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SURGEONS EXPECT PATIENTS TO BUY-IN TO POSTOPERATIVE LIFE SUPPORT PREOPERATIVELY: RESULTS OF A NATIONAL SURVEY

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Abstract

Objective—Evidence suggests that surgeons implicitly negotiate with their patients preoperatively about the use of life supporting treatments postoperatively as a condition for performing surgery. We sought to examine whether this surgical buy-in behavior is present among a large, nationally representative sample of surgeons who routinely perform high risk operations.

Design—Using findings from a qualitative study, we designed a survey to determine the prevalence of surgical buy-in and its consequences. Respondents were asked to consider their response to a patient at moderate risk for prolonged mechanical ventilation or dialysis who has a preoperative request to limit postoperative life supporting treatment. We used bivariate and multivariate analysis to identify surgeon characteristics associated with a) preoperatively creating an informal contract with the patient defining agreed upon limitations of postoperative life support and b) declining to operate on such patients.

Setting and subjects—US-mail based survey of 2100 cardiothoracic, vascular and neurosurgeons.

Interventions—None.

Measurements and Main Results—The adjusted response rate was 56%. Nearly two-thirds of respondents (62%) reported they would create an informal contract with the patient describing agreed upon limitations of aggressive therapy and a similar number (60%) endorsed sometimes or always refusing to operate on a patient with preferences to limit life support. After adjusting for potentially confounding covariates, the odds of preoperatively contracting about life supporting therapy were more than twofold greater among surgeons who felt it was acceptable to withdraw life support on postoperative day 14 as compared to those who felt it was not acceptable to withdraw life support on postoperative day 14 (odds ratio 2.1, 95% confidence intervals 1.3-3.2).

Conclusions—Many surgeons will report contracting informally with patients preoperatively about the use of postoperative life support. Recognition of this process and its limitations may help to inform postoperative decision making.

Keywords

ethics; decision making; patient autonomy; informed consent; surgical outcomes

Introduction

Withdrawal of postoperative life supporting treatment often precipitates conflict as these complex decisions require accurate prognostication and discussions of end-of-life care with surrogates.[1, 2] To compound this problem, many surgeons are known to deny or delay requests to withdraw life supporting treatments after an operation.[3-5] One investigator has concluded that the surgeon's normative response of "doing everything possible to save the patient" stems from the surgeon's psychological defense against the inevitable poor outcome.[6] Others posit a covenantal bond formed with the patient, "Let me invade your body and I will do everything possible to keep you alive," that prevents the surgeon from respecting the patient's (or surrogate's) desire to withdraw aggressive postoperative care.[3, 4]

We have previously used qualitative methods to examine surgeons' reluctance to withdraw postoperative life support and described an additional contributor to this problem: an implicit contract formed between the surgeon and patient preoperatively that necessitates the patient's participation in aggressive postoperative treatments.[7] We call this preoperative commitment to postoperative life supporting care "surgical buy-in." Surgeons in our study noted that an extensive conversation between surgeons and patients occurs before surgery in which a clear understanding is reached about the potential for significant complications and the use of burdensome treatments postoperatively. Patient participation in postoperative life supporting therapy is seen from the surgeon's perspective as part of a "package deal." Part and parcel with the agreement to proceed with surgery, surgeons describe a practice of negotiating preoperatively with patients who express a desire for limitation of life supporting treatments postoperatively or alternatively declining to operate if preoperative consensus about the use of such treatments cannot be achieved.

Although our previous study has resonated with surgeons and other clinicians[8, 9], this study was qualitative in nature and limited to a small group of physicians practicing in Wisconsin. Here, we sought to examine the attitudes and experiences of a large nationally representative sample of surgeons who routinely perform high risk operations. In addition, we aimed to describe the prevalence of this self-reported behavior in clinical practice.

