

A Comparison of Methods to Communicate Treatment Preferences in Nursing Facilities: Traditional Practices Versus the Physician Orders for Life-Sustaining Treatment Program

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OBJECTIVES: To evaluate the relationship between two methods to communicate treatment preferences (Physician Orders for Life-Sustaining Treatment (POLST) program vs traditional practices) and documentation of life-sustaining treatment orders, symptom assessment and management, and use of life-sustaining treatments.

DESIGN: Retrospective observational cohort study conducted between June 2006 and April 2007.

SETTING: A stratified, random sample of 90 Medicaid-eligible nursing facilities in Oregon, Wisconsin, and West Virginia.

PARTICIPANTS: One thousand seven hundred eleven living and deceased nursing facility residents aged 65 and older with a minimum 60-day stay.

MEASUREMENTS: Life-sustaining treatment orders; pain, shortness of breath, and related treatments over a 7-day period; and use of life-sustaining treatments over a 60-day period.

RESULTS: Residents with POLST forms were more likely to have orders about life-sustaining treatment preferences beyond cardiopulmonary resuscitation than residents without (98.0% vs 16.1%, $P < .001$). There were no differences between residents with and without POLST forms in symptom assessment or management. Residents with POLST forms indicating orders for comfort measures only were less likely to receive medical interventions (e.g., hospitalization) than residents with POLST full treatment orders ($P = .004$), residents with traditional do-not-resuscitate orders ($P < .001$), or residents with traditional full code orders ($P < .001$).

CONCLUSION: Residents with POLST forms were more likely to have treatment preferences documented as medical orders than those who did not, but there were no differences in symptom management or assessment. POLST orders restricting medical interventions were associated with less use of life-sustaining treatments. Findings suggest that the POLST program offers significant advantages over traditional methods to communicate preferences about life-sustaining treatments. *J Am Geriatr Soc* 58:1241–1248, 2010.

Key words: end-of-life; ethics; nursing facility; do not resuscitate; do not hospitalize

Life-sustaining treatment preferences are traditionally communicated using patient-generated advance directives or medical orders regarding cardiopulmonary resuscitation (CPR) status. Unfortunately, these traditional practices are largely ineffective at altering end-of-life treatments.^{1–4} Patient-generated instructive advance directives (e.g., living wills) are generally unhelpful in the clinical setting because of vague instructions^{1,2,5} and difficulty ascertaining when to act on the expressed preferences.^{6–8} Medical orders regarding CPR status may appear to be more useful but are relevant only for patients in cardiopulmonary arrest. Patients with do-not-resuscitate (DNR) orders are often assumed to prefer less-aggressive care, resulting in limitations on treatment that may not necessarily reflect patient preferences.^{9–11} Advance directives and CPR status orders often fail to take into account a person's specific medical condition and lack an immediate effect on treatment.¹²

The Physician Orders for Life-Sustaining Treatment (POLST) program was developed to overcome the limitations of traditional practices for communicating treatment preferences. It is designed for persons with progressive chronic illness or frailty. The POLST form expands upon CPR status orders to include orders based on preferences

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about a range of life-sustaining treatments. The POLST program was initially developed in Oregon, but its use has spread in the past decade to states including West Virginia and parts of Wisconsin. (See <http://www.polst.org> for a current list of the more than 30 states with active or developing programs.) The name varies according to state (e.g., Physician Orders for Scope of Treatment in West Virginia), but the programs share important elements, including a form with medical orders reflecting preferences about CPR status (Section A), medical interventions including hospitalization (Section B), antibiotics (Section C), and artificial nutrition (Section D) (Figure 1). These orders are recorded on a brightly colored, standardized medical order form that transfers across care settings. Research on the POLST program confirms that it facilitates documentation of a range of treatment preferences^{13,14} and is associated with low rates of unwanted hospitalizations,¹⁴⁻¹⁶ although existing descriptive data come from convenience samples of

POLST users that do not permit direct comparisons with traditional practices and limit generalizability.

