Published in final edited form as:

Ann Surg. 2017 January ; 265(1): 97–102. doi:10.1097/SLA.0000000000001645.

Patient-reported Limitations to Surgical Buy-in:

A Qualitative Study of Patients Facing High-risk Surgery

Michael J. Nabozny, MD*, Jacqueline M. Kruser, MD†, Nicole M. Steffens, MPH*, Kristen E. Pecanac, MS, RN‡, Karen J. Brasel, MD, MPH§, Eva H. Chittenden, MD¶, Zara Cooper, MD, MSc ||, Martin F. McKneally, MD, PhD**,††, and Margaret L. Schwarze, MD, MPP*,‡‡

*Department of Surgery, University of Wisconsin, Madison, WI

†Department of Medicine, Northwestern University. Chicago, IL

‡School of Nursing, University of Wisconsin. Madison, WI

§Department of Surgery, Oregon Health & Science University, Portland, OR

¶Department of Medicine, Massachusetts General Hospital. Boston, MA

|| Center for Surgery and Public Health, Department of Surgery, Brigham and Women's Hospital. Boston, MA

**Department of Surgery, University of Toronto, Toronto, Ontario, Canada

††Joint Centre for Bioethics, University of Toronto, Toronto, Ontario, Canada

‡‡Department of Medical History and Bioethics, University of Wisconsin, Madison, WI

Abstract

Objective—To characterize how patients buy-in to treatments beyond the operating room and what limits they would place on additional life-supporting treatments.

Background—During a high-risk operation, surgeons generally assume that patients buy-in to life-supporting interventions that might be necessary postoperatively. How patients understand this agreement and their willingness to participate in additional treatment is unknown.

Methods—We purposively sampled surgeons in Toronto, Ontario, Boston, Massachusetts, and Madison, Wisconsin, who are good communicators and routinely perform high-risk operations. We audio-recorded their conversations with patients considering high-risk surgery. For patients who were then scheduled for surgery, we performed open-ended preoperative and postoperative interviews. We used directed qualitative content analysis to analyze the interviews and surgeon visits, specifically evaluating the content about the use of postoperative life support.

Results—We recorded 43 patients' conversations with surgeons, 34 preoperative, and 27 postoperative interviews. Patients expressed trust in their surgeon to make decisions about additional treatments if a serious complication occurred, yet expressed a preference for significant treatment limitations that were not discussed with their surgeon preoperatively. Patients valued the existence or creation of an advance directive preoperatively, but they did not discuss this directive

with their surgeon. Instead they assumed it would be effective if needed and that family members knew their wishes.

Conclusions—Patients implicitly trust their surgeons to treat postoperative complications as they arise. Although patients may buy-in to some additional postoperative interventions, they hold a broad range of preferences for treatment limitations that were not discussed with the surgeon preoperatively.

Keywords

advance directives; high-risk surgery; intensive care conflict; medical ethics; palliative care; patient communication; surgical buy-in

“... during a big operation surgeons feel that there is a commitment made by both the patient and the surgeon to get through the operation as well as all of the postoperative issues that come up.” “Surgical Buy-in” *Critical Care Medicine*, 2010.

Conflict about postoperative withdrawal of life-supporting treatment between surgeons, intensivists, patients, and their family members is well described.^{1–3} This conflict negatively impacts quality of care^{2,4} and quality of life for survivors.⁵ It also contributes to increased intensive care unit (ICU) length of stay, ICU staff burnout, and clinician shortages.^{6,7} Although the etiology of this conflict is likely multifactorial^{8,9} and rooted in surgeons’ deep notions about error and responsibility,¹⁰ one clear driver of this conflict is surgeons’ tacit understanding that patients who consent to pursue invasive operations have also agreed to additional interventions to ensure survival.¹¹ We call this surgeon-reported phenomenon “Surgical Buy-in.”¹²