Methods

Survey Design

To investigate the question, "why do surgeons have such a hard time withdrawing life support on their postoperative patients" we designed a hypothesis generating qualitative study that identified a preoperative process of negotiating an implicit contract between surgeons and patients regarding the use or limitation of life support postoperatively.[7]

To test the generalizability of this finding we posed the following question: "Imagine that one of your patients requires non-emergent surgery and is at moderate risk for long-term postoperative ventilatory support or dialysis. If this patient had a specific request to limit life-sustaining therapy postoperatively such as ventilatory support or dialysis, how often, if ever, would you..."

Multiple non-exclusive options were offered including: decline to operate, negotiate a time period after which life support could be withdrawn, and create an informal contract. We used a four-point Likert scale (never, rarely, sometimes, always) for the response frame. In addition we included survey questions regarding the surgeons' beliefs about the timing of withdrawal of life support postoperatively, surgeon concern about outcomes reporting and demographic questions including the number of high risk operations performed per month, practice setting and administrative model of ICU care at the surgeon's primary hospital.

To insure internal validity of the survey questions, all survey questions were tested in a stepwise iterative process using cognitive interviewing with 10 surgeons who routinely perform high risk operations but do not practice the subspecialties we chose to study (in order to avoid sampling a potential respondent). After each interview, survey questions were modified and re-tested for clarity, ease of use and internal reliability.

Survey Participants

We sent a survey via US mail to 2100 randomly selected surgeons from the regional vascular societies (Midwestern, New England, Eastern and Western societies), the Society of Thoracic Surgeons and the American Association of Neurological Surgeons (AANS) (700 per subspecialty). Each survey contained a laser pointer pen and an addressed and stamped return envelope. Non-responders received a second survey and return envelope. Due to a poor response rate from the neurosurgical group, non-responder addresses were verified via internet search and corrupt addresses were discarded and replaced in a one-to-one fashion with an additional 179 AANS members. This third mailing to neurosurgeons contained a letter from a key neurosurgical opinion leader encouraging participation as well as a laser-pointer pen.

We specifically excluded trauma, transplant and non-thoracic oncology surgeons who might routinely perform high risk operations, because of the emergency nature of trauma surgery, the unique issue of allocation of scarce resources in transplant surgery and heterogeneity within surgical oncology regarding performance of high risk operations (for example: breast and endocrine versus hepatobiliary surgeons). In accordance with other commonly used definitions, we defined "high-risk operation" throughout the survey as an operation with a greater than 1% operative mortality or significant morbidity such as renal failure, major stroke, paralysis or long-term ventilator dependence.[10, 11]

This study was approved by the Institutional Review Boards of the University of Wisconsin and University of Chicago.

Response rate

We used the American Association of Public Reporting (AAPOR) guidelines to calculate the adjusted response rate.[12] To this end a 20% sample of responder and non-responder addresses from each subspecialty group was checked via internet search. The percentage of correct addresses was then used in the following formula to calculate the adjusted response rate: $ARR = (R) / [(R) + e(T-R-NE)]$, where ARR=adjusted response rate, R=eligible respondents, e= the proportion of non-respondents estimated to be ineligible, T=total number of surveys, and NE=ineligible respondents (including return to sender). As a proxy for non-response bias we examined forward response wave trends.[13] To this end we compared the responses of early respondents and late respondents using chi-squared analysis.

Data Analysis

We examined two primary outcomes: the surgeon's propensity to create an informal contract preoperatively about the use of life support postoperatively and the surgeon's decision to decline to operate on a patient with expressed limitations for postoperative life support. We dichotomized the four point response frame into "never and rarely" and "sometimes and always" and found no difference in outcome using either the two point or four point response frames. We then examined the bivariate association between surgeon factors (subspecialty, number of high risk cases performed per month, ICU administrative model), attitudes about the timing of postoperative withdraw of life support and concern about outcomes report with the likelihood of the surgeon creating an informal contract and/or declining to operate. Lastly, we constructed a stepwise multivariate logistic regression model to identify factors independently associated with our outcomes of interest. Our final models included surgeon factors significant at $p = 0.1$ on bivariate analysis as well as surgeon willingness to withdraw life support on postoperative day 7 and 14, and surgeon concern about outcomes reporting. All analyses were conducted using SAS version 9.1 (SAS Institute Inc., Cary, NC).