A multistate, retrospective observational cohort study was undertaken to compare the POLST program with traditional practices in nursing facilities. Data were collected from Oregon, Wisconsin, and West Virginia to increase variability in the sample. These states have similar versions of the POLST program and use POLST widely enough to generate an adequate sample for statistical comparisons but have different patterns of healthcare utilization in nursing facilities¹⁷ and at the end of life.¹⁸ The first goal of the study was to verify that residents with POLST forms are more likely to have orders reflecting life-sustaining treatment preferences than residents with traditional practices. The second goal was to evaluate whether there were any differences between residents with POLST forms and those with traditional practices in the presence or management of two of the most common symptoms near the end of life: pain

HIPAA PERMITS DISCLOSURE OF POLST TO OTHER HEALTH CARE PROFESSIONALS AS NECESSARY		
Physician Orders for Life-Sustaining Treatment (POLST)		Last Name
First follow these orders, then contact physician or NP. This is a Physician Order Sheet based on the person's medical condition and wishes. Any section not completed implies full treatment for that section. Everyone shall be treated with dignity and respect.		First Name/ Middle Initial
		Date of Birth
A <i>Check One</i>	CARDIOPULMONARY RESUSCITATION(CPR): Person has no pulse and is not breathing. <input type="checkbox"/> Resuscitate/CPR <input type="checkbox"/> Do Not Attempt Resuscitation (DNR/no CPR) When not in cardiopulmonary arrest, follow orders in B, C and D.	
B <i>Check One</i>	MEDICAL INTERVENTIONS: Person has pulse and/or is breathing. <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>Do not transfer to hospital for life-sustaining treatment. Transfer if comfort needs cannot be met in current location.</i> <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. <i>Transfer to hospital if indicated. Avoid intensive care.</i> <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> Additional Orders: _____	
C <i>Check One</i>	ANTIBIOTICS <input type="checkbox"/> No antibiotics. Use other measures to relieve symptoms. <input type="checkbox"/> Determine use or limitation of antibiotics when infection occurs. <input type="checkbox"/> Use antibiotics if life can be prolonged. Additional Orders: _____	
D <i>Check One</i>	ARTIFICIALLY ADMINISTERED NUTRITION: Always offer food by mouth if feasible. <input type="checkbox"/> No artificial nutrition by tube. <input type="checkbox"/> Defined trial period of artificial nutrition by tube. <input type="checkbox"/> Long-term artificial nutrition by tube. Additional Orders: _____	
SUMMARY OF MEDICAL CONDITION AND SIGNATURES		
E	Discussed with: <input type="checkbox"/> Patient <input type="checkbox"/> Parent of Minor <input type="checkbox"/> Health Care Representative <input type="checkbox"/> Court-Appointed Guardian <input type="checkbox"/> Other: _____	Summary of Medical Condition _____
Print Physician/ Nurse Practitioner Name		MD/DO/NP Phone Number
Physician/ NP Signature (mandatory)		Office Use Only
Date		
SEND FORM WITH PERSON WHENEVER TRANSFERRED OR DISCHARGED		

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Figure 1. Oregon Physician Orders for Life-Sustaining Treatment (POLST) form.

and shortness of breath.¹⁹ Although research suggests that residents with POLST forms have higher than expected use of opioids,¹⁶ it is also possible that the presence of a POLST form may negatively affect symptom management. The third goal was to compare the use of life-sustaining treatments for residents with POLST forms with that of residents with traditional practices.

METHODS

The institutional review boards for the protection of human subjects at Oregon Health & Science University, Gunderson Clinic, Ltd. (La Crosse, WI), and West Virginia University reviewed and approved this research.

