

BRIEF REPORT

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Crucial Conversations for High-Risk Populations before Surgery: Advance Care Planning in a Preoperative Setting

Roma Patel, MD, MPH,^{1,*} Alexia Torke, MD, MS,²⁻⁶ Barb Nation, RN, CHPN,^{1,2} Ann Cottingham, MAR, MA,^{1,6-8} Jennifer Hur, MD,¹ Rachel Gruber, MS,^{7,8} and Shilpee Sinha, MD, FACP^{1,2,7}

Abstract

Background: High-risk patients undergoing elective surgery are at risk for perioperative complications, including readmissions and death. Advance care planning (ACP) may allow for preparation for such events.

Objectives: (1) To assess the completion rate of advance directives (ADs) and their association with one year readmissions and mortality (2) to examine clinical events for decedents.

Design: This is an observational cohort study conducted through chart review.

Setting/Subjects: Subjects were 400 patients undergoing preoperative evaluation for elective surgery at two hospitals in the United States.

Measurements: The prevalence of ADs at the time of surgery and at one year, readmissions, and mortality at one year were determined.

Results: Three-hundred ninety patients were included. In total, 102 (26.4%) patients were readmitted, yet did not complete an AD. Seventeen (4.4%) patients filed an AD during follow-up. Nineteen patients died and mortality rate was 4.9%. There was a significant association between completing an AD before death. Of the decedents, seven (37%) underwent resuscitation, but only four had ADs.

Conclusions: Many high-risk surgical patients would benefit from ADs before clinical decline. Preoperative clinics present a missed opportunity to ensure ACP occurs before complications arise.

Keywords: advance care planning; mortality; preoperative clinic; readmissions

Introduction

Chronic disease and frailty account for diminished cognitive and functional measures and are associated with high surgical risk and postoperative outcomes.¹⁻⁵ High-risk patients who undergo elective surgery have an increased likelihood of life-

threatening complications.⁶⁻⁹ In the perioperative period, patients often lack decision-making capacity, highlighting the importance of upstream advance care planning (ACP).^{10,11} ACP improves concordance between patient's wishes and medical interventions.^{12,13}

¹Indiana University School of Medicine, Indianapolis, Indiana, USA.

²IU Health Physicians, Indianapolis, Indiana, USA.

³Indiana University Center for Aging Research, Regenstrief Institute, Inc., Indianapolis, Indiana, USA.

⁴Division of General Internal Medicine and Geriatrics, School of Medicine, Indiana University, Indianapolis, Indiana, USA.

⁵Fairbanks Center for Medical Ethics, IU Health, Indianapolis, Indiana, USA.

⁶Daniel F. Evans Center for Spiritual and Religious Values in Healthcare, IU Health, Indianapolis, Indiana, USA.

⁷Advanced Scholars Program for Internists in Research and Education (ASPIRE) Indiana University (IU) School of Medicine, Indianapolis, Indiana, USA.

⁸Indiana University Center for Health Services and Outcomes Research, Regenstrief Institute, Inc., Indianapolis, Indiana, USA.

[†]ORCID ID (<https://orcid.org/0000-0001-7586-4303>).

*Address correspondence to: Roma Patel, MD, MPH, Indiana University School of Medicine, 1633 N Capitol Avenue, Suite 301, Indianapolis, IN 46202, USA; E-mail: rpatel21@iuhealth.org



There is emerging support for ACP in high-risk surgery patients,^{10,14} but the ideal timing of ACP discussions is not well defined.¹⁵⁻¹⁷ Counseling and documentation of advanced directives (ADs) are not standard in preoperative clinics, though research has demonstrated its feasibility.¹⁸ Studies have shown completion of ADs is associated with lower readmission rates^{19,20} and decreased ICU utilization.²¹ This has implications for patients and health systems.²²⁻²⁵

We have previously published a retrospective chart review of patients seen in a preoperative clinic to identify the prevalence of ADs.²⁶ In the present analysis, we followed these patients for one year. The primary objective was to assess the completion of ADs before surgery or in follow-up and association with readmissions or death at one year. The secondary objective was to examine the completion of ADs in decedents who required cardiopulmonary resuscitation and reintubation (defined as resuscitation).

Methods

This study was an observational chart review cohort study conducted at two large urban academic hospitals. They are tertiary referral centers for the state's largest health care organization that totals 18 hospitals, >110,00 admissions per year, and >2500 beds. Four hundred consecutive patients between February and March 2017 referred for preoperative evaluation for elective surgery at two preadmission testing (PAT) clinics were identified. Patients are referred by their surgeons for risk assessment and optimization by internal medicine hospitalists who staff the PAT clinics. This study was approved by the Indiana University Institutional Review Board, which serves the entire organization.

Demographics and comorbidities were obtained from the preoperative evaluation. The electronic medical record (EMR) was reviewed at one year from the PAT clinic appointment for the presence of ADs, mortality, and readmissions. Patients were coded as having an AD if their EMR had a legal document naming an SDM (surrogate decision maker, including health care representative, health care power of attorney), and/or a living will, physicians order for scope of treatment or out of hospital do not resuscitate. Statistical methods included descriptive statistics of patient characteristics, and chi-square and Fisher's exact tests for comparison between groups.

