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In the Eye of the Beholder

Preferences of Patients, Family Physicians, and Surgeons for Lumbar Spinal Surgery

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Study Design. Survey to all orthopedic and neurosurgeons, a random sample of family physicians (FPs) and patients in Ontario, Canada.

Objective. To identify the dominant clinical factors influencing patient and physician preferences for lumbar spinal surgery.

Summary of Background Data. Surgery on the degenerative lumbar spine offers significant benefit for patients with moderate-severe symptoms failing nonoperative treatment. Referring FPs have little appreciation of factors that identify the ideal surgical candidate. Differences in preferences may lead to wide variation in referrals and impedes the shared decision-making process.

Methods. We used conjoint analysis, a rigorous method for eliciting preferences, to determine the importance that respondents place on decisions for lumbar spinal surgery. We identified 6 clinical factors (walking tolerance, pain duration, severity, neurologic symptoms, typical onset, and dominant location of pain) and presented hypothetical vignettes to participants who rated their preference for surgery. Data were analyzed using random-effects ordered probit regression models and the importance of each clinical factor relative to the others was determined.

Results. We obtained responses from 131 surgeons, 202 FPs, and 164 patients. We found that FPs had the highest overall preferences for surgery and surgeons had the lowest. Surgeons placed the highest importance on the location of pain. FPs considered neurologic symptoms, walking tolerance, and severity to be of similar importance. Pain severity, walking tolerance, and duration of pain were the most important factors for patients in deciding for surgery. Orthopedic (over neurosurgical) surgeons had a lower preference for surgery ($P < 0.05$). Older patients ($P < 0.03$) and previous surgical consultation ($P < 0.03$) had greater patient preferences for surgery.

Conclusion. Different preferences for surgery exist between surgeons, FPs, and patients. FPs may reduce over- and under-referrals by appreciating surgeons' importance on location of pain (leg vs. back). Surgeons and FPs may improve the shared decision-making process by understanding that patients place high importance on quality of life symptoms.

Key words: spinal stenosis, lumbar spondylosis, lumbar decompression, lumbar fusion, patient preferences, physician preferences, conjoint analysis. **Spine 2010;35: 108–115**

Systematic literature reviews as recently as 2005 have found insufficient evidence concerning the efficacy of surgical treatment for degenerative disease of the lumbar spine (DDLS).[1,2] Despite a lack of high-quality evidence, surgeons believe that surgery confers significant benefit over nonoperative treatment and thus surgical rates have steadily increased over the past 2 decades.[3] Only in the last 3 years have randomized clinical trials confirmed that surgery benefits selected patients with specific degenerative conditions (i.e., spinal stenosis and degenerative spondylolisthesis).[4,5]

Since surgical consultation can only be obtained following physician referral in Ontario, the family physician (FP) typically serves as the "gatekeeper" to care. Even in the United States, FPs are an important source of referrals for surgical treatment. There is little appreciation among referring FPs on the factors that identify an appropriate surgical candidate for discretionary surgery.[6] Furthermore, the need to include patient preferences in guiding medical decision-making is now widely accepted.[7,8] Patients rarely make decisions for referral and surgery entirely on their own. The FP, in partnership with the patient, often decides on the appropriateness of surgical referral and, in turn, the surgeon, in partnership with the patient, decides on the benefits of surgery. Thus, the decision to undergo surgery is a shared process involving patient, FP, and spinal surgeon. Greater agreement in patient-physician decisions is associated, not only with a more streamlined shared decision-making process, but also with improved patient satisfaction and overall health status.[9]

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The specific preferences of surgeons, FPs, and patients in surgical decisions for DDLS are poorly understood. To the best of our knowledge, there exist no studies that assess preferences and quantify the importance of different clinical factors for surgery for DDLS. Conjoint Analysis (CA) is a method for eliciting preferences that is being used more commonly in healthcare to understand how different factors influence patients' decisions for the provision of health services.[10] The objective of this study was to determine the relative importance that surgeons, FPs, and patients place on presenting clinical symptoms when considering surgery for DDLS. We further aimed to investigate if other nonclinical factors such as physician characteristics or patient demographics were associated with these preferences.

