

Selected Topics: Prehospital Care

THE OREGON PHYSICIAN ORDERS FOR LIFE-SUSTAINING TREATMENT REGISTRY: A PRELIMINARY STUDY OF EMERGENCY MEDICAL SERVICES UTILIZATION

Terri A. Schmidt, MD, MS,*† Elizabeth A. Olszewski, MPH,* Dana Zive, MPH,* Erik K. Fromme, MD, MCR,†† and Susan W. Tolle, MD†§

*Center for Policy and Research in Emergency Medicine, Department of Emergency Medicine, †Center for Ethics in Health Care, ‡Division of Hematology & Medical Oncology, Department of Medicine, and §Division of General Internal Medicine and Geriatrics, Department of Medicine, Oregon Health & Science University, Portland, Oregon

Reprint Address: Terri A. Schmidt, MD, MS, Center for Policy and Research in Emergency Medicine, Department of Emergency Medicine, Oregon Health & Science University, 3181 SW Sam Jackson Park Road, Mail Code CDW-EM, Portland, OR 97239

Abstract—Background: The Physician Orders for Life-Sustaining Treatment (POLST) form translates patient treatment preferences into medical orders. The Oregon POLST Registry provides emergency personnel 24-h access to POLST forms. **Objective:** To determine if Emergency Medical Technicians (EMTs) can use the Oregon POLST Registry to honor patient preferences. **Methods:** Two telephone surveys were developed: one for the EMT who made a call to the Registry and one for the patient or the surrogate. The EMT survey was designed to determine if the POLST form accessed through the Registry changed the care of the patient. The patient/surrogate survey was designed to determine if the care provided matched the preferences on the POLST. When feasible, the Emergency Medical Services (EMS) record was reviewed to determine whether or not treatment was provided. **Results:** During the study period there were 34 EMS calls with matches to patients' POLST forms, and 23 interviews were completed with EMS callers, for a response rate of 68%. In seven cases (30%) the patient was in cardiopulmonary arrest; one patient had a respiratory arrest with a pulse. Eight respondents (35%) reported that the patient was conscious and apparently able to make decisions about preferences. For 10 cases (44%) the POLST orders changed treatment, and in six instances (26%) they affected the decision to transport the patient. For the 10/11 patients or surrogates interviewed, the care reportedly matched their wishes. **Conclusion:** This small study suggests that an electronic reg-

istry of POLST forms can be used by EMTs to enhance their ability to locate and honor patient preferences regarding life-sustaining treatments. © 2013 Elsevier Inc.

Keywords—POLST; resuscitation; EMS

INTRODUCTION

It has been estimated that about 155,000 people experience Emergency Medical Services (EMS)-treated cardiac arrest each year (1). In the 1990s, unwanted resuscitation attempts were common. In a 1-year study in King County, Washington, a third of resuscitation attempts were in patients with chronic disease and were unwanted attempts. These attempts were also less likely to be successful (2,3). Further, a 2003 EMS study in King County found that 39% of calls to long-term care facilities for patients in cardiac arrest were for patients with Do Not Resuscitate (DNR) orders (4). This is in the context of overall survival to hospital discharge from out-of-hospital cardiac arrest, which has been reported to range from 2% to 25% in all patients, and from 3.0% to 16.3% in EMS-treated patients (5,6).

Respecting patient wishes was the primary goal of the 1991 Patient Self-Determination Act that required

hospitals to provide information about advance directives (ADs). However, research has found that advance directives (ADs) are relatively ineffective in relaying patient wishes and are often inaccessible (3,7–19). This is particularly true when EMS is called because ADs usually take the form of general philosophical statements such as, “if I was permanently unconscious I would not want life support.” These statements of future preference often cannot be interpreted or honored in the out-of-hospital setting.

Recognizing the difficulty in using ADs in a time of crisis and the frequency of unwanted resuscitation attempts, medical ethics leaders, EMS, and health care organizations in Oregon together created a portable medical orders document based on a patient’s preferences for life-sustaining treatment, called Physicians Orders for Life-Sustaining Treatment (POLST) (20). To validate the form, the authors used theoretical scenarios to determine whether or not primary care physicians, emergency physicians, paramedics, and long-term care nurses could correctly interpret the orders. Overall, providers were able to correctly use the order set to identify treatments to provide or withhold (20). Subsequent studies support its effectiveness at honoring patient preferences (21–27).

In 2004, a random sample of 572 Oregon emergency medical technicians (EMTs) was surveyed regarding their experiences and perceptions of POLST. Responses indicated that when present, the POLST form changed the course of treatment in 45% of cases. Most EMTs (75%) indicated that the POLST form gave clear instructions on patients’ wishes. However, that study found that when asked to consider the last time they expected a POLST form on a scene, EMS personnel were initially unable to locate a form 25% of the time, thus creating a potential barrier to the honoring of patients’ end-of-life wishes because the form could not be found (28).