Our previous work has explored this topic from the surgeon’s perspective. In a national survey of surgeons who routinely perform high-risk surgery, surgeons universally reported preoperative discussion of serious complications and most reported they discussed patient preferences to limit life-sustaining procedures and the details of patients’ advance directives.¹³ In a subsequent multisite study, we evaluated preoperative conversations about high-risk surgery.¹⁴ We found that surgeons routinely stress high-risk surgery can have grave consequences. Surgeons describe their commitment to the patient, disclose serious risks, and note the regular use of postoperative intensive care. Nonetheless, surgeons do not routinely discuss the use of prolonged life-supporting treatments, advance directives, or how a serious complication might be treated. Although surgeons may believe buy-in has occurred after these conversations, we found no statement from patients that could be used to determine preferences about prolonged life support, their valuation of burdensome treatments, or characterization of unacceptable outcomes.

Our knowledge about surgical buy-in is based on surgeon report and direct observation. How, and whether, patients understand this unspoken agreement and what it implies about their willingness to participate in additional treatment is unknown. The objective of this study is to characterize how patients buy-in to treatments beyond the operating room and what limits they might want on additional postoperative interventions.

METHODS

Setting and Participants

To capture conversations where surgeons were most likely to discuss the use of postoperative life-supporting treatments and attend to patient preferences, we purposively sampled surgeons who routinely perform high-risk operations and were identified by peers as good communicators. We selected surgeons from a range of subspecialties: hepatopancreaticobiliary (1), thoracic (1), vascular (1), neurosurgery (2), and oversampled cardiac surgeons (5) as our previous work suggested cardiac surgeons were more likely to proceed under the assumptions of surgical buy-in.¹⁵

Surgeons at 3 academic medical centers in Madison, Wisconsin (n = 3); Boston, Massachusetts (n = 3); and Toronto, Ontario (n = 4) identified patients considering high-risk surgery before their clinic visit. We approached all patients older than 50 who were identified as coming to discuss high-risk surgery and spoke English fluently. We recorded 1 or 2 preoperative conversations between patients, family members, and their surgeon. When the discussion with the surgeon culminated with a decision to proceed with surgery, we performed an in-person open-ended semistructured interview at the surgical clinic a median of 15 days before surgery. Interview questions included the following domains: understanding of the operation and postoperative care; preferences for decision-making; intensive care and surgical complications; the surgeon-patient relationship; and advance care planning. To specifically query about surgical buy-in, we asked, “Do you and your surgeon have a common understanding about how to take care of you if there is a complication?”

We conducted a second open-ended, semistructured interview, with the patient and any family members present between 1 and 3 months postoperatively, either in person or via telephone. Postoperatively, we asked respondents to “tell the story” of their surgery,¹⁶ probed about the use of additional postoperative treatments, and how preoperative expectations compared with the postoperative experience. To focus our analysis on the patients’ individual experience of surgery, we did not review the patients’ medical record.

Analysis

We used directed qualitative content analysis to analyze written transcripts of the audio-recorded conversation between the patient and surgeon, and the pre and postoperative interviews. This approach allowed us to use our empirically derived model of surgical buy-in for our initial coding scheme and generate original codes for novel concepts and ideas. After we coded the transcripts individually, a team of at least 3 investigators adjudicated each code to establish consensus or examine disagreement. This process promoted higher-level analysis and allowed us to explore the content of the patients’ and family members’ stories about the use of postoperative life support. Data collection proceeded simultaneously with analysis, so we could iteratively revise our interview script to explore important themes and query respondents postoperatively about items they identified preoperatively. We catalogued our coded transcripts using NVivo software (QSR, Melbourne, Australia).

Researchers

To mitigate professional biases, our research team included 1 critical care nurse, 1 public health researcher, and 5 physicians from a range of subspecialties (general surgery, internal medicine, trauma/critical care surgery, palliative care, cardiothoracic surgery, and vascular surgery). The diversity of professional backgrounds allowed us to consider our role-related biases and examine different perspectives throughout analysis.