■ Materials and Methods

We used a mailed survey to measure preferences of surgeons, FPs, and patients. Institutional ethics review board approval was obtained. We mailed surveys to the 519 orthopedic and neurosurgeons in Ontario using a 4-step mailing technique and considered only those surgeons who consult on these patients eligible for this study.[11] FPs were surveyed using a random sampling design stratified across provincial counties and we followed-up low response counties with telephone calls where needed. We determined that a minimum of 125 FPs would be required for analysis.[12] We asked FPs to request their own patients complete questionnaire packages.[13] Patients eligible for survey participation were those ages 50 and over with any history of ≥2 months of back or leg pain consistent with DDLS (with or without previous imaging, referral, or surgery).

CA is a technique for eliciting preferences founded on the principle that any health state can be deconstructed by its clinical factors and that the extent an individual values a certain action or decision depends on the nature and level of these clinical factors.[14] This technique involves presenting multiple hypothetical clinical vignettes comprised of different levels of clinical factors and asking respondents to rate, rank, or make discrete choices between vignettes. Once the data have been gathered, regression techniques are used to establish the average relative importance of each clinical factor. In healthcare, the discrete choice method has been used most commonly, however, rating methods are being used more frequently.[15–17]

We developed our questionnaire as a CA experiment using clinical vignettes in order to measure implicit preferences of patients and physicians.[18] In addition to clinical vignettes, respondents were asked to report their demographics (age, sex) and professional characteristics for physicians (years in practice, university affiliation, medical training location, patient volume, and subspecialty training in spine for surgeons).

In general, the 4 main steps in conducting a CA study are to (1) identify the characteristics, (2) assign levels to the characteristics, (3) choose the scenarios, and (4) establish preferences. Statistical analysis then follows the data collection.[10]

We first identified the relevant clinical factors used in the clinical vignettes by literature review. Using a published systematic review of preoperative predictors for outcome in patients undergoing surgery for lumbar spinal stenosis, we identified 21 relevant articles.[19] To maintain a similar questionnaire for patients and physicians, we selected all clinical factors from these articles that represented symptoms describable by patients, not requiring clinical or radiographic examination. Sixteen clinical factors were identified and presented to a pilot group of surgeons, FPs, and patients who individually ranked all clinical factors influencing their decision towards surgery. Since it has been recommended that CA studies contain no more than 6 factors, after combining the group rankings, we selected the 6 most important clinical factors for use in our clinical vignettes.[20,21]

Table 1. Clinical Factors and Levels for Conjoint Experiment

Clinical Factors	Mild Level (−1)	Severe Level (+1)
Duration of pain	Less than 4 mo	More than 8 mo
Severity of pain	Mild/moderate	Severe
Location of pain	Back-dominant	Leg-dominant
Onset of pain	Only with walking	At night or at rest
Neurological symptoms	Mild numbness/tingling	Moderate leg weakness
Walking tolerance	More than 6 blocks	Less than 2 blocks

Second, in CA studies, each clinical factor may have multiple levels of severity or categories. To avoid a biasing effect of different numbers of levels for each factor, we chose to constrain our design to 2 levels for each factor.[20] The specific levels were determined using the information from the literature review, the pilot survey, and an understanding of the variation in levels that would be plausible yet still actionable. We used *effects coding* in our design to standardize the parameters, whereby the "severe" level was coded as +1 and "mild" level as −1 (Table 1).[22] Since we were interested in preferences for discretionary surgery and not knowledge of absolute indications (*i.e.*, for *cauda equina* syndrome), we limited the neurologic symptoms to include some motor weakness as the most severe level.

Third, we selected the vignettes to be presented to the participants. With 6 clinical factors and 2 levels each, a full-factorial model would yield a total of 64 different vignettes (2^6), which would place too large a burden on each participant to complete. In order to reduce the number of vignettes to a manageable size, we relied on a one-fourth fractional factorial experimental design yielding a total of 16 vignettes. Using the SAS Macro MktEx[23] we created an experimental design of 16 vignettes (Table 2) which included 2 vignettes for validation purposes (best case scenario and worst case scenario) yielding a balanced, noncorrelated set of vignettes with high information efficiency.[24] Furthermore, all vignettes were considered clinically sensible and plausible.