Results

Respondents

We received 912 completed questionnaires; 203 surveys were returned to sender. The American Association for Public Reporting adjusted response rate was 56% for vascular surgeons [327/ (327+ (0.8 * 326))], 54% for cardiothoracic surgeons and 56% for neurosurgeons. We found no evidence of late response bias when comparing the responses of early survey responders and late responders regarding the study questions.

Respondent characteristics are presented in Table 1. Almost all surgeons (96%) performed at least one high-risk operation each month and more than half of our respondents reported performing over 5 high risk operations per month. Fifty-seven percent of surgeons reported working in an ICU with both closed and open features while fewer worked in strictly open ICUs (32%) and just over one tenth (11%) worked primarily in a closed ICU.

Attitudes about withdrawal of postoperative life support

Surgeons' beliefs about the acceptability of withdrawing life supporting treatment after a non-emergent operation at the patient or surrogate's request if the patient's survival was uncertain and depended on the timing of the request (Table 2). Only 6% of surgeons thought it acceptable to honor this request on postoperative day 1, while at postoperative day 7, surgeons were equally divided. By postoperative day 14, 85% of surgeons thought it was acceptable to withdraw life support and nearly all surgeons thought it was acceptable to withdraw on postoperative day 35.

Preoperative negotiations with patients

For a patient undergoing a high-risk, non-emergent operation who was at moderate risk for long-term ventilator support or dialysis, 60% of respondents would sometimes or always refuse to operate if the patient had a specific request to limit specific life supporting treatments postoperatively. Two-thirds (62%) also endorsed the creation of an informal contract with the patient describing agreed upon limitations of aggressive postoperative treatments, and a small proportion of surgeons (20%) would formally document this contractual agreement. (Table 3) In addition, 50% of respondents felt that the current emphasis on outcomes measures and physician profiling was a somewhat or very challenging aspect of surgical practice (data not shown).

Surgeon characteristics associated with the use of informal contracts

On bivariate analysis, surgeons who believed it was acceptable to withdraw life support on postoperative day 14 were significantly more likely than those who did not feel this was acceptable to create an informal contract with their patients describing agreed upon limitations of life supporting treatments. (64 vs 43%, $p < 0.0001$) (Table 4) On multivariate analysis, we found that surgical subspecialty, the number of high risk operations performed per month and the belief that it is acceptable to withdraw life support on postoperative day 14 were independent predictors of the surgeon's odds of creating an informal contract preoperatively about postoperative limitations of care. For example, for cardiac surgeons the odds of contracting with patients preoperatively were 30% lower (OR = 0.7, 95% CI: 0.5 – 0.9) than vascular surgeons. In addition, for surgeons who perform at least one high risk operation per month the odds of contracting with patients preoperatively about postoperative life support were more than twice as great as their colleagues who do not perform high risk procedures regularly. (OR = 2.7, 95% CI: 1.3 – 5.7). Finally, for surgeons who believe that it is sometimes or always acceptable to withdraw life support on postoperative day 14 the odds of creating an informal contract preoperatively were twice as great (OR: 2.1, 95% CI: 1.3-3.2) as for surgeons who felt it was rarely or never acceptable to withdraw life support on postoperative day 14 upon patient or surrogate request. (Table 4)

Surgeon characteristics associated with declining to operate

On bivariate analysis, cardiothoracic surgeons were significantly more likely than vascular surgeons or neurosurgeons to decline to perform an elective operation on a patient with a preoperative request to limit postoperative life support. (69% vs. 56% vs. 57% respectively, $p = 0.001$) There was also a significant association on bivariate analysis between the belief that it was not acceptable to withdraw life support on postoperative day 7 and on postoperative day 14 and the likelihood of declining to operate on a patient with a preoperatively expressed preference to limit postoperative life support. (Table 5)

In addition, there was a significant association between those surgeons who felt challenged by mandatory outcomes reporting and declining to operate on patients. (65% vs. 56%, $p = 0.007$) While this was true for both cardiothoracic and neurosurgeons, vascular surgeons who expressed concern about outcomes measures were not more likely to decline to operate (52% vs. 59%, $p = 0.23$). Cardiothoracic surgeons who expressed concern about physician profiling were significantly more likely than neurosurgeons who shared this concern to decline to operate (78% vs. 63%, $p = 0.005$). This is distinctly different than our findings about contracting where the odds of cardiothoracic surgeons contracting with patients preoperatively were 30% less than for vascular surgeons.

