased range of motion. Similarly, Sandberg et al18 as-
assessed information recall in healthy volunteers who were
questioned immediately after viewing a 5-minute video
about the preoperative discussion of anesthesia. Immediately
following the video, subjects were only able to recall
25% of the information spontaneously. It is plausible that
poor patient recall of the risks, benefits, and complications of
surgery may also underscore the ineffectiveness of the pre-
operative counseling process on changing expectations. It is
unclear whether improving patient recall after counseling
would alter patient expectations of the surgical procedure.
Since patient comprehension and recall of information
discussed preoperatively is limited and since our current
methods of counseling do not seem to influence patient
expectations, clinicians should consider implementing tech-
niques to enhance the process. One way to improve under-
standing of preoperative education and counseling is the use
of multimedia tools. Patients undergoing orthopedic surgery
who used multimedia tools as adjuncts to routine preopera-
tive counseling felt more informed and performed higher on
postoperative assessments, even when the multimedia tool
did not provide any more information than what was rou-
tinely covered in the preoperative discussion.19–21
The present study focused on how preoperative counsel-
ing influences patients’ expectations of shoulder surgery. The lack of difference in expectations could indicate that
preoperative counseling does not substantially alter expect-
tations. Many patients are referred by other physicians who
may have already discussed certain aspects of surgery and
directed to the formation of the patient’s expectations.
Alternately, patients frequently use the Internet to obtain
medical information and may have performed their research
on their condition and options for treatment. Whether or not
the information obtained is accurate is unknown, but regard-
less of accuracy, it may shape patients’ expectations before
meeting the surgeon. Another possible explanation for the
lack of difference in expectations is that our current methods
of preoperative education and counseling are inadequate. As
evidenced in the studies mentioned above, patients do not
sufficiently recall much of what is discussed preoperatively,
even immediately after the preoperative discussion. This
indicates the presence of a communication barrier between
surgeons and patients that need to be addressed. The use of
multimedia tools to enhance understanding of risks, bene-
fits, and complications may be a promising solution. Also,
asking patients what they already know about their condi-
tions and where they obtained the information may provide
further insight and allow for management of expectations on
an individual basis. Given that unrealistic expectations or
unfulfilled expectations can result in poor patient satisfac-
tion with outcome, methods to effectively manage preopera-
tive expectations may have considerable value. Despite this,
it remains unclear whether, in our cohort, alteration in
patient’s expectations preoperatively would have influenced
ultimate satisfaction with surgery.
This study has several limitations. A minimal clinically
important difference for this scoring scale does not exist, but
we believe that the maximum difference of 6.2 points from the
95% confidence interval is not a substantial change in expecta-
tions. Because of this, even though this study may be under-
powered, we do not believe that the small differences in HSS

### Table 3 Expectations Score pre- and postappointment with surgeon

<table>
<thead>
<tr>
<th>Expectations Score</th>
<th>Mean</th>
<th>Range</th>
<th>SD</th>
<th>p Value</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preappointment</td>
<td>72.5</td>
<td>33.8–100.0</td>
<td>17.0</td>
<td>–</td>
<td>67.3–77.7</td>
</tr>
<tr>
<td>Postappointment</td>
<td>74.8</td>
<td>31.3–100.0</td>
<td>17.7</td>
<td>–</td>
<td>69.4–80.2</td>
</tr>
<tr>
<td>Difference</td>
<td>–2.3</td>
<td>–28.8 to 27.5</td>
<td>12.3</td>
<td>0.242</td>
<td>–6.2 to 1.6</td>
</tr>
</tbody>
</table>

Abbreviations: CI, confidence interval; Expectations Score, Hospital for Special Surgery’s Shoulder Surgery Expectations Score; SD, standard deviation.

### Table 4 Expectations Score scores by surgeon

<table>
<thead>
<tr>
<th>Surgeon</th>
<th>Mean previsit score</th>
<th>Mean postvisit score</th>
<th>Difference</th>
<th>p Value&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgeon 1</td>
<td>70.6</td>
<td>71.7</td>
<td>1.1</td>
<td>0.880</td>
</tr>
<tr>
<td>Surgeon 2</td>
<td>74.2</td>
<td>79.4</td>
<td>5.2</td>
<td>0.365</td>
</tr>
<tr>
<td>Surgeon 3</td>
<td>73.3</td>
<td>79.6</td>
<td>6.3</td>
<td>0.453</td>
</tr>
<tr>
<td>Surgeon 4</td>
<td>70.3</td>
<td>66.3</td>
<td>–4.0</td>
<td>0.659</td>
</tr>
<tr>
<td>p Value&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.698</td>
<td>0.224</td>
<td>0.146</td>
<td></td>
</tr>
</tbody>
</table>

Abbreviation: Expectations Score, Hospital for Special Surgery’s Shoulder Surgery Expectations Score.
<sup>a</sup>Two-tailed t-test.
<sup>b</sup>One way analysis of variance comparison of delta score.

Discussion

Baseline patient expectations were not substantially altered by
preoperative counseling with a shoulder surgeon. Specific
demographic or operative factors were not associated with a
change in expectations before and after visiting the surgeon.
These findings suggest that our current methods of preoperative
counseling do not substantially influence patients’ expectations
of shoulder surgery and, when necessary, alternative strategies
may be required to modify patient expectations of surgery.

Since patient comprehension and recall of information
discussed preoperatively is limited and since our current
methods of counseling do not seem to influence patient
expectation score observed are clinically important. Also, patients received preoperative education and counseling from four different shoulder surgeons, which may have influenced expectations of surgery; however, this is reflective of a true clinical scenario. Based on prior research, level of education influences patient comprehension and recall, and lower levels of education correspond with low health literacy.\textsuperscript{22–24} We did not investigate the influence of education level or socioeconomic status on alteration of expectations. We included an assessment of medical comorbidities but did not use a validated quantification, such as Charlson’s comorbidity scores. We included multiple different diagnoses which could have influenced the expectations scores. Given that we were primarily evaluating a change in expectations, we do not believe that the inclusion of multiple diagnoses substantially influences the results. Finally, we do not have a method to determine whether patient’s expectations of surgery were appropriate or inappropriate, so it is possible that patient’s appropriate expectations of surgery were simply reinforced or minimally altered by the surgeon. Based on previous literature noting poor patient recall and comprehension during preoperative counseling, we believe this to be an unlikely explanation for our findings.

In this patient cohort, preoperative counseling did not affect patients’ expectations of shoulder surgery, and there were no significant correlations between patients’ expectations and demographic or surgical factors. Further investigation is required to identify factors that specifically influence patients’ expectations, the impact of unaltered expectations on postoperative satisfaction, and methods for improving the preoperative education and counseling process.

Note
This study was performed at the Rothman Institute, Thomas Jefferson University Hospital, Philadelphia, Pennsylvania, United States. Institutional review board approval number is #12D.233.

Conflict of Interest
None.

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\begin{enumerate}
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\end{enumerate}