Fourth, in CA studies, responses may take the form of ratings, rankings, or even discrete choice. Rating responses allows a respondent to rate different vignettes using the same scale such that 2 or more vignettes could be assigned the same response. Since our study attempts to measure preferences, rather than choices or behavior, we chose a ratings outcome.[10,15] From our mailed surveys, we established rating preferences from all of our 3 groups, namely, surgeons (recommending surgery), FPs (appropriateness of surgery), and patients (likelihood of considering surgery) and determined the preference for surgery for each of the clinical vignettes on a scale from 1 to 6.

The validity of the model was tested within the framework of CA in 2 ways. Internal (theoretical) validity was tested by exploring model consistency with a *priori* expectations. That is, belief that one or more of the clinical factors presented in the

Table 2. Table of 16 Presented Clinical Vignettes

Vignette	Duration of Pain	Severity	Location of Pain	Onset of Pain	Neurological Symptoms	Walking Tolerance
1	8 mo	Severe	Back	At rest	Mild numbness/tingling	2 blocks
2	4 mo	Moderate	Back	At rest	Mild numbness/tingling	2 blocks
3	4 mo	Moderate	Back	With walking	Mild numbness/tingling	6 blocks
4	4 mo	Severe	Legs	With walking	Moderate weakness	6 blocks
5	8 mo	Moderate	Legs	With walking	Mild numbness/tingling	6 blocks
6	4 mo	Moderate	Legs	With walking	Moderate weakness	2 blocks
7	8 mo	Severe	Back	With walking	Moderate weakness	6 blocks
8	4 mo	Severe	Back	At rest	Moderate weakness	6 blocks
9	8 mo	Severe	Legs	At rest	Moderate weakness	2 blocks
10	4 mo	Severe	Legs	At rest	Mild numbness/tingling	6 blocks
11	4 mo	Severe	Back	With walking	Mild numbness/tingling	2 blocks
12	4 mo	Moderate	Legs	At rest	Moderate weakness	2 blocks
13	8 mo	Moderate	Legs	At rest	Mild numbness/tingling	6 blocks
14	8 mo	Moderate	Back	At rest	Moderate weakness	6 blocks
15	8 mo	Moderate	Back	With walking	Moderate weakness	2 blocks
16	8 mo	Severe	Legs	With walking	Mild numbness/tingling	2 blocks

scenarios have strong directions for preference was tested by examining the direction and significance of the coefficient of that clinical factor. In the design of our analysis, none of the 6 clinical factors should result in a significant negative coefficient if the clinical symptoms are interpreted correctly, since our effects coding (−1 for mild level and +1 for severe level) ensured that the more severe level, with higher probability of requiring surgery, was greater than the milder level. Patients and FPs, not being spinal experts, may not necessarily appreciate the "severe level" for the dominant location of pain (*i.e.*, leg-dominant) or the typical onset of pain (*i.e.*, pain at rest), however, we assumed that for surgeons, this was an acceptable validation of the experiment.

Second, internal consistency was assessed by determining the proportion of 1 vignette rated higher than another when they differ by one having more "severe" levels than the other.[25] In the design of our CA we included 2 extreme scenarios (best case and worst case). Our first test of internal consistency was that the most extreme vignette (vignette 9) would be rated higher than the least extreme (vignette 3). As a second test, we chose 2 vignettes that differed only in their severity of pain and walking tolerance—2 clinical factors whereby the levels could be easily interpreted by both patients and physicians as better or worse. Vignette 16 had both "severe" levels (severe pain, <2 blocks) and vignette 5 had both "mild" levels. Therefore, to measure internal inconsistency, we looked at the proportion of respondents who rated vignette 3 higher than 9, and vignette 5 higher than 16.