A strong and statistically significant relationship persisted on multivariate analysis such that for surgeons who were concerned about physician profiling the odds of declining to operate were 40% higher than for surgeons who did not express concerns about physician profiling. (OR: 1.4, 95% CI: 1.1 – 1.9)

Discussion

In this nationally representative survey of surgeons who routinely perform high risk operations, we found that a majority of surgeons will report informally contracting, negotiating or declining to operate on patients with a preoperative request to limit postoperative life supporting treatments that might be necessary for the patient to survive to discharge. Surgeons who feel it is sometimes or always acceptable to withdraw life support within the first two postoperative weeks are significantly more likely to try to accommodate the patient's preferences about prolonged life supporting therapy than those surgeons who

do not believe it is acceptable to withdraw life support within this postoperative time frame. In addition, surgeons who feel that physician profiling is a significant challenge are more likely to decline to perform an operation than their colleagues who are less concerned about outcome measures reporting.

These findings are important because they impact the surgeon's decision making about the use of life supporting treatments postoperatively which may strain relationships between intensivists and surgeons[2-4, 14] as this preoperative conversation is unknown to the critical care team. Although certainty about patient preferences is frequently elusive, an awareness of this preoperative negotiation can be used to inform postoperative decision making provided that these preferences, preoperatively expressed to the surgeon, accurately represent the patient's forecasted desires. Given the significance of these conversations, there are some important implications regarding this practice for surgeons, patients and intensivists.

For surgeons who perform high risk operations, it may appear contradictory that a patient would consent to one burdensome treatment – surgery – and would not feel equally tolerant of subsequent burdensome interventions – such as prolonged mechanical ventilation or dialysis – necessary to achieve the initial goals of surgery.[15] Thus, surgeons may use the preoperative negotiation as a barometer of the patient's understanding about the significance of the operation and willingness to proceed with aggressive care.[16] However, even patients willing to participate in major operations in order to achieve specific goals may be unwilling to tolerate the burdens of prolonged life support when the goals of surgery are no longer possible due to surgical complications or when the burdens (and/or duration) of treatment are unexpectedly high. Furthermore, an informal contract may not genuinely represent the patient's preferences as the patient may have agreed to aggressive treatments without limitation in order to convince the surgeon to perform an operation that he or she desires. As such, surgeons who use the patient's preoperatively stated preferences to inform their postoperative decision making should fully explore the patient's goals and values[17] rather than simply accept their patient's acquiescence to tolerate life supporting treatments for a certain time period.

For patients, reaching an accommodation preoperatively with their surgeon about postoperative treatments may be critical. Although we currently have no information about the patient's understanding or role in this process, we suspect this contract is not explicitly obvious to patients given the emotionally charged nature of preoperative conversation.[18] This may pose a considerable obstacle for a patient for whom the goals of surgery are realistic but who has strong feelings about treatment limitations. For example, a patient who has a true preference for maintaining a perioperative DNR order for cardiac surgery is unlikely to be aware that the success of CPR (and cardioversion) in the immediate postoperative period is distinctly different than the use of CPR for a dying patient given the hemodynamic-fluctuations that are so common after heart surgery. Instead of negotiating about procedures and treatments, a process that may lead to an impasse with respect to surgery,[19] we propose initiation of a conversation about the patient's goals (less chest pain and shortness of breath) and fears (disabling stroke and loss of independence) in order to create an appropriate care plan that accurately represents the patient's desire for treatment and conditions under which limitations of life support would be acceptable. In addition, we believe that forging an understanding of these values in conjunction with the patient's designated surrogate decision maker and documenting these discussions in the patient's record would improve this process.