This study was approved by the institutional review boards at the University of Wisconsin, Partners Health Care System, and The University Health Network in Toronto. Surgeons and patients provided written informed consent.

RESULTS

Patients

We approached 66 eligible patients and 43 enrolled. We recorded the preoperative consultations between all enrolled patients and their surgeon. Nine patients were clearly not surgical candidates. We interviewed the remaining 34 patients preoperatively, and 27 of these patients and/or their family members postoperatively (Fig. 1). Most patients had at least 1 family member present during the conversation with the surgeon and for their interview with our research team. We interviewed family members for 3 patients who were unable to participate in a postoperative interview. Most patients were white and 65% had a high school diploma or less as their terminal degree. Patients were prepared for a wide range of high-risk surgical procedures including major cardiac and vascular procedures, open thoracic and abdominal surgery, and 5 neurosurgical operations (Table 1). Whereas nearly all patients reported pain postoperatively, 22% of the patients suffered a major complication including intraoperative hemorrhage, postoperative death, cardiac arrest, reoperation, and postoperative sepsis. Respondents also described minor complications including prolonged hospitalization, cardiac arrhythmia, and prolonged tube thoracostomy (Table 2).

Common Understanding About Treatment of Complications

With some exceptions, surgeons did not ask patients about advance directives or treatment limitations. Notably, 2 Canadian cardiac surgeons routinely asked patients to discuss their preferences with family in the event of a severe postoperative stroke. Few patients volunteered preferences for treatment limitations or expressed concerns about unacceptable postoperative health states with their surgeon. One patient noted she had a do-not-resuscitate (DNR) order, which the surgeon affirmed. He did not further explore the patient's preferences for management of the DNR order perioperatively. Two patients told their surgeon about their goal to maintain "a decent" life postoperatively. These desires were noted by the surgeon, but not further scrutinized.

Despite modest discussion between patients and surgeons before surgery about goals, preferences, or burdens of treatment, most patients and their family members believed that they and their surgeon shared a common understanding about how to care for the patient in the event of a serious postoperative complication. This belief was based on 2 notions. First, they believed the surgeon shared their values and would do the right thing if a complication

did occur. For example, "...So we're kind of close to the same generation. He may be a bit older than I am. But he knows that we cross-country ski, we bike, so I think whatever complication there would be he would try to fix it, lessen it so that the quality of life could remain close to the same" and "We didn't [discuss it] ...but see, he knows what he's doing. I don't really, whatever, you know, he knows that I don't want to be a vegetable, and he, common sense tells him that." Second, they believed the surgeon had the necessary expertise for treating complications and that such treatment decisions were not personal or preference-sensitive, but rather guided by protocol or other standards. "Doc, look, you are in charge. That's your decision to tell me, not for me to tell you." And "Well I assume that they have experience in these kinds of things so they know what to do."

Acceptance of Additional Postoperative Interventions

Although surgeons did not develop a clear agreement or negotiate with patients about the use of postoperative life-supporting treatments, in interviews with our research team, most patients asserted they would accept some additional interventions. Several patients explicitly noted the surgeon could or should do everything possible to make things better. This wide leeway was based on the patients' faith in the surgeon's capacity and was associated with the desire to survive surgery without consideration of other possibly unacceptable outcomes. Others saw no need to consider the possibility for additional interventions. Although they were clear they had been informed of serious risks they preferred not to ponder them or assumed they would not occur (Table 3).

In contrast, many patients had reflected on the consequences of a bad outcome. These patients saw treatment of serious complications as a collaborative venture between surgeon and patient, whereby the patient would actively decide about additional treatments. Although these patients reported their desire to work through postoperative complications, they also expressed a fatalistic outlook about surgery. They did not desire death, but recognized it might be better than some other outcomes, "if I was to die ... I was happy with that. I mean, I'm not happy with that, but I've had a nice life."

