

RESEARCH ARTICLE

Use of a standardized code status explanation by residents among hospitalized patients

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Objectives: There is wide variability in the discussion of code status by residents among hospitalized patients. The primary objective of this study was to determine the effect of a scripted code status explanation on patient understanding of choices pertaining to code status and end-of-life care.

Methods: This was a single center, randomized trial in a teaching hospital. Patients were randomized to a control (questionnaire alone) or intervention arm (standardized explanation+ questionnaire). A composite score was generated based on patient responses to assess comprehension.

Results: The composite score was 5.27 in the intervention compared to 4.93 in the control arm ($p=0.066$). The score was lower in older patients ($p<0.001$), patients with multiple comorbidities ($p\leq 0.001$), KATZ score <6 ($p=0.008$), and those living in an assisted living/nursing home ($p=0.005$). There were significant differences in patient understanding of the ability to receive chest compressions, intravenous fluids, and tube feeds by code status.

Conclusion: The scripted code status explanation did not significantly impact the composite score. Age, comorbidities, performance status, and type of residence demonstrated a significant association with patient understanding of code status choices.

Practice implications: Standardized discussion of code status and training in communication of end-of-life care merit further research.

Keywords: *Code status; physician–patient communication; end-of-life discussion; cardiopulmonary resuscitation*

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The Patient Self Determination Act was enacted in 1990 to address the rights of health care users, enabling patients to stipulate how they would like to be treated when incapacitated (1). This act required, for the first time, the inclusion of code status discussion and documentation of the presence of advance directives (ADs) at the time of hospital admission by all Medicare/Medicaid-certified institutions. ADs are a tool for patients to express their choices about end-of-life care to their caregivers and families. They are legally enforceable, and empower health care proxies to use best-substituted judgment, but are significantly underutilized, with only 15–20% of adults in the United States possessing written documentation of ADs (2). In 1995,

results from the multicentric SUPPORT trial were published, revealing that 49% of patients, who did not want cardiopulmonary resuscitation (CPR), did not have a Do Not Resuscitate (DNR) order during that hospitalization (3). These findings reflected a glaring deficiency in patient–physician discussion of code status, and provided an impetus for further research to bridge this gap.

There is significant variability in the content, style, and timing of conversations centered around code status determination. Barriers such as lack of continuity of care, inadequate physician communication skills and insufficient time during patient encounters contribute to inconsistencies during end-of-life care discussions (4–6). In teaching hospitals, where residents-in-training are

often the first point-of-contact for patients, this variability could be significantly higher, due to lack of training, inexperience and frequent hand-offs from restriction of duty-hours. Residents are not frequently observed by attending physicians during code status discussions, and many of them do not feel very comfortable with this aspect of clinical care (7). Several reports have highlighted specific shortcomings of physician–patient conversations about resuscitation (8–11). Physicians often fail to elicit patient’s functional goals during code status discussions and do not always discuss risks, benefits, and outcomes of CPR (12); nor do they provide specific recommendations regarding CPR based on the patient’s prognosis and goals, contrary to recommendations from professional associations (13–16). Systems-level interventions to support best-practice CPR discussions have thus been recommended (12). In addition, to overcome inconsistencies in documentation of code status, a standardized code status document that is easily comprehensible, universally recognizable and transferable, has also been recommended (9).

Several studies have evaluated the effect of interventions directed specifically at residents and trainees regarding effective code status discussions. An end-of-life educational program developed for first year residents (PGY-I) has demonstrated improved performance in communication skills in objective structured clinical examinations (OSCEs) (17). Additionally, multimodality education for residents has demonstrated improved performance in communication skills on simulated tests (18). Other investigators have similarly explored training modules for enhancing resident communication skills (19, 20).

Contemporary code status discussions should include identification of patient’s goals and values, with recommendations for treatment within those premises (12–16). Development of a standardized code status explanation may have the potential to enhance residents’ competency in engaging patients in these discussions, which could improve physician–patient communication. We postulated that a standardized code status explanation by residents may enhance patient comprehension of choices made at the time of hospitalization, paving the path for a more successful code status discussion. The primary objective of this study was to evaluate the effect of a standardized explanation of code status by residents on patient understanding of end-of-life choices. Additionally, we compared demographic, medical, and social factors associated with patients’ comprehension of code status.

Methods

Design

The study was conducted at a single center and was approved by the institutional review board. The standardized code status explanation was developed based

on a review of literature and was approved by a panel including both established hospitalists and internists. To ensure standardization of the experimental tools, participating researchers received a briefing and simulation training including administration of the standardized explanation and ensuing questionnaire.