Procedures

Every licensed nursing facility in each study state ($N = 685$) was contacted by telephone or mail to obtain an estimate of the number of residents with POLST forms (none, less than half, about half, more than half, nearly all, or all). Chart reviews were conducted in nursing facilities in Oregon, Wisconsin, and West Virginia between June 2006 and April 2007. For the chart review, a systematic, stratified random sample of 30 Medicaid- or Medicare-certified nursing facilities was selected in each state for a total of 90 facilities. Telephone survey data were used to categorize POLST program use by facilities as high (about half to all) or low (less than half or none). Facilities were stratified based on POLST program use and location (rural vs urban) based on the U.S. Department of Agriculture's continuum codes.²⁰ Facilities within these categories were also ranked according to the estimated percentage of nonwhite residents based on facility-level Minimum Data Set (MDS) data obtained from the Centers for Medicare and Medicaid Services. Facilities with the highest proportion of nonwhite residents were targeted first for the chart review to help ensure a representative sample of nonwhite residents.

Twenty medical charts were randomly selected at each facility with the goal of obtaining equal numbers of charts for living residents and deceased residents, but additional charts of living residents were used when there were insufficient numbers of charts from eligible deceased residents. Research assistants worked with staff to identify nonwhite residents, and these residents were then proportionally oversampled based on a predetermined sampling plan using random selection. Chart data were abstracted for the 60 days before the date of data collection for living residents and for the 60 days before the date of death for deceased residents. For symptom assessment and management data, data collection was restricted to a 7-day period. For living residents, this represented the week before data collection. For deceased residents, this represented the last week of life. For orders, preferences, and treatments, data were collected from all 60 days. Data were restricted to what was available in the nursing facility medical chart, which sometimes included hospital discharge reports.

Participants

The sample consisted of living and deceased nursing facility residents aged 65 and older. Living residents resided within the facility at the time of data collection with an original admission date of at least 60 days before the date of data

collection. Deceased residents had all died in that setting during the 6 months before the date of data collection and had an original admission of at least 60 days before death.

Data Collection Tools

Data collection focused on demographics; MDS assessments to identify hospice use and calculate cognitive status using the MDS Cognition Scale (MDS-COGS; range 0 = cognitively intact to 10 = severely impaired);²¹ orders regarding CPR, hospitalization, antibiotics, and feeding tube use; symptoms, including the presence of pain (yes/no), the number of days with pain, shortness of breath (yes/no), and the number of days with shortness of breath; symptom management for pain, including the use of any pain medication (yes/no), the use of nonopioids (yes/no), and the average amount of opioid pain medication per day in oral morphine equivalents; symptom management for shortness of breath, including oxygen (yes/no), suctioning (yes/no), and medications such as inhalers or opioids specifically identified as being used to treat shortness of breath (yes/no); use of the life-sustaining treatments identified as likely to be used in this population, organized according to the section of the POLST form addressing each treatment: CPR (Section A); hospitalization or emergency department (ED) visits, intravenous fluids, dialysis, transfusion, surgery or invasive diagnostic tests, chemotherapy or radiation, and intubation or ventilator support (Section B); antibiotics (Section C); and feeding tubes (Section D).

Interrater Reliability

Interrater reliability was assessed throughout data collection. Within each state, research assistants performed two overlapping chart reviews at each site (1 living, 1 deceased), for a total of 60 charts per team. Across states, interrater reliability was assessed by having research assistants review anonymized charts (15 total) at regular intervals throughout the course of data collection.

Data Analysis

Descriptive statistics were computed using SPSS 16.0 (SPSS, Inc., Chicago, IL). Multilevel statistical modeling with HLM 6.0 (Scientific Software International, Inc., Lincolnwood, IL) was used to test for differences in descriptive characteristics between those with and without a POLST form and evaluate whether use of the POLST form was associated with symptom assessment and management or the use of life-sustaining treatments. Multilevel modeling was selected because practice cultures may result in similar care delivery patterns within facilities, and residents within the same facility may be more similar than residents in different facilities. If this "nesting" of residents within facilities is not taken into account, standard errors are biased downward. Multilevel statistical modeling corrects the standard errors by taking the nesting of patients within facilities into account.