The details of the statistical theory of CA are beyond the scope of this study. To properly account for the ordinal data, we used the proportional odds model[26] and employed a probit regression, as is commonly used in CA. Furthermore, to account for potential variation between respondents, we used a random-effects model. Using the magnitude of the coefficients, we calculated the "relative importance" of each clinical factor for each group (the ratio of the width of the utility range of 1 factor to the sum of the ranges for all factors). Since all factors were coded in a similar way, the regression coefficients are directly comparable. Results were compared across all 3 groups and we analyzed the data using multivariate regression controlling for the demographics and professional/clinical characteristics of each respondent. All statistical analyses were carried out using SAS v9.1 (Cary, NC) and the regression was performed using the SAS Procedure GLIMMIX.[27–30]

Results

Responses were obtained from 131 of 302 potentially eligible surgeons (43%). We obtained responses from 202 of 1694 potentially eligible FPs (12%) and 164 patients from 87 FPs (mean: 1.9 patients/FP). There were no significant differences in sex, years in practice, or location between FP responders and nonresponders. The characteristics of surgeons and FPs are shown in Table 3 and patients in Table 4.

Rates of internal inconsistency were low (≤5%). Although physicians generally understood the task well, a large proportion of patients (21.6%) reported the same response for all scenarios. All of these respondents were subsequently excluded from the analysis. No differences in age, sex, education level, location of residence, previous utilization of surgical services, or clinical symptoms were observed for patients who reported the same response compared with the rest of the cohort.

Responses for surgical preferences varied between surgeons, FPs, and patients (Figure 1). Least squares means for surgery preference was 3.57 (95% confidence interval [CI]: 3.45–3.68), 3.89 (95% CI: 3.85–3.93), and 3.77 (95% CI: 3.71–3.83) for surgeons, FPs, and patients, respectively. Both FPs and patients had a signifi-

Table 3. Physician Characteristics

Characteristics	Surgeons (n = 131)	Family Physicians (n = 202)
Mean age (range)	52.8 (33–82)	50.2 (29–84)
Female (%)	8 (6.1%)	69 (34.3%)
Mean years in practice (range)	21.6 (1–48)	23.2 (2–58)
North American medical training (%)	110 (85.3%)	173 (86.5%)
University affiliation (%)	78 (60.0%)	37 (18.4%)
Median monthly volume of patients (range)	10 (1–300)	4 (0–100)
Orthopedic surgeons	100 (76.3%)	N/A
Neurosurgeons	31 (23.7%)	
Spinal subspecialty fellowship (%)	43 (33.1%)	N/A
Median monthly volume of operations (range)	5 (1–20)	N/A

Table 4. Patient Characteristics

Characteristics	Patients (n = 164)
Mean age (range)	62.4 (30–88)
Female (%)	86 (52.8%)
Highest level of education	
Did not complete high school	39 (24.5%)
Completed high school	38 (23.9%)
Postsecondary studies	49 (30.8%)
University (undergraduate)	19 (12.0%)
University (professional or graduate)	14 (8.8%)
Surgical consultation	96 (58.5%)
Orthopedics	42 (46.2%)
Neurosurgery	38 (41.8%)
Both	11 (12.1%)
Undergone surgery (%)	36 (22.0%)

cantly higher mean response ($P < 0.0001$ and $P < 0.002$, respectively) compared with surgeons for overall surgery preference.

Table 5 shows the regression results for recommendation and consideration of surgery for surgeons, FPs, and patients. Significant between-respondent variation was observed. All of the clinical factor regression coefficients, except for patients' interpretation of the dominant location of pain, were positive and significant (internal validity).

Orthopedic specialty was statistically associated with a lower preference for recommending surgery compared with neurosurgical specialty ($P < 0.05$). Older age ($P < 0.03$) and previous surgical consultation ($P < 0.03$) were both associated with a greater patient preference for considering surgical treatment. No FP characteristics were found to have any significant association with surgical preference.

The relative importance of each clinical factor in deciding for surgery is shown in Figure 2. Surgeons placed the highest importance on the location of pain (34%) while FPs considered neurologic symptoms to be the most important (23%), followed closely by walking tolerance (20%), and severity of pain (20%). The severity of pain (29%), walking tolerance (29%), and the duration of pain (28%) were all considered important for patients in deciding for surgery.