Setting and participants

Eligible participants were identified from the daily admission log. Patients aged 18 years or older admitted to the regular nursing floor were eligible for the study. Patients who were admitted to the intensive care unit (ICU), had an altered mental status or were unable to consent were excluded from enrollment. The study investigators interviewed the eligible participants within 48 hours of their admission. Study design is summarized in the CONSORT flow diagram (Fig. 1). Three hundred and forty-six patients admitted to the regular nursing floor were screened for eligibility. Ten patients were excluded either due to being non-English speaking (5) or for refusal to participate (5). The remaining 336 patients were sequentially randomized using a unified patient log with a 1:1 allocation ratio to control (170) or intervention arm (166). Ten patients were excluded due to potential depressive symptomatology based on PHQ-2 screening (six in the control arm, four in the intervention arm) (21). Data were incomplete for 26 patients and, consequently, data from 150 patients were analyzed in each arm.

The intervention group was provided a standardized explanation on code status, ADs and end-of-life care (see Supplementary file), immediately followed by administration of a questionnaire designed to assess patient understanding of code status (Supplementary file). The control group was administered the questionnaire alone within 48 hours of admission. Total time spent was about 15 min for the control group and about 25 min for the intervention group, including 10 min for the standardized explanation. A medical record chart review was used to collect data on medical conditions and the code status as documented by the admitting physician who had completed the original admission orders. Participants were also asked whether they had any difficulty performing six basic activities of daily living (ADL), and KATZ score of ADL was thus evaluated (22). The documented code status categories included: Full Code (use all life-sustaining maneuvers as necessary), Do Not Intubate (no insertion of advanced airway), Do Not Resuscitate (meaning no chest compressions), Do Not Resuscitate/Do Not Intubate (no chest compressions or advanced airway), and Comfort Measures Only (management of end-of-life symptoms such as pain and dyspnea alone, without any life prolonging measures). Code status was documented at the time of admission by the admitting physician.

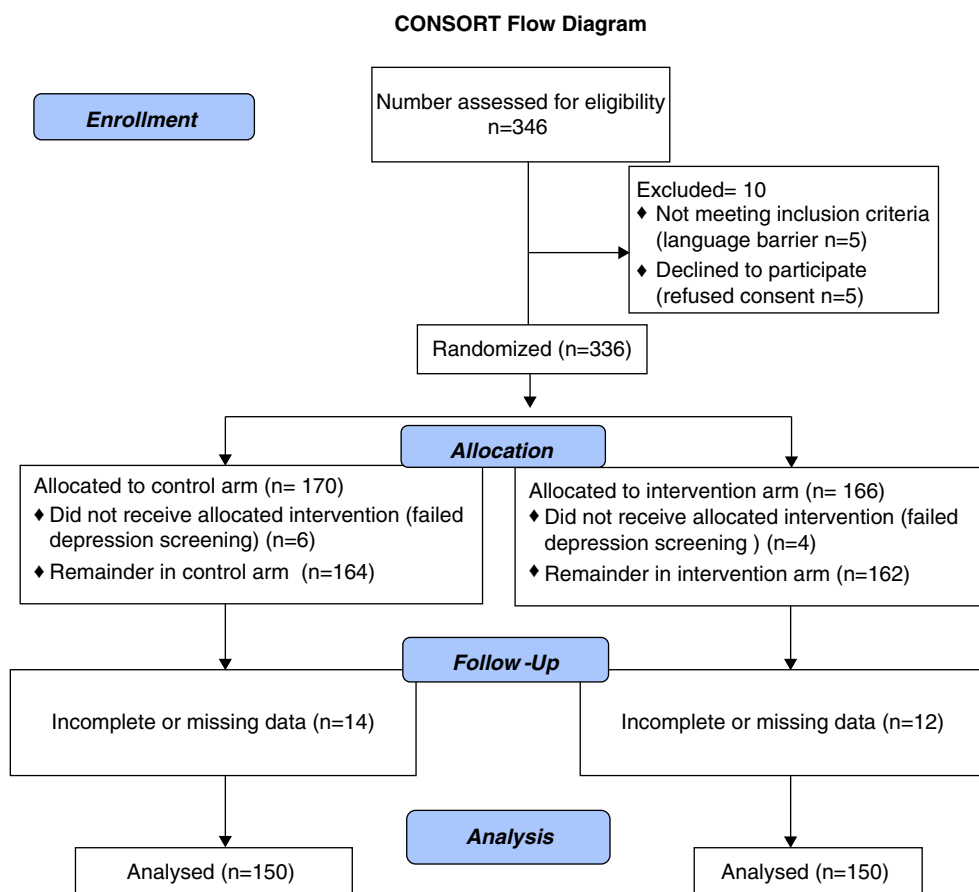


Fig. 1. CONSORT flow diagram depicting flow of patients.