POLST has become a national model for portable medical orders and is now being implemented or used in over 30 states (see www.polst.org). The concern over not finding patients’ POLST forms when needed sparked the initiative to create an electronic registry, available to treating health care professionals 24 h a day, 7 days a week (24/7). Design of the Oregon POLST Registry was completed in December 2008 and system training and testing began in early 2009. On May 26, 2009, a single-county (Clackamas County, OR) pilot phase began. On July 1, 2009, state legislation was passed that partnered the Registry with the Department of Human Services and the Oregon Health Authority, facilitating subsequent statewide expansion of the Registry (Oregon Administrative Rules, Ch. 595, Sec. 1184, 2009).

On December 3, 2009, The Oregon POLST Registry became available 24/7 for EMTs, Emergency Depart-

ments (EDs), and acute care units statewide to access in an emergent setting when the original POLST form cannot be located. In addition to housing POLST information in an easy-to-use database, the Registry also houses copies of each active POLST form that can be faxed to hospitals for consultation once a patient arrives. Unless a patient notes specifically on their POLST form that they do not want to be included in the Registry (by checking an “opt out box”), health care professionals signing the POLST form are required to submit the form to the Registry. For patients, completing the form is voluntary and nothing in the legislation has changed that.

A recent article in the *Journal of the American Medical Association* documented the types of orders for over 25,000 POLST forms completed during the first year of operation of the Oregon POLST Registry (29). That study showed that about 75% of people with a POLST in the Registry had a DNR order, and about half the people who had DNR as part of their POLST orders had orders for more than “comfort measures only.” This study’s objective was to determine EMTs’ experience with using the new Registry to obtain those orders and determine if using the Registry allowed them to honor patient preferences at the time of an EMS call by changing treatment and transport decisions based on the POLST orders.

METHODS

Population

The population considered for analysis included both EMTs who contacted the Oregon POLST Registry and received orders from registered POLST forms and the patients (or surrogates) for whom the calls were made from September 1, 2010 to March 31, 2011.

Design

Two telephone surveys were developed: one for the EMT who called the Registry and one for the patient or surrogate (Appendix 1). The EMT survey was designed to determine the circumstances under which EMS was called and whether or not the POLST form changed the care of the patient. The patient/surrogate survey was designed to determine if the care provided matched the expressed preferences. A second member of the research team listened in on some of the calls to ensure that the questions were asked in a consistent manner. In addition, when feasible, the EMS record was reviewed to determine the treatments and care provided, and data abstracted using a customized data abstraction tool. A second researcher reviewed the record to ensure that data were captured correctly. (Reviewing the record required written consent from the patient or surrogate.)

A call log is maintained in the Registry. The call log was checked daily for new calls. When a call was received, research staff contacted the caller (EMS agency) and requested that the EMT who made the call to the Registry contact research staff during her or his next shift for a 5–10-min interview. Descriptive statistics were used to describe the aggregate data.

Three weeks after the call was made to the Registry, research staff sent a letter to the patient (or surrogate if the patient was known to be deceased) requesting that he or she complete a brief interview about the day the Registry was called and consent for a review of the EMS chart from that day to compare with the wishes they had recorded on the POLST form. Patients or surrogates were given an opportunity in that letter to mail back a card or call the research staff if they did not wish to participate in the study. No further contact was attempted when a request not to participate was received. For all other patients or surrogates, 1 week after the letter was sent, research staff called the subject to complete the interview or set up a time to do so later. Contact information for patients/surrogates was obtained through the Registry, EMS agencies, and telephone directories. POLST forms for these patients were obtained through the Registry.

For those patients or surrogates who consented to the record review, POLST form orders were recorded from the Registry and compared with the care the patient received as indicated in the EMS chart for each POLST form order section. Descriptive statistics were used to quantify, for each order section, the concordance between treatment received and treatment ordered on the POLST form and whether there was either under- or over-treatment based upon recorded treatment preferences. (See [Figure 1](#) for the POLST form that was in use at the time of the study).

Finally, patient and surrogate interviews were reviewed both quantitatively and qualitatively to assess perceived utility of the POLST form accessed through the Registry. Interviews were analyzed to determine thematic patterns of response, including thematic saturation (the point at which no new themes emerge).

The study was approved by both the Oregon Health & Sciences University Institutional Review Board and the Oregon Public Health Institutional Review Board.

RESULTS

EMT Interviews

There were a total of 34 matches to calls from EMS to the Registry during the study period and 23 interviews were completed with the EMS callers, for a response rate of 68%. The median length of all calls

with a match in the Registry from December 2010 through May 2011 was 1.43 min. The sample included respondents from 12 different EMS agencies throughout Oregon.