The first level of each model contained resident-level variables, including covariates identified in preliminary analyses. Facilities formed the second level of the model. For brevity, residents with POLST forms in their charts are referred to as POLST users and residents with traditional practices (CPR status orders, living wills, or no

documentation reflecting preferences) are referred to as non-POLST users. Non-POLST users were grouped according to code status orders based on evidence suggesting that preferences for CPR are overgeneralized.^{9–11} The symptom assessment and management analysis included residents with the same POLST orders in place for the 7-day review period and non-POLST users. POLST users were compared with non-POLST users on the variables of number of pain days, receipt of any pain medication, nonopioid pain medication, average daily morphine equivalents, number of days with shortness of breath, and any treatment for shortness of breath over a 7-day review period. In addition, multilevel models were performed on a subset of residents with the same orders in place for at least 60 days to assess the effect of orders on the use of relevant life-sustaining treatments. Life-sustaining treatments were grouped together to reflect the scope of orders in each section of the POLST form (Sections A–D—Figure 1). Logistic models were used for binary outcomes and Poisson models for count variables. An alpha level of $P = .01$ was used for all analyses because of multiple comparisons with possibly related dependent variables.

RESULTS

Facility Characteristics

A majority of all facilities (87%) provided data about use of the POLST program, and a majority of those approached (87%) agreed to participate in the chart reviews. There were no differences in facility participation in the telephone survey or chart review based on race, rural versus urban setting, bed size, or proprietary status (nonprofit vs for profit). Chart reviews occurred at 90 nursing facilities that were primarily urban (60%) and proprietary (67%), with an average bed size of 101 beds (range 41–473) and a median nonwhite resident population of 4.1% (range 0–67%).

Interrater Reliability

The within-state interrater agreement ranged between 89% (charts of deceased residents) and 95% (charts of living residents), with kappas for 10 key variables ranging from 0.91 to 1.00. Across states, the six-way interrater agreement ranged between 90% (charts of deceased residents) to 95% (charts of living residents), with kappa for 10 key variables ranging from 0.94 to 1.00.

Sample Description

The sample of 1,711 residents had an average age of 84.2 ± 8.2 , MDS-COGS score of 4.9 ± 2.9 , and length of stay of 3.2 ± 3.5 years. The majority of the sample was female (69.7%) and white (87.7%). Nonwhite residents were 9.0% African American, 1.3% Asian, 1.3% Hispanic, 0.6% Native American, and 0.1% Native Hawaiian or Pacific Islander. Fewer than half (42.1%) of the residents in the sample were deceased, and 11.0% of the overall sample were enrolled in hospice during at least part of the 60-day review. The residents were evenly distributed across Oregon (32.6%), Wisconsin (33.8%), and West Virginia (33.5%). POLST forms were found more frequently in the charts of residents who were white, in hospice, and deceased (Table 1). Although equal numbers of high- and

Table 1. Characteristics of Residents with and without Physician Orders for Life-Sustaining Treatment (POLST) Forms

Characteristic	With POLST n = 817	Without POLST n = 894	P-Value
Age, mean \pm SD	84.5 \pm 8.3	83.9 \pm 8.2	.25
Minimum Data Set Cognition Scale, mean \pm SD (range 0 (cognitively intact) to 10 (very severe impairment)) ²¹	4.9 \pm 2.9	5.0 \pm 2.9	.75
Length of stay, years, mean \pm SD	3.2 \pm 3.2	3.2 \pm 3.8	.56
Female, n (%)	565 (69.2)	627 (70.1)	.69
White, n (%)	744 (91.1)	757 (84.7)	<.01
Deceased, n (%)	372 (45.5)	349 (39.0)	<.01
Hospice use, n (%)	113 (13.8)	75 (8.4)	<.001

SD = standard deviation.

low-POLST-using facilities were visited in each state, there were differences in the number of residents in the sample who had POLST forms according to state. In Oregon, 57.2% of the charts sampled had POLST forms; in West Virginia, 50.5% had POLST forms; in Wisconsin, where use is primarily regional, 35.9% had POLST forms. A resident or surrogate signature was found on 74.2% of forms. (A resident or surrogate signature is mandatory in West Virginia but optional in Oregon and Wisconsin.)

