

# TRIAD VII: Do Prehospital Providers Understand Physician Orders for Life-Sustaining Treatment Documents?

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**Background:** Physician Orders for Life-Sustaining Treatment (POLST) documents are medical orders intended to honor patient choice in the hospital and prehospital settings. We hypothesized that prehospital personnel will find these forms confusing.

**Objectives:** The aim of this study was to determine whether POLST documents accord consensus in determining code status and treatment decisions among emergency medical services providers on the basis of an Internet survey. Consensus in this context reflects content clarity.

**Methods:** A statewide survey of Pennsylvania emergency medical technicians and paramedics was conducted from October 2013 to January 2014. Respondents supplied code status and treatment decisions for scenarios involving critically ill patients who present with POLST documents and then develop cardiac arrest. The gamut of combinations of resuscitations (do not resuscitate [DNR], cardiopulmonary resuscitation) and treatment (full, limited, comfort measures) was represented. Subgroup analysis was done using the Fisher exact test with a Bonferroni-corrected  $P = 0.017$  as significant. We defined consensus as a supermajority of 95%.

**Results:** Response to the survey was 18.4% (1069/5800). For scenarios specifying DNR and full or limited treatment, most chose DNR (59%–84%) and 25% to 75% chose resuscitation. With DNR and comfort measures specified, approximately 85% selected DNR and withheld resuscitation. When cardiopulmonary resuscitation/full treatment was presented, 95% selected “full code” and resuscitation. Respondent age significantly affected response rates ( $P \leq 0.004$ ); prior POLST education had no impact. For most scenarios, responses failed to attain consensus, suggesting confusion in interpretation of the form.

**Conclusions:** In the Pennsylvania prehospital setting, POLST documents can be confusing, presenting a risk to patient safety. Additional research, standardized education, training, and/or safeguards are required to facilitate patient choice and protect safety.

**Key Words:** Pennsylvania, prehospital, POLST, DNR, confusion, patient safety

(*J Patient Saf* 2015;11: 00–00)

A tacit precondition for ensuring patient safety is that any documents related to patient care must be unambiguous, clear, and understood by the chain of care providers, whether a prehospital, hospital, or ancillary health care facility. If the converse is true and caregivers do not universally understand a document or what conditions activate a document, it creates confusion and thus introduces a risk for patient safety. The importance of this fundamental tenet is especially relevant to patient preferences for care should a patient become incapable of expressing his/her wishes. Living wills are 1 example. By definition in Pennsylvania, a *living will* is a legal document that indicates patient preferences for

resuscitation and/or long-term life support if the patient becomes incompetent (unconscious, mental incapacitation) to make decisions about treatment. This directive becomes enacted only when the patient's condition satisfies the criteria for enactment of the document—he/she is permanently incompetent, has a terminal condition, or is in a persistent vegetative state.<sup>1</sup> Examples of medical care include the desire for or refusal of cardiopulmonary resuscitation (CPR), electroconversion, mechanical ventilation, and artificial feeding. Living wills are legal documents, not physician orders. As such, their portability during patient transfers and their accessibility during emergency situations remain problematic.

The prehospital setting represents another environment of care in which patient prerogatives need to be honored. In this setting, Out-of-Hospital (OOH) Resuscitation Forms have been developed for the terminally or critically ill patient who refuses resuscitation when found in cardiac arrest or with critical illness, exemplified by the Pennsylvania OOH Do-Not-Resuscitate (DNR) act.<sup>2</sup> Out-of-Hospital DNR orders are valid medical orders and represent enacted DNR orders that prohibit resuscitation should a patient arrest. Although emergency medical services (EMS) providers are not permitted to interpret advance directives, in some states, they are permitted to honor OOH resuscitation forms or medallions and withhold resuscitation independent of medical command physician oversight. A compounding factor is that unambiguous communication with the patient is often compromised.