For intensivists, understanding, acknowledging and referencing this preoperative agreement may help to guide postoperative decision making in the ICU. Although the preoperative

agreement may not truly reflect the patient's preferences or the patient may have changed his/her mind after surgery, the patient was clearly, at one point, willing to go to great lengths (high-risk surgery) to achieve a specific goal. Subsequent decision making would benefit from inclusion of this perspective.

Whether surgical buy-in is ethically justified is an important question. On the one hand, a significant outlay of resources is invested during a high-risk operation for which it seems unreasonable to cease expected and short-term postoperative life support. In addition, surgeons have a strong aversion to being an "agent of death" [6, 7] and struggle with boundary issues linking their performance to the patient's outcome (irrespective of public reporting), [3, 9, 20] particularly when their hands are tied with restrictions on life supporting treatments. However, given the problem of affective forecasting (where patients are unable to predict the value of a future health state [21]) and the immense burden of unwanted prolonged life supporting treatment, a contractual stance is overly paternalistic. Furthermore, given that the surgeon decides whether to operate, the patient is uniquely vulnerable to the surgeon's demands. Respect for patient autonomy requires both offering an operation that has a reasonable chance of achieving the patient's goals and allowing patients to change their mind about the use of life support postoperatively if the goals are no longer possible or the burdens of treatment are, from the patient's perspective, intolerable.

In our previous analysis, surgeons did not implicate physician profiling as a factor in their decision making regarding withdraw of postoperative life supporting treatments for a hypothetical patient [5]. As such, we were surprised to find an association between surgeon concern about outcomes profiling and declining to operate. Recent efforts to improve quality through outcomes reporting have likely prevented some patients who have expressed preferences for limiting postoperative life support from having an operation they desire. We have clearly shown that cardiothoracic surgeons, who have been exposed to public reporting of outcomes for many years, [22] are significantly more likely to decline to operate on patients with a preoperative restriction on postoperative life support than vascular or neurosurgeons. Although the value of improved quality in surgery that may come with public reporting cannot be understated, this is an unfortunate side effect. More widespread use of palliative care codes in surgery may help to alleviate this problem, as their use in non-surgical arenas can dramatically change the inferences made from "poor grades" on process measures or quality indicators. [23] Our study has several limitations. We designed this study to test the generalizability of our initial findings about the self-reported practices of surgeons. As such the meaning of an informal contract was left up to the interpretation of the respondent and we have no additional information about whether patients recognize or actually participate in an agreement that surgeons have described originally in our qualitative study as an "informal contract." Thus, the contractual stance we discuss is a self-reported description of the surgeon's perceptions about the interaction and the patient's role in this process is ripe for future study.

Like all surveys ours is limited by non-response bias whereby non-responders may be different than those who answered the survey. Although we did not see any evidence of forward-wave response bias, a proxy for non-response bias, we cannot rule out that those who did not respond were significantly different. In addition, we examined only surgeons from the fields of cardiothoracic, vascular and neurosurgery as we wanted to insure that our respondents routinely perform high-risk operations. We suspect other surgical subspecialties likely have different practices with regards to buy-in. For example, the need for buy-in may be much higher in transplant surgery given the issue of scarce resources and potentially lower for hepatobiliary surgeons who may operate more frequently on patients with terminal disease.

Conclusions

Surgeons report frequently negotiating with or declining to operate on patients who are unwilling to tolerate aggressive care beyond treatment provided in the operating room. Recognition of and reference to this preoperative negotiation may help to inform postoperative decision making if this practice can be improved to accurately represent the patient's stated preferences. Currently, a healthy skepticism about surgical buy-in as a condition to proceed with surgery is warranted. In the future, interventions designed to enhance preoperative communication between surgeons and patients may increase the value of these conversations in order to fully respect patients' postoperative values and goals.

