

# Surgeon clinical practice variation and patient preferences during the informed consent discussion: a mixed-methods analysis in lumbar spine surgery

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**Background:** Patients with lumbar disc herniation may greatly benefit from microdiscectomy. Although spine surgeons performing microdiscectomy routinely obtain informed consent, the potential adverse events they disclose often vary. Moreover, little is known about what disclosures are deemed most valuable by patients. The aim of this mixed-methods study was to determine practice variations among spine surgeons in regard to the disclosure of potential adverse events during informed consent discussions for lumbar microdiscectomy and to determine which topics patients perceived to be valuable in the consent discussion.

**Methods:** A survey evaluating the frequency with which spine surgeons disclose 15 potential adverse events related to lumbar microdiscectomy during informed consent discussions was distributed among Canadian Spine Society members. Additionally, semistructured interviews were conducted with preoperative patients, postoperative patients, attending spine surgeons, spine fellows and orthopedic residents. Interview transcripts were analyzed using thematic analysis with open coding.

**Results:** Fifty-one Canadian Spine Society members completed the survey. The number of potential adverse events not routinely discussed was greater among orthopedic surgeons than among neurosurgeons (relative risk 1.83; 95% confidence interval 1.22–2.73;  $p = 0.003$ ). Three preoperative patients, 7 postoperative patients, 6 attending spine surgeons, 3 spine fellows and 5 orthopedic residents participated in the semistructured interviews. The interviews identified gaps in information provided to patients, particularly on topics relating to postoperative care such as expected recovery time, activity restrictions and need for a caregiver.

**Conclusion:** There is variation in the disclosure of potential adverse events during informed consent discussions for lumbar microdiscectomy among Canadian spine surgeons. Patients desire more information regarding their postoperative care. Further research should focus on developing guidelines to reduce practice variation and optimize the effectiveness of consent discussions.

**Contexte :** Les patients atteints d'une hernie discale lombaire pourraient profiter grandement d'une microdiscectomie. Bien que les chirurgiens spécialistes de la colonne vertébrale réalisant des microdiscectomies obtiennent toujours le consentement éclairé du patient, les événements indésirables potentiels présentés varient souvent. De plus, on en connaît peu sur les informations les plus importantes du point de vue des patients. L'objectif de cette étude à méthodes mixtes était de déterminer les différentes pratiques des chirurgiens en ce qui a trait à la présentation des événements indésirables potentiels pendant les discussions sur le consentement éclairé pour les microdiscectomies lombaires et de déterminer les sujets les plus importants pour les patients pendant ces discussions.

**Méthodes :** Un sondage sur la fréquence à laquelle les chirurgiens présentent 15 événements indésirables potentiels associés à la microdiscectomie lombaire pendant les discussions sur le consentement éclairé a été distribué aux membres de la Société canadienne du rachis. De plus, des entretiens semi-dirigés ont été réalisés auprès de patients en période préopératoire, de patients en période postopératoire, de chirurgiens spécialistes de la colonne vertébrale, de fellows en chirurgie spinale et de résidents en chirurgie orthopédique. Des analyses thématiques utilisant un code ouvert ont été réalisées sur les transcriptions des entretiens.

**Résultats :** Cinquante-et-un membres de la Société canadienne du rachis ont répondu au sondage. Le nombre d'événements indésirables potentiels non systématiquement mentionnés était plus élevé chez les chirurgiens orthopédiques que chez les

neurochirurgiens (risque relatif 1,83; intervalle de confiance de 95 % 1,22–2,73;  $p = 0,003$ ). Dans les entretiens semi-dirigés, on a recueilli les commentaires de 3 patients en période préopératoire, de 7 patients en période postopératoire, de 6 chirurgiens spécialistes de la colonne vertébrale, de 3 fellows en chirurgie spinale et de 5 résidents en chirurgie orthopédique. Les entretiens ont révélé des lacunes dans l'information transmise aux patients, particulièrement sur les soins postopératoires, comme le temps de récupération attendu, les restrictions quant aux activités et la nécessité d'un soignant.

**Conclusion :** On a trouvé une variation dans la présentation des événements indésirables potentiels pendant les discussions sur le consentement éclairé pour les microdiscectomies lombaires chez les chirurgiens spécialistes de la colonne vertébrale au Canada. Les patients veulent en savoir plus sur les soins postopératoires. Des lignes directrices devraient être établies pour réduire les différences entre les pratiques et optimiser l'efficacité des discussions sur le consentement.