Orders Reflecting Preferences

By definition, 100% of residents with POLST forms had orders reflecting life-sustaining treatment preferences. Residents with POLST forms were more likely to have standing orders regarding any life-sustaining treatment than non-POLST users (100% vs 87.0%, $P < .001$). When CPR orders were excluded from the analysis, residents with POLST forms had significantly more standing orders reflecting life-sustaining treatment preferences than non-POLST users (98.0% vs 16.1%, $P < .001$). This pattern was consistent for orders reflected by each section of the POLST: Section A—CPR status (100% vs 85.7%, $P < .001$); Section B—medical interventions such as hospitalization (97.4% vs 13.9%, $P < .001$); Section C—antibiotic use (95.7% vs 3.2%, $P < .001$); and Section D—feeding tubes (92.3% vs 6.7%, $P < .001$).

Symptom Management

POLST users and non-POLST users differed in terms of race, life status (living vs deceased), and hospice use, so these variables were included as resident-level covariates in the multilevel modeling (Table 1). Findings indicated there were no differences between POLST users ($n = 817$) and non-POLST users ($n = 894$) using the a priori P -value of $P < .01$ on any of the symptom assessment or management measures. Wide standard deviations were noted for the average daily morphine equivalents, so medians were calculated (POLST = 26.2, non-POLST = 23.3). Additionally, a nonparametric test (Mann-Whitney U) was performed, but the difference between POLST users and non-POLST users

Table 2. Symptom Assessment and Management for Residents with and without Physician Orders for Life-Sustaining Treatment (POLST) Forms

Symptoms and Symptom Management	POLST Users n = 817	Non-POLST Users n = 894	Odds Ratio (95% CI)	Regression Coefficient (95% CI)	P-Value*
Symptoms					
Pain present (% yes) [†]	40.6	35.9	1.15 (0.88–1.50)	—	.31
Number of days of pain, mean ± SD [‡]	1.29 ± 2.07	1.08 ± 1.89	—	1.20 (0.97–1.49)	.09
Shortness of breath present (% yes) [†]	20.6	18.6	0.67 (0.47–0.97)	—	.03
Number of days of shortness of breath, mean ± SD [‡]	0.47 ± 1.21	0.41 ± 1.09	—	0.96 (0.76–1.13)	.70
Symptom management					
Any pain medication (% yes) [†]	79.6	80.9	0.82 (0.59–1.13)	—	.22
Any nonopioid pain medication (% yes) [†]	61.4	66.4	1.23 (0.91–1.67)	—	.17
Daily morphine equivalent, mg, mean ± SD [§]	63.2 ± 164.5	80.6 ± 220.4	—	– 16.14 (– 42.05–9.77)	.23
Any treatments for shortness of breath (% yes) [†]	52.0	41.7	0.79 (0.60–1.04)	—	.09

Race (white vs nonwhite), life status (deceased vs living), and hospice use (yes vs no) were covariates in the analysis. Data reflect documentation of symptoms and symptom management over the last 7 days of life for residents who had died and over the last 7 days of available charting for living residents.

* A priori P-value set at P < .01.

[†] Logistic model.

[‡] Poisson model.

[§] Normal distribution model. Average daily morphine equivalents calculated in those with opioid medication (n = 422 for POLST, n = 406 for non-POLST).

CI = confidence interval; SD = standard deviation.

was still not significant (P = .34). See Table 2 for more information.

Life-Sustaining Treatments

The sample for these analyses eliminated POLST users with changes to their POLST forms during the 60-day review period (n = 45, 6%). For the analysis of each section of the POLST form (Section A–D, Figure 1), the sample is further restricted to include only residents with orders for that section and complete data for relevant covariates.

