Advance Care Planning in A Preoperative Clinic: A Retrospective Chart Review

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INTRODUCTION

Patients seen in preoperative testing clinics are at an increased risk of surgical complications and most are incapacitated for during anesthesia. Advance directives (ADs) are important to guide care in the event of emergencies when patients are unable to speak for themselves. The goal of this study was to determine the frequency with which ADs are completed for patients seen in preoperative clinics prior to elective surgery and identify demographic and clinical characteristics associated with having ADs available in the electronic medical record (EMR).

METHODS

Study Design

A retrospective EMR chart review was conducted on 400 consecutive patients who underwent a preoperative evaluation in a preoperative clinic from February 1 through early March 2017 at two high-volume hospitals in a midwestern urban academic tertiary referral center.

Data Collection

All raters first completed chart reviews of the same 30 patients to calculate interrater reliability.

We collected demographic variables, elevated perioperative risk of surgery,[1] Revised Cardiac Risk Index (RCRI) > 1%,[2] and presence of revised Charleston comorbid conditions.[3] Functional capacity was reported in the EMR as either metabolic equivalents (METS) scale (1 through 4) or as "good," "borderline," or "poor." We dichotomized patients' functional capacity as "good" or 4 METS versus and "other" or 1–3 METS.

Reviewers assessed the presence of AD documents scanned into the EMR, including an SDM, a living will, or either (any AD). The study was approved by the Indiana University Institutional Review Board.

Statistical Analysis

Patient characteristics were compared based upon the presence of having either type of AD documents in the EMR using two sample *t* tests for the continuous variables and Fisher's exact tests for the categorical variables. All preoperative patient clinical and demographic variables significant in the univariate model at the alpha = 0.15 level were included in multiple logistic regression modeling of the AD outcome. Both stepwise and backward methods were used to identify a final parsimonious model with all variables significant at the alpha = 0.05 level.

RESULTS

Interrater reliability for the Charlson[3] score showed interclass correlations from 0.76–0.97. The range for Cohen's kappa coefficients on categorical data ranged from 0.37 to 1, and percentage agreement ranged from 67 to 100% for pairwise comparisons.

We found 64 (16.0%) of patients had evidence of either AD scanned into the EMR, 43 (10.8%) had an SDM, and 46 (11.5%) had a living will. In a bivariate analysis, age 54.7 vs. 31.3%, $p = 0.0005$) and higher functional status (17.7 vs. 7.0%, $p = 0.0118$) were associated with the presence of any AD. There were no differences between those with and without ADs with complications or death (Table 1).

Multiple logistic regression examining preoperative characteristics associated with any AD found patients age 65 and older (odds ratio (OR), 2.85; 95% confidence interval (CI),

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Table 1 Comparison of Patient Characteristics and Hospital Events by Presence of any Advance Directive (Surrogate Decision Maker or Living Will) in the Electronic Medical Record

