Climbing several flights of stairs:
___ Yes, limited a lot
___ Yes, limited a little
___ No, not limited at all

During the PAST 4 WEEKS have you had any of the following problems with your work or other regular activities AS A RESULT OF YOUR PHYSICAL HEALTH?
3. Accomplished less than you would like:
___ Yes
___ No

4. Were limited in the KIND of work or other activities:
___ Yes
___ No

During the PAST 4 WEEKS, were you limited in the kind of work you do or other regular activities AS A RESULT OF ANY EMOTIONAL PROBLEMS (such as feeling depressed or anxious)?

5. ACCOMPLISHED LESS than you would like:
___ Yes
___ No

6. Didn’t do work or other activities as CAREFULLY as usual:
___ Yes
___ No

7. During the PAST 4 WEEKS, how much did PAIN interfere with your normal work (including both work outside the home and housework)?
___ Not at all
___ A little bit
___ Moderately
___ Quite a bit
___ Extremely

The next three questions are about how you feel and how things have been DURING THE PAST 4 WEEKS. For each question, please give the one answer that comes closest to the way you have been feeling. How much of the time during the PAST 4 WEEKS

8. Have you felt calm and peaceful?
___ All of the time
___ Most of the time
___ A good bit of the time
___ Some of the time

9. Did you have a lot of energy?
___ All of the time
___ Most of the time
___ A good bit of the time
___ Some of the time
___ A little bit of the time
___ None of the time

10. Have you felt downhearted and blue?
___ All of the time
___ Most of the time
___ A good bit of the time
___ Some of the time
___ A little bit of the time
___ None of the time

11. During the PAST 4 WEEKS, how much of the time has your PHYSICAL HEALTH OR EMOTIONAL PROBLEMS interfered with your social activities (like visiting with friends, relatives, etc.)?
___ All of the time
___ Most of the time
___ A good bit of the time
___ Some of the time
___ A little bit of the time
___ None of the time

Discussion
Dr Gary W. Chmielewski (Chicago, Ill). I would like to congratulate Dr Bryant on a good presentation and I would like to thank the authors for getting the manuscript to Dr Liptay and I before the meeting. Dr Liptay and I would like to thank the Association for the chance to review this and discuss.

As surgeons, we have 2 goals in performing a pulmonary resection. One is to get rid of the cancer and the other is to get patients back to their lives. The authors are to be congratulated on looking at the second part of the equation, which most often is overlooked.

In this paper, the authors look at postoperative QOL scores in patients undergoing pneumonectomy. They report on 111 patients operated on during a 13-year period. Five-year survivals were 37%, with QOL scores obtained in 98% of these patients who were out 1 year from surgery. In summary, the mental quality of life scores were better compared with to the average population whereas the physical component score was significantly worse than the average population. As was pointed out here, in their article the authors state that it’s a misnomer to call a pneumonectomy a disease, and they also emphasized the need to use separate
mental and physical parameters to assess the impact of our surgery on our patients’ quality of life. Although I agree with the authors that the QOL scores are important in looking at our overall surgical results, it does appear from your data that we are inducing somewhat of a chronic disease state on these patients, because they do have QOL scores physically that are worse than patients with heart disease, renal disease, and diabetes mellitus.

That said, I have 3 questions. The first 2 are: Now that your institution is armed with these data, do your surgeons plan to give a preoperative QOL questionnaire and, if there are surgeons in the audience who are inclined to go ahead and use these questionnaires in their postoperative care, what interval do you suggest that we query our patients on?

**Dr Bryant.** Based on these data, we do plan to implement not only just the QOL survey but physiologic measurements such as PFTs and a 6-minute walk test. I think a 6-month interval for the first few years postoperatively would be ideal, and then yearly for the remainder of the patient’s life, or as far as possible.

**Dr Chmielewski.** This is an uncommon circumstance, but did you see any dramatic differences in the QOL scores in the rare patient who required a right pneumonectomy who also received neo-adjuvant therapy compared with the rest of the group?