The top two reasons EMS callers reported for deciding the patient probably had a POLST form were finding a Registry number or magnet at the scene (35%), or someone at the scene saying that the patient had a POLST but it was unable to be located (30%). In seven cases (30%), the patient was in cardiopulmonary arrest, and one patient had a respiratory arrest with a pulse. Eight of the 23 EMS respondents (35%) reported that the patient on the scene was conscious and apparently able to make decisions about preferences for health care. In 10 instances (44%), the POLST orders changed the treatment provided to the patient. In six instances (26%), the POLST orders affected the decision of whether or not to transport the patient. Family members were present at the scene in 17/23 (74%) cases and were reported to have influenced how the POLST form order from the Registry was carried out in 10/17 (59% of cases with family present), usually by informing EMS that the patient had a form. The original paper POLST form was never located at the scene in 87% of all cases reviewed.

Chart Reviews

We received written consent to review 7 EMS charts from the day of the incident. In one case, the patient was dead at the scene and no medical treatment was provided. Two patients were in cardiac arrest and in both cases, cardiopulmonary resuscitation (CPR) and medical interventions were attempted until the POLST form orders were received, after which they were terminated based on the POLST orders for DNR. For the remaining four cases, the treatment received matched the recorded wishes in three cases. In the last case, although the POLST form would have directed that the patient not be transported to the hospital, the EMS chart indicated that the patient requested transport.

Patient/Surrogate Interviews

We were able to interview 2 patients and 9 surrogates. Eight refused consent and 15 could not be reached. Most (8/11, 73%) were aware that they (or the patients) had a POLST form, but fewer (6/11, 55%) were aware that the form was in the Registry. Interviewees believed that their wishes or the wishes of the patient were honored in all but one incident (10/11, 91%); in that one instance, the surrogate would have preferred that EMS had not been called at all. See [Table 1](#) for excerpts from interviews.

HIPAA PERMITS DISCLOSURE TO HEALTH CARE PROFESSIONALS & ELECTRONIC REGISTRY AS NECESSARY FOR TREATMENT					
Physician Orders for Life-Sustaining Treatment (POLST)					
<p><small>First follow these orders, then contact physician, NP, or PA. These medical orders are based on the person's current medical condition and preferences. Any section not completed does not invalidate the form and implies full treatment for that section.</small></p>					
<p>Last Name/ First/ Middle Initial</p> <p>Address</p> <p>City / State / Zip</p> <p>Date of Birth (mm/dd/yyyy) Last 4 SSN Gender</p> <p>____/____/____ ____ ____ ____ ____ <input type="checkbox"/> M <input type="checkbox"/> F</p>					
A <small>Check One</small>	<p>CARDIOPULMONARY RESUSCITATION (CPR): Person has no pulse <u>and</u> is not breathing.</p> <p><input type="checkbox"/> Attempt Resuscitation/CPR <input type="checkbox"/> Do Not Attempt Resuscitation/DNR (<u>Allow</u> <u>Natural</u> <u>Death</u>)</p> <p>When not in cardiopulmonary arrest, follow orders in B, C and D.</p>				
B <small>Check One</small>	<p>MEDICAL INTERVENTIONS: Person has pulse <u>and/or</u> is breathing.</p> <p><input type="checkbox"/> Comfort Measures Only Use medication by any route, positioning, wound care and other measures to relieve pain and suffering. Use oxygen, suction and manual treatment of airway obstruction as needed for comfort. <i>Patient prefers no transfer to hospital for life-sustaining treatment. Transfer if comfort needs cannot be met in current location.</i></p> <p><input type="checkbox"/> Limited Additional Interventions Includes care described above. Use medical treatment, IV fluids and cardiac monitor as indicated. Do not use intubation, advanced airway interventions, or mechanical ventilation. May consider less invasive airway support (e.g. CPAP, BiPAP). <i>Transfer to hospital if indicated. Avoid intensive care.</i></p> <p><input type="checkbox"/> Full Treatment Includes care described above. Use intubation, advanced airway interventions, mechanical ventilation, and cardioversion as indicated. <i>Transfer to hospital if indicated. Includes intensive care.</i></p> <p><i>Additional Orders:</i> _____</p>				
C <small>Check One</small>	<p>ANTIBIOTICS</p> <p><input type="checkbox"/> No antibiotics. Use other measures to relieve symptoms.</p> <p><input type="checkbox"/> Determine use or limitation of antibiotics when infection occurs.</p> <p><input type="checkbox"/> Use antibiotics if medically indicated.</p> <p><i>Additional Orders:</i> _____</p>				
D <small>Check One</small>	<p>ARTIFICIALLY ADMINISTERED NUTRITION: Always offer food by mouth if feasible.</p> <p><input type="checkbox"/> No artificial nutrition by tube.</p> <p><input type="checkbox"/> Defined trial period of artificial nutrition by tube.</p> <p><input type="checkbox"/> Long-term artificial nutrition by tube.</p> <p><i>Additional Orders:</i> _____</p>				
E	<p>REASON FOR ORDERS AND SIGNATURES</p> <p>My signature below indicates to the best of my knowledge that these orders are consistent with the person's current medical condition and preferences as indicated by discussion with:</p> <p><input type="checkbox"/> Patient <input type="checkbox"/> Health Care Representative <input type="checkbox"/> Surrogate for patient with developmental disabilities or significant mental health condition (Note: Special requirements for completion. See reverse side.)</p> <p><input type="checkbox"/> Parent of Minor <input type="checkbox"/> Court-Appointed Guardian</p> <p><input type="checkbox"/> Other _____</p> <table border="1" style="width: 100%;"> <tr> <td style="width: 70%;">Print Primary Care Professional Name</td> <td rowspan="3" style="background-color: #e0e0e0; text-align: center; vertical-align: middle;">Office Use Only</td> </tr> <tr> <td>Print Signing Physician / NP / PA Name and Phone Number</td> </tr> <tr> <td>Physician / NP / PA Signature (mandatory) Date</td> </tr> </table>	Print Primary Care Professional Name	Office Use Only	Print Signing Physician / NP / PA Name and Phone Number	Physician / NP / PA Signature (mandatory) Date
Print Primary Care Professional Name	Office Use Only				
Print Signing Physician / NP / PA Name and Phone Number					
Physician / NP / PA Signature (mandatory) Date					
ORIGINAL TO ACCOMPANY PERSON IF TRANSFERRED OR DISCHARGED, SUBMIT COPY TO REGISTRY					