In the context of global patient care, OOH DNR orders are limited: their focus is on resuscitation when found in cardiac arrest, and additional care measures are not considered in all states.<sup>3</sup> To remedy this shortcoming, the Physician Orders for Life-Sustaining Treatment (POLST) was conceptualized and implemented in Oregon.<sup>4</sup> It is not an advance directive but a set of medical orders often created by nonmedical personnel and made valid and enacted with the signature of physicians or physician extenders and then becomes a part of the medical record. Physician Orders for Life-Sustaining Treatment forms consist of a hierarchical order set that stipulates implementation or withholding of CPR if the patient is pulseless and apneic as well as levels of medical treatment, antibiotic use, and hydration/nutrition if the patient has a pulse and/or is respiring (Fig. 1). This national paradigm has rapidly disseminated to 20 states.<sup>5</sup> The POLST has received national recognition and policy support and is being rapidly enacted across the United States at a pace that is precluding research, educational, or licensure requirements. Support has also been witnessed from Portland-area emergency medical technicians (EMTs) who found the form especially helpful during cardiac arrests. However, 37% found it confusing when a patient was not in cardiac arrest.<sup>6</sup> The content of POLST forms has also undergone modification or has been adapted to specific patient populations or types of treatment facilities.<sup>7–9</sup> At present, some states allow or are considering allowing EMS providers to honor POLST forms, in lieu of the OOH DNR resuscitation forms, without the supervision of a medical command physician.<sup>10</sup>

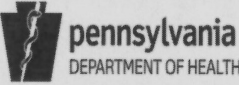
If clarity and lack of ambiguity are requisites for ensuring compliance with patient wishes and their safety, living wills and OOH DNRs fail the litmus test. For advance directives and DNR orders,

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The authors disclose no conflict of interest.

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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		
	<b>Pennsylvania Orders for Life-Sustaining Treatment (POLST)</b>	Last Name <hr/> First/Middle Initial <hr/> Date of Birth <hr/>
<b>FIRST</b> follow these orders, <b>THEN</b> contact physician, certified registered nurse practitioner or physician assistant. This is an Order Sheet based on the person's medical condition and wishes at the time the orders were issued. Everyone shall be treated with dignity and respect.		
<b>A</b> Check One	<b>CARDIOPULMONARY RESUSCITATION (CPR): Person has no pulse <u>and</u> is not breathing.</b> <input type="checkbox"/> CPR/Attempt Resuscitation <input type="checkbox"/> DNR/Do Not Attempt Resuscitation (Allow Natural Death) When not in cardiopulmonary arrest, follow orders in <b>B, C</b> and <b>D</b> .	
<b>B</b> Check One	<b>MEDICAL INTERVENTIONS: Person has pulse <u>and/or</u> is breathing.</b> <input type="checkbox"/> <b>COMFORT MEASURES ONLY</b> Use medication by any route, positioning, wound care and other measures to relieve pain and suffering. Use oxygen, oral suction and manual treatment of airway obstruction as needed for comfort. <b>Do not transfer to hospital for life-sustaining treatment. Transfer if comfort needs cannot be met in current location.</b> <input type="checkbox"/> <b>LIMITED ADDITIONAL INTERVENTIONS</b> Includes care described above. Use medical treatment, IV fluids and cardiac monitor as indicated. Do not use intubation, advanced airway interventions, or mechanical ventilation. <b>Transfer to hospital if indicated. Avoid intensive care if possible.</b> <input type="checkbox"/> <b>FULL TREATMENT</b> Includes care described above. Use intubation, advanced airway interventions, mechanical ventilation, and cardioversion as indicated. <b>Transfer to hospital if indicated. Includes intensive care.</b> Additional Orders _____	
<b>C</b> Check One	<b>ANTIBIOTICS:</b> <input type="checkbox"/> No antibiotics. Use other measures to relieve symptoms. <input type="checkbox"/> Determine use or limitation of antibiotics when infection occurs, with comfort as goal <input type="checkbox"/> Use antibiotics if life can be prolonged Additional Orders _____	<b>D</b> Check One
<b>ARTIFICIALLY ADMINISTERED HYDRATION / NUTRITION:</b> Always offer food and liquids by mouth if feasible <input type="checkbox"/> No hydration and artificial nutrition by tube. <input type="checkbox"/> Trial period of artificial hydration and nutrition by tube. <input type="checkbox"/> Long-term artificial hydration and nutrition by tube. Additional Orders _____		Additional Orders _____
<b>SUMMARY OF GOALS, MEDICAL CONDITION AND SIGNATURES:</b>		
<b>E</b> Check One	Discussed with <input type="checkbox"/> Patient <input type="checkbox"/> Parent of Minor <input type="checkbox"/> Health Care Agent <input type="checkbox"/> Health Care Representative <input type="checkbox"/> Court-Appointed Guardian <input type="checkbox"/> Other: _____	<b>Patient Goals/Medical Condition:</b> _____ _____ _____
By signing this form, I acknowledge that this request regarding resuscitative measures is consistent with the known desires of, and in the best interest of, the individual who is the subject of the form.		
Physician /PA/CRNP Printed Name: _____		Physician /PA/CRNP Phone Number _____
Physician/PA/CRNP Signature (Required): _____		DATE _____
<b>Signature of Patient or Surrogate</b>		
Signature (required) _____	Name (print) _____	Relationship (write "self" if patient) _____