Discussion

The recent Spine Patient Outcomes Research Trials have demonstrated the benefit of surgical treatment for spinal stenosis and degenerative spondylolisthesis.[4,5] Despite the recent findings, misperceptions about the benefits of surgery are widespread. Inappropriate referrals to orthopedic surgeons range from 25% to 43%.[31–33] For back pain surgical referrals, Oldmeadow *et al*[34] found that 70% were considered more appropriate for nonsurgical management. Conversely, Schroth *et al*[35] found that only

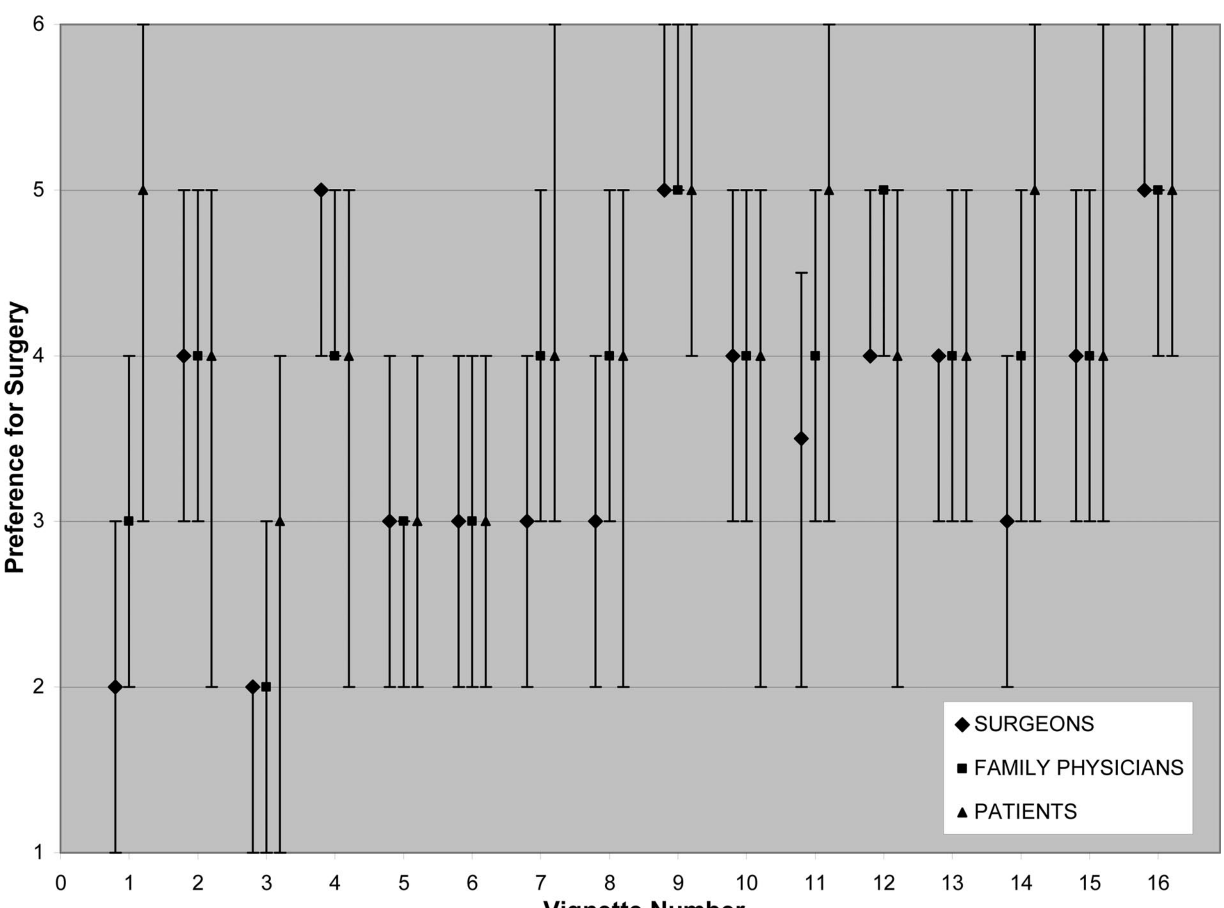

Figure 1. Surgical preference quartile responses. Symbols represent median responses. Upper and lower tails represent 75th and 25th percentile responses, respectively.

