

# TRIAD VI: How Well Do Emergency Physicians Understand Physicians Orders for Life Sustaining Treatment (POLST) Forms?

Ferdinando L. Mirarchi, DO, FAAEM, FACEP,\* Ankur A. Doshi, MD,† Samuel W. Zerkle, DO,\* and Timothy E. Cooney, MS‡

**Background:** Physician Orders for Life-Sustaining Treatment (POLST) documents are active medical orders to be followed with intention to bridge treatment across health care systems. We hypothesized that these forms can be confusing and jeopardize patient safety.

**Objectives:** The aim of this study was to determine whether POLST documents are confusing in the emergency department setting and how confusion impacts the provision or withholding of lifesaving interventions.

**Methods:** Members of the Pennsylvania chapter of the American College of Emergency Physicians were surveyed between September and October 2013. Respondents were to determine code status and treatment decisions in scenarios of critically ill patients with POLST documents who emergently arrest. Combinations of resuscitations (do not resuscitate [DNR], cardiopulmonary resuscitation) and levels of treatment (full, limited, comfort measures) were represented. Responses were summarized as percentages and analyzed by subgroup using the Fisher exact test.  $P = 0.05$  was considered significant. We defined confusion in response as absence of consensus (supermajority of 95%).

**Results:** Our response rate was 26% (223/855). For scenarios specifying DNR and either full or limited treatment, most chose DNR (59%–84%) and 25% to 75% chose resuscitation. When the POLST specified DNR with comfort measures, 90% selected DNR and withheld resuscitation. When cardiopulmonary resuscitation/full treatment was presented, 95% selected “full code” and resuscitation. Physician age and experience significantly affected response rates; prior POLST education had no impact. In most scenarios depicted, responses reflected confusion over its interpretation.

**Conclusions:** Significant confusion exists among members of the Pennsylvania chapter of the American College of Emergency Physicians regarding the use of POLST in critically ill patients. This confusion poses risk to patient safety. Additional training and/or safeguards are needed to allow patient choice as well as protect their safety.

**Key Words:** Pa-ACEP, POLST, DNR, confusion, patient safety

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Honoring patient prerogatives for patients who are incompetent to provide instructions (unconscious or with dementia) requires direction from an appointed proxy (Power of Attorney nearest relative) or written instructions. When a proxy is unavailable, written instructions form the sole basis for treatment decision making. Given that the intent is to provide care consistent with patient wishes (neither overtreating or undertreating),

understanding these written documents is an imperative. If fidelity to patient intent is the goal, at least some written documents fall short. Our studies suggest, for example, that living wills can be misunderstood.<sup>1–3</sup> Others have suggested that treatment decisions based on a living will may not be straightforward in some situations<sup>4,5</sup> and may fail to reflect patient preference when substituted judgment (proxy) is used.<sup>6</sup> The scope of the problem is significant because the proportion of those older than 65 years with a living will is upward of 35% according to the Centers for Disease Control and Prevention.<sup>7</sup> Evidence suggests that physicians are undertrained in the interpretation of advance directives.<sup>2</sup> Paradoxically, training sometimes yields little improved understanding and comprehension.<sup>8</sup>

Misunderstanding aside, another problematic area for a living will is portability: it frequently does not accompany patients during transfers (cited by Wenger et al,<sup>9</sup> 2012). Physician orders, in the form of Out-of-Hospital Do-Not-Resuscitate (DNR) orders, have been used to bridge the gap in directing care during transfers and to curtail unwanted resuscitations by paramedics.<sup>10</sup> However, DNRs, too, have been subject to misinterpretation, resulting in compromised care to patients.<sup>11,12</sup> As well, these orders are restrictive in focus—they do not provide clear guidance in terms of preferences if resuscitation is irrelevant.

In an attempt to remedy some of the deficiencies of the living will and Out-of-Hospital DNR orders, the Physician Orders for Life-Sustaining Treatment (POLST) has been added to the cache of patient documents. Use of the POLST has received national recognition and policy support and is being rapidly enacted across the United States; at least 20 states have launched POLST initiatives.<sup>13</sup> As further attestation of its adoption, Hickman et al<sup>14</sup> (2004) found that POLST forms were used by 71% of nursing homes in Oregon. Another survey of the Portland area found that emergency medical technicians perceived the form helpful in 93% of cardiac arrest scenarios but in only 63% of non-cardiac arrest scenarios.<sup>15</sup>

The emergence of POLST reflects a so-called paradigm shift, from that of a legal transaction to one of portable, goal-oriented, end-of-life treatment. It is distinct from a living will in that it is not an advance directive but rather activated physician medical orders that become part of the medical record and are to be followed by other medical personnel. Although these are physician medical orders, 70% are often completed by nonphysicians but are activated by a physician's signature.<sup>16</sup> The POLST is a brightly colored form (Fig. 1) and attempts to address the issue of intervention and care when patients present in cardiac arrest or requiring life-sustaining treatment. The POLST form follows a treatment hierarchy, starting with resuscitation if the patient has had cardiac arrest (orders for cardiopulmonary resuscitation [CPR] or DNR, Box A of the POLST form) and followed by care when not in cardiac arrest (Box B, comfort care, limited care, or full treatment). These selections on the POLST form represent the focus of the present study. If understanding written documents is the imperative, assessing

From the \*Department of Emergency Medicine, University of Pittsburgh Medical Center Hamot, Erie; †University of Pittsburgh School of Medicine, Pittsburgh; and ‡Basic Science Research, University of Pittsburgh Medical Center Hamot, Erie, Pennsylvania.