PaDOH version 10-14-10

1 of 2

FIGURE 1. POLST form currently in use in Pennsylvania.

several authors suggest that treatment decisions are not clear-cut for reversible conditions.<sup>11-13</sup> As well, patient and family needs may not be addressed,<sup>14</sup> and treatment can be compromised.<sup>15,16</sup> Finally, living wills seem to be equated to a DNR order by care providers.<sup>17-19</sup> Often, EMS prehospital providers view living wills as the equivalent of DNR orders and understand DNR orders as equivalent to comfort care/end-of-life-care.<sup>20</sup> One study intimated that misunderstanding of advance directives resulted in patient deaths.<sup>11</sup>

Given that living wills and DNR orders are fraught with misunderstanding, concern mounts as POLST orders gain acceptance in patient care areas outside the hospital. In a survey of nursing homes in California, approximately 20% reported problems in translating a POLST form into a treatment action.<sup>21</sup> Concern was also raised by the State of Delaware, which issued a statewide declaration to discontinue the use of POLST in the prehospital setting because it was being inappropriately used.<sup>22</sup> In the face of its burgeoning use and modification, we are unaware of any specific educational requirements for using this document. Similarly, we know of no study that has measured the ability of POLST to provide clear, unambiguous instructions for caregivers. In this respect, we asked whether POLST forms facilitate consensus decision making when patients present for emergent medical treatment. The present study sought to evaluate the level of consensus decisions accorded by POLST forms as interpreted by EMS providers. We hypothesized that, in this context, the POLST document fails to provide unambiguous directions for patient care.

**METHODS**

This was an Internet survey-based (SurveyMonkey, www.surveymonkey.com) study designed as a prospective, statewide

convenience sample of Pennsylvania EMS prehospital first responders conducted between October 2013 and January 2014. Statewide EMS providers were identified via Pennsylvania registry data consisting of EMTs, EMT-paramedics (EMT-Ps), and prehospital nurses. A solicitation letter was sent to each of the regional council EMS leaders by the senior author, requesting distribution of the survey link to member providers. The total number of surveys distributed was 5800. A follow-up reminder was sent approximately 2 weeks after the first solicitation.

Participants were asked to review a consecutive set of POLST forms (Fig. 1), which designated levels of intervention, from DNR/comfort care to CPR/attempt resuscitation with full treatment. Questions prompted the respondents to select a code status and determine whether to resuscitate on the basis of clinical scenarios that were created from medical peer review (Table 1). The initial survey questions portrayed a stand-alone POLST document and queried respondents to assign a code status (DNR, full code, or unsure) and define "DNR" (full care or comfort care/end-of-life care). Thereafter, scenarios portrayed critically ill patients who present with a POLST form and then lapse into cardiac arrest. For scenarios A to D, DNR with full or limited treatment was specified on the POLST forms. Scenario D duplicated the content of scenario A to allow determination of respondents' response consistency/reliability. For scenario E, the POLST document denoted DNR and comfort measures only (CMO); and for scenario F, CPR/attempt resuscitation 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