Aims and outcomes

The primary aim of the study was to evaluate the effect of a standardized code status explanation on patient comprehension of end-of-life care. The primary end point was a composite score that was generated based on code status appropriate responses to seven individual components of the questionnaire (Supplementary file). Questions 1 and 2 were coded as correct based on each patient's code status documented at admission. Patients with a 'DNR/DNI' status were coded as correct if they answered questions 1 and 2 as No. Patients with a 'Full Code' were coded as correct if they answered questions 1 and 2 as 'Yes'. Questions 2–6 were coded as correct if the patient answered 'Yes', and question 7 was coded as correct if the subject answered 'Anytime they want'. The correct responses were summed with unsure responses considered as incorrect. The possible composite score ranged from 0 to 7. The secondary aim of the study was to evaluate the medical, demographic and other factors associated with patient understanding of code status choices.

Statistical analysis

Comparisons in patient characteristics between the intervention and control group were made with a Chi-square test or Fisher's exact test for categorical variables, and a

Wilcoxon rank test for continuous variables. A Wilcoxon rank test was used to determine differences between the intervention and control group in the composite score. Linear regression was used for the analysis of patient characteristics with the composite score. Continuous predictors were assessed for linearity with the composite score using lowess curves, and non-linear predictors were categorized. Logistic regression along with backward stepwise logistic regression with a cutoff p -value of 0.10 was used to determine an adjusted model for the patient characteristics related to the composite score and code status. Reliability of the composite score was assessed with Cronbach's alpha and a principle component factor analysis was performed to determine dimensionality of the scale. All analyses were run using Stata 12 (StataCorp.2011).

Results

Baseline patient characteristics of control and intervention groups are depicted in table 1 (see supplementary files). There were 150 patients in each arm. Overall, 45.7% patients were male, and 54.3% patients were female. The mean age was 63.6 years in the intervention group compared to 68.6 years in the control group ($p=0.006$).

The distribution of patients by code status (Full Code, DNR/DNI, or CMO) is also represented in Supplementary file. A total of 25.3% and 14% patients in the control and intervention groups had DNR/DNI listed as their code status, respectively. One patient in each group was CMO, and these two patients were excluded from participation in the standardized questionnaire phase. The number of medical conditions and the scores on KATZ ADL scale (KATZ-ADL) and PHQ-2 depression screening scale were comparable in both groups. Overall, 59.3% patients did not recall having prior AD discussion, while 89.6% patients felt it was appropriate to have a pre-emptive discussion on code status and AD. 68.7% patients claimed to have a designated health care proxy (HCP). The intervention was well received, as 71.3% of the intervention group expressed that they were explained the code status satisfactorily vs. 39.3% of the control group ($p < 0.001$).

The primary end point of the study was the composite score based on appropriateness of responses to the code status documented in patient charts. The score items were shown to have relatively high internal consistency with a Cronbach's alpha = 0.78. Factor analysis of the score items showed uni-dimensionality with most of the explained variance coming from the first factor. Standardized explanation led to a slight increase in the composite score, (5.27 in the intervention arm compared to 4.93 in the control arm; standard deviation = 2.0 for both groups), which however did not reach statistical significance ($p = 0.066$). We anticipated an arbitrary difference of 20% or greater in the composite score to be clinically meaningful, which was not achieved. Post hoc power analysis with the current data indicated that we would need a sample size of 545 in each group to detect an effect size of 0.17 ($1\beta = 0.80$ and $\alpha = 0.05$).

Table 2 (see supplementary files) depicts the distribution of correct and incorrect responses to individual questions utilized in generating the composite score. An unplanned subset analysis revealed that patient responses were most consistent with regards to intubation across both code status groups (83.1% versus 74.9% correct responses respectively in the DNR/DNI and Full Code groups) and when patients thought they could change their code status (64.4% versus 70.7%, respectively). There were significant differences in patient understanding of the ability to receive chest compressions, intravenous fluids, tube feeds, major surgery, and cancer treatment between patients who were Full Code and DNR/DNI (Supplementary file). It is noteworthy that overall, only 37.6% of patients across both arms answered all questions correctly. Furthermore, 30.5% patients were unaware that they could change their code status at anytime.

Unadjusted and adjusted linear regression of the composite score was also performed to study associations with patient characteristics table 3, (Supplementary file). In unadjusted models, composite scores were lower in patients

aged 65 or older ($p < 0.001$), patients with 1–2 or 3 or more medical conditions ($p \leq 0.001$), KATZ score less than 6 ($p = 0.008$), and patients who lived in assisted living, rest home or nursing home ($p = 0.005$). Patients with a medical history of hypertension, congestive heart failure, and/or chronic renal insufficiency also had significantly lower composite scores. Backward stepwise regression determined that age group, terminal illness, number of medical conditions and type of residence should be kept in the model.

