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Preoperative education for lumbar radiculopathy: A survey of US spine surgeons

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Abstract

Background: We sought to determine current utilization, importance, content, and delivery methods of preoperative education by spine surgeons in the United States for patients with lumbar radiculopathy.

Methods: An online cross-sectional survey was used to study a random sample of spine surgeons in the United States. The Spinal Surgery Education Questionnaire (SSEQ) was developed based on previous related surveys and assessed for face and content validity by an expert panel. The SSEQ captured information on demographics, content, delivery methods, utilization, and importance of preoperative education as rated by surgeons. Descriptive statistics were used to describe the current utilization, importance, content, and delivery methods of preoperative education by spine surgeons in the United States for patients with lumbar radiculopathy.

Results: Of 200 surgeons, 89 (45% response rate) responded to the online survey. The majority (64.2%) provide preoperative education informally during the course of clinical consultation versus a formal preoperative education session. The mean time from the decision to undergo surgery to the date of surgery was 33.65 days. The highest rated educational topics are surgical procedure (96.3%), complications (96.3%), outcomes/expectations (93.8%), anatomy (92.6%), amount of postoperative pain expected (90.1%), and hospital stay (90.1%). Surgeons estimated spending approximately 20% of the preoperative education time specifically addressing pain. Seventy-five percent of the surgeons personally provide the education, and nearly all surgeons (96.3%) use verbal communication with the use of a spine model.

Conclusions: Spine surgeons believe that preoperative education is important and use a predominantly biomedical approach in preparing patients for surgery. Larger studies are needed to validate these findings.

Keywords: Spine; Surgery; Education; Survey; Preoperative

The literature on preoperative education for lumbar spine surgery is dominated by studies that use experimental designs to measure the effects of structured educational programs on patient outcomes.[1–4] These studies predominantly compare structured, preoperative educational interventions with the usual care that patients receive. "Usual care," however, is largely elusive and unexplored.[1] To date, several studies have been conducted in reference to preoperative education for lumbar surgery,[5–13] but the heterogeneous nature of these studies does not provide a clear view of what constitutes "usual care" for preoperative education for spinal surgery. These include different surgical interventions, such as surgery for scoliosis,[8,9] disc surgery,[11,12] decompressive surgery,[11,12] and "not specified."[6,10] The delivery methods also vary among verbal education by a nurse,[6,9] surgeon,[10,13] or physical therapist[13] or video-only instruction.[7,8] The content of preoperative education varies among cognitive behavioral therapy,[7,8] information regarding the surgical procedure,[6–8,10] information on activities of daily living,[13] anatomy,[6] risks associated with the surgery,[6,7,10,13] general hospital procedures,[6,7] and length of hospital stay.[6,7] Educational interventions use various types of educational aids, including leaflets and booklets,[6,9,10] spine models,[10] posters,[9,10] or verbal communication with no educational aids.[9] Preoperative education is administered to adults,[6,10] as well as adolescents and children.[7–9] With regard to the

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timing and duration of education, only 1 study specifies preoperative education to be administered 1 to 2 weeks preoperatively for 40 minutes.[6]

It is clear from the vast variety of methods in the literature reviewed that very little is known regarding what constitutes "usual care" as it relates to the utilization, content, and preferred education delivery methods used in studies and thus also by spine surgeons in the United States. The purpose of this study was to determine the current utilization, content, and delivery methods of preoperative education by spine surgeons in the United States for patients undergoing surgery for lumbar radiculopathy. In addition, the study aimed to determine the importance that spine surgeons in the United States place on preoperative education for lumbar radiculopathy. Future studies that use experimental designs to measure the effects of structured education programs on patient outcomes may benefit from knowing what constitutes "usual care" in preoperative education for spinal surgery in the United States.

Methods

Questionnaire development and administration

Because no similar studies have been conducted, the Spinal Surgery Education Questionnaire (SSEQ) was developed to determine the utilization, content, delivery methods, and importance of education as rated by spine surgeons in the United States (Appendix 1). The questionnaire was designed based on previous surveys of physicians and surgeons related to various other surgical interventions,[14–21] a previous study surveying patients having undergone lumbar surgery for radiculopathy,[11] and objectives of the study. Section 1 of the questionnaire gathered demographic and practice information from the responding spine surgeon, whereas section 2 gathered information on the content, delivery methods, utilization, and importance of spinal surgery as rated by the surgeons.