**TABLE 1.** Scenarios

Scenario	POLST Notations	Clinical Presentation
A	DNR, 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. The family provided a list of medications and the POLST document. Abruptly the patient's clinical status changes during transport: she becomes unresponsive and develops VT/VF arrest.
B	DNR, limited treatment	A 70-y-old man with a history of DM, HTN, dyslipidemia, and CAD status post CABG 10 y ago. The patient is experiencing chest pain, is clammy, and is in mild distress. Vital signs: T, 36°C; P, 60; BP, 100/60; RR, 22; SaO <sub>2</sub> , 98%RA. The family gave a list of medications and the POLST document. Abruptly, the patient becomes unresponsive without palpable pulses; the monitor shows VF.
C	DNR, full treatment	An 87-y-old man called 911, with complaint of sudden SOB. The patient 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. The patient's wife gave a list of medications and the POLST document. Abruptly, the patient goes into respiratory arrest.
D*	DNR, 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. The family provided a list of medications and the POLST document. Abruptly the patient's clinical status changes during transport: she becomes unresponsive and develops VT/VF arrest.
E	DNR, CMO	A 52-y-old man 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. The family provided a list of medications and the POLST document. Abruptly, he becomes unresponsive and develops respiratory arrest in the back of your ambulance.
F	CPR, full treatment	A 90-y-old man with sudden SOB. The patient is agitated, confused, and in severe respiratory distress. Vital signs: P, 120; RR, 46; BP, 84/60; T, 37°C; SaO <sub>2</sub> , 72% on nonrebreather. His wife gave you a list of medications and the POLST document. Abruptly, the patient goes into respiratory arrest.

\*Duplication of scenario A to assess reliability.

BP, blood pressure; CAD, coronary artery disease; DM, diabetes mellitus; HTN, hypertension; P, pulse; RA, room air; RR, respiratory rate; SaO<sub>2</sub>, oxygen saturation, arterial; SOB, shortness of breath; T, temperature; VF, ventricular fibrillation; VT, ventricular tachycardia.

limitations. Response choices for the former were “yes,” “no,” and “unsure”; and for the latter, “very comfortable,” “comfortable,” and “not very comfortable.” Consistent with a prior study (Swamy et al,<sup>23</sup> 2014), we defined consensus as a supermajority of 95% or more. Response rates that failed to attain consensus were considered disparate and served as ipso facto evidence of fundamental misunderstanding and/or confusion among the respondents. Given the inherent sampling error, we used the upper bound of the 95% confidence interval for rates to make the determination of consensus (e.g., a response rate of 89% [88/100] has an upper bound of 95% for the confidence interval and would thus satisfy our criteria for consensus).

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. This Pennsylvania EMS study was approved by the Pennsylvania state EMS director and then was approved by the hospital institutional review board.

Assessment of survey psychometric properties was consistent with that described by Carmines and Zeller<sup>24</sup> (1979). Validity of the content of the survey was strictly based upon medical peer review. Reliability was assessed by a variant of the split-halves method via duplication of a scenario (scenarios A and D were identical). An  $\alpha$  of 0.7 is considered acceptable internal consistency and hence internal reliability.<sup>25</sup> The present survey represents a variant of one that has been previously used and demonstrated acceptable internal consistency.<sup>17</sup>

Data were summarized as overall rates for choosing code status and treatment decisions. The McNemar test was used to compare code status responses between select scenarios. 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. A priori power analysis indicated that we required 45 participants to enable the detection of at least a 25% difference in rates of responses based on prior rates of correct code status designation for an advance directive,<sup>17</sup> based on a type I error level of 0.05 and a type II error level of 0.2. 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. Missing data were treated using pairwise deletion<sup>26</sup> and were analyzed for systematic bias by contrasting rates of missing responses to demographics using  $\chi^2$  tests. SPSS version 12.0 (Chicago, IL) was used for all statistical tests and data reduction.

## RESULTS

### Response Rate and Demographics

The response rate was 18.4% (1069/5800). Approximately 65% (683-698) responded to questions about demographics. Most were men (72%, 502/698), with a mean (SD) age of 43 (12.8) years. Half of the respondents were paramedics and the other half were EMTs, with nearly all certified and educated in the state of Pennsylvania. Thirty percent (211/700) indicated that they had prior POLST education, which, when queried further, amounts to a mean (SD) of 1.8 (1.4) hours. The respondents represented a cross section of the state, and the vast majority (72%, 825/1040) of all state counties was included in the sample. According to the Pennsylvania Department of Public Welfare regional designation, most of the respondents (93%, 643/692 responses) originated in the Western and Central areas of the state (Table 2).