**Dr Bryant.** In our patient cohort we did not see any differences.

**Dr Chmielewski.** My final question is: Have your surgeons at your institution selecting patients differently for pneumonectomy or, I guess I’d like to ask Cerf, do you plan to manage any of these preoperative or postoperative parameters differently so that we can improve on our patients’ QOL?

**Dr Cerfolio.** This is the one that Cam should be getting up and giving me the business on, not the other one. This paper was really Dr Bryant’s idea, not mine—QOL. I said, you know, QOL, really, I’m a surgeon. But these are great data. And when she collected the data, I was really depressed to see several things: That 40 patients out of 150 are dead at a year. That’s embarrassing, but that’s my own data. They were all R0 resections and they all were N2 negative on mediastinoscopy, endobronchial ultrasound, or frozen at the time of surgery. I think 6 or 7 ended up having N2 positive on final pathology. But I thought I picked the best of the best, and 1 in 3 are dead at a year. That’s not very good.

**Dr Shrager.** Most of them were stage IB, right? That would be better than the published data for stage IB.

**Dr Cerfolio.** Well, I appreciate you saying that, but I’m not happy with the results. And then to find out that the two thirds who are alive aren’t really very happy with their QOL, especially if they’re old. So I have gotten less aggressive. So now it looks like the only way to get an R0 resection is to do a pneumonectomy. I am having a different conversation since Dr Bryant has presented me with this data, to be honest. My initial thing when I wrote the abstract was, oh, pneumonectomy is a disease really is a misnomer; it’s not a disease, but it depends how you define disease, and if you define hypertension and diabetes mellitus and chronic liver disease as a disease, and I guess we should, then a pneumonectomy is a disease, and so I’m wrong. What else new?

**Dr Todd L. Denmy (Buffalo, NY).** The SF-12 is an abbreviated form of the SF-36. The 2 dimensions on these studies that people get a major effect after lung resection tend to be dyspnea and pain. Is the ability to measure those dimensions reduced on the SF-12?

**Dr Bryant.** On the SF-12, the questions that are asked are more about are you able to perform your activities of daily life. Indirectly, it’s asking about their functional status. We actually added a few questions in our survey that address specifically those issues, pain, but we did not find any correlations.

**Dr Demmy.** It’s interesting to study that interaction because with more lung resected there is more muscle use, probably aggravating the chronic pain mechanism. So I think you should look at that. The other data point that tends to categorize the QOL on these surveys is diffusing capacity rather than FEV1. Did you break out your scores based on the DLCO?

**Dr Bryant.** We did. We looked at both FEV1 and DLCO. We did not find a correlation with DLCO. It may be that the patients with the poorest PFT status may have expired within that first year.

**Dr Demmy.** Usually as you approach 40% DLCO, that’s a group that does much worse with QOL. So you should analyze based on those levels of residual diffusing capacity.

**Dr Rafael S. Andrade (Minneapolis, Minn).** I’m very impressed with compliance of 98% in answering the surveys, which I think would be good for a clinical trial. How did you actually do that? In Minnesota, the IRB is very insistent that you can contact patients maybe up to 3 times by letter, but you can’t be hammering them. And some of these patients are 12 years out. They have no reason to come back. How did you get 98% compliance?

**Dr Bryant.** We primarily mailed the surveys and then followed up with a phone call. Our IRB did not make a stipulation of how many times we could contact them. Every patient that Dr Cerfolio has operated on since 1996, we have obtained permission to include their data in his prospective database, and we tell them up front that this may be used for research. I think that’s one of the reasons that the IRB gave us permission and allowed us to waive consent. But it was very aggressive mail-outs and phone calls to get that 98% response.

**Dr Betty C. Tong (Durham, NC).** I have 2 questions. First, how do you think your data might be different or more robust if you had longitudinal data?

**Dr Bryant.** I think it would help with assessing temporal changes.

**Dr Tong.** Second, would you discuss a little bit how you chose the SF-12 as your measure of QOL rather than another validated measure, such as the European Organization for Research and Treatment of Cancer (EORTC) Quality of Life Component 30 with the LC13 module, which is geared specifically toward patients with lung cancer.