Correspondence: Ferdinando L. Mirarchi, DO, FAAEM, FACEP, Department of Emergency Medicine, University of Pittsburgh Medical Center Hamot, 201 State St, Erie, PA 16550 (e-mail: mirarchifl@upmc.edu).

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The form is titled "Pennsylvania Orders for Life-Sustaining Treatment (POLST)". It includes a header with the Pennsylvania Department of Health logo and instructions: "SEND FORM WITH PERSON WHENEVER TRANSFERRED OR DISCHARGED. To follow these orders, an EMS provider must have an order from his/her medical command physician." The form is divided into several sections:

- Section A:** "CARDIOPULMONARY RESUSCITATION (CPR): Person has no pulse and is not breathing." It includes checkboxes for "CPR/Attempt Resuscitation" and "DNR/Do Not Attempt Resuscitation (Allow Natural Death)".
- Section B:** "MEDICAL INTERVENTIONS: Person has pulse and/or is breathing." It includes checkboxes for "COMFORT MEASURES ONLY", "LIMITED ADDITIONAL INTERVENTIONS", and "FULL TREATMENT".
- Section C:** "ANTIBIOTICS:" and "ARTIFICIALLY ADMINISTERED HYDRATION / NUTRITION:". It includes checkboxes for antibiotic use and hydration/nutrition options.
- Section E:** "SUMMARY OF GOALS, MEDICAL CONDITION AND SIGNATURES." It includes a section for "Patient Goals/Medical Condition" and a section for "Signatures of Patient or Surrogate" with fields for name, title, and relationship to patient.

FIGURE 1. POLST document.

comprehension of POLST forms should assume high priority especially in light of its current level of dissemination.

As POLST continues to gain momentum, how well are POLST documents comprehended and do they result in treatment consistent with patient wishes? As with any document that directs patient care, emergent treatment situations require clarity because time is a matter of saving life or withholding treatment and allowing death to naturally occur. Therefore, 2 criteria emerge for POLST documents: fidelity to patient treatment preferences and clarity (e.g., easily comprehended). Reporting on the agreement between POLST documents and treatment by emergency services in Oregon, Richardson et al<sup>17</sup> (2014) reported that 84% of those who wanted CPR were resuscitated and 78% of those with DNR did not receive resuscitation. Their data suggest rates of discordant treatment of between 16% and 22% for overtreatment and undertreatment. Is this acceptable?

When examined under the scrutiny of document clarity, several state-based POLST Web sites have intimated that some issues exist. California issued a white paper suggesting 250 changes,<sup>18</sup> and Delaware issued a statewide declaration to discontinue the use of POLST because it was being inappropriately used.<sup>19</sup> Rather than a standardized content, POLST forms have undergone modification or have been adapted to specific patient populations or types of treatment facilities,<sup>20–22</sup> which could complicate implementing educational programs. Regarding education, we are unaware of any specific educational requirements for using this document. Finally, POLST was never fully tested for patient safety with respect to critically ill patients before its advocacy and use.

Because there are some indications that POLST documents are not fully understood, the present study sought to evaluate physician understanding of POLST, as a stand-alone document and in the context of clinical scenarios, recreated from the medical peer

review process, involving critically ill patients. We hypothesized that, in this context, the POLST document can be confusing.

## METHODS

This was an Internet survey-based (SurveyMonkey, Palo Alto, CA) study designed as a prospective convenience sample of members of the Pennsylvania Chapter of the American College of Emergency Physicians (Pa-ACEP; 855 members). The survey required participants to review POLST forms (Fig. 1), which portrayed several levels of intervention, from DNR/comfort care to CPR/full code. Questions prompted respondents to select a code status and determine whether to intervene on the basis of clinical scenarios (Table 1). The initial set of questions merely portrayed a POLST document formatted as DNR/full treatment and asked the respondents to assign a code status (DNR, full code, or unsure) and define DNR (full care or comfort care/end-of-life care). Ensuing scenarios portrayed patients who present critically ill and then lapse into cardiac or respiratory arrest. For scenarios A to D, POLST forms specified DNR with full or limited treatment. Scenario D duplicated the content of A to allow determination of the respondents' response consistency/reliability. Scenario E used a POLST document specifying DNR and comfort measures; and scenario F, CPR and full treatment.

A final set of questions sought to understand the respondents' comfort with the POLST. One question asked whether the respondents felt that patients were adequately informed when they consented to treatment limitations. A follow-up asked whether the respondents were comfortable withholding these treatment limitations on the basis of the perception of informed consent. Response choices for the former were "yes," "no," and "unsure"; and for the latter, "very comfortable," "comfortable," and "not very comfortable."

For the purposes of this study and because these are life-or-death decisions, we defined consensus as a supermajority of 95% or more, consistent with precedent.<sup>23</sup> Given the inherent sampling error, we used the lower bounds of the 95% confidence interval of this threshold, 92%, as the cutoff. Response rates that failed to attain this threshold failed to show consensus, suggesting misunderstanding and/or confusion by the respondents.