### Global Survey Responses

Of the 1069 survey respondents, between 73% (776) and 99% (1059) provided answers to the survey questions. As a stand-alone document, 58% (616/1059) of the respondents selected DNR as the appropriate patient code status for a POLST form that specified DNR/full treatment. Most (79%) defined DNR as comfort care/end-of-life care. For scenarios A, B, C, and E, POLST forms stipulated DNR with either full or limited treatment or CMO. When queried for the patient code status, DNR was indicated 50% to 83% of the time along with decisions to withhold treatment of 57% to 84%. On the basis of our criteria, none of the responses to these scenarios reflected consensus. Only scenario F, with a POLST form that designated CPR/attempt resuscitation and full treatment, obtained consensus for determining code status and treatment decisions. Scenario D was a duplication of the first scenario, and responses were nearly identical. Reliability estimates, based upon comparing scenario A and D responses, yielded Cronbach  $\alpha$  values of 0.723 and 0.672 for code status and intervention, respectively, suggestive of acceptable-to-good internal consistency.

The respondents' code status choices varied significantly across similar scenarios, despite the fact that DNR was consistently stipulated and the clinical portrayals were acute instances of cardiac arrest (e.g., scenarios A, B, E). Between 26% and 35% of the respondents changed coding responses between scenarios ( $P < 0.0001$ ) (Tables 3 and 4).

### Subgroup Analysis

Sex, occupation (EMT-Basic versus EMT-P), or prior POLST instruction did not exert any consistent effect on either code status responses or decisions to resuscitate. For 5 of the 6 scenarios, age of the respondent (<40 y versus  $\geq 40$  y) exerted a significant impact on both code status and treatment responses (9%–16%,  $P \leq 0.017$ ). In 2 of 6 scenarios, the respondents' “comfort” with limiting treatment significantly impacted determination of code status and resuscitation responses, although some differences are likely inconsequential (11%–13%,  $P = 0.007$ ) (Tables 5).

### Missing Data Analysis

Sex, occupation (EMT versus EMT-P), or age group (<40 versus  $\geq 40$ ) did not suggest any trend in rates of missing responses to survey questions ( $P \geq 0.300$ ).

## DISCUSSION

Physician Orders for Life-Sustaining Treatment is not about limiting *patient* choice; rather, it is about care coordination. It has the ability to be honored universally among many health care settings. In addition, it has specific indications for its use. Physician Orders for Life-Sustaining Treatment 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>27</sup>

The pivotal issue, as with any patient-directed advance care planning document, is how well it is understood and effectuated at all levels of care involvement. The data herein suggest that at least some of the EMS providers in Pennsylvania did not fully understand POLST orders. We set a fairly rigorous requirement of a 95% “supermajority” in responses to reflect consensus. That consensus was reached in only 1 of 6 scenarios suggests that these documents are poorly understood. Further, for determination of code status only, approximately 25% of the respondents responded differently to scenarios with similar clinical presentation and POLST orders (e.g., scenarios A, C, E). Survey fatigue is possible but an unlikely explanation for these varied responses across

**TABLE 2.** Demographics

Age (683)	43 (12.8) y
Years in practice (693)	18 (12.4)
Sex (698)	
Male	72% (502)
Female	28% (196)
Occupation (674)	
EMT-P	47% (325)
EMT-B	48% (338)
FR	2% (14)
RN	3% (20)
Physician	0.1% (1)
Certified (693)	
Yes	97% (674)
No	3% (19)
Location of EMS service (by PA counties)	
Erie	14% (99/693)
Lancaster	8% (52/693)
Dauphin	7% (48/693)
Allegheny	6% (44/693)
Centre	6% (41/693)
Lebanon	5% (36/693)
Clearfield	4% (30/693)
Cumberland	4% (30/693)
Mercer	4% (28/693)
Crawford	4% (27/693)
York	4% (26/693)
Not specified	4% (28/693)
All other counties	29% (204/693)
Out of state	1% (10/693)
Statewide response (PA counties)	72% (48/67)
Location, EMS training/education	
PA	93% (643/689)
Other*	7% (46/689)
POLST instruction	30% (211/700)
Type of POLST instruction	
Formal/didactic	45% (95/211)
Self-tutorial	55% (116/211)
Hours of POLST instruction (115)	1.8 (1.4)

\*Other state, country, or combination of states.

FR, first responder; RN, registered nurse.

similar scenarios. Responses between the scenarios used to establish internal consistency (scenarios A and D) were very similar; so much so, the measurement of internal consistency was acceptable.