Results

A total of 400 charts were reviewed. At one year, 10 patients did not undergo surgery, leaving 390 records.

The average age of patients was 58.4 years (standard deviation 14.6) and 187 (48%) were male. The cohort was predominantly white (85%). A previously published article discusses the preoperative risk, functional status, and comorbidities of this cohort.²⁶ In brief, 87% of patients had an elevated perioperative risk of surgery, the mean revised Charlson comorbidity index was 1.9 (standard deviation 2.2), and 21% of patients had a functional capacity described as "borderline" or "poor." Thirty percent of patients had cancer.

Only 63 (16.2%) patients had an AD in the EMR before surgery.²⁶ Seventeen (4.4%) patients filed an AD during the follow-up period, 2 of whom had an AD on file at the time of surgery. There was no association between completion of AD with age, gender, or race ($p > 0.05$). One-hundred nineteen patients had cancer (Table 1). There was no statistically significant difference in survival or AD completion between those who had metastatic and nonmetastatic cancer. Of the seven patients who underwent palliative surgery, one had an AD before surgery and one completed an AD during follow-up.

In total, 102 (26.4%) patients were readmitted at least once and no association was found between AD completion and readmission ($p = 0.42$). About one-third of the readmissions were patients with cancer. An additional 40 (10.3%) patients returned to the emergency department but were not admitted.

Three patients died during the index hospitalization and 16 patients died during follow-up, for a total mortality rate of 4.9% (Table 2). Fourteen of the decedents had cancer. Four of them had metastatic cancer, none of whom had an AD on file before surgery. Twelve of the 19 (63%) decedents had an AD on file (Fig. 1), with 3 of them (16%) had an AD on file before surgery. Of the nine decedents who completed an AD during follow-up, two completed a living will, four completed an SDM document, and three completed both. Nine decedents completed an AD during follow-up (47%),

Table 1. Characteristics of Patients with Cancer

Variable	Overall cohort, N = 390, N (%)	Nonmetastatic/unknown cancer, N = 93, N (%)	Metastatic cancer, N = 26, N (%)
AD on file before surgery	63 (16)	16 (17)	3 (14)
AD completed during follow-up	17 (4)	0 (0)	1 (5)
Palliative surgery	N/A	0 (0)	7 (27)
Survivors	371 (95)	82 (88)	22 (85)

ADs, advance directives.



Table 2. Characteristics and Outcomes of Survivors and Decedents

Variable	Survivors, N=371, N (%)	Decedents, N=19, N (%)
Gender		
Female	194 (52)	9 (47)
Surgery		
Cancer	102 (28)	14 (74)
Dental	16 (4)	2 (11)
General surgery	46 (12)	0 (0)
Ear, nose, and throat	34 (9)	0 (0)
Gynecology	11 (3)	0 (0)
Neurosurgery	61 (16)	0 (0)
Orthopedic	53 (14)	1 (5)
Urology	12 (3)	0 (0)
Other	36 (10)	2 (11)
Died during initial/surgical hospitalization	N/A	3 (16)
Died in the hospital	N/A	8 (42)
Resuscitation (CPR or intubation)	3 (1)	7 (37)
Died during code	N/A	2 (29)

compared with eight survivors (2%). Those with mortality had a strong correlation with AD completion (18% of survivors vs. 63% of decedents, $p < 0.001$).

Regarding our secondary objective, 10 patients (2.5%) underwent resuscitation during the follow-up period, 3 of whom survived. Of the surviving patients, one suffered a stroke and required reintubation, another required reintubation due to respiratory distress and ultimately required a tracheostomy; neither of these had an AD on file. The third patient required reintubation and vasopressors but had a living will on file and was able to express desire for reintubation to the medical team. Of the 19 patients who died, 7 (37%) underwent resuscitation—3 of whom were intubated and 4

of whom experienced cardiopulmonary arrest. The five patients had return of spontaneous circulation but were ultimately transitioned to comfort measures. Only four of the decedents who underwent resuscitation had an AD on file (two had an SDM and two had a living will). Both of the living wills stated generic language regarding their desire to die naturally without artificial prolongation of life if they were thought to have a terminal condition.

Discussion

Similar to prior studies, a low proportion of our patients had an AD on file.^{27,28} Patients with metastatic cancer did not differ in their rate of AD completion. There was a low rate of palliative surgery, likely due to selection bias of patients sent to the PAT clinic. This may be due to an understanding that these patients may not be able to be medically optimized, and the risks of surgical intervention outweigh the benefits. Over a quarter of the patients were readmitted during follow-up, which is a large proportion, though in line with prior studies.²⁹ In contrast to prior studies, our data did not find an association between having an AD on file and reduced likelihood of readmission.^{19,20} Readmissions still highlight a missed opportunity as this cohort has more contacts with the health system and are potentially sicker.