To establish face and content validity, the draft questionnaire was sent to a panel of national and international experts in the fields of patient education, questionnaire design, and spinal surgery.[22] Upon completion of the expert panel review, a pilot study comprising a convenience sample of spine surgeons was conducted to review the content, the ease of completion, and the time it took to complete the questionnaire. The finalized SSEQ was uploaded on a secure Web site for use in the study. To obtain a random sample of US spine surgeons, a company tracking outcomes for spine surgeons (Visiontree, San Diego, CA, USA), as well as a marketing agency (Medical Marketing Services, Inc., Wood Dale, IL, USA), was asked to provide a random sample of spine surgeons, representing all states, to participate in the survey study. E-mail invitations were sent to 200 surgeons describing the study and asking them to participate in the online survey. Surgeons included in the study were men or women, practicing in the United States, and actively involved in performing spinal surgery. Exclusion criteria included surgeons not fluent in reading or writing the English language and those not actively involved in spinal surgery. Data were collected over a 3-month period, with 4 separate E-mail messages sent to the surgeons as reminders and 1 sent in appreciation for their time and participation.

Statistical analysis

The survey data were captured by the Web site software and compiled in Excel spreadsheet files (Microsoft, Redmond, Washington), and statistical testing was performed with SPSS software (version 16.00; SPSS, Inc., Chicago, Illinois). This was, to a large degree, a descriptive study. Descriptive statistics such as counts and percentages, frequency distributions, means, standard deviations, and confidence intervals were used to describe variables. Some prespecified comparisons were made between certain variables. Where both variables were categorical, contingency analysis was used to detect association. Both the χ^2 test and Fisher exact test were used. Statistical significance was set at $P < .05$. When relationships between a categorical variable and a continuous outcome were analyzed, a t test or analysis of variance was used to detect significant differences. Where the assumptions of normality were violated, the nonparametric equivalents were used to analyze the data.

Results

Overview of population demographics

A total of 89 of the 200 surgeons (45%) responded to the online survey. Eight questionnaires had to be excluded because of incomplete data, resulting in a total of 81 completed questionnaires that were available for analysis. According to the biographic information captured (Table 1), 90% of the respondents were orthopedic surgeons and 10% neurosurgeons. Of the respondents, 91% were trained as medical doctors and 9% as doctors of osteopathy. Male surgeons constituted the majority in that all but 3 respondents were male spine surgeons (97.5%). The distribution among cohorts in terms of the length of time in practice indicated that the sample consisted of surgeons with extensive experience performing spinal surgery, where 46.9% had been practicing for more than 20 years; 30.9%, between 10 and 20 years; 16.1%, between 5 and 10 years; and 6.2%, less than 5 years. The majority of surgeons (56.8%) were working in a private practice exclusively, whereas 27.2% indicated that they worked in an academic setting. A small group of surgeons (13.6%) indicated that they worked in both private practice and academic settings. Almost two-thirds of the respondents (65.4%) indicated that they provide education for medical students/residents. A small percentage of surgeons (n = 7, 8.6%) indicated that they had additional training in pain management. Of the surgeons, 43.2% indicated that they performed fewer than 10 decompressive surgeries for lumbar radiculopathy per month, fol-

Table 1
Demographic information on respondents of SSEQ

	Data
Gender	
Male	97.5%
Female	2.5%
Medical training	
MD	91%
DO	9%
Surgical training	
Orthopedic	90%
Neurosurgery	10%
Time in practice	
<5 yr	6.1%
5–10 yr	16.1%
10–20 yr	30.9%
>20 yr	46.9%
Practice setting	
Private	56.8%
Academic	27.2%
Both private and academic	13.6%
No response	2.4%
Provide education for medical students/residents?	
Yes	65.4%
No	34.6%
No. of decompressive surgeries per month	
<10	43.2%
10–20	38.3%
>20	18.5%
Had surgeon undergone lumbar surgery?	
Yes	14.6%
No	86.4%
Had immediate family undergone lumbar surgery?	
Yes	34.6%
No	65.4%

Abbreviations: DO, doctor of osteopathy; MD, medical doctor.

lowed by 38.3% performing between 10 and 20 surgeries and 18.5% performing more than 20 surgeries per month. Most surgeons (86.4%) indicated that they had not undergone lumbar surgery themselves, whereas nearly two-thirds of the surgeons (65.4%) indicated that they did not have an immediate family member who had undergone lumbar surgery. Surgeons who had additional training in pain management were more likely to have personally undergone lumbar surgery ($P = .018$) and were more likely to have had an immediate family member undergo lumbar surgery ($P = .002$) compared with surgeons who did not have additional training in pain management.