Responses were anonymous, and written consent was not sought. Prefacing remarks noted the voluntary nature of the study and advised the respondents that completing the survey was evidence of consent. The Pa-ACEP study was approved by the hospital institutional review board, distributed by Pa-ACEP and conducted during a 4-week period, and concluded October 2013.

The survey design was consistent with tenets of survey design as described by Carmines and Zeller<sup>24</sup> (1979). Validity was strictly based on both face and content as determined by expert review. Reliability was assessed by a variant of the split-halves method via duplication of a scenario (scenarios A and D were identical). By precedent, an alpha of 0.7 is considered acceptable internal consistency and hence internal reliability.<sup>25</sup> Our prior studies formed the basis for the present survey. These surveys have demonstrated acceptable intrarater agreement, internal consistency, and content validity.<sup>1–3</sup>

Data were summarized as overall rates for choosing code status and treatment decisions. The McNemar test was used to analyze the degree to which the respondents changed coding responses on the basis of like scenarios (A, B, E). Given that repeated pairings were contrasted, a Bonferroni correction was used on the threshold for significance (0.05/3 paired comparisons = 0.017). Subgroup analysis was used to determine whether demographic characteristics (sex, age, experience, etc) exerted an impact on these rates, based on the  $\chi^2$  or the Fisher exact test. On the basis of prior

**TABLE 1.** Survey Scenarios and Questions

Condition	POLST Document	Patient Hx/Signs/Sx	Questions
Stand-alone POLST document	Section A: DNR Section B: full treatment	N/A	1. Patient code status a. DNR b. Full code 2. Define DNR a. Full care b. Comfort care
POLST + scenario A	Section A: DNR Section B: full treatment	A 66-y-old woman with chest pain, SOB, and diaphoresis. Vital signs: P, 110; RR, 30; SaO <sub>2</sub> , 97% RA; T, 37°C; BP, 130/70. The patient was given O <sub>2</sub> , aspirin, and nitroglycerin en route. Prehospital ECG shows acute ST elevation anterior wall MI. List of medications and POLST document available. Abruptly the patients clinical status changes, becomes unresponsive and goes into VT/VF arrest.	1. Patient code status a. DNR b. Full code c. Unsure 2. Intervention decision: a. Defibrillate b. Do not defibrillate c. Unsure
POLST + scenario B	Section A: DNR  Section B: limited intervention	A 70-y-old man is experiencing chest pain, is clammy, and is in mild distress. Hx of DM, HTN, dyslipidemia, and CAD status post CABG 10 y ago. Vital signs: T, 36°C; P, 60; BP, 100/60; RR, 22; SaO <sub>2</sub> , 98% RA. List of medications and POLST provided. Abruptly, the patient becomes unresponsive, with no palpable pulses. The monitor shows VF.	1. Patient code status a. DNR b. Full code c. Unsure 2. Intervention decision: a. Defibrillate b. Do not defibrillate c. Unsure
POLST + scenario C	Section A: DNR	An 87-y-old man with SOB is agitated, confused, and in severe respiratory distress. Vital signs: P, 130; RR, 50; BP, 70/50; T, 37°C; SaO <sub>2</sub> , 78% on nonrebreather. List of medications and POLST document provided. The patient abruptly goes into respiratory arrest.	1. Patient code status a. DNR b. Full code c. Unsure 2. Intervention decision: a. Intubate b. Do not intubate c. Unsure
POLST + scenario D	Section B: full treatment	Duplication of POLST + scenario A	Same questions as A
POLST + scenario E	Section A: DNR  Section B: comfort measures	A 52-y-old man with SOB, chest pain, and diaphoresis. Vital signs: P, 110; RR, 30; SaO <sub>2</sub> , 97% RA; T, 37°C; BP, 130/70. The patient was given O <sub>2</sub> , aspirin, and nitroglycerin en route. Prehospital ECG shows acute ST elevation anterior wall MI. List of medications and POLST document provided. Abruptly, he becomes unresponsive and develops respiratory arrest in the emergency department.	1. Patient code status 2. Intervention decision: a. Intubate b. Do not intubate c. Unsure
POLST + scenario F	Section A: CPR Section B: full treatment	A 90-y-old man with sudden-onset SOB. The patient is confused, agitated, and in severe respiratory distress. Vital signs: P, 120; RR, 46; BP, 84/60; T, 37°C; SaO <sub>2</sub> , 72% on nonrebreather. List of medications and POLST provided. Abruptly, the patient goes into respiratory arrest.	1. Patient code status 2. Intervention decision: a. Intubate b. Do not intubate c. Unsure

BP, blood pressure; CABG, coronary artery bypass grafting; CAD, coronary artery disease; DM, diabetes mellitus; ECG, electrocardiogram; HTN, hypertension; Hx, history; MI, myocardial infarction; N/A, not applicable; P, pulse; RA, room air; RR, respiratory rate; SaO<sub>2</sub>, oxygen saturation, arterial; SOB, shortness of breath; Sx, symptoms; T, temperature; VF, ventricular fibrillation; VT, ventricular tachycardia.