**L**umbar disc herniation is a prevalent condition associated with substantial socioeconomic burdens.<sup>1,2</sup> In patients for whom conservative treatment is unsuccessful, lumbar microdiscectomy can reliably relieve radicular leg pain and improve quality of life.<sup>1,3,4</sup> However, many patients also have concomitant back pain, which does not typically improve after microdiscectomy.<sup>1</sup> The common false expectation that back pain predictably improves may result in patients perceiving poorer postoperative outcomes.<sup>5–7</sup>

Informed consent is a fundamental requirement of any surgical procedure.<sup>8,9</sup> Consent discussions present an excellent opportunity to not only discuss the potential adverse events associated with the proposed procedure but also help patients establish realistic expectations regarding postoperative outcomes.<sup>10,11</sup> Although surgeons who perform microdiscectomy routinely obtain informed consent, the potential adverse events that they disclose often vary,<sup>12</sup> as there are no established guidelines on what topics should be discussed. Moreover, little is known about what topics are deemed most valuable by patients.

The objectives of this study were therefore to (a) evaluate the clinical practice variation in the disclosure of potential adverse events during the consent discussion for lumbar microdiscectomy among Canadian spine surgeons and (b) determine topics perceived by patients undergoing microdiscectomy to be valuable in the consent discussion.

## METHODS

### Study design

We used a mixed-methods research design<sup>13</sup> with a combination of a cross-sectional survey and focus group interviews involving patients undergoing microdiscectomy and members of the surgical team. This allowed us to both quantify clinical practice variation on a macroscopic scale and elucidate themes within individual patient–surgeon encounters.

### Cross-sectional survey

A cross-sectional survey of Canadian Spine Society members was administered through email to assess

adverse events disclosed during the consent discussion. An established framework<sup>14</sup> was used to identify 15 routinely reported adverse events related to posterior lumbar single-level microdiscectomy for inclusion in the survey. Respondents graded these adverse events as commonly discussed, uncommonly discussed, rarely discussed or not routinely discussed. Demographic information including level of training, years in practice, practice setting (academic v. community), location and specialty (orthopedics v. neurosurgery) was collected. An open-ended section was available for respondents to list any additional adverse events that were routinely discussed with patients.

Categorical data were reported as frequency counts and percentages. Continuous data were reported as means with standard deviations if determined to be normally distributed by the Shapiro–Wilk test, and as medians with interquartile ranges if not. A 2-tailed Student *t* test or Mann–Whitney test was used to detect group differences for continuous variables. Two authors (A.Z., V.P.) independently reviewed written comments from the open-ended section of the survey to establish common themes. Any discrepancy was resolved by consensus.

We calculated the number of adverse events not routinely discussed for each respondent and compared these values on the basis of specialty, practice setting, level of training and number of prior consent discussions (< 100 v. > 100). The Spearman rank correlation coefficient was used to determine whether an association existed between years in practice and number of adverse events not discussed. Multivariable Poisson regression analysis was performed to determine surgeon and practice factors associated with the number of adverse events not discussed. All statistical analyses were performed using Stata 15 (StataCorp). A *p* value of less than 0.05 was considered statistically significant.

### Focus group interviews

Approval was obtained from the Sunnybrook Health Sciences Centre research ethics board (project 146-2009) to conduct semistructured focus group interviews lasting 1–1.5 hours with the following stakeholder groups:

preoperative patients, postoperative patients, attending spine surgeons (faculty/staff surgeons in orthopedics or neurosurgery), spine fellows (surgeons pursuing additional training after residency) and orthopedic surgery residents.

Patients who had consented to or who had already undergone lumbar microdiscectomy at our tertiary referral centre were eligible for inclusion. Patients with emergent spinal pathologies (i.e., cauda equina syndrome) or language or cognitive impairments that would prevent them from being able to participate in interviews conducted in English were excluded. Demographic information including age, sex and level of education and information on duration of symptoms was collected using a paper questionnaire. Back and leg pain were assessed using a visual analogue scale (VAS).

A semistructured interview guide was used for each focus group (Appendix 1, available at [canjsurg.ca/005619-a1](http://canjsurg.ca/005619-a1)). Interviews were moderated to ensure consistency. The conversations were subsequently transcribed verbatim, except that identifying information was removed. The moderator and 2 qualitative analysts (A.Z., V.P.) independently analyzed the transcripts using thematic analysis with open coding in NVivo 9.5. Line-by-line content analysis was used to systematically make inferences from the text and to code the text into themes.<sup>15</sup> Word clusters that corresponded to discrete themes were identified and placed in a Microsoft Word memo document. Each analyst independently developed a list of identified themes; through comparison, the analysts established consensus on a list of themes and subthemes. Each theme was developed and refined on the basis of analysis of each focus group transcript in a continuous back and forth process. Focus groups were conducted until data saturation was reached.