Figure 1. Oregon POLST form.

DISCUSSION

POLST orders were created to help ensure that patients' preferences to have or to limit life-sustaining interventions are honored at the time of a medical emergency. A previous EMS study found that POLST orders were effective in doing so as long as the form could be found but that frequently it was unavailable (28). This preliminary study of the Oregon POLST Registry found that when EMTs were able to access POLST form orders through the Registry, the orders relayed influenced treatment. Patients who were in cardiopulmonary arrest when the Registry was accessed and had a POLST form indicating they had a DNR order had CPR stopped. Patients not in arrest also had their preferences honored, including decisions about whether or not to be transported to the hospital.

The only case in this small sample in which the treatments did not match the orders on a POLST form was a patient with decision-making capacity at the time of the EMS call who requested treatment that differed from the form. A POLST form can be revoked at any time. Thus, in that case, the treatment matched the changed preference of the patient. We did find that about a third of the patients for whom the Registry was called were conscious and reportedly able to make their own medical decisions at the time of the EMS call. For these patients, the POLST orders may or may not have been needed for decision-making at the time of the EMS call. The form was also faxed to the receiving ED.

Overall, patients and their surrogates with whom we spoke reported that the patient's preferences were honored. In one case the surrogate who was interviewed

HIPAA PERMITS DISCLOSURE TO HEALTH CARE PROFESSIONALS & ELECTRONIC REGISTRY AS NECESSARY FOR TREATMENT				
Information for Person Named on this Form <u>Person's Name (print)</u>				
This voluntary form records your preferences for life-sustaining treatment in your current state of health. It can be reviewed and updated by your health care professional at any time if your preferences change. If you are unable to make your own health care decisions, the orders should reflect your preferences as best understood by your surrogate.				
Signature of Person or Surrogate				
Signature	Name (print)		Relationship (write "self" if patient)	
Opt Out <input type="checkbox"/> Check box if you <u>do not</u> want this form included in the electronic POLST registry.				
Contact Information				
Surrogate (optional)	Relationship	Phone Number	Address	
Health Care Professional Preparing Form (optional)	Preparer Title		Phone Number	Date Prepared
PA's Supervising Physician			Phone Number	
Directions for Health Care Professionals				
Completing POLST				
<ul style="list-style-type: none"> • Should reflect current preferences of persons with advanced illness or frailty. Encourage completion of an Advance Directive. • Verbal / phone orders are acceptable with follow-up signature by physician/NP/PA in accordance with facility/community policy. • Use of original form is encouraged. Photocopies, faxes, and electronic registry forms are also legal and valid. • A person with developmental disabilities or significant mental health condition requires additional consideration before completing the POLST form, refer to <i>Guidance for Health Care Professionals</i> at http://www.ohsu.edu/polst/programs/docs/guidance.pdf 				
Sending to POLST Registry (Required unless "Opt Out" box is checked)				
<ul style="list-style-type: none"> • For the POLST Registry, the following information on the other side of the form <u>must</u> be completed: <ul style="list-style-type: none"> • Person's full name • Date of birth • Section A • Physician / NP / PA Signature and date signed 		<ul style="list-style-type: none"> • Send a copy of <u>both</u> sides of this POLST form to the POLST Registry. • FAX or eFAX: (503) 418-2161 Date ____/____/____ or • Mail: Oregon POLST Registry Date ____/____/____ Mail Code: CDW-EM 3181 SW Sam Jackson Park Road Portland, OR 97239 		
Reviewing POLST				
This POLST should be reviewed periodically and if:				
<ul style="list-style-type: none"> • The person is transferred from one care setting or care level to another, or • There is a substantial change in the person's health status, or • The person's treatment preferences change. 				
Voiding POLST				
<ul style="list-style-type: none"> • A person with capacity, or the valid surrogate of a person without capacity, can void the form and request alternative treatment. • Draw line through sections A through E and write "VOID" in large letters if POLST is replaced or becomes invalid. • Send a copy of the voided form to the POLST Registry as above (Required). • If included in an electronic medical record, follow voiding procedures of facility/community. 				
For permission to use the copyrighted form contact the OHSU Center for Ethics in Health Care. Information on the POLST program is available online at www.polst.org or at polst@ohsu.edu .				
ORIGINAL TO ACCOMPANY PERSON IF TRANSFERRED OR DISCHARGED, SUBMIT COPY TO REGISTRY				