**TABLE 2.** Respondent Demographics/Characteristics\*

Age	42 (11.8) y
Sex (n = 164)	
Male	54% (121)
Female	19% (43)
Undisclosed	27% (54)
Experience (n = 165)	
Resident	19% (32)
Attending	81% (133)
Specialty (n = 164)	
Emergency medicine	99% (163)
Family practice	<1% (1)
Board certification (n = 163)	
Yes	77% (125)
No	23% (38)
Region of residency training (n = 153)	
Northeast	84% (128)
Midwest	9% (13)
South	4% (6)
West	2% (3)
Northeast and South	2% (3)
Comfortable withholding treatment (n = 165)	
Not very	15% (24)
Comfortable	41% (67)
Very comfortable	45% (74)
POLST training (n = 166)	
Yes	36% (60)
No	64% (106)
Hours of POLST training* (n = 48)	1.3 (1.0)

\*Either formal (classroom) or informal (literature).

study,<sup>1</sup> a priori power analysis indicated that 45 participants per group were needed to discriminate differences of at least 25% in patient code responses for subgroup analysis. Type I and II error levels of 0.05 and 0.2, respectively, were used in the calculation. For paired comparisons, this sample size would afford 90% power to detect a 25% difference. Survey reliability and internal consistency were assessed using a test-retest approach (scenarios A versus D) and measured using Cronbach statistic. For these tests, the threshold for type I errors (alpha) was set at 0.05. SPSS version 12.0 (Chicago, IL) was used for all statistical tests and data reduction.

**RESULTS**

**Demographics**

Of the 855 members of the Pa-ACEP, 223 provided responses (26%). Of these responders, between 161 and 165 supplied demographics (Table 2). The mean age of the respondents was 42 years, and approximately half were men (54%). Attending physicians constituted 81%, and 36% of the participants received POLST training for a mean (SD) of 1.3 (1.0) hours.

**Overall Responses**

When shown only a POLST document denoting DNR/full treatment, 59% selected DNR, 14% selected full code, and 27% were unsure of the code status (Table 3). Approximately half of the respondents construed DNR as comfort care/end-of-life care.

**TABLE 3.** Overall Responses

Information Presented	POLST Document Notation	Code Status	Care	Coding/Care Consensus:*	Decision to Resuscitate	Resuscitation Consensus:*
POLST document	DNR/full treatment	59% (128)	27% (58)	No	N/A	—
Meaning of DNR	—	N/A	53% (111)	45% (97)	No	N/A
Scenario A	DNR/full treatment	62% (117)	16% (31)	No	49% (94)	No
Scenario B	DNR/limited treatment	84% (155)	9% (16)	No	25% (46)	No
Scenario C	DNR/full treatment	59% (106)	17% (30)	No	74% (132)	No
Scenario D	DNR/full treatment	65% (113)	20% (34)	No	50% (86)	No
Scenario E	DNR/CMO	90% (153)	4% (8)	No	11% (18)	No
Scenario F	CPR/full treatment	5% (9)	1% (2)	Yes	95% (159)	Yes

\*Based on a minimum 92% response rate—see Methods for explanation. CMO, comfort measures only; N/A, not applicable.

**TABLE 4.** Paired Comparisons of Responses to Similar Scenarios\*

Comparison	Coding Decision Unchanged				Coding Changed				P
	DNR → DNR	FC → FC	UNS → UNS	Total	DNR ↔ FC	DNR ↔ UNS	FC ↔ UNS	Total	
A:B	97% (114)	29% (11)	23% (7)	71% (132)	41% (22)	44% (24)	15% (8)	32% (54)	<0.0001
A:E	91% (108)	6% (7)	3% (4)	69% (119)	51% (27)	42% (22)	7% (4)	31% (53)	<0.0001
B:E	95% (137)	2% (3)	2% (3)	83% (143)	47% (14)	43% (13)	10% (3)	17% (30)	0.334

\*Bonferroni-corrected level of significance:  $P = 0.017$ .

FC, full code; UNS, unsure.

For scenarios A to D, which specified DNR and either full or limited treatment, most of the respondents chose DNR as the appropriate patient code status (59%–84%). When the POLST document specified either DNR with comfort measures (scenario E) or CPR with full treatment (scenario F), the respondents selected either DNR or full code nearly exclusively. On the basis of our criterion, 13% (1/8) of code status/care questions and 17% (1/6) of questions about intervention led to consensus.

For similar scenarios (A, B, E), between 17% and 32% of the respondents changed their answers (Table 4). In 2 of the 3 comparisons, the percentage of those who changed coding answers was highly significant and satisfied the threshold imposed by Bonferroni correction (31%–32%,  $P < 0.0001$ ).

The majority of respondents generally expressed agreement that they were comfortable with the adequacy of patient informed consent as well as limiting treatment as denoted on POLST documents. For the comfort with consent, 40% (89/223) agreed, 13% (29/223) disagreed, 21% (47/223) were unsure, and 26% (58/223) did not provide a response. For comfort with limiting treatment, 63% (141/223) were either “very comfortable” or “comfortable,” 11% (24/223) were uncomfortable, and 26% (58) did not provide a response. Responses to these questions failed to reach consensus.

### Subgroup Analysis

Sex exerted little or no effect on responses (Table 5). The maximum difference in rates of response between the male and female physicians was 9% across all scenarios ( $P = 0.052$ ). None of these differences reached the established threshold for significance.

By contrast, age of the physician affected responses. For physicians 40 years or older, rates of choosing DNR were between 17% and 31% lower than younger physicians for 3 of the 6 scenarios as well as the stand-alone POLST document ( $P = 0.008$ ). In 3 of 6 scenarios, treatment decisions varied by 17% to 18% ( $P \leq 0.040$ ).