Use of preoperative education for lumbar radiculopathy

All surgeons in the survey indicated that they provided preoperative education for lumbar radiculopathy. Nearly two-thirds of the surgeons (64.2%) indicated that their preoperative education was provided informally during the course of clinical consultation rather than a formal, designed and preplanned session providing preoperative education. Most surgeons (83.9%) indicated that they provided their preoperative education during the final consultation session at their office. The mean time from the decision to undergo surgery to the date of surgery was 33.65 days, with a median of 17.5 days. Three-quarters of the surgeons (75.3%) indicated that the facilities where they perform surgery, such as a hospital or surgery center, did not provide structured preoperative educational sessions or classes. Thirty-six comparisons were made between orthopedic surgeons and neurosurgeons in the following 5 categories: demographics, educational sessions, content of the educational section, tools/props used for education, and physical therapy referrals. None of these showed a statistically significant difference, indicating that orthopedic surgeons and neurosurgeons have similar practice patterns regarding preoperative education for lumbar surgery for radiculopathy.

Content

Of the 19 topics listed in the SSEQ (Appendix 1), 10 were chosen by at least 80% of the surgeons to be included in preoperative education for lumbar surgery for radiculopathy. Surgeons rated topics to include in preoperative education by order of importance as follows: surgical procedure (96.3%), complications (96.3%), outcomes/expectations (93.8%), anatomy (92.6%), amount of postoperative pain expected (90.1%), hospital stay (90.1%), how surgery will affect pain (88.9%), precautions after surgery (86.4%), infection (85.2%), and smoking (83.9%). Surgeons estimated that they spent an average of approximately 20% of the preoperative education time specifically addressing pain (range, 3%–80%). Nearly two-thirds of surgeons reported that they routinely send their patients to undergo rehabilitation in physical therapy after lumbar surgery for radiculopathy. The surgeons who indicated that they send patients to rehabilitation on average send 85% of their patients to physical therapy.

Education delivery methods

Three-quarters of the surgeons (75.3%) indicated that they themselves provided the educational sessions. Nearly all surgeons (96.3%) indicated that they used verbal communication and discussion with the use of a spine model. Nearly two-thirds of the surgeons (64.2%) estimated that the educational session lasted approximately 15 minutes. Half of the surgeons (51.9%) indicated that they used booklets with images as a teaching tool, and more than 1 in 3 surgeons (38.3%) refer patients to Web sites. When asked to indicate a specific Web site used for referral, choices showed no consistent pattern.

Importance of preoperative education

More than 85% of the surgeons (85.2%) rated the importance of preoperative education as 8 or higher on a scale of 0 to 10, with the mean score being 8.8 of 10 (SD, 1.47). Surgeons' indication as to why preoperative education was important comprised a combination of the following 4 reasons: (1) it is an ethical and/or legal obligation, (2) it provided an opportunity to answer questions, (3) it helped

reduce anxiety before surgery, and (4) it provided better surgical outcomes.

Discussion

To our knowledge, this is the first study centered on determining the practice patterns of US spine surgeons related to preoperative education for lumbar surgery for radiculopathy.

Use of preoperative education

The results of this study indicate that spine surgeons in the United States do use preoperative education before lumbar surgery for radiculopathy. This finding concurs with other studies assessing preoperative education in orthopedics and spinal surgery[6–9,11,12,23] and is in line with preoperative education in other surgical areas, such as orthopedic peripheral joint surgery,[5,24–27] cardiac surgery,[28–32] and abdominal surgery.[4,33–36] The results from this study showed that surgeons use preoperative education as a means of providing better outcomes, answering patient questions, covering legal and ethical requirements, and reducing patient anxiety. These intentions correspond with studies showing that preoperative education helped increase knowledge of the surgical procedure,[3,5,37,38] reduced anxiety,[29,35,39–41] reduced postoperative pain,[6,8,35,42,43] decreased length of hospital stay,[5,26,43,44] and facilitated a faster return to preoperative functional levels.[6,13,26,28,42]