Recent literature offers some measure of contradiction to our observations. For patients with POLST forms, Richardson et al<sup>28</sup> (2013) observed that treatment conformed to resuscitation indications in 78% and 84% of the cases specifying either DNR or CPR/attempt resuscitation, respectively. This suggests an error rate (overtreatment or undertreatment) of between 16% and 22%. However, in this study, 94% of those patients with a POLST formatted with a DNR designation had resuscitation withheld or ceased before hospital admission. This finding alone could have an enormous impact on controlling the \$170 billion dollars annually as it related to expenditures at end of life.<sup>29</sup> In a 3-state sample of nursing home records, Hickman et al<sup>27</sup> (2010) determined that residents who had POLST orders for comfort care only had 59%

fewer resuscitation attempts than patients with a traditional DNR. However, for deceased patients with CPR/attempt resuscitation orders, only 1 in 7 received resuscitation.<sup>30</sup> In telephone interviews of a small cohort of Oregon EMS providers, POLST forms resulted in changes in treatment 44% of the time and changes in transfer decisions 26% of the time.<sup>31</sup> Overall, for POLST orders documenting DNR, studies corroborate that resuscitation is withheld in the overwhelming majority of occurrences. Whether this reflects actual patient intent or informed consent has yet to be determined by any published study. The disparity between our findings and these studies may be attributable to study design (retrospective versus prospective), outcomes measured (observed versus intended treatment), and POLST knowledge and education.

A prior report on the development and use of POLST documents noted that the majority of EMTs sampled in Oregon had prior training, either formal or informal.<sup>6</sup> By contrast, only 30% of the EMTs represented in the present study completed education or training in POLST documents. For those who did, educational sessions averaged approximately 1 hour. That training in advance care directives is substantially deficient has already been noted,<sup>32</sup> thus suggesting that the lack of education in the present study cohort is not unusual. Nonetheless, EMS providers who are poorly informed about the POLST document may fail to grasp implementation issues.

Education aside, there is ample precedent that different forms of patient prerogative have been misinterpreted. Some have indicated that advance directives are fraught with problems inherent to the nature of advanced care planning, issues involving communication, realistic expectations, translating goals into clinical actions, and changing patient medical conditions.<sup>33</sup> Although POLST represents an order set, it is apparent that the spectrum of documents reflecting patient prerogative is subject to misinterpretation. And for any such document, varied and complex clinical presentations further confound understanding and clarity.

Although POLST is a medical order set, its universal acceptance in the prehospital setting should proceed with caution, and further research is required because the POLST process is not standardized. As previously noted, several states have issued cautions regarding this document.<sup>21,22</sup> In addition, the State of Maryland significantly deviated from the approved POLST process and requires the POLST to be completed on every patient rather than within the published eligibility guidelines.<sup>7</sup> Concerns that may support and propagate this risk are supported by the lack of standardization. States can customize form content, color, formatting, and the orders it contains. These changes, perceived as minor, may produce unintended consequences affecting patient safety in the prehospital setting, placing both patients and EMS providers at risk. In addition, there are 6 different combinations possible in the POLST form. There are 3 possible DNR selections and 3 possible attempt resuscitation/CPR selections. Schmidt et al<sup>34</sup> (2014) have proposed that only 3 combinations (DNR/CMO, DNR limited interventions, and attempt CPR/full treatment) make sense to health care professionals. However, EMS was not specifically evaluated for understanding of these 3 combinations. In addition, which one of these 3 combinations is accurately reflecting the intention of the OOH DNR order? As previously mentioned, in Pennsylvania, the OOH order applies to the patient who is found deceased or is critically ill. This represents an underresearched issue that poses confusion and risk.

The process by which a POLST is created may also raise concerns in how the order set may be used in the prehospital setting. A recent report determined that 72% of POLST documents were created by nonmedical personnel and then made valid and activated with the signature by a medical provider such as a physician or advanced practice provider.<sup>35</sup> The understanding of the POLST

