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Documentation of Code Status for Elderly Patients Admitted to a Hospital

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Abstract

Introduction: Determining resuscitation preferences (code status) for hospitalized older adults has been identified as an indicator of quality of care by the Assessing Care of Vulnerable Elders (ACOVE) Project.

Objectives: The primary objective of this study is to determine the rate of Advance Care Directives (code status) documentation among older patients hospitalized on the medical and cardiology units of the Hamilton General Hospital between July 1st 2009 to the end of June 2010. The secondary objective is to determine factors associated with the documentation rate of Code Status in the study group.

Methods: This was a retrospective cross-sectional study (chart review) conducted at the Inpatient Medical and Cardiology Units of Hamilton General Hospital, among all patients aged of 65 years or older admitted between July 1st 2009 and June 30 2010, and with complete charts. Data of 100 patients randomly chosen through computer program were collected and analyzed.

Results: This study shows that 39% of the sample only had there code status documented, the strongest indicator of being documented were heart failure, dementia, admit time (during regular hours) and admit location (ICU/CCU).

Conclusion: Documentation of code status was low although is known to be one of the quality indicators in care of the elderly. It needs to be discussed and addressed more with residents and clinical clerks, study shows that some factors may increase or decrease the documentations.

Keywords: Advance care planning; Substitute decision maker; Diabetes mellitus; Hypertension

Introduction

Determining Advance Care Directives is one of the most important aspects of medical care. Advances in medical technology have resulted in the proliferation of novel and often invasive therapies. These therapies are frequently offered to patients more complex and frail than those in whom they were initially evaluated, and for whom the associated side effects may be more frequent and serious, with little evidence of benefit.

Advance Care Planning (ACP) is a process whereby a patient, in conversation and reflection with family members, important others and health care providers, makes decisions about future health care. Usually ACP can describe patients' wishes for care in the event of a specific medical scenario ("living will"), and assign another party to express patients' wishes in the event they are unable to do so ("power of attorney"). The process of obtaining patient approval for a medical procedure is known as "informed consent". This process arises from the first principle of medical ethics, the "respect for autonomy", which entails respect and acknowledgement that a person's right to make choices and take actions is based solely on that person's own values and belief system.

In case of incapacity, a substitute decision maker (SDM) should be designated to make the decision. The Consent to Treatment Act establishes a hierarchy of SDM. Legal guardians of the person and those with power of attorney for the individual's personal care have the highest priority, followed in order by the patient's spouse or partner, children, parents or legal guardian, brother or sister, and any other relative. The definition of partner includes a common-law spouse as well as a partner of the same sex. The SDM must have been in personal contact with the incapable person during the preceding 12 months and there must be no reason to believe that that person might object to his or her appointment. If there is conflict between SDMs with the same priority or if no one listed is available, the Public Guardian and Trustee may give or refuse consent. The appointment of the SDM may be appealed to the Consent and Capacity Review Board. The decision should be made first according to the patient's previously expressed wishes, but if no record exists of such wishes, decisions should be guided by what is known of the patient's values and beliefs and what is in his or her best interest.

Determining patient preferences for Cardiopulmonary Resuscitation (CPR) is a particularly important aspect of ACP relevant to hospitalized seniors. According to the 2010 AHA guidelines for CPR and Emergency Cardiovascular Care, all patients who suffer cardiac arrest in a hospital setting should have resuscitative attempts initiated unless the patient has a valid "Do Not Resuscitate" (DNR) order or has objective signs of irreversible death. Systematic reviews suggest that survival to hospital discharge is no more than 20% for patients with in-hospital cardiac arrest, and 7.6% for patients with out-of-hospital arrest. While age per se does not appear to be an important factor in predicting survival after cardiac arrest, patients with poor pre-arrest functional status or multiple comorbidities, including frailty and cognitive impairment, are much less likely to survive to hospital discharge [1-3].

Administering CPR to patients who would not wish to undergo this intervention is unethical as it breaches patient autonomy, and may lead to emotional and physical injury to the patient and emotional trauma to the family. It can also lead to the inappropriate use of the hospital resources, and may entail legal consequences to the responsible health care providers and institution. It is therefore important that patient preferences for resuscitation be established early during the hospitalization. Several studies showed that factors such as the patient's age, diagnosis and sex, in addition to the physician's specialty, the medical institution and the hospital unit, were all significantly associated with variable patterns of code status ordering. Perhaps most importantly, the majority of those studies showed that patients were infrequently involved in code status decisions even when they were mentally competent [4,5].

Determining resuscitation preferences (code status) for hospitalized older adults has been identified as an indicator of quality of care by the Assessing Care of Vulnerable Elders (ACOVE) Project. Therefore, we sought to determine adherence to this recommendation for elderly patients hospitalized on the medical and cardiology units at the Hamilton General hospital over a one-year period [6].

Literature Review

Rate of code status documentation varies according to study site and population, and it range from 7-46%. That variation is due to a lot of factors some of it are patient factors and some is related to type of practice where the study was done and also wither a code status form was used or not [7-11].