Our one-year mortality rate was <5%. In-hospital and/or six-month mortality rates of patients undergoing elective surgeries were between <1% and 3%.^{1,2,30} Although there was a statistically significant relationship between death and completing a prior AD, some were in response to the patient’s imminently declining

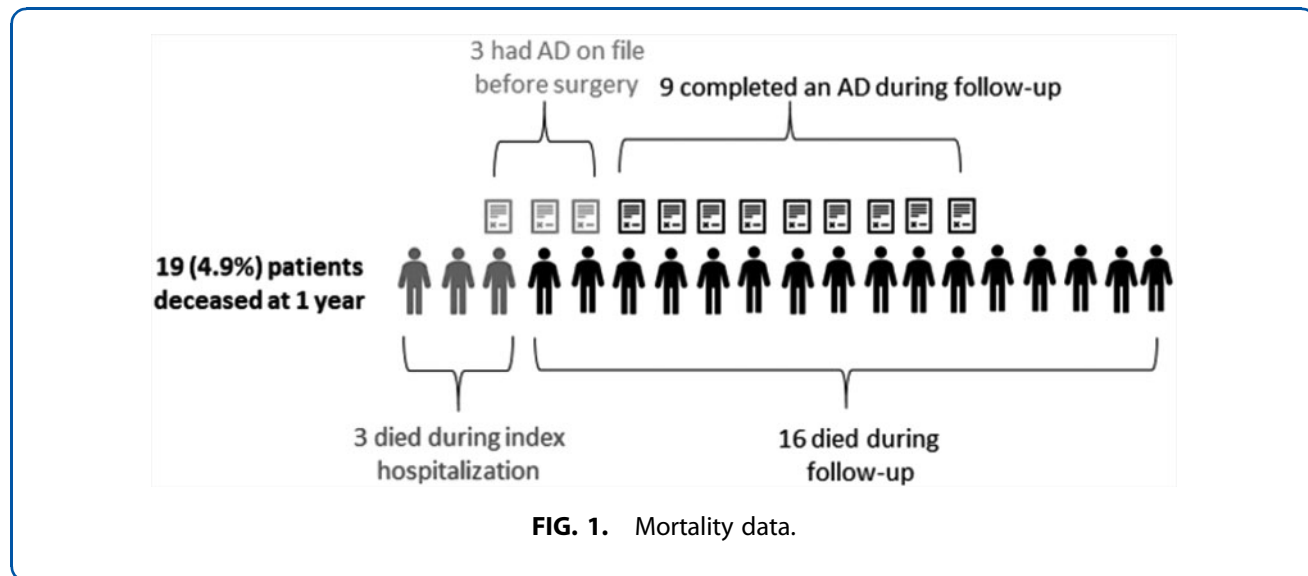


FIG. 1. Mortality data.



condition, emphasized by 47% of decedents completing an AD compared with 2% of survivors. Similar AD completion during clinical decline was seen in a prior study.²⁷

Although the ideal time to complete ADs is poorly defined, early engagement in ACP discussions is desired and recommended.^{31–33} There are various barriers including time constraints, patient and disease characteristics, concern about receptivity, provider comfort and skill, disease trajectory, and prognostic uncertainty.^{15–17,34} Change in patient's clinical condition, hospital admission, and surgery have been identified as possible key trigger points for ACP discussion.^{10,14,16,17,34} Although it may be appropriate for patients to complete ADs as they become seriously ill, these findings suggest a missed opportunity for identifying higher risk patients early in the trajectory and facilitate goals-of-care conversations and complete ADs in advance. The preoperative clinic setting provides one touch point with the health care system with a cohort of identifiable high-risk patients and a potential target to initiate ACP discussions to reduce the proportion of patients who die or undergo resuscitation without prior ACP.

There are several limitations to this study. It was conducted within one health system and tertiary care hospitals, which may attract a higher risk surgical population. Observational data were collected over only one year. In addition, there is likely a selection bias among the patients as those who were sent to the PAT for evaluation as this was based on the surgeon's discretion. Moreover, this study did not examine the contents of the ACP documents nor discussions regarding goals of care to assess for concordance of readmissions and/or resuscitation with patient's wishes.

Conclusion

One year follow-up of a high-risk surgical population found more decedents completed an AD compared with survivors, but the overall number of decedents who had completed an AD was still low and done late in the trajectory of illness. This highlights an opportunity for earlier timed ACP discussions. Our finding that postoperative resuscitation efforts were usually performed when there was no AD further supports the need for more studies aimed at optimal timing for ACP discussions, AD completion, and opportunities preoperative clinics provide for high-risk patients undergoing surgical interventions for ACP discussions earlier in their clinical trajectory.

Authors' Contributions

A.T. and S.S. designed the project; B.N., A.C., R.G., S.S., and R.P. performed acquisition and analysis; R.P., A.T., J.R., and S.S. interpreted the data; R.P. drafted the article; and all authors contributed to substantially revising the article.

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Abbreviations Used

ACP = advance care planning
ADs = advance directives
EMR = electronic medical record
PAT = preadmission testing
SDM = surrogate decision maker

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