Figure 1. (continued).

wished that EMS had not been called at all but was not dissatisfied with the care provided once they did arrive. In Table 1, Story 1 illustrates how POLST orders and an electronic registry can improve patient care at the scene of an emergency. Having access to the POLST orders, which could not originally be found, allowed the EMTs to stop an unwanted resuscitation. According to the patient's daughter, "My mother was coughing and I came in the room...[I] hit her on the back because I thought she was choking. Called 9-1-1 because her lips were blue...put her on the floor and did CPR. The medics came and took over. I told them she had a POLST but I couldn't find it...the form used to be on the fridge but we got a new one and hadn't moved it there yet. I found it a week later in a pile of stuff from the old fridge... [that day] her wishes were honored." The EMTs on that

same call reported, "The daughter was the one who informed first responders that the patient had a POLST form, which prompted us to call the Registry...All life-saving measures were terminated as soon as the orders were announced, to honor end of life wishes." In another story, the family called 9-1-1 when the patient collapsed but then determined that he had a POLST form and reported, "This is what he wanted. (His wishes were) definitely honored."

We asked EMTs the reasons that they suspected there might be a POLST form that led them to call the Registry. The Registry provides patients with a magnet that has the patient's name and Registry ID number that they can place on their refrigerator or other prominent place. One of the most common reasons for calling the Registry was seeing the magnet. One medic we interviewed

Table 1. Interview Excerpts**Story 1**

"My mother was coughing and I came in the room... [I] hit her on the back because I thought she was choking. Called 9-1-1 because her lips were blue... put her on the floor and did CPR. The medics came and took over. I told them she had a POLST but I couldn't find it... the form used to be on the fridge but we got a new one and hadn't moved it there yet. I found it a week later in a pile of stuff from the old fridge... [that day] her wishes were honored." – Daughter of patient

"The daughter was the one who informed first responders that the patient had a POLST form, which prompted us to call the Registry... All life-saving measures were terminated as soon as orders were announced to honor end of life wishes... The Registry is a good thing. It is a stressful time for family and the ability to call and get the wishes is really helpful; a great resource, easier on everybody, and I think it helps the family in these kinds of situations move on to the next steps." – Medic on the scene

Story 2

"We had dinner, [he] was holding the placemats, and he just went down and collapsed. There was no eye contact, no voice contact. I called 9-1-1 and my son and daughter-in-law came over... asked if they wanted to override the POLST and we decided no. This is what he wanted. [His wishes were] definitely honored. [EMS was] professional, quick, and efficient... [The Registry] is a wonderful idea. Should be more publicized so people know where to put it [POLST form]." – Wife of patient

Story 3

"The patient was very old and in cardiac arrest. There was a language barrier at the scene and we were trying to ask the daughter if he had a POLST. Daughter came back with magnet. Without them [the family] the POLST would have never been known to exist... overall, it [call to the Registry] was successful." – Medic on the scene

Story 4

"Parents of the child brought us a card and letter indicating a POLST. We respected their wishes and discontinued all treatment. It [calling the Registry] was easy and straight forward. [I] appreciated that they had a translator for us at scene, but the Registry made it very clear. It was a positive experience." – Medic on the scene

reported, "The patient was very old and in cardiac arrest... we were trying to ask the daughter if he had a POLST. Daughter came back with magnet."

This is important because we learned in informal discussions with patients before implementing the Registry that many patients did not like the idea of placing their POLST form on their refrigerator. One patient put it well saying, "I do not want to look at my POLST form every time I get milk." However, the magnet may be an effective way to alert EMS that a POLST form is available.

EMTs found the Registry helpful. For example, one EMT reported, "...the Registry made it very clear. It was a positive experience." In most cases they are able to access information with a telephone call that lasts just over a minute. This brief call allows them to make decisions about patient care that are consistent with the patient's previously documented preferences.