Content of preoperative education

The majority of the content covered in preoperative education for lumbar radiculopathy addressed issues related to the outcome of the surgery. Outcomes related to spinal surgery have become a hotly debated topic in the literature.[45–52] Studies indicate that patients often have high expectations of surgery and outcomes are often not met.[45,53]

Of all the topics covered in preoperative education for lumbar surgery for radiculopathy, surgeons rated "surgical procedure" the highest. This finding correlates with previous studies that investigated surgeon practice patterns[4,5,11,54] and indicated that surgeons spent most of the time discussing the impending surgical procedure and anatomic reasoning behind the proposed surgery. Discussion of the surgical procedure is expected, because surgeons are often viewed as expert technicians and thus view spinal disorders from a technical point of view.[55–59] It is important to note that in a recent study that surveyed patients having undergone lumbar surgery for radiculopathy,[11] patients were asked to rate the importance of various topics covered during preoperative education and "surgical procedure" was only ranked No. 9.[11] The survey showed that patients wanted to know how surgery would affect their symptoms (ranked No. 1) and may have had only a limited interest in a full discussion of the surgical procedure.[11,45] In addition, the survey showed that patients were interested in knowing more about pain issues related to their impending surgical intervention. Several pain issues, such as how pain would be affected by the surgery, complete loss of pain, preoperative pain, and other pain, were rated more important than "surgical procedure."[11] In our study, surgeons on average estimated that they spent 20% of their educational session specifically addressing pain. Because surgery data indicate that the primary reason for lumbar surgery is pain,[11,12,45,51] this finding may show a shortcoming in the surveyed preoperative education by not adequately addressing a more detailed discussion of pain.[11] Although several studies have implicated unrealistic expectations on the patient's part and possible improper presentation of these expectations by the surgeon,[13,53] it may also reflect the potential lack of provision of adequate information explaining in detail to patients their pain. A more comprehensive discussion of pain would imply use of a more elaborate biopsychosocial approach. Previous studies have implicated that psychosocial factors are powerful determinants in surgical outcome and need to be addressed before surgery, including the determination of whether surgery should even be performed.[60,61] The results of this survey portray a traditional biomedical model focusing on the faulty tissue ("surgical procedure" ranked No. 1 and "anatomy" ranked No. 4 by surgeons), rather than a larger, more comprehensive biopsychosocial approach.[60,62] Two recent studies highlighted the influence of psychological factors in spinal surgery and recommended that these factors be addressed in preoperative education for lumbar surgery.[63,64]

Another interesting finding from this study is that surgeons, regardless of their training, academic involvement, personal and family history of spinal surgery, experience, and additional pain management training, agreed on the topics needed for inclusion preoperatively, as well as their ranking. Surgeons are known to have different viewpoints related to various topics, including the use of new technology, diagnostics, complications, outcomes, and rehabilitation after surgery.[14,17,21,23,46,65] This study showed that despite considering a number of variables among spine surgeons thought to produce different results, it did not do so. The positive implication is that surgeons are all doing the same things, because there seemed to be agreement as to what should be included in preoperative education for lumbar surgery for radiculopathy. Future studies that use experimental designs to measure the effects of structured education programs on patient outcomes should benefit from knowing what constitutes usual care in preoperative education for spinal surgery in the United States.[1] The negative implication of this finding is that if the preoperative educational program surgeons are using in the United States is lacking in any way, the preoperative education that is provided may be universally suboptimal. This concern is highlighted by the results of this study indicating that nearly half of the surgeons did not choose "strategies to cope with pain" as an option to include in their preoperative educational program. Furthermore, it is well-established that the preoperative environment is associated with increased levels of anxiety and

fear,[32,66–71] which has the potential to negatively impact outcomes of surgery.[60,61] Addressing fear and anxiety forms part of a true biopsychosocial approach,[60,62,72] and several studies have shown that educational strategies aimed at reducing fear and anxiety have the potential to do exactly that.[7,25,67,73–75] In our study, of the 4 main reasons surgeons felt the need to include in preoperative education, "reducing anxiety" was rated least important. This may reflect a potential lack of applying a true biopsychosocial approach to preoperative education for lumbar surgery for radiculopathy.