Table 5. Regression Results for Preferences About Surgery

	Surgeons*		FPs†		Patients‡	
Parameter	Estimate (SE)	*P*	Estimate (SE)	*P*	Estimate (SE)	*P*
Intercept 1	−1.43 (0.26)	<0.0001	−1.94 (0.20)	<0.0001	−3.17 (0.63)	<0.0001
Intercept 2	−0.41 (0.26)	0.12	−0.60 (0.20)	0.003	−2.12 (0.63)	0.0009
Intercept 3	0.36 (0.26)	0.17	0.40 (0.20)	0.05	−1.29 (0.63)	0.04
Intercept 4	1.07 (0.26)	<0.0001	1.10 (0.20)	<0.0001	−0.47 (0.63)	0.45
Intercept 5	2.13 (0.26)	<0.0001	2.08 (0.20)	<0.0001	0.93 (0.63)	0.14
Duration	0.09 (0.03)	0.0005	0.14 (0.003)	<0.0001	0.38 (0.006)	<0.0001
Location	0.43 (0.03)	<0.0001	0.15 (0.003)	<0.0001	−0.016 (0.006)	0.003
Neuro	0.19 (0.03)	<0.0001	0.34 (0.003)	<0.0001	0.030 (0.006)	<0.0001
Onset	0.07 (0.03)	0.01	0.24 (0.003)	<0.0001	0.14 (0.006)	<0.0001
Severity	0.24 (0.03)	<0.0001	0.30 (0.003)	<0.0001	0.39 (0.006)	<0.0001
Walking	0.23 (0.03)	<0.0001	0.30 (0.003)	<0.0001	0.39 (0.006)	<0.0001
Female	0.40 (0.28)	0.17	0.005 (0.12)	0.97	0.06 (0.21)	0.78
Years in practice	−0.009 (0.005)	0.10	0.003 (0.005)	0.55	N/A	N/A
NA trained	0.24 (0.19)	0.22	0.01 (0.16)	0.94	N/A	N/A
Monthly volume of consultations	−0.0008 (0.004)	0.86	0.003 (0.004)	0.45	N/A	N/A
Orthopedics	−0.31 (0.15)	0.05	N/A	N/A	N/A	N/A
Age	N/A	N/A	N/A	N/A	0.019 (0.009)	0.03
Postsecondary education	N/A	N/A	N/A	N/A	0.17 (0.22)	0.43
Consultation	N/A	N/A	N/A	N/A	0.47 (0.21)	0.03
Between-subject variance	0.30 (0.06)	N/A	0.37 (0.06)	N/A	0.79 (0.17)	N/A
χ^2 LR test§	2254.8	<0.0001	5333.4	<0.0001	1295.4	<0.0001

*Random effects probit regression model.
†Random effects weighted probit regression model.
‡Multilevel random effects weighted probit regression model.
§McFadden's R-square and χ^2 likelihood ratio test based on fixed effects models.
SE indicates standard error; NA, North American; LR, likelihood ratio.

14% of surgical referrals for back pain, according to the best available evidence, were clearly inappropriate, but that 47% of patients with potential indications for surgery were not referred demonstrating that problems exist with both over- and under-referral of these patients.

In our study, surgeons placed high importance on the dominant location of pain (*i.e.*, leg-dominant over back-dominant) in their decisions for surgery meaning that, over all other clinical factors, a patient with leg-dominant symptoms would be a more preferable surgical candidate over one with back-dominant symptoms. Surgical outcomes for conditions with nerve root involvement, such as spinal stenosis, over back-dominant conditions, such as degenerative disc disease or facet arthrosis, are significantly better.[36] Surgeons want the best outcomes for their patients, and therefore, knowingly or unknowingly, may prefer or "select" those who they feel will benefit most, namely, those with leg-dominant symptoms. These distinctions may not necessarily be well-known to FPs or patients and therefore may not be appreciated as a significant influence on the decision to operate.

Irwin *et al*[37] found that surgeon-specific characteristics, such as training background (specialty, fellowship training) and years in practice had a profound influence on the choice of surgical procedure (*i.e.*, fusion *vs.* decompression, the use of instrumentation, and anterior *vs.* posterior approach) for a variety of degenerative lumbar spinal conditions. The authors found that younger surgeons preferred instrumentation and orthopedic surgeons recommended fusion and instrumentation over neurosurgeons. In this study, we found that preference for surgical treatment was higher for neurosurgeons over orthopedic surgeons. The implication of this finding is that the type of specialist seeing a patient may influence the probability of a recommendation for surgical (or nonsurgical) treatment.