		Advance directive in EMR		
	Total	Yes	No	*p* value
	N = 400	*N* = 64 (16.0%)	*N* = 336 (84.0%)	
Preoperative patient characteristics				
Age ≥ 65, *n* (%)	140 (35.0)	35 (54.7)	105 (31.3)	0.0005
Sex, male *n* (%)	193 (48.3)	24 (37.5)	169 (50.3)	0.0756
Race, white vs. non-white, *n* (%)	339 (84.8)	56 (87.5)	283 (84.2)	0.5744
Hospital 1 vs. hospital 2, *n* (%)	199 (49.8)	36 (56.3)	163 (48.5)	0.2772
Insurance: Medicaid, *n* (%)	46 (11.5)	7 (10.9)	39 (11.6)	1.0000
Perioperative risk of surgery elevated, *n* (%)	347 (86.8)	57 (89.1)	290 (86.3)	0.6886
Revised cardiac risk index > 1%, *n* (%)	158 (39.5)	28 (43.8)	130 (38.7)	0.4865
Reason for surgery: cancer, *n* (%)	122 (30.5)	20 (31.3)	102 (30.4)	0.8831
Revised Charlson comorbidity index, mean (SD)	1.9 (2.2)	1.9 (2.1)	1.9 (2.3)	0.9629
Myocardial infarction, *n* (%)	25 (6.3)	1 (1.6)	24 (7.1)	0.1527
Congestive heart failure, *n* (%)	22 (5.5)	8 (12.5)	14 (4.2)	0.0139
Peripheral vascular disease, *n* (%)	18 (4.5)	0 (0.0)	18 (5.4)	0.0911
Cerebrovascular disease, *n* (%)	33 (8.3)	4 (6.3)	29 (8.6)	0.6285
Dementia, *n* (%)	4 (1.0)	0 (0.0)	4 (1.2)	1.0000
Chronic pulmonary disease, *n* (%)	60 (15.0)	11 (17.2)	49 (14.6)	0.5702
Rheumatologic disease, *n* (%)	13 (3.3)	4 (6.3)	9 (2.7)	0.1380
Peptic ulcer disease, *n* (%)	0 (0.0)	0 (0.0)	0 (0.0)	N/A
Mild liver disease, *n* (%)	10 (2.5)	0 (0.0)	10 (3.0)	0.3756
Diabetes without chronic complications, *n* (%)	57 (14.3)	4 (6.3)	53 (15.8)	0.0505
Diabetes with chronic complications, *n* (%)	37 (9.3)	6 (9.4)	31 (9.2)	1.0000
Hemiplegia or paraplegia, *n* (%)	9 (2.3)	2 (3.1)	7 (2.1)	0.6407
Renal disease, *n* (%)	44 (11.0)	7 (10.9)	37 (11.0)	1.0000
Any malignancy, *n* (%)	129 (32.3)	22 (34.4)	107 (31.9)	0.7706
Moderate or severe liver disease, *n* (%)	16 (4.0)	1 (1.6)	15 (4.5)	0.4859
Metastatic solid tumor, *n* (%)	28 (7.0)	3 (4.7)	25 (7.4)	0.5954
AIDS/HIV, *n* (%)	6 (1.5)	2 (3.1)	4 (1.2)	0.2466
Functional capacity, *n* (%) good	184 (46.0)	11 (17.7)	23 (7.0)	0.0118
Hospital events				
PC consult, *n* (%)	7 (1.8)	3 (4.7)	4 (1.2)	0.0849
Underwent planned surgery, *n* (%)	386 (96.5)	62 (96.9)	324 (96.4)	1.0000
Length of surgery, mean (SD)*	2.9 (2.1)	2.7 (1.7)	2.9 (2.2)	0.2396
ICU stay, *n* (%)†	56 (14.1)	13 (20.3)	43 (12.9)	0.1199
Postop complications				
Yes vs. none	54 (13.6)	12 (18.8)	42 (12.6)	0.2303
Death, *n* (%)	3 (0.8)	1 (1.6)	2 (0.6)	0.4081
Length of stay, mean (SD)‡	4.3 (5.8)	4.5 (3.9)	4.3 (6.2)	0.7445
Location of discharge, *n* (%)				0.0002
Home	342 (87.69)	44 (71.0)	298 (90.9)	
Rehab	41 (10.5)	16 (25.8)	25 (7.6)	
Other	7 (1.8)	2 (3.2)	5 (1.5)	
Functional status on discharge, ambulatory *n* (%)	356 (91.3)	51 (82.3)	305 (93.0)	0.0118

**Length of surgery was calculated in hours from anesthesia records*
†Patients who required any length of ICU stay
‡Length of stay was days spent in hospital

1.63, 4.98) and those with congestive heart failure (OR, 4.04; 95% CI, 1.55, 10.54) had significantly higher odds of having ADs. Men had significantly lower odds of having AD than females (OR, 0.56; 95% CI, (0.32, 0.99).

There were 14 (3.5%; *n* = 10 SDM/8 living will) patients who had not reported having an AD at the clinic visit but had one documented in the EMR prior to surgery and 66 (16.5%) who reported having an AD at the clinic visit but did not have one documented in the EMR prior to surgery (Table 2).

DISCUSSION

Patients undergoing elective surgery and evaluated in a PAT had a low prevalence of AD, a finding similar to reports that identify low levels of ACP completion in other settings,[1,4] and studies finding that the integration of ACP conversations into the preoperative clinic process is not an established norm.[5] Lack of AD documentation places a burden on family members to make decisions on

Table 2 Frequency of Advance Directive (AD) Reported to Exist by Patient Compared to Scanned to Electronic Medical Record (EMR), *n* (%)

AD reported to exist by patient	AD scanned to EMR		
	Yes	No	Total
Yes	50 (12.5)	66 (16.5)	116 (29.0)
No	14 (3.5)	270 (67.5)	284 (71.0)
Total	64 (16.0)	336 (84.0)	400 (100.0)

their loved one's behalf without patient guidance and can lead to care that does not comport with the patient's preference. Also, some ADs that patients report completing are not available in the EMR where clinicians could access them when needed. A limitation of this study was that it included only one health system. Local practice patterns may differ at other hospitals. Our findings suggest that there is a significant opportunity for improvement in ACP in this clinical setting. Future research should focus on processes to make ACP more available to high-risk patient populations.[6]

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Compliance with Ethical Standards:

Conflict of Interest: *The authors declare that they do not have a conflict of interest.*

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