**TABLE 3.** Overall Results

Information Presented	POLST Document Notation	Code Status			Care		Intervention?		Consensus?
		DNR	FC	Unsure	Comfort Care	Full Care	Yes	No	
POLST document	DNR/full treatment	58% (616)	15% (159)	27% (284)	N/A		N/A		No
Meaning of DNR	—		N/A		79% (825)	21% (215)	N/A		No
Scenario A	DNR/full treatment	64% (599)	22% (209)	14% (126)	N/A		43% (405)	57% (528)	No
Scenario B	DNR/limited treatment	74% (657)	16% (140)	10% (83)	N/A		29% (249)	71% (610)	No
Scenario C	DNR/full treatment	50% (414)	40% (328)	10% (83)	N/A		79% (655)	21% (175)	No
Scenario D	DNR/full treatment	67% (538)	24% (190)	9% (77)	N/A		49% (389)	51% (412)	No
Scenario E	DNR/CMO	83% (654)	12% (91)	5% (42)	N/A		16% (127)	84% (665)	No
Scenario F	CPR/full treatment	5% (20)	<b>95%</b> (737)	2% (19)	N/A		<b>96%</b> (748)	4% (30)	Yes

Values in bold denote consensus decisions.

FC, full code; N/A, not applicable.

between the creator and the prehospital personnel may be a source of confusion and should be researched for its effect on patient safety before gaining universal acceptance in the prehospital setting. Specially noted by POLST investigators, POLST is not an advance directive, and once it is created, it is a live order set to be followed. Some states allow EMS to provide or withhold care and treatment in accordance with the POLST if present without medical command oversight. Other states are lobbying to allow similar freedoms in the prehospital setting. Our results provide a statewide assessment of readiness and reveal deficiencies in understanding and education. These deficiencies pose a threat to patient safety.

For POLST use in the prehospital setting to be a safe and effective mechanism to communicate patient prerogative for end-of-life care, we believe that implementation of suggestions from the American Bar Association's legislative guide regarding POLST is warranted. This guide was created and approved by both the Bar Association and the National POLST Paradigm Task Force. It specifically recommends that POLST documents be reviewed periodically and specifically when (1) patients are transferred from one care setting or care level to another, (2) there is a substantial change in the patients' health, and (3) the patients' goals or treatment preferences change.<sup>36</sup> These requirements could easily apply in the prehospital setting and act as a safeguard to enable the safe continued use of POLST while preserving patient wishes and promoting safety. In the prehospital setting, we use the ABC mnemonic often to establish structure and standardization, and it has proven very useful and effective in certification processes related to resuscitative medicine, 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 these creates a *resuscitation pause*

or an *advance directive pause*, facilitating the creation of a patient safety checklist (Fig. 2).<sup>37-39</sup> This rapid and simplistic patient safety checklist could be applied to all acts of resuscitation (not just cardiac arrest) when patients present critically ill and require interventions for conditions such as respiratory distress, myocardial infarction (MI), sepsis, or gastrointestinal bleeding. A safeguard or patient safety checklist such as this can quickly be used in the prehospital setting to make sure we individualize a plan of care to get it right for each patient, each time.

**Limitations**

The present study has limitations. Responses were obtained in 1 state. An additional limitation could be our definition of consensus. We chose consensus with a supermajority value of 95%; some readers may find this value too stringent and unacceptable. Others may find it not stringent enough because it accepts a 5% error rate and these are life-or-death decisions. Precedent has been established for a similar rate of consensus (94%) for orthopedic anatomy training (Swamy et al,<sup>23</sup> 2014). Our final limitation is one that is well known with survey research: we are unaware of any data to date revealing a correlation between responses to hypothetical, written scenarios versus decisions during actual emergent conditions with critically ill patients. Research with patient simulators may provide an opportunity of further research.

**CONCLUSIONS**

Our study reveals in the Pennsylvania prehospital setting that POLST orders are confusing. This should prompt other states to consider research (possibly a nationwide qualitative study) to be performed before implementation of the process. Otherwise, we are rapidly accepting a process that will have unintended

**TABLE 4.** Scenario Comparisons

Comparison	Coding Decision Unchanged				Coding Changed				P
	DNR → DNR	FC → FC	UNS → UNS	Total	DNR ↔ FC	DNR ↔ UNS	FC ↔ UNS	Total	
A:B	55% (475)	9% (74)	4% (32)	68% (581)	17% (147)	11% (91)	4% (37)	32% (275)	<0.0001
A:E	58% (451)	5% (38)	2% (13)	65% (502)	21% (167)	13% (99)	2% (16)	35% (282)	<0.0001
B:E	66% (519)	5% (38)	3% (21)	74% (578)	17% (132)	8% (64)	1% (10)	26% (206)	<0.0001

FC, full code; UNS, unsure.