Similarly, physician experience (as characterized by the dichotomy of “attending” versus “resident”) also affected rates of responses. The rates of choosing DNR by the attendings for 2 of the 6 scenarios as well as the stand-alone POLST were significantly less than the residents (19%–32%,  $P = 0.029$ ). Decisions to resuscitate were higher for the attendings in 2 of 6 scenarios, but these differences were not significant (13%–19%,  $P = 0.075$ ).

Prior POLST training had little effect on either rates of choosing DNR or treatment decisions. Differences for the former varied, up to –8% to +13% ( $P = 0.075$ ). For the latter, differences in rates were not significant (0% to –13%,  $P = 0.058$ ). One exception was scenario E, for which training affected treatment decisions by 14% ( $P = 0.003$ ).

Level of comfort with treatment-limiting POLST had little effect on choosing code status or correct decisions. Differences in the decision to assign a DNR status varied from –6.6% to 13.1%; the latter was significant, however ( $P = 0.029$ ).

Differences in rates of treatment decisions were similarly varied, from –9.7% to +11.3% ( $P = 0.297$ ).

### Consistency in Survey Responses

Comparison of scenario A and scenario D (identical scenarios) showed acceptable consistency for code status (0.791) and treatment decision (0.825).

### DISCUSSION

The POLST provides medical orders that are to be universally honored across various health care settings. It has become a national paradigm and has rapidly become embraced. The POLST is to be used for patients who are of “progressive chronic illness or frailty, in whom it would not be surprising if they died suddenly within a year.”<sup>26</sup> It has generally been adapted for use for those who are of advanced age, terminal conditions, and advanced illness; patients expected to die within 6 months to 1 year; residents of nursing homes; and those in palliative care/hospice care. However, even with national recommendations, states can customize their POLST process, as recently seen in Maryland, to be more inclusive, adding assisted living programs, home health agencies, kidney dialysis centers, as well as all patient admissions and transfers.<sup>20</sup> In addition, states can customize form content, color, formatting, and the orders it contains. These changes, perceived as minor, may produce unintended consequences affecting patient safety.

Studies during the past decade indicate fidelity of treatment to POLST orders as well as its usefulness in directing care. Reports of nursing home residents suggest that DNR indications were upheld,<sup>27</sup> medical interventions were consistent with the level selected,<sup>26</sup> and POLST documents were consistent with patients’ treatment goals 90% of the time.<sup>28</sup> Studies of emergency medical services providers support the nursing home data. As stated, a survey of the Portland-area emergency medical technicians perceived the form helpful in 93% of cardiac arrest scenarios but in only 63% of non-cardiac arrest scenarios.<sup>15</sup> A study by Richardson et al (2014) reported that 94% of patients with a POLST order of DNR died before hospital admission. This finding alone could have a major impact on the \$170 billion annually spent on end-of-life care expenditures.<sup>29</sup> This same study reported that 84% of those who wanted CPR were resuscitated and 78% of those with DNR did not receive resuscitation.<sup>17</sup> This supports our mounting concern because some of these studies clearly indicate that not all treatment was consistent with intent of the POLST form. Further, these studies do not ensure informed consent on the part of the patient because this has yet to be determined by any published study.

The present study stands at odds with some of these reports of the utility of the POLST document. In particular, we previously have shown that adding patient code status to a living will is helpful but does not fully resolve the ambiguity of the document.<sup>2</sup> It

**TABLE 5.** Subgroup Analysis

Respondent Subgroup	Condition	Difference in Rates,* Coding DNR	Coding P Value†	Difference in Rates,* Tx	Tx P Value
Sex: female (versus male) (n = 163)	std POLST	9%	0.596	—	—
	Scenario A	−2%	0.591	3%	0.859
	Scenario B	2%	0.957‡	6%	0.532
	Scenario C	−8%	0.620	0%	>0.999
	Scenario D	−1%	0.726	0%	>0.999
	Scenario E	−5%	0.052‡	−2%	0.774‡
	Scenario F	−1%	0.719‡	4%	0.682‡
Age: 40 y (versus <40 y) (n = 160)	std POLST	−26%	<b>0.001</b>	—	—
	Scenario A	−28%	<b>0.001</b>	17%	<b>0.040</b>
	Scenario B	−17%	<b>0.008</b>	13%	0.065
	Scenario C	−6%	0.560	−19%	<b>0.011</b>
	Scenario D	−31%	< <b>0.0001</b>	18%	<b>0.027</b>
	Scenario E	−6%	0.316‡	−3%	0.589‡
	Scenario F	1%	0.574‡	−2%	0.719‡
Experience: attending (versus resident) (n = 163)	std POLST	−29%	<b>0.012</b>	—	—
	Scenario A	−20%	0.058	19%	<b>0.075</b>
	Scenario B	−19%	<b>0.029</b>	13%	0.110
	Scenario C	−16%	0.248	−1%	>0.999
	Scenario D	−32%	<b>0.003‡</b>	17%	0.110
	Scenario E	−7%	0.309‡	−6%	0.530‡
	Scenario F	−4%	0.442‡	2%	0.654‡
POLST training: yes (versus no) (n = 166)	std POLST	−8%	0.163	—	—
	Scenario A	1%	0.824	0%	>0.999
	Scenario B	13%	0.075‡	−13%	0.058
	Scenario C	6%	0.698	−4%	0.579
	Scenario D	5%	0.321	−6%	0.515
	Scenario E	11%	<b>0.041‡</b>	14%	<b>0.003</b>
	Scenario F	4%	0.268‡	−3%	0.458‡
Level of comfort with limiting Tx: “not very” (versus “comfortable”/“very comfortable”) (n = 164)	std POLST	2.5%	0.772‡	—	—
	Scenario A	−1.8%	0.820‡	−1.0%	>0.999
	Scenario B	−6.6%	0.634‡	11.3%	0.297
	Scenario C	−5.4%	0.185‡	−9.7%	0.315
	Scenario D	2.4%	0.558‡	0%	>0.999
	Scenario E	5.7%	0.554‡	3%	>0.999‡
	Scenario F	13.1%	<b>0.029‡</b>	−8.9%	0.094‡

Values in bold represent statistically significant differences.