RESULTS

Cross-sectional survey

Demographic characteristics of the 51 survey respondents are presented in Table 1. The overall response rate was 41%. Thirty-three respondents (65%) had more than 100 lumbar microdiscectomy consent discussions before completing the survey. The median number of years in practice for the staff surgeons who responded to the survey was 13 (range 6–24) years; there was no significant difference between orthopedic surgeons and neurosurgeons. The majority of the respondents practised in academic institutions.

Survey responses are presented in Table 2. The median number of adverse events not routinely discussed

Table 1. Characteristics of survey respondents

Characteristic	No. (%) of respondents* n = 51
Career stage	
Staff surgeon	37 (72)
Fellow	8 (16)
Resident	6 (12)
Time in practice, yr, mean ± SD	15.8 ± 11.0
Type of practice	
Academic	43 (84)
Community	8 (16)
Specialty	
Neurosurgery	15 (29)
Orthopedic surgery	36 (71)
Reported no. of consent discussions	
< 100	18 (35)
> 100	33 (65)

SD = standard deviation.  
\*Unless indicated otherwise.

Table 2. Frequency with which complications are discussed by surgeons during informed consent conversations

Complication	Total no. of respondents	No. (%) of respondents			
		Not routinely discussed	Rarely discussed (< 1% of conversations)	Uncommonly discussed (< 5% of conversations)	Commonly discussed (> 5% of conversations)
Infection	51	0 (0)	13 (26)	29 (57)	9 (18)
Myocardial infarction	51	19 (37)	24 (47)	4 (8)	4 (8)
Cerebrovascular accident	51	22 (43)	23 (45)	3 (6)	3 (6)
Nerve root injury	50	0 (0)	21 (42)	22 (44)	7 (14)
Bowel or bladder injury	50	7 (14)	28 (56)	7 (14)	8 (16)
Dural tear, cerebrospinal fluid leak	51	1 (2)	8 (16)	30 (59)	12 (24)
Ongoing pain	50	3 (6)	1 (2)	7 (14)	39 (78)
Recurrence of herniated disc	51	1 (2)	3 (6)	7 (14)	40 (78)
Spinal instability	51	8 (16)	12 (24)	20 (39)	11 (22)
Pneumonia	50	34 (68)	10 (20)	4 (8)	2 (4)
Infection due to obesity	51	14 (28)	4 (8)	23 (45)	10 (20)
Deep vein thrombosis	51	13 (26)	19 (37)	11 (22)	8 (16)
Paraplegia	51	12 (24)	33 (65)	3 (6)	3 (6)
Blood vessel injury	51	20 (39)	27 (53)	1 (2)	3 (6)
Surgery at incorrect level	51	31 (61)	17 (33)	2 (4)	1 (2)

was 3 (range 1–6). This number was greater among orthopedic surgeons than among neurosurgeons (4 [range 2–7] v. 1 [range, 0–5];  $p = 0.021$ ), and it was greater among surgeons reporting fewer than 100 consent discussions than among those reporting more than 100 consent discussions (5.5 [range 2–7] v. 3 [range 1–5];  $p = 0.043$ ). The median number of adverse events not routinely discussed did not differ by practice setting, and it was not associated with number of years in practice.

Multivariate Poisson regression analysis also found the number of adverse events not routinely discussed to be higher among orthopedic surgeons than among neurosurgeons (relative risk 1.83; 95% confidence interval 1.22–2.73;  $p = 0.003$ ). No significant differences were found for practice setting, number of prior consent discussions and level of training.

All respondents routinely discussed infection and nerve root injury as potential adverse events. Less frequently discussed adverse events included pneumonia (34/51; 68%), incorrect level of surgery (31/51; 61%) and stroke (22/51; 43%).

### Focus group interviews

Focus groups were conducted with the following surgical health care providers: 6 fellowship-trained spine surgeons (all men), 3 spine fellows (all men) and 5 orthopedic surgery residents (4 men, 1 woman). The characteristics of the patients who participated in the focus groups are presented in Table 3. A total of 10 patients were interviewed (6 men and 4 women). The mean patient age was 42.6 years (range 20–67 yr). Mean preoperative patient VAS scores for leg pain and back pain were 6.2 and 5.5, respectively. Mean postoperative patient VAS scores for leg pain and back pain were 4.3 and 3.4, respectively. Sixty-seven percent of postoperative patients were employed; 33% were receiving Workplace Safety and Insurance Board benefits.