Education delivery methods

The choice of verbal one-on-one education by the surgeons concurs with other studies that indicate that surgeons tend to take the lead in providing the education before surgery.[4,11] Mordiffi et al[76] investigated the preferred method of preoperative information delivery in 67 patients and found that about 90% of the respondents preferred information to be delivered verbally by the surgeon. This finding is further validated by the fact that surgeons view preoperative education as a means for them to answer patient questions. Considering that surgeons rated "surgical procedure" most highly as a factor to be included in preoperative educational sessions and that education delivery mainly consists of verbal one-on-one communication, it can be argued that the surgeon should perform the educational session, because he or she will be performing the surgical procedure. Although the majority of surgeons indicated that they perform the education and patients prefer surgeons to perform the educational session,[11] the results from this study showed that almost 25% of the education sessions were delivered by other healthcare professionals. Several studies have highlighted time constraints on physicians, especially surgeons.[77–80] There has been a gradual increase in surgeons using allied healthcare professionals, such as physician assistants, nurses, and nurse practitioners.[5,81–85] Future studies should investigate this trend and its potential impact on preoperative education for lumbar surgery.

The benefits of one-on-one verbal education seem to outweigh the potential shortcomings. One-on-one verbal education is what peers are using; patients request it; it provides a chance to answer the patient's questions and is more personable and provides an ability to alter the message to meet the educational needs of the patient.[4,76,86,87] Problems associated with one-on-one verbal-only communication include difficulty with limited recall, language barriers, learning disabilities, educational level, age, and cultural considerations.[4,88–90] Considering all the potential barriers to optimal learning, it becomes clear that one-on-one verbal education should also be accompanied with educational material, which has shown to aid recall of information presented to the patient through one-on-one verbal communication.[91–93] The results from this study showed that surgeons preferred to accompany their verbal one-on-one educational session with the use of a spine model. This finding is not surprising, considering that surgeons rated "surgical procedure" (ranked No. 1), "anatomy" (ranked No. 4), and "surgery affecting pain" (ranked No. 7) high in terms of content used to educate patients before lumbar surgery for radiculopathy. The surgeon will thus use this information to describe to the patient the anatomic reason for the patient's pain and how the surgical procedure aims to correct the problem.[53,94] This information is deemed necessary to help patients weigh risks and benefits from surgery and help establish realistic goals and expectations regarding their surgical outcome.[45] This educational model is a true biomedical model with a heavy focus on anatomy and pathoanatomy.[60,62] This finding is underscored by the fact that 96% of the surgeons in this study chose "spine model and verbal communication" compared with only 9% choosing "verbal only." The biomedical model assumes that the patient's pain is a result of an anatomic problem, such as a herniated disc,[46,94] spinal degeneration,[95,96] or stenosis.[97,98] Surgical decompression aims to alleviate the irritation on the neuromeningeal tissues, thus alleviating the patient's pain and neurologic deficit and restoring function.[46,53,94] Although it is not argued that these interventions are beneficial for patients with lumbar radiculopathy,[46] this model may not adequately include factors that have been shown to impact surgical outcomes, such as fear, anxiety, expectations, coping skills, and catastrophization.[2,60,71,75,99,100]

Conclusion

The results of this survey show that spine surgeons in the United States regularly use preoperative education and believe it to be an important aspect in preparing patients for lumbar surgery. However, surgeons tend to use biomedical models in their preoperative education and focus on the surgical procedure rather than explaining the patients' pain through a more comprehensive biopsychosocial approach. Future research should examine postoperative outcomes with the current preoperative education (biomedical model) and compare them with preoperative neuroscience education (biopsychosocial model) in surgery for lumbar radiculopathy. From a clinical perspective, it would be prudent for surgeons to balance the contemporaneous biomedical educational approach with a biopsychosocial approach to provide a more rounded and medicolegally defensible approach to patient management.

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Appendix 1

The SSEQ is aimed at developing a greater understanding of preoperative education provided to patients undergoing lumbar surgery for radiculopathy. Preoperative education is defined as a set of planned educational activities delivered to a patient before surgery, designed to improve a patient's health behavior, health status, or both. Such activities are aimed at facilitating a patient's knowledge base.

Section 1 (demographic/practice information)

Please complete the following demographic information sheet.