\*Positive difference: rate of specified level of the variable is higher by amount denoted; negative difference: rate is lower as denoted.

†P = 0.05 threshold for significance.

‡Approximate P value.

Tx, treatment.

was not surprising then that POLST orders can be confusing. Our survey data suggest that between 59% and 84% of respondents chose DNR as the appropriate code for clinical scenarios involving a POLST document that specifies DNR for cardiopulmonary arrest and either full or limited treatment for emergent conditions. Up to 20% of responses reflected uncertainty (respondent unsure of the answer). Decisions to provide resuscitation varied from 25% to 74% for clinical scenarios involving a POLST form that specified DNR. On the basis of the criteria we posited (95% concordance), it is clear that consensus was absent for most of the survey responses. In turn, we interpret this as reflecting misunderstanding and confusion about this document. When POLST documentation provided a more consistent treatment picture (e.g., when either DNR/comfort measures only or CPR/full treatment was specified),

correct treatment responses improved to 90% to 95%. This suggests that the POLST document may be viewed (and interpreted) in a holistic manner rather than a strict hierarchical algorithm.

It is likely that this misunderstanding is not confined to just the population under study. Initial POLST research may have forewarned of concerns that could develop. Before Oregon’s statewide adoption of POLST, a so-called Medical Treatment Coversheet was piloted and shown to result in inappropriate withholding of advanced emergency treatment by 18% of acute care providers.<sup>30</sup> More recently, California issued a white paper suggesting 250 changes,<sup>18</sup> and Delaware issued a statewide declaration to discontinue the use of POLST because it was being inappropriately used.<sup>19</sup> In their analysis of POLST registry data from Oregon, Fromme et al<sup>31</sup> noted that half of the orders that specified DNR also included either

**ABCDE's of the Living Will, DNR or POLST— Medical Provider**

- **A – Ask** the patient or surrogate to be clear as to their intentions of their advance directive (Living Will, DNR order or POLST form).
- **B – Be clear** as to if this is a terminal condition despite sound medical treatment, PVS vs. a treatable critical illness.
- **C – Communicate** clearly if you feel the condition is reversible and treatable with a good or poor prognostic outcome.
- **D – Design a plan and discuss next steps.** For example, your mom is critically ill. We can give her a trial of instituting life-sustaining care for 48 to 72 hours and if there is no benefit we can withdraw life supporting care and provide comfort measures.
- **E – Explain** that it's ok to withhold or withdraw life sustaining care and treatment so long as it's in keeping with the perceived patients' wishes. Also, take a moment to "Explain" the benefits of Palliative Care and Hospice.

FIGURE 2. Resuscitation pause.

full or limited treatment for noncardiac, life-threatening conditions. Their conclusion: although the DNR order does not mean “do not treat,” there is substantial evidence that DNR orders influence care more broadly. Despite their conclusion, the POLST form and process are still being advocated for nationwide adoption and use. Another recent study affirms this concern as early DNR designated within 24 hours of out-of-hospital cardiac arrest revealed statistically significant decreases in critical hospital interventions, procedures, and survival to discharge. It affirms that early advance care planning completion with DNR designated within 24 hours is premature given the early lack of prognostic indicators after out-of-hospital cardiac arrest.<sup>32</sup> In addition, registry data illustrate why clinicians should not use the term *DNR* to infer more than an order specific to resuscitation only, regarding the patient's wishes. We suggest, then, that our data are consonant with prior reports and indicate that POLST forms can be misinterpreted.

The ideal conception and implementation of POLST orders, as well as advance directives and DNR orders, should have their basis on in-depth and frequent communication between the physician and the patient. Bomba et al<sup>33</sup> (2012) note, “Shared medical decision-making must be well-informed.” In this regard, are patients provided adequate information that is consonant with informed consent? For example, for patients who agree to DNR/limited intervention, does this include refusal to both airway intervention as well as defibrillation? Are patients agreeable to not receive life-saving defibrillation in the setting of a critical yet treatable illness in which advanced cardiac life support could be provided, saving the patient's life immediately? Cardiac arrest, in the past, had dismal outcomes; however, depending on the etiology, medical advances related to induced hypothermia has produced dramatic improvements in outcomes, with predictors of outcomes being extended into the period of 24 to 72 hours.<sup>34,35</sup> Finally, as noted by Miller<sup>36</sup> (2009), a standardized, limited order set is not a substitute for a well-defined treatment plan and a thoroughly informed surrogate.