Limitations on Postoperative Life-supporting Treatments

In interviews with our research team before surgery, patients and their family members expressed a broad range of preferences for treatment limitations after surgery. Patients most commonly wanted to avoid a vegetative state, prolonged life support, or a combination of both. Patients who wanted to avoid a vegetative state described this as: "brain dead," "brain damage," "living like a vegetable," "[someone] that has no idea what's going on," "stuck in bed," and "being kept artificially alive." Patients who expressed preferences about limiting life support did not want to "be breathed by a machine" or "[fed] through a tube." They expressed a strong preference for family or physicians to "pull the plug." Respondents believed the need for life-supporting treatments was linked specifically to brain death or a vegetative state, and few conceived life support might be used for failure of other organs without brain death. Patients assumed this unwanted vegetative condition was easily identifiable and decisions about life support held no uncertainty about survival or functional status.

Several patients maintained a desire to withhold resuscitation and described these wishes to us specifically: “cardiopulmonary resuscitation (CPR) I want if it prolongs a decent life. Oh, and then if I reach a point where it is expected that I will not recover, then to cease things” and “Well, in my own mind, the simplest way to put it, if, if my heart was to stop, then start again. If it stops again, start it again. But if it stops a third time, then it doesn’t want to go on anymore, leave it, stop.” Few patients reported treatment limitations attached to unique outcomes. Although these patients were more precise about what was important to them, their goals were highly variable. (Table 4)

Written Advance Directives

Although some patients reported they had a living will with actual directives about treatments, more patients reported designation of a durable power of attorney for health care without specific treatment directives. Only 4 patients told us they had discussed their advance directive with a surgeon preoperatively. These patients had all visited with 1 of the 2 Canadian heart surgeons who routinely asked patients about treatment preferences in the event of neurologic injury.

Patients spoke favorably about the value and need for a health care proxy and/or a living will before their high-risk operation. They fully believed their advance directive would protect their wishes and direct treatment if a serious postoperative complication were to occur. As 1 patient said, “Well, they know exactly what it says in here, what they’re to do and what they’re not to do, and how they’re supposed to do it and when.” Others were confident that family members or others who were designated power of attorney for health care would be able to make the right decision based on previous conversations or their intimate relationship with the proxy. For example, “We’re very close about everything, and I have 100% trust in my brother...”

Many patients did not think it was important or necessary to discuss their advance directive or treatment preferences with their surgeon. They believed that the directive was on file and would be understood and used appropriately by the treating team, “...we believe it’s really not in the hands of the medical teams, it’s their job to carry out our wishes which we have been very specific about.” Some felt that their preferences and wishes were a private issue not to be shared with their surgeon. For example, “No... for me advance directives are kind of family stuff.”

Postoperative Conflict About Life-supporting Treatments

Given most patients have good outcomes and our small sample size, we did not expect to observe conflict about the use of life-supporting treatments in this study. Although 20% of our purposeful sample suffered major complications, nearly all patients spoke positively about the care they received and did not report concerns about treatments. One patient and 1 family member reported conflict about the use of CPR. In the first instance, the patient suffered intraoperative cardiac arrest for which he was successfully resuscitated. Although the patient had told us preoperatively “if I die, I do not want to come back,” and believed he had an active DNR order in place, he arrested in the operating room and received CPR. Postoperatively, he told us that he was “just a little bit mad” about being resuscitated as he

was in chronic pain and viewed death in the operating room as a satisfactory outcome. In the second instance, a patient suffered lethal intraoperative bleeding and was brought to the ICU. His family member was asked if he should have CPR post-operatively. This caused intense decisional conflict, “Should I let him go ahead and do the CPR? ...I didn’t want to put him through that....It’s the hardest decision I’ve ever made.”