**Dr Bryant.** We chose the SF-12 primarily because it’s a shorter version of the survey and we were trading off compliance and patient response. With the longer surveys we found that patients often didn’t respond or the survey was incomplete. With the SF-12, we found that they are more likely to respond and complete the survey.

**Dr Tong.** I think that the EORTC Quality of Life Component 30 with the LC13 module, although longer, would address some of the things that Dr Demmy had highlighted with regard to pain, shortness of breath, and other symptoms.

**Dr Cerfolio.** I would like to add one response to that. We tried that before and failed. Patients in Alabama, and maybe it’s Alabama, but people who come to see me, they’re not going to spend time filling out more forms than they already have to just...
for the hospital and insurance company, and now answering more questions for research stuff. So we did that before and we had a low compliance. This is much higher with the 12 instead of the 36.

Dr David J. Sugarbaker (Boston, Mass). I just wanted to congratulate Dr Cerfolio and the group on a really carefully done study. I think it really highlights that when you say the word pneumonectomy, it means different things to different people, and if you select your patients well and the operation goes well, those patients can live a very happy, relatively normal life. So when you hear people talk about pneumonectomy, or even extrapleural pneumonectomy, it means different things to different people, but I think what these data show is that it can mean good things for our patients. Congratulations.

Dr Gail Darling (Toronto, Ontario, Canada). I would just like to follow along on the previous question about the instrument that was chosen. I congratulate you for addressing QOL in our patients, but I think, as surgeons, we should remember that QOL is not just physical symptoms and debility and that sort of thing. There are many other components to QOL. It’s not just their FEV1 or their pain scores. I think some of the other instruments, the EORTC instrument, the FACT, measure some of these other dimensions of QOL, including things like emotional well-being, social well-being, functional well-being, which are not really captured by the SF-12 or SF-36.

Dr Bryant. Thank you.

Dr Gaetano Rocco (Naples, Italy). I would like to ask a question, Cerf. Could confounding factors in the analysis of the results be the age threshold that you chose of 58 and the fact that more than 10% of these patients were completion pneumonectomies?

Dr Cerfolio. I appreciate you trying to make me feel better. Yes. Some of these were completion pneumonectomies and some of these were destroyed lungs and difficult operations—not just cancer patients—but I have to also look in the mirror and be honest and reflective about the poor reflection that is not very appealing, and say that a 9-out-of-150 operative mortality and then an 11-out-of-150 90-day mortality is not so good, and another 29 died within a year. That’s pretty ugly. I think they were a sick group of patients, I agree, but I think everybody in this room operates on a group of sick patients. How would they have done if they had never meet me is the other question we need more data on.

Dr Mohamed Khereba (Montreal, Quebec, Canada). You compared your QOL with hypertension and patients with renal disease. What kind of renal disease exactly? Is it terminal renal disease or just a patient with a different creatinine? What kind of liver disease? A patient with severely debilitating liver disease or not? If we are comparing pneumonectomy with a patient with just working hypertension who has better control with 1 or 2 medications, it’s not a disease as we would call it.

Dr Bryant. That’s an excellent question and a comment. I think that’s one of the limitations of our study. The definitions of those diseases were not clear. The reason that we used these data to show as comparison data is that it’s really actually one of the few data points that we found that is comparable, and it’s also released by the same company that makes the SF-12. So we felt that it was comparable, but perhaps not the ideal.

Dr Khereba. I would suggest maybe you can compare them with terminal renal disease, with very severe chronic obstructive pulmonary disease, with patients after pneumonectomy with some debilitating disease with a patient who has a very morbid procedure like pneumonectomy.

Dr Joseph B. Shrager (Stanford, Calif). In most studies that have looked at this, the control group is lobectomy patients. I don’t know if you have the data, but you probably really want to compare pneumonectomy patients with lobectomy patients.