Our results reveal clinical and safety issues related to confusion. The American Bar Association has a POLST legislative guide created and approved by both the Bar Association and the National POLST Paradigm Task Force. The guide specifically recommends that POLST documents be reviewed periodically and specifically when (1) the patient is transferred from one care setting or care level to another, (2) there is a substantial change in the patient's health status, and (3) the patient's goals or treatment preferences change.<sup>37</sup> With this requirement and in addition to the necessary communication component of physician orders and advance directives, the addition of safeguards is possible. The ABC (airway, breathing, and circulation) mnemonic has proven useful in resuscitative medicine, especially as it relates to certification processes, for example, course work and certifications in advanced cardiac life support, pediatric advanced

life support, and advanced trauma life support. The *surgical pause* is a hospital safeguard used to resolve issues of wrong patient or wrong-site surgery. Combining the two creates a *resuscitation pause* or an *advance directive pause*, which acts as a rapid and simplistic patient safety checklist<sup>38</sup> (Fig. 2). This could be applied to all acts of resuscitation (not only cardiac arrest) when encountering any document.

**Limitations**

The present study has limitations. The respondents were derived from 1 state of a nationwide professional organization. In addition, the response rate was 26% but is consistent with previous research directed by Pa-ACEP that typically produces a response rate of 25%. Despite these limitations, these findings are very unlikely to be limited to Pennsylvania alone because there is little difference in the practice and curriculum of emergency medicine across the country.

Another issue pertains to a suitable level of consensus decisions in the context of resuscitation. We chose consensus with a supermajority value of 95% and provide precedent on the basis of educational objectives. Some readers may find this value unacceptable because it accepts a 5% error rate. As well, a consensus of response (or opinion) does not necessarily equate to “correct” decisions.

Randomization was not used in ordering the questions in this survey. It is known that the survey context effects exert effects on survey responses.<sup>39,40</sup> It is entirely possible that context effects were operational and were responsible for some of the changes in responses we observed for similar scenarios (cited in the Results).

Finally, we are unaware of any data to date showing the correlation between responses to written scenarios versus decisions in actual emergent conditions with critically ill patients. This deficiency is universal to all survey research, although our findings are consistent with other literature.

**CONCLUSIONS**

Our data suggest that POLST orders can be confusing for Pennsylvania emergency physicians and, likely, for physicians nationwide. Continued research, education, possible licensure requirements, and safeguards (such as the Resuscitation Pause patient safety checklist) are necessary to ensure both patient autonomy and appropriate care for portable documents involving treatment instructions.

**REFERENCES**

1. Mirarchi FL, Hite LA, Cooney TE, et al. TRIAD I—the realistic interpretation of advanced directives. *J Patient Saf.* 2008;4:235–240.

