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Original Contributions

TRIAD III: NATIONWIDE ASSESSMENT OF LIVING WILLS AND DO NOT RESUSCITATE ORDERS

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Abstract—Background: Concern exists that living wills are misinterpreted and may result in compromised patient safety. **Objective:** To determine whether adding code status to a living will improves understanding and treatment decisions. **Methods:** An Internet survey was conducted of General Surgery, and Family, Internal, and Emergency Medicine residencies between May and December 2009. The survey posed a fictitious living will with and without additional clarification in the form of code status. An emergent patient care scenario was then presented that included medical history and signs/symptoms. Respondents were asked to assign a code status and choose appropriate intervention. Questions were formatted as dichotomous responses. Correct response rate was based on legal statute. Significance of changes in response due to the addition of either clinical context (past medical history/signs/symptoms) or code status was assessed by contingency table analysis. **Results:** Seven hundred sixty-eight faculty and residents at accredited training centers in 34 states responded. At baseline, 22% denoted “full code” as the code status for a typical living will, and 36% equated “full care” with a code status DNR. Adding clinical context improved correct responses by 21%. Specifying code status further improved correct interpretation by 28% to 34%. *Treatment decisions* were either improved 12–17% by adding code status (“Full Code,” “Hospice Care”) or worsened 22% (“DNR”). **Conclusion:** Misunderstanding of advance directives is a nationwide problem. Addition of code status may help to resolve the problem. Further research is required to ensure safety, understanding, and appropriate care to patients. © 2011 Elsevier Inc.

Keywords—living will; interpretation; DNR; code status; patient safety

INTRODUCTION

The first living will was legalized in 1977, which led to the “Natural Death Act” (1). Its purpose was to protect patient autonomy in the case of terminal illness. The Patient Self Determination Act in 1990 required that patients be provided information on their rights to execute an advance directive at institutions receiving Medicare or Medicaid funding. However, this was never evidence-based in evaluating patient safety (2). With 60 million living wills in the United States, incorrect interpretation could have deleterious impacts on safety and care of patients who call 911 for an emergency or present for emergency treatment (3).

Advance directives have become a complex, global issue. In some European and Asian countries, they are not legally recognized, whereas in others, it is a requirement for euthanasia to be enacted (4,5). As such, it is critical that we recognize the implications of living wills and clarify documents to ensure patient care and safety.

A recent study by Silveira et al. indicated that a small but significant proportion of patients with a living will failed to receive the aggressive treatment they requested, and half of the cohort did not receive all care possible (2). Additionally, studies reveal that patients with advance

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directives (living will or health care proxy) are less likely to receive aggressive care (6,7). It is unclear whether this outcome was consistent with the patients' wishes, which strengthens the argument that clarifications are required. Living wills are not synonymous with Do-Not-Resuscitate (DNR) orders. DNR orders apply only to patients with terminal conditions found pulseless or apneic. In Pennsylvania, state statute stipulates that advance directives are meant to be enacted only if a patient is in a terminal state or in a state of permanent unconsciousness; otherwise, life support should be provided (8). Case studies reveal ethical dilemmas surrounding withdrawal of care based on living wills in potentially reversible conditions (9,10). This raises the question of who determines that particular interventions will not be successful and who determines whether a patient's wishes per their living will should still be upheld if it conflicts with their current wishes. These are dilemmas where advance directives fall short.

Several published case studies have demonstrated that language in living wills is often vague or poorly defined (11,12). Evidence from other institutions reveals that there are vast differences in the understanding of living wills among patients, family members, and physicians. Additionally, evidence suggests that the majority of those interpreting advance directives are poorly trained or untrained in the interpretation of these documents (13).