DISCUSSION

In preparation for high-risk surgery, surgeons discuss serious risks and the routine use of postoperative intensive care. In turn, patients feel they have a common understanding with their surgeon about the treatment of complications. Although surgeons do not explicitly discuss patient preferences, this tacit understanding seems to stem from the patient’s belief that the surgeon and patient share similar values and that decisions about treatment should be determined by the surgeon’s expertise and are not preference-sensitive. Whereas some patients explicitly buy-in to any necessary additional treatment, others see postoperative decision-making as a collaborative process.

Although some patients asserted permission for additional postoperative interventions during interviews with our research team, they also reported a preference for a wide range of treatment limitations they had not discussed with their surgeon. These limitations targeted health states they considered intolerable from life in a vegetative state to the inability to cross-country ski. Patients valued written advance directives before surgery and believed these documents would protect them postoperatively if they were unable to speak for themselves. Remarkably, patients viewed their advance directive as a private matter to share with family and did not endorse discussing these directives with their surgeon.

Given assumptions made by both surgeons and patients regarding postoperative treatments, it is not surprising that conflict about prolonged life support occurs in the setting of a serious postoperative complication. These findings have important implications for surgeons and patients.

For surgeons, preoperative discussions have significant downstream implications. Although surgeons describe risks, acknowledgment of risk does little to provide insight into the patient’s hopes or fears about surgery. To understand how much patients have bought in, preoperative conversations will need to elicit patients’ goals and values. This is not easy as physicians of all specialties struggle to learn what is important to patients,^{17,18} and the prospect of high-risk surgery is inherently frightening. Lynn and DeGrazia recommend a technique that presents a range of possible outcomes—like stories in a series of books on a shelf¹⁹—including both the best possible outcome and the worst case scenario.^{20,21} This can create a platform for discussion about what matters most to patients without implying that an undesirable outcome is destined to occur. Instead of “What questions do you have?” asking patients “What do you think about all of this?” may prompt patients to provide insight about what is important to them.

Given known barriers to changing physician communication²² and the real challenge of eliciting preferences about life support from patients considering major surgery, at a

minimum, surgeons should not assume that patients have bought in to all possible treatments after surgery. It is difficult to delineate exactly where the limits of buy-in might lie as patients who are likely to need intensive care in the immediate postoperative period will need to consent to some use of ventilatory support and other similar treatments to proceed. However, once an unexpected outcome or serious complication has occurred, patient preferences need to be revisited. The broad range of assertions about life-supporting treatments and quality of life suggests this is a hypervariable phenomenon that requires asking the patient about his/her preferences rather than presuming there is a general trend in preferences with occasional outliers.

For patients, we have concerns about their overreliance on a written advance directive to defend their autonomous wishes in the setting of an unwanted outcome. Patients reported deep faith that the document would protect them in the event of a serious postoperative complication, absent other communication with the surgeon or family members; they did not recognize that advance directives are often vague and inadequate in settings of prognostic uncertainty or for conditions other than a vegetative state.^{23–26} Although patients did not see the need to discuss their written directive with a surgeon, many were happy to discuss this directive with us before surgery and felt it was an appropriate time to verify their documents were in order. We worry that several patients viewed their advance directive as a personal document that would be on file and called to action when needed. This is an ineffective strategy; the use of treatments described in a directive is typically context-dependent and subject to interpretation particularly in the setting of high-risk surgery when patients have clearly expressed a desire to proceed with invasive treatment. Routine inquiry about the perioperative use of an advance directive by the surgeon and/or patient in the presence of family is the only strategy to ensure these directives will be appropriately implemented.

Despite our small sample, we did see conflict about the use of additional life-supporting treatment that was potentially avoidable through preoperative exploration of patient preferences. Although many patients will want to suspend a DNR order perioperatively or note other constraints on their advance directive, their desire to do so should not be assumed.²⁷ It is difficult to know whether surgery was consistent with the goals of the patient who received unwanted CPR, but a more targeted preoperative discussion might have revealed this.