The following themes emerged from the focus group interviews: medical terminology, diagnosis and treatment options, overview of the procedure, goals of surgery, adverse events, length of hospital admission, recovery time, expected symptoms, activity restrictions, wound care, need for a caregiver and physiotherapy. When the data were specifically analyzed to determine whether

there were differences in responses related to sex, age, education level or VAS pain score, no such differences were found and no new themes emerged.

### Medical terminology

Both preoperative and postoperative patients had difficulty understanding the medical terminology used to describe their condition and procedure. As a result, many patients did not fully understand the procedure to which they had consented. For instance, 1 postoperative patient confessed, “I’m not really sure what I’m agreeing to” and another stated, “I didn’t even know the term ‘microdiscectomy’ until after I had left the building.” Many patients used the Internet to learn more about the procedure after having consented to surgery.

### Diagnosis and treatment options

Surgeons inform patients of their diagnosis during the initial consultation, which serves as the basis for treatment recommendations. Surgeons believe that, for patients, “the main things are that they understand the diagnosis [and] they understand what the surgery is going to treat and what it’s likely not going to treat.”

### Overview of the procedure

All stakeholder groups felt that an overview of the procedure should be included in the consent discussion. Patient-specific imaging or spine models were used as visual aids to describe the procedure. Patients were interested in the basics of the procedure, including the incision location and size, as well as the length of the operation. Given that patients awaiting spine surgery are often in severe pain, many also wanted to know the date of surgery as soon as possible.

### Goals of surgery

Both surgeons and patients viewed the amount of symptomatic relief one can expect after surgery as the most important topic during the consent discussion. However, surgeons felt that despite efforts to set what they deemed to be realistic expectations, they were not always successful at getting that message across, as “patients hear what they want to hear.” Many patients are confused about whether microdiscectomy is meant to relieve back pain or leg pain.

**Table 3. Characteristics of patients who participated in the focus groups**

Patient category	Age, yr, mean (range)	Sex	Symptom duration, range	VAS score, mean (range)		Length of postoperative period, wk, mean (range)
				Back pain	Leg pain	
Preoperative	43.7 (20–67)	1 man, 2 women	6 wk – 30 yr	5.5 (1–8.5)	6.2 (3–8.5)	NA
Postoperative	42.1 (29–58)	5 men, 2 women	7 mo – 40 yr	3.4 (0–8)	4.3 (0–8)	5 (2–12)

NA = not applicable; VAS = visual analogue scale.

**Adverse events**

Attending surgeons, fellows and residents unanimously emphasized the importance of discussing potential adverse events with patients. Interestingly, patients placed far less emphasis on adverse events than the surgical team. One postoperative patient conveyed this notion by saying, “I wasn’t interested in the technicalities ... I didn’t care.”

**Length of hospital admission**

Although the majority of microdiscectomy procedures are performed in an outpatient setting, questions relating to the length of hospital stay were repeatedly brought up by all stakeholder groups.

**Recovery time**

Postoperative recovery time was identified to be a major topic on which patients needed information. Many patients felt unprepared for their postoperative course because of a lack of information from the surgical team. One postoperative patient stated, “For me what was going to be most important — was recovery” and “I wish I knew how long the recovery was really going to be.”

**Expected symptoms**

Many patients stated that they were not informed about what level of pain they should expect after surgery, and as a result they felt unprepared for their postoperative course. Surgical residents also felt that patients needed more information regarding postoperative pain and other expected symptoms, highlighting that “nobody told them that even at 6 weeks postoperatively, they could still expect swelling and have pain when they walk.”

**Activity restrictions**

Patients expressed confusion about postoperative activity restrictions and desired a more thorough discussion of expected postoperative function during the consent discussion. One postoperative patient also expressed confusion regarding the instructions she received before discharge: “‘You’re going to be able to walk.’ What does that mean? How long can I walk for? Can I walk the whole day? Can I walk the dog? Can I jog a bit? Can I go up the stairs?”

Many surgeons preferred discussing postoperative restrictions, such as restrictions on showering and ambulation, during either the preadmission visit or the immediate postoperative period. One limitation of this strategy is that patients often have little to no recollection of the information they receive in the recovery area before discharge.<sup>16</sup> One patient stated, “I was in a lot of pain so I couldn’t remember what anyone was saying to me. ... So when I came out of surgery I had no idea what I was supposed to do.”