2. Mirarchi FL, Costello E, Puller J, et al. TRIAD III: nationwide assessment of living wills and do not resuscitate orders. *J Emerg Med*. 2012;42:511–520.
3. Mirarchi FL, Ray M, Cooney T. TRIAD IV: Nationwide Survey of Medical Students' Understanding of Living Wills and DNR Orders. *J Patient Saf*. 2014 Feb 27. [Epub ahead of print].
4. Murphy J, Fayanju O, Brown D, et al. Withdrawal of care in a potentially curable patient. *Surgery*. 2010;147:441–445.
5. Varelius J. Respect for autonomy, advance directives, and minimally conscious state. *Bioethics*. 2011;25:505–515.
6. Mazur DJ. How successful are we at protecting preferences? Consent, informed consent, advance directives, and substituted judgment. *Med Decis Making*. 2006;26:106–109.
7. Centers for Disease Control and Prevention. Available at: <http://www.cdc.gov/nchs/data/has/2010/fig36.pdf>. Accessed November 10, 2014.
8. Aylor AL, Koen S, MacLaughlin EJ, et al. Compliance with and understanding advance directives in trainee doctors. *J Miss State Med Assoc*. 2009;50:3–7.
9. Wenger NS, Citko J, O'Malley K, et al. Implementation of Physician Orders for Life Sustaining Treatment in nursing homes in California: evaluation of a novel statewide dissemination mechanism. *J Gen Intern Med*. 2013;28:51–57.
10. Sabatino CP. The evolution of health care advance planning law and policy. *Milbank Q*. 2010;88:211–239.
11. Beach MC, Morrison RS. The effect of do-not-resuscitate orders on physician decision-making. *J Am Geriatr Soc*. 2002;50:2057–2061.
12. Keenan CH, Kish SK. The influence of do-not-resuscitate orders on care provided for patients in the surgical intensive care unit of a cancer center. *Crit Care Nurs Clin North Am*. 2000;12:385–390.
13. Hickman SE, Nelson CA, Smith-Howell E, et al. Use of the Physician Orders for Life-Sustaining Treatment program for patients being discharged from the hospital to the nursing facility. *J Palliat Med*. 2014;17:43–49.
14. Hickman SE, Tolle SW, Brummel-Smith K, et al. Use of the Physician Orders for Life-Sustaining Treatment program in Oregon nursing facilities: beyond resuscitation status. *J Am Geriatr Soc*. 2004;52:1424–1429.
15. Schmidt TA, Hickman SE, Tolle SW, et al. The Physician Orders for Life-Sustaining Treatment program: Oregon emergency medical technicians' practical experiences and attitudes. *J Am Geriatr Soc*. 2004;52:1430–1434.
16. California Advocates for Nursing Home Reform (CANHR). Physician Orders for Life Sustaining Treatment (“POLST”): problems and recommendations, 2010. Page 3, #5. Available at: [http://www.canhr.org/reports/2010/POLST\\_WhitePaper.pdf](http://www.canhr.org/reports/2010/POLST_WhitePaper.pdf). Accessed April 9, 2014.
17. Richardson DK, Fromme E, Zive D, et al. Concordance of out-of-hospital and emergency department cardiac arrest resuscitation with documented end-of-life choices in Oregon. *Ann Emerg Med*. 2014;63:375–383.
18. Revised California POLST Form—summary of changes. Available at: [www.caPOLST.org](http://www.caPOLST.org). Accessed November 21, 2013.
19. Delaware Health and Social Services, Division of Public Health. November 14, 2012. Available at: <http://www.medsocdel.org/Portals/1/In%20the%20News/MOLST%20Form%20Letter%20111412.pdf>. Accessed November 21, 2013.
20. Use of the MOLST Form. Available at: <http://www.dsd.state.md.us/comar/getfile.aspx?file=10.01.21.04.htm>. Accessed December 12, 2013.
21. Caprio AJ, Rollins VP, Roberts E. Health care professionals' perceptions and use of the medical orders for scope of treatment (MOST) form in North Carolina nursing homes. *J Am Med Dir Assoc*. 2012;13:162–168.
22. Newport KB, Patel S, Lyckholm L, et al. The “PSOST”: providers' signout for scope of treatment. *J Palliat Med*. 2010;13:1055–1058.
23. Swamy M, Venkatachalam S, McLachlan J. A Delphi consensus study to identify current clinically most valuable orthopaedic anatomy components for teaching medical students. *BMC Med Educ*. 2014;14:230.
24. Carmines EG, Zeller RA. *Reliability and Validity Assessment*. Sage University Paper Series on Quantitative Applications in the Social Sciences, Series number 07-017, pages 37–49. Beverly Hills: Sage, 1979.
25. Schwarzkopf D, Westermann I, Skupin H, et al. A novel questionnaire to measure staff perception of end-of-life decision making in the intensive care unit—development and psychometric testing. *J Crit Care*. 2015;30:187–195.
26. Hickman SE, Nelson CA, Perrin NA, et al. A comparison of methods to communicate treatment preferences in nursing facilities: traditional practices versus the Physician Orders for Life-Sustaining Treatment program. *J Am Geriatr Soc*. 2010;58:1241–1248.
27. Tolle SW, Tilden VP, Nelson CA, et al. A prospective study of the efficacy of the physician order form for life-sustaining treatment. *J Am Geriatr Soc*. 1998;46:1097–1102.
28. Meyers JL, Moore C, McGrory A, et al. Physician Orders for Life-Sustaining Treatment form: honoring end-of-life directives for nursing home residents. *J Gerontol Nurs*. 2004;30:37–46.
29. Institute of Medicine. Available at: <http://www.iom.edu/Reports/2014/Dying-In-America-Improving-Quality-and-Honoring-Individual-Preferences-Near-the-End-of-Life.aspx>. Accessed November 14, 2014.
30. Dunn PM, Schmidt TA, Carley MM, et al. A method to communicate patient preferences about medically indicated life-sustaining treatment in the out-of-hospital setting. *J Am Geriatr Soc*. 1996;44:785–791.
31. Fromme EK, Zive D, Schmidt TA, et al. POLST Registry do-not-resuscitate orders and other patient treatment preferences. *JAMA*. 2012;307:34–35.
32. Richardson DK, Zive D, Daya M, et al. The impact of early do not resuscitate (DNR) orders on patient care and outcomes following resuscitation from out of hospital cardiac arrest. *Resuscitation*. 2013;84:483–487.
33. Bomba PA, Kemp M, Black JS. POLST: an improvement over traditional advance directives. *Cleve Clin J Med*. 2012;79:457–464.
34. Wijdicks EF, Hijdra A, Young GB, et al. Practice parameter: prediction of outcome in comatose survivors after cardiopulmonary resuscitation (an evidence-based review): report of the Quality Standards Subcommittee of the American Academy of Neurology. *Neurology*. 2006;67:203–210.
35. Grossestreuer AV, Abella BS, Leary M, et al. Time to awakening and neurologic outcome in therapeutic hypothermia-treated cardiac arrest patients. *Resuscitation*. 2013;84:1741–1746.
36. Miller RB. Physician orders to supplement advance directives: rescuing patient autonomy. *J Clin Ethics*. 2009;20:212–219.
37. National POLST Paradigm Task Force. POLST Legislative Guide. February 28, 2014. Page 23. Available at: <http://www.polst.org/wp-content/uploads/2014/02/2014-02-20-POLST-Legislative-Guide-FINAL.pdf>. Accessed March 13, 2014.
38. Mirarchi F, Cammarata C. RE: The Oregon Physician Orders for Life-Sustaining Treatment Registry. *J Emerg Med*. 2014 Sep 30 [Epub ahead of print].
39. Dillman DA, Smyth JD. Design effects in the transition to Web-based surveys. *Am J Prev Med*. 2007;32:S90–S96.
40. Smyth JD, Dillman DA. Context effects in Internet surveys: new issues and evidence. April 23, 2008. Available at: <http://www.sesrc.wsu.edu/dillman/papers/2007/ContextEffects.pdf>. Accessed January 10, 2014.