Limitations

This study has several limitations. First, it is necessarily small because only 34 matched calls to the Registry occurred during the study period. The study period was early in the implementation of the statewide Registry and was still new to EMS and to patients. As the Registry accumulates more POLST forms (at the time this study was initiated, there were only 35,000 forms in the Registry, compared to nearly 80,000 forms and 277 successful matches to POLST forms as of November 30, 2011) and EMTs become more accustomed to calling, the number of calls and the number of matches will increase. For example, there were 81 calls in the month of November 2011, and the match rate for calls was 38%. A second lim-

itation was that we were unable to locate a large proportion of patients or surrogates, and a relatively high number declined to participate. POLST does not include contact information other than address. Patients for whom EMS was called often died or did not return to their previous address. Furthermore, patients for whom calls are made to the Registry are in a time of crisis and transition that limits their ability to participate in research studies. Finally, to review EMS records, we were required to obtain written consent from the patient or surrogate, and some patients or surrogates verbally agreed to participate but did not return the consent form, limiting our ability to review records.

CONCLUSION

This preliminary study suggests that an electronic registry of POLST forms can be used by EMS to enhance the ability to honor patient preferences regarding life-sustaining treatments.

REFERENCES

1. Rea TD, Eisenberg MS, Sinibaldi G, White RD. Incidence of EMS-treated out-of-hospital cardiac arrest in the United States. *Resuscitation* 2004;63:17–24.
2. Dull SM, Graves JR, Larsen MP, Cummins RO. Expected death and unwanted resuscitation in the prehospital setting. *Ann Emerg Med* 1994;23:997–1002.
3. Teno J, Lynn J, Wenger N, et al. Advance directives for seriously ill hospitalized patients: effectiveness with the patient self-determination act and the SUPPORT intervention. SUPPORT Investigators. Study to Understand Prognoses and Preferences for Outcomes and Risks of Treatment. *J Am Geriatr Soc* 1997;45:500–7.
4. Becker LJ, Yeargin K, Rea TD, Owens M, Eisenberg MS. Resuscitation of residents with do not resuscitate orders in long-term care facilities. *Prehosp Emerg Care* 2003;7:303–6.

5. Nichol G, Thomas E, Callaway CW, et al. Regional variation in out-of-hospital cardiac arrest incidence and outcome. *JAMA* 2008;300:1423–31.
6. Eisenberg MS, Horwood BT, Cummins RO, Reynolds-Haertle R, Hearne TR. Cardiac arrest and resuscitation: a tale of 29 cities. *Ann Emerg Med* 1990;19:179–86.
7. Morrison RS, Olson E, Mertz KR, Meier DE. The inaccessibility of advance directives on transfer from ambulatory to acute care settings. *JAMA* 1995;274:478–82.
8. Danis M, Southerland LI, Garrett JM, et al. A prospective study of advance directives for life-sustaining care. *N Engl J Med* 1991;324:882–8.
9. Partridge RA, Virk A, Sayah A, Antosia R. Field experience with prehospital advance directives. *Ann Emerg Med* 1998;32:589–93.
10. Kish Wallace S, Martin CG, Shaw AD, Price KJ. Influence of an advance directive on the initiation of life support technology in critically ill cancer patients. *Crit Care Med* 2001;29:2294–8.
11. Dobbins EH. End-of-life decisions: influence of advance directives on patient care. *J Gerontol Nurs* 2007;33:50–6.
12. Teno JM, Stevens M, Spernak S, Lynn J. Role of written advance directives in decision making: insights from qualitative and quantitative data. *J Gen Intern Med* 1998;13:439–46.
13. Teno JM, Licks S, Lynn J, et al. Do advance directives provide instructions that direct care? SUPPORT Investigators. Study to Understand Prognoses and Preferences for Outcomes and Risks of Treatment. *J Am Geriatr Soc* 1997;45:508–12.
14. Teno JM, Lynn J, Phillips RS, et al. Do formal advance directives affect resuscitation decisions and the use of resources for seriously ill patients? SUPPORT Investigators. Study to Understand Prognoses and Preferences for Outcomes and Risks of Treatments. *J Clin Ethics* 1994;5:23–30.
15. Hardin SB, Yusufaly YA. Difficult end-of-life treatment decisions: do other factors trump advance directives? *Arch Intern Med* 2004;164:1531–3.
16. Weinnick RM, Wilcox SR, Park ER, Griffey RT, Weissman JS. Use of advance directives for nursing home residents in the emergency department. *Am J Hosp Palliat Care* 2008;25:179–83.
17. Wilkinson A, Wenger N, Shugarman LR; U.S. Department of Health and Human Services. Literature review on advance directives; 2007. Available at: <http://aspe.hhs.gov/daltcp/reports/2007/advdir.htm>. Accessed December 15, 2012.
18. Castillo LS, Williams BA, Hooper SM, Sabatino CP, Weithorn LA, Sudore RL. Lost in translation: the unintended consequences of advance directive law on clinical care. *Ann Intern Med* 2011;154:121–8.
19. Bomba PA, Vermilyea D. Integrating POLST into palliative care guidelines: a paradigm shift in advance care planning in oncology. *J Natl Compr Canc Netw* 2006;4:819–29.
20. Dunn PM, Schmidt TA, Carley MM, Donius M, Weinstein MA, Dull VT. A method to communicate patient preferences about medically indicated life-sustaining treatment in the out-of-hospital setting. *J Am Geriatr Soc* 1996;44:785–91.
21. Lee MA, Brummel-Smith K, Meyer J, Drew N, London MR. Physician orders for life-sustaining treatment (POLST): outcomes in a PACE program. Program of All-Inclusive Care for the Elderly. *J Am Geriatr Soc* 2000;48:1219–25.
22. Hickman SE, Hammes BJ, Tolle SW, Moss AH. A viable alternative to traditional living wills. *Hastings Cent Rep* 2004;34:4–5, author reply 5–6.
23. Hickman SE, Nelson CA, Moss AH, et al. Use of the Physician Orders for Life-Sustaining Treatment (POLST) paradigm program in the hospice setting. *J Palliat Med* 2009;12:133–41.
24. Meyers JL, Moore C, McGrory A, Sparr J, Ahern M. Physician orders for life-sustaining treatment form: honoring end-of-life directives for nursing home residents. *J Gerontol Nurs* 2004;30:37–46.
25. Tolle SW, Tilden VP, Nelson CA, Dunn PM. A prospective study of the efficacy of the physician order form for life-sustaining treatment. *J Am Geriatr Soc* 1998;46:1097–102.
26. Hickman SE, Nelson CA, Perrin NA, Moss AH, Hammes BJ, Tolle SW. 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;58:1241–8.
27. Hickman SE, Nelson CA, Moss AH, Tolle SW, Perrin NA, Hammes BJ. The consistency between treatments provided to nursing facility residents and orders on the physician orders for life-sustaining treatment form. *J Am Geriatr Soc* 2011;59:2091–9.
28. Schmidt TA, Hickman SE, Tolle SW, Brooks HS. The Physician Orders for Life-Sustaining Treatment program: Oregon emergency medical technicians' practical experiences and attitudes. *J Am Geriatr Soc* 2004;52:1430–4.
29. Fromme EK, Zive D, Schmidt TA, Olszewski E, Tolle SW. POLST Registry do-not-resuscitate orders and other patient treatment preferences. *JAMA* 2012;307:34–5.