**Wound care**

Patients desired information on wound care. Patients seemed better informed, however, on managing their wound than on other subthemes in postoperative care.

**Need for a caregiver**

Given that most patients are discharged the same day after microdiscectomy, the topic of arranging for a caregiver was strongly emphasized by postoperative patients as their hindsight advice for future patients. One patient stated, “I really relied on my husband and my children, but I mean just going to the washroom, rolling over in bed, getting out of bed, getting into bed, walking a short distance ... I didn’t know it was going to be that bad.” Another expressed similar sentiments, stating, “I wish they had told me that for the next 4 days I needed somebody there.”

**Physiotherapy**

Patients often asked residents preoperatively and during follow-up visits about the role of physiotherapy in their rehabilitation.

**Checking of the study findings**

A summary of the derived themes was shared with 3 stakeholder groups: attending spine surgeons, preoperative patients and postoperative patients. Each group was asked to comment on the appropriateness of the themes identified as well as on the usefulness of such information for preoperative patients.

Attending spine surgeons unanimously agreed with the appropriateness and usefulness of the derived themes. Preoperative and postoperative patients also confirmed that the themes identified were highly valuable and in line with their information needs. These findings validate the importance of providing patients with information relating to their entire spectrum of care, with emphasis on the postoperative course.

**DISCUSSION**

This study evaluated practice variations among Canadian spine surgeons in the informed consent discussion for lumbar microdiscectomy, and it also evaluated the information needs of patients undergoing this procedure. Our cross-sectional analysis identified variability in self-reported practice in the disclosure of potential adverse events during the informed consent process as well as gaps in information provided to patients, particularly relating to postoperative care.

In our survey, orthopedic surgeons reported discussing fewer adverse events during the consent process than neurosurgeons. Previous studies have identified neurosurgery as a high-risk specialty with regard to potential harm from adverse events and cost of

litigation.<sup>17</sup> This may, in part, influence the degree of detail disclosed during informed consent discussions, and it may explain the fact that the neurosurgeons in our survey reported providing more detailed disclosure of potential adverse events to their patients than did the orthopedic surgeons.

The most frequently disclosed potential adverse events in our survey were nerve root injury and infection, both of which were reported by all respondents. Shriver and colleagues<sup>14</sup> previously reported the rates of these adverse events to be 2.6% and 2.1%, respectively. In their meta-analysis, the most commonly reported adverse events after lumbar microdiscectomy included recurrent disc herniation (4.4%), reoperation (7.1%) and incidental durotomy (3.9%).<sup>14</sup> In our study, recurrent disc herniation and incidental durotomy were reported to not be routinely discussed by only 1 respondent each. In other words, these more common adverse events were frequently disclosed to patients. Of the technical disclosures that were made, 60% of survey respondents indicated that they did not routinely discuss wrong-level surgery. The importance of disclosing potential adverse events in spine surgery has recently been highlighted by a large retrospective analysis that identified failure to adequately explain adverse events and alternative options as the most common reason for malpractice litigation.<sup>18</sup>

Given the serious potential adverse events associated with spine surgery, it is essential to ensure that patients have realistic expectations. This is difficult because of the limited face time between patients and surgeons and because a patient typically interacts with a large number of health care providers. Providing patients with an educational resource outlining the goals of surgery, expected outcomes, potential adverse events and other procedure-related details during the initial surgical consultation may help overcome these barriers in communication.<sup>19</sup>

Currently, the consent discussion focuses on basic information regarding the procedure and its associated risks and benefits, rather than on the postoperative course. This is understandable given the medicolegal implications of informed consent, the time constraints inherent in surgical consultations and the wait time between obtaining consent and surgery. However, with patients' interest hinged on postoperative information, the current content areas covered during consultations leave their needs unmet.

Patients' need for more preoperative information has been demonstrated by previous studies in the literature. Rönnerberg and colleagues found that despite clear verbal instructions on 2 separate occasions by the surgical team and physiotherapists, only 46% of patients undergoing lumbar spine surgery were satisfied with the

information they received preoperatively.<sup>20</sup> Keulers and colleagues administered an 80-item questionnaire to assess the relative importance of preoperative information on various topics to patients and surgeons.<sup>21</sup> Topics examined included disease pathophysiology, physical examination, preoperative period, anesthesia, operation, postoperative period, self-care and general hospital information. The authors reported a mismatch between topics deemed important by patients and surgeons. Patients emphasized the need for information on the preoperative period, anesthesia, operation, postoperative period, self-care and general hospital information. By contrast, surgeons believed that patients desired more extensive information on the pathophysiology and prognosis of the disease process. These findings are consistent with observations from our study and suggest that surgeons routinely underestimate their patients' need for extensive and adequate provision of preoperative information.