FPs had the highest overall preference for surgery and, on average, considered neurologic symptoms to be the most important clinical factor, only slightly more important than pain severity and walking tolerance. We speculate that a worsening neurologic condition or the presence of motor weakness may signal a more urgent need for surgical intervention from the primary care perspective regardless of the prognosis for recovery or the degree of improvement. No specific physician characteristics were associated with higher preferences for surgery. On the other hand, however, patients were found to have higher preferences for duration of pain, walking tolerance, and severity of pain. All of these symptoms are highly related to quality of life and have little direct bearing on outcomes following surgery. Not surprisingly, the dominant location of pain, for example, does not play a major role in their decision to proceed with surgery. The longer and more severe their pain and the greater their disability (walking tolerance) the more patients would consider surgery. Patients who have had previous consultations had higher preferences for surgery, likely because they are better informed about potential outcomes.

This study has several limitations. First, we had relatively low response rates from our survey. We obtained responses from 43% of practicing orthopedic and neu-

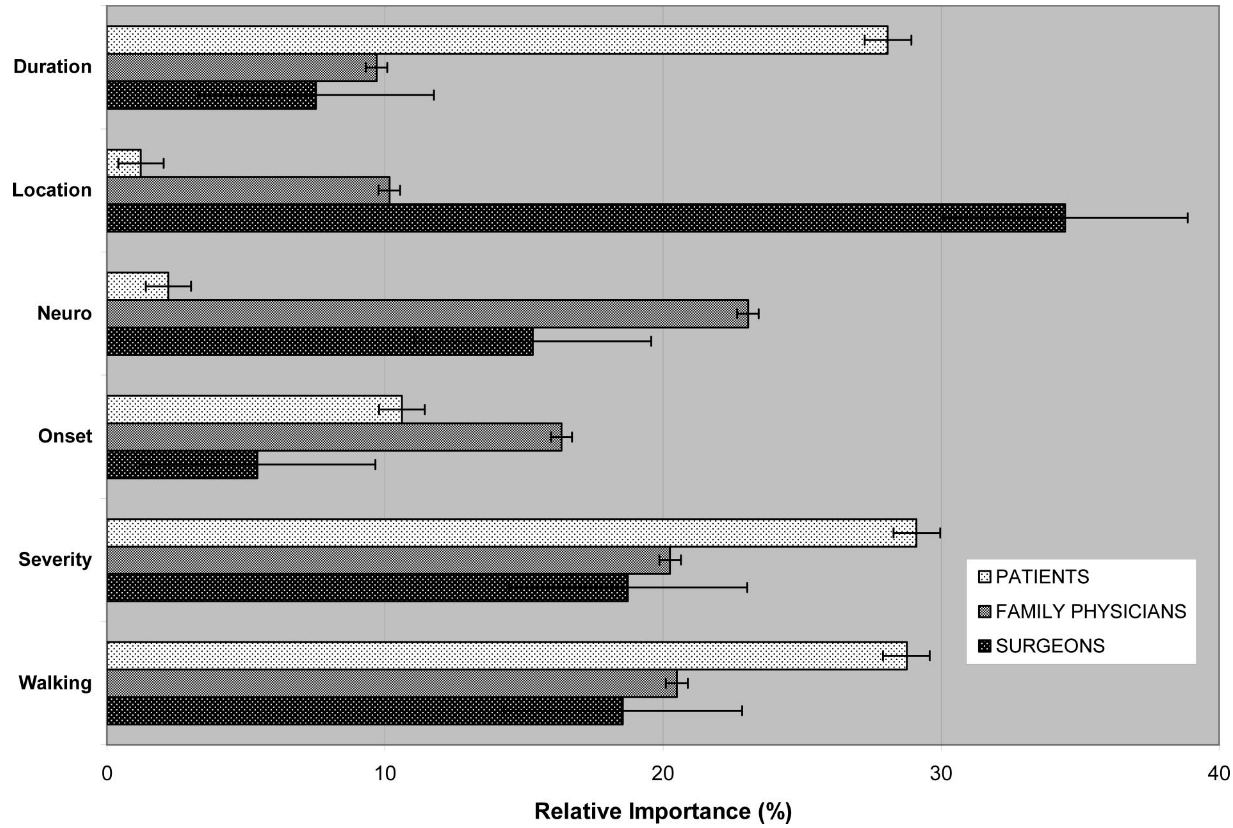

Figure 2. Relative importance of clinical factors in the decision for surgery. Error bars represent 95% confidence intervals.