APPENDIX 1: SURVEY INSTRUMENT

A New Electronic POLST Registry: Utilization, Impact on Care, and Dissemination

EMT Structured Interview

Interviewer Name: _____

Subject Name: _____

Date: _____ **Time:** _____

We would like to ask you some questions about the experience that you had when you called the Oregon Electronic POLST Registry on (date) for (name of patient). In this way we hope to improve the Registry. Your participation is completely voluntary and you are free to stop the interview at any time; it should take 10–15 minutes of your time. Would you be willing to participate?

If yes:

Thank you. As a participant in this study, we want you to be aware of the following

- The purpose of the study is to collect information about how the Oregon POLST Registry affects patient care in a medical emergency.
 - Your participation in this study is limited to your participation in this phone interview.
 - You will not be identified by name or location in any study documents. The specific information we collect from you will be limited to your responses to questions during this interview with research staff.
- In addition to this interview, we are conducting a record review that will include EMS and emergency department records, if applicable, and will be limited to review of procedures/care relating to POLST form orders (cardiopulmonary resuscitation, comfort measures, intubation, management of airway, transport to hospital/admission to intensive care) to determine if treatment, transport and admission decisions matched recorded treatment preferences. We are also interviewing patients or patient surrogates [family

members] about their experience regarding the POLST orders.

- Any information collected during this interview or the record review will be confidential and not shared with anyone outside of the research team.
- This study is considered minimal risk. Although we have made every effort to protect your identify, there is a minimal risk of loss of confidentiality.
- You do not have to join this or any research study. IF you do join, and later change your mind, you may quit at any time. If you refuse to join or withdraw early from the study, there will be no penalty or loss of any benefits to which you are otherwise entitled.
- You will not benefit personally from being in this study. However, by serving as a subject, you may help us learn how to benefit patients in the future.

May I document your consent now?

