

## Discordance in TKA Expectations Between Patients and Surgeons

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### Abstract

**Background** Aligning patient and surgeon expectations preoperatively may lead to better postoperative medical and rehabilitation compliance and therefore improve outcomes and increase satisfaction.

**Questions/Purposes** We (1) determined the rate of discordantly high patient expectations compared with those of their surgeon in patients undergoing TKA; and (2) evaluated the impact of the preoperative educational class, patient characteristics, and functional status on the likelihood of having discordantly high patient expectations.

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Each author certifies that his or her institution approved the human protocol for this investigation, that all investigations were conducted in conformity with ethical principles of research, and that informed consent for participation in the study was obtained.

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**Methods** We enrolled 205 patients awaiting TKA. Each patient completed a validated questionnaire that addresses expectations of postoperative pain relief, function, and well-being as part of a preoperative assessment. The surgeon completed the same expectations questionnaire preoperatively blinded to their patient's response. Patients had discordantly high expectations if their scores were  $\geq 7$  points higher than the surgeon on a 0 to 100 score range. Regression analysis was performed to determine the effect of class, patient characteristics, and functional status on the likelihood of having discordantly high patient expectations.

**Results** Thirty-seven percent of the patients had expectation scores  $\geq 7$  points higher than those of their surgeon. Patients were less likely to have discordantly higher expectations if they were female (OR, 0.56; CI, 0.32–0.97) and if their pain level was high (OR, 0.99; CI, 0.98–0.99). Patients were more likely to have discordantly higher expectations if they filled out the expectations survey before rather than after the preoperative educational class (OR, 1.80; CI, 1.08–3.01).

**Conclusions** With increasing TKA use, surgeons will likely encounter more patients with discordantly high expectations. The preoperative educational class can be used to target patients more likely to have discordantly high expectations.

**Level of Evidence** Level I, prognostic study. See Guidelines for Authors for a complete description of levels of evidence.

### Introduction

The number of TKAs doubled between 1998 and 2004 and is expected to exceed 3.4 million procedures per year by 2030 [4, 17, 24]. Because of improvement in knee implant

designs, surgical technique, and procedure safety, both elderly and active young individuals have high expectations for the outcomes of surgery [3, 6, 9, 12–14, 16]. However, these preoperative expectations are not always met, leading to postoperative dissatisfaction. One recent study showed approximately one-fifth of 1703 patients undergoing primary TKA were not satisfied with their outcome, and the strongest predictor of patient dissatisfaction was expectations not met ( $10.7\times$  greater risk).

Patient recovery expectations have been defined as “anticipations that given events are likely to occur during or as a result of medical care” [20]. In routine clinical care, surgeons and their staff spend a substantial amount of time with the patient discussing the surgery and the achievement of short- and long-term goals to make sure patients’ expectations are realistic. In addition, a growing number of hospitals have instituted educational classes that patients can take before surgery. Despite these efforts, the extent to which patients’ expectations align with their surgeons’ expectation as a result of these efforts remains largely unstudied, partly because patients usually give their doctor the impression that they understand and agree to the surgery and its consequences and in part because of the lack of methods to properly and reliably assess expectations.

We therefore (1) determined the rate of discordantly high patient expectations, compared with their surgeon, in patients undergoing TKA; and (2) evaluated the impact of taking the preoperative educational class, patient characteristics, and functional status on the likelihood of having discordantly high patient expectation.

## Materials and Methods

We prospectively recruited 205 patients scheduled for primary TKA between January 2009 and April 2011 after obtaining written informed consent. We included only patients 18 years of age or older scheduled to undergo unilateral TKA. We excluded patients if they had a prior contralateral TKA or if they had cognitive problems. The patients came from the practices of eight adult reconstructive surgeons. Females represented 71.7% of the study cohort. The mean age was  $66.3 \pm 9.2$  years (range, 27–87 years).