rosurgeons across Ontario. Although this number is in keeping with several other provincial surveys,[38,39] we believe that it is an underestimation since the number of eligible surgeons is likely lower than that of the nonresponders. Response rates from FPs, on the other hand, were significantly lower (12%). To obtain enough physicians, this necessitated a second round of mailings. Although we obtained results from 202 physicians, well above our specified number, we are not able to generalize to all FPs across the province. Nonetheless, we are reassured by another similar survey capturing patient data *via* physicians with low response.[40] Furthermore, we observed no significant differences between responders and nonresponders in sex, years in practice, and location of practice. Furthermore, a wider response rate would likely result in even greater variability of response. Patients were sampled purposefully through their FPs, and therefore may not represent the true preferences of patients across Ontario. Despite this, the demographics of our patient sample encompass a wide range of clinical severities and experiences with the health care system.

Second, eliciting preferences based on clinical vignettes may not determine the true preferences physicians have for real clinical encounters. However, using holistic vignettes with implicit clinical factors instead of explicit lists of clinical parameters can simulate real clinical scenarios more accurately.[18,41,42] We recognize that this technique comes at the expense of a limited number of clinical factors with which to test preferences (6 factors), but it is a practical limit to the number of factors respondents can consider in a vignette. Asking patients to give their preferences for treatment based on theoretical clinical vignettes rather that their actual situation does not necessarily provide a true account of their attitudes in reality. However, it would be extremely difficult to obtain enough patients that fit the same exact clinical scenarios presented to physicians. Alternatively, surveying patients without any clinical symptoms would be easier but less valuable since they have not experienced the disease state.[43]

Third, CA is a relatively new technique and may require further work to establish it as a rigorous methodological tool.[16] Despite these concerns, CA has been highly recommended as a quantitative technique to elicit preferences.[44] Results from our analysis demonstrated generally high rates of internal consistency and internal validity. One major concern was that approximately 20% of patients reported the same response for all vignettes presented. This might be explained by either a frustration with the exercise or rather that these patients failed to understand the task. No differences were noted between patient respondents suggesting this problem may be the latter. Using a ranking or choice-based technique would doubtlessly have resulted in higher rates of task misunderstanding.

Finally, this survey was confined to clinical practice in Ontario and the results may not necessarily generalize to other Canadian provinces, or to other areas outside Canada. However, our results are worth considering in any health system whereby referring physicians play an intermediary role with patients and surgeons regarding decisions about referral and treatment. Even in jurisdictions with self-referral, surgeon understanding of patient preferences may facilitate the shared decision-making process.

In conclusion, understanding preferences for surgery on the degenerative lumbar spine among patients, FPs, and surgeons and where significant sources of variation and disagreement exist, can have several beneficial effects. First, aligning opinions of patients and physicians would improve the shared decision-making process itself and patients' expectations about surgery would be more accurate. This can directly result in a significant improvement in patient satisfaction with the healthcare process and even overall health status following treatment.[9] Second, with FPs having a better appreciation for symptoms related to nerve root involvement (*i.e.*, leg-dominant pain) the referral process may be more efficient. This allows the most appropriate surgical candidates to obtain timely assessments. Future research will need to test strategies to align preferences particularly between FPs and surgeons and between surgical specialists.

■ Key Points

- Family physicians had the highest preferences for surgery while surgeons had the lowest.
- Surgeons placed the highest importance on dominant location of pain (*i.e.*, leg *vs.* back) when recommending surgery.
- Patients placed the highest importance on quality of life symptoms (severity, walking tolerance, and duration of pain) when considering surgery.
- By recognizing the importance that surgeons place on location of pain, referring physicians can reduce variation in referral practice.
- The shared decision-making process can be improved by appreciating the importance patients have for quality of life symptoms.

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