Consented _____ **Declined** _____

We would like to start with a few questions about the situation that prompted you to call the Registry:

1. First we are interested in knowing why you thought the patient may have had a POLST form.
 - Someone at the scene said there was a POLST form but we could not find it
 - We found a Registry number or magnet at the scene
 - It is routine procedure to check for POLST form when patient is in cardiac arrest
 - The patient's overall medical condition made us think there might be form
 - The patient was in a long term care setting, making us think there might be a form
 - The patient was enrolled in hospice
 - I always check in older patients
 - Other: _____
2. Now we would like to know a little about the patient's condition when you called the Registry.
 - a. When you called the Registry, did the patient have a pulse?
 - Yes No
 - b. When you called the Registry, was the patient breathing?
 - Yes No (If no, please skip to question 3.)
 - c. When you called the Registry, was the patient conscious and apparently able to make decisions and communicate preferences about his/her health care?
 - Yes No

3. Now we would like to hear about your experience with the call center.

- a. Did you have any problem with knowing the number to call or getting through to the call center?
 - Yes No
 - If yes, please explain:
Did you get a response in an acceptable amount of time?
 - Yes No
 - If no, please explain: _____
- b. Did you have any problem having enough demographic information to find the patient in the Registry?
 - Yes No

If yes, please explain:

4. Most importantly, we would like to know if the POLST orders you received changed the treatment that you provided for the patient. For instance, did you: Limit or modify treatments, interventions or medications because of the POLST orders? If so, please describe: _____

Interviewer: If not addressed, prompt:

Did you modify or limit CPR because of the POLST orders? Did you modify or limit airway interventions (i.e. intubation, advanced airway intervention, or mechanical intervention) because of the POLST orders? Did you start additional treatment, medication or procedures based on the form?

5. Did the POLST form orders from the Registry affect your decision to transport the patient to a hospital for ongoing care? Please describe:
6. Were family members present during care?
 - Yes No
 - a. If yes, did the presence of family members influence how POLST form orders from the Registry were implemented? Please explain: _____
7. Was the original paper POLST form for the patient found at any time while you were at the scene?
 - Yes No
8. Is there any other information about calling the POLST Registry that you would like to share?

A New Electronic POLST Registry: Utilization, Impact on Care, and Dissemination

Script 2: Surrogate/Patient Structured Interview

Interviewer Name: _____
Subject Name: _____
Date: _____ **Time:** _____
Consented _____ **Declined** _____

Hello, my name is _____ from the Oregon POLST Registry. I am following up on a letter we sent you a few weeks ago. Is this a good time to talk?

If yes, continue to A.

If no:

If no, interviewer will arrange a time. If subject opts out, interviewer will thank them for time and no further contact will be initiated-subject not enrolled.

A-On (date) the Registry received a call from an emergency provider about your (or your family member's) POLST form. In order to better serve people who have their forms in the Registry we would like to take a few minutes to talk to you about your experience that day. Your participation is completely voluntary and all of your answers will be confidential. This should not take more than 15–20 minutes of your time. May I ask you a few questions about that day?

If no, interviewer will arrange a time. If subject opts out, interviewer will thank them for time and no further contact will be initiated-subject not enrolled.

[If the patient has died and this was not known to investigator prior to call:

I am very sorry for your loss and am sorry to call you during this unfortunate time. I understand this may not be the best time to talk to you; is there a better time for me to reach you?]

If yes:

Thank you very much. I just want to remind you that your answers will be confidential and you can feel free to stop or slow down at any time. I also want to let you know that we will also be talking to the providers who were on the scene that day. The release of information in your packet will allow us to obtain records from the EMS providers who took care of you [patient] that day. If you haven't already, if you could sign and send that to me after we talk, I would appreciate it; we will not request the records without your written permission. The

Study Information Sheet provides more detailed information about this request. I understand that these questions may be stressful for you to answer and that you can take a break or stop at anytime.

Can we go ahead and begin?

1. A POLST form is a bright pink form that a patient and his or her physician completes together that tells emergency service providers about end-of-life treatment preferences. Oregon has a statewide Registry that houses POLST forms for EMS to access in the event the original cannot be found during an emergency.

Were you aware that you/[patient] had a POLST form? _____

Did you know that the POLST form was in the Registry? _____

2. Please tell me about your experience the day that the Registry was called for you (or your family member).
3. How did you make the treating healthcare professional aware that you had a pink POLST form, or, if you were unable to do so, did you have a magnet, wallet card, or other mechanism to inform caregivers?
4. On that day, do you think your wishes (or your family member's wishes), as recorded on the pink POLST form, were honored?
5. Thinking about the POLST form and its intent to record your (or your family member's) preferences for life-sustaining treatment, how satisfied are you with the experience that day? What seemed to work well? Is there anything you would like to see changed?
6. Do you have any comments you would like to share about pink POLST?

ARTICLE SUMMARY

1. Why is this topic important?

EMS is often called for patients with serious chronic illnesses and these patients may or may not want all of the life supporting treatments that EMS offers. POLST orders are being used in many states to transform patient treatment preferences into medical orders that can be honored by EMS. One barrier to using these orders is that they may not be found at the time of an emergency.

2. What does this study attempt to show?

An electronic Registry can be used to convey POLST orders to EMS and these orders change patient treatment and transport decisions.

3. What are the key findings?

In 10 instances (44%), The POLST orders relayed changed the treatment in 44% of the patients and transport decisions in 26%.

4. How is patient care impacted?

For 10/11 patients or surrogates interviewed the care matched their wishes. One surrogate did not think that EMS should have been called.