Patient factors associated with documentation of code status are white race, female sex, greater age, admission from a nursing home, a poor performance status and greater illness or co morbidities especially depression and cancer diabetes and stroke (higher Greater Charlson Comorbidity Index), also being referred to a hospital and have been hospitalized in the last 12 months. Living farther from a hospital was inversely related to documentation of code status [7-11].

Hospital factors that are associated with documentation of code status are being small, nonprofit, non-academic hospitals. Also introducing a code status form improves documentation of code status significantly but the documentation rate was around 46%.

The impact of performing unnecessary code is great in every part of medical care and also financially plus great emotional impact on families of the patients and so as documentation as both are related a study done by De jonge et al. shows that Patients with delay DNR orders (>24 hours) had more costly hospital stays and higher mortality compared with admission DNR and full code patients [12].

Methods

This was a retrospective cross-sectional study (chart review) conducted at the Inpatient Medical and Cardiology Units of Hamilton General Hospital, among all patients aged of 65 years or older admitted between July 1 2009 and June 30 2010, and with complete charts.

Data collected included demographics (age, gender, and marital status); administrative information including whether admission was to ICU/CCU, time of admission (between 8:00 am and 5:00 pm or otherwise), whether the patient was admitted by a clerk or a junior or senior resident), the specialty the patient was admitted under, and code status, but not the specifics of the order if any. Whether code status was documented with 24 hours of admission, between 25 and 48 hours later, or longer than that was recorded.

The primary objective of this study is to determine the rate of Advance Care Directives (code status) documentation among older patients hospitalized on the medical and cardiology units of the Hamilton General Hospital between July 2009 to the end of June 2010. The secondary objective is to determine factors associated with the documentation rate of Code Status in the study group

Medical data collected included diagnoses, comorbidities – specifically diabetes mellitus (DM), hypertension (HTN), coronary artery disease (CAD), heart failure (CHF), dementia, and comorbidity count-regular medication count, and scores on sodium (Na), creatinine and albumin.

Data were extracted from charts and entered in Excel, from which they were exported to SPSS 19.0 for analysis. Analysis was by frequency distribution at the univariate level, t-test with Bonferroni correction for multiple hypotheses, and binary logistic regression. This is a technique for describing the relationship between one or more predictors and a dichotomous dependent variable, expressed as a probability: we display odds ratios, pseudo-R^2, and a Hosmer-Lemeshow goodness-of-fit test. In this study, documentation of code status was the dependent.

Results

This study consists of 100 patients with a mean age of 78. Fifty-five patients were female, and 49 were married. On admission, 68 had coronary artery disease (CAD), 20 heart failure (HF) and 75 hypertension (HTN). Twenty-four were admitted with respiratory issues, but only 13 had been diagnosed with dementia. On average, they had five comorbid diagnoses, and were on eight medications. Sodium (Na) score averaged 139, and 21 were abnormal; albumin means were 37 with 22 abnormal. However, creatinine (CCRL) averaged 74 and 88 were abnormal **(Table 1)**.

Table 1: Description (N=100).

Variable	Mean or Percent (Range)	Standard Deviation
Demography		
Age	77.8 (65 to 97)	7.753
Gender (Female)	55	0.5
Marital Status (Married)	49	0.502
Labs and medications		
Medications Count	7.7 (1 to 16)	3.341
Na Score	138.7 (133 to 146)	2.992
Na Status (Abnormal)	21	0.409
Creatinine Score	73.6 (47 to 103)	13.069
CCRL Status (Abnormal)	88	0.327
Albumin Score	37.3 (20 to 42)	3.209
Albumin Status (Abnormal)	22	0.416
Diagnoses		
Admit Diagnosis (Respiratory)	24	0.429
Diabetes (No Diabetes)	55	0.5
Hypertension (Normotensive)	25	0.435
CAD (No CAD)	68	0.469
Heart Failure (No HF)	80	0.402
Dementia (Not Demented)	83	0.378
Comorbidity Count	5.2 (1 to 14)	2.169
Administrative Data		
Specialty (Cardiology)	16	0.368
Admit Time Code (After Hours)	37	0.485
Admit Md Code	19	0.394
Admission (Not Admitted through ICU or CCU	91	0.288
Code Status Documentation (Documented)	39	0.49

Sixty-three were admitted during regular hours and only nine were admitted through intensive or critical care units (ICU/CCU), 16 by cardiology or vascular specialties and 84 attended by internal medicine. Nineteen were admitted by a clerk, and the remainder by residents **(Table 1)**. Thirty-nine had code status documented and 61 did not **(Table 1)**.

In bivariate terms **(Table 2)**, only a diagnosis of dementia and two administrative variables-time and site of admission-were significant predictors of code status documentation. When simultaneous controls are invoked (not shown), only dementia remains a significant predictor, but heart failure and albumin both show probabilities of <0.1.