Section A: Resuscitation

CPR was provided to one POLST user (<0.1%) and four non-POLST users (0.2%). Cell sizes were too small to conduct multilevel modeling to evaluate the effect of orders on treatments.

Section B: Medical Interventions

The frequency of medical interventions for POLST users with Section B orders and non-POLST users (n = 1,606) were as follows (n POLST users/n non-POLST users): hospitalization or ED visit (107/185), intravenous fluids (28/59), dialysis (4/12), transfusion (5/6), surgery or invasive diagnostic tests (1/8), chemotherapy or radiation (0/5), and intubation or ventilator support (0/1).

Multilevel modeling with associated odds ratios (ORs) was performed to evaluate the relationship between orders and treatments for Section B. The model tested the effect of five types of orders on the use of medical interventions addressed by Section B of the POLST form using covariates identified in preliminary analyses: age, cognitive status, race, life status, and hospice (Table 3). The five types of orders were POLST comfort care only (as the reference group: n = 300); POLST limited interventions (n = 335);

Table 3. Characteristics of Residents Based on Section B Orders for Physician Orders for Life-Sustaining Treatment (POLST) Users and Non-POLST Users with Traditional Code Status Orders

Characteristic	POLST Comfort Measures Only n = 300	POLST Limited Additional Interventions n = 335	POLST Full Treatment n = 83	Traditional Do Not Resuscitate n = 626	Traditional Full Code n = 262
Age, mean ± SD	86.0 ± 8.2	84.9 ± 7.9	79.0 ± 8.6*	84.8 ± 7.8	82.0 ± 8.8*
Minimum Data Set Cognition Scale, mean ± SD, (range 0 (cognitively intact) to 10 (very severe impairment)) ²¹	5.5 ± 2.8	4.6 ± 2.97*	3.4 ± 2.6*	5.2 ± 2.9	4.4 ± 2.9*
Length of stay, years, mean ± SD	3.3 ± 3.4	3.0 ± 3.0	2.6 ± 2.5	3.3 ± 3.8	2.9 ± 3.4
Female, n (%)	210 (70.0)	238 (71.0)	55 (66.3)	455 (72.7)	170 (64.9)
White, n (%)	279 (93.0)	316 (94.3)	59 (71.1)*	555 (88.7)*	197 (75.2)*
Deceased, n (%)	160 (53.3)	127 (37.9)*	12 (14.5)*	280 (44.7)	63 (24.0)*
Hospice use, n (%)	56 (18.7)	31 (9.3)	2 (2.4)*	65 (10.4)*	10 (3.8)*

* Significantly different from reference group (POLST Comfort Measures Only) at P < .01.

SD = standard deviation.

Table 4. Comparison of Orders and Life-Sustaining Treatments Addressed by Section B of the Physician Orders for Life-Sustaining Treatment (POLST) Form for POLST Users and POLST Non-Users with Traditional Code Status Orders*

Medical Order	N	Receiving Life-Sustaining Treatment, %	Odds Ratio (95% Confidence Interval)	P-Value [†]
POLST comfort only	300	13.7	1.00 (Reference group)	—
POLST limited interventions	335	18.8	1.73 (1.06–2.83)	.03
POLST full treatment	83	22.9	3.03 (1.45–6.34)	<.01
Traditional do-not-resuscitate order	626	25.9	2.44 (1.56–3.79)	<.001
Traditional full code	262	24.4	3.40 (1.98–5.85)	<.001

Age, cognitive status (Minimum Data Set Cognition Scale),²¹ race (white vs nonwhite), life status (living vs deceased), and hospice use (hospice vs no hospice) were included as covariates in the analysis. Data reflect chart documentation of orders and the use of life-sustaining treatment in place for the last 60 days of life for residents who died and for the last 60 days of available charting for living residents.

*The following life-sustaining treatments are included in this analysis: hospitalization or emergency department visits, intravenous fluids, dialysis, transfusion, surgery or invasive diagnostic tests, chemotherapy, radiation, and intubation or ventilator support.