TABLE 5. Subgroup Analysis

Respondent Subgroup	Condition	Difference in Rates, Coding DNR	Coding P Value	Difference in Rates, Resuscitation	Intervention P Value
Sex: female (versus male)	std POLST	4.9%	0.236	—	—
	Scenario A	-6.2%	0.278	4.5%	0.303
	Scenario B	-3.4%	0.273	-0.1%	>0.999
	Scenario C	2.3%	0.561	2.7%	0.464
	Scenario D	-10.9%	<b>0.022</b>	11.8%	<b>0.005</b>
	Scenario E	-3.5%	0.537	1.8%	0.554
	Scenario F	1.1%	0.333	-1.8%	0.242
Mean difference (scenarios)		-3.4%		3.4%	
Age: ≥40 y (versus <40 y)	std POLST	-16.2%	<b>&lt;0.0001</b>	—	—
	Scenario A	-15.9%	<b>&lt;0.0001</b>	16.4%	<b>&lt;0.0001</b>
	Scenario B	-11.6%	<b>0.002</b>	4.0%	0.265
	Scenario C	-15.3%	<b>&lt;0.0001</b>	-2.4%	0.442
	Scenario D	-16.3%	<b>&lt;0.0001</b>	11.6%	<b>0.004</b>
	Scenario E	-8.5%	<b>0.017</b>	-9.7%	<b>0.001</b>
	Scenario F	0.9%	0.361	-2.1%	0.114
Mean difference (scenarios)		-11.1%		3.0%	
Occupation: EMT-P (versus EMT-B)	std POLST	5.7%	0.097	—	—
	Scenario A	-2.0%	0.295	3.4%	0.384
	Scenario B	8.1%	<b>0.032</b>	-6.2%	0.081
	Scenario C	2.6%	0.786	0.4%	0.923
	Scenario D	6.3%	0.220	-6.1%	0.119
	Scenario E	9.4%	<b>0.005</b>	-6.9%	<b>0.012</b>
	Scenario F	0.7%	0.186	-0.1%	>0.999
Mean difference (scenarios)		4.3%		-0.1%	
POLST instruction: yes (versus no)	std POLST	4.5%	<b>0.023</b>	—	—
	Scenario A	13.6%	<b>0.001</b>	-13%	<b>0.001</b>
	Scenario B	2.7%	0.531	-0.1%	0.962
	Scenario C	5.8%	0.354	1.8%	0.582
	Scenario D	11.2%	<b>0.003</b>	-4.5%	0.272
	Scenario E	3.0%	0.606	1.2%	0.684
	Scenario F	0.3%	0.577	-0.2%	0.873
Mean difference (scenarios)		6.1%		-2.5%	
Level of comfort with limiting treatment: “not very” (versus “comfortable”/“very comfortable”)	std POLST	-9.8%	<b>&lt;0.0001</b>	—	—
	Scenario A	-11.4%	<b>0.004</b>	11.6%	<b>0.007</b>
	Scenario B	-4.5%	0.340	4.3%	0.271
	Scenario C	-7.6%	<b>0.019</b>	-6.9	0.053
	Scenario D	-9.7%	<b>0.046</b>	3.5%	0.435
	Scenario E	-12.9%	<b>&lt;0.0001</b>	8.5%	<b>0.007</b>
	Scenario F	0.7%	<b>0.001</b>	-3.8%	0.025
Mean difference (scenarios)		-7.6%		-0.3%	

std POLST, stand-alone POLST. Values in bold represent statistically significant differences.

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.

consequences on patient care and safety in the prehospital setting. Our research indicates a desperate need for further research and education. From research, education could be created and standardized. It can then be evaluated and, if found to be beneficial, proposed as a requirement to ensure competency before implementation. Prehospital providers are a valuable and crucial component of the health care delivery system. They should not be placed in clinical situations that expose both themselves and patients in a realm of confusion and risk. Ensuring that they are educated, prepared, and equipped with the knowledge and process of POLST would promote patient wishes and safety. Lastly, implementing already existing recommendations from the POLST legislative guide could enable the development of safeguards (such as the Resuscitation Pause patient safety checklist) to ensure both patient autonomy and appropriate treatment.

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