However, using these controls exceeds the "rule-of-thumb" guideline of 10 events per predictor variable; therefore, a more abbreviated multivariate model was produced, using only six variables: those that had proven significant in the bivariate analysis, or that had a probability of <0.1 in the regression analysis. Albumin did not acquire statistical significance and was dropped from the analysis, leaving heart failure, dementia, admit time, and admit location.

Table 2: Independent t-test of Documented Code Status by Predictor Variables (N=100; Bonferroni Correction for Multiple Comparisons).

Dependent Variable	Mean Difference (95% Confidence Interval)	Std. Error	P
Patient Demographics			
Age	-0.52 (-3.69 to 2.65)	1.6	0.75
Female	0.15 (-0.06 to 0.35)	0.1	0.16
Married	-0.14 (-0.34 to 0.06)	0.1	0.18
Administrative Traits			
Specialty (cardiology or vascular)	-0.03 (-0.18 to 0.11)	0.07	0.65
Admit time (after regular hours)	0.28 (0.08 to 0.47)	**0.1**	**0.01**
Admitted by clerk	0.04 (-0.12 to 0.20)	0.2	0.62
Not admitted to ICU or CCU	0.20 (0.08 to 0.31)	**0.06**	**0**
Diagnoses			
Diabetes	0.01 (-0.19 to 0.21)	0.1	0.93
Hypertension	-0.06 (-0.24 to 0.13)	0.09	0.54
CAD	0.07 (-0.12 to 0.26)	0.1	0.48
HF	0.11 (-0.05 to 0.27)	0.08	0.17
Dementia	0.16 (0.01 to 0.30)	**0.07**	**0.03**
Comorbodity Count	-0.46 (-1.35 to 0.42)	0.44	0.3
MedicationsCount	-0.24 (-1.60 to 1.13)	0.69	0.73
Labs			
Na	-0.25 (-1.47 to 0.98)	0.62	0.69
Creatinine	2.22 (-3.11 to 7.54)	2.68	0.41
Albumin	0.97 (-0.33 to 2.27)	0.65	0.14
Values are rounded			

Table 3: Odds Ratios for Significant Variables in the Equation, Documentation of Code Status Independent.

Variables	B	Standard Error	Wald	Odds Ratio	P
Heart failure	1.14	0.571	3.99	3.126	0.046
Dementia	1.489	0.611	5.94	4.434	0.015
Admit time	1.01	0.511	3.9	2.745	0.048
Admit other than ICU/CCU	3.171	1.124	7.96	23.834	0.005
Constant	-1.88	0.486	14.99	0.153	0
Values are rounded					

The results of that analysis are shown in **Table 3**.

Hosmer-Lemeshow chi-square is not significant (p=0.809), and Nagelkerke R^2 is modest at 0.34 **(Table 4)**.

Table 4: Model Explanation.

Hosmer and Lemeshow Test		Nagelkerke Pseudo-R2
Chi-square (df)	Sig.	
4.5 (8)	0.809	0.34

Discussion

The finding that code status was not documented for almost two-thirds (61%) of patients, even though the fact of a quality assurance study was known, and even though this is a group of patients with several comorbidities, is striking. Previous literature led us to believe that about two-thirds would have had an advance directive. It may be that the same is true for this population, but that they had not been documented (e.g. had been established verbally but not charted). If so, then in those cases quality is an issue, as continuity of care might be disrupted with something as small as a change in shift [13-16].

Those with a diagnosis of dementia were more than four times more likely to have had a documented status, but none of the other comorbidities or laboratory results that were tracked for this study played a significant role. Being admitted during regular hours and outside of ICU/CCU was also significant. Nothing else was, and, as noted, even these declined to insignificance within a multivariate model [17-19].

Indeed, contrary to predictions from the literature, patient's age and sex, and most-responsible physician specialty were not associated with code status; Heart failure and dementia diagnoses were significantly associated with variable patterns of code status ordering, but administrative variables – especially location – were strong predictors. The Hosmer-Lemeshow test combined with the pseudo-R^2 indicates that the model, derived from the literature to date, is not fully specified as yet; more work has to be done [20,21].

Limitations

Logistic regression tends to systematically overestimate odds ratios when the study size is small, as in this study; so the very strong odds ratios shown in admit site may not stand up to comparison with similar studies in other sites. Moreover, the use of pseudo-R^2 and goodness-of-fit measures suggests that the model leaves out important and as yet unknown-predictors.

The small size of this study limits its power. Standard errors (not shown) are consequently quite large. A minimum of 10 events per independent variable has been recommended. In this study, failure to document code status is the outcome of interest, and 61 of 100 patients had no status document; therefore, the maximum number of independent variables the model can support is 61/10=6. Bivariate tests (Table 2) and a first logistic regression (Table 3) indicate that only the four variables shown in Table 3 were significant predictors.

Conclusions

This quality assurance study indicates that health care in the facility under study still has room for improvement in its documentation of code status for elderly patients, as might be expected from previous research. Despite extensive attention to the ethics and costs of end of life care, little is available on. Our work shows that the previous literature constituted is of little utility in establishing the "risk of success" for documented end of life strategies. Further research might focus on effective knowledge transfer techniques in this domain.

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