[†]A priori P-value set at <.01.

POLST full treatment (n = 83); traditional DNR (n = 626); and traditional full code (includes default full code orders, n = 262). Results indicated that residents with POLST comfort care only orders were 42% less likely to receive life-sustaining medical interventions than residents with POLST limited interventions ($P = .03$) and 67% less likely to receive life-sustaining medical interventions than residents with POLST full treatment orders ($P = .004$). Similarly, residents with POLST comfort care only orders were 59% less likely to receive life-sustaining treatments than residents with traditional DNR orders ($P < .001$) and 71% less likely than residents with traditional full code orders ($P < .001$) (Table 4). Post hoc analyses found no differences in the use of medical interventions between residents with POLST full treatment orders and those with traditional full code orders (OR = 1.25, 95% confidence interval (CI) = 0.61–2.28, $P = .54$). Similarly, there were no differences in the use of medical interventions between residents with traditional DNR orders and those with traditional full code orders (OR = 1.40, 95% CI = 0.91–2.14, $P = .12$).

Section C: Antibiotics

Multilevel modeling with associated ORs was also performed to evaluate the relationship between orders and treatments for Section C. Antibiotics were provided to 250 POLST users with Section C orders (35%) and 349 non-POLST users (39%).

The model tested the effect of POLST Section C and traditional practices on the use of antibiotics: POLST no antibiotics (n = 28), POLST no antibiotics except for comfort and no invasive antibiotics (n = 227), POLST full treatment (as the reference group: n = 454), traditional DNR (n = 626), and traditional full code (n = 259). Because the five groups differed in terms of age, cognitive status, race, life status, and hospice, these variables were included as resident-level covariates. Multilevel modeling found that there were no differences between these five groups in the use of antibiotics. The overall percentage of residents receiving antibiotics ranged from 32.1% to 41.7% regardless of the orders in Section C of the POLST form or code status.

Section D: Artificial Nutrition

Feeding tubes were used for 25 POLST users (3.4%) and 62 non-POLST users (6.9%). Cell sizes were too small to conduct multilevel modeling to evaluate the effect of orders on treatments.

DISCUSSION

Traditional practices for documenting and communicating end-of-life treatment preferences beyond CPR have generally not been found to be helpful in making treatment decisions at the bedside and do not alter care,⁴ but the findings from this multistate chart review study suggest that the POLST program may make a difference. Nursing facility residents with POLST forms have more medical orders reflecting treatment preferences about CPR and other interventions than residents without POLST forms, suggesting more consistency in the generation of such orders than is seen with traditional practices. POLST form use alone did not affect symptom frequency or management, suggesting comparable attention to comfort in both groups. More importantly, residents with POLST forms reflecting preferences for comfort measures only in Section B were significantly less likely to receive life-sustaining medical interventions (13.7%) than residents with POLST full treatment orders (22.9%), traditional DNR orders (25.9%), or traditional full code orders (24.4%).

This is the first study to compare the use of the POLST program with traditional practices. The POLST program's association with less use of unwanted life-sustaining treatments in a large, geographically disparate sample is unprecedented. Although a few studies have suggested that the systematic implementation of clinically designed advance care planning programs can result in end-of-life treatments that honor patient preferences in nursing facilities within the same community,^{22,23} most efforts undertaken to ensure that end-of-life treatments are consistent with patient preferences do not succeed.^{4,24} The POLST program is built upon a coordinated system of care across treatment settings that includes emergency services, hospitals, primary care practices, hospices, and nursing facilities and relies on standardized, specific orders for a range of treatments, which