Expectations were captured using the validated Hospital for Special Surgery (HSS) 19-item TKA expectations survey [14, 16]. Validation included face and content validity; the survey also has high construct validity and test-retest reliability. The survey has a patient format and a surgeon format that have identical items and has been developed to evaluate expectations of the different aspects of the recovery including pain relief; walking; the ability to perform personal, recreational, and social activities of daily living; and psychological well-being [14]. The improvement expected on

each item was evaluated on a 4-point Likert scale (1 = back to normal or complete improvement; 2 = not back to normal but a lot of improvement; 3 = not back to normal but a moderate amount of improvement; 4 = not back to normal but little improvement) and each item also has a no-expectation option (5 = I do not have this expectation or this expectation does not apply to me).

After the preoperative evaluation visit, each surgeon recorded his impressions of outcome using the surgeon version of the TKA expectations survey for each candidate patient. Patients who were scheduled for surgery were approached to enroll and complete a baseline expectations survey. One hundred twenty-four patients (61%) completed their surveys after a preoperative educational class, whereas the remaining patients completed the survey before the class. The class is scheduled as part of a preoperative screening day, which primarily involves blood tests and medical examinations and is mandated for all patients as part of the hospital’s preoperative preparation. Patients had the option to take the survey home and send it by mail or bring it back on the day of the surgery because it was not always feasible during that day to complete this assessment. Although this may be perceived as a limitation of the study, patient expectations are usually based on the most part on discussions with the surgeon in most orthopaedic practices.

The patient expectations survey was part of the battery of baseline assessments that included age, sex and education, and health status questionnaires including the SF-36 [21–23] and the Knee Injury Osteoarthritis Outcomes Score (KOOS) [18, 19]. The baseline patient assessment also included a question regarding whether the patient filled out the expectations survey before or after the preoperative educational class. Both patients and surgeon completed the questionnaires independently and were blinded to each other’s responses.

A patient and a surgeon expectations score were calculated for each subject by summing the scores of all the questions and converting to a 0 to 100 scale with 100 being the highest expectation of returning back to normal in all aspects and 0 being most pessimistic (meaning that there are no expectations of improvement after surgery in any aspect) [14]. Items for which the respondent does not have an expectation are given no weight (weight = 0) in calculating the score.

Agreement between the patient and the surgeon was determined using a validated definition of the clinically meaningful difference in expectations scores, which was applied to the difference between the scores [14]. Based on this definition, patients had discordantly high expectations if their scores were  $\geq 7$  points higher than the surgeon.

Descriptive statistics were performed using means and SDs for continuous variables and frequencies for binary and categorical variables. To determine independent baseline predictors of discordantly high patient expectations, a multivariate regression generalized estimating equation (GEE)

was used because, unlike linear least square regression, it accounts for the grouping of patients by a specific surgeon. The GEE model estimated the effect on discordance of preoperative class, age, sex, education, comorbidity, body mass index, SF-36 physical and mental scores (PCS and MCS) [21, 23], the WOMAC function, stiffness, and pain subscales, and a pain visual analog scale score (0–100, 100 being the highest level of pain). WOMAC Osteoarthritis Index subscale scores of pain stiffness and function were derived from the KOOS instrument [1, 2]. Effect of the class was included in the model as a dichotomous variable to indicate whether the patient expectations survey was completed before or after the recommended preoperative educational class. Comorbidity was assessed using the Charlson comorbidity index score and body mass index was calculated using height and weight. Comorbidities as well as height and weight information were abstracted from patient charts.

All analyses were conducted in SPSS 18.0 (IBM/SPSS Inc, Armonk, NY, USA). The study was approved by the institutional review board at our institution.

## Results

Patient scores ranged from 22.4 to 100, whereas surgeon scores ranged from 44.8 to 100. When the two scores were compared using the clinically meaningful definition of a 7-point difference in the expectations score, 36.6% of patients had expectations higher than those of their surgeon; however, this percentage varied widely between surgeons (range, 8.3%–65.8%).