Our secondary end point was to compare differences in demographic, medical, social and associated factors with patient choice of code status. In unadjusted analysis table 4 (Supplementary file), older patients (age ≥ 65) were less likely to be Full Code than younger patients ($p < 0.001$). Females were less likely to be Full Code than males ($p = 0.010$). Patients with 1–2, or 3 or more chronic medical conditions were less likely to be Full Code than patients with no chronic medical conditions ($p = 0.021$). Patients with a PHQ2 Depression score of 2 were less likely to be Full Code than patients with a score of 0 ($p = 0.037$). Patients with a KATZ score of less than 6 were less likely to be Full Code than patients with a score of 6 ($p = 0.002$). Patients living in assisted living, rest home or nursing home were less likely to be Full Code than patients living at home (OR = 0.24, $p = 0.003$). The backward stepwise adjusted logistic regression determined that randomization group, age group, gender and the PHQ2 Depression scale had significant association with choice of code status.

Discussion

The discussion of patient preferences for life-sustaining treatment during hospital encounters is subject to variability related to turn-over of providers and frequent hand-off among resident teams. Moreover, preferences for life-sustaining treatment elicited in one state of health may not remain consistent across varying clinical states. There is evidence that patients who do not have ADs, and those who desire the most aggressive treatment at baseline, demonstrate the most changeable preferences varying with their state of health (23). Interestingly, not wanting CPR is associated with similar mortality as Full Code status (3). While several studies have attempted to understand factors impacting patient choices of code status, there is a paucity of interventional studies evaluating tools directed specifically at enhancing patient understanding of resuscitation orders. This study incorporates the use of a standardized code status explanation by residents to assess the understanding of resuscitation choices among hospitalized patients.

The study suggests that older patients, those with greater number of medical morbidities, less functionally active individuals, and patients not living independently at home demonstrate inferior understanding of code

status. Moreover, these groups of patients are less likely to be Full Code, as are female patients; these latter findings are consistent with results from prior studies (3, 24, 25). Our results also demonstrate that a little over a third of patients have previously discussed ADs with their physicians. Another significant finding is the disparity in the proportion of patients with a designated HCP (over 65% in both groups) compared to those with knowledge of AD (25% in control group), indicating patient awareness of a need for advance planning, but a lack of established means for executing end-of-life decisions, placing the burden of decision making on caregivers and families. Often times admitting physicians may hesitate in initiating discussions on ADs or code status, either due to time constraints, being uncomfortable with these discussions (26), or from fear of decreasing patient satisfaction (27). Anderson et al. have previously demonstrated that discussing code status on admission does not affect patient or surrogate satisfaction (27). Our own findings indicate that even though patients do not frequently initiate AD discussions, the majority (89.6%) of them deem it appropriate to conduct preemptive discussions regarding end-of-life care.

The numeric increase in patient comprehension of code status as a result of our intervention was not statistically significant. The inability to meet the primary end point could be attributed to study limitations that included inadequate sample size, use of a non-validated tool given that the study was a pilot project, and potential discrepancies in the determination of code status. The appropriateness of patient responses in generating the composite score was based on the code status documented by the admitting physician prior to the investigators' encounters with patients. The determination of the code status may have been limited by some of the barriers in physician–patient communication that have been identified previously (8–11). It was not possible to calculate power calculations ahead of time for the new composite score in this pilot study. Post hoc sensitivity analysis with the current data indicates with a sample size of 150 in each group we would be able to detect an effect size of 0.32 or greater. The current study was underpowered, with an effect size of 0.17. Furthermore, while choices regarding chest compressions and intubation may be clearly defined by 'DNR/DNI' or 'Full Code' documentation in the medical chart, decisions regarding feeding tubes and major surgeries are more complex and involve case-by-case decision making between physicians and patients. The inclusion of the latter subjects in calculation of the composite score added some variability to our primary end point. The significantly lower understanding among the DNR/DNI cohort with regards to receiving chest compressions, parenteral fluids or tube feeds also suggests the need for further emphasis on these aspects of code status explanations.

In conclusion, significant variations in patient understanding of code status were highlighted in this study, but the standardized explanation did not significantly enhance patient understanding as assessed by our questionnaire. Recent data suggest that video images accompanying code status discussions can enhance patient knowledge of CPR (28). Another subsequent trial incorporating use of an informational brochure with code status discussions has failed to demonstrate improvement in patient knowledge of CPR over time (29). Given the wide variability in content and style of code status explanations, development of standardized communication tools merits further research.

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