makes the POLST program unique and may explain its apparent success.^{2,25}

POLST form orders were most highly associated with differences in the use of life-sustaining medical interventions addressed by Section B of the POLST form. In this sample, these medical interventions primarily consisted of hospitalization and ED visits. Research suggests that the unwanted and potentially nonbeneficial hospitalization of nursing facility residents is a common but often preventable event that carries significant risks for these individuals, who are susceptible to hospital-acquired infections and other adverse outcomes.²⁶ Specific do-not-hospitalize orders, similar to the types of orders found on the POLST form, are associated with less hospitalization of nursing home residents but are rarely used.^{27–29} Only 14% of non-POLST users in this sample had orders reflecting preferences about hospitalization, compared with 97% of POLST users, and most POLST forms reflected a preference to restrict hospitalization or decline intensive care unit (ICU) care. The POLST form offers an advantage over traditional do-not-hospitalize orders, because it includes orders for hospitalization when comfort needs cannot be met in the current care setting and also allows for hospitalization while opting out of more-aggressive ICU care. Residents with POLST forms who desired full treatment received the same level of treatment as residents without POLST forms.

In contrast, POLST orders were not associated with the use of antibiotics, despite specific orders addressing antibiotic use in Section C. These findings suggest that the use of standing orders to prospectively make decisions about antibiotics may be an ineffective strategy, perhaps because there is substantial variability in interpretation of when antibiotics should be used to enhance comfort.³⁰ Further research is needed to determine the value of standing orders regarding antibiotic use and factors that may influence decisions regarding the use of medications to treat infections near the end of life.

There were differences in the use of the POLST form by nonwhite residents, a majority of whom were African American. Nonwhite residents were less likely to have a POLST form than white residents, and the orders on these forms reflected a preference for more-aggressive interventions in Section B. This is consistent with prior research that has found that healthcare providers engage in fewer discussions about possible treatment restrictions with nonwhite residents and family members than with white residents³¹ and that nonwhite nursing home residents are less likely to have advance directives or DNR orders than white residents.^{32,33} The study findings also demonstrate the flexibility of the POLST form as a tool to facilitate preferences to both elect and decline life-sustaining treatments.

Limitations

This sample consisted of long-term stay residents (≥ 60 days) with no changes in their POLST forms during the review period, so findings may not apply to residents with shorter lengths of stay or more frequently rewritten POLST orders. Many factors may influence whether a facility uses the POLST program or whether a specific resident has a POLST form, and not all these factors could be accounted for in the analysis. It is also possible that adherence to

preferences to limit hospitalization is not as high as the findings suggest, because residents discharged to the hospital without readmission were excluded from this sample, and the chart abstraction method yielded limited information about treatments provided outside the nursing facility setting. The reliance on nursing facility records may also result in an underrepresentation of residents with orders for more-aggressive interventions who died after transfer to the hospital. Challenges in interpreting the wide variety of state- and facility-specific advance directives led to a decision to group non-POLST users according to CPR status only and forgo analysis by advance directive use. It is unclear whether and to what extent advance directives guided treatment decisions in either group, although the methodological challenges faced in using advance directives in the analyses mirrors criticisms of their clinical utility.^{1,2,5} Finally, it was not possible to analyze the association between POLST orders and the use of CPR or feeding tubes because of their infrequent use in this sample.

Directions for Future Research

These findings raise several questions about the POLST program that merit further investigation. First, although a majority of POLST forms contained resident or surrogate signatures, additional data are needed to confirm that the orders on the POLST form are reflective of resident treatment preferences, as has been suggested by previous pilot research.³⁴ Second, it is unclear how the POLST program is used outside of the nursing facility and hospice setting.¹⁴ Future research should focus on tracking individuals with POLST forms throughout the system of care, which would capture short-term and rehabilitation nursing facility residents as well as individuals within hospital and community settings.

CONCLUSION

Residents with POLST forms were more likely to have treatment preferences documented as medical orders than residents with traditional practices, and POLST orders restricting medical interventions were associated with the lower use of life-sustaining treatments such as hospitalization and intravenous fluids. There was no relationship between symptoms or symptom management and use of POLST program. Study findings suggest use of the POLST program offers significant advantages over traditional methods to communicate treatment preferences in the nursing facility setting.

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