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Table 1

Survey Respondents (N=912)

	No. (%)
Male gender	850 (94)
Specialty	
Vascular	327 (36)
Neurological	273 (30)
Cardiothoracic	312 (34)
Practice setting	
Private practice	376 (42)
Academic practice	328 (37)
Private practice with academic affiliation	182 (20)
Other	8 (1)
Years in practice	
<10	187 (22)
11-20	208 (25)
21-30	229 (27)
>30	216 (26)
Number of high risk operations performed each month	
0	34 (4)
1 – 5	311 (34)
6 – 10	256 (31)
11+	238 (29)
Model of ICU Care	
Closed	96 (11)
Open	277 (32)
Mixed	500 (57)
Other	4 (0.5)

Table 2

Surgeons' attitudes about the timing of withdraw of postoperative life supporting treatment

If your patient or his surrogate requested withdrawal of life supporting therapy <i>after</i> a high risk, non-emergent operation would you consider it acceptable to withdraw at ...	Sometimes or Always (%)
Postoperative Day #1	6
Postoperative Day #7	50
Postoperative Day #14	85
Postoperative Day # 35	95

Table 3

Surgeons' response to a patient's request to limit postoperative life supporting treatment for non-emergent surgery

<i>Preoperatively, for a patient at moderate risk for long-term ventilatory support or dialysis and a specific request to limit postoperative life supporting therapy, how often would you...</i>	Sometimes or Always (%)
Decline to operate	60
Negotiate a time period after which life supporting therapy could be discontinued	72
Tell the patient you could not honor the request	27
Create an informal contract with the patient describing agreed upon limitations in care	62
Create a formal contract	20

Table 4

Factors associated with creating an informal contract with the patient describing agreed upon limitations of life supporting care

Characteristic	N	Would create an informal contract with the patient describing agreed upon limitations of LST (%)	Bivariate P-value	OR (95% CI)
Subspecialty				
Vascular	322	65	0.06	Ref
Cardiothoracic	306	57		0.7 (0.5 – 0.9) *
Neurosurgery	266	62		0.8 (0.6 – 1.3)
Number of High Risk Operations performed/Month				
0	33	42	0.09	Ref
1 – 5	305	64		2.7 (1.3 – 5.7) *
6 – 10	250	61		2.4 (1.1 – 5.2) *
11+	236	63		2.8 (1.3 – 6.0) *
Believe it is acceptable to withdraw LST POD #7				
Never, rarely	444	57	0.01	Ref
Sometimes, always	444	65		1.0 (0.8 – 1.5)
Believe it is acceptable to withdraw LST POD #14				
Never, rarely	127	43	<0.0001	Ref
Sometimes, always	760	64		2.1 (1.3 – 3.2) *
Concern about outcomes profiling				
Not at all/a little concerned	441	61	0.6	Not in model
Somewhat/very concerned	442	62		P>0.1

* denotes significance $p < 0.05$

Table 5

Factors associated with declining to operate on a patient with a request to limit postoperative life support

Characteristic	N	Would decline to operate (%)	Bivariate P-value	OR (95% CI)
Subspecialty				
Vascular	322	56	0.001	Ref
Cardiothoracic	306	69		1.4 (1.0 - 2.0)
Neurosurgery	266	57		1.0 (0.7 - 1.4)
Number of high-risk operations performed/month				
0	33	64	0.81	Not in model P>0.1
1 - 5	307	62		
6 - 10	252	58		
11+	234	62		
Practice Setting				
Private Practice	337	66	0.02	Ref
Academic Practice	317	55		0.7 (0.5 - 1.0)
Private with Academic Affiliation	161	57		0.8 (0.5 - 1.1)
Other	61	66		1.0 (0.5 - 1.7)
Model of ICU Care				
Closed	95	47	0.0007	Ref
Open	269	66		1.6 (1.0 - 2.7)
Mixed	494	59		1.4 (0.9 - 2.2)
Believe it is acceptable to withdraw LST POD #7				
Never, rarely	444	64	0.02	Ref
Sometimes, always	444	56		0.9 (0.6 - 1.2)
Believe it is acceptable to withdraw LST POD #14				
Never, rarely	127	71	0.05	Ref
Sometimes, always	760	59		0.6 (0.4 - 1.0)
Concern about outcomes profiling				
Not at all/a little concerned	443	56	0.007	Ref
Somewhat/very concerned	442	65		1.4 (1.1 - 1.9)*

* denotes significance p<0.05