The Realistic Interpretation of Advance Directives (TRIAD I) study identified that the majority of living wills presented to various health care providers were incorrectly interpreted as synonymous to DNR orders (89% Emergency Medical Services, 79% nurses, 64% physicians) (12). These results prompted further investigation of living wills, specifically among pre-hospital providers (TRIAD II) (14). In this three-part study, providers were presented case scenarios and living wills in which: 1) patient details were withheld, 2) case details were disclosed, and 3) a code status was provided with the living will and case details. By providing a code status designation, correct living will interpretation increased. Although intriguing, TRIAD I and II findings may not be generalizable as they were performed in a limited population.

Controversy and public interest on the issue of advance directives prompted the present study to expand upon these preliminary studies by polling physicians involved in primary and initial aspects of patient care (Emergency, Internal, Family Medicine, and General Surgery) at health care systems nationwide via an Internet-based survey. The primary goal was to determine the impact of adding code status to a standard advance directive in terms of patient care decisions. We hypothesized that, in the absence of code status, providers construe living wills to define DNR and end-of-life care; if

code status is provided, respondents are more likely to make correct patient care decisions.

METHODS

The study population consisted of health care institutions offering residencies in General Surgery, and Emergency, Internal, and Family Medicine as identified by the Accreditation Council for Graduate Medical Education and American Osteopathic Association registries. Program directors were contacted to solicit cooperation and provide survey access (SurveyMonkey.com). Access was password-protected and responses were encrypted to ensure security of the data. Program directors were asked to forward the solicitation to both residents and attending faculty. The study protocol was approved by our hospital's institutional review board.

The survey, which solicited anonymous responses, consisted of a demographic section followed by several advance directives and patient care scenarios. Initially, respondents were asked to supply a code status for a generic living will (Figure 1). Legal review of the document was conducted to ensure content validity. A second question asked for the relevance of the term "DNR" to care provided (comfort care vs. full care) (Figure 2). Thereafter, this living will was presented with or without a specific code status designation (Figure 3, Scenarios A–E). If provided, one of three versions was utilized—Code Status: Full Code, DNR, or Hospice/Comfort Care. With each directive, a patient scenario followed that required an emergent decision concerning life-saving interventions. The survey was enabled in "forward-response mode" only; recursive changes were prevented. To establish reliability, the first advance directive-patient care scenario ("A") was repeated near the close of the survey (Scenario "D").

Prevailing legal statutes were utilized to interpret correct from incorrect responses. These statutes require *enactment* of a living will (e.g., patient is incapable of decision-making, has a terminal condition [not a critical illness], or is in a persistent vegetative state [PVS]). Additionally, statutes define "DNR" as a designation to withhold cardiopulmonary resuscitation (CPR) if a patient is found pulseless or apneic. The cases portrayed were intended to depict an emergent condition for which information on terminal illness or PVS is unknown. When code status was assigned to the living will document, these designations assumed priority over de facto statute for determining correct response. For example, in Scenario B, the living will stipulates DNR. Therefore, the correct code status is DNR. Additionally, we scored resuscitation decisions based upon the enactment of the living will. The correct intervention for the patient depicted in Scenario B is "defibrillate" because the document had

(My specific direction to my family and health care providers)
I, being of sound mind, willfully and voluntarily make this declaration to be followed if I become incompetent. This declaration reflects my firm and settled commitment to refuse life-sustaining treatment under the circumstances indicated below.

I direct my attending physician to withhold or withdraw life-sustaining treatment that serves only to prolong the process of my dying, if I should be in a terminal condition or in a state of persistent unconsciousness.

I direct that treatment to be limited to measures to keep me comfortable and to relieve pain, including any pain that might occur by withholding or withdrawing life-sustaining treatment.

In addition, if I am in the condition described above, I feel especially strong about the following forms of treatment:

I do do not want cardio-pulmonary resuscitation.

I do do not want electrocardioversion.

I do do not want mechanical respiration.

I do do not want tube feeding or any other artificial or invasive form of nutrition (food) or Hydration (water).

I do do not want blood or blood products.