There were no differences in demographic and patient-reported outcome measures between the concordant/discordantly low and the discordantly high groups in the bivariate analyses (Table 1). However, we found predictors of discordantly high expectations in the multivariate analysis. Being female was associated with less likelihood (OR, 0.56; 95% CI, 0.32–0.97;  $p = 0.04$ ) of having discordantly higher expectations (Table 2). However, filling out the expectations survey before rather than after the preoperative educational class was associated with a higher likelihood (OR, 1.80; 95% CI, 1.08–3.01;  $p = 0.02$ ) of having discordantly higher expectations. Having a higher pain visual analog scale score was associated with a less likelihood (OR, 0.99; 95% CI, 0.98–0.99;  $p = 0.03$ ) of having discordantly higher expectations.

## Discussion

Expectations not being met have been associated with postoperative dissatisfaction with outcomes of TKA. Surgeons aim to guide expectations for recovery through discussions with their patients so that there is agreement on the goals of surgery to avoid dissatisfaction with the surgery outcomes. Despite these efforts, the extent to which patients' expectations align with their surgeon's expectation and what factors impact this discordance remains largely unstudied. In this study we aimed to determine the rate of discordantly high patient expectations, compared with their surgeon, in patients undergoing TKA and to evaluate the impact of taking the preoperative educational

**Table 1.** Factors associated with discordance in patients undergoing total joint arthroplasty

Factor	Patient expectations as compared with the surgeon's expectations		
	Concordant or lower (N = 129)	Higher (N = 76)	p value
Mean age, years (SD)	65.8 ± 9.6	67.2 ± 8.4	0.27
Female sex, number (%)	98 (75.4%)	49 (65.3%)	0.09
Education, percent college graduates	77 (59.7%)	43 (56.6%)	0.43
Charlson Comorbidity Index score	0.5 ± 0.9	0.5 ± 1.1	0.89
Body mass index, percent 30 kg/m <sup>2</sup> or greater	65 (50.3%)	45 (59.2%)	0.11
SF-36 physical component score (0–100)	32.0 ± 8.6	33.5 ± 7.1	0.21
SF-36 mental component score (0–100)	49.9 ± 12.7	49.8 ± 12.8	0.99
WOMAC pain (0–20)	10.2 ± 3.4	9.7 ± 3.2	0.28
WOMAC stiffness (0–8)	4.6 ± 1.6	4.3 ± 1.8	0.18
WOMAC function (0–68)	35.1 ± 11.6	33.3 ± 11.6	0.29
Percent patients filling out the expectations survey before the preoperative education class	46 (35.8%)	35 (46.5%)	0.09
Overall pain score (0–100)	64.5 ± 22.8	62.01 ± 22.9	0.46

**Table 2.** Risk factors for discordantly high patient expectations

Factor	Odds ratio for discordant high compared with concordant or lower	p value
Age 65 years or older	0.99 (0.63–1.58)	0.98
Female sex	0.56 (0.32–0.97)	0.04
College graduate education	0.74 (0.37–1.47)	0.39
Charlson Comorbidity Index score	0.94 (0.74–1.19)	0.63
Body mass index 30 kg/m <sup>2</sup> or greater	0.75 (0.41–1.38)	0.36
SF-36 physical component score (0–100)	1.01 (0.96–1.07)	0.53
SF-36 mental component score (0–100)	0.99 (0.96–1.02)	0.49
WOMAC pain (0–100)	0.98 (0.86–1.12)	0.75
WOMAC stiffness (0–100)	0.94 (0.74–1.18)	0.59
WOMAC function (0–100)	1.01 (0.95–1.07)	0.67
Patients filling out the expectations survey before the preoperative education class	1.80 (1.08–3.01)	0.02
Overall pain score (0–100)	0.99 (0.98–0.99)	0.03

95% confidence intervals in parentheses.

class, patient characteristics, and functional status on the likelihood of having discordantly high patient expectation.