Given that microdiscectomy is typically a day procedure, there is less time for discussing postoperative recovery before patient discharge than there is with in-patient procedures. Discussing such details immediately after surgery is not optimal, as many patients have little recollection of these conversations in the recovery room.<sup>16</sup> Our interview revealed that the information booklet patients received before discharge contained no specific instructions on recovery, ambulation and functional limitations, leaving patients in a state of uncertainty until their postoperative follow-up appointment.

Inadequate instructions regarding postoperative care may create anxiety, hinder rehabilitation and potentially compromise a desirable outcome.<sup>22</sup> Our interviews revealed that patients were often afraid to partake in any activity for fear of damaging their "spine." Providing time-specific activity instructions for the period leading up to the first follow-up visit will probably decrease patient fear and anxiety over postoperative ambulation and activity restrictions and may improve functional outcomes.

On the basis of the findings from our focus group interviews, we postulate that patients want ownership of the aspects of their care over which they have control. Patients, for the most part, have no control over their surgical procedure. Hence, many were not interested in the technical details of their procedure. However, postoperative recovery is a large element of care over which patients do have substantial control. Therefore, an information resource that clearly outlines the postoperative course will help patients take more ownership of their care.

It is also important to discuss what motivates a patient's desire for information. The phenomenon of response shift has been described in the medical

literature, including for degenerative spinal conditions.<sup>23</sup> Having received treatment, with either a positive, neutral or negative effect, may alter one's response and/or expectations for ongoing as well as future treatment. Patient expectations for treatment and other cognitive factors influencing patient experience, as well as concomitant changes in appraisal, are also important to consider to accurately interpret changes measured by standard outcomes reported by patients who undergo spinal procedures.<sup>24,25</sup>

### Limitations

This study has several limitations. First, most of the survey respondents practised in academic settings, limiting the generalizability of our findings to community practice settings. Second, there may be recall bias because of the time lapse between the consent discussion and the semistructured interview and because the information regarding adverse events routinely disclosed was based on surgeons' self-reported data rather than on medical records or recordings of consent discussions. Third, information gathered from focus groups represents the range, not prevalence, of views among stakeholder groups. Thus, we could not make inferences regarding the prevalence of each patient concern among the entire population of patients undergoing microdiscectomy. Fourth, although we recorded VAS back and leg pain scores for the patients we interviewed, we did not formally measure generic and disease-specific patient-reported functional outcomes to determine the minimal clinically important difference. Fifth, our findings may not be generalizable to other surgical procedures and institutions, which may have different clinical care pathways and different time frames between consultation and surgery. Finally, the focus group data are contextualized within a specific social situation<sup>26</sup> and may not be generalizable to other social situations.

### CONCLUSION

Our mixed-methods study found significant variation in the reported disclosure of potential adverse events during the informed consent process for lumbar microdiscectomy among Canadian spine surgeons. The patients we interviewed desired more information regarding their postoperative care than they received. Further research should focus on exploring the potential benefit of developing guidelines to reduce reported practice variation in consent discussions. Quality improvement efforts including patient-centred educational materials for the postoperative care period are also likely to enhance the patient care experience.

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**Competing interests:** A. Yee is an executive member of the Canadian Spine Society. He was not involved in distributing the survey or collating the survey results. He was involved in interpreting the survey results. He reports receiving educational grants, sponsorship of his university and hospital's spine program activities, personal fees and in-kind research support from Medtronic, outside the submitted work. He also reports receiving educational grants and sponsorship of his university and hospital's spine program activities from Stryker, Zimmer Biomet, Johnson & Johnson and DePuy Synthes, outside the submitted work. No other competing interests declared.

**Contributors:** A. Zahrai, K. Bhanot, Z. Tan, A. Yee and V. Palda designed the study. A. Zahrai, K. Bhanot, Z. Tan and A. Yee acquired the data, which A. Zahrai, K. Bhanot, X. Mei, E. Crawford, Z. Tan and A. Yee analyzed. A. Zahrai, K. Bhanot, X. Mei, E. Crawford, Z. Tan and V. Palda wrote the article, which K. Bhanot, X. Mei, A. Yee and V. Palda critically reviewed. All authors gave final approval of the article to be published.

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