I do do not want any form of surgery or invasive diagnostic tests.

I do do not want kidney dialysis.

I do do not want antibiotics.

Figure 1. Living will.

not become enacted, and DNR pertains to the action of CPR and not Advanced Cardiac Life Support.

The study was designed as a repeat-measures study. Based upon prior studies, we estimated that the addition of code status to a living will would improve correct responses by 30% and yield comparable improvements in patient care decisions. A power analysis indicated that a minimum of 30 subjects was required to establish a 95% certainty of detecting this 30% difference. Given that current enrollment in the targeted specialties of Emergency, Family, and Internal Medicine, and General Surgery is approximately 44,700 (http://www.acgme.org/adspublic/reports/accredited_programs.asp), we sought to obtain a sample representing 10% of enrollment, or 4470 subjects.

Data were summarized as means (continuous) or percentages (categories). Bivariate chi-squared or Fisher's exact tests were utilized to contrast demographics against responses to patient scenarios using 0.05 as the threshold for significance. Given that this was a repeated-measures study, McNemar test was utilized to assess changes in response based on code status. Because multiple compari-

Based on this living will, what is the patient's code status?

- DNR
 Full Code

What is your understanding of DNR status?

- Comfort Care/End-of-Life Care
 Full Care

Figure 2. Queries, generic living will.

sons were made, Bonferroni correction was applied and yielded a threshold of 0.017 for achieving statistical significance. Finally, agreement between split-halves test responses was measured with a kappa statistic (15).

RESULTS

Demographics

Seven hundred sixty-eight responses were registered over 18 months (Table 1: demographic information). Respondents averaged 36 years in age, with slightly more males (56%) represented. Responses were predominantly residents (62%), in the Emergency Medicine specialty (57%), and in programs located in the Northeast and the South (64% total, $n = 530$), representing programs from 34 states (Table 2).

Responses to a Typical Living Will

Overall, 22% (164/736) correctly denoted "full code" as the code status for a typical living will (Figure 2), and 36% (263/732) correctly equated "full care" with a code status of DNR (Table 2 subgroup analysis). Those who selected "full code" were significantly older (41.5 ± 28.9 vs. 34.5 ± 9.4 years, respectively; $p = 0.03$), whereas age exerted no effect on the understanding of the level of care provided if the patient was DNR ("Comfort Care": 36.1 ± 16.3 years; "Full Care":

Scenario A: Code Unspecified (as in Fig 1)

A 46-year-old female presents with complaints of chest pain, shortness of breath and diaphoresis. Vitals: P:110; RR:30; SaO₂: 97%RA; T: 37C; BP: 130/70. Patient has been given oxygen, aspirin, and nitroglycerin enroute. Pre-hospital ECG shows acute ST elevation anterior wall myocardial infarction. EMS presents you with a list of medications and their living will. Abruptly her status changes as you evaluate her. She becomes unresponsive and develops VT/VF arrest.

WHAT IS HER CODE STATUS based on the Living Will that was just reviewed?

- DNR
- Full Code**

For Case A, what is the next course of action?

- Defibrillate**
- Don't defibrillate

Scenario B: Living Will + Code Status Stipulated as DNR (as in Fig 1)

A 68-year-old male presents with a history of diabetes, hypertension, dyslipidemia, and CAD s/p CABG 10 years ago. Patient is experiencing chest pain. He is clammy. He is in mild distress. Vitals: T: 36C; P:60; RR:22; SaO₂: 98%RA. The family gives you his list of medications and living will. Abruptly, the patient becomes unresponsive without palpable pulses. The monitor shows ventricular fibrillation.

WHAT IS THIS PATIENT'S CODE STATUS based on the Living Will that was just reviewed?

- DNR**
- Full Code

For the patient in Case B, what is the next course of action?