These data raise an important ethical question about the boundaries of informed consent and the patient's right to self-determination. Must patients buy-in to postoperative life-supporting treatment for surgeons to agree to operate? Patients agree to undergo surgery and buy-in to some life-supporting treatment based on what they hope to achieve regarding longevity and/or quality of life. To the degree that these goals are attainable and they are aware of the treatments required to meet these goals, patients will need to buy-in. Given the wide range of outcomes and real potential for a bad outcome, to respect autonomy, surgeons must allow patients to change their mind when their personally identified goals are no longer possible or if subsequent treatments are unexpectedly burdensome, particularly when these treatments require a prolonged ICU stay, long-term placement in a skilled nursing facility, or portend a markedly diminished quality of life.

Limitations

Our qualitative study was not designed to allow inferences about intrinsic patient factors and how these might predict preferences for treatment limitations. Although we saw very consistent patterns of preoperative conversations at all 3 medical centers,²⁸ surgeons may be more or less explicit about postoperative treatments and advance directives in other regions. While we audio-recorded 1 to 2 conversations with the surgeon per patient, discussion of treatment limitations may have occurred outside these conversations. Nonetheless, patients reported they did not discuss these limitations with their surgeon. Our patients expressed a broad range of preferences about postoperative treatment limitations before surgery, the stability of these preferences might have wavered in the setting of an unwanted outcome.²⁹

CONCLUSIONS

During a big operation surgeons and patients presume an unspoken understanding about the treatment of complications. This ambiguous arrangement about the use of additional life-supporting treatments should not be relied on postoperatively. Patients express a wide variety of preferences to limit treatments and avoid unacceptable outcomes that have not been discussed with their surgeon.

Acknowledgments

The authors would like to thank the Qualitative Research Group supported by the Institute for Clinical and Translational Research (ICTR) at the University of Wisconsin and Nora Jacobson, PhD, for assistance with study design and presentation of results.

Disclosures: Dr Schwarze is supported by a training award (KL2TR000428) from the Clinical and Translational Science Award (CTSA) program, through the NIH National Center for Advancing Translational Sciences (NCATS), grant (UL1 TR000427), and the Greenwall Foundation (Greenwall Faculty Scholars Program). These funding sources had no role in the design and conduct of the study; collection, management, analysis, or interpretation of the data; and preparation, review, or approval of the manuscript for publication. No other financial support was declared for the remaining authors.

References

1. Azoulay E, Timsit JF, Sprung CL, et al. Prevalence and factors of intensive care unit conflicts: the conflicus study. *Am J Respir Crit Care Med*. 2009; 180:853–860. [PubMed: 19644049]
2. Danjoux Meth N, Lawless B, Hawryluck L. Conflicts in the ICU: perspectives of administrators and clinicians. *Intensive Care Med*. 2009; 35:2068–2077. [PubMed: 19756499]
3. Larochelle MR, Rodriguez KL, Arnold RM, et al. Hospital staff attributions of the causes of physician variation in end-of-life treatment intensity. *Palliat Med*. 2009; 23:460–470. [PubMed: 19324922]
4. Studdert DM, Mello MM, Burns JP, et al. Conflict in the care of patients with prolonged stay in the ICU: types, sources, and predictors. *Intensive Care Med*. 2003; 29:1489–1497. [PubMed: 12879243]
5. Lemiale V, Kentish-Barnes N, Chaize M, et al. Health-related quality of life in family members of intensive care unit patients. *J Palliat Med*. 2010; 13:1131–1137. [PubMed: 20836638]
6. Embriaco N, Azoulay E, Barrau K, et al. High level of burnout in intensivists: prevalence and associated factors. *Am J Respir Crit Care Med*. 2007; 175:686–692. [PubMed: 17234905]
7. Poncet MC, Toullic P, Papazian L, et al. Burnout syndrome in critical care nursing staff. *Am J Respir Crit Care Med*. 2007; 175:698–704. [PubMed: 17110646]