This study has several limitations. First, patients' preoperative expectations were assessed using the HSS TKA 19-item survey, which was derived from patient interviews and is the most comprehensive expectations assessment tool available [16]. As a result, it captures a broad spectrum of patient-centered variables that have been identified by the World Health Organization as important for judging health outcomes [8]. Specifically, questions address the three domains of (1) impairment (ie, pain); (2) activity limitation (eg, ability to go up and down stairs or perform daily activities around the home); and (3) participation limitation (eg, ability to participate in social events or play sports). This does not however preclude that there may have been other expectations that were not captured. Second, expectations are likely to change throughout the process of care between the time of first interaction with the surgeon and the time of surgery. Third, this study may not have accounted for all factors that could potentially influence patient expectations including psychological variables such as dispositional optimism or pessimism, sense of self-efficacy, and locus of control [10]. We have not collected this information for this study. Fourth, we restricted our analyses to patients with primary unilateral TKAs with no history of contralateral TKA to assure that patients' expectations are not biased by prior experience with surgery. Therefore, these results are not generalizable to other patients having TKA. Finally, our study represents the experience of one specialized orthopaedic center where TKA is performed in large numbers. Not only do the patients seeking TKA have access to substantial information about the procedure, but the surgeons in the study also perform a high TKA volume and thus should have fairly

realistic knowledge of the likely outcomes, risks, and benefits of the surgery and presumably able to communicate this information to the patient. However, this may not be generalizable to the average patient seeing a general orthopaedic surgeon in a community hospital.

With more than one-third of patients having discordantly high expectations, our results confirmed the conjectures suggested in prior papers that patient expectations are unrealistically high for a substantial percentage of patients undergoing TKA [7, 12, 13]. In this study, we also found patients who filled out the expectations survey before taking their preoperative educational class were 80% more likely to have discordantly higher expectations compared with those who filled out the survey after the class. These findings highlight the importance of devoting special attention to educating patients before they undergo the surgery and not to restrict it to the surgeon-patient dialogue. The importance of the preoperative educational class in changing patient expectations was highlighted in an earlier study by Mancuso et al. [14]. The authors conducted a randomized trial whereby they randomized consecutive patients scheduled to receive TKA to (1) a preoperative class that addresses immediate postoperative recovery only; and (2) one that has an additional knee-specific module addressing recovery during the first 12 months postoperatively. They found that a clinically meaningful change in expectations was observed in 56% of the patients undergoing TKA randomized to the class that addresses recovery during the first 12 months compared with 34% in the other class. However, the authors could not tell whether such change brought patient expectations closer to their surgeon's or swayed them away from the surgeon. After this study, the educational class at our institution modified the preoperative educational class to include the additional



knee-specific module addressing first-year recovery expectations. All patients in our study took the class with the additional module. Therefore, our finding that expectations were more aligned in those who had taken the class suggests a preoperative educational class should be beneficial in setting realistic expectations.

We found females were 44% less likely than males to have discordantly high expectations. Karlson et al. [11] conducted focus group discussions regarding total joint arthroplasty among 18 females and 12 males with moderately severe osteoarthritis of the hip or knee and found that men were more likely to opt for surgery earlier in the disease than women and had higher expectations for success. Similarly, Mancuso et al. [15] studied the expectations of 1103 patients undergoing THA and found that men had substantially higher expectations than women. In addition, in a recently published study by Hepinstall et al. [7], it was noted in a cohort of 1943 patients that higher expectations were associated with being male. However, these studies did not indicate whether these higher expectations were realistic. In prior pilot work [5] we compared expectations of one surgeon and 28 patients undergoing TKA and found a similar trend (not significant) with 80% females in the concordant/discordantly low group versus 70% in the discordantly high group. After adjusting for other potentially confounding variables, we show in this study that females were less likely than males to have discordantly high expectations. These observed differences are based on an overall score and may be the result of males and females emphasizing different aspects of recovery. Surgeons should therefore devote more time to discuss, in some detail, the underlying drivers for having surgery.

In conclusion, more than one-third of patients had discordantly high expectations compared with their surgeons. With the expected growth in TKAs over the next two decades, surgeons will encounter more of these patients. The preoperative educational class can be a useful and modifiable tool to target certain patient subpopulations more likely to have discordantly high expectations.

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