- Defibrillate**
- Don't defibrillate

Scenario C: Living Will + Code status stipulated as Full Code (as in Fig 1)

An 87-year-old male presents with a complaint of sudden shortness of breath. Patient is agitated, confused, and in severe respiratory distress. Vitals: P:130; RR 50; BP: 70/50; T:37C; SaO₂: 78% on nonrebreather. The patient's wife gives you a list of medications and the living will. Abruptly, while examining him, the patient goes into respiratory arrest.

WHAT IS THIS PATIENT'S CODE STATUS based on the Living Will that was just reviewed?

- DNR
- Full Code**

For the patient in Case C, what is the next course of action?

- Intubate**
- Don't intubate

Scenario D: Code Unspecified (as in Fig 1)

A 46-year-old female presents with complaints of chest pain, shortness of breath and diaphoresis. Vitals: P:110; RR:30; SaO₂: 97%RA; T: 37C; BP: 130/70. Patient has been given oxygen, aspirin, and nitroglycerin enroute. Pre-hospital ECG shows acute ST elevation anterior wall myocardial infarction. EMS presents you with a list of medications and their living will. Abruptly her status changes as you evaluate her. She becomes unresponsive and develops VT/VF arrest.

WHAT IS HER CODE STATUS based on the Living Will that was just reviewed?

- DNR
- Full Code**

For Case D, what is the next course of action?

- Defibrillate**
- Don't defibrillate

Scenario E: Hospice/Comfort Care Specified (as in Fig 1)

A 68-year-old male presents with a history of diabetes, hypertension, dyslipidemia, and CAD s/p CABG 10 years ago. Patient is experiencing chest pain. He is clammy. He is in mild distress. Vitals: T: 36C; P:60; RR:22; SaO₂: 98%RA. The family gives you his list of medications and living will. Abruptly, the patient becomes unresponsive without palpable pulses. The monitor shows ventricular fibrillation.

WHAT IS THIS PATIENT'S CODE STATUS based on the Living Will that was just reviewed?

- DNR**
- Full Code

For the patient in Case E, what is the next course of action?

- Defibrillate
- Don't defibrillate**

Figure 3. Queries, code-stipulated living will, and patient interventions.

36.0 ± 16.4 years, $p = 0.908$). This age effect was mirrored by the clinical experience of the respondents: differences between attendings and physicians in-training were as great as 32% ($p < 0.001$). Also, differences in physician specialty were as great as 27% (Internal Medicine vs. other specialties, $p < 0.001$).

The Effect of Adding Context, Stipulating Code Status

Providing context of past medical history and symptoms (without code status) (Figure 3, Scenario A) resulted in 43% (302/702) correctly assigning a code status of "full code." When "DNR" was noted on the living will

Table 1. Respondent Demographics

| Age, Years (mean, SD) | Gender (n = 746) | Specialty (n = 740) | Experience (n = 742) | State (n = 757) |
|-----------------------|------------------------------------|---|---|--|
| 36.1 ± 16.0 | 56% male (418) 44% female (328) | 27% FM (202) 57% EM (423) 12% IM/Hospitalist (91) 4% GS (24) | 38% Attendings (284) 62% residents/fellows (458) | 38% Northeast (288) 19% Midwest (143) 32% South (242) 11% West (84) |

FM = Family Medicine; EM = Emergency Medicine; IM = Internal Medicine; GS = General Surgery.

(Figure 3, Scenario B), 79% (542/682) correctly denoted “DNR” as the code status. Finally, 67% (442/664) correctly assigned “full code” as stipulated in the living will (Figure 3, Scenario C).

When compared to the initial set of responses for a typical living will, adding patient context improved correct responses by 21% ($p < 0.001$, Table 3). Stipulating code status on the document, along with a case scenario, affected improvements between 29% and 60% ($p < 0.0001$). Discounting a net 21% improvement by adding a contextual clue, adding a code status further improved decisions between 28% (60%-[11% errant change +21% context]), Scenario C) and 34% (59%-[14% errant +21% context], Scenario B); only the former was a significant change ($p < 0.001$).