8. Maxwell BG, Wong JK, Miller DC, et al. Temporal changes in survival after cardiac surgery are associated with the thirty-day mortality benchmark. *Health Serv Res.* 2014; 49:1659–1669. [PubMed: 24713085]
9. Cassell J, Buchman TG, Streat S, et al. Surgeons, intensivists, and the covenant of care: administrative models and values affecting care at the end of life: updated. *Crit Care Med.* 2003; 31:1551–1557. [PubMed: 12771632]
10. Bosk, CL. *Error, Rank and Responsibility.* Chicago: The University of Chicago Press; 1979. p. 36-70.
11. Schwarze ML, Redmann AJ, Brasel KJ, et al. The role of surgeon error in withdrawal of postoperative life support. *Ann Surg.* 2012; 256:10–15. [PubMed: 22584696]
12. Schwarze ML, Bradley CT, Brasel KJ. Surgical “buy-in”: the contractual relationship between surgeons and patients that influences decisions regarding life-supporting therapy. *Crit Care Med.* 2010; 38:843–848. [PubMed: 20048678]
13. Redmann AJ, Brasel KJ, Alexander CG, et al. Use of advance directives for high-risk operations: a national survey of surgeons. *Ann Surg.* 2012; 255:418–423. [PubMed: 22167006]
14. Pecanac KE, Kehler JM, Brasel KJ, et al. It’s big surgery: preoperative expressions of risk, responsibility, and commitment to treatment after high-risk operations. *Ann Surg.* 2014; 259:458–463. [PubMed: 24253139]
15. Schwarze ML, Redmann AJ, Alexander GC, et al. Surgeons expect patients to buy-in to postoperative life support preoperatively: results of a national survey. *Crit Care Med.* 2013; 41:1–8. [PubMed: 2322269]
16. Spradley, JP. *The Ethnographic Interview.* New York: Holt, Rinehart and Winston; 1979.
17. Dunn AS, Shridharani KV, Lou W, et al. Physician-patient discussions of controversial cancer screening tests. *Am J Prev Med.* 2001; 20:130–134. [PubMed: 11165455]
18. Fallowfield L, Jenkins V, Farewell V, et al. Efficacy of a Cancer Research UK communication skills training model for oncologists: a randomised controlled trial. *Lancet.* 2002; 359:650–656. [PubMed: 11879860]
19. Lynn J, DeGrazia D. An outcomes model of medical decision making. *Theor Med.* 1991; 12:325–343. [PubMed: 1801302]
20. Schwarze ML, Kehler JM, Campbell TC. Navigating high risk procedures with more than just a street map. *J Palliat Med.* 2013; 16:1169–1171. [PubMed: 24003993]
21. Kruser JM, Nabozny MJ, Steffens NM, et al. Best case/worst case”: qualitative evaluation of a novel communication tool for difficult in-the-moment surgical decisions. *J Am Geriatr Soc.* 2015; 63:1805–1811. [PubMed: 26280462]
22. Investigators TSP. A controlled trial to improve care for seriously ill hospitalized patients. The study to understand prognoses and preferences for outcomes and risks of treatments (SUPPORT). *JAMA.* 1995; 274:1591–1598. [PubMed: 7474243]
23. Fagerlin A, Schneider CE. Enough. The failure of the living will. *Hastings Cent Rep.* 2004; 34:30–42. [PubMed: 15156835]
24. Perkins HS. Controlling death: the false promise of advance directives. *Ann Intern Med.* 2007; 147:51–57. [PubMed: 17606961]
25. Teno JM, Stevens M, Spornak S, et al. Role of written advance directives in decision making: insights from qualitative and quantitative data. *J Gen Intern Med.* 1998; 13:439–446. [PubMed: 9686709]
26. Hardin SB, Yusufaly YA. Difficult end-of-life treatment decisions: do other factors trump advance directives? *Arch Intern Med.* 2004; 164:1531–1533. [PubMed: 15277284]
27. Statement on advance directives by patients: “do not resuscitate” in the operating room. *Bull Am Coll Surg.* 2014; 99:42–43.
28. Kruser JM, Pecanac KE, Brasel KJ, et al. “And I Think That We Can Fix It”: mental models used in high-risk surgical decision making. *Ann Surg.* 2015; 261:678–684. [PubMed: 25749396]
29. Winter L, Parker B. Current health and preferences for life-prolonging treatments: an application of prospect theory to end-of-life decision making. *Soc Sci Med.* 2007; 65:1695–1707. [PubMed: 17655996]

FIGURE 1.
Patient recruitment and enrollment.