1. Are you ☐ an orthopedic surgeon or ☐ a neurosurgeon?
2. Please circle your medical qualification: ☐ MD ☐ DO
3. Gender: ☐ Male ☐ Female
4. Age: _____
5. In which state do you primarily/mostly practice? _____
6. How long have you been in practice? ☐ <5 years ☐ 5–10 years ☐ 10–20 years ☐ >20 years
7. Do you work ☐ in an academic setting or ☐ in a private practice?
8. Are you actively involved in teaching residents and/or medical students? ☐ Yes ☐ No
9. Do you have any specialized/extra training in pain management (eg, fellowship or residency)? ☐ Yes ☐ No
10. On average, how many decompressive surgeries for lumbar radiculopathy do you perform per month? ☐ <10 ☐ 10–20 ☐ >20
11. Have you personally undergone spinal surgery? ☐ Yes ☐ No
12. Has any immediate family member undergone spinal surgery? ☐ Yes ☐ No
13. In your practice, what is the average time (days) it takes for a patient to go from having decided to undergo surgery to the actual surgical procedure? _____

Section 2

1. How would you describe your preoperative education sessions for lumbar surgery for radiculopathy?

   ☐ formal (specially designed and planned session to provide education and interaction with the patient)
   ☐ informal (during the course of the clinical consultation)

2. In your office, who provides the majority of the preoperative education for patients undergoing lumbar surgery for radiculopathy?

   ☐ You (the surgeon)
   ☐ Nurse
   ☐ Physician assistant
   ☐ Office personnel
   ☐ Other; please specify _____

3. When do you provide the preoperative educational information?

   ☐ At the last consultation in your clinic
   ☐ In the hospital before surgery
   ☐ At the first visit to the patient after surgery
   ☐ Other; please specify _____

4. On average, how much time would you estimate is spent on preoperative education/information per patient undergoing lumbar surgery for radiculopathy?

☐ <5 minutes
☐ 5–15 minutes
☐ >15 minutes

5. Do you, or the hospital/institution with which you are affiliated, provide a formal (structured) preoperative education program for spinal surgery, such as a class or referral to a person/group that performs such preoperative education?

☐ No
☐ Yes
If yes:
Who delivers the education (profession)? _____
How long does it last? _____minutes
Is it mandatory to attend? ☐ Yes ☐ No

6. On the basis of your experience, please indicate on the line graph below how important you view preoperative education/information for your patients, from 0, indicating "not important," to 10, indicating "very important."

|----------|
Not important Very important

7. Indicate why you would include preoperative education/information for your surgery patients:

☐ I am obliged to (ethically and/or legally)
☐ It provides an opportunity to answer patient questions
☐ It helps reduce anxiety before surgery
☐ It provides "better" surgical outcomes
☐ Other; please specify _____

8. Below, you will find a list of topics related to spinal surgery. Please check off the items that form part of your preoperative educational/informational program. Indicate as many as you need.

☐ Anatomy
☐ Biomechanics
☐ Surgical procedure
☐ Blood work before surgery
☐ Medicine use before surgery
☐ Smoking
☐ Food intake before surgery
☐ Hospital issues (admission and so on)
☐ Complications
☐ Outcomes/expectations
☐ Consent
☐ Surgical scar
☐ Surgery affecting pain
☐ Amount of postoperative pain
☐ Physical therapy
☐ Strategies to cope with pain
☐ Infections
☐ Hospital stay
☐ Precautions after surgery
☐ Other; specify _____

9. Of all the items listed above, please indicate from the menu below which of the following categories you rate as the single most important aspect to cover before lumbar surgery for radiculopathy.

☐ Surgical procedure (anatomy, biomechanics, instrumentation)
☐ Medical care preoperatively (blood work, medicine use, smoking, hospital admission)
☐ Outcomes (pain, function, strength)
☐ Legal (consent, possible complications, risks/benefits)
☐ Postoperative (physical therapy, physician visit, limitations after surgery)

10. What percentage of your preoperative education is dedicated to specifically address pain experienced by the patient? _____%
11. In providing preoperative education, please choose from the list below any tools/props you use during the educational session:

- ☐ Spine model and verbal description/communication
- ☐ Only verbal description/communication
- ☐ Booklet with images
- ☐ Booklet with no images, only words of advice
- ☐ DVD/video of the surgery
- ☐ Referral to a Web site; if so, which one? _____
- ☐ Other; please explain _____

12. Do you routinely send patients after lumbar surgery for radiculopathy to physical therapy for rehabilitation?

- ☐ No
- ☐ Yes

When you do, approximately what % of your patients? _____%

Thank you for your time.