Given that physician experience may influence assigning a code status (Table 2), code status choices were subgrouped by experience. For residents/fellows (Table 3),

adding a contextual clue improved their choice of code status by a net of 9% ($p < 0.001$), with further net improvements of 50% (Scenario B) and 41% (Scenario C); only the latter attained statistical significance ($p < 0.001$). For attendings (Table 3), a 36% improvement ($p < 0.001$) occurred by adding context, with a further improvement of 10% when code status was applied (Scenario C, $p < 0.001$).

Treatment Decisions

Decisions to provide interventions were influenced by the addition of a code status. In Scenario A (patient contextual clues only), 55% (386/706) made the correct decision. Only professional experience exerted a significant effect on these responses (Tables 4, 5; $p < 0.001$). Designating “DNR” (Scenario B), “Full Code” (Scenario C), or “Hospice Care” (Scenario E) resulted

Table 2. Interpretation of a Living Will by Subgroups

| Group | Code Status | | | DNR = ? | | |
|-----------------------------|-------------|---------------|----------|------------------|---------------|----------|
| | DNR (n) | Full Code (n) | P Value | Comfort Care (n) | Full Care (n) | P Value |
| Gender | | | 0.719 | | | 0.581 |
| Males | 77% (312) | 23% (93) | | 63% (256) | 37% (147) | |
| Females | 78% (244) | 22% (68) | | 66% (204) | 34% (106) | |
| Specialty | | | 0.447 | | | < 0.0001 |
| FM | 74% (142) | 26% (51) | | 60% (114) | 40% (76) | |
| EM | 80% (325) | 20% (84) | | 71% (289) | 29% (117) | |
| IM/Hospitalist | 77% (67) | 23% (20) | | 44% (39) | 56% (49) | |
| GS | 79% (19) | 21% (5) | | 71% (17) | 29% (7) | |
| Experience | | | < 0.0001 | | | 0.764 |
| PGY1 | 85% (108) | 15% (19) | | 63% (81) | 37% (47) | |
| PGY2 | 84% (101) | 16% (20) | | 65% (79) | 35% (42) | |
| PGY3 | 79% (112) | 21% (29) | | 61% (86) | 39% (54) | |
| PGY4 | 88% (37) | 12% (5) | | 71% (30) | 29% (12) | |
| Fellow | 100% (10) | | | 50% (5) | 50% (5) | |
| Attending | 68% (186) | 32% (87) | | 65% (176) | 35% (93) | |
| Region | | | 0.741 | | | 0.640 |
| Northeast | 79% (220) | 21% (59) | | 63% (174) | 37% (102) | |
| Midwest | 75% (102) | 25% (35) | | 66% (91) | 34% (47) | |
| South | 78% (182) | 22% (50) | | 64% (147) | 36% (84) | |
| West | 76% (60) | 24% (79) | | 71% (55) | 29% (23) | |
| Advance directives training | | | 0.242 | | | 0.099 |
| Yes | 76% (284) | 24% (90) | | 62% (229) | 38% (143) | |
| No | 80% (271) | 20% (69) | | 68% (229) | 32% (109) | |

DNR = Do-Not-Resuscitate orders; FM = Family Medicine; EM = Emergency Medicine; IM = Internal Medicine; GS = General Surgery; PGY = postgraduate year.