TABLE 1

Participant Characteristics

Patient Characteristics (n = 43)	No. (%)
Male	30 (70)
Age* (y)	
50–59	4 (10)
60–69	15 (36)
70–79	20 (48)
80+	3 (7)
Race	
White	39 (91)
Asian	2 (5)
Other	2 (5)
Education level	
Some high school or less	5 (12)
High school diploma or GED	16 (37)
Vocational degree or some college	8 (16)
College degree	3 (7)
Professional or graduate degree	12 (28)
Operations planned (n = 34)	
Cardiac surgery	18 (53)
Intracranial surgery	5 (15)
Aortic aneurysm repair	4 (12)
Thoracic/esophageal surgery	3 (9)
Abdominal/GI surgery	4 (12)

* One patient's age unknown.

TABLE 2

Patient-reported Complications

Patient-reported Complications	Number (%) (n = 27)	Examples
Major	6 (22%)	Death/cardiac arrest/sepsis/major hemorrhage
Minor	10 (37%)	Prolonged hospitalization/arrhythmia
None	11 (41%)	—

TABLE 3**Patient-asserted Acceptance of Postoperative Treatment**

Assertion	Description	Representative Quotes
All in, unconditional, unlimited	Surgeon has wide leeway to deal with complications after surgery. Surgeon has expertise Patient has blind faith Treatment of complications is not preference sensitive	"No holds barred. You know, if he's got to do something else, cut something else out on this side ... might as well do it." "I have complete confidence in that he would do everything that could possibly be done, could be done at the time would be done."
Unaware: denial or suppression of risk	Patient is apprised of risks but has not considered or contemplated how complications will be treated	"I think anytime you go under anesthesia that there's always going to be a risk... "I realize that there's problems that could happen in anything, but normally they don't."
Desires reconsideration	Patient desires a collaborative process if complications occur Fatalistic Desire to avoid states worse than death	"We usually deal with whatever comes up. ...And nothing is ever perfect and if there is a complication, we will deal with the complication, that's all." "I'm not afraid of death. It's all the other bullshit you go through to getting there."

TABLE 4

Range of Patient-expressed Limitations

Description	Representative Quotes
Least limited	<p>“They just know what they got to do. I don’t want to be laying around being a vegetable.”</p> <p>“Well, if things go bad, I don’t want to be on a feeding tube or a life support deal.”</p> <p>“If I’m on life support systems and that’s what’s keeping me alive, I have told everybody and anybody, if I’m on life support systems, you pull the plug. I don’t want to live like, I’m a person that is a person that goes 24/7. Now I am laying in a bed being breathed by a machine. That is for some people. It’s not for me. I would want the plug pulled.”</p> <p>“CPR I want if it prolongs decent life.”</p> <p>“The only thing I don’t want, if I do die, I don’t want to be revived.”</p> <p>“I don’t want to be put in a nursing home. Just I’ll go there for rehab and all that, but not just to be. And I think a lot of my kids wouldn’t put me there anyway, because that, I don’t expect to be so bad that I have to be in a nursing home.”</p> <p>“If I can’t come back normal, I don’t want to come back.”</p> <p>“So that’s what made me hesitate about having the surgery to begin with because of all the stuff that he was put through. And I thought, no, I don’t know if I want to get a leg cut off.”</p>
Most limited	<p>“No. As long as, if they’re doing what’s said is going to be done with the operation or anything like that, anything further than that, just, no, quit.”</p>