Table 3. Effect of Adding Context, Code Status

| Scenario | Code Status | Response* | | | | P Value |
|-----------------------------|-------------|------------|-----------|------------|-----------|---------|
| | | Consistent | | Change | | |
| | | DNR | FC | DNR to FC | FC to DNR | |
| Global effect | | | | | | |
| A | Undefined | 71% (384) | 92% (142) | 29% (156)† | 8% (12) | < 0.001 |
| B | DNR | 86% (450) | 41% (63) | 14% (74) | 59% (89)† | 0.273 |
| C | Full Code | 40% (205) | 89% (134) | 60% (303)† | 11% (16) | < 0.001 |
| Resident/Fellows' responses | | | | | | |
| A | Undefined | 78% (273) | 87% (59) | 22% (79)† | 13% (9) | < 0.001 |
| B | DNR | 91% (311) | 32% (22) | 9% (30) | 68% (46)† | 0.085 |
| C | Full Code | 38% (124) | 88% (60) | 62% (205)† | 12% (8) | < 0.001 |
| Attendings' responses | | | | | | |
| A | Undefined | 60% (103) | 96% (59) | 40% (68)† | 4% (3) | < 0.001 |
| B | DNR | 75% (125) | 50% (40) | 25% (42) | 50% (40)† | 0.912 |
| C | Full Code | 44% (71) | 90% (70) | 56% (92)† | 10% (8) | < 0.001 |

DNR = Do-Not-Resuscitate orders; FC = full code.

* Compared to queries for a typical living will (Figure 1).

† Improvement in responses.

in correct decisions 32% (222/684), 60% (397/664), and 72% (460/637). Adding "DNR" significantly increased the rate of *incorrectly* withholding life-saving interventions by 40% (Table 5, $p < 0.001$), whereas designating "Hospice Care" improved decision-making by 49% ($p < 0.001$). Given that experience affects decision-making, sub-group analyses for residents/fellows (Table 3) showed that adding code status to living wills significantly changed their decisions by -48% (net decline)

Table 4. Demographics and Treatment Decisions*

| Group (n) | % Correct Response (n) | P Value |
|-----------------------------|------------------------|---------|
| Gender | | |
| Males (388) | 55% (212) | 0.938 |
| Females (299) | 54% (162) | |
| Specialty | | |
| FM (187) | 58% (109) | 0.563 |
| EM (388) | 53% (204) | |
| IM/Hospitalist (85) | 54% (46) | |
| GS (23) | 48% (11) | |
| Experience | | |
| PGY1 (128) | 34% (43) | < 0.001 |
| PGY2 (115) | 38% (44) | |
| PGY3 (129) | 48% (62) | |
| PGY4 (42) | 62% (26) | |
| Fellow (9) | 33% (3) | |
| Attending (261) | 74% (192) | |
| Region | | |
| Northeast (263) | 56% (146) | 0.489 |
| Midwest (138) | 59% (81) | |
| South (222) | 54% (119) | |
| West (75) | 48% (36) | |
| Advance directives training | | |
| Yes (327) | 53% (172) | 0.442 |
| No (357) | 56% (199) | |

FM = Family Medicine; EM = Emergency Medicine; IM = Internal Medicine; GS = General Surgery; PGY = postgraduate year.

* Scenario A.

to $+57\%$ (net improvement). For attendings, similar rates of -30% to $+45\%$ were observed (Table 3).

Reliability

Seventy-four percent (260/353) of respondents consistently assigned a DNR for Scenarios A and D (identical scenario), whereas 94% (273/291) consistently assigned "Full Code." Conversely, 26% (93/353) changed from "DNR" to "Full Code," and 6% (18/291) changed from "Full Code" to "DNR." Although not perfect concordance, intra-rater reliability was significant ($\kappa = 0.644$, $p < 0.0001$).

DISCUSSION

Living wills and DNR orders have never been tested with respect to patient safety, interpretation, or applicability in situations involving critically ill patients. The term DNR has been questioned as far as understanding and safety for two decades (16–19). Recently, living wills have been questioned as far as understanding and effect on patient safety. This study was designed to ascertain how the current understanding of living wills and DNR orders would affect care provided to a patient who is critically ill and requiring life-saving interventions. For clarification, a living will that is present with a patient is only an effective document, defining presence and validity. At this point it is not enacted. A living will becomes enacted when a patient is incapable of making decisions, is terminal as defined by law, or enters a persistent vegetative state. Previous studies indicate that providers have a preconceived notion that a living will equates to a DNR order and that a DNR order equates to end-of-life care

Table 5. Effect of Adding Code Status, Decision to Intervene

| Scenario | Code Status | Correct Decision?* | | | | P Value |
|-------------------|-------------|--------------------|-----------|----------------------|----------------------|---------|
| | | Consistent | | Change | | |
| | | Incorrect | Correct | Incorrect to Correct | Correct to Incorrect | |
| Overall | | | | | | |
| B | DNR | 94% (287) | 54% (205) | 6% (17) | 46% (174) | < 0.001 |
| C | Full code | 59% (172) | 75% (278) | 41% (119) | 26% (95) | 0.116 |
| E | Hospice | 11% (30) | 60% (217) | 89% (243) | 40% (147) | < 0.001 |
| Residents/Fellows | | | | | | |
| B | DNR | 95% (222) | 46% (81) | 6% (13) | 54% (95) | < 0.001 |
| C | Full code | 57% (128) | 73% (128) | 43% (96) | 27% (47) | < 0.001 |
| E | Hospice | 12% (26) | 69% (118) | 88% (188) | 31% (54) | < 0.001 |
| Attendants | | | | | | |
| B | DNR | 94% (60) | 63% (118) | 6% (4) | 37% (69) | < 0.001 |
| C | Full code | 65% (40) | 76% (139) | 36% (22) | 24% (43) | 0.013 |
| E | Hospice | 6% (3) | 51% (89) | 94% (51) | 49% (87) | 0.003 |

DNR = Do-Not-Resuscitate orders.

* Compared to Scenario A (unspecified code/care status) (see Table 4).

(12). Our nationwide results further suggest that most physicians misinterpret a living will as a DNR designation and associate DNR orders with comfort care/end-of-life care. Our results indicate that patients nationwide are at risk of not receiving life-saving interventions if they have a living will or DNR order. Additionally, one could debate that a living will or DNR order should have no place in the initial resuscitation of a critically ill patient. In Emergency Departments, patients may be incapable of making decisions; however, that may be temporary and often there are too many unknowns as to the patient's existing or even established advanced care plan. Concerns also arise as to whether informed consent was truly obtained. Physicians, when discussing DNR and end-of-life issues with patients, spend 5.6 min on the topic and speak for two-thirds of the conversation (20). Questions could arise as to whether this is enough time for a layperson to be adequately informed and appropriately consented. Furthermore, attorneys who create large numbers of advance directives do not have the medical scope of practice to inform the patient with respect to reversible and treatable conditions that often present with acute exacerbations (e.g., congestive heart failure, chronic obstructive pulmonary disease).

Our data reveal that adding patient context to this document improves but does not fully provide sufficient information for physicians to correctly determine the code status and appropriate resuscitation measures. Adding code status to this document either further improves comprehension or confounds it. Specifically, when adding the code status DNR to the living will, providers were more likely to withhold life-saving interventions. This supports the suggestion that providers do not understand the legal and societal policy meaning of the term DNR. Societal policy, set by a Presidential Directive, Vet-

erans Health Administration policy, and American Medical Association Code of Medical Ethics (opinion 2.22), states that any DNR order should have no implications on any other treatment decisions other than the order not to perform CPR (21–23).

We did reveal that the term Hospice Care/Comfort Care was likely to be associated with withholding life-saving interventions. This holds promise as a way to better identify patients who do not wish to receive aggressive life-saving interventions. However, this further supports the relation that providers associate DNR with end-of-life care. The pre-hospital DNR Act and order, in states where available, is proposed to identify these patients who do not wish to have 911 activated (24). However, a recent report questions the education and understanding of these orders among providers and portrays how confusion can compromise patient care and safety (25).

A confounding issue was noted when the term 'Full Code' was added to the living will. Normally, it is assumed that all patients are full code and that life-saving interventions are enacted when patients present with a living will unless there is evidence it's been enacted. Adding 'Full Code' as a code status should merely reinforce this notion. Nonetheless, only 67% of respondents chose full code, despite this designation. We suspect this reflected confusion or misinterpretation, given that sample living will declined life-saving intervention (Figure 3, Scenario C). It is clear from the data that misunderstanding pervades medical specialties and is not resolved by the current instructional curricula involving advance directives training and end-of-life decision-making. These curricula may be influencing how states educate and deploy their programs related to pre-hospital DNR Acts.

Our results offer states with Patient Safety Organizations with reporting systems the ability to query databases to investigate this new patient safety concern. The Pennsylvania Patient Safety Advisory (PA-PSRS) released a special report (26). PA-PSRS reports received between June 2004 and September 2008 revealed that misinterpretation of living wills and DNR orders may have inadvertently resulted in the provision of unwanted care or the withdrawal or withholding of otherwise appropriate interventions (26).

Content validity of the survey was established by independent legal review. Construct and criterion validity have yet to be established. Reliability, utilizing split-halves approach, was "substantial" based upon criteria of Landis and Koch (1977) (15). We note that a small percentage of respondents changed their minds. We noted that patient scenarios provided context and helped to "prime" or shape some of the responses. In survey research, the questions, their structure, and order help to shape context for respondents (27). This makes assessment of reliability challenging, especially in light of the significance attached to queries about a living will. We suspect that some of those who changed their minds were responding to contextual clues inherent in the survey design and content. Overall, we submit that the data are reliable, with validity established by content review.

Limitations

Our sample size is small, however, due to its nationwide sampling, does support that the results are generalizable. There are limitations related to the sampling and enrollment as we could not identify all that had the ability to participate in this survey. Additionally, all who responded, as this was voluntary, may have an interest in the subject matter, which then raises the concern of selection bias. Our study is also limited as it does not account for the more specialized subspecialty areas (e.g., Cardiology, Orthopedic Surgery). In our experience, the more sub-specialized the physician, the less of an understanding they have as far as living wills and DNR orders. Lastly, contextual wording and survey structure may have influenced how participants responded.

CONCLUSION

Did this TRIAD III study identify a safety concern with advance directives or did it reveal a significant nationwide misunderstanding regarding advance directives? Our results indicate that most living wills are perceived as DNR orders and most DNR orders are perceived as end-of-life care. Furthermore, there are considerable differences related to variable interpretation, understanding,

and applicability to initial aspects of life-saving resuscitative care. The resolution to this problem is not simple and should prompt reevaluation of current educational curricula. Addition of code status designation may help to improve health care provider understanding and may lead to a more accurate provision or withholding of life-saving care. Further multicenter and nationwide research related to patient safety is required if we are going to ensure safety and understanding and provide appropriate care to our patients.

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ARTICLE SUMMARY

1. Why is this topic important?

Living wills have become commonplace, and our results indicate that most living wills are perceived as do-not-resuscitate (DNR) orders, and most DNR orders are perceived as end-of-life care. Furthermore, there are considerable differences related to variable interpretation, understanding, and applicability to initial aspects of life-saving resuscitative care.

2. What does this study attempt to show?

This study reveals a nationwide problem with the understanding of living wills and DNR orders and how they may impact patient care. It also reveals that the addition of a code status designation can improve understanding and ensure the appropriate level of treatment.

3. What are the key findings?

We found that the structure of the living will when declining life-saving care is presumed to be enacted and equated with a DNR order. When the living will is present with the patient who experiences a critical illness, it has the potential to limit or delay life-saving care.

4. How is patient care impacted?

This study provides clarification as to when a living will is enacted and promotes patient care and safety. The addition of code status designation may help to improve health care provider understanding and may lead to a more